

Water Supply Reserve Account – Grant and Loan Program
Water Activity Summary Sheet
March 16-17, 2016
Agenda Item 14(x)

Applicant & Fiscal Agent: Dolores Water Conservancy District

Water Activity Name: SW Colorado Weather Modification Strategic Plan for Winter Snow Pack Augmentation

Water Activity Purpose: Strategic Planning (Ag, M&I, Rec & Env)

County: All w/in Southwest Basin

Drainage Basin: Southwest

Water Source: Atmosphere

Amount Requested/Source of Funds: \$55,620 Southwest Basin Account

Matching Funds: n/a (none provided)

Staff Recommendation:

Staff recommends approval of up to \$55,620 from the Southwest Basin Account to help fund the project titled: SW Colorado Weather Modification Strategic Plan for Winter Snow Pack Augmentation.
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Water Activity Summary: WSRA funds, if approved, will be expended to provide funding to: Establish a local oversight group that can actively assist and support the cloud seeding program development and improvements, and to request new sources for additional funding. This group may only meet once per year or possibly only through conference calling to control travel & time commitment. This group should also actively coordinate with CWCB and the Lower Basin funding partners; and Contract with an appropriate independent weather modification professional to help a local group develop a strategic plan for the southwest Colorado programs. The plan will focus on program improvements and efficiencies, and assist the basin in meeting “gaps” identified in our Basin Implementation Plan by adding additional or augmented water supplies. These objectives will be accomplished by: enabling the Strategic Planning Group (via the Dolores Water Conservancy District) to solicit, review, select and contract with an appropriate qualified weather modification firm, individual or team; conduct representative plume studies to guide other questions necessary to complete the strategic plan; inventory, map and evaluate existing program equipment and placement, technology and practices; review available technologies and modernize equipment then prioritize with current cost estimates; and conduct local meetings with Strategic Planning Team to review Final Reports, exhibits and conclusions.

The current Southwest cloud seeding efforts are supported by nine (9) local sponsors, the State of Colorado, neighboring New Mexico Interstate Stream Commission and three Lower Basin states. The local sponsors have committed \$151,900 with another \$86,000 from the other parties to the 2015 cloud seeding programs. The local sponsors have provided similar levels of funding for many years along with CWCB while New Mexico and the Lower Basin California, Arizona and Nevada parties are more recent contributors to the San Juan programs.

Multiple parties currently fund the existing operations, but do not have a formal organized structure to proceed as a group to guide program improvements. This funding will focus and guide the group towards an actionable plan that will improve the current weather modification programs. It will provide efforts that no single party would undertake alone. The combined \$237,900 input by the local, state and out of state participants over multiple years demonstrates significant commitments to continuing these cloud seeding programs. Additional participation of time guiding the strategic planning efforts will likewise show further interest and commitment. The end result of the plan would lead participants to increase funding sources for improving the current programs.

Discussion: This project aligns with well with several of the Southwest Basin Implementation Plan's Basin Goals and Measurable Outcomes; such as: A2. Support specific and unique IPPs important to maintaining the quality of live in this region, and to address multiple purposes including municipal, industrial, environmental, recreational, agricultural, risk management, and compact compliance needs (SWBIP, Section 1: Basin Goals and Measurable Outcomes; Table 1: Goals and Measurable Outcomes for the Southwest Basin Implementation Plan, page 12). While this effort has not been specifically identified as a Project or Methods, or an IPP in the SWBIP, funding opportunities should include efforts that have been initiated subsequent to the submission of the SWBIP.

In addition this effort advances the Critical Goals and Actions to Meet Colorado's Water Gaps (CWP Chapter 10.3, A. Supply – Demand Gap, 10-9).

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

Threshold and Evaluation Criteria: The application meets all four Threshold Criteria.

Tier 1-3 Evaluation Criteria: n/a

Funding Summary/Matching Funds: n/a

CWCB Project Manager: Joe Busto

All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and will help promote the development of a common technical platform. In accordance with the revised WSRA Criteria and Guidelines, staff would like to highlight additional reporting and final deliverable requirements. The specific requirements are provided below.

