COLORADO WATER CONSERVATION BOARD

WATER SUPPLY RESERVE ACCOUNT
GRANT APPLICATION FORM

A Multi-Media Program for Reporting Crop and Turf Water Use Estimates from the Colorado Agricultural Meteorological Network (CoAgMet)

Name of Water Activity/Project

Approving Basin Roundtable

$ 46,971	**Total Amount of Funds Requested**	**Amount from Statewide Account**	$ 37,577
		Amount from Basin Account	$ 9,394

Application Content

Attachments

1. Reference Information
2. Insurance Requirements (Projects Over $25,000)
3. WSRA Standard Contract (Projects Over $100,000)
4. W-9 Form (Required for All Projects)

Water Supply Reserve Account – Grant Application Form
Form Revised March 2009

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

1. Applicant Name(s): Sangre de Cristo RC&D Council, Inc.

Mailing address: 200 S. Santa Fe Ave.
4th Floor
Pueblo, CO 81003

Taxpayer ID#: Email address: info@sangredecristorcd.org

Phone Numbers: Business: (719) 543-8386
Home:
Fax: (719) 545-4835

2. Person to contact regarding this application if different from above:

Name: William E. Alt

Position/Title Chairman

3. Eligible entities that may apply for grants from the WSRA 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) – special, water and sanitation, conservancy, conservation, irrigation, or 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.

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

4. Provide a brief description of your organization.

The proposed activities will be carried out through the Sangre de Cristo Resource Conservation and Development (RC&D) Program, with assistance from Colorado State University (CSU). The Sangre de Cristo Resource RC&D will administer the project funds and manage project reporting. Subcontracts with CSU and CSU-Pueblo will be written to hire a computer programmer and student intern, respectively, for specific tasks on this project. The arrangement of this partnership is desirable, due to the fact that the majority of project will be managed from Pueblo, CO in coordination with Arkansas Basin members, CSU Extension, and the Colorado Water Institute. A specific task related to CoAgMet will be conducted in Ft. Collins, however, where the program is headquartered.

Background and History. The **Resource Conservation and Development (RC&D) Program** is a nation-wide U.S. Department of Agriculture (USDA) program administered by the Natural Resources Conservation Service (NRCS). The purpose of the RC&D program is to accelerate the conservation, development and use of natural resources; improve the general level of economic activity; and enhance the environment and standard of living in designated RC&D areas. Current program objectives focus on an enhanced of quality of life achieved through natural resource conservation; and sustainable community development achieved through natural resource conservation and development. The Officers and Board of Trustees manage the affairs of the RC&D Council as an incorporated 501(c)(3). The Board formally approves the Area Plan, mission, policies, budget, projects, and hiring of Council Staff. Board members have legal and fiduciary responsibilities. The Board of Directors ensures that the organization is well-managed and running properly in order to achieve the goals of the RC&D Council.

The RC&D Council is the heart of the RC&D concept. The Council is a membership-based nonprofit entity that is established and run by local leaders to carry out the mission of the RC&D. The Council is composed of members who are key community leaders in land conservation, water management, environmental enhancement, and community development. They are a steering committee and action team to implement the Area Plan, a community-driven strategic long-range plan to improve the quality of life and enhance the economy in the communities within the RC&D Area. RC&D Council members are action-oriented volunteers and leaders who help the Council address needs in the community through good planning and project implementation. In this "make it happen" style, the Council also periodically evaluates its progress on the Area Plan and gathers input from the community. Current Sangre de Cristo Council members are: Bill Alt (*President Turkey Creek Conservation District, Chairman*); Eve Triffo (*Ditch and Reservoir Company Alliance Board Member, Vice Chairman*); Patricia Coffee (*Pueblo County Road and Bridge, Secretary-treasurer*); Mike Stiehl (*Fremont County Commissioner, Trustee*); Jim Austin (*Custer County Commissioner, Trustee*); Rich Green (*Fremont Conservation District, Trustee*); Robin Young (*Custer County Conservation District, Trustee*); Tom Piltingsrud (*Trustee*).

CSU Extension was originally authorized through the United States Congress by the Smith-Lever Act (1914) as the Cooperative Extension Service. The Cooperative State Research, Education, and Extension Service (CSREES) of the USDA administers supportive funding for Smith-Lever Act services (including Extension) under the auspices of state and county governments and each state's designated land-grant universities. Extension is a public educational entity for providing research-based outreach to solve problems and improve the lives of US citizens. More simply, *the purpose of Extension is to provide a link between the university and the citizens of the state*, and our philosophy is that the entire state is our campus, and its residents are our students. Extension in Colorado is headquartered at CSU, and our system of county offices also puts Extension resources within easy reach of Colorado's 64 counties. The Otero County Extension office (Rocky Ford, CO), for instance,

is the central point for outreach on irrigation and water resources in the Lower Arkansas Valley. Examples of educational courses provided by CSU Extension include 4-H Youth Development, Healthwise for Life, and Value-Added Agriculture.

The **Colorado Water Institute** (CWI), an affiliate of Colorado State University, exists for the express purpose of focusing the water expertise of higher education on the evolving water concerns and problems being faced by Colorado citizens. The Colorado Water Institute (CWI) is authorized and funded by Congress and the Colorado Legislature. CWI is accountable to Congress via its annual appropriation, a required annual report, and a thorough congressionally mandated peer review conducted every five years under the auspices of the U.S. Geological Survey. Copies of CWI's Federal and State authorizing legislation are attached to the Annual Report PDF. CWI is operated, by law, as a state-wide water research institute, obligated to connect all water expertise in Colorado's higher education system with research and education needs of Colorado's water managers and users.

Contact Personnel. The principal collaborators this project are Ms. Jane Wustrow, Mr. Troy Bauder, Dr. Perry Cabot, Dr. Sara Tompkins, and Mr. Nolan Doesken. Ms. Wustrow is the Sangre de Cristo USDA Coordinator. She assists the Council in carrying out its goals and objectives, as a facilitator, advisor, and coach to the RC&D Council. (*Current Address: 200 S. Santa Fe Ave., 4th Floor, Pueblo, CO 81003; Phone Number: (719) 543-8386*). Dr. Cabot is a Water Resources Specialist for the Colorado Water Institute and CSU Extension. He completed his Ph.D. in Agricultural Engineering and Land Resources at the University of Wisconsin. He is also an affiliate assistant professor of the CSU Department of Civil and Environmental Engineering and an adjunct professor at CSU-Pueblo (*Current Address: CSU-Pueblo, 2200 Bonforte Boulevard, 417 Chemistry Building, Pueblo, CO 81004; Phone Number: (719) 549-2045*). Mr. Troy Bauder (Extension Water Quality Specialist) and Dr. Perry Cabot (Extension Water Resources Specialist). Mr. Bauder has worked in the Arkansas Valley for over 10 years in various academic and professional capacities. He is a respected authority on agricultural irrigation systems and water resource management. He currently maintains an active research and outreach program on irrigation topics, having received funding from federal, state, and local sources (*Current Address: Department of Soil and Crop Sciences, Colorado State University, Ft. Collins, CO; (970) 491-4923*). Dr. Sara Tompkins is a program evaluator that has conducted program planning and evaluation on grants from federal (NIH; ACH) and local agencies (MS Society; Alzheimer's Association). Dr. Tompkins completed her Ph.D. in the social sciences at Colorado State University and was drawn to the area of evaluation in order to concretely show meaningful change in programs that make a difference for residents of Colorado (*Current Address: 2901 Michener Ct., Ft. Collins, CO 80526; Phone Number: (970) 556-0862*). Mr. Nolan Doesken is the State Climatologist for Colorado. Mr. Doesken received a B.S. in Meteorology and Oceanography from the College of Engineering at the University of Michigan in 1974 and M.S. in Atmospheric Science from the University of Illinois in 1976. He is currently the president of the American Association of State Climatologists. In addition to monitoring current and long term climatic conditions in Colorado, he is also the founder and national director of the Community Collaborative Rain, Hail and Snow network (CoCoRaHS) (*Current Address: Colorado Climate Center, Department of Atmospheric Science, 1371 General Delivery , Colorado State University, Ft. Collins, Colorado 80523-1371; Phone Number: (970) 491-8545*.

