COLORADO WATER CONSERVATION BOARD

WATER SUPPLY RESERVE ACCOUNT APPLICATION FORM

Grace and Shehi Diversion Rehabilitation Project (Phase I & II - Alternatives Evaluation & Detailed Design)

Name of Water Activity/Project

Grace and Shehi Ditch Owner Mr. William Grange
(See Part I.)

Name of Applicant

Colorado River Basin Roundtable

Amount from Statewide Account: $0

Amount from Basin Account(s): ~~$54,000~~

Total WSRA Funds Requested: ~~$54,000~~

Approving Basin Roundtable(s)
(If multiple basins specify amounts in parentheses.)

Application Content

Required Exhibits

A. Statement of Work, Budget, and Schedule
B. Project Map
C. As Needed (i.e. letters of support, photos, maps, etc.)

Appendices – Reference Material

1. Program Information
2. Insurance Requirements
3. WSRA Standard Contract Information (Required for Projects Over $100,000)
4. W-9 Form (Required for All Projects Prior to Contracting)

Instructions

To receive funding from the Water Supply Reserve Account (WSRA), a proposed water activity must be approved by the local Basin Roundtable **AND** the Colorado Water Conservation Board (CWCB). The process for Basin Roundtable consideration and approval is outlined in materials in Appendix 1.

Once approved by the local Basin Roundtable, the applicant should submit this application **with a detailed statement of work including budget and schedule as Exhibit A** to CWCB staff by the application deadline.

WSRA applications are due with the roundtable letter of support 60 calendar days prior to the bi-monthly Board meeting at which it will be considered. Board meetings are held in January, March, May, July, September, and November. Meeting details, including scheduled dates, agendas, etc. are posted on the CWCB website at: http://cwcb.state.co.us Applications to the WSRA Basin Account are considered at every board meeting, while applications to the WSRA Statewide Account are only considered at the March and September board meetings.

When completing this application, the applicant should refer to the WSRA Criteria and Guidelines available at: http://cwcb.state.co.us/LoansGrants/water-supply-reserve-account-grants/Documents/WSRACriteriaGuidelines.pdf

The application, statement of work, budget, and schedule **must be submitted in electronic format** (Microsoft Word or text-enabled PDF are preferred) and can be emailed or mailed on a disk to:

Greg Johnson – WSRA Application
Colorado Water Conservation Board
1580 Logan Street, Suite 200
Denver, CO 80203
gregory.johnson@state.co.us

If you have questions or need additional assistance, please contact Greg Johnson at: 303-866-3441 x3249 or gregory.johnson@state.co.us.

Water Supply Reserve Account – Application Form
Revised December 2011

Part I. - Description of the Applicant (Project Sponsor or Owner);

1. Applicant Name(s): Mr. William Grange

Mailing address: Mr. William Grange
408 West Cody Lane
Basalt, CO 81621

Taxpayer ID#: Not Available

Primary Contact: Mr. Louis Meyer Position/Title: Professional Engineer

Email: louism@sgm-inc.com

Phone Numbers: Cell: NA Office: 970-945-1004

Alternate Contact: Ken Ransford Position/Title: Attorney at Law, CPA

Email: kenransford@comcast.net

Phone Numbers: Cell: NA Office: 970-927-1200

2. Eligible entities for WSRA funds include the following. What type of entity is the Applicant?

☐ Public (Government) – municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities and the local entity should be the grant recipient. Federal agencies are eligible, but only if they can make a compelling case for why a local partner cannot be the grant recipient.

☐ Public (Districts) – authorities, Title 32/special districts, (conservancy, conservation, and irrigation districts), and water activity enterprises.

☐ Private Incorporated – mutual ditch companies, homeowners associations, corporations.

☑ Private individuals, partnerships, and sole proprietors are eligible for funding from the Basin Accounts but not for funding from the Statewide Account.

☐ Non-governmental organizations – broadly defined as any organization that is not part of the government.

3. Provide a brief description of your organization

The Grace and Shehi Ditch provides water to eight water owners which are made up of agricultural ranches, a golf course, conservancy district, municipality and school district interests. It is an unincorporated ditch consisting of individual owners with decision-making procedures voted upon based on their decreed amount. Financial obligations are also encumbered based on their decreed amount. Water from the ditch is decreed for irrigation use only. The ditch's water supply is the Roaring Fork River with a total decreed amount of 20.74 cfs. The following eight individuals hold rights to water supplied via the ditch: Roaring Fork Club (2.5 cfs), Mr. William Grange (4.32 cfs), Mr. Reno Cerise (9.1 cfs), Ms. Alice Stott (0.23 cfs), Basalt Water Conservancy District (1.02 cfs), Town of Basalt (1.57 cfs), RE-1 School District (1.5 cfs), Ms. Martha Waterman (0.5 cfs)

4. If the Contracting Entity is different then the Applicant (Project Sponsor or Owner) please describe the Contracting Entity here.

The contracting entities will be Mr. William Grange and Mr. Reno Cerise

5. Successful applicants will have to execute a contract with the CWCB prior to beginning work on the portion of the project funded by the WSRA grant. In order to expedite the contracting process the CWCB has established a standard contract with provisions the applicant must adhere to. A link to this standard contract is included in Appendix 3. Please review this contract and check the appropriate box.

[X] The Applicant will be able to contract with the CWCB using the Standard Contract

[ ] The Applicant has reviewed the standard contract and has some questions/issues/concerns. Please be aware that any deviation from the standard contract could result in a significant delay between grant approval and the funds being available.

6. The Tax Payer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect the applicant.

Not Applicable.

Part II. - Description of the Water Activity/Project

1. What is the primary purpose of this grant application? (Please check only one)

✓	Nonconsumptive (Environmental or Recreational)
✓	Agricultural
	Municipal/Industrial
	Needs Assessment
	Education
	Other Explain:

2. If you feel this project addresses multiple purposes please explain.

See Attachment 1.

3. Is this project primarily a study or implementation of a water activity/project? (Please check only one)

X	Study
	Implementation

4. To catalog measurable results achieved with WSRA funds can you provide any of the following numbers?

	New Storage Created (acre-feet)
	New Annual Water Supplies Developed, Consumptive or Nonconsumptive (acre-feet)
	Existing Storage Preserved or Enhanced (acre-feet)
20 LF	Length of Stream Restored or Protected (linear feet)
5 LF	Length of Pipe/Canal Built or Improved (linear feet)
	Efficiency Savings (acre-feet/year OR dollars/year – **circle one**)
	Area of Restored or Preserved Habitat (acres)
x	Other -- Explain: Cost savings due to regular in-channel maintenance.

