COLORADO
Colorado Water Conservation Board
Department of Natural Resources

1313 Sherman Street, Room 721
Denver, CO 80203

July 29, 2014

Trinchera Irrigation Company
Attn: Wayne Schwab, Superintendent
P.O. Box 41
Blanca, CO 81123

RE: Notice to Proceed - WSRA Grant – Trinchera Irrigation Company – Feasibility Study for Mountain Home Reservoir Dam Outlet Works Upgrade in the Rio Grande River Basin

Dear Wayne,

This letter is to inform you that the purchase order to assist in the above WSRA grant project was approved on July 29, 2014. The email copy will serve as the original documentation.

With the executed purchase order, you are now able to proceed with the project and invoice the State of Colorado for costs incurred through March 31, 2015. Upon receipt of your invoice(s), the State of Colorado will provide payment no later than 45 days. I wish you much success in your project. Please forward your invoices and any supporting documents directly to Dori Vigil at dori.vigil@state.co.us.

If you have any project related questions or concerns regarding the project, please contact me.

Sincerely,

//s//

Craig Godbout
Program Manager
Colorado Water Conservation Board
Water Supply Planning Section
1580 Logan Street, Suite 200
Denver CO 80203
(303) 866-3441, ext 3210 (office)
(303) 547-8061 (cell)
craig.godbout@state.co.us

PURCHASE ORDER GRANTS GIVEN
STATE OF COLORADO
Department of Natural Resources

ORDER
Number: POGG1 PDAA 20150000000000000120
Date: 07/29/14
Description:
PDAA 2500 CMS#71938 TELLURIDE PINES WATER AUGMENTATION

BUYER
Buyer: Vigil Dori
Email: dori.vigil@state.co.us

VENDOR
TRINCHERA IRRIGATION COMPANY
PO BOX 41
BLANCA, CO 81123-0041

Contact: .
Phone: 7193793467

**** 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	$25,000.00	☐

Description: PDAA 2500 CMS#71938 TELLURIDE PINES WATER AUGMENTATION
Start Date: 08/01/14 End Date: 03/31/15

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

DOCUMENT TOTAL = $25,000.00

EXHIBIT A
Statement of Work

WATER ACTIVITY NAME
Feasibility Study for Mountain Home Reservoir Dam Outlet Works Upgrade

GRANT RECIPIENT – Trinchera Irrigation Company

FUNDING SOURCE – Water Supply Reserve Account - $25,000 Basin Account

INTRODUCTION AND BACKGROUND
Provide a brief description of the project. (Please limit to **no more than 200 words**; this will be used to inform reviewers and the public about your proposal)

Trinchera Irrigation Company (TIC) will conduct a Phase I feasibility study prior to undertaking the state-mandated repair and/or replacement of two and possibly all three gates at Mountain Home Reservoir. Gate #1 operates poorly and the other two have not been opened in several decades. TIC has a long-standing Agreement with the Division of Wildlife, or Colorado Parks and Wildlife (CPW), the terms of which include the requirement that TIC make every effort to avoid emptying the reservoir or reducing its level lower than the survivor pool of 653 AF. Parallel to this structural feasibility study, CPW and Trout Unlimited (TU) will work with TIC to determine practical ways to improve recreation opportunities and to enhance wildlife habitat at Mountain Home Reservoir State Wildlife Area. TIC requests $25,000 for a feasibility study, with $10,000 in technical assistance from CPW and an as yet unspecified but significant contribution from TU. The outcome of this feasibility study will determine the most favorable option for the State-mandate repairs/upgrades. Deliverables: 1) Enhanced dam safety with reliable water level elevation management and required draw-down capability of the reservoir; 2) Improved water storage management and reduced storage loss; and 3) Protection of the CPW conservation pool and enhancement of recreational and wildlife habitat assets.

OBJECTIVES

Conduct underwater inspection of the outlet works in order to determine the feasibility of various approaches to repair, upgrade or replace the gates.

Gather data for a plan to repair, upgrade or replace the gates at Mountain Home Reservoir in order to accomplish optimal operability of the outlet works of the reservoir.

Prepare cost analyses of various alternatives and determine the most favorable course of action in subsequent phases.

Collaborate with CPW and TU to enhance recreational fishing and wildlife habitat assets.
NOTE 1: During the course of this feasibility study TIC Superintendent will oversee all operations prior to, during and following the underwater video inspection. Superintendent will also coordinate with CPW, TU and other entities to prepare for Phase II environmental and wildlife aspects of this project.