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

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

Engineering: All engineering work (as defined in the Engineers Practice Act (§12-25-102(10) C.R.S.)) performed under this grant shall be performed by or under the responsible charge of professional engineer licensed by the State of Colorado to practice Engineering.

SOUTHWEST BASINS ROUNDTABLE

Michael Preston, Chair

c/o Dolores Water Conservancy District

P.O. Box 1150

Cortez, Colorado 81321

970-565-7562

January 15, 2016

Mr. Craig Godbout

Water Supply Management Section

Colorado Water Conservation Board

1580 Logan Street, Suite 600

Denver, Colorado 80203

SUBJECT: SW Colorado Weather Modification Strategic Plan for Winter Snow Pack
Augmentation, \$55,620 from Southwest Basin Account

Dear Mr. Godbout:

The Southwest Basin Roundtable approved funding of \$55,620 from the Basin Account for SW Colorado Weather Modification Strategic Plan for Winter Snow Pack Augmentation. The application was considered in detail and approved at the January 13, 2016 meeting of the Southwest Basin Roundtable. There was a quorum of Roundtable members present.

This strategic plan will engage stakeholders in two major cloud seeding programs in Southwest Colorado to improve the effectiveness of these programs and strategically introduce new technologies and lessons learned from recent cloud seeding experimentation and verification research.

Snow augmentation is recognized by the State of Colorado and the lower Basin states as a primary tool for helping to mitigate long term storage deficits and upper basin shortages that have plagued the Colorado Basin over the last 15 years. The strategic modernization of the cloud seeding programs in Southwest Colorado will add to the potential of this tool.

The completed Grant Application will be forwarded directly to you by the applicant. Please contact the applicant directly or me at 970-565-7562, mpreston@frontier.net, if you have questions or wish to discuss this application in more detail.

Sincerely,

A handwritten signature in blue ink, appearing to be 'Michael Preston', written over a circular blue stamp or seal.

Michael Preston

Southwest Basin Roundtable Chair



COLORADO WATER CONSERVATION BOARD



WATER SUPPLY RESERVE ACCOUNT APPLICATION FORM

Today's Date: December 14, 2015

SW Colorado Weather Modification Strategic Plan for Winter Snow
Pack Augmentation

Name of Water Activity/Project

Dolores Water Conservancy District (DWCD)

Name of Applicant

Southwest

Amount from Statewide Account:

Amount from Basin Account(s):

55,620

Total WSRA Funds Requested:

55,620

Approving Basin Roundtable(s)

(If multiple basins specify amounts in parentheses.)

FEIN: 84-0625315

Application Content

Application Instructions	page 2
Part I – Description of the Applicant	page 3
Part II – Description of the Water Activity	page 5
Part III – Threshold and Evaluation Criteria	page 7
Part IV – Required Supporting Material	
Water Rights, Availability, and Sustainability	page 10
Related Studies	page 10
Signature Page	page 12

Required Exhibits

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

Appendices – Reference Material

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

Water Supply Reserve Account – Application Form

Revised October 2013

Instructions

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

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

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

When completing this application, the applicant should refer to the WSRA Criteria and Guidelines available at: <http://cwcb.state.co.us/LoansGrants/water-supply-reserve-account-grants/Documents/WSRACriteriaGuidelines.pdf>. In addition, the applicant should also refer to the [Supplemental Scoring Matrix](#) applied to Evaluation Criteria Tiers 1-3 for Statewide Account requests .

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

Craig Godbout - WSRA Application
Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203
Craig.godbout@state.co.us

If you have questions or need additional assistance, please contact Craig Godbout at: 303-866-3441 x3210 or craig.godbout@state.co.us.