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

The contracting entity will be the same as the applicant. Sub-contract awards will be arranged with Colorado State University and Colorado State University-Pueblo for specific portions of the grant.

6. 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 copy of this standard contract is included in Attachment 3. Please review this contract and check the appropriate box.

   [XX] 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.

7. 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.

   TABOR Issues. Taxpayer Bill of Rights (TABOR) issues are not anticipated to be relevant to these demonstration projects because the project will not affect governmental revenues or expenditures.

Part B. - Description of the Water Activity

1. Name of the Water Activity/Project:

   A Multi-Media Program for Reporting Crop and Turf Water Use Estimates from the Colorado Agricultural Meteorological Network (CoAgMet)

2. What is the purpose of this grant application? (Please check all that apply.)

[ ] Environmental compliance and feasibility study

[ ] Technical Assistance regarding permitting, feasibility studies, and environmental compliance

[ ] Studies or analysis of structural, nonstructural, consumptive, nonconsumptive water needs, projects

Study or Analysis of:

- [ ] Structural project or activity
- [ ] Nonstructural project or activity
- [ ] Consumptive project or activity
- [ ] Nonconsumptive project or activity

[XX] Structural and/ or nonstructural water project or activity

3. 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.

   The proposed activity will employ a multi-media approach to communicate crop and turf water use reports to irrigators. For the purpose of this project, the deployment region will comprise the Arkansas Basin, in particular the areas served by the Colorado Agricultural Meteorological Network (CoAgMet) in this basin. CoAgMet is a network of weather stations that collect localized weather data in irrigated agricultural areas. In the Lower Arkansas Basin, for example, CoAgMet maintains stations in Avondale, Rocky Ford, Lamar, Holly, and Hoehne. New stations are also planned in Chaffee, Fremont, and Custer Counties. Each station is equipped with standardized instrumentation to record and transmit measurements of temperature, relative humidity, wind speed, solar radiation, precipitation, and soil temperature. Measurements are then used to calculate crop-specific evapotranspiration (ET), based on the Kimberly-Penman and the American Society of Civil Engineers standardized Penman-Monteith equations, to estimate daily crop and turf water use locally.

   Rates for ET can fluctuate daily and impact the demand for water by crops and turf. Knowing ET rates for local settings helps irrigators "fine-tune" irrigation and conserve water using the water-balance approach. Irrigation scheduling by the water balance approach is based on estimating the soil water content, from which daily withdrawals are subtracted and deposits are added. Irrigators often know their rates of water application, and may record daily precipitation, but the ET rates for their crops are not easily known, hence the justification for the CoAgMet Network. With complete knowledge of all water inputs (i.e., irrigation, precipitation) and outputs (i.e., crop water use or ET), subsequent irrigations can be planned for the optimal time when available water in the soil drops too low as a function of soil textures and crop types. CoAgMet currently reports ET for alfalfa, corn, drybeans, small grain, sugar beets, potatoes, onions, winter wheat, and cool season turf.

   The WSRA funding will be used to deploy a multi-media approach (3-yrs) to expand access to the crop and turf water use reports provided by CoAgMet. Currently, these reports are available through the CoAgMet Internet site (www.coagmet.com). Feedback from CoAgMet users indicates, however, that the although the site is appealing and helpful, it is not used to full advantage due to two primary obstacles: 1) field schedules do not afford irrigators consistent time to access the online site, and; 2) some irrigators are not regular online computer users. An expanded multi-media approach will work to overcome these obstacles by using print media (e.g., local newspapers) and cellular telephone text-messaging for interested subscribers.

   In regards to print media, CSU Extension has for several years coordinated with local newspapers and radio stations in the San Luis Valley to outreach CoAgMet reports to readers, by submitting crop water use reports for specific crops on a weekly basis. The program in the Arkansas Basin would mimic this successful outreach program, but coordinating with newspapers (e.g., *Salida Citizen, Wet Mountain Tribune, Ag Journal, Lamar Ledger,* etc.) and radio stations (e.g., *KBLJ-La Junta*) up and down the river. Funds will be used to pay a part-time staff person (likely a CSU-Pueblo student) will be paid through the Sangre de Cristo RC&D to create and disseminate the weekly reports. The other project component will develop a telemetric system for distributing daily (or weekly) ET reports through cellular telephone text-messaging. A recent survey by the American Farm Bureau, for example, indicated that 75% of farmers and ranchers use social media such as Facebook and Twitter, but this trend is concentrated among younger demographics. CSU Extension has received similar requests to develop a text-messaging service for some current CoAgMet users. This novel approach reflects other farming trends towards greater efficiency in the use of time and resources, and warrants a pilot program to test its extension to irrigation practices. The WSRA funds will be used to subcontract the time for a programmer at CSU Extension to complete the remaining coding necessary to develop and trouble-shoot the text-messaging service for a pilot group of cooperators in the Arkansas Basin.

Part C. – 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]

   This project will in not affect or injure water rights. Pilot project collaborators and future participants are irrigators within the Arkansas Basin with water shares or well permits. The deliverables of the project will not impact the title, allocation, priority, transferability of irrigation shares (or water rights) in the basin. Rather, it will provide irrigators with additional and more accurate information for scheduling their irrigation activities.

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

   The project concept was presented to the Arkansas Basin Roundtable on November 10, 2010 by Dr. Perry Cabot. Questions were fielded by Dr. Cabot, pertaining to the project budget as it spans the 3-year timeline, the relationship between the current CoAgMet website and the proposed text messaging system, the overall value of CoAgMet for the purposes of irrigation scheduling, and potential future funding of the project. No objections were raised at the Arkansas Basin Roundtable meeting. The project will be presented in full to the Arkansas Basin Roundtable Needs Assessment committee on December 2, 2010.

   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

[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.

[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.

roundtable's consumptive and/or non-consumptive needs assessments.

One of the deliverables for the project is calculated estimates of seasonal consumptive use and resulting irrigation efficiencies for participating producers. This will not only provide the basin with new data on agricultural consumptive use but provide local producers who are enrolled in EQIP with the ability to quickly generate the annual report of water use that is required by the USDA of contract holders.

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

Table 1. Matching Contributions.