4. To help us map WSRA projects please include a map (Exhibit B) and provide the general coordinates below:

Latitude: 39°20'46.82”N Longitude: 107°00'48.57”W

5. Please provide an overview/summary of the proposed water activity (no more than one page). Include a description of the overall water activity and specifically what the WSRA funding will be used for. A full **Statement of Work** with a detailed budget and schedule is required as **Exhibit A** of this application.

The existing diversion structure consists of a cobble berm and head gate. The cobble berm provides hydraulic grade control and extends from the river's west bank linearly into the river's main channel. The head gate is a concrete structure with a sliding gate and downstream vaulted flume. Together, the head gate and flume controls, measures and directs flow into the ditch network. During moderate and low flow seasons, the existing cobble berm is insufficient to bring adequate flows into the ditch. Furthermore, water passage across the cobble berm tends to trap debris and obstruct recreational boat passage and silt build-up has occurred immediately downstream of the berm. The existing head gate is manually operated and provides no automated flow rate adjustment into the ditch. The ditch owners would like to conduct a feasibility analysis of potential options for retrofitting the cobble berm and head gate. The best-fit option would allow for adequate delivery of water into the ditch during variable flow conditions, provide automated adjustment during all flow seasons, provide safe passage for recreational boat traffic and maintain or enhance fish passage in the vicinity of the diversion point. The WSRA funding will be used to conduct feasibility analysis and conceptual-level cost estimate to construct the various options in order to select the best-fit solution (Phase I) and to design and permit the selected alternative (Phase II).

Part III. – Threshold and Evaluation Criteria

1. Describe how the water activity meets these **Threshold Criteria.** (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines.)

   a) The water activity is consistent with Section 37-75-102 Colorado Revised Statutes.[1]

The project does not supersede, abrogate or otherwise impair water rights or the adjudication system because the proposed work simply aims to enhance the accuracy of the existing flow diversion structure while working to improve in-channel characteristics to expand the use of the Roaring Fork River for recreational purposes. All proposed work would be conducted in accordance with the existing local, state and federal laws and procedures.

   b) The water activity underwent an evaluation and approval process and was approved by the Basin Roundtable (BRT) and the application includes a description of the results of the BRTs evaluation and approval of the activity. At a minimum, the description must include the level of agreement reached by the roundtable, including any minority opinion(s) if there was not general agreement for the activity. The description must also include reasons why general agreement was not reached (if it was not), including who opposed the activity and why they opposed it. Note- If this information is included in the letter from the roundtable chair simply reference that letter.

The applicant is soliciting grant funds only from the Colorado Basin Round Table, and evaluation and approval of those funds will be pending the review of this submission. It is anticipated that Colorado BRT review process will be in compliance with this criterion.

[1] 37-75-102. Water rights - protections. (1) It is the policy of the General Assembly that the current system of allocating water within Colorado shall not be superseded, abrogated, or otherwise impaired by this article. Nothing in this article shall be interpreted to repeal or in any manner amend the existing water rights adjudication system. The General Assembly affirms the state constitution's recognition of water rights as a private usufructuary property right, and this article is not intended to restrict the ability of the holder of a water right to use or to dispose of that water right in any manner permitted under Colorado law. (2) The General Assembly affirms the protections for contractual and property rights recognized by the contract and takings protections under the state constitution and related statutes. This article shall not be implemented in any way that would diminish, impair, or cause injury to any property or contractual right created by intergovernmental agreements, contracts, stipulations among parties to water cases, terms and conditions in water decrees, or any other similar document related to the allocation or use of water. This article shall not be construed to supersede, abrogate, or cause injury to vested water rights or decreed conditional water rights. The General Assembly affirms that this article does not impair, limit, or otherwise affect the rights of persons or entities to enter into agreements, contracts, or memoranda of understanding with other persons or entities relating to the appropriation, movement, or use of water under other provisions of law.

c) The water activity meets the provisions of Section 37-75-104(2), Colorado Revised Statutes.[2] The Basin Roundtable Chairs shall include in their approval letters for particular WSRA grant applications a description of how the water activity will assist in meeting the water supply needs identified in the basin roundtable's consumptive and/or non-consumptive needs assessments.

Consumptive needs within the Colorado River Basin have been evaluated as part of the Statewide Water Supply Inititive, evaluating water needs for M&I and SSI. Non-consumptive needs within the Colorado River Basin have been evaluated as part of the BRT's 2010 Non-Consumptive needs assessment. Both documents indicate need for improved efficiency within the existing agricultural-based infrastructure for in-stream flow enhancement. This project works to benefit agricultural water users while improving existing channel characteristics to the benefit of non-consumptive Roaring Fork River water users.
Through evaluation of this application, it is anticipated that Colorado's BRT will approve the project in light of provisions of Section 37-75-104(2). The applicant is not seeking statewide funding for which approval letters would need to be attached prior to developing this submittal.

d) Matching Requirement: For requests from the **Statewide Fund**, the applicants is required to demonstrate a **20 percent** (or greater) match of the request from the Statewide Account. Statewide requests must also include a minimum match of **5 percent** of the total grant amount from Basin Funds. Sources of matching funds include but are not limited to Basin Funds, in-kind services, funding from other sources, and/or direct cash match. Past expenditures directly related to the project may be considered as matching funds if the expenditures occurred within 9 months of the date the application was submitted to the CWCB. Please describe the source(s) of matching funds. (NOTE: These matching funds should also be reflected in your Detailed Budget in **Exhibit A** of this application)

This applicant is soliciting funds from the BRT only. The applicant proposes a 5% direct cash match to be put towards the total project cost.

[2] 37-75-104 (2)(c). Using data and information from the Statewide Water Supply Initiative and other appropriate sources and in cooperation with the on-going Statewide Water Supply Initiative, develop a basin-wide consumptive and nonconsumptive water supply needs assessment, conduct an analysis of available unappropriated waters within the basin, and propose projects or methods, both structural and nonstructural, for meeting those needs and utilizing those unappropriated waters where appropriate. Basin Roundtables shall actively seek the input and advice of affected local governments, water providers, and other interested stakeholders and persons in establishing its needs assessment, and shall propose projects or methods for meeting those needs. Recommendations from this assessment shall be forwarded to the Interbasin Compact Committee and other basin roundtables for analysis and consideration after the General Assembly has approved the Interbasin Compact Charter.