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

1.	Applicant Name(s):	Dolores Water Conservancy District (DWCD)		
	Mailing address:	PO Box 1150 60 S. Cactus St. Cortez, CO 81321		
	FEIN #:	84-0625315		
	Primary Contact:	Ken Curtis	Position/Title:	District Engineer
	Email:	kcurtis@frontier.net		
	Phone Numbers:	Cell: 970-749-7099	Office:	970-882-2164 x5
	Alternate Contact:	Mike Preston	Position/Title:	General Manager
	Email:	mpreston@frontier.net		
	Phone Numbers:	Cell: 970-739-4181	Office:	970-565-7562

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

- ☐ Public (Government) – municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities and the local entity should be the grant recipient. Federal agencies are eligible, but only if they can make a compelling case for why a local partner cannot be the grant recipient.
- ☒ Public (Districts) – authorities, Title 32/special districts, (conservancy, conservation, and irrigation districts), and water activity enterprises.
- ☐ Private Incorporated – mutual ditch companies, homeowners associations, corporations.
- ☐ Private individuals, partnerships, and sole proprietors are eligible for funding from the Basin Accounts but not for funding from the Statewide Account.
- ☐ Non-governmental organizations – broadly defined as any organization that is not part of the government.

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3. Provide a brief description of your organization

Formed in 1961, DWCD exists to operate and maintain Reclamation's Dolores Project (DP) with McPhee Dam & Reservoir as the primary storage facility. The DP provides a full supply of irrigation water to 7,700 acres of the Ute Mountain Ute Tribe and 29,000 acres in Montezuma and Dolores Counties plus a supplemental supply to the classified 26,300 acres in the Montezuma Valley. The Project storage also provides ecological mitigation flows for the Dolores River below McPhee Dam and secures reliable municipal water supplies for the District communities. DWCD participates with 9 local sponsors in 3 cloud seeding programs in the Southwest Basin.

4. If the Contracting Entity is different then the Applicant (Project Sponsor or Owner) please describe the Contracting Entity here.
5. Successful applicants will have to execute a contract with the CWCB prior to beginning work on the portion of the project funded by the WSRA grant. In order to expedite the contracting process the CWCB has established a standard contract with provisions the applicant must adhere to. A link to this standard contract is included in Appendix 3. Please review this contract and check the appropriate box.

☒

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

☐

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

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

The District's electors voted to remove Tabor limits in the November 3, 2015 election, by passing Ballot Issue 4A in Montezuma and Dolores Counties.

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Part II. - Description of the Water Activity/Project

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

☐

Nonconsumptive (Environmental or Recreational)

☐

Agricultural

☐

Municipal/Industrial

☐

Needs Assessment

☐

Education

☒

Other

Explain:

Strategic Planning

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

Cloud seeding provides augmentation to all water supplies in the basin, both consumptive and non-consumptive.

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

☒

Study

☐

Implementation

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

New Storage Created (acre-feet)

New Annual Water Supplies Developed, Consumptive or Nonconsumptive (acre-feet)

Existing Storage Preserved or Enhanced (acre-feet)

Length of Stream Restored or Protected (linear feet)

Length of Pipe/Canal Built or Improved (linear feet)

Efficiency Savings (acre-feet/year OR dollars/year – **circle one**)

Area of Restored or Preserved Habitat (acres)

15-75KAF

Other -- Explain:

May increase snowpack by 5-10% & runoff

Water Supply Reserve Account – Application Form

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

Latitude: 37 to 38 N

Longitude: 107 to 108 W

The location is not a specific point, but instead runs through the southern San Juan Mountains. Target areas run from around Telluride on the north and west back towards Wolf Creek Pass encompassing mountain areas above 9,000' and a few interior valleys. Exhibit B, map shows weather modification target areas.

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

Establish a local oversight group including the local funding participants that can actively assist and support the cloud seeding program development and improvements, and to request new sources for additional funding. This group will coordinate with the CWCB and Lower Basin funders.

The WSRA funds will be used to contract with an appropriate independent professional to provide technical assistance and some modeling and application ideas for the group in support of the strategic plan. The plan will focus on program improvements and efficiencies, and assist the basin in meeting “gaps” identified in our Basin Implementation Plan by adding additional or augmented water supplies.