		Direct Costs			Indirect (Overhead)			
Category	*Name*	*Affiliation*	*Quantity*		*Sub-Total*	*Rate*	*Costs*	*Total Match*
Salary Match	Cabot, Perry	""	$5,025/mo @ 0.75 mo/yr	(Year 1)	$ 3,769	26%	$ 980	$ 4,749
Fringe Match	""	""	$1,271/mo @ 0.75 mo/yr	""	$ 954	26%	$ 248	$ 1,202
Salary Match	""	""	$5,226/mo @ 0.75 mo/yr	(Year 2)	$ 3,920	26%	$ 1,019	$ 4,939
Fringe Match	""	""	$1,343/mo @ 0.75 mo/yr	""	$ 1,007	26%	$ 262	$ 1,269
Salary Match	""	""	$5,435/mo @ 0.75 mo/yr	(Year 3)	$ 4,076	26%	$ 1,060	$ 5,136
Fringe Match	""	""	$1,413/mo @ 0.75 mo/yr	""	$ 1,060	26%	$ 276	$ 1,336
Cash Match	SE Colorado WCD		$3,500/yr	@ 3 yr	$ 10,500	0%	$ 0	$ 10,500
Cash Match	Lower Ark. Valley WCD		$2,000/yr	@ 3 yr	$ 6,000	0%	$ 0	$ 6,000
TOTAL					**$ 31,286**		**$ 3,845**	**$ 35,131**

2. For Applications that include a request for funds from the Statewide Account, describe how the water activity meets the **Evaluation Criteria.** (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines.)

   Statewide funds have been requested since resulting benefits of this pilot study will be ultimately available to other irrigators in the state.

   Tier 1: Promoting Collaboration and 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).

      The multi-media program for reporting crop and turf water use estimates is designed for water resources management on irrigated land in the Arkansas River Basin. The Gunnison Basin Roundtable recently advanced a comparable project entitled "*Agricultural Weather Data Delivery Improvements to Uncompahgre Valley Irrigators.*" The North Platte Basin Roundtable also sponsors a CoAgMet station in Cowdrey (COW01), which is approximately 9 miles north of Walden, CO, and the South Platte Basin Roundtable has also requested funding to support the program. These projects demonstrate a high degree of external support for CoAgMet outside of the Arkansas Basin. To the extent that the pilot program in the Arkansas Basin will serve as a statewide model for broader deployment of CoAgMet data, this project will address the needs of multiple basins and interests, with particular application to agricultural water conservation.

   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 proposed CoAgMet reporting system will be made available for wider community testing and use during and after development. Specifically, the proposed pilot text-messaging system will be applicable to the entire state of Colorado (therefore intrabasin and interbasin), addressing an identified need to communicate requested information to agricultural irrigators. It is hoped that the multi-media approach will allow agricultural water users to better monitor their irrigation practices for their own livelihoods.

   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.

      The 2007 Statewide Water Supply Initiative (SWSI Phase II) reported the establishment of Technical Roundtables (TRTs) to analyze, evaluate, and develop deeper consensus on key issues and needs. The TRT scope of work included technical analysis around four key areas, one of which was Water Conservation and Efficiency (**Agricultural** and Municipal and Industrial). The SWSI Phase II Report noted, however, that "limited progress was made on agricultural water efficiency and this remains a significant challenge." This

challenge stems from the fact that agricultural return flows are subsequently used by downstream water rights holders, and at a watershed level there are significant limitations in the overall net potential savings that can be realized. The SWSI Phase II Report simply states that "follow-up efforts should include this group of water users."

To be clear, the advantages of CoAgMet for water conservation are best realized when farmer or growers have significant control over their irrigation system, as in the case where groundwater is used for irrigation. Under these conditions, energy and water can both be conserved by minimizing extra pumping when crop water conditions area already satisfied. In the case where irrigators utilize ditch and canal systems, CoAgMet can be also used to practice irrigation scheduling, which may result in greater efficiencies. This practice does not entail a technical change to their irrigation system, but merely a more efficient operation of their current system. Irrigation scheduling has long been advocated as a way to minimize crop water stress and maximize yields. It reduces the farmer's cost of water and labor through fewer irrigations, thereby making maximum use of soil moisture storage. It also lowers fertilizer costs by holding surface runoff and deep percolation (leaching) to a minimum. It minimizes water-logging problems and may therefore reduce non-beneficial consumptive use. Moreover, the issue of irrigation scheduling may become more dominant as arrangements are evaluated that would allow farmers to lease a portion of their consumptive use.

Tier 2: Facilitating Water Activity Implementation

d. Funding from this Account will reduce the uncertainty that the water activity will be implemented. For this criterion the applicant should discuss how receiving funding from the Account will make a significant difference in the implementation of the water activity (i.e., how will receiving funding enable the water activity to move forward or the inability obtaining funding elsewhere).

Funding from this account is essential for support of the complex and extensive tasks in developing the proposed reporting program, expanding the range of access to valuable CoAgMet data, and conducting the training program to carry out the pilot project. Due to funding cuts elsewhere, the sustainability of the CoAgMet program rests on it definitive value to the agricultural community and a diverse range of project supporters. Although limited funding is available from federal sources, local Districts and other entities within the Arkansas River Basin, these entities are currently insufficient to support the entire pilot project, due to other funding commitments.

e. The applicant must demonstrate its ability to implement the proposed activity.

The Colorado Agricultural Meteorological Network (CoAgMet) is a network of automatic weather stations distributed across the state, and managed through the Colorado Climate Center at Colorado State University. The project is managed under the supervision of Mr. Nolan Doesken (State Climatologist) who is also a collaborator on this project. Other project collaborators (Mr. Troy Bauder, Dr. Perry Cabot) are water resources specialist with academic and professional background in irrigation. The project will also hire a consultant, Dr. Sara Tompkins with Madipen Consulting, who has an extensive background in program evaluation, specifically pertaining to Extension.

f. The applicant is providing matching funds and the amount of matching funds or is obtaining partial funding from other sources and the amount and source of such other funds or is providing demonstrable in-kind

contributions.

The project is receiving a significant share of its funding (20%) from the Southeastern Colorado Water Conservancy District and the Lower Arkansas Valley Water Conservancy District. The Lower Arkansas Valley Water Conservancy District and the Southeastern Colorado Water Conservancy District have pledged to support the project for $6,000 and $10,500, respectively, over 3 years. Colorado State University will also support the project in the amount of $18,631 which includes Salary, Fringe, and Indirect Costs associated with Dr. Cabot's contribution to the project.

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

g. The water activity helps sustain agriculture, and open space, or meets environmental or recreational needs.

A strong argument can be made to practice irrigation scheduling, as a means of filling gaps associated with local agricultural shortages. This issue may become especially paramount to the extent that identified M&I projects are not successfully implemented, in which case Colorado will see a significantly greater reduction in irrigated agricultural lands as M&I water providers seek additional permanent transfers of agricultural water rights. Because irrigation scheduling assists in controlling root zone salinity problems through controlled leaching, this practice will help sustain the valuable agriculture sector in the Arkansas River Valley through reducing salinity and thereby increasing productivity of the land and the economic vitality of the Valley's rural communities. These strategies also benefit the environment by reducing salinity and Se concentrations in the soils, and lowering salt and Se loadings in return flows to the mainstem Arkansas River and its tributaries. Similar issues are emerging in other intensively irrigated river valleys in Colorado such as the Colorado and South Platte River Basins.

h. 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.