2. For Applications that include a request for funds from the **Statewide Account**, describe how the water activity/project meets all applicable **Evaluation Criteria.** (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines and repeated below.) Projects will be assessed on how well they meet the Evaluation Criteria. **Please attach additional pages as necessary.**

Evaluation Criteria – the following criteria will be utilized to further evaluate the merits of the water activity proposed for funding from the Statewide Account. In evaluation of proposed water activities, preference will be given to projects that meet one or more criteria from each of the three "tiers" or categories. Each "tier" is grouped in level of importance. For instance, projects that meet Tier 1 criteria will outweigh projects that only meet Tier 3 criteria. WSRA grant requests for projects that may qualify for loans through the CWCB loan program will receive preference in the Statewide Evaluation Criteria if the grant request is part of a CWCB loan/WSRA grant package. For these CWCB loan/WSRA grant packages, the applicant must have a CWCB loan/WSRA grant ratio of 1:1 or higher. Preference will be given to those with a higher loan/grant ratio.

Tier 1: Promoting Collaboration/Cooperation and Meeting Water Management Goals and Identified Water Needs

a. The water activity addresses multiple needs or issues, including consumptive and/or non-consumptive needs, or the needs and issues of multiple interests or multiple basins. This can be demonstrated by obtaining letters of support from other basin roundtables (in addition to an approval letter from the sponsoring basin).
b. The number and types of entities represented in the application and the degree to which the activity will promote cooperation and collaboration among traditional consumptive water interests and/or non-consumptive interests, and if applicable, the degree to which the water activity is effective in addressing intrabasin or interbasin needs or issues.
c. The water activity helps implement projects and processes identified as helping meet Colorado's future water needs, and/or addresses the gap areas between available water supply and future need as identified in SWSI or a roundtable's basin-wide water needs assessment.

Tier 2: Facilitating Water Activity Implementation

d. Funding from this Account will reduce the uncertainty that the water activity will be implemented. For this criterion the applicant should discuss how receiving funding from the Account will make a significant difference in the implementation of the water activity (i.e., how will receiving funding enable the water activity to move forward or the inability obtaining funding elsewhere).
e. The amount of matching funds provided by the applicant via direct contributions, demonstrable in-kind contributions, and/or other sources demonstrates a significant & appropriate commitment to the project.

Tier 3: The Water Activity Addresses Other Issues of Statewide Value and Maximizes Benefits

f. The water activity helps sustain agriculture & open space, or meets environmental or recreational needs.
g. The water activity assists in the administration of compact-entitled waters or addresses problems related to compact entitled waters and compact compliance and the degree to which the activity promotes maximum utilization of state waters.
h. The water activity assists in the recovery of threatened and endangered wildlife species or Colorado State species of concern.
i. The water activity provides a high level of benefit to Colorado in relationship to the amount of funds requested.
j. The water activity is complimentary to or assists in the implementation of other CWCB programs.

Continued: Explanation of how the water activity/project meets all applicable **Evaluation Criteria**.
Please attach additional pages as necessary.

This applicant is not requesting funds from the Statewide Account.

Part IV. – Required Supporting Material

1. **Water Rights, Availability, and Sustainability** – This information is needed to assess the viability of the water project or activity. Please provide a description of the water supply source to be utilized, or the water body to be affected by, the water activity. This should include a description of applicable water rights, and water rights issues, and the name/location of water bodies affected by the water activity.

The Grace and Shehi Ditch is a surface-water diversion (Structure ID 715) that draws water from The Roaring Fork River, a tributary to the Colorado River. It is located in Division 5 (Colorado River Basin), sub-district 38 (Roaring Fork River Basin). The ditch's total decreed amount is 20.74 CFS. The ditch's senior water rights were adjudicated in 1889.

2. Please provide a brief narrative of any related studies or permitting issues.

See Attachment 2.

3. Statement of Work, Detailed Budget, and Project Schedule

The statement of work will form the basis for the contract between the Applicant and the State of Colorado. In short, the Applicant is agreeing to undertake the work for the compensation outlined in the statement of work and budget, and in return, the State of Colorado is receiving the deliverables/products specified. **Please note that costs incurred prior to execution of a contract or purchase order are not subject to reimbursement**. All WSRA funds are disbursed on a reimbursement basis after review invoices and appropriate backup material.

Please provide a detailed statement of work using the template in Exhibit A. Additional sections or modifications may be included as necessary. Please define all acronyms and include page numbers.

See Exhibit A-1 Statement of Work, Exhibit A-2 Detailed Budget and Exhibit A-3 Project Schedule

REPORTING AND FINAL DELIVERABLE

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

PAYMENT

Payment will be made based on actual expenditures and invoicing by the applicant. Invoices from any other entity (i.e. subcontractors) cannot be processed by the State. The request for payment must include a description of the work accomplished by major task, and estimate of the percent completion for individual tasks and the entire water activity in relation to the percentage of budget spent, identification of any major issues and proposed or implemented corrective actions. The last 5 percent of the entire water activity budget will be withheld until final project/water activity documentation is completed. All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and help promote the development of a common technical platform.

The above statements are true to the best of my knowledge:

Signature of Applicant: William Grange

Print Applicant's Name: WILLIAM GRANGE

Project Title: Grace and Shehi Diversion Rehabilitation Project (Phase I & II - Alternatives Evaluation & Detailed Design)

Return an electronic version (hardcopy may also be submitted) of this application to:

Greg Johnson – WSRA Application
Colorado Water Conservation Board
1580 Logan Street, Suite 200
Denver, CO 80203
gregory.johnson@state.co.us

Attachment 1.

Part II.

2. <u>If you feel this project addresses multiple purposes please explain.</u>

   The project involves feasibility analysis, to assess potential design and conceptual-level costs to rehabilitate the existing diversion structure, as well as detailed design and permitting of the best-fit alternatives. This part of the Project (Phase I and II) will be followed by construction and implementation (Phase III) of two elements to the Grace and Shehi Ditch diversion structure located on the Roaring Fork River.

