COLORADO
Colorado Water Conservation Board
Department of Natural Resources

1313 Sherman Street, Room 721
Denver, CO 80203

January 29, 2018

Grange Family Ranches, Inc.
Attn: Mr. William Grange
408 W. Cody Lane
Basalt, CO 81621

RE: Notice to Proceed – WSRA Grant – Grace & Shehi Diversion Project in the Colorado River Basin

Dear William:

This letter is to inform you that the purchase order request for the WSRA grant to assist in the Grace & Shehi Diversion Project in the Colorado River Basin was approved on January 29, 2015.

With the executed purchase order, you are now able to proceed with the project and begin invoicing the State of Colorado for costs incurred through October 31, 2015. Please provide the project name, contract or purchase order number, and basin when corresponding with or invoicing the State of Colorado for your project. Upon receipt of your invoice(s), the State of Colorado will provide payment no later than 45days after review and signed approval by the project manager. I wish you much success in your project.

Sincerely,

/s/

Craig Godbout
Program Manager
Colorado Water Conservation Board
Water Supply Planning Section
1313 Sherman St, Rm. 721
Denver CO 80203
(303) 866-3441, ext 3210 (office)
(303) 547-8061 (cell)
craig.godbout@state.co.us

Attachments

STATE OF COLORADO
Department of Natural Resources

ORDER
Number: POGG1 PDAA 20150000000000000227
Date: 01/29/15
Description:
PDAA 2500 Grace & Shehi Diversion in CO Riv Basin

BUYER
Buyer:
Email:

VENDOR
GRANGE FAMILY RANCHES LLC
408 W CODY LANE
BASALT, CO 81621

Contact: William Grange
Phone: .

**** IMPORTANT ****
The order number and line number must appear on all invoices, packing slips, cartons and correspondence

BILL TO
COLORADO WATER BOARD CONSERVATION
1313 SHERMAN STREET, ROOM 718
DENVER, CO 80203

SHIP TO
COLORADO WATER BOARD CONSERVATION
1313 SHERMAN STREET, ROOM 718
DENVER, CO 80203

SHIPPING INSTRUCTIONS
Delivery/Install Date:
F.O.B:
VENDOR INSTRUCTIONS:

Line Item	Commodity/Item Code	UOM	QTY	Unit Cost	Total Cost	MSDS Req.
1	G1000		0	0.00	$40,500.00	☐

Description: PDAA 2500 Grace & Shehi Diversion in CO Riv Basin

Start Date: 01/30/15 End Date: 10/31/15

TERMS AND CONDITIONS
https://www.colorado.gov/osc/purchase-order-terms-conditions

DOCUMENT TOTAL = $40,500.00

Exhibit A Statement of Work

Part IV. Required Supporting Material 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.

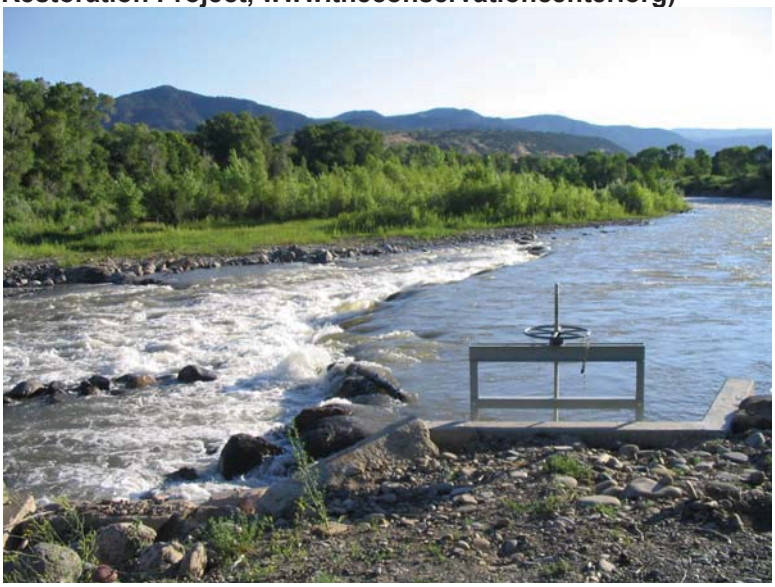
Phase I

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)

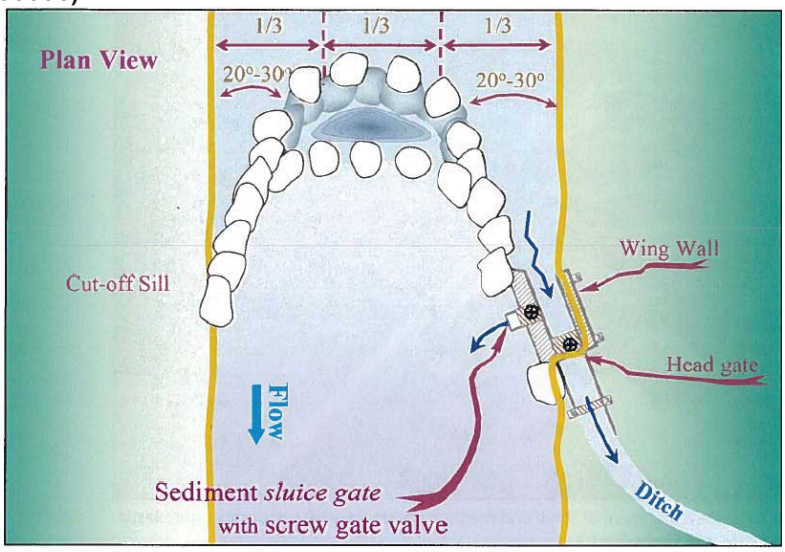


GC2. **Concrete Drop Structure** – Concrete grade control structures are commonly used and have been proven to provide the grade-control function needed here. Furthermore, well-designed and properly-installed concrete drop structures are sturdy and are capable of withstanding many of the variable flow 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.

