Water Supply Reserve Fund – Grant and Loan Program
Water Activity Summary Sheet
May 15-16, 2019
Agenda Item 26(b)

Applicant & Grantee:	Delta Brick & Climate Company
Water Activity Name:	Chemical Water Production via Methane Mitigation
Water Activity Purpose:	Greenhouse gas mitigation and water production
County:	Gunnison
Drainage Basin:	Gunnison
Water Source:	Paonia Reservoir
Amount Requested:	$18,000 Gunnison Basin Account
Matching Funds:	Applicant Match (in-kind) = $5,000 • 28% of the Basin Account request (meets 25% min)

Staff Recommendation:
Staff recommends approval of up to $18,000 from the Gunnison Basin Account to help fund the project titled: Chemical Water Production via Methane Mitigation.

Water Activity Summary: WSRF grant funds, if approved, will assist Delta Brick & Climate Company Ltd to partner with Vessels Coal Gas LLC to produce a new source of water in the North Fork of the Gunnison River basin. Vessels Coal Gas produces greenhouse gas offsets and electricity from coal mine methane, converting methane and oxygen into carbon dioxide, water and energy. The afore mentioned water is created chemically and would not otherwise exist. Methane is a very potent greenhouse gas, and the water can be thought of as a naturally occurring by-product of methane destruction. The water is currently vented as vapor, and only a tiny fraction returns to the watershed as precipitation. The proposed water activity is the condensation of this steam into a new water source.

Gunnison Basin Roundtable funds will be used for engineering design, purchase, and installation of a pilot condensation apparatus. Successful testing of this pilot apparatus would result in additional combusting of gas that is currently venting.

Discussion: This project supports the goals of protecting existing water uses in the Gunnison Basin as called for in the Gunnison Basin Implementation Plan, as well as assisting the state achieve the goal of maintaining or developing additional storage as indicated in Chapter 10, Section 10.3 of Colorado's Water Plan.

Issues/Additional Needs: No issues or additional needs have been identified

Eligibility Requirements: The application meets requirements of all eligibility components: General Eligibility, Entity Eligibility, Water Activity Eligibility, and Eligibility Based on Match Requirements.

Evaluation Criteria: This activity has undergone review and evaluation and staff has determined that it satisfies the Evaluation Criteria. Please refer to Basin Roundtable Chair's Recommendation Letter and the WSRF Grant Application for applicant's detailed response.

Funding Summary/Matching Funds:

Funding Sources	Cash	In-kind	Total	Status
Delta Brick & Climate Company	$0	$5,000	$5,000	Secured
WSRF Gunnison Basin Account	$18,000	$0	$18,000	Secured
Total Study Costs	**$18,000**	**$5,000**	**$23,000**	

CWCB Project Manager: Craig Godbout

The Gunnison Basin Roundtable
210 West Spencer, Suite B
Gunnison, CO 81230

February 4, 2019

Mr. Craig Godbout
Water Supply Management Section
COLORADO WATER CONSERVATION BOARD
1313 Sherman St., Room 718
Denver, CO 80203

Re: WSRF Grant Request: North Fork New Water Source Production Project

Dear Mr. Godbout:

This letter is presented to advise you that the grant application submitted by the Delta Brick & Climate Company for $20,000 from Basin Account funds from the Water Supply Reserve Fund for the North Fork New Water Source Production Project was reviewed by the Gunnison Basin Roundtable and its Project Screening Committee. The request for funding was approved in the amount of $18,000 by a unanimous vote of the Gunnison Basin Roundtable during our meeting on January 21, 2019.

This water activity meets the provisions of Section 37-75-104(2), Colorado Revised Statutes. The requirements/language from the statute is provided in Part 3 of the Criteria and Guidelines.

Thank you for your support of this grant application.

Sincerely,

Frank J. Kugel
Gunnison Basin Roundtable

cc: Kathleen Curry (email)
Tom Alvey (email)
Delta Brick & Climate Company, applicant (email)

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Last Update: July 31, 2018

Colorado Water Conservation Board
Water Supply Reserve Fund Grant Application

Instructions

All WSRF grant applications shall conform to the current 2016 WSRF Criteria and Guidelines.

To receive funding from the WSRF, a proposed water activity must be approved by a Roundtable(s) **AND** the Colorado Water Conservation Board (CWCB). The process for Roundtable consideration and recommendation is outlined in the 2016 WSRF Criteria and Guidelines. The CWCB meets bimonthly according to the schedule on page 2 of this application.

If you have questions, please contact the current CWCB staff Roundtable liaison:

Arkansas	**Gunnison | North Platte | South Platte | Yampa/White**	**Colorado | Metro | Rio Grande | Southwest**
Ben Wade	Craig Godbout	Megan Holcomb
ben.wade@state.co.us	craig.godbout@state.co.us	megan.holcomb@state.co.us
303-866-3441 x3238	303-866-3441 x3210	303-866-3441 x3222