The goals for the Strategic Plan include:

- **Provide an independent evaluation of current program that specifically can recommend actionable improvements.**
- **Look at specific SW CO topography & weather patterns to preliminarily assess current and new equipment selection and placement.**
- **Provide evaluation of possible technologies listed above that would improve the SW Colorado programs and an evaluation of costs & benefits of each. Relate to the specific three cloud seeding programs.**
- **Provide current best cost data on all possible options for new program operational or equipment improvements. This should include long term operation, maintenance and replacement costs.**

- **Address questions above in the “Questions” section that relate to the technical cloud seeding operations.**
- **Increased efficiency in cloud seeding program operations and generator location.**
- **Supplement (augment) snowpack and water supply for all uses (i.e. ski industry, municipal, recreation, and agriculture.**
- **Increase system supply for the Colorado River system to assist with drought management and Contingency Planning.**
- **Leverage additional funding for Lower Basin participation in the programs in southwestern Colorado.**

The process will specifically evaluate the following specific new technologies and equipment:

- **Radar:** A 2010 demonstration project showed the benefits of local radar to cover gaps over the four corners that would improve local weather forecasts for winter cloud seeding and other times of the year.
- **Icing meters:** These meters can detect presence of super-cooled liquid water that can assist the seed/no seed decision.
- **Radiometers:** This equipment detects an array of localized weather conditions including temperature, water vapor and liquid from the ground to six miles up in the atmosphere. This data greatly improves the actionable information available to the operating forecasters specifically showing available super cooled liquid water with continuous updates.
- **Modeling:** New improved weather modeling can help choose locations for new equipment or validate location of existing equipment. It can also help with decision making for individual storm operations.
- **Remote Generator Units:** Allow the strategic placement at higher elevations and improve consistent and timely operation relative to shifting weather conditions.
- **LP Generator Units:** Introduction of these units would allow cloud seeding on warmer temperatures which would expand the opportunities available in the shoulder seasons. Unfortunately they require placement at high elevations to reach the cloud base.
- **Target Studies:** This modeling could validate our current equipment placement and

Water Supply Reserve Account – Application Form

Revised October 2013

assist in determining placement for new equipment.

- Weather Stations: Placed at strategic locations, these can provide the specific conditions, wind speed, wind direction, temperature, solar radiation, relative humidity, icing, barometric pressure, and precipitation to inform the operating forecasters.
- Precipitation Gauges: High intensity precipitation gages are helpful at key locations in Target areas to more accurately measure precipitation and correlate observations with SNOTEL data sites.
- Ceilometers: These measure cloud height and vertical visibility to determine the appropriate meteorological conditions conducive to cloud seeding.

The technical work is expected to run several atmospheric models as appropriate for the target area geography and our southwest weather patterns to provide data to reach strategic plan goals.

Water Supply Reserve Account – Application Form

Revised October 2013

Part III. – Threshold and Evaluation Criteria

1. Describe how the water activity meets these **Threshold Criteria**. (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines.)
 - a) The water activity is consistent with Section 37-75-102 Colorado Revised Statutes.¹

Yes, this strategic planning process would be compliant with Section 37-75-102 C.R.S. Increased water supplies, which result from weather modification to augment winter snowpack, are administered by the Office of State Engineer fully compliant with Colorado water rights as part of the natural water supply.

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

See attached letter from the Southwest Basin Round Table Chair.

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

Water Supply Reserve Account – Application Form

Revised October 2013

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

Yes, this proposal for creating a strategic plan seeks to increase the winter snowpack at the top of the watershed thereby increasing water supply to all downstream uses and therefore improves the ability to meet all local water supply gaps identified by the local basin and identified by SWSI 2010.