   Phase I and II will aim to identify and technically design best-fit solutions for two elements of the diversion structure:

   The first of the two elements, the ditch's existing grade control structure, is a linear cobble berm that crosses the majority of the river channel. During moderate and low flow seasons, the existing cobble berm is insufficient to bring adequate flows into the ditch. Furthermore, water passage across the cobble berm tends to trap debris and obstruct recreational boat passage and silt build-up has occurred immediately downstream of the berm. Rehabilitation of this berm will improve non-consumptive use of Roaring Fork River channel for recreational purposes.

   The second element is that of the head gate and flow measurement flume. The existing head gate is manually operated and provides no automated flow rate adjustment into the ditch. The ditch owners would like to conduct a feasibility analysis of potential options for retrofitting the head gate. Improvements to or replacement of the gate will allow ditch users to improve delivery reliability and to easily make adjustments based on stream flow conditions. Delivery reliability improvements to the head gate and flow measurement flume would act as a benefit to the agricultural-decreed ditch water owners.

   Overall benefits will improve ditch delivery reliability, enhance flexibility for flow adjustment into the ditch based on stream flow conditions while also providing improved boat passage and limiting bank erosion.

Attachment 2.

Part IV. Required Supporting Material

2. Please provide a brief narrative of any related studies or permitting issues.
   To date, no previous studies have been conducted on the grade control structure or the head gate and flow measurement flume.

   Permit requirements for this proposed project are detailed in the Statement of Work and include, Army Corps of Engineer (ACE) Nationwide 33 Permit, CDPHE 401 Certification and Pitkin County Floodplain Permit, at a minimum. In addition, as part of the permit process for the agencies listed above, coordination will likely be required with the Colorado State Engineer through the local Division of Water Resources (DWR) as well as with the Colorado Parks and Wildlife.

   ACE Nationwide 33 Permit:
   While maintenance to the ditch and head gate qualify for agricultural exemption, construction requirements for improvements to the cobble berm grade control structure, including temporary installation of coffer dam and construction de-watering result in the need to obtain an ACE Nationwide 33 Permit.

   CDPHE 401 Certification:
   Certification from CDPHE will be needed to comply with ACE Nationwide Permit. This certification includes provisions for design and construction that will maintain water quality in the river throughout the duration of the project.

   Pitkin County Floodplain Permit:
   Because of work that will be conducted within the floodplain for the Roaring Fork River, floodplain permitting will be required. The local permitting authority is Pitkin County.

   Additional Agency Coordination:
   Agency coordination is expected to be needed with State Engineer's local Division of Water Resources office to verify the design meets the needs of the local water commissioner.

   The project is not located in the Gold Medal waters of the Roaring Fork River. However, through Pitkin County Floodplain Permitting and ACE Permitting, design coordination (such as regarding use of grout) as well as scheduling requirements (such as impact of construction on fish spawning season) will likely be needed with Colorado Parks and Wildlife.

Exhibit A.

Part IV.

3. Statement of Work, Detailed Budget, and Project Schedule.

   Exhibit A-1 Statement of Work
   Exhibit A-2 Detailed Budget
   Exhibit A-3 Project Schedule

Exhibit A-1. Statement of Work

Part IV. Required Supporting Material

3. Statement of Work, Detailed Budget, and Project Schedule

Statement of Work for Grace and Shehi Ditch Intake Restoration

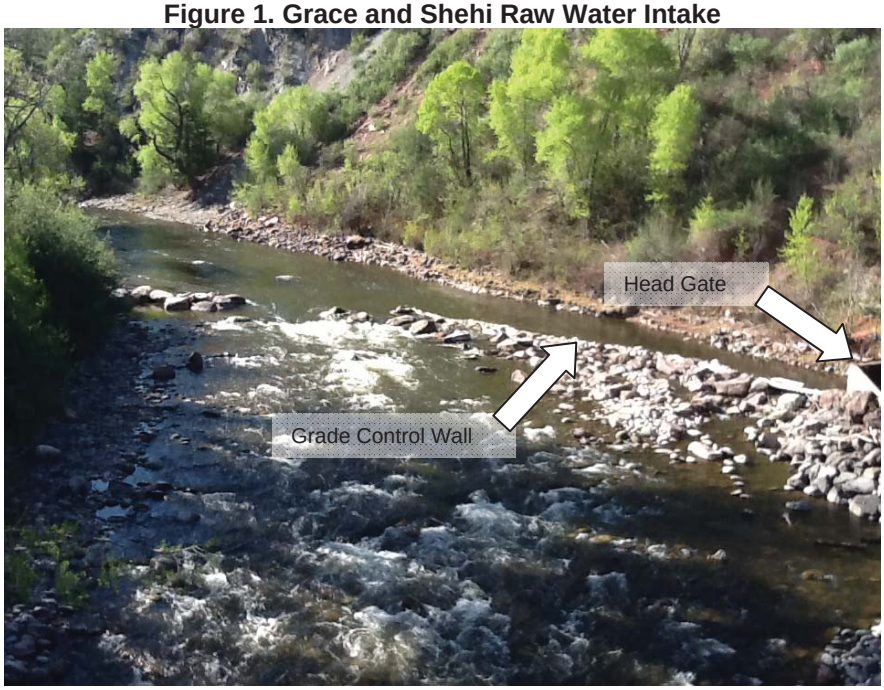
This document presents the proposed Statement of Work for preliminary evaluation, engineering design and construction of the potential improvements to the Grace and Shehi Ditch raw water intake structure located on the Roaring Fork River.

PROJECT BACKGROUND

The existing raw water intake structure on the Roaring Fork River is located adjacent to Highway 82 at the southeast end of the Roaring Fork Club (Exhibit B).

The existing diversion structure consists of a cobble berm and head gate. The cobble berm provides hydraulic grade control and extends from the river's west bank linearly into the river's main channel (Figure 1). The head gate is a concrete structure with a sliding gate and downstream vaulted flume. Together, the head gate and flume controls, measures and directs flow into the ditch network. During moderate and low flow seasons, the existing cobble berm is insufficient to bring adequate flows into the ditch. Furthermore, water passage across the cobble berm tends to trap debris and obstruct recreational boat passage and silt build-up has occurred immediately downstream of the berm. The existing head gate is manually operated and provides no automated flow rate adjustment into the ditch. The ditch owners would like to conduct a feasibility analysis of potential options for retrofitting the cobble berm and head gate. The best-fit option would allow for adequate delivery of water into the ditch during variable flow conditions, provide automated adjustment during all flow seasons, provide safe passage for recreational boat traffic and maintain or enhance fish passage in the vicinity of the diversion point. The WSRA funding will be used to conduct feasibility analysis and conceptual-level cost estimate to construct the various options in order to select the best-fit solution (Phase I) and to design and permit the selected alternative (Phase II). Additional construction phase (Phase III) will be needed to construction the best-fit solution.