NOTE 2: Contractor RJH Consultants has based its price on the video survey taking no more than one day. In order to anticipate the potential for inclement weather, increased turbidity, low visibility, etc., TIC has incorporated such eventualities into the Scope of Work and the Budget. Following are the assumptions of RJH Consultants:

- The reservoir will not be drained for inspection and evaluation of the outlet works.
- The video inspection can be completed in 1 day.
- The dam is currently classified as a large size, high hazard dam and will remain this classification.
- Inspection, assessment, and evaluations will be limited to the outlet works, which includes the intake structure and trash rack, three normally pressurized 30-inch steel conduits, three 30-inch-diameter gate valves and operators. The downstream outlet tunnel will not be evaluated or inspected.
- Dredging of silt from the outlet intake structure and trash rack will not be necessary for the insertion and retrieval of an underwater video inspection camera.
- No site-specific survey information will be required for the development of rehabilitation alternatives.
- The reservoir will not be drained for implementation of the selected alternative.
- One review meeting with Trinchera will be held at the RJH offices to discuss the developed rehabilitation alternatives.

TASK 1 – Access and Mobilization

Description of Task - TIC oversees mobilization and ensures safety of equipment/personnel access. ASI divers assist in temporarily removing trash rack.

Method/Procedure – TIC Superintendent oversees work area as ASI mobilizes commercial dive team with shallow air package and video equipment to site; delivers inspection class underwater ROV for conduit inspection to site; launches dive support vessel for diving and ROV operations.

TIC and ASI personnel remove existing corroded steel trash rack structure using surface supplied divers and lift bag.

TIC, CPW and TU collaborate to clarify boundaries and to create safe access to recreational and wildlife habitat work areas.

Deliverable - Underwater inspection team, equipment and dive support vessel are deployed and in place. TIC is provided assurances with respect to access, activities and construction operations which will take place on its property.

TASK 2 – Inspect Outlet Works

Description of Task Conduct underwater inspection and capture video data for delivery in DVD format.

Method/Procedure Under supervision of TIC Superintendent, The quality of the video will depend upon water turbidity levels.

- Perform an underwater video inspection of the trash rack, intake structure, and three 30-inch-diameter conduits. Document current conditions and identify deficient locations and potential problem areas. The video inspection will start at the trash rack and progress downstream to the upstream face of the three 30-inch valves. The downstream tunnel will not be videoed or inspected.
- Inspect and evaluate the condition of the three 30-inch-diameter gate valves and operators. Video document the condition of the valves using digital photographs and digital video devices.
- Prepare an outlet inspection memorandum.

Deliverable Outlet inspection memorandum and data collected for evaluation

TASK 3 – Alternatives Development and Report

Description of Task Evaluate data and develop alternative plans to rehabilitate the outlet works.

Method/Procedure Identify discovered outlet deficiencies and describe the problems they represent to dam safety and operations of the outlet works; Complete the report within 15 days of completion of the inspection, as follows:

- Identify discovered outlet deficiencies and describe the problems they represent to dam safety and operations of the outlet works, including SEO reservoir outlet drawdown criteria.
- Develop at least two rehabilitation alternatives and develop a comparative cost for each alternative to include sufficient detail for concept understanding and evaluation.
- Identify advantages and disadvantages of the alternative and work with Trinchera to select a preferred alternative to rehabilitate the outlet works.
- Develop a typical plan and section figure to illustrate the preferred concept and develop a cost estimate for the final design and construction of the selected rehabilitation alternative.
- Prepare a memorandum that documents the work performed. This will include findings, recommendations, concept drawings, and cost opinion.
- Participate in a meeting with Trinchera to discuss the alternatives and to select the preferred alternative.

Deliverable At least two rehabilitation alternatives are developed with comparative cost analysis for each alternative. The most favorable alternative is identified and recommended.

TASK 4: Colorado Parks & Wildlife – Coordination - TBD during feasibility period

TASK 5: Trout Unlimited – Coordination - TBD during feasibility period

BUDGET

Provide a detailed budget by task including number of hours and rates for labor and unit costs for other direct costs (i.e. mileage, $/unit of material for construction, etc.). A detailed and perfectly balanced budget that shows all costs is required for the State's contracting and purchase order processes. Sample budget tables are provided below. Please note that these budget tables are examples and will need to be adapted to fit each individual application. Tasks should correspond to the tasks described above.

(next page)

B U D G E T

FEASIBILITY STUDY FOR MOUNTAIN HOME RESERVOIR DAM OUTLET WORKS UPGRADE

TASK			MATCH	WSRA	PROJ TOTAL
1	TIC staff	3 x 187.5/day	562.50		
	Equipment Rental	$1,000/day x 1 day		1,000	
	Title research, legal	Boundaries, access		2,000	
2	RJH	Per quote/contract		7,900	
	TIC staff	3 x 187.5/day	562.50		
3	RJH	Per quote/contract		11,300	
	Turbidity/Weather contingency	Per RJH quote & assumptions		2,800	
4	CPW-Design	Per RB estimate	10,000		
	TIC staff	4 x 187.5/day	750		
5	TU	Per KT estimate	400		
	TIC staff	2 x 187.5/day	375		
TOTAL			$12,650	$25,000	$37,650