WSRF Submittal Checklist (Required)	
X	I acknowledge this request was recommended for CWCB approval by the sponsoring roundtable.
X	I acknowledge I have read and understand the 2016 WSRF Criteria and Guidelines.
X	I acknowledge the Grantee will be able to contract with CWCB using the Standard Contract.(1)
Application Documents	
X	Exhibit A: Statement of Work(2) *(Word – see Template)*
X	Exhibit B: Budget & Schedule(2) *(Excel Spreadsheet – see Template)*
	Letters of Matching and/or Pending 3rd Party Commitments(2)
X	Map(2)
	Photos/Drawings/Reports
X	Letters of Support
Contracting Documents(3)	
	Detailed/Itemized Budget(3) *(Excel Spreadsheet – see Template)*
	Certificate of Insurance(4) *(General, Auto, & Workers' Comp.)*
	Certificate of Good Standing(4)
	W-9 Form(4)
	Independent Contractor Form(4) *(If applicant is individual, not company/organization)*
	Electronic Funds Transfer (ETF) Form(4)

(1) Click "Grant Agreements". For reference only/do not fill out or submit/required for contracting
(2) Required with application if applicable.
(3) Additional documentation providing a Detailed/Itemized Budget maybe required for contracting. Applicants are encouraged to coordinate with the CWCB Project Manager to determine specifics.

Last Update: July 31, 2018
(4) Required for contracting. While optional at the time of this application, submission can expedite contracting upon CWCB Board approval.

Schedule		
CWCB Meeting	**Application Submittal Dates**	**Type of Request**
January	December 1	Basin Account; BIP
March	February 1	Basin/Statewide Account; BIP
May	April 1	Basin Account; BIP
July	June 1	Basin Account; BIP
September	August 1	Basin/Statewide Account; BIP
November	October 1	Basin Account/BIP

Desired Timeline	
Desired CWCB Hearing Month:	March 2019
Desired Notice to Proceed Date:	April or May 2019

Water Activity Summary	
Name of Applicant	Delta Brick & Climate Company
Name of Water Activity	Chemical Water Production via Methane Mitigation

Approving Roundtable(s)	Basin Account Request(s)(1)
Basin Account Request Subtotal	$ 18,000
Statewide Account Request(1)	$ none
Total WSRF Funds Requested (Basin & Statewide)	$ 18,000
Total Project Costs	$ 23,000

(1) Please indicate the amount recommended for approval by the Roundtable(s)

Last Update: July 31, 2018

Grantee and Applicant Information	
Name of Grantee(s)	Delta Brick & Climate Company Ltd
Mailing Address	1732 Wazee St #206 Denver, CO 80202
FEIN	83-1321716
Grantee's Organization Contact(1)	Christopher Caskey
Position/Title	Founder
Email	chris@cmcaskey.com
Phone	720-421-2633
Grant Management Contact(2)	Christopher Caskey
Position/Title	Founder
Email	chris@cmcaskey.com
Phone	720-421-2633
Name of Applicant (if different than grantee)	
Mailing Address	
Position/Title	
Email	
Phone	

(1) Person with signatory authority

(2) Person responsible for creating reimbursement invoices (Invoice for Services) and corresponding with CWCB staff.

Description of Grantee
Provide a brief description of the grantee's organization (100 words or less).
Delta Brick & Climate Company is a private, for-profit startup founded in 2018 to address climate change and water issues in western Colorado. Our primary activities are 1) combusting waste methane, a potent greenhouse gas, leaking from coal mines; 2) Using heat from this combustion to convert sediment clogging Paonia Reservoir into brick and tile; and 3) Condensing steam from methane combustion into liquid water.

Type of Eligible Entity (check one)

Last Update: July 31, 2018

	Public (Government): municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities. 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
X	**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, any organization that is not part of the government
	Covered Entity: as defined in Section 37-60-126 Colorado Revised Statutes

Type of Water Activity (check one)	
	Study
X	Implementation

Category of Water Activity (check all that apply)		
	Nonconsumptive (Environmental)	
	Nonconsumptive (Recreational)	
	Agricultural	
	Municipal/Industrial	
	Needs Assessment	
	Education & Outreach	
X	Other	Explain: Greenhouse gas mitigation and water production

Location of Water Activity	
Please provide the general county and coordinates of the proposed activity below in **decimal degrees**. The Applicant shall also provide, in Exhibit C, a site map if applicable.	
County/Counties	Gunnison County
Latitude	39.93 N
Longitude	107.46 W

Last Update: July 31, 2018

Water Activity Overview
Please provide a summary of the proposed water activity (200 words or less). Include a description of the activity and what the WSRF funding will be used for specifically (e.g. studies, permitting, construction). Provide a description of the water supply source to be utilized or the water body affected by the activity. Include details such as acres under irrigation, types of crops irrigated, number of residential and commercial taps, length of ditch improvements, length of pipe installed, area of habitat improvements. If this project addresses multiple purposes or spans multiple basins, please explain. The Applicant shall also provide, in Exhibit A, a detailed Statement of Work, Budget, and Schedule.
Delta Brick & Climate Company Ltd has the opportunity to partner with Vessels Coal Gas LLC to produce a new source of water in the North Fork of the Gunnison River basin. Vessels Coal Gas produces greenhouse gas offsets and electricity from coal mine methane under the following reaction: $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ + energy. This water is created chemically and would not otherwise exist. Methane is a very potent greenhouse gas, and the water can be thought of as a naturally occurring by-product of methane destruction. The water is currently vented as vapor, and only a tiny fraction returns to the watershed as precipitation. **The proposed water activity is the condensation of this steam into a new water source.** Gunnison Basin Roundtable funds will be used for engineering design, purchase, and installation of a pilot condensation apparatus. Successful testing of this pilot apparatus would result in additional combusting of gas that is currently venting.

Measurable Results		
To catalog measurable results achieved with WSRF funds please provide any of the following values.		
	New Storage Created (acre-feet)	
	New Annual Water Supplies Developed or Conserved (acre-feet), Consumptive or Nonconsumptive	
	Existing Storage Preserved or Enhanced (acre-feet)	
	Length of Stream Restored or Protected (linear feet)	
	Efficiency Savings (indicate acre-feet/year OR dollars/year)	
	Area of Restored or Preserved Habitat (acres)	
	Length of Pipe/Canal Built or Improved	
0.28 af/year	Other	Explain: new water created and condensed

Last Update: July 31, 2018

Water Activity Justification

Provide a description of how this water activity supports the goals of Colorado's Water Plan, the most recent Statewide Water Supply Initiative, and the respective Roundtable Basin Implementation Plan and Education Action Plan [(1)]. The Applicant is required to reference specific needs, goals, themes, or Identified Projects and Processes (IPPs), including citations (e.g. document, chapters, sections, or page numbers).

For applications that include a request for funds from the Statewide Account, the proposed water activity shall be evaluated based upon how well the proposal conforms to Colorado's Water Plan criteria for state support (CWP, Section 9.4, pp. 9-43 to 9-44;) (Also listed pp. 4-5 in 2016 WSRF Criteria and Guidelines).

There are no new water sources in the Colorado River basin. Aridification due to climate change and over-appropriation are well-understood challenges. One of the largest sources of climate pollution in Colorado is the coal mine methane venting from the North Fork coal region. (Compared to CO2, methane is a less common, but much more potent, greenhouse gas.) Senate Bill 06-179, which created the Water Supply Reserve Fund, states that funding may be used to "Build projects or identify methods to meet the water supply needs of the river basin." Reducing the climate burden to Colorado's water supply via methane mitigation while creating a new source of water is clearly justifiable under WSRF goals.

Reducing the climate burden to Colorado's water supply via methane mitigation while creating a new source of water supports the stated goals for the WSRF.

Available water

Presently, 2 billion cubic feet of natural gas vent annually from the North Fork region. If combusted, this would generate 4 billion cubic feet of steam, condensable into 73 acre-feet of water annually. Practical and stakeholder limitations likely constrain the combustible methane to 1 billion cf, and engineering constraints may limit the condensation efficiency to 50%. Even still, 18 acre-feet of water per year is available that does not currently exist.

This number may go up or down, but will be relatively stable for a generation: Resumption of mining at the Bowie #2 mine would cause a spike in methane emissions, as would West Elk's planned expansion into a new coal seam. Methane continues to leak from coal mines long after mine closure, diminishing for the first several years then leveling off and venting steadily for many decades.

There are many gassy coal mines elsewhere in Colorado. The Cameo and Roadside Mines outside Palisade vent 6.9 million cubic feet per year, and the Redstone coal mining region vents 470 million cubic feet per year. Mines outside Trinidad produce 340 million cf per year, though much of this is captured and sold. Combustion and condensation technology is further deployable to landfill gas, a methane-rich mixture that is typically flared. Data is patchy, but over 4 billion cubic feet of landfill gas are flared or vented across Colorado annually.

Additional waste gas sources exist in the Upper Colorado River Basin. In aggregate, hundreds of acre-feet annually could be made available to augment consumptive uses, provide environmental flows, and blunt the impact of drought contingency plans.

Concurring Plans and Initiatives

The Statewide Water Supply Initiative (SWSI) states that climate change is not considered in the 2010 report, but that "Climate change is an important factor for consideration in conjunction with future water demands and should be included in subsequent forecasting efforts." Climate change will certainly increase evaporation and transpiration and will likely reduce precipitation. The Colorado Climate Plan commits the state to "Reduce statewide greenhouse gas emissions by more than 26 percent from 2005 levels by 2025." (Ex. Sum.) Burning coal mine methane is a clear win for the climate, and full implementation of this project would eliminate millions of tons of CO2 equivalent annually.

Last Update: July 31, 2018

The Colorado Climate Plan also commits to "Formalize and expand upon cross-agency actions to provide economic development strategies and other supportive services to communities impacted by the changing energy landscape". (Ex. Sum.) Delta Brick & Climate Company is creating economic development in an area highly impacted by coal mine closures, and this project provides CWCB an opportunity to align its project portfolio with state climate action goals.

The Gunnison Basin Implementation Plan states "As an initial attempt to incorporate [climate and growth] scenario planning in the Gunnison Basin this plan includes analyses of varying future hydrologic and water demand scenarios. [...]The GBRT believes risk management criteria must be developed to prevent harm to existing water rights". (Page 29, Basin Goals). The proposed water activity is a risk management action, and therefore helps risk management criteria development. Adding a new water source could blunt the impact of drought contingency planning and therefore supports the primary goal of protecting existing water users in the Gunnison Basin. The activity also supports goal 6, to "Maintain or, where necessary, improve water quality throughout the Gunnison Basin" (page 28). This is because the condensed water is similar to distilled water: free of salts, selenium, bacteria, and nutrients. It's introduction to the wider system will have a dilutive effect on any existing pollutants. Finally, should condensed water be used as for environmental flows, it would support the BIP's measurable outcome of "Maintain[ing] mileage and volume of instream flows for environmental and recreational uses" (page 31).

Why we are asking for funding

This project requires grant funding because there is not a clear commercial benefit to installing water condensers on methane combustors. Additionally, there are multiple stakeholder challenges that will impact deployability, including governmental oversight and mineral estate holders. These barriers discourage private funders.

What will happen with the water created?

Pending permitting, the water created will be piped to a nearby creek and discharged. Candidate methane combustors are located near Elk Creek and Sanborn Creek. Both are tributaries of the North Fork of the Gunnison River. In the future, DBCC may look to decree discharged water as a right for consumptive use or environmental flows.

Should water be condensed from existing natural gas power plants?

No. Condensation uses a large amount of energy and is only viable in fossil fuel exhaust where the energy from combustion is otherwise going to waste.

How this relates to sedimentation

DBCC is currently raising capital for its pilot factory that will make ceramics from Paonia Reservoir sediment. It has secured access to much more gas than that pilot plant will need. The excess gas can be put to use by generating water. Furthermore, DBCC's factory will not be in operation for over a year, and the condensation portion of its project will be able to impact the watershed positively in the near term.

(1) Access Basin Implementation Plans or Education Action Plans from Basin drop down menu.

Last Update: July 31, 2018

Matching Requirements: Basin Account Requests	
Basin (only) Account grant requests require a 25% match (cash and/or in-kind) from the Applicant or 3rd party and shall be accompanied by a **letter of commitment** as described in the 2016 WSRF Criteria and Guidelines (submitted on the contributing entity's letterhead). Attach additional sheet if necessary.	
Contributing Entity	Amount and Form of Match (note cash or in-kind)
Delta Brick & Climate Company	
Contributing engineering and design work	$5,000 in kind
Vessels Coal Gas	
Contributing use of a $400,000 methane combustor	in kind--difficult to value
Total Match	$5,000 +
If you requested a Waiver to the Basin Account matching requirements, indicate the percentage you wish waived.	

Matching Requirements: Statewide Account Requests	
Statewide Account grant requests require a 50% match as described in the 2016 WSRF Criteria and Guidelines. A minimum of 10% match shall be from Basin Account funds (cash only). A minimum of 10% match shall be provided by the applicant or 3rd party (cash, in-kind, or combination). The remaining 30% of the required match may be provided from any other source (Basin, applicant, or 3rd party) and shall be accompanied by a **letter of commitment.** Attach additional sheet if necessary.	
Contributing Entity	Amount and Form of Match (note cash or in-kind):
Total Match	$
If you requested a Waiver to the Statewide Account matching, indicate % you wish waived. (Max 50% reduction of requirement).	

Last Update: July 31, 2018

Related Studies

Please provide a list of any related studies, including if the water activity is complementary to or assists in the implementation of other CWCB programs.

Coal mine methane literature:
https://www.colorado.gov/pacific/energyoffice/methane-capture

Previous CWCB Grants

List all previous or current CWCB grants (including WSRF) awarded to both the Applicant and Grantee. Include: 1) Applicant name; 2) Water activity name; 3) Approving RT(s); 4) CWCB board meeting date; 5) Contract number or purchase order

Delta Brick & Climate Company was awarded a Water Plan Grant at the November 2018 CWCB meeting for "Paonia Reservoir Sediment Utilization". The contract is being negotiated as of late November and was issued in February. The grant amount is $19,000 and is in the Innovation and Education Section. POGG1 number 2019-2671

Delta Brick & Climate Company has also collaborated with the North Fork Water Conservancy District to submit a Water Plan grant to the Storage section. The grantee would be NFWCD and DBCC would serve as a subcontractor. The grant request is $337,758 and total project cost is $689,658. The title is "Paonia Reservoir Sediment Removal and Utilization" and will be heard by the full board at their May 2019 meeting.

Tax Payer Bill of Rights

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.

None known

Last Update: January 9, 2018

Colorado Water Conservation Board	
Water Supply Reserve Fund	
Exhibit A - Statement of Work	
Date:	November 2018
Water Activity Name:	Chemical Production of Water via Methane Mitigation
Grant Recipient:	Delta Brick & Climate Company
Funding Source:	Gunnison Basin Roundtable

Water Activity Overview: (Please provide brief description of the proposed water activity (no more than 200 words). Include a description of the overall water activity and specifically what the WSRF funding will be used for.

Delta Brick & Climate Company Ltd has the opportunity to partner with Vessels Coal Gas LLC to produce a new source of water in the North Fork of the Gunnison River basin. Vessels Coal Gas produces greenhouse gas offsets and electricity from coal mine methane under the following reaction: $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ + energy. This water is created chemically and would not otherwise exist. Methane is a very potent greenhouse gas, and the water can be thought of as a naturally-occuring by-product of methane destruction. The water is currently vented as vapor, and only a tiny fraction returns to the watershed as precipitation. **The proposed water activity is the condensation of this steam into a new water source.**

Gunnison Basin Roundtable funds will be used for engineering design, purchase, and installation of a pilot condensation apparatus. Successful testing of this pilot apparatus would result in additional combusting of gas that is currently venting.

Objectives: (List the objectives of the project)

Design, build, install, and monitor a water-condensation apparatus on an existing coal mine methane combustion project.

Last Update: January 9, 2018

Tasks
Provide a detailed description of each task using the following format:
Task 1 - Engineering and Design of Condensation Apparatus
Description of Task:
Delta Brick & Climate Company will design and engineer a condensation apparatus suitable for attachment to existing coal mine methane combustors. These combustors are owned and operated by Vessels Coal Gas LLC. Use of these combustors, which cost around $400,000, is considered an in-kind contribution. Vessels Coal Gas will likely serve as an engineering subcontractor in this task. Budget breakdown: $5000 for engineering time, up to 10 hours subcontracted to Vessels. Additional engineering time provided by DBCC in-kind as needed. All labor rates are $150/hour for Sr Scientists and Engineers and $100/hour for technicians.
Method/Procedure:
The condensation apparatus will be a heat pump that extracts energy from methane combustion and produces coldness (refrigeration). This coldness will put in contact with the exhaust stream, causing condensation. This can be accomplished in a number of ways and will be guided by the following sub-tasks: 1.1: Understand candidate host combustors Multiple types and locations of combustors are available. They have different geometries, constraints on their use, and ease of access for maintenance. 1.2 Identify relevant considerations including: costs, geometry, moving parts, maintenance needs, energy fluxes, energy conversion efficiencies, data reporting, etc. Weight these considerations by importance. 1.3 Produce a few candidate designs, and rank them according to compliance with weighted considerations from subtask 1.3. Choose a design and price components. 1.4 Estimate water discharge based on design and apply for water discharge permit if needed.
Grantee Deliverable: (Describe the deliverable the grantee expects from this task)
Knowledge of suitable design criteria and costs for pilot condensation apparatus
CWCB Deliverable: (Describe the deliverable the grantee will provide CWCB documenting the completion of this task)
DBCC will provide general design information to CWCB in mid-project and final reports. However, disclosures may be constrained by intellectual property considerations.

Last Update: January 9, 2018

Tasks
Provide a detailed description of each task using the following format:
Task 2 - Component Purchase and Construction of Pilot Condensation Apparatus
Description of Task:
Purchase components of apparatus designed in Task 1. Assemble components. Budget: $8,000 for component purchase and shipping. Assembly time provided by DBCC in-kind. All components are expected to be available in a variety of sizes. The size of the apparatus will be chosen to condense as much water as possible for under $8,000. This will likely be much less water than is available in the exhaust stream, but will serve as a useful proof-of-concept.
Method/Procedure:
Spend a lot of time on McMaster-Carr's website. Assemble components at Delta Brick & Climate's office in Denver or operational headquarters in the North Fork. DBCC's founder is an experienced designer and builder of electromechanical systems. See https://www.cmcaskey.com/#/vacuum-chamber-build/
Grantee Deliverable: (Describe the deliverable the grantee expects from this task)
At the end of task 2, DBCC will have a functioning water condensation apparatus.
CWCB Deliverable: (Describe the deliverable the grantee will provide CWCB documenting the completion of this task)
DBCC will inform CWCB of progress through mid- and final project reports.

Last Update: January 9, 2018

Tasks
Provide a detailed description of each task using the following format:
Task 3 - Installation of Pilot Condensation Apparatus
Description of Task:
The assembled pilot apparatus will be attached to the chosen methane combustor. Budget $4,000 for engineering/mechanic time. Up to half of this will be subcontracted to Vessels Coal Gas. Additional effort will be provided by DBCC in-kind. Candidate methane combustors consume ~78 million cf/year, which equates to 2.8 af/year water vapor. We may be able to condense 10% of this with a pilot apparatus, or 257 gallons of water per day.
Method/Procedure:
Physically bolt or otherwise attach condensation apparatus to methane combustor. Pipe condensed water past a flow meter and to nearby stream.
Grantee Deliverable: (Describe the deliverable the grantee expects from this task)
At the end of Task 3, DBCC will have an water condensation apparatus in operation on a methane combustor.
CWCB Deliverable: (Describe the deliverable the grantee will provide CWCB documenting the completion of this task)
Water in a Colorado stream! Or at least dampness. DBCC will inform CWCB of progress through mid- and final project reports.

Last Update: January 9, 2018

Tasks
Provide a detailed description of each task using the following format:
Task 4 - Monitoring and Reporting
Description of Task:
DBCC will monitor the effectiveness of the condensation apparatus, water produced, and maintenance needs. The period of monitoring will be 1 year or device failure, whichever comes first. The purpose of this task is to understand: 1) How well the condenser performs 2) Other methane sources where the technology is relevant 3) Total water producible and methane mitigatable across Colorado, based on publicly-available numbers Budget $1,000 for DBCC staff time. Additional effort provided by DBCC in-kind.
Method/Procedure:
Passive monitoring equipment will be incorporated in the design. Performance will be extrapolated to other combustion and condensation opportunities.
Grantee Deliverable: (Describe the deliverable the grantee expects from this task)
DBCC will gain an understanding of the potential and scale of condensation technology.
CWCB Deliverable: (Describe the deliverable the grantee will provide CWCB documenting the completion of this task)
DBCC will write a final report and deliver it to CWCB.

Last Update: January 9, 2018

Budget and Schedule

Exhibit B - Budget and Schedule: This Statement of Work shall be accompanied by a combined Budget and Schedule that reflects the Tasks identified in the Statement of Work and shall be submitted to CWCB in excel format. A separate excel formatted Budget is required for engineering costs to include rate and unit costs.

Reporting Requirements

Progress Reports: The grantee shall provide the CWCB a progress report every 6 months, beginning from the date of issuance of a purchase order, or the execution of a contract. The progress report shall describe the status 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. The CWCB may withhold reimbursement until satisfactory progress reports have been submitted.

Final Report: At completion of the project, the grantee shall provide the CWCB a Final Report on the grantee's letterhead that:

- Summarizes the project and how the project was completed.
- Describes any obstacles encountered, and how these obstacles were overcome.
- Confirms that all matching commitments have been fulfilled.
- Includes photographs, summaries of meetings and engineering reports/designs.

Payments

Payment will be made based on actual expenditures, must include invoices for all work completed and must be on grantee's letterhead. The request for payment must include a description of the work accomplished by task, an estimate of the percent completion for individual tasks and the entire Project in relation to the percentage of budget spent, identification of any major issues, and proposed or implemented corrective actions.

The CWCB will pay the last 10% of the entire water activity budget when the Final Report is completed to the satisfaction of CWCB staff. Once the Final Report has been accepted, and final payment has been issued, the water activity and purchase order or contract will be closed without any further payment. Any entity that fails to complete a satisfactory Final Report and submit to CWCB within 90 days of the expiration of a purchase order or contract may be denied consideration for future funding of any type from CWCB.

Performance Requirements

Performance measures for this contract shall include the following:
(a) Performance standards and evaluation: Grantee will produce detailed deliverables for each task as specified. Grantee shall maintain receipts for all project expenses and documentation of the minimum in-kind contributions (if applicable) per the budget in Exhibit B. Per Grant Guidelines, the CWCB will pay out the last 10% of the budget when the final deliverable is completed to the satisfaction of CWCB staff. Once the final deliverable has been accepted, and final payment has been issued, the purchase order or grant will be closed without any further payment.
(b) Accountability: Per the Grant Guidelines full documentation of project progress must be submitted with each invoice for reimbursement. Grantee must confirm that all grant conditions have been complied with on each invoice. In addition, per the Grant Guidelines, Progress Reports must be submitted at least once every 6 months. A Final Report must be submitted and approved before final project payment.
(c) Monitoring Requirements: Grantee is responsible for ongoing monitoring of project progress per Exhibit A. Progress shall be detailed in each invoice and in each Progress Report, as detailed above. Additional inspections or field consultations will be arranged as may be necessary.
(d) Noncompliance Resolution: Payment will be withheld if grantee is not current on all grant conditions. Flagrant disregard for grant conditions will result in a stop work order and cancellation of the Grant Agreement.

Last Update: July 31, 2018

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Water Conservation Board

Water Supply Reserve Fund

EXHIBIT B - BUDGET AND SCHEDULE - Direct & Indirect (Administrative) Costs

Date: 26Nov2018

Water Activity Name: Chemical Water Production via Methane Mitigation

Grantee Name: Delta Brick & Climate Company Ltd

Task No.[1]	Description	Start Date[2]	End Date	Matching Funds (cash & in-kind)[3]	WSRF Funds (Basin & Statewide combined)[3]	Total
1	Engineering & Design of Condensation Apparatus	June 2019	July 2019	$2,000	$5,000	$7,000
2	Component Purchase and Construction Pilot of Condensation Apperatus	July 2019	August 2019	$0	$8,000	$8,000
3	Installation of Pilot Condensation Apparatus	August 2019	September 2019	$1,000	$4,000	$5,000
4	Monitoring and Reporting	September 2019	September 2020	$2,000	$1,000	$3,000
						$0
						$0
						$0
						$0
						$0
						$0
						$0
						$0
						$0
			Total	$5,000	$18,000	$23,000

(1) The single task that include costs for Grant Administration must provide a labor breakdown (see Indirect Costs tab below) where the total WSRF Grant contribution towards that task does not exceed 15% of the total WSRF Grant amount.
(2) Start Date for funding under $100K - 45 Days from Board Approval; Start Date for funding over $100K - 90 Days from Board Approval.
(3) Round values up to the nearest hundred dollars.
• Additional documentation providing a Detailed/Itemized Budget may be required for contracting. Applicants are encouraged to coordinate with the CWCB Project Manager to determine specifics.
• Reimbursement eligibility commences upon the grantee's receipt of a Notice to Proceed (NTP)
• NTP will not be accepted as a start date. Project activities may commence as soon as the grantee enters contract and receives formal signed State Agreement.
The CWCB will pay the last 10% of the entire water activity budget when the Final Report is completed to the satisfaction of the CWCB staff project manager. Once the Final Report has been accepted, the final payment has been issued, the water activity and purchase order (PO) or contract will be closed without any futher payment. Any entity that fails to complete a satisfactory Final Report and submit to the CWCB with 90 days of the expiration of the PO or contract may be denied consideration for future funding of any type from the CWCB.
• Additonally, the applicant shall provide a progress report every 6 months, beginning from the date of contract execution
• Standard contracting proceedures dictate that the Expiration Date of the contract shall be 5 years from the Effective Date.

United States Department of the Interior

BUREAU OF RECLAMATION
Upper Colorado Region
Western Colorado Area Office
445 West Gunnison Avenue, Suite 221
Grand Junction, CO 81501

IN REPLY REFER TO:

WCG-PIpson
2.2.3.18

JUN 11 2018

VIA ELECTRONIC MAIL ONLY

Mr. Christopher Caskey
Delta Brick & Climate Company
1732 Wazee St. #206
Denver, Colorado 80202

Subject: Response to Inquiry for Use of Sediment in Paonia Reservoir, Paonia Project, Colorado

Dear Mr. Caskey:

Thank you for meeting with us to discuss your proposal of using sediment from Paonia Reservoir to make ceramics. We are very interested in this proposal and are willing to work with you and your partners, Western Slope Conservation Center and Colorado Farm and Food Alliance, to explore the necessary steps to allow removal of sediment from Paonia Reservoir. If you have any questions, please contact Phil Ipson at 970-248-0663 or pipson@usbr.gov.

Sincerely,

Ed Warner
Area Manager

cc: Mr. Steve Fletcher, Superintendent
Fire Mountain Canal and
Reservoir Company
P.O. Box 543
Hotchkiss, CO 81419

Ms. Dixie Luke
Fire Mountain Canal and
Reservoir Company
P.O. Box 543
Hotchkiss, CO 81419

Mr. Tom Alvey, President
North Fork Water Conservancy District
P.O. Box 217
Hotchkiss, CO 81419

WCG-TFowlds, WCG-LMcWhirter, WCG-MWerkmeister

DELTA COUNTY, COLORADO

BOARD OF COUNTY COMMISSIONERS

COUNTY COURTHOUSE • 501 PALMER STREET • SUITE 227 • DELTA • COLORADO • 81416-1796

PHONE: (970) 874-2100 FAX: (970) 874-2114

www.deltacounty.com

Dist. 1: C. Douglas Atchley - Dist. 2: Don Suppes - Dist. 3: J. Mark Roeber

April 24, 2018

To: To Whom It May Concern

Delta Board of County Commissioners endorses the potential project being submitted by Chris Caskey. Delta County's economy is based on coal mining, agriculture and recreation. Our coal industry has seen a significant reduction with the closing of two of the three mines and a work force that has decreased by over 800 mining families. Delta County has taken significant steps to further diversify its economy and embracing entrepreneurial endeavors.

The Paonia Dam and Reservoir provides an integral resource for the East end of Delta County and all of related agriculture. The downside of the Paonia Reservoir is that it is filling up with fine, clay-like sediment. The resilience of the water system is threatened by this sedimentation, which reduces storage capacity and requires periodic sediment flushing. In addition, the coal mines in the area--active, inactive, and abandoned--vent methane gas as a waste. To facilitate stakeholder dialogue, Delta County convened the North Fork Coal Mine Methane Working Group whose stated mission is "the support of the coal mines and surrounding communities in the North Fork Valley through the development of a comprehensive strategy for education, capture, exploration of mitigation, and economic utilization of coal mine methane."

Chris Caskey has brought forward an interesting potential solution to both of the sedimentation and methane challenges. He proposes to use heat from burning methane to fire ceramics (such as brick, tile, and pots) from Paonia Reservoir clay. Delta County Board of Commissioners supports this proposal to further study such utilization, as there are engineering, market, stakeholder acceptance, and environmental questions outstanding. If you have further questions, contact Robbie LeValley, Delta Count Administrator at 970-874-2102 or rlevalley@deltacounty.com.

Sincerely,

Delta Board of County Commissioners

C. Douglas Atchley, Chairman

J. Mark Roeber, Vice Chairman

Don Suppes, Commissioner

Colorado Watershed Assembly
P.O. Box 211729
Denver, Colorado

Dear Colorado Watershed Assembly Review Panel,

We support the Western Slope Conservation Center's proposal to the Colorado Healthy Rivers Fund. Fire Mountain Canal and Reservoir Company manages Paonia Reservoir Dam, which impounds Muddy Creek, stores agricultural water for 488 shareholders, and irrigates approximately 15,300 acres of land.

The North Fork of the Gunnison River is a vital stream supporting wildlife, recreation, towns, ranches, farms, orchards, and vineyards. The primary function of Paonia Reservoir is to provide water for Fire Mountain Canal diversion decrees. However, the Reservoir greatly benefits the entire North Fork system by extending the irrigation season beyond what would be the normal run-off period for the watershed. Constructed in 1962, Paonia Dam and Reservoir is at the end of its planned life as it fills with a fine, clay-like sediment. The Reservoir and North Fork river are now facing substantial challenges due to high sediment loads.

Located approximately 4 miles downstream from Paonia Reservoir are number of different coal mines--active, inactive, and abandoned—which vent significant amounts of methane as waste. A local stakeholder group, The North Fork Coal Mine Methane Working Group, has convened to discuss practical options for mitigating this issue.

The Western Slope Conservation Center is working on a solution to both of these challenges that would use heat from burning methane to fire ceramics (such as brick, tile, and pots) from Paonia Reservoir clay. We support this proposal to further study such utilization, as there are engineering, market, stakeholder acceptance, and environmental questions outstanding. Successful utilization would bring many positive impacts including increased water supply resilience, improved health to the North Fork river, increased recreation opportunities to our local community, mitigation of the climate impact of methane venting, and job creation.

We strongly support this planning project and look forward to the next steps in this important enterprise.

Sincerely,

Dixie Luke, Fire Mountain Canal and Reservoir Company, President
Steve Fletcher, Fire Mountain Canal and Reservoir Company, Manager

Gunnison County
COLORADO

Gunnison County Board of County Commissioners
Phone: (970) 641–0248 • Fax: (970) 641–3061
Email: bocc@gunnisoncounty.org • www.GunnisonCounty.org

Christopher Caskey
Delta Brick & Climate Company
1732 Wazee Street #206
Denver, CO 80202

Dear Christopher Caskey,

Gunnison County is a high-elevation county in western Colorado containing the headwaters of several significant river systems. As such, watershed health in our county has enormous impact on water users in Gunnison County and downstream. Northwest Gunnison County is the watershed of the North Fork of the Gunnison River, an important stream supporting wildlife, recreation, towns, ranches, farms, orchards, and vineyards. Much of the North Forks' flow is mediated by Paonia Dam and Reservoir, which is at the end of its planned life as it fills with fine, clay-like sediment. The resilience of our water system is threatened by this sedimentation, which reduces storage capacity and requires sediment flushing in ways that impact the downstream environment. We are therefore interested in solutions that will mitigate reservoir siltation.

This North Fork area is also a location of a number of different coal mines --active, inactive, and abandoned—which vent significant amounts of methane as waste. To facilitate stakeholder dialogue, Gunnison and Delta counties convened the North Fork Coal Mine Methane Working Group whose stated mission is "the support of the coal mines and surrounding communities in the North Fork Valley through the development of a comprehensive strategy for education, capture, exploration of mitigation, and economic utilization of coal mine methane."

We appreciate your work on developing a potential solution to both these challenges by using heat from burning methane to fire ceramics (such as brick, tile, and pots) from Paonia Reservoir clay. We support your proposal to further study such utilization, as there are engineering, market, stakeholder acceptance, and environmental questions outstanding. Successful utilization would bring many positive impacts including increased water supply resilience, improved recreation opportunities in Paonia State Park and the river system downstream, mitigation of the climate impact of methane venting, and job creation. Please keep us informed of your progress and we would be happy to continue to offer our perspective and introductions as appropriate.

Sincerely,

Phil Chamberland, Chairperson | Jonathan Houck, Commissioner | John Messner, Commissioner

OXBOW MINING, LLC

3737 Hwy 133 P.O. Box 535 Somerset, Colorado 81434 USA Tel (970)929-5122 Fax (970)929-5177

Two whom it may concern,

Oxbow Mining, LLC was founded in 1995 to develop coal resources in Colorado's North Fork Valley. As is the case with many coal seams, the coal in the North Fork Valley is saturated with natural gas. For worker safety, that gas--called coal mine methane--is vented or flared.

In 2011 Oxbow partnered with Gunnison Energy, Vessels Coal Gas, Holy Cross Electric, and Aspen Ski Company to use this resource. The result was a methane capture system and three megawatts of electric generation, enough to power Aspen Ski Area. There are few coal mine methane utilization projects in the country, and this project establishes us as a national leader.

Because of our leadership and local presence, we were invited to join the North Fork Coal Mine Methane Working Group, a stakeholder dialogue organized by Delta and Gunnison Counties whose stated mission is "the support of the coal mines and surrounding communities in the North Fork Valley through the development of a comprehensive strategy for education, capture, exploration of mitigation, and economic utilization of coal mine methane."

One interesting idea to emerge from this dialogue is to use heat from flared coal mine methane to fire ceramics such as brick and tile. Clay for the ceramics would be sourced from Paonia Reservoir, a local irrigation reservoir which has lost a third of its storage to sedimentation. This project would create a win-win scenario by restoring reservoir function, putting coal mine methane to beneficial use, and create local jobs.

The Western Slope Conservation Center and Delta Brick & Climate Company are both pursuing funding for different aspects of such a project. Oxbow Mining supports these efforts. We have space at our mine site that could host a ceramics factory, methane that is currently being gathered and flared, and a rail load-out facility. We will continue to communicate with different stakeholders as the project progresses.

Best Regards,

Michael Ludlow
President
Oxbow Mining, LLC

Vessels Coal Gas, Inc.
www.vesselscoalgas.com

730 17th Street
Suite 430
Denver, Colorado 80202

Office: 303-534-0488

September 6, 2018

To whom it may concern,

Re: Vessels Coal Gas Letter of Support

Vessels Coal Gas was founded in 2003 with the purpose to destroy and use coal mine methane, a potent climate pollutant and large wasted resource. We operate several methane destruction facilities that generate greenhouse gas offset credits that we sell on several markets, primarily California's cap-and-trade system. Our flagship project generates 3 MW of electrical power in Colorado's North Fork valley using gas from the Elk Creek coal mine. The project was developed in conjunction with Oxbow Mining, Gunnison Energy, Aspen Ski area, Holy Cross Energy, and Delta Montrose Electric Association. The Elk Creek Mine produces more gas than required for electric generation, so our project also flares over three hundred million cubic of methane per year. Additional uncontrolled methane emissions are estimated to be over two billion cubic feet per year. We are national leaders in coal gas capture and greenhouse gas management.

Greenhouse gas management is an emerging industry and offsets are a new commodity. There is a significant business opportunity in greenhouse gas management, and we note that legislation and regulation has lagged behind the market and environmental needs of this business area.

Vessels Coal Gas is in discussions with Delta Brick & Climate Company to use gas currently being flared to fire ceramics from locally-sourced clay. We are willing to divert gas from our flare, provided we are compensated for our time and expenses and retain the rights to generated greenhouse gas offsets. We encourage the recipients of this letter to look favorably on proposals submitted by Delta Brick & Climate Co.

Please contact us for more information.

Regards, Tom Vessels

President of Vessels Coal Gas, Inc.