- d) Matching Requirement: For requests from the Statewide Fund, the applicants will be required to demonstrate a **25 percent** (or greater) match of the total grant request from the other sources, including by not limited to Basin Funds. A minimum match of 5% of the total grant amount shall be from Basin funds. A minimum match of 5% of the total grant amount must come from the applicant or 3rd party sources. Sources of matching funds include but are not limited to Basin Funds, in-kind services, funding from other sources, and/or direct cash match. Past expenditures directly related to the project may be considered as matching funds if the expenditures occurred within 9 months of the date the contract or purchase order between the applicant and the State of Colorado is executed. Please describe the source(s) of matching funds. (NOTE: These matching funds should also be reflected in your Detailed Budget in **Exhibit A** of this application)

Not Applicable

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

Water Supply Reserve Account – Application Form

Revised October 2013

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

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

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

- a. The water activity addresses multiple needs or issues, including consumptive and/or non-consumptive needs, or the needs and issues of multiple interests or multiple basins. This can be demonstrated by obtaining letters of support from other basin roundtables (in addition to an approval letter from the sponsoring basin).
- b. The number and types of entities represented in the application and the degree to which the activity will promote cooperation and collaboration among traditional consumptive water interests and/or non-consumptive interests, and if applicable, the degree to which the water activity is effective in addressing intrabasin or interbasin needs or issues.

The current Southwest cloud seeding efforts are supported by nine (9) local sponsors, the State of Colorado, neighboring New Mexico Interstate Stream Commission and three Lower Basin states. The local sponsors have committed \$151,900 with another \$86,000 from the other parties to the 2015 cloud seeding programs. The local sponsors have provided similar levels of funding for many years along with CWCB while New Mexico and the Lower Basin California, Arizona and Nevada parties are more recent contributors to the San Juan programs.

- c. The water activity helps implement projects and processes identified as helping meet Colorado’s future water needs, and/or addresses the gap areas between available water supply and future need as identified in SWSI or a roundtable’s basin-wide water needs assessment.

Increasing snowpack and resulting increases to water supply by definition will assist meeting identified gaps both in the basin and for the state relative to downstream compacts.

Tier 2: Facilitating Water Activity Implementation

- d. Funding from this Account will reduce the uncertainty that the water activity will be implemented. For this criterion the applicant should discuss how receiving funding from the Account will make a

Water Supply Reserve Account – Application Form

Revised October 2013

significant difference in the implementation of the water activity (i.e., how will receiving funding enable the water activity to move forward or the inability obtaining funding elsewhere).

Multiple parties currently fund the existing operations, but do not have a formal organized structure to proceed as a group to guide program improvements. This funding will focus and guide the group towards an actionable plan that will improve the current weather modification programs. It will provide effort that no single party would undertake alone.

- e. The amount of matching funds provided by the applicant via direct contributions, demonstrable in-kind contributions, and/or other sources demonstrates a significant & appropriate commitment to the project.

The combined \$237,900 input by the local, state and out of state participants over multiple years demonstrates significant commitments to continuing these cloud seeding programs. Additional participation of time guiding the strategic planning efforts will likewise show further interest and commitment. The end result of the plan would lead participants to increase funding sources for improving the current programs.

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

- f. The water activity helps sustain agriculture & open space, or meets environmental or recreational needs.

By definition the increased water supply would be administered pursuant to Colorado water rights in priority. To the extent that additional water runs in natural channels as it works downstream the new water may also meet ecological gaps.

- g. The water activity assists in the administration of compact-entitled waters or addresses problems related to compact entitled waters and compact compliance and the degree to which the activity promotes maximum utilization of state waters.

Weather modification for augmenting winter precipitation is a recognized watershed management option to improve supplies in the Colorado River Basin as recognized in the Reclamation's Basin Study Contingency Plan. The wide support for these programs is readily demonstrated by the multi-state participation in current Colorado winter snowpack augmentation efforts.

- h. The water activity assists in the recovery of threatened and endangered wildlife species or Colorado State species of concern.
- i. The water activity provides a high level of benefit to Colorado in relationship to the amount of funds requested.
- j. The water activity is complimentary to or assists in the implementation of other CWCB programs.

Water Supply Reserve Account – Application Form

Revised October 2013

Part IV. – Required Supporting Material

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

Not Applicable

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

CWCB handles cloud seeding permits under their 2012 revised rules and regulations. No additional permitting is needed for the strategic planning. Future actions may require additional permits for new equipment sites from the USFS.