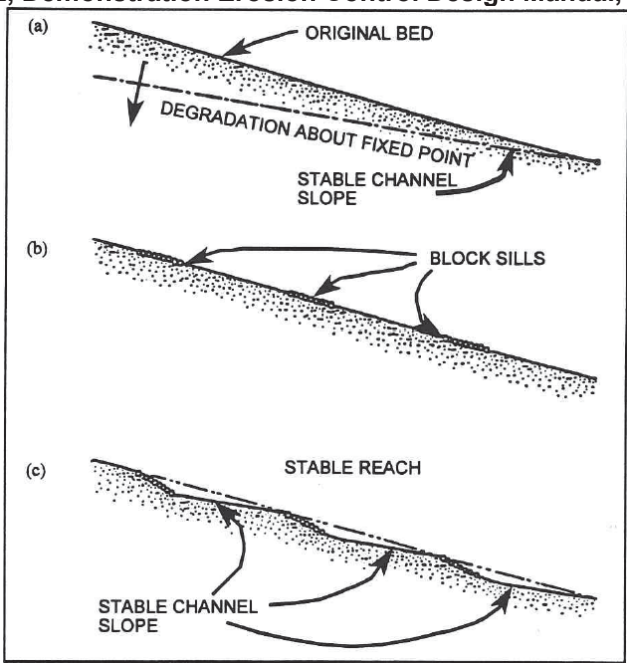
GC3. **Single-Sill Rosgen Structure** - The Single-Sill Rosgen wall has been proposed as an alternative to the existing wall's configuration. The U-shaped wall is constructed, primarily, of rock. The shape of the wall directs the majority of the river's water towards the center of the channel while providing 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 chan nel characteristics are such that bed erosion will occur that woul d 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 h ead gate is an industry standard manual sluice -type weir g ate with a horizontal barrier that opens from the bottom up with a hand-wheel operated, vertical slide feature to a djust flow rate. Several technolog ies exist that build on this design by incorporating SCADA programming functionality into the gat e's flow control ability, including Wat ch Technologies "Smart Sluice," and Rubicon SlipMeter™. The slide g ate is fit with an electro nic actuator (which can be solar-powered if need ed), that au tomatically adjusts the position of the gate to adjust flow. While Rubicon SlipMeters™ incorporate flow measurement into their equipment, a Watch Te chnologies' Smart Sluice would require retrofit with an ultra sonic 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 automat ically controlled and use a central-hinged gate design to adjust flow across the struct ure. As wit h the “Smart Sluice” this gate technology does not incorpora te flow mea surement. Therefore, the alternative would require retrofit of an ultrasonic flow meter into the existing flow measurement vault (Figur e 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 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**

Grant approved for $40,500

CORRECTION TO TOTAL BRT GRANT REQUESTED AND APPLICANT $.

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

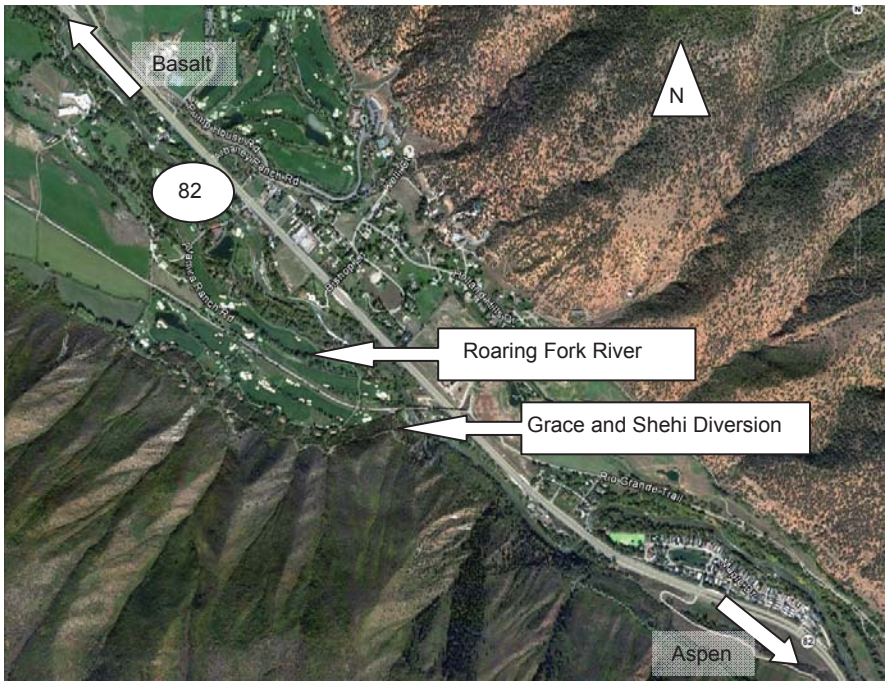


Exhibit C. Letter of Support Pitkin County Healthy Rivers and Streams

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