Maximum utilization of state waters is promoted by developing strategies that can enhance water conservation in the Arkansas River Basin while maintaining full compliance with water rights and compact entitlements. These strategies may involve reoperation programs for Pueblo and John Martin Reservoirs that aid in the administration of compact entitlements.

i. The water activity assists in the recovery of threatened and endangered wildlife species or Colorado State species of concern.

Although issues of recovery of threatened and endangered wildlife species are not directly addressed in this water activity, it is believed that the irrigation scheduling strategies in this project will enhance water quality conditions for maintaining aquatic wildlife habitat, particularly related to selenium (Se) contamination. The findings could have promising applications in other river basins in Colorado.

j. The water activity provides a high level of benefit to Colorado in relationship to the amount of funds requested.

A recent report published by Kenney et al. (2010) in *Colorado Water*, the newsletter of the Water Center

of Colorado State University, noted that conservation is among the cheapest and best management practices to make water available for other purposes. Coupled with the potential for improvements in water quality in the basin, the educational value of the program, and the convenience it will provide producers, the cost of this project (average $15,657/year) is a small fraction of the potential benefits that can be produced through this water activity.

k. The water activity is complimentary to or assists in the implementation of other CWCB programs.

Continued development and support for the CoAgMet Network is complimentary to many of the CWCB programs that are helping meet the goals of the Statewide Water Supply Initiative. Statewide funds have been requested since resulting benefits of this pilot study will be ultimately available to other irrigators in the state. Other agricultural regions are also pursuing CoAgMet improvements specific to their regions through local roundtable funds as needed (North Platte, Arkansas). The economic vitality of the State is enhanced by efforts to reverse the current economic and environmental degradation that is occurring in the agriculture-based communities in Colorado such as those in the Arkansas River Valley.

Part D. – 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 the name/location of water bodies affected by the water activity.

   The project will partner with print media suppliers,radio stations, irrigators, and conservancy districts in Upper Arkansas and Lower Arkansas Valley irrigation system and will focus only on the management of water. No supply source or body of water will be affected in the course of this project.

2. Please provide a brief narrative of any related or relevant previous studies.

   a. *Validation and Demonstration of the Colorado Agricultural Meteorological Network – CoAgMet for Improved Irrigation and Pest Management*. Colorado NRCS Conservation Innovation Grant (CIG) – funding to Colorado State University 2006-2008 (PI: Mr. Troy Bauder). Project to enhance the precision of pest and disease forecasting and expand knowledge and adoption of CoAgMet for irrigation scheduling in the Lower Arkansas Valley. Project was successful at improving pest and disease forecasting and use of CoAgMet for irrigation scheduling during the project period.

   b. *Using the ASCE Standardized Reference Evapotranspiration Equation and Appropriate Crop Coefficients for Irrigation Management in Colorado.* Colorado NRCS Conservation Innovation Grant (CIG) – funding to Colorado State University 2009-2012 (PI: Dr. Allan Andales). Field testing of the American Society of Civil Engineers (ASCE) standardized equation for reference EvapoTranspiration (ET). Four CoAgMet sites in the South Platte (two sites) and Arkansas (two sites) basins will be used to compare accuracy of the ASCE standardized equation to the Kimberly-Penman equation that has been the more recent standard for Colorado.

   c. *Improvement of lysimeter operations and consumptive use quantification in high-altitude, irrigated meadows in the Yampa-White Basin.* 2010-2011. WSRA funding to Colorado Climate Center / Division of Water Resources, Division 6 (PI's: Nolan Doesken, Erin Light). This study will install new bucket type lysimeters and a fully automated weather station on the Carpenter Ranch owned by the Nature Conservancy. The lysimeters that will be installed are weighing lysimeters instead of compensating lysimeters. This will allow for operation of the lyismeters to closely mimic the irrigation environment of the Yampa basin. Four lysimeters plots, buckets in this case, will be installed - two will be seeded with grass-reference vegetation and two will be seeded with vegetation representative of the surrounding irrigated meadow. This will allow for direct determination of crop coefficients that could be applied to any future weather-based calculations of grass-reference ET.

   d. The North Platte Roundtable and CWCB recently approved a study submitted by the Colorado Climate Center to quantify consumptive use throughout North Park for their consumptive use needs assessment. Three automated weather stations were placed around North Park to not only characterize weather conditions across North Park but to also understand differences in consumptive use across the basin. Crop coefficients for North Park will be developed by utilizing the lysimeter data at the Arapahoe National Wildlife Refuge operated by the Colorado Division of Water Resources and data from low cost atmometers (ETgages).

e. *Agricultural Weather Data Delivery Improvements to Uncompahgre Valley Irrigators*. 2010-2012. WSRA funding to Colorado Water Institute / Colorado Climate Center / CSU Extension (PI's: Denis Reich, Nolan Doesken, Troy Bauder). This project provides the tools for this group of producers to lead adoption of irrigation scheduling techniques that will maximize instantaneous and seasonal irrigation efficiency and help quantify agricultural consumptive use in the Uncompahgre Valley. Benefits include mitigation of selenium leaching from local soils that threaten the recovery of local endangered fish species. Incentives for local agricultural irrigators are increased, more consistent productivity and profitability.

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

[see continued discussion on Page 13]

Statement of Work

WATER ACTIVITY NAME - A Multi-Media Program for Reporting Crop and Turf Water Use Estimates from the Colorado Agricultural Meteorological Network (CoAgMet)

GRANT RECIPIENT – Sangre de Cristo RC&D Council, Inc.

FUNDING SOURCE – Arkansas Basin Roundtable (20%) and Statewide (80%) Water Supply Reserve Account

INTRODUCTION AND BACKGROUND

A multi-media approach (3-yrs) in order to expand access to the crop water use reports provided by CoAgMet. Feedback from CoAgMet users indicates that CoAgMet is appealing and helpful, but not used to full advantage due to two primary obstacles: 1) field schedules do not afford irrigators consistent time to access the online site, and; 2) some irrigators are not regular online computer users. An expanded multi-media approach will work to overcome these obstacles by using print media (e.g., local newspapers) and cellular telephone text-messaging for interested subscribers.

OBJECTIVES

1. The program will mimic a successful CoAgMet outreach program in the San Luis Valley, by coordinating with newspapers and radio stations to disseminate weekly ET reports for local crops and weather conditions.
2. The other project component will develop a telemetric system for distributing daily (or weekly) ET reports through cellular telephone text-messaging.

TASK 1 – Distribution of crop and turf water use reports to newspapers and print media outlets ($10,220).

Description of Task. Currently, CoAgMet users can only access the network through the Internet website. A major focus of this project is to expanded use of the CoAgMet data. Many newspapers in the Arkansas Basin print public service announcements and upcoming events for the benefit of their readers. These news outlets will be interested providing CoAgMet data to their readers, some of whom will be irrigators or landowners who wish to conserve water through irrigation scheduling. These news outlets include, but are not limited to the *Rocky Ford Daily Gazette*, *Lamar Ledger*, *Ordway New Era*, *Trinidad Times*, *The Plainsman Herald*, *Canon City Daily Record*, *The Mountain Mail*, *Chaffee Times*, *Salida Citizen*, *The Chieftain* (Pueblo), *La Junta Tribune*, *Bent County Times*, *Fowler Tribune*, and *Ag Journal*. The list could include as many as 13 newspapers. A similar program was conducted in the Arkansas Valley years ago, also in coordination with the Sangre de Cristo RC&D.

Method/Procedure. Over a 3-year period, a student intern will generate weekly ET reports during the growing season, based on the preferences of local irrigators and landowners. The reports will utilize ET rate estimates from the nearest CoAgMet station in the vicinity of the participating news outlet. Example reports are provided in Table 2.1, 2.2 and 2.3 (following page) for the Rocky Ford, Lamar, and Hoehne irrigated regions, respectively. The intern will send the reports to participating newspapers for weekly printing.

Deliverable. The primary output will be improved access to daily agricultural water use data for key crops irrigated in the Arkansas Basin. To the extent that irrigators use the reports, the primary outcome will be the water savings achieved through irrigation scheduling.

Table 2.1. 7-Day Crop and Turf ET Report for April 26, 2010 (Rocky Ford, CO)

Station:CSU Expt Stn Rocky Ford
Location:2.5 mi SE Rocky Ford
Elevation:4180
Longitude:103.695
Latitude:38.0385

Crop Evapotranspiration in Inches

Date	Alfalfa	Corn	Drybeans	Smallgrn	Sgrbeets	Potatoes	Onion/sd	WntrWheat	Turf	RefET	Precip
04/26/2010	0.06	0.03		0.13	0.04		0.07	0.17	0.09	0.17	0.15
04/27/2010	0.08	0.05		0.18	0.05		0.10	0.23	0.13	0.23	0.00
04/28/2010	0.14	0.07		0.30	0.08		0.16	0.35	0.20	0.35	0.00
04/29/2010	0.13	0.06		0.28	0.08		0.14	0.31	0.18	0.31	0.00
04/30/2010	0.11	0.05		0.22	0.06		0.11	0.24	0.14	0.24	0.00
05/01/2010	0.10	0.04		0.19	0.05		0.10	0.21	0.12	0.21	0.00
05/02/2010	0.10	0.04		0.18	0.05		0.09	0.19	0.11	0.19	0.00
Sum	0.72	0.34	0.00	1.48	0.41	0.00	0.78	1.71	0.97	1.71	0.15
Average	0.10	0.05	0.00	0.21	0.06	0.00	0.11	0.24	0.14	0.24	0.02

Table 2.2. 7-Day Crop and Turf ET Report for April 26, 2010 (Lamar, CO)

Station:Lamar #4
Location:4.5 mi NNE Lamar
Elevation:3705
Longitude:102.599
Latitude:38.1539

Crop Evapotranspiration in Inches

Date	Alfalfa	Corn	Drybeans	Smallgrn	Sgrbeets	Potatoes	Onion/sd	WntrWheat	Turf	RefET	Precip
04/26/2010	0.08	0.04		0.16	0.05		0.10	0.22	0.12	0.22	0.17
04/27/2010	0.08	0.04		0.17	0.05		0.10	0.22	0.12	0.22	0.00
04/28/2010	0.08	0.04		0.18	0.05		0.10	0.22	0.13	0.22	0.09
04/29/2010	0.10	0.05		0.20	0.06		0.11	0.24	0.14	0.24	0.00
04/30/2010	0.10	0.05		0.20	0.06		0.11	0.24	0.14	0.24	0.00
05/01/2010	0.09	0.04		0.17	0.05		0.09	0.20	0.11	0.20	0.00
05/02/2010	0.08	0.03		0.15	0.04		0.08	0.17	0.10	0.17	0.00
Sum	0.60	0.30	0.00	1.23	0.35	0.00	0.68	1.51	0.86	1.51	0.26
Average	0.09	0.04	0.00	0.18	0.05	0.00	0.10	0.22	0.12	0.22	0.04

Table 2.3. 7-Day Crop and Turf ET Report for April 26, 2010 (Hoehne, CO)

Station:Hoehne
Location:NE Trinidad
Elevation:5625
Longitude:104.313
Latitude:37.2893

Crop Evapotranspiration in Inches

Date	Alfalfa	Corn	Drybeans	Smallgrn	Sgrbeets	Potatoes	Onion/sd	WntrWheat	Turf	RefET	Precip
04/26/2010	0.05	0.03		0.11	0.03		0.06	0.14	0.08	0.14	0.11
04/27/2010	0.09	0.05		0.19	0.06		0.11	0.24	0.13	0.24	0.00
04/28/2010	0.13	0.07		0.29	0.08		0.16	0.35	0.20	0.35	0.00
04/29/2010	0.16	0.08		0.33	0.09		0.17	0.38	0.22	0.38	0.00
04/30/2010	0.10	0.04		0.20	0.05		0.10	0.22	0.13	0.22	0.00
05/01/2010	0.09	0.04		0.17	0.05		0.09	0.19	0.11	0.19	0.00
05/02/2010	0.08	0.03		0.14	0.04		0.07	0.16	0.09	0.16	0.00
Sum	0.70	0.34	0.00	1.42	0.40	0.00	0.76	1.68	0.95	1.68	0.11
Average	0.10	0.05	0.00	0.20	0.06	0.00	0.11	0.24	0.14	0.24	0.02

TASK 2 – Distribution of crop and turf water use reports to radio stations ($7,880).

Description of Task. Radio stations throughout the Arkansas Basin broadcast public service announcements and upcoming events for the benefit of their listeners. These radio stations will be interested providing CoAgMet data to their listeners, some of whom will be irrigators or landowners who wish to conserve water through irrigation scheduling. These news outlets include, but are not limited to KLMR (Lamar), KVAY (Lamar), KRLN (Canon City), KBLJ/KTHN (La Junta), and KSPK (Walsenburg). This list could include as many as 5 radio stations.

Method/Procedure. Over a 3-year period, a student intern will generated weekly ET reports, based on the preferences of local irrigators and landowners. The reports will utilize ET rate estimates from the nearest CoAgMet station in the vicinity of the participating radio station. The generated reports will be read and digitized as a sound recording, then sent to participating radio stations for daily (or weekly broadcast). Should the station choose to broadcast the information themselves, an ET report will be generated and sent to them, in a fashion similar to that used for the print media outlet.

Deliverable. The primary output will be improved access to daily agricultural water use data for key crops irrigated in the Arkansas Basin. To the extent that irrigators utilize the information provided in the reports, the primary outcome will be the water savings achieved through irrigation scheduling.

TASK 3 – Development of coding and programming for pilot telemetric subscription service ($24,000).

Description of Task. A customary form of communication popularized by cellular telephone services is "text messaging." A text allows the cell phone user to receive a single message not exceeding 160 characters. A system will be developed through CSU (via sub-award agreement) by contracting the CoAgMet programmer (Mr. John Kleist) to write the necessary coding for a pilot subscription service. A beta-version of the service, CoAgMet-PRO (Personal Records Outreach) will be tested by participating producers. An example text message that would appear on the participant's phone is shown below for ET and Precipitation during a 7-day period for the week of April 26, 2010 in Rocky Ford, CO:

```
04/26 A 0.06 C 0.03 P 0.15
04/27 A 0.08 C 0.05 P 0.00
04/28 A 0.14 C 0.07 P 0.00
04/29 A 0.13 C 0.06 P 0.00
04/30 A 0.11 C 0.05 P 0.00
05/01 A 0.10 C 0.04 P 0.00
05/02 A 0.10 C 0.04 P 0.00
7DSUM A 0.72 C 0.34 P 0.15
```

Where A = Alfalfa, C = Corn, and P = Precipitation

The above text message is longer than 160 characters, so some modifications may be necessary for participants to receive single messages. *The system is currently established for daily reports, which are much shorter. To simplify, a modification may require those choosing weekly reports to get only the summation of the 7-day period*. Other modifications would include removal of spaces, symbols, and unnecessary punctuation, or perhaps only texting the summation quantity (i.e., 7-day summary, abbreviated "7DSUM") instead of each daily ET rate. A standardized messaging system will be developed in cooperation with pilot partner-irrigators.

Method/Procedure. The CoAgMet text/email service will consist of two parts. The first part will require a Web page developed to handle user authentication and user preferences. The user will be able to select which crops to monitor, specify the period over which to summarize and specify the frequency of text/email should be sent. For example: "Send a 7 day summary for corn and small grains every 3 days." The second part is the delivery routine that will run periodically and send the summaries. The delivery will use the same hypertext

preprocessor (php) code that is already part of CoAgMet's Web based crop ET reports. Four planning meetings are also scheduled for this task, three of which will involve travel from Ft. Collins to Pueblo for Mr. Bauder (and perhaps the programmer, Mr. Kleist).

Deliverable. The primary output will be an automated data delivery approach for sending ET rates to participant cell phones, based on simple text messaging tools. Text messages will be customized based on the preferences of the receiver, who may select which crops and CoAgMet stations serve as the basis of the ET rates. This output will also serve as the underpinning for a statewide model of information transfer, coordinated with CoAgMet.

TASK 4 – Deployment of telemetric subscription service to cooperators ($28,039)

Description of Task. Upon development of the text messaging system, pilot participants will be enlisted to utilize and troubleshoot the data delivery service.

Method/Procedure. A major element of this task will involve workshops in the various regions of the Arkansas Basin that will benefit from the service. Four (4) workshops will be conducted each year in the Upper and Lower Arkansas Basin areas (Salida, Trinidad, Rocky Ford, Lamar). During these workshops, producers will be introduced to the text messaging subscription service and instructed on how they can subscribe in order to receive ET reports according their preferences, which will be customized to the extent possible.

Deliverable. The primary output will be a standard presentation that will be available for the program in the event that a statewide application is recommended. As irrigators utilize the information provided by the text messaging service, the primary outcome will be the water savings achieved through irrigation scheduling.

TASK 5 – Monitoring and assessment of program ($12,043)

Description of Task. A program evaluation will be necessary to systematically collect information about the activities, characteristics, and results of the program. The evaluation will enable judgments to be made about the program, improve or further develop program effectiveness, inform decisions about future program development, and increase understanding of our accomplishments.

Method/Procedure. The majority of the evaluation work will focus on the innovative use of text messaging in order to reduce water consumption. Surveys will be administered at the workshops listed in Task 4 and at a post program follow-up in order to assess long-term change due to program participation. Questions will include concepts such as attitudes toward water conservation (e.g., water survey questionnaire that measures attitudes, knowledge, and behavioral intention to save water; Watson et al., 1988) and self-efficacy of ET text reports (i.e., the irrigator's belief in their ability to use the text reports to conserve water).

Deliverable. The primary output will be a professional evaluation that will be utilized to allow the program to be developed for statewide application.

BUDGET

Table 3. Complete Itemized Budget (includes adjustments for 4% annual inflation)

Category	Year 1	Year 2	Year 3	Total
PERSONNEL SALARIES				
Administrative Professional (Perry Cabot):	$ 3,769	$ 3,920	$ 4,076	$ 11,765
Fringe Rate (26%)	$ 980	$ 992	$ 1,048	$ 3,020
Administrative Professional (John Kleist):	$ 8,000	$ 3,328	$ 3,461	$ 14,789
Fringe Rate (26%)	$ 2,080	$ 842	$ 889	$ 3,811
Non-Student Hourly (CSU-Pueblo Intern):	$ 4,800	$ 3,328	$ 3,461	$ 11,589
Fringe Rate (3.50%)	$ 547	$ 493	$ 519	$ 1,559
TOTAL SALARY:	$ 19,869	$ 14,008	$ 14,567	$ 48,444
TOTAL FRINGE:	$ 4,465	$ 3,195	$ 3,373	$ 11,033
TOTAL PERSONNEL:	**$ 24,334**	**$ 17,203**	**$ 17,940**	**$ 59,477**
DOMESTIC TRAVEL (see Table 5 below):	**$ 1,397**	**$ 982**	**$ 1,023**	**$ 3,402**
MATERIALS/SUPPLIES (see Table 6 below)	**$ 4,800**	**$ 2,704**	**$ 2,812**	**$ 10,316**
OTHER DIRECT COSTS (see Table 7 below)				
Evaluation and Survey Consultant & Analysis:	**$ 3,200**	**$ 2,080**	**$ 2,163**	**$ 7,443**
SUBCONTRACTS:				
EQUIPMENT:				
TOTAL DIRECT COSTS:	**$ 29,573**	**$ 18,669**	**$ 19,452**	**$ 67,694**

Table 4. Simple Budget Breakdown.

Category	Total Direct	Indirect (Overhead Rate	Indirect (Overhead Cost	Project Total Cost
Sangre de Cristo RC&D, Inc.	$ 17,759	10%	$ 1,776	$ 19,535
Colorado State University (Salary Matching Contribution + Fringe + Indirect Costs)	$ 14,786	26%†	$ 3,845	$ 18,631
Colorado State University (Sub-Award)	$ 22,002	25%‡	$ 5,501	$ 27,503
Colorado State University – Pueblo (Sub-Award)	$ 13,147	25%	$ 3,286	$ 16,431
TOTAL:	**$ 67,694**		**$ 14,408**	**$ 82,102**
Matching (Southeastern Colorado Water Conservancy Dist@ $3,500/yr @ 3 yrs)				$ 10,500
Matching (Lower Arkansas Valley Water Conservancy Dist @ $2,000/yr @ 3 yrs)				$ 6,000
Colorado State University (Salary Matching Contribution + Fringe + Indirect Costs) – Table 2 (above)				$ 18,631
TOTAL MATCHING CONTRIBUTION				**$ 35,131**
TOTAL FUNDS REQUESTED from CWCB Water Supply Reserve Account				**$ 46,971**
TOTAL FUNDS REQUESTED (Statewide Account)				**$ 37,577**
TOTAL FUNDS REQUESTED (Basin Account)				**$ 9,394**
Matching Percentage (Matching Contribution/Total)				43%

† Indirect Cost (Facilities and Administrative) for CSU Matching Contribution
‡ Maximum allowable Indirect Cost Rate for Colorado Water Conservation Board

Table 5. Labor Costs.

Task	Personnel Description	Labor Rate	Inflation	Fringe	Commitment	Total Labor Cost
Task 1. Print Media Outlet Distribution	Intern	$20/hr	4%	11.4%	160 hours	$ 3,756
Task 2. Radio Media Distribution	Intern	$20/hr	4%	11.4%	160 hours	$ 3,756
Task 3. Telemetric Subscription Service Development	Programmer	$40/hr	4%	26.0%	360 hours	$ 18,600
Task 4. Telemetric Subscription Workshops	Intern	$20/hr	4%	11.4%	240 hours	$ 5,635

Table 6. Project Costs associated with WSRA request.

	Personnel	*Travel Mileage and Per Diem*	*Materials and Supplies*	*Evaluation*	*Indirect Costs*	*Total*
Item Description						
Task 1. Print Media Outlet Distribution	$ 6,220		$ 2,200		$ 1,800	$ 10,220
Task 2. Radio Media Distribution	$ 6,220				$ 1,580	$ 7,880
Task 3. Telemetric Subscription Service Development	$ 18,600	$ 600			$ 4,800	$ 24,000
Task 4. Telemetric Subscription Workshops	$ 13,028	$ 2,202	$ 8,116		$ 4,693	$ 28,039
Task 5. Evaluation and Assessment	$ 2,465	$ 600		$ 7,443	$ 1,535	$ 12,043
TOTAL Project Cost	**$ 46,533**	**$ 3,402**	**$ 10,316**	**$ 7,443**	**$ 14,408**	**$ 82,102**

Matching (Southeastern Colorado Water Conservancy Dist@ $3,500/yr @ 3 yrs)	$ 10,500
Matching (Lower Arkansas Valley Water Conservancy Dist @ $2,000/yr @ 3 yrs)	$ 6,000
Matching (CSU Salary Matching Contribution + Fringe + Indirect Costs) – Table 1 (above))	$ 18,631
TOTAL FUNDS REQUESTED from CWCB Water Supply Reserve Account	**$ 46,971**

Table 7. Travel Schedule Breakdown (based on $0.45/mile State of Colorado mileage rate and 4% inflation per year)

Meeting Title	*Destination*	*Traveler*	*Year 1*	*Year 2*	*Year 3*	*Total*
Planning Meeting (CSU group)	Ft. Collins, CO	Cabot, Perry (or Intern)	$ 240	$ ---	$ ---	$ 240
Planning Meeting (CSU group)	Pueblo, CO	Bauder, Troy ; Kleist, J.	$ 312	$ 324	$ 337	$ 973
Planning Meeting (Upper Arkansas)	Salida, CO	Cabot, Perry (or Intern)	$ 240	$ ---	$ ---	$ 240
Planning Meeting (Lower Arkansas)	La Junta, CO	Cabot, Perry (or Intern)	$ 210	$ ---	$ ---	$ 210
Planning Meeting (Purgatoire River Area)	Trinidad, CO	Cabot, Perry (or Intern)	$ 81	$ 81	$ 88	$ 253
Workshop - Upper Arkansas	Salida, CO	Cabot, Perry (or Intern)	$ 90	$ 90	$ 97	$ 281
Workshop - Lower Arkansas	La Junta, CO	Cabot, Perry (or Intern)	$ 60	$ 60	$ 65	$ 187
Workshop - Lower Arkansas	Lamar, CO	Cabot, Perry (or Intern)	$ 262	$ 262	$ 283	$ 817
Workshop – Purgatoire	Trinidad, CO	Cabot, Perry (or Intern)	$ 81	$ 81	$ 88	$ 253
Winter Water Storage Meeting	La Junta, CO	Cabot, Perry (or Intern)	$ 60	$ 60	$ 65	$ 187
TOTAL			**$ 1,397**	**$ 982**	**$ 1,023**	**$ 3,402**

Table 8. Materials and Supplies Breakdown.

		Year 1		*Year 2*		*Year 3*		
Item Description	*Price*	*Qty*	*Cost*	*Qty*	*Cost*	*Qty*	Cost	*Total*
CoAgMet WORKSHOPS								
1. Facility Rental	$ 300	4	$ 1,200	4	$ 1,248	4	$ 1,298	$ 3,746
2. Refreshments, Drinks, etc.	$ 200	4	$ 800	4	$ 832	4	$ 865	$ 2,497
3. Print Costs (CoAgMet Handbooks)	$ 150	4	$ 600	4	$ 624	4	$ 649	$ 1,873
Laptop Computer (2.53GHz Processor; 17.3" Display; 6GB Memory; 640GB Hard Drive	$ 1,500	1	$ 1,500	0	$ -	0	$ -	$ 1,500
Software (Spreadsheet, Processing, etc.)	$ 700	1	$ 700	0	$ -	0	$ -	$ 700
Anti-Virus Software	$ 50	1	$ 50	1	$ 52	1	$ 54	$ 156
TOTAL								**$ 10,316**

Table 9. Other Direct Costs (Evaluation and Assessment Program).

Item Description	*Year 1*	*Year 2*	*Year 3*	*Total*
Evaluation and Assessment Program				
Phase I: Program Design, Literature Search & Instrument Development	$ 800	$ ---	$ ---	$ 800
Phase II: Program Implementation & Assessment	$ 1,000	$ 832	$ 865	$ 2,697
Phase III: Data Analysis & Reporting Statistics	$ 1,000	$ 832	$ 865	$ 2,697
Phase IV: Program Improvement, Interpretations & Recommendations	$ 400	$ 416	$ 433	$ 1,249
TOTAL	$ 3,200	$ 2,080	$ 2,163	**$ 7,443**

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.

The proposed start date for the project is early Spring 2011, pending contract approval by the Colorado Water Conservation Board.

Table 10. Project Timeline for WSRA Project (Arkansas Basin)	**YEAR 1 (2011)**												**YEAR 2 (2012)**												**YEAR 3 (2013)**											
OBJECTIVES and TASKS	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Task 1. Print Media Outlet Distribution																																				
Interview and hire student intern; begin on-the-job training	■	■																																		
Develop protocol for reporting system through CoAgMet (e.g., contacts with newspapers, etc.)		■																																		
Begin deploying weekly ET reports to participating newspaper outlets		■	■	■	■								■	■	■	■	■																			
Task 2. Radio Media Distribution																																				
Develop protocol for reporting system through CoAgMet (e.g., contacts with radio stations, etc.)		■																																		
Begin deploying weekly (or daily) ET reports to participating radio stations		■	■	■	■								■	■	■	■	■									■	■	■	■	■						
Task 3. Telemetric Subscription Service Development																																				
Development of web page developed to handle user authentication and user preferences	■	■	■																																	
Development of delivery routine to run periodically and send the summaries		■	■	■																																
Initial run of text-messaging delivery service				■																																
Trouble-shooting and revision of text-messaging delivery service					■	■																														
Full deployment of text-messaging delivery service to Arkansas Basin													■	■	■	■	■									■	■	■	■	■						
Re-evaluation and modification of text-messaging delivery service, based on assessment phases																	■	■	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■
Task 4. Telemetric Subscription Workshops																																				
Initial planning meetings to prepare for first run of text-messaging service				■																																
After-action review (AAR) meetings to receive feedback on first run of text-messaging service						■	■	■																												
Mini-Workshop and Coordination Meeting (Upper Arkansas area serving Chaffee, Fremont, and Custer Counties)					■																															
Mini-Workshop and Coordination Meeting (Lower Arkansas Valley area serving Pueblo, Otero, Crowley, Bent Counties)					■																															
Mini-Workshop and Coordination Meeting (Ogallala Aquifer area serving Prowers and Baca Counties)					■																															
Mini-Workshop and Coordination Meeting (Purgatoire River area serving Las Animas and Huerfano Counties)					■																															
Full Workshop (Upper Arkansas area serving Chaffee, Fremont, and Custer Counties)														■												■										
Full Workshop (Lower Arkansas Valley area serving Pueblo, Otero, Crowley, Bent Counties)														■												■										
Full Workshop (Ogallala Aquifer area serving Prowers and Baca Counties)														■												■										
Full Workshop (Purgatoire River area serving Las Animas and Huerfano Counties)														■												■										
Task 5. Evaluation and Assessment																																				
Phase I: Program Design (Literature Search & Instrument Development)					■	■	■	■	■	■	■	■	■	■	■	■																				
Phase II: Program Implementation & Assessment								■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Phase III: Data Analysis & Reporting Statistics																■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Phase IV: Program Improvement, Interpretations & Recommendations																						■	■	■												■

PAYMENT

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

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

Signature of Applicant:

Print Applicant's Name:

Project Title:

Return this application to:

Mr. Todd Doherty
Intrastate Water Management and Development Section
COLORADO WATER CONSERVATION BOARD
1580 Logan Street, Suite 200
Denver, CO 80203

To submit applications by Email, send to: todd.doherty@state.co.us

Attachment 1
Reference Information

The following information is available via the internet. The reference information provides additional detail and background information.

Colorado Water Conservation Board (http://cwcb.state.co.us/)

Loan and Grant policies and information are available at – http://cwcb.state.co.us/Finance/

Interbasin Compact Committee and Basin Roundtables (http://ibcc.state.co.us/)

Interbasin Compact Committee By-laws and Charter (under Helpful Links section) –

http://ibcc.state.co.us/Basins/IBCC/

Legislation

House Bill 05-1177 - Also known as the Water for the 21st Century Act –

http://cwcbweblink.state.co.us/DocView.aspx?id=105662&searchhandle=28318

House Bill 06-1400 – Adopted the Interbasin Compact Committee Charter –

http://cwcbweblink.state.co.us/DocView.aspx?id=21291&searchhandle=12911

Senate Bill 06-179 – Created the Water Supply Reserve Account –

http://cwcbweblink.state.co.us/DocView.aspx?id=21379&searchhandle=12911

Statewide Water Supply Initiative

General Information – http://cwcb.state.co.us/IWMD/

Phase 1 Report – http://cwcb.state.co.us/IWMD/SWSITechnicalResources/SWSIPhaseIReport/

Attachment 2
Insurance Requirements

NOTE: The following insurance requirements taken from the standard contract apply to WSRA projects that exceed $25,000 in accordance with the policies of the State Controller's Office. Proof of insurance as stated below is necessary prior to the execution of a contract.

13. INSURANCE

Grantee and its Sub-grantees shall obtain and maintain insurance as specified in this section at all times during the term of this Grant: All policies evidencing the insurance coverage required hereunder shall be issued by insurance companies satisfactory to Grantee and the State.

A. Grantee

i. Public Entities

If Grantee is a "public entity" within the meaning of the Colorado Governmental Immunity Act, CRS §24-10-101, et seq., as amended (the "GIA"), then Grantee shall maintain at all times during the term of this Grant such liability insurance, by commercial policy or self-insurance, as is necessary to meet its liabilities under the GIA. Grantee shall show proof of such insurance satisfactory to the State, if requested by the State. Grantee shall require each Grant with Sub-grantees that are public entities, providing Goods or Services hereunder, to include the insurance requirements necessary to meet Sub-grantee's liabilities under the GIA.

ii. Non-Public Entities

If Grantee is not a "public entity" within the meaning of the GIA, Grantee shall obtain and maintain during the term of this Grant insurance coverage and policies meeting the same requirements set forth in **§13(B)** with respect to sub-Grantees that are not "public entities".

B. Sub-Grantees

Grantee shall require each Grant with Sub-grantees, other than those that are public entities, providing Goods or Services in connection with this Grant, to include insurance requirements substantially similar to the following:

i. Worker's Compensation

Worker's Compensation Insurance as required by State statute, and Employer's Liability Insurance covering all of Grantee and Sub-grantee employees acting within the course and scope of their employment.

ii. General Liability

Commercial General Liability Insurance written on ISO occurrence form CG 00 01 10/93 or equivalent, covering premises operations, fire damage, independent Grantees, products and completed operations, blanket Grantual liability, personal injury, and advertising liability with minimum limits as follows: **(a)**$1,000,000 each occurrence; **(b)** $1,000,000 general aggregate; **(c)** $1,000,000 products and completed operations aggregate; and **(d)** $50,000 any one fire. If any aggregate limit is reduced below $1,000,000 because of claims made or paid, Sub-grantee shall immediately obtain additional insurance to restore the full aggregate limit and furnish to Grantee a certificate or other document satisfactory to Grantee showing compliance with this provision.

iii. Automobile Liability

Automobile Liability Insurance covering any auto (including owned, hired and non-owned autos) with a minimum limit of $1,000,000 each accident combined single limit.

iv. Additional Insured

Grantee and the State shall be named as additional insured on the Commercial General Liability and Automobile Liability Insurance policies (leases and construction Grants require additional insured coverage for completed operations on endorsements CG 2010 11/85, CG 2037, or equivalent).

v. Primacy of Coverage

Coverage required of Grantee and Sub-grantees shall be primary over any insurance or self-insurance program carried by Grantee or the State.

vi. Cancellation

The above insurance policies shall include provisions preventing cancellation or non-renewal without at least 45 days prior notice to the Grantee and the State by certified mail.

vii. Subrogation Waiver

All insurance policies in any way related to this Grant and secured and maintained by Grantee or its Sub-grantees as required herein shall include clauses stating that each carrier shall waive all rights of recovery, under subrogation or otherwise, against Grantee or the State, its agencies, institutions, organizations, officers, agents, employees, and volunteers.

C. Certificates

Grantee and all Sub-grantees shall provide certificates showing insurance coverage required hereunder to the State within seven business days of the Effective Date of this Grant. No later than 15 days prior to the expiration date of any such coverage, Grantee and each Sub-grantee shall deliver to the State or Grantee certificates of insurance evidencing renewals thereof. In addition, upon request by the State at any other time during the term of this Grant or any sub-grant, Grantee and each Sub-grantee shall, within 10 days of such request, supply to the State evidence satisfactory to the State of compliance with the provisions of this **§13**.

Attachment 3
Water Supply Reserve Account Standard Contract

NOTE: The following contract is required for WSRA projects that exceed $100,000. (Projects under this amount will normally be funded through a purchase order process.) Applicants are encouraged to review the standard contract to understand the terms and conditions required by the State in the event a WSRA grant is awarded. Significant changes to the standard contract require approval of the State Controller's Office and often prolong the contracting process.

It should also be noted that grant funds to be used for the purchase of real property (e.g. water rights, land, conservation easements, etc.) will require additional review and approval. In such cases applicants should expect the grant contracting process to take approximately 3 to 6 months from the date of CWCB approval.

Attachment 4
W-9 Form

NOTE: A completed W-9 form is required for all WSRA projects prior execution of a contract or purchase order. Please submit this form with the completed application.