A significant number of technical studies have led to improved weather modification technology that led to this current effort for a strategic plan to guide future program investments. A brief list of significant studies includes:

- **Colorado River Water Consultants. *Study of Long-Term Augmentation Options for the Water Supply of the Colorado River System.* 2008,**
- **U.S. Bureau of Reclamation. *Colorado River Basin Water Supply and Demand Study.* 2012**
- **Colorado Water Conservation Board. *Cloud Seeding Frequently Asked Questions.* May 2014.**
- **Colorado Water Conservation Board. *Inventory and Assessment of Colorado Weather Modification Programs.* October 1, 2015.**
- **National Center for Atmospheric Research. *Wyoming Weather Modification Pilot Program.* December 2014**
- **National Center for Atmospheric Research. *An Evaluation of Seeding Effectiveness in the Central Colorado Mountains River Basin Program.* February 4, 2015.**
- **Griffith, Don and Solak, Mark. *The Potential Use of Winter Cloud Seeding Programs to Augment the Flow of the Colorado River.* March 2006.**

Water Supply Reserve Account – Application Form

Revised October 2013

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

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

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

REPORTING AND FINAL DELIVERABLE

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

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

PAYMENT

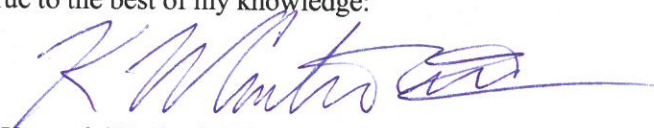
Payment will be made based on actual expenditures and invoicing by the applicant. Invoices from any other entity (i.e. subcontractors) cannot be processed by the State. The request for payment must include a description of the work accomplished by major task, and estimate of the percent completion for individual tasks and the entire water activity in relation to the percentage of budget spent, identification of any major issues and proposed or implemented corrective actions. The last 10 percent of the entire water activity budget will be withheld until final project/water activity documentation is completed. All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and help promote the development of a common technical platform.

Water Supply Reserve Account – Application Form

Revised October 2013

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

Signature of Applicant:



Print Applicant's Name: Kenneth W. Curtis III

Project Title: SW Colorado Weather Modification Strategic Plan for
Winter Snow Pack Augmentation

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

Craig Godbout – WSRA Application
Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203
303-866-3441, ext. 3210 (office)
303-547-8061 (cell)
craig.godbout@state.co.us

Exhibit A
Statement of Work
Date: December 15, 2015

WATER ACTIVITY NAME - SW Colorado Weather Modification Strategic Plan for Winter Snow Augmentation

GRANT RECIPIENT – Dolores Water Conservancy District (DWCD)

FUNDING SOURCE - Southwest Basin Roundtable WSRA grant

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)

This project will lead a local group with interested outside parties (CWCB & LB) through a strategic planning effort. This project will specifically fund the technical support and some organizational support to complete the plan. The current 3 SW Colorado Cloud seeding areas are funded by \$151,900 local dollars and \$86,000 outside supporters to augment snow for improved ski / tourism conditions and improve the water supply. Significant advancements in the technology and equipment have been made over the last 15 years and the SW Basin area would like to bring these new technological improvements and modern equipment to our local program.

OBJECTIVES

1. Establish a local oversight group that can actively assist and support the cloud seeding program development and improvements, and to request new sources for additional funding. This group may only meet once per year or possibly only through conference calling to control travel & time commitment. This group should also actively coordinate with CWCB and the Lower Basin funding partners.
2. Contract with an appropriate independent weather modification professional to help a local group develop a strategic plan for the southwest Colorado programs. The plan will focus on program improvements and efficiencies, and assist the basin in meeting “gaps” identified in our Basin Implementation Plan by adding additional or augmented water supplies.

Item one is coordinated locally while the second goal is the reason for a SWBRT grant request.

TASKS

TASK 1 – Contractor Selection & Project Initiation

Description of Task: Strategic Planning Group (through DWCD) will solicit, review, select and contract with an appropriately qualified weather modification firm, individual or team. Upon selection successful contractor to visit with group and review specific scoping.

Method/Procedure: Group will seek Request for Proposals (RFP) through known professional organizations and known contacts through CWCB.

Deliverable: Suitable negotiated contract.

TASK 2 – Plume Studies

Description of Task: Contractor to conduct representative plume studies to guide other questions necessary to complete strategic plan.

Method/Procedure: Contractor to use suitable topographic information combined with technological proven and modern weather model to verify several representative storms that bring winter precipitation to the 3 SW Colorado target areas.

Deliverable: Modeling results that show likely affects & targets for specific cloud seeder locations.

TASK 3 – Existing Equipment Fleet Review

Description of Task: Inventory, map and evaluate existing program equipment type & placement, technology and practices.

Method/Procedure: Contractor to review past annual reports and work with WWC to compile detailed information.

Deliverable: Chapter in the final report.

TASK 4 – Review available new technologies and modernized equipment then prioritize with current cost information.

Description of Task: Contractor will assemble quotes and technical data into logical combined packages and sequence to maximum benefit to the cloud seeding programs. This should address operating, maintenance and replacement costs. This information should give some analysis to costs and benefits. Include a funding schedule that pairs logical upgrade packages in even dollar increments. Also include potential new locations to site new equipment.

Deliverable: Chapter in final report.

TASK 5 – Local meeting with strategic planning team to review draft Final Report, Exhibits and conclusions.

Deliverable: Notes on group discussion and follow up activities included in final report.

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.

	Contractor	DWCD Administrative Costs (3%)	Total Project Costs
Task 1 - Contractor Selection & Project Initiation	\$2,500		
Task 2 – Plume studies	\$37,500		
Task 3 – Existing Program Review	\$4,000		
Task 4 – Technology & Equipment Review	\$2,000		
Task 5 – De-brief meeting & final report	\$3,000		
Overhead (Travel, Publishing, Meeting Organization)	\$5,000		
Total Costs:	\$54,000	\$1,620	\$55,620

Note that though we haven't included in kind services, we expect significant participation from local funders, other local interested parties, CWCB and the LB. These will include communication, work product reviews and meetings.

SCHEDULE

Provide a project schedule including key milestones for each task and the completion dates or time period from the Notice to Proceed (NTP). This dating method allows flexibility in the event of potential delays from the procurement process. Sample schedules are provided below. Please note that these schedules are examples and will need to be adapted to fit each individual application.

Task	Start Date *	Finish Date *
1 - Contractor Selection & Project Initiation	Upon NTP	NTP + 180 days
2 - Plume studies	NTP + 180 days	NTP + 365 days
3 - Existing Program Review	NTP + 365 days	NTP + 545 days
4 - Technology & Equipment Review	NTP + 365 days	NTP + 545
5 - De-brief meeting & final report	NTP + 545 days	June 2018

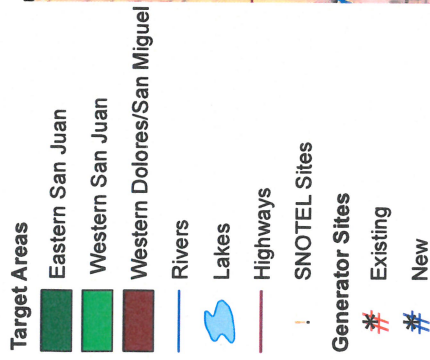
NTP = Notice to Proceed

*We have recognized an extended schedule over two (2) years. Although the contractor work probably does not require a full two years all parties are involved in the water business and the contractor may have a counter cyclic schedule in the winter season along with local ski area funders and WWC our local program operator. For these reasons combined with a dispersed group, we chose to extend the schedule to allow maximum participation.

PAYMENT

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

Weather Modification Sites and Target Areas San Juan/Dolores River Basins - Exhibit B



of Generators: 30

Target Area Coverage:

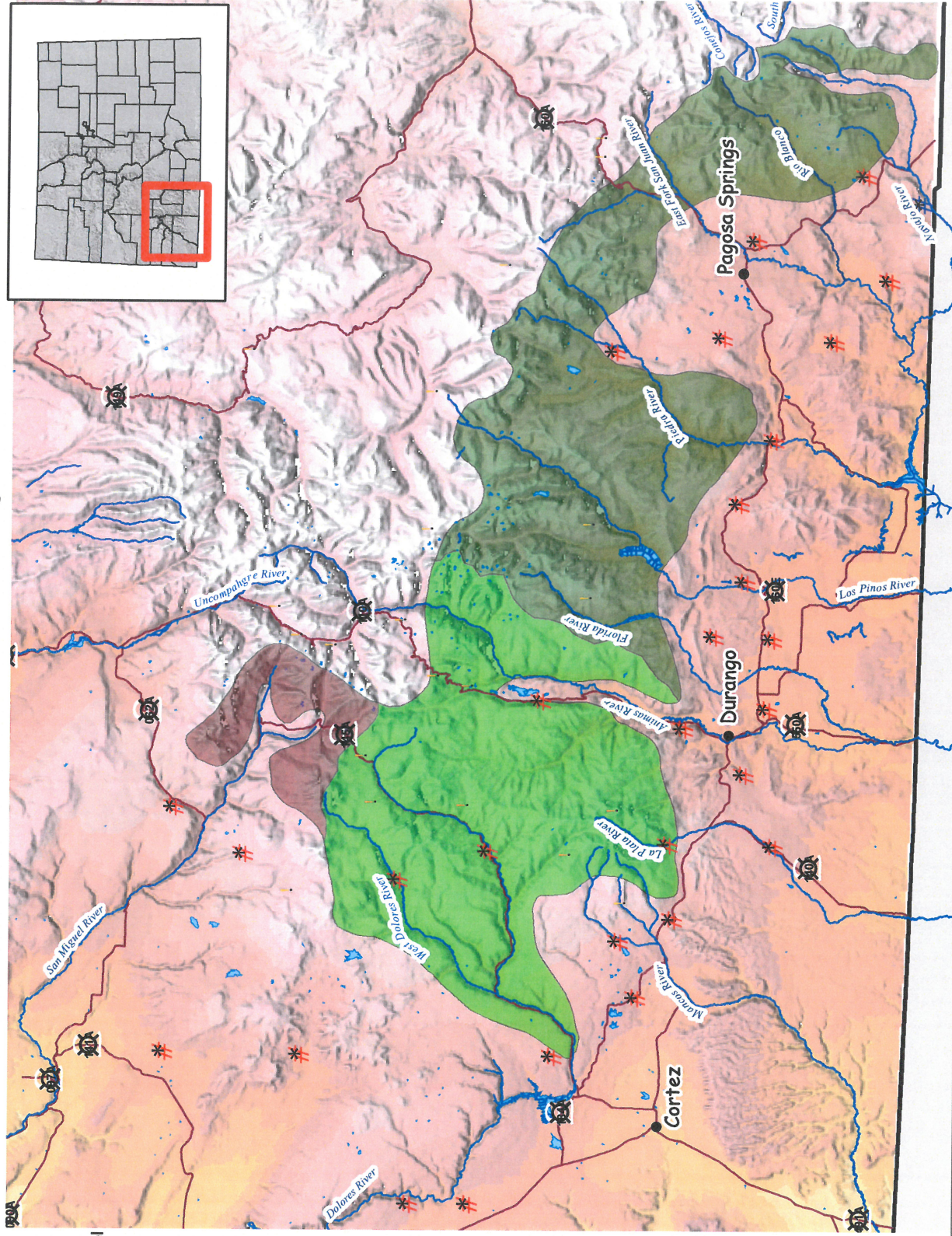
E. San Juan: 1100 sq miles

W. San Juan: 990 sq miles

W. Dolores/San Miguel: 147 sq miles



Map created by Carolyn Fritz
CWCB GIS Coordinator
September 28, 2007



Program Sponsors:

Colorado Water Conservation Board, Southwestern Water Conservation Dist., New Mexico Interstate Stream Commission
E. San Juan - SWCD, Pine River Irrigation Dist., Pagosa Area W & S, San Juan WCD
W. San Juan - SWCD, Dolores WCD, Durango Mtn. Resort, Animas La Plata WCD, City of Durango