**Water Supply Reserve Account – Grant and Loan Program**
**Water Activity Summary Sheet**
**September 21-22, 2016**
**Agenda Item 19(h)**

| | |
|---|---|
| **Applicant & Fiscal Agent:** | Upper Arkansas Water Conservancy District |
| **Water Activity Name:** | Groundwater and Surface Water Interactions and Potential for Underground Storage |
| **Water Activity Purpose:** | Study (Multipurpose Water Balance) |
| **County:** | All Counties w/in Arkansas Basin |
| **Drainage Basin:** | Arkansas |
| **Water Source:** | Arkansas River and all tributaries |
| **Amount Requested/Source of Funds:** | $50,000 Arkansas Basin Account<br>$256,618 Statewide Account<br>$306,618 Total Grant Request |
| **Matching Funds:** | Basin Account Match ($50,000) = 16.3% of total grant request;<br>Applicant/3rd Party Match ($360,442) = 118% of Total Grant Request (meets 5% min);<br>Basin & Applicant/3rd Party Match ($101,000) = 134% of Total Grant Request (meets 25% min).<br>(refer to *Funding Summary/Matching Funds* section) |

**Staff Recommendation:**

Staff recommends approval of up to $50,000 from the Arkansas Basin Account; and $256,618 from the Statewide Account to help fund the project titled: Groundwater and Surface Water Interactions and Potential for Underground Storage.

**Water Activity Summary:** WSRF grant funds, if approved will be expended to assist the Upper Arkansas Water Conservancy District in conducting the Groundwater and Surface-Water Interaction and Potential for Underground Water Storage study that will address the 'gap' through the evaluation of the available supply of water and the water balance of the Upper Arkansas Basin. This study will provide the tools necessary to manage future water supplies and will offer insight on the potential for alluvial aquifer storage, and create a mechanism for evaluating and implementing efficient irrigation practices. This study will quantify surface-water and groundwater, including recharge rates, and characterize the interactions between them in order to estimate the availability and sustainability of water resources and the effects that changes in water use or climate might have on water supplies. Agriculture represents the largest user group in the upper basin and agricultural water management will be evaluated through field-scale irrigation management data collection to create an agricultural water balance. Study results will meet both Basin and State needs for consumptive and non-consumptive use. Study results can be used for both water and land use planning and will provide important data for future water management and storage options. This study will provide data for

multiple purposes through a collaborative approach to meet future water challenges and addresses all measurable objectives identified in Colorado's Water Plan.

**Discussion:** This project furthers multiple goals and objectives of the Arkansas Basin Implementation Plan. With respect to the Colorado Water Plan, this project supports Objective A. Supply-Demand Gap: "Meet Colorado's Water Supply Gaps" Objective D. Agriculture: "Support Agricultural Conservation and Efficiency," Objective E. Storage: "Assess and promote opportunities for multipurpose and multi-partner storage projects that address strategic needs," and Objective F. Watershed Health, Environment and Recreation: "Protect healthy environments" (Section 10.3).

**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:**
This activity has undergone review and evaluation and staff has determined that it satisfies the Evaluation Criteria. Please refer to WSRA Application for applicant's detailed response.

**Funding Summary/Matching Funds:**

| **Funding Source** | **Cash** | **In-kind** | **Total** |
|---|---|---|---|
| Upper Arkansas Water Conservancy District | $43,639 | $25,000 | $68,639 |
| Chaffee County & Municipalities | $30,000 | $0 | $30,000 |
| Fremont Counties & Municipalities | $30,000 | $0 | $30,000 |
| Custer County & Municipalities | $10,000 | $0 | $10,000 |
| USGS | $192,300 | $0 | $192,300 |
| CSU Pueblo | $29,503 | $0 | $29,503 |
| Subtotal Matching Funds | $335,442 | $25,000 | $360,442 |
| WSRA Arkansas Basin Account | $50,000 | n/a | $50,000 |
| WSRA Statewide Account | $256,618 | n/a | $256,618 |
| **Total Project Costs** | **$642,060** | **$25,000** | **$667,056** |

**CWCB Project Manager:** Andy Moore

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.