Figure 1. Grace and Shehi Raw Water Intake



PROJECT GOALS

The overall goal of the project is to identify a solution for improving diversion flow management while simultaneously restoring recreational boat and fish passage in the Roaring Fork River. A best-fit solution will achieve the following:

- Reliable delivery of Grace and Shehi Ditch's allocated water
- Maximize the operational convenience and flexibility
- Be cost-effective
- Be technically appropriate
- Maintain or enhance the existing natural viewshed of the River at the point of diversion
- Minimize debris buildup within the Roaring Fork River channel in the vicinity of the diversion
- Provide recreation boat passage in the vicinity of the diversion
- Minimize sediment erosion within the main channel as well as near the diversion
- Facilitate fish passage in the vicinity of the structure

PROJECT APPROACH AND PHASING

The project approach will be organized into three phases. The following generally describes the anticipated work to be conducted as part of each Phase. This grant application request is made for Phases I and II. Costs and potential impacts associated with Phase III depend on decisions made in Phase I and II; the applicant will submit a separate grant request for Phase III upon completion of Phases I and II.

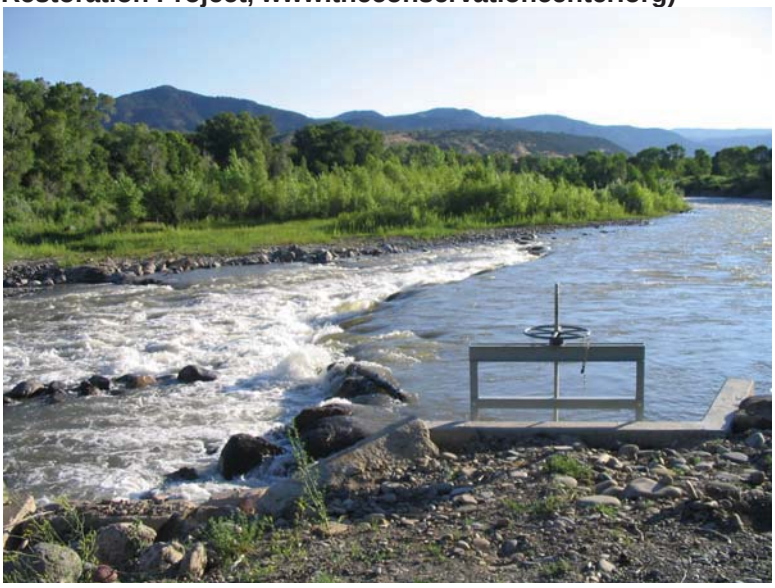
Phase I

Phase I is an alternatives evaluation and development of a conceptual design. Preliminary improvement recommendations have been proposed that include a cross-vane grade control berm (Rosgen Structure) and Rubicon FlumeGate™ at the head gate. Alternatives will be evaluated based on the following criteria: (1) ability to meet project goals, (2) cost, (3) ease of construction, (4) visual impact; however, these criteria may be modified, as needed, as the project proceeds. The results of the alternatives evaluation will be summarized in a technical memorandum that will provide the basis for final engineering design.

Alternatives evaluation will be considered based upon improvements to: (1) grade control structure and the (2) head gate (existing manual sluice gate). The following alternatives are anticipated to be evaluated for the Grade Control (GC) berm:

GC1. **Rehabilitate Existing Linear Cobble Berm** – It is not uncommon for grade control walls made of natural, non-fixed materials, such as this one, to require annual maintenance. If such maintenance does not occurred regularly, rehabilitation of the existing linear cobble wall might represent the most cost effective solution. While the linear wall, as it functions currently, does not satisfy the all of the identified goals, rehabilitation of the existing wall, including installation of a pre-formed scour pit and low-flow channel, could address some of its shortfalls (Figure 2).

Figure 2. Successfully Rehabilitated Linear Grade Control Wall (NFRIA-WSERC Conservation Center, North Fork of the Gunnison River Restoration Project, www.theconservationcenter.org)

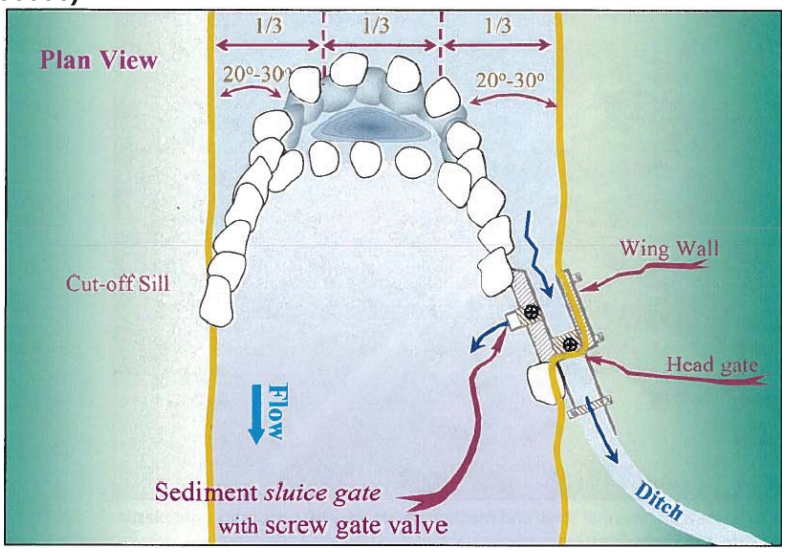


GC2. **Concrete Drop Structure** – Concrete grade control structures are commonly used and have been proven to provide the grade-control function needed here. Furthermore, well-designed and properly-installed concrete drop structures are sturdy and are capable of withstanding many of the variable flow regimes that can occur in natural river channels without shifting or settling. Such a structure would likely include engineered scour pit for erosion control and low-flow channel for boat passage.

The technical need for Single- or Series-Sill Rosgen structures should be determined, based on the river's slope in the vicinity of the diversion structure, as part of Phase I.

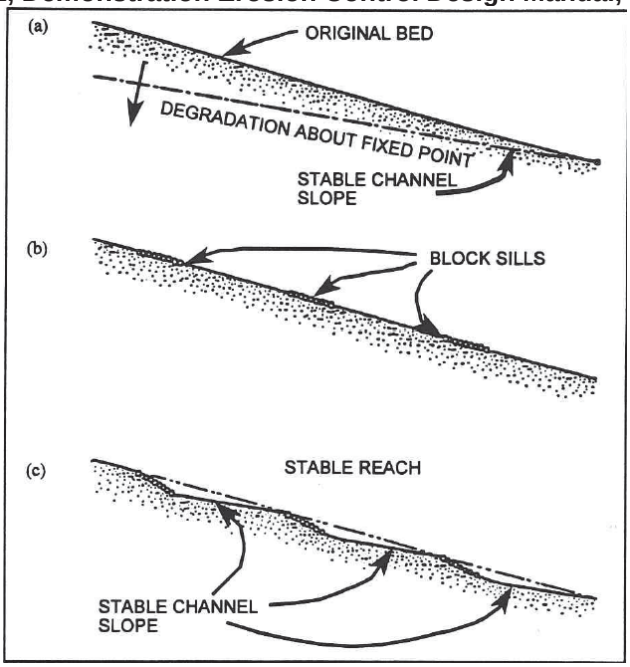
GC3. **Single-Sill Rosgen Structure** - The Single-Sill Rosgen wall has been proposed as an alternative to the existing wall's configuration. The U-shaped wall is constructed, primarily, of rock. The shape of the wall directs the majority of the river's water towards the center of the channel while providing grade control on the river's two banks. Properly spaced boulders in the center of the wall would allow recreational boat passage and minimize debris buildup. The wall would also include a secondary, downstream barrier that would contain scour and minimize erosion (Figure 3).

Figure 3. Single-Sill Rosgen Structure Conceptual Drawing (St.Jude's CRCP 26(a)(2), Dave Rosgen, 2nd Supp Disclosures, 10/19/2010, 000006)



GC4. **Series Sill Rosgen Structure** – Multiple sills, in series could be needed if the channel characteristics are such that bed erosion will occur that would cause functionality of the Single-Sill to decrease structure over time. In addition, fish passage across the structure will also dictate the need for Series vs. a Single-Sill (Figure 4).

Figure 4. Series-Sill Structures for Bed Stabilization
(USACE, Demonstration Erosion Control Design Manual, 1999)



The following alternatives will be evaluated for improving water delivery reliability (DR):

DR1. **Rubicon FlumeGate™** – Rubicon FlumeGate™ is proprietary, mechanical head gate equipment used to measure and control the amount of water that passes from the river into the irrigation ditch. This equipment is capable of reading and recording flow rate and adjusting the amount of water passage as upstream hydraulic parameters change. Such a gate would allow ditch owners to divert an accurate a defined amount of water and easily make adjustment to modify the inflow rate as needed (Figure 5).

Figure 5. Rubicon FlumeGate (TM) (www.rubicon.com)

DR2. **Automated Sluice Gate (Rubicon SlipMeter™ or Watch Technologies "Smart Sluice")** – The Grace and Shehi Ditch's existing head gate is an industry standard manual sluice-type weir gate with a horizontal barrier that opens from the bottom up with a hand-wheel operated, vertical slide feature to adjust flow rate. Several technologies exist that build on this design by incorporating SCADA programming functionality into the gate's flow control ability, including Watch Technologies "Smart Sluice," and Rubicon SlipMeter™. The slide gate is fit with an electronic actuator (which can be solar-powered if needed), that automatically adjusts the position of the gate to adjust flow. While Rubicon SlipMeters™ incorporate flow measurement into their equipment, a Watch Technologies' Smart Sluice would require retrofit with an ultrasonic recorder to deliver flow data to the Smart Sluice for automated adjustment (Figure 6).

Figure 6. Automated Sluice Gate Alternatives: Rubicon SlipMeter(TM) (http://rubicon.com.au) and Watch Technologies "Smart Sluice" (www.watchtechnologies.com)

DR3. **Aqua Systems 2000 Langemann® Gates** – Langemann® Gates are automatically controlled and use a central-hinged gate design to adjust flow across the structure. As with the "Smart Sluice" this gate technology does not incorporate flow measurement. Therefore, the alternative would require retrofit of an ultrasonic flow meter into the existing flow measurement vault (Figure 7).

Figure 7. Aqua Systems 2000 Langemann(R) Gates (www.as2i.net)

Phase II

Phase II will include the detailed engineering design based on the objectively-selected design alternatives selected as part of Phase I. Phase II will deliver completed construction documents, including plan drawings as well as project specification book and contractor bid documents, if needed. Agency coordination will also occur as part of this Phase. Anticipated permit requirements include Pitkin County Floodplain Permit and Army Corps of Engineer Nationwide 33 Permit and CDPHE 401 Certification. In addition, if the ditch's flow-measurement device changes, coordination with the State Engineer's local Division of Water Resources office will also be necessary in the form of design review. Finally, the project will likely require additional coordination with Colorado Parks and Wildlife.

Phase III

Phase III will include construction of the engineered solution. Cost of this phase will cover bid process contractor selection and coordination of contract documents, material purchase, contractor labor and equipment cost for material installation and engineer observation services. Phase III is not included in this grant request as it depends on decisions made throughout Phases I and II.

PROPOSED SCOPE FOR PHASES I AND II

Task 01 – Project Management/Meetings/Site Visits

The objective of Task 01 is to provide for the necessary communications and coordination to support efficient, effective, and timely project execution. A preliminary meeting will be held with ditch-owners and ditch-owner representatives to discuss the proposed project goals and determine which (if any) are of higher priority than others, as well as to discuss project goals, funding obligations, schedule verification, and other preliminary elements that will set the stage for the work to precede. A preliminary site visit will be held to establish operating conditions. In addition, an internal project kickoff meeting will be held to incorporate input from a variety of technical expertise. Other project management tasks will include monthly project budget and schedule checks and review invoices, communicate with ditch owner representatives, as needed, on project progress, etc., and internal coordination and communication.

Task 02 – Conduct Phase I Alternatives Evaluation

The objective of Task 02 is to evaluate the proposed alternatives for Grade Control Structures and for Delivery Reliability Improvements and determine best-fit solution for this location. For each of the two elements (Grade Control Structure and Delivery Reliability Improvements), the four proposed options will be evaluated for planning-level cost, and technical applicability. Each alternative will then be ranked based on their ability to achieve the approved overall project goals:

- Reliable delivery of Grace and Shehi Ditch's allocated water
- Maximize the operational convenience and flexibility
- Be cost-effective
- Be technically appropriate
- Maintain or enhance the existing natural viewshed of the river at the point of diversion

- Minimize debris buildup within the Roaring Fork River channel in the vicinity of the diversion
- Provide recreation boat passage in the vicinity of the diversion
- Minimize sediment erosion within the main channel as well as near the diversion
- Facilitate fish passage in the vicinity of the structure

This evaluation will provide the basis for alternative selection. Evaluation results will be summarized in a technical memorandum. A DRAFT memorandum will be distributed to the ditch-owners and ditch-owner representatives and a meeting will be held to discuss feedback and comments to the alternatives selected and to the selection process. At that time, a final memorandum will be completed.

Task 03 – Conduct Phase II Detailed Design

The objective of Task 03 is to implement conceptual design decisions made in Task 02 through detailed technical design. This task will begin by collecting topographic survey of the existing conditions and creation of an AutoCAD base map.

This phase will also include agency coordination and obtaining necessary permits. Anticipated permit requirements/considerations for the proposed project include:

- Floodplain permit through Pitkin County, including HEC-RAS modeling.
- ACE Nationwide 33 permit.
- CDPHE 401 certification.

In addition, agency coordination is expected to be needed with throughout duration of design and construction of this project. The following agencies have been identified:

- State Engineer's local Division of Water Resources office. The local office is located in Glenwood Springs. Office representatives indicate that they will accept flows from measurement technology alternatives identified in this scope of work; however, a meeting with the local water commissioner is recommended to verify that the design incorporates accessibility requirements.

- Colorado Parks and Wildlife. Design considerations associated with potential use of grout as well as scheduling considerations associated with fish spawning seasons will be incorporated into this project as part of the local permitting process.

Finally, this phase also includes development of the selected option and completion of a full plan-set ready for bid. A detailed book of specifications and bid documents will be provided in a complete project manual. An engineer's estimate of probable construction costs will be delivered along with bid-ready construction documents.

Exhibit A-2. Detailed Budget

			Staff, Classification							Totals	
Task	Task Description	L. Meyer, Client Mngr, QA/QC Principal Engr	D. Kotz, PM/Sen. Engr I	A. Fowler, Design. Engr II	R. Mittleider, CADD Mgr.	Survey	Engr Sub (Electrical/ Telemetry)	Permit Fee	J. Preisner, Admin.	Labor Hours	Costs
		$155	$130	$110	$115				$65		
1	**Project Management/Meetings/Site Visit**										
	Kickoff meeting with ditch owners	2	2	4						8	$1,010
	Preliminary site visit	4	4	4						12	$1,580
	Set up project, establish internal project plan, review plan, and hold design kickoff meeting	2	2	4	1	1				10	$1,126
	Perform monthly budget/schedule/invoice reviews (4-month project duration)	2		4						6	$750
	Provide project status email updates to ditch owners (4-month project duration)	2	2	4						8	$1,010
	Internal project coordination	2	2	2	2	2			2	12	$1,152
	Client project communication and coordination	8		8						16	$2,120
	Task 1 Subtotal Hours	**22**	**12**	**30**	**3**	**3**	**0**		**2**	**72**	
	Task 1 Subtotal Costs	**$3,410**	**$1,560**	**$3,300**	**$345**	**$0**	**$0**		**$130**		**$8,748**
2	**Conduct Phase I Alternatives Evaluation**										
2a.	**Conduct Phase I Alternatives Evaluation**										
	Vendor Correspondance (4 alternatives) - correpsondance with vendors to evaluate equipment appropriateness, cost, installation capatability, etc.			12						12	$1,320
	Owner interviews (4 alternatives) - interview existing owners of equipment alternatives to understand pros/cons			4						4	$440
	Develop technical design conditions (determine structure sizing)		4	24						28	$3,160
	Develop planning-level construction cost estimate (4 alternatives)			8						8	$880
	Apply prioritized project goals to each alternative and identify best-fit alternative	1	1	4						6	$725
2b.	Grade Control Structure Alternatives Assessment										
	Survey					$4,000				NA	$4,000
	Owner interviews (4 alternatives) - interview existing owners of equipment alternatives to understand pros/cons			4						4	$440
	Develop technical design conditions (estimate design flow rate/velocity, estimate 10-year flows, structure sizing {slope, dimensions, bed material, etc.})			24						24	$2,640
	Preliminary HEC-RAS Modelling			40						40	$4,400
	Develop planning-level construction cost estimate (4 alternatives)			8						8	$880
	Apply prioritized project goals to each alternative and identify best-fit alternative	1	1	4						6	$725
2c.	Develop Design Recommendation Memorandum										
	Develop DRAFT memorandum & distribute to ditch owners	2	2	8					1	13	$1,515
	Meet with ditch owners to discuss recommendations	2	2	3						7	$900
	Finalize & distribute memorandum			2					1	3	$285
	Task 2 Subtotal Hours	**6**	**10**	**145**	**0**	**4000**	**0**		**2**	**4163**	
	Task 2 Subtotal Costs	**$930**	**$1,300**	**$15,950**	**$0**	**$0**	**$0**		**$130**		**$22,310**
3	**Conduct Phase II Detailed Design**										
3.a	Permitting and Agency Coordination										
	Pitkin County Floodplain Permit & Final alternative HEC-RAS Model		2	24				$ 849		875	$3,749
	CDPHE 401 Certification			3						3	$330
	Army Corps of Engineer's Nationwide 33 Permit		5	50						55	$6,150
	Division of Water Resources Coordination			2						2	$220
	United States Fish and Wildlife Service Coordination			2						2	$220
	Colorado Division of Wildlife Coordination			6						6	$660
3.b	Sub-consultants										
	Electrical Engineer						$3,000			NA	$3,000
	Telemetetry/Programming						$2,000			NA	$2,000
3.c	Develop Bid-Ready Design Documents										
	Construction Drawings	2	4	8	35				6	55	$6,125
	Project Manual/Design Specifications Book		4	12					4	20	$2,100
	Engineer's Opinion of Probable Construction Cost	1	1	8						10	$1,165
	Task 3 Subtotal Hours	**3**	**16**	**115**	**35**				**10**	**179**	
	Task 3 Subtotal Costs	**$465**	**$2,080**	**$12,650**	**$4,025**	**$0**	**$5,000**	**$ 849**	**$650**		**$25,719**
									Total Cost Phase I & Phase II		**$56,777**
									Total BRT Grant Request		**$54,000**
									Total Applicant Contribution		**$2,777**

Exhibit A-3. Project Schedule

Task	Task Description	Grant Approval/Fund Distribution01-2013	Mar-13 wk.1	wk.2	wk.3	wk.4	Apr-13 wk.1	wk.2	wk.3	wk.4	May-13 wk.1	wk.2	wk.3	wk.4	Jun-13 wk.1	wk.2	wk.3	wk.4
1	**Project Management**																	
	Kickoff meeting with ditch owners																	
	Preliminary site visit																	
	Set up project, establish internal project plan, review plan, and hold design kickoff meeting																	
	Perform monthly budget/schedule/invoice reviews (4-month project duration)																	
	Provide project status email updates to ditch owners (4-month project duration)																	
	Internal project coordination																	
	Client project communication and coordination																	
2	**Conduct Phase I Alternatives Evaluation**																	
2a.	Delivery Reliability Improvement (Headgate and Flow Measurement Flume) Alternatives Assessment																	
	Vendor Correspondance (4 alternatives)																	
	Owner interviews (4 alternatives)																	
	Develop technical design conditions (determine structure sizing)																	
	Develop planning-level construction cost estimate (4 alternatives)																	
	Apply prioritized project goals to each alternative and identify best-fit alternative																	
2b.	Grade Control Structure Alternatives Assessment																	
	Survey																	
	Owner interviews (4 alternatives)																	
	Develop technical design conditions																	
	Preliminary HEC-RAS Modeling																	
	Develop planning-level construction cost estimate (4 alternatives)																	
	Apply prioritized project goals to each alternative and identify best-fit alternative																	
2c.	Develop Design Recommendation Memorandum																	
	Develop DRAFT memorandum & distribute to ditch owners																	
	Meet with ditch owners to discuss recommendations																	
	Finalize & distribute memorandum																	
3	**Conduct Phase II Detailed Design**																	
3.a	Permitting and Agency Coordination																	
	Pitkin County Floodplain Permit & HEC-RAS Model																	
	CDPHE 401 Certification																	
	Army Corps of Engineer's Nationwide 33 Permit																	
	Division of Water Resources Coordination																	
	United States Fish and Wildlife Service Coordination																	
	Colorado Division of Wildlife Coordination																	
3.b	Sub-consultants																	
	Electrical Engineer																	
	Telemetetry/Programming																	
3.c	Develop Bid-Ready Design Documents																	
	Construction Drawings																	
	Project Manual/Design Specifications Book																	
	Engineer's Opinion of Probable Construction Cost																	

Exhibit B. Project Map

Exhibit B. Project Map

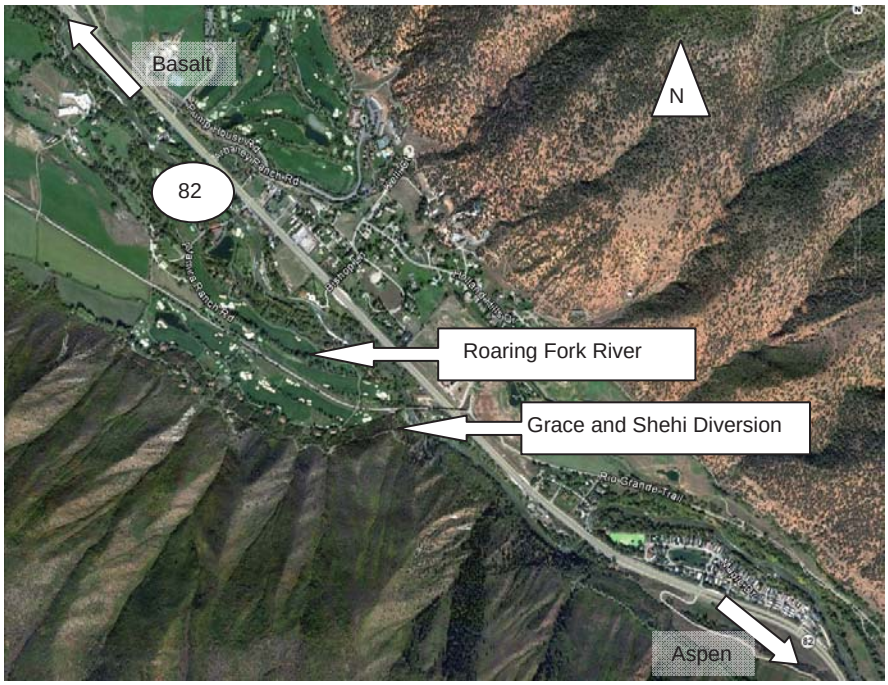


Exhibit C. Letter of Support Pitkin County Healthy Rivers and Streams

PITKIN COUNTY

Healthy Rivers and Streams Citizens Advisory Board

October 19, 2012

Jim Pokrandt
Colorado Basin Roundtable
Colorado River Water Conservation District
201 Centennial Street, Suite #200
P.O. Box 1120
Glenwood Springs, CO 81602

Email jpokrandt@crwcd.org

Dear Mr. Pokrandt,

The Pitkin County Healthy Rivers and Streams Program is excited about the proposal to improve the Grace and Shehi irrigation ditch on the Roaring Fork River at the Roaring Fork Club upstream of Basalt. This reach of the river is often depleted below the Grace and Shehi ditch due to functional quality of the ditch. We support the proposal to place a Rosgen Structure in the river and a Rubicon ditch device to manage the flow in the ditch. We believe this will help to both deliver irrigation water to the irrigators dependent on the ditch. In addition, the Rosgen structure will likely limit further stream channel erosion from occurring in this stretch of the river, and prevent the ditch owners from having to regularly go into the river to dredge out the rock weir that now diverts water into the Grace and Shehi ditch.

In summary, we believe this proposal will improve the delivery of agricultural irrigation water to the ditch owners. Please consider this when deciding upon whether to fund the feasibility study.

Thank you for your attention to this matter.

Pitkin County Healthy Rivers and Streams Citizens Advisory Board

Greg Poschman, Chair

Lisa Tasker

Steve Hunter

Andre Wille

Bill Jochems