SCHEDULE

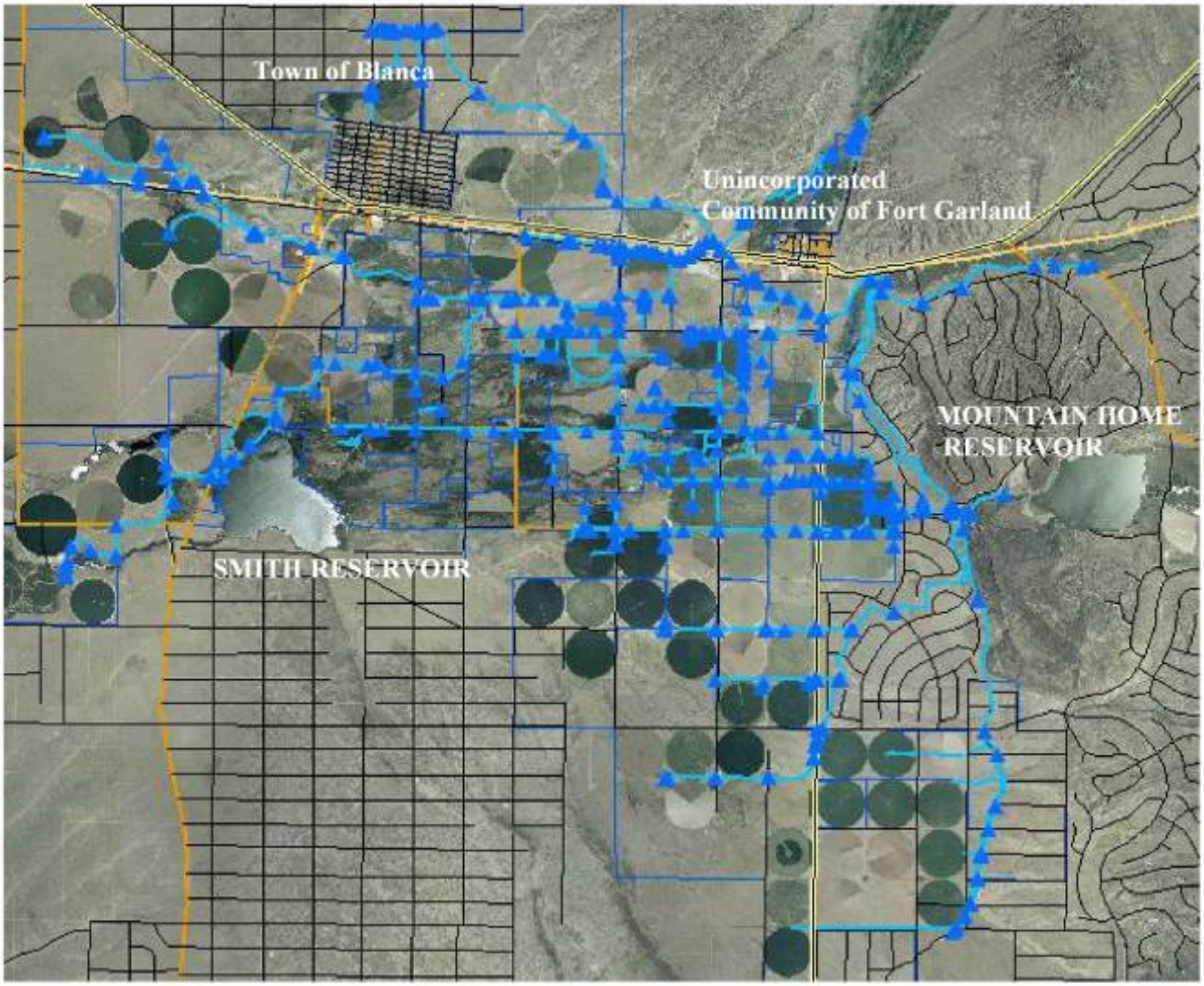
Underwater inspection is anticipated to take no more than one day, but one week is allowed for in the event of unforeseen circumstances.

The entire feasibility project will be completed in fewer than 3 months after NTP

2014	July	August	September	October
Notice to Proceed (NTP)				
Underwater Inspection				
Engineering/Analysis/Reporting				
FINAL REPORT to CWCB				

EXHIBIT B

Maps, Photos, Additional Data

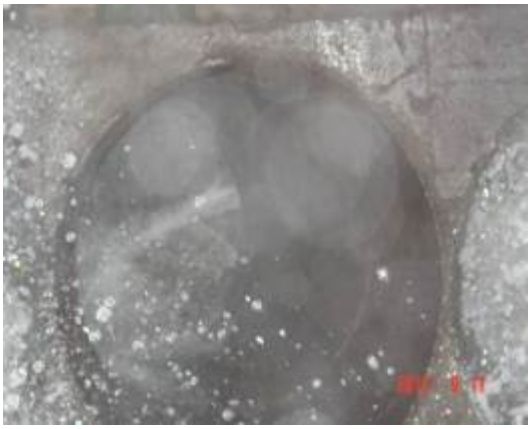


PRE-PROJECT PHOTOS

Gate Room

Outlet Works

Valves



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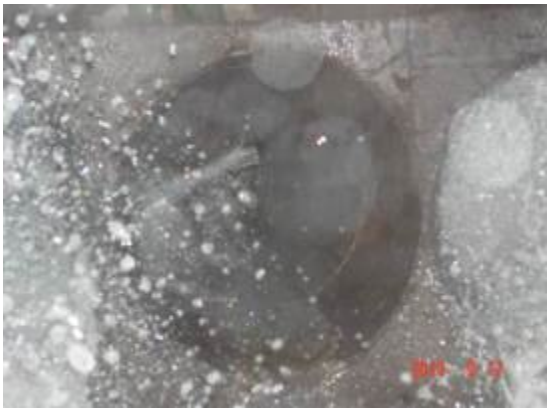

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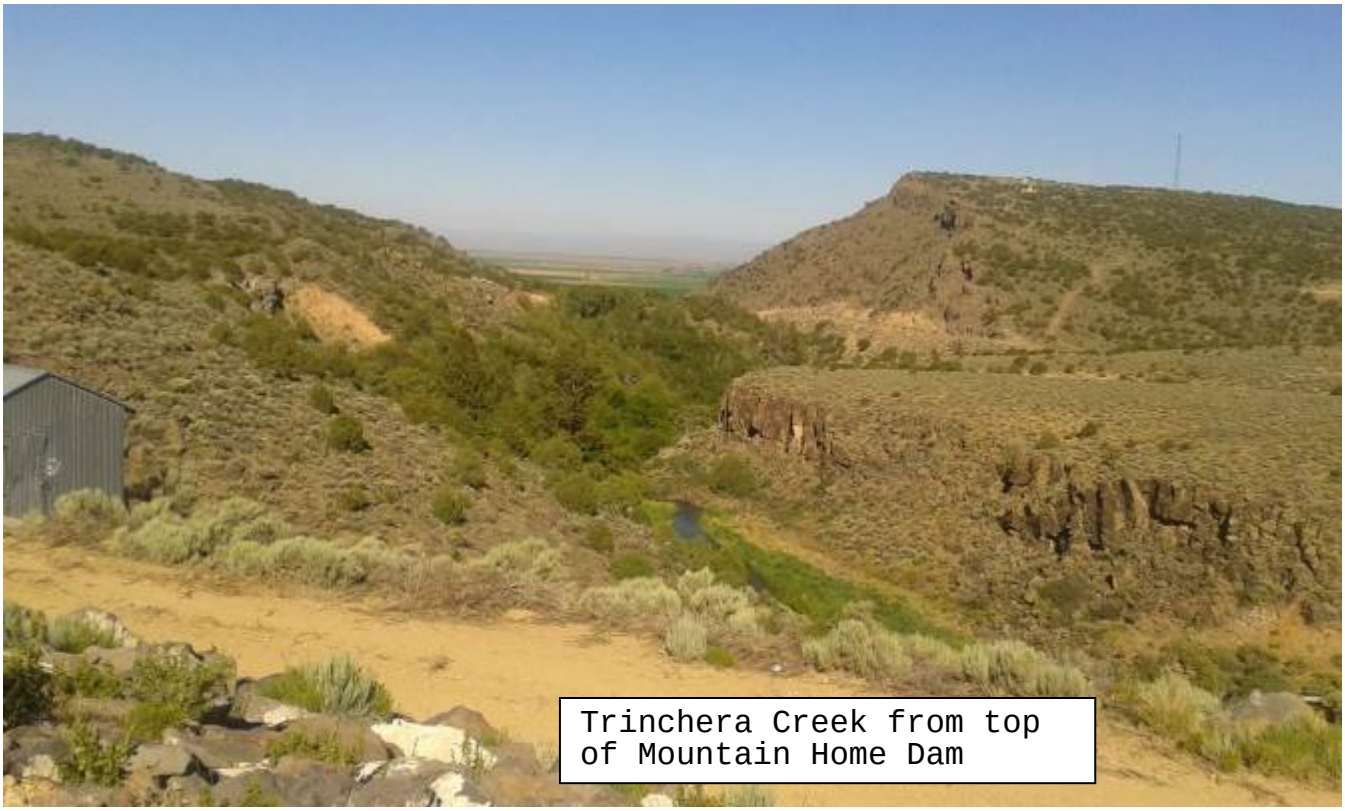
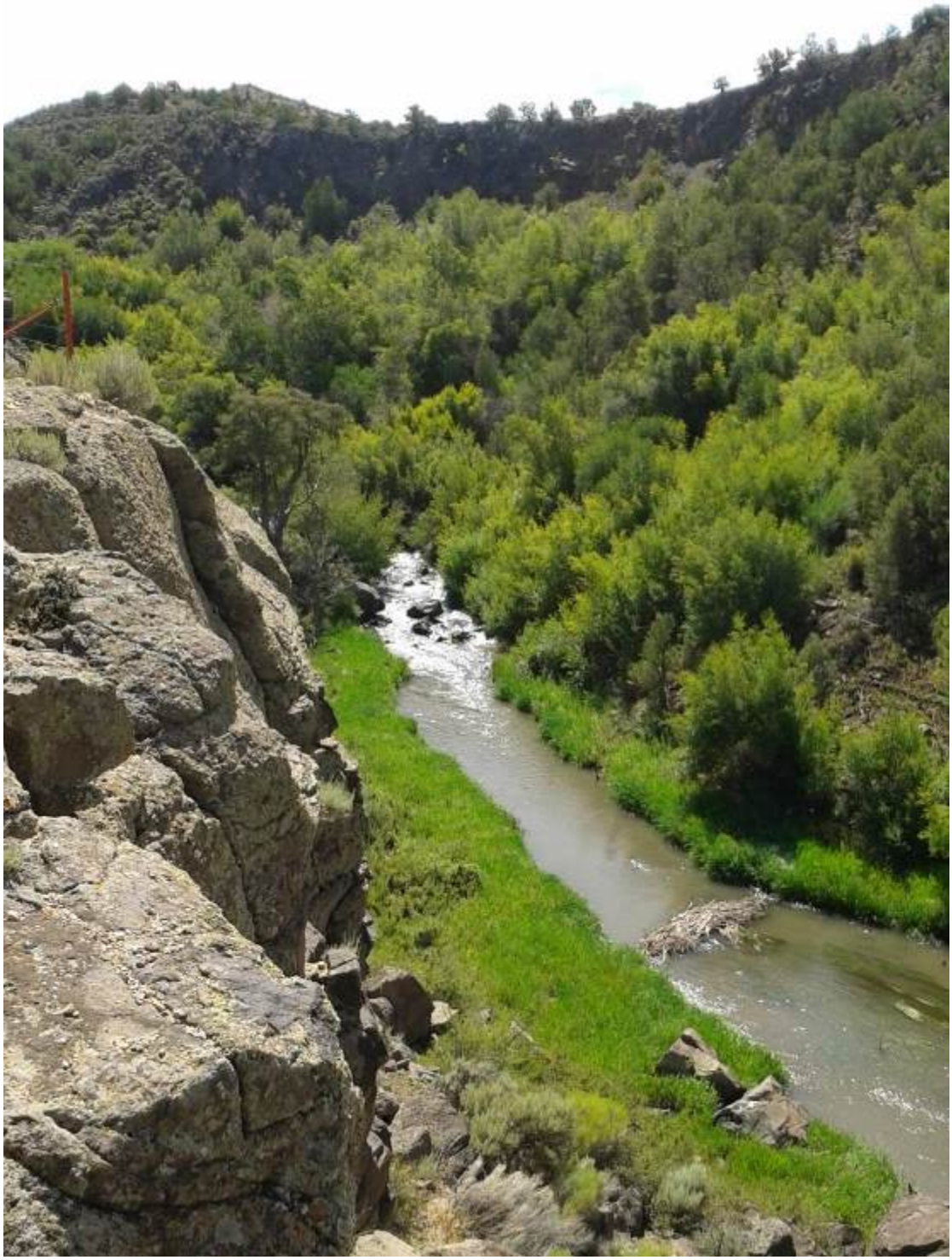


Trinchera Creek from top of Mountain Home Dam


Trinchera Creek Canyon Midway
below Mountain Home Dam

Trinchera Creek, Mouth of
Canyon Below Mountain Home Dam

Trinchera Creek, midway below, facing Mountain Home Dam



OPERATION AND MAINTENANCE
(Wayne Schwab, Superintendent)

In irrigation season the operation of the gates at Mountain Home Reservoir starts with the availability of water, per DWR determination. Stockholders call in to request their allotted amount and how they would like it delivered, for example, "2 acre feet for 10 days." Every morning, as necessary, we open or close the gate according to what is needed for the day. On the next page is a sample from last year showing a portion of the log which we maintain. Each number represents the number of turns of the wheel to open or close the gate.

Automation of the outlet works will be among the options considered during this feasibility study.

At the beginning and end of the water season we perform a routine Preventive Maintenance on the gas motor and regularly grease the gears.

Mountain Home Dam

Gate Valves

compensate 10 turns for slack when changing direction

Date	Open	Close	Total Open	cfs	Reservoir af
4/12/2013	25		25	2.8	2280
4/12/2013	5		30	3.9	2280
4/13/2013	10		40	5.8	2283
4/21/2013	40		80	6.8	2279
4/23/2013		20	60	5.6	2267
4/23/2013		15	45	4.1	2267
4/28/2013	15		60	4.1	2269
4/29/2013	10		70	7.0	2270
4/29/2013	10		80	7.6	2270
5/1/2013		40	40	4.1	2264
5/11/2013	35		75	7.1	2306
5/16/2013		35	40	4.5	2313
6/3/2013	35		75	5.1	2509
6/4/2013	3		78	6.8	2514
6/10/2013		35	43	4.3	2525
6/24/2013	35		78	5.6	2522
6/25/2013	10		88	7.6	2509
6/28/2013	10		98	12.0	2462
6/29/2013		5	93	11.7	2438
6/30/2013		30	63	7.3	2418
7/12/2013	22		85	7.7	2244
7/13/2013	10		95	10.3	2234
8/5/2013	5		100	13.2	1826
8/8/2013		60	40	3.4	1798
8/16/2013	40		80	6.1	1811
8/17/2013	5		85	7.3	1803
8/19/2013	10		95	11.7	1779
8/26/2013		45	50	3.1	1647
8/27/2013	15		65	4.3	1642
8/28/2013	10		75	5.6	1636
9/1/2013	5		80	6.6	1606
9/6/2013	10		90	9.7	1558
9/13/2013		40	50	6.4	1451
9/16/2013		50	0	2.7	1483

RJH CONSULTANTS

RJH Consultants, Inc. (RJH) is a geotechnical water resources firm specializing in evaluation, civil design, and construction engineering for raw water supply systems; dams, reservoirs, and appurtenant facilities; and water conveyance infrastructure.

RJH projects range from small geotechnical explorations to large embankment dam design and construction. RJH manages projects with overall costs ranging from several thousand dollars to in excess of $200 million.

RJH specializes in geotechnical and water resources engineering. The firm's primary expertise, experience, and identity are in feasibility, conceptual, and final design services for evaluation, design, rehabilitation, and construction of raw water storage projects. Specifically, RJH has successfully provided planning, design, and construction engineering services for over 50 dam projects since the company was established in 2005.
RJH provides comprehensive services in the following areas:

Geologic and geotechnical assessment, investigations, and analyses to evaluate dam locations and foundation conditions; and develop material properties for foundations and embankments.
Hydraulic and hydrologic design for spillways, outlet works, and terminal facilities.
Structural design of spillway structures, intake structures, conduits, outlet works structures, and other appurtenant structures such as vaults and buildings.
Preparation of Dam Safety Inspection Reports, Emergency Action Plans, Standard Operating Procedures, Operation and Maintenance Manuals, and floodplain modification studies.
Dam Breach analysis to determine the potential hazard classification and the inundation area downstream of a dam.
Planning and feasibility studies to identify water supply alternatives and water resource planning to develop Client water resources portfolio.
Design and evaluation of earthen and concrete gravity dams.

Additional services include forensic analysis of dam deficiencies; design, installation, and evaluation of instrumentation; and dam safety inspections and investigations.

http://www.rjh-consultants.com/

RJH Consultants were selected to perform the feasibility study primarily because they did not require emptying the reservoir.

DIVISION OF WATER RESOURCES

Letter from Dick Wolfe, P.E.
Director/State Engineer

Estimated Range of Stream Depletions for Four Proposed Responses Areas:
Conejos Response Area,
Alamosa-LaJara Response Area
Trinchera Response Area
Rio Grande Alluvium Response Area

September 25, 2013

Following is a letter from State Engineer Dick Wolfe to the Rio Grande Water Conservation District which detailed the ranges of anticipated stream depletions from well operations for areas in the southern part of the San Luis Valley as of that date.

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER RESOURCES

John W. Hickenlooper
Governor

Mike King
Executive Director

Dick Wolfe, P.E.
Director/State Engineer

September 25, 2013

Steve Vandiver, Manager
Rio Grande Water Conservation District
10600 Hwy 160
Alamosa, CO 81101

RE: Estimated Range of Stream Depletions for Four Proposed Responses Areas: Conejos Response Area, the Alamosa-La Jara Response Area, the Trinchera Response Area, and the Rio Grande Alluvium Response Area

Dear Steve,

This letter is to provide the Rio Grande Water Conservation District ("District") with estimated stream depletion ranges for four of the planned Response Areas in the San Luis Valley. This information will help the District provide guidance to those forming groundwater management subdistricts in those Response Areas and developing draft Plans of Water Management for those subdistricts. We understand that the subdistricts need this information both for planning and for development of their financial structures.

BACKGROUND:
As you know, the RGDSS groundwater model is operated in paired runs to determine the impact of net groundwater consumptive use by wells in the various response areas. A comparison between a Response Area's 'no-pumping' and 'pumping ' runs generates a list of differences in items such as stream flow, aquifer storage, native evapotranspiration, sub-irrigation, etc. Of interest to the District will be the difference between the streamflow in the 'pumping' and 'no-pumping' runs, which are the depletions to impacted stream reaches caused by well pumping. These stream depletions may injure senior water rights, and any injurious stream depletions must be replaced or otherwise remedied through a subdistrict's plan of water management.

The Rio Grande Decision Support System (RGDSS) utilizes data from 1936 through 2010. The comparative runs made for this analysis for each Response Area used the hydrology, streamflows, aquifer conditions, diversion data, climate data, crop demands, etc. for the period 2001-2010 to estimate the range of stream depletions. This time period has excellent data, is reflective of recent conditions in the valley, and should provide a range of stream depletions caused by well pumping that can be used for your planning purposes. Actual stream depletions will vary from year-to-year, sometimes very much so, depending on climatic conditions, crop demands, aquifer conditions, and available water supplies. With that year-to-year variability in mind, we are providing the maximum and minimum annual values from a suite of the model runs for your planning purposes.

Office of the State Engineer
1313 Sherman Street, Suite 818 • Denver, CO 80203 • Phone: 303-866-3581 • Fax: 303-866-3589
http://water.state.co.us

Please recognize that it is possible that the RGDSS groundwater model will predict stream depletions in future years that are outside the ranges provided in this letter. While providing fixed ranges at this time is not possible, my staff and I understand that the District needs the enclosed estimates as a starting point from which to begin the planning necessary for forming new subdistricts and developing their plans of water management.

RANGES PROVIDED:
The table below provides information for the Conejos Response Area, the Alamosa-La Jara Response Area, the Trinchera Response Area, and the Rio Grande Alluvium Response Area. The impacts are divided into the various rivers or streams on which the RGDSS groundwater model estimates the depletions occur.

We are still incorporating into the model the recent borehole drilling/geologic work the District funded last month in the northern part of the basin in the Saguache and San Luis Creek areas. Incorporating into the model the data provided by this recent work will help the model more accurately predict impacts in those areas. We are not providing estimated ranges of depletions for those Response Areas, but will do so when the Division of Water Resources ("DWR") finishes incorporating the new data and calibrating the model for those two areas. Our overall review indicates that the information being incorporated in the Saguache and San Luis Response Areas will not affect the results in the southern part of the basin to any large degree, so we are comfortable with the information we are providing for the southern Response Areas at this time.

Please note that we have broken La Jara Creek into 'Upper' and 'Lower' administrative reaches. Confined aquifer pumping can put extra water into a stream, generally as return flows from irrigation. This condition manifests itself particularly in lower La Jara Creek where there is a large volume of confined aquifer well pumping. That well pumping can deplete the upper end of the creek while the return flows add to the water supply in the lower end of the creek. The return flows are represented as 'negative' values in the table because here the well pumping results in more water in those reaches of the stream rather than stream depletions. Thus, we separated La Jara Creek into administrative reaches because if we simply looked at the entire stream for stream depletions, confined aquifer pumping return flows at the lower end would obscure the potential for injurious depletions in the upper stream reach.

The table below provides estimated stream depletions by administrative reach for La Jara Creek so that the District understands that future subdistricts will be required to replace or otherwise remedy injurious stream depletions in administrative reaches in which they occur even if a different administrative reach on the same stream experiences gains due to groundwater withdrawals made by subdistrict wells.

The table below lists the maximum and minimum values of stream depletions to the various streams for the four Response Areas based on recent runs of the RGDSS groundwater model as described above. These runs of the groundwater model have some variability as DWR continued incorporating new or improved information and calibrating the model. These values represent the annual variability across the suite of model runs.

Annual Stream Impact Ranges by Response Area for Impacted Streams
(all values in acre-feet/year)

			Response Areas			
			Rio Grande Alluvium	Conejos	Alamosa-La Jara	Trinchera
Impacted Stream Systems	Rio Grande	Min	1,400	330	4,900	1,200
		Max	2,800	920	11,800	2,000
	Conejos River System	Min		2,900	4,000	190
		Max		6,500	9,000	610
	Alamosa River	Min		***	-780	
		Max		110	440	
	La Jara Creek Upper	Min		***	***	
		Max		150	1,100	
	La Jara Creek Lower	Min		-250	-1,400	
		Max		***	80	
	Trinchera Creek	Min				140
		Max				990

- *Minimum and maximum values are derived from a suite of model runs, do not represent actual replacement obligations, and are provided for planning purposes only*
- *Conejos River System includes the Conejos, Los Pinos, and San Antonio Rivers*
- *La Jara Creek is divided into upper and lower administrative reaches at the Hardtack Ditches (WDIDs 2100537 and 2100538)*
- **** Near zero impact*

RESPONSE AREAS:
The enclosed map illustrates the planned Response Areas used in the model runs. The Response Areas have been delineated based on common hydrologic conditions, similar aquifer characteristics, well completion depths, ditch service areas, groundwater information, etc., so that they group wells that have similar impacts on stream flows.

SUSTAINABILITY:
C.R.S. 37-92-501(4) directs the State Engineer to regulate use of the confined and unconfined aquifers so as to maintain a sustainable water supply in each aquifer system. The legislature further directed the State Engineer to regulate use of the confined aquifer such that artesian pressure is allowed to fluctuate in the same range and manner as it did between 1978 and 2000. Accordingly, each subdistrict's Plan of Water Management must address the sustainability of the aquifers from which its wells withdraw groundwater. DWR anticipates discussing with the San Luis Valley Advisory Committee in October how future subdistricts will meet the statutory sustainability requirements and achieve any necessary recovery in aquifer conditions.

DIVISION OF WATER RESOURCES

DWR understands that sustainability requirements will impact the financial planning of the subdistricts. We will provide additional guidance on sustainability as soon possible.

We believe that the information provided above will assist your constituents as they work toward forming subdistricts and developing Plans of Water Management. As DWR develops more detailed information, including Response Functions for the various Response Areas, we will provide that more detailed data to you for your planning purposes.

Thank you for your patience in this process.

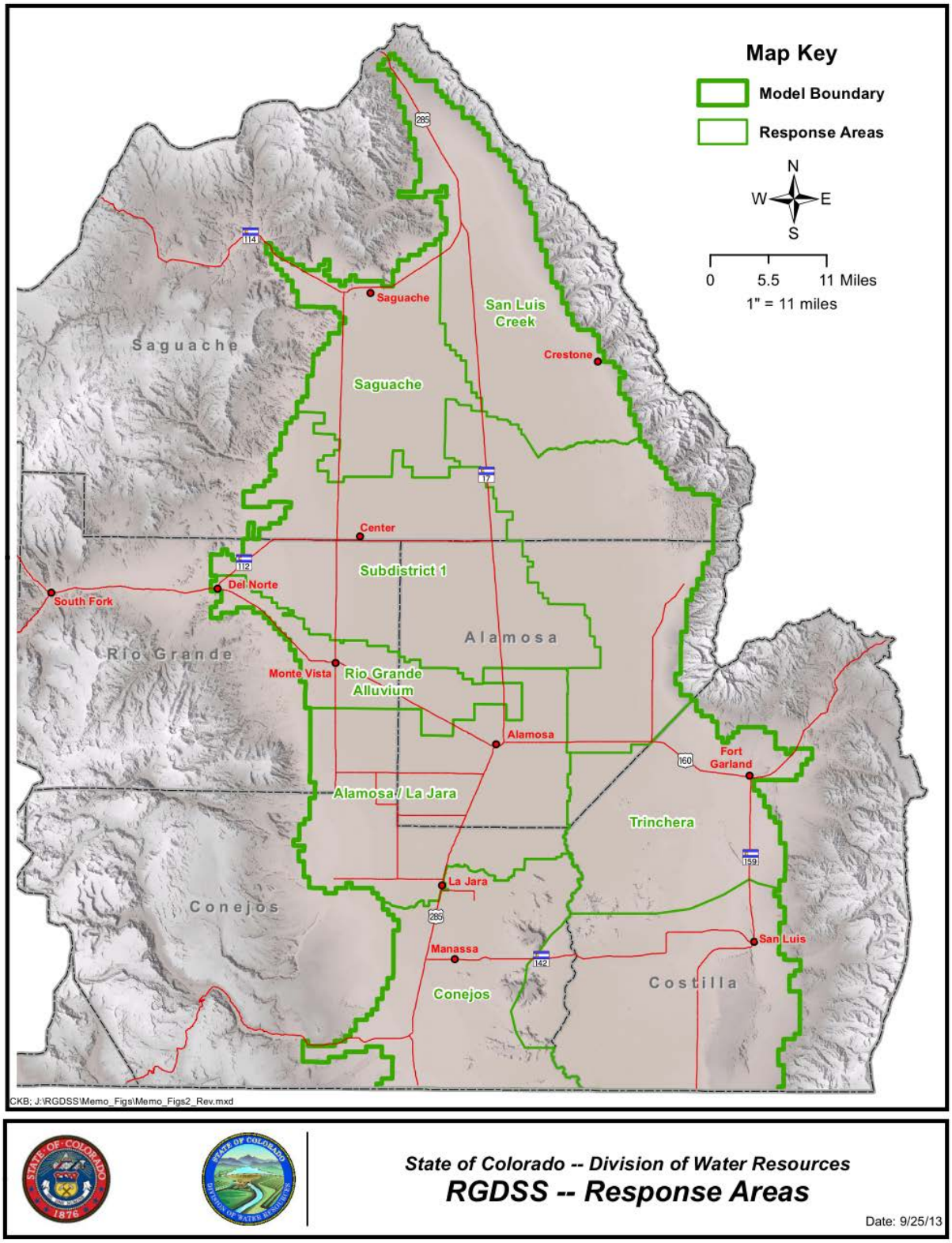
Sincerely,

Dick Wolfe

Dick Wolfe, P.E.
State Engineer, Director
Colorado Division of Water Resources

Cc: AAG Hartman
Div 3 Cotten
SLVAC

Encl: Response Area Map


Map Key
Model Boundary
Response Areas
N
W
E
S
0
5.5
11 Miles
1" = 11 miles
Saguache
San Luis Creek
Crestone
Saguache
Center
Subdistrict 1
Del Norte
South Fork
Rio Grande
Alamosa
Monte Vista
Rio Grande Alluvium
Alamosa
Fort Garland
Alamosa / La Jara
Trinchera
La Jara
Conejos
Manassa
San Luis
Conejos
Costilla
CKB; J:\RGDSS\Memo_Figs\Memo_Figs2_Rev.mxd
State of Colorado -- Division of Water Resources
RGDSS -- Response Areas
Date: 9/25/13