# Arkansas Basin Roundtable

July 13, 2016

***Via Electronic Mail: craig.godbout@state.co.us***

Mr. Craig Godbout
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, CO 80203

Re: Water Supply Reserve Account Grant Application: Groundwater and Surface-Water Interaction and Potential for Underground Water Storage – Phase 2

Dear Craig:

At its July 13, 2016 meeting, the Arkansas Roundtable approved the referenced grant request for $50,000 in Basin Funds, $256,618 in Statewide Funds with $360,438 in matching funds from the applicant along with the United States Geologic Survey and the Water Institute of Colorado State University. There were no dissenting opinions expressed in the consensus decision.

This project furthers multiple goals and objectives of the Arkansas Basin Implementation Plan. With respect to the Colorado Water Plan, this project supports Objective A. Supply-Demand Gap: "*Meet Colorado's Water Supply Gaps,*" Objective D. Agriculture: "*Support Agricultural Conservation and Efficiency,*" Objective E. Storage: "*Assess and promote opportunities for multipurpose and multi-partner storage projects that address strategic needs,*" and Objective F. Watershed Health, Environment and Recreation: "*Protect healthy environments*" (Section 10.3).

Should you have any questions or concerns, please feel free to contact me either by telephone, 719-742-6164, or by email, sandy@white-jankowski.com.

With warm regards

Michael D. (Sandy) White
Chair

Copy via email:
Applicant
ABRT Executive Committee

COLORADO
DEPARTMENT OF NATURAL RESOURCES

# COLORADO WATER CONSERVATION BOARD

## WATER SUPPLY RESERVE ACCOUNT APPLICATION FORM

**Today's Date: July 27, 2016**

Groundwater and Surface-Water Interaction and Potential for Underground Water Storage: Phase 2

**Name of Water Activity/Project**

Upper Arkansas Water Conservancy District

**Name of Applicant**

Arkansas Basin Roundtable

**Amount from Statewide Account:** $ 256,618

**Amount from Basin Account(s):** $ 50,000

**Total WSRA Funds Requested:** $ 306,618

**Approving Basin Roundtable(s)**
*(If multiple basins specify amounts in parentheses.)*

**FEIN:**

## Application Content



**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)

## 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.

**Water Supply Reserve Account – Application Form**
**Revised October 2013**

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

1. Applicant Name(s): Upper Arkansas Water Conservancy District

Mailing address: UAWCD
P.O BOX 1090
Salida, CO. 81201

FEIN #:

**Primary Contact**: Ralph "Terry" Scanga Jr. Position/Title: Manager

Email: manager@uawcd.com

Phone Numbers: Cell: Office: 719-539-5425

**Alternate Contact**: Chelsey Nutter Position/Title: Project Coordinator

Email: projects@uawcd.com

Phone Numbers: Cell: 719-221-8213 Office: 719-539-5425

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.

[x] 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.

3. Provide a brief description of your organization

The Upper Arkansas Water Conservancy District (UAWCD) was formed in 1979 pursuant to C.R.S. 37-45-102 and case number 79CV30. The district is a quasi-municipality created to conserve water resources and to provide optimal water usage in the Upper Arkansas River Basin by construction as defined in C.R.S. 37-45-103(10): dams, reservoirs, canals, conduits, pipelines, tunnels, and all works, facilities, improvements, and property necessary or convenient for supplying water for domestic, irrigation, power, milling, manufacturing, mining, metallurgical, and all other beneficial uses. About 7,000 District customers use water for irrigation (38% of use); municipal storage (25%); and domestic and commercial augmentation (18%). The service area of the district covers over 2 million high mountain acres in Chaffee, Fremont, Custer and parts of Saguache and El Paso Counties.

**A brief history of the applicant**

**In 1979**, the Upper Arkansas Water Conservancy District (UAWCD) was created. In 1982, it assumed control of three high mountain reservoirs in Chaffee County. Since assuming control of the reservoirs, UAWCD has provided storage for two growing municipalities on the South Arkansas River: Salida and Poncha Springs.

**From 1980-2000,** UAWCD pioneered conjunctive ground water and surface water management, filing the first-ever blanket water augmentation plan for all of Chaffee and part of Fremont County. It acquired storage at two reservoirs tributary to the Arkansas River. It acquired water rights to meet increased demand for augmentation due to promulgation in 1996 of *Amended Rules and Regulations Governing the Diversion and Use of Tributary Ground Water in the Arkansas River Basin*. The Arkansas River Basin is fully-appropriated.

**By the early-2000s,** population escalated. Double-digit population growth increased municipal demands, intensifying the need for reservoir storage. By utilizing Pueblo Reservoir and Twin Lakes water in conjunction with its tributary storage, UAWCD increased water use efficiency and met municipal demand. To meet growing municipal and augmentation demand, UAWCD expanded the geographic extent of its blanket augmentation plans into eastern Fremont and Custer Counties. As part of its approval, the State Engineer mandated that UAWCD install remote continuous recording instrumentation at most of its reservoirs and certain stream locations.

**In the late-2000s**, UAWCD built 22 high mountain telemetry water data collection platforms To do so, it leveraged federal Bureau of Reclamation funds of ~$285,000 and state funds of ~$285,000. The project was twice selected as a nationwide success story. More than 500,000 down-basin residents are affected by available supplies of Upper Arkansas River water. Data is managed with Colorado Division of Water Resources software so records for administration/augmentation agree. See http://www.dwr.state.co.us/SurfaceWater/ and http://www.uawcd.com/water_resources.php

**In the early 2010s**, UAWCD implemented its ~$400,000 US Geological Survey (USGS) water balance study to quantify both surface water and ground water and characterize the interaction between them in the Upper Arkansas River Basin. UAWCD leveraged federal USGS funds of ~$135,000 and state funds of ~$180,000. Study results will enhance the basin-wide decision-making framework for water users including municipalities, irrigators, and recreationists.

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

Contracting Entity here.

The Upper Arkansas Water Conservancy District (UAWCD) will be working in partnership with the United States Geological Survey (USGS) Pueblo Office, and Colorado State University Extension (CSU) Pueblo Office.

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.

[x] 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.

Funding will not trigger any TABOR limitations

**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 |
| [X] | Other Explain: Multi-Purpose Water Balance Study |

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

This study will provide data and analysis for M&I, agriculture, environment, and recreation. The data will be used by upper basin municipalities, land-use planners, irrigators and water managers. The data will also be used by the United States Geological Survey and Colorado State University and will be submitted for use in the Statewide Water Supply Initiative and the Arkansas Basin Decision Support System.

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

[X] 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) |
| [ ] | Other -- Explain: |

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

Latitude: 38.2013900 Longitude: -105.4658300

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.

The Upper Arkansas region consisting on Lake, Chaffee, Fremont, and Custer counties is expected to experience significant growth according to the Department of Local Affairs Regional Profile Report released in 2012. The area is projected to grow by 2% per year and reach over 100,000 people by 2030. Planning for this future growth will require an understanding of the current water balance and the sustainability of these water resources. It is imperative that we develop future growth plans that center around meeting increasing demand for water and dealing with projected climate change.

Colorado's Water Plan released in 2015, set a measurable objective of reducing the projected 2050 municipal and industrial gap from as much as 560,000 acre-feet to zero acre-feet by 2030. Colorado's Water Plan also set a measurable objective of attaining 400,000 acre-feet of water storage in order to manage and share conserved water by 2050. New storage projects will be increasingly innovative, and will rely on technologies such as aquifer storage and recharge. In addition, water managers will need to be more agile in responding to changing conditions, so that storage can be more rapidly added to Colorado's water portfolio while maintaining strong environmental health (Colorado's Water Plan Executive Summary, pg. 14-15).

The *Groundwater and Surface-Water Interaction and Potential for Underground Water Storage* study will address the 'gap' through the evaluation of the available supply of water and the water balance of the Upper Arkansas Basin. This study will provide the tools necessary to manage future water supplies and will offer insight on the potential for alluvial aquifer storage, and create a mechanism for evaluating and implementing efficient irrigation practices. This study will quantify surface-water and groundwater, including recharge rates, and characterize the interactions between them in order to estimate the availability and sustainability of water resources and the effects that changes in water use or climate might have on water supplies. Agriculture represents the largest user group in the upper basin and agricultural water management will be evaluated through field-scale irrigation management data collection to create an agricultural water balance. Study results will meet both Basin and State needs for consumptive and non-consumptive use. Study results can be used for both water and land use planning and will provide important data for future water management.

This study will also address the storage gap by assisting in the identification of areas in the Wet Mountain Valley that have a high potential for alluvial aquifer storage. Phase-1 was instrumental in the identification of areas in the Buena-Vista Salida region that showed potential for this type of storage. Phase-1 assisted the Upper Arkansas Water Conservancy District in moving forward with two multi-purpose storage projects that have the potential to provide an additional 20,000+ acre-feet of underground storage in the upper basin. Earlier studies conducted by the State, identified the Wet Mountain Valley drainage as a candidate for alluvial aquifer storage. Phase-2 of this study will allow for the intense monitoring and data collection needed to accurately identify areas in the Wet Mountain Valley that could serve as aquifer recharge and storage sites.

There are multiple benefits associated with the use of alluvial aquifer storage. Aquifer storage allows for the infiltration of surface water through recharge ponds and for the use the aquifer as a storage vessel. This reduces the need for traditional surface storage and conserves water by reducing evaporative loss. Alluvial storage does not require any surface construction beyond the development of recharge ponds. These ponds double as wetlands, providing a habitat for migratory birds while protecting open space and wildlife corridors. Alluvial aquifer storage is the future and addresses both consumptive and non-consumptive needs. Storage and the management of storage is the key element needed in order to be successful in facing our future water challenges.

## 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]

   This grant application is for a study and will not harm any water rights.

   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.

   Arkansas Basin Roundtable approval letter was sent to CWCB on 7/20/216

[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.

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.

Arkansas Basin Roundtable approval letter was sent to CWCB on 7/20/216

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)

| Matching | | |
|---|---|---|
| **Organization** | **Amount, $** | **% of Total** |
| Upper Arkansas Water Conservancy District & Local Cost Share Partners | $138,635 | 21% |
| United States Geological Survey, Pueblo | $192,300 | 29% |
| Colorado State University Extension, Pueblo | $29,503 | 4% |
| WSRA- Ark. Basin Funds | $50,000 | 12% |
| TOTALS Matching Funds | $410,438 | 62% |

[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.

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).

   This study will address consumptive and non-consumptive needs and provide data that will be beneficial for all water use components. The study will assist in quantifying the projected "gap" and provide information for the Colorado Water Plan, the State, the Basin, and multiple organizations and agencies. Results from this study can be used in the Statewide Water Supply Initiative(s) and in the development of the Arkansas Basin Decision Support System. Study results can also be used to estimate the effects of changes in water use or climate on the availability and sustainability of groundwater resources. Data from the study will assist in the management of reservoirs, diversions, and conveyance to accommodate changes in snowpack, steam flow timing, and hydrograph evolution. The agricultural component will provide data for irrigation efficiencies. The storage component of this study will promote the protection of open space, stimulate conservation, positively impact municipal supply, protect irrigated agriculture, and provide environmental benefits.

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 District will be working in partnership with the United State Geologic Survey, Colorado State University, and several local matching partners for Phase 2. The District received seventeen letters of support from multiple organizations during the development of this study. Letters of support were received from city and county officials in Lake, Chaffee, Fremont, Custer, and Pueblo counties as well as, municipal, agricultural, economic, recreational, and environmental organizations. Additional letters of support for Phase 2 were provided by all cost share participants (see attached letters of support in Exhibit A).

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 study will assist in quantifying the projected "gap" and provide data for the Colorado Water Plan, Water Supply Initiative(s) and the Arkansas Basin Decision Support System. No new water will be made available. However, data will be generated regarding the potential for aquifer storage in the headwaters region. This innovative storage technique will address multiple consumptive and non-consumptive demands and promote conservation through reduced evaporation associated with traditional surface storage vessels. See Exhibit A for full list of how this project meets the needs of the Colorado Water Plan.

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).

The amount of funds requested is minimal, given the benefit to Colorado. It leverages local and federal funding and will support multiple needs and purposes. Funding from the WSRA will allow for the continuation of data collection needed to accurately establish a water budget in the upper basin. This study is complex and requires multiple years of data collection. Without funding, this degree of depth and accuracy will not be reached.

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 applicant demonstrates a significant commitment to the project by leveraging funding from multiple sources and from federal, state, and local funds. The total matching funds is 62% of the project total. The Upper District and local cost share partners will provide 21% of the project total.

| Matching | | |
|---|---|---|
| **Organization** | **Amount, $** | **% of Total** |
| Upper Arkansas Water Conservancy District & Local Cost Share Partners | $138,635 | 21% |
| United States Geological Survey, Pueblo | $192,300 | 29% |
| Colorado State University Extension, Pueblo | $29,503 | 4% |
| WSRA- Ark. Basin Funds | $50,000 | 12% |
| TOTALS Matching Funds | $410,438 | 62% |

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.

This study will help sustain agriculture by providing data and water balance information to irrigators. Data can be used for drought and flood planning and to help sustain productive agricultural use of land while optimizing water availability for municipal uses. Recreational benefits include data that can help analyze water availability and integrated water resource management and planning to enhance recreational opportunities. Environmental benefits include data that can be used to measure inflow stream and lake levels because environmental riparian zones are particularly sensitive to changes in availability of surface water and ground water, as either can effect vegetation, nutrient cycling, flood mitigation, erosion stabilization, as well as fish and bird species.

Identification of potential areas for alluvial aquifer storage will also provide numerous agricultural, recreational, and environmental benefits including: protection of open space, aquifer recharge, creation of wetlands, protection of wildlife corridors, enhancement of river flows from upper basin storage, and enhancement of the VFMP.

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.

Data generated by this structural hydrologic water balance will preserve in-state water rights and protect the Colorado-Kansas compact. By providing augmentation supplies for out-of-priority well use, the UAWCD benefits Colorado in meeting compact obligations. Data generated about the interchange between ground water and surface water in the high mountain headwaters will affect the entire Arkansas Basin, which is 30% of the state.

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

This study will generate data that can be used to protect aquatic and terrestrial habitat to assist in the recovery of threatened and endangered wildlife species or Colorado state specie of concern. For instance, data that helps explicate changes in availability of surface water and groundwater can help manage riparian zones.

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

This study will benefit multiple local entities and interest groups, including the State as a whole. This study has the ability to provide much needed monitoring, data collection and analysis that can be used in the developments of the Statewide Water Initiative (SWSI), the Arkansas Basin Decision Support System (ArkDSS), and identification of alluvial aquifer storage sites. Finally, this study addresses all goals identified in the Colorado Water plan and has the ability to address both consumptive and non-consumptive needs.

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

This study assists in several CWCB programs including:

- The Statewide Water Initiative (SWSI)
- The Arkansas Basin Decision Support System (ArkDSS)
- Meeting the goals identified in the Colorado Water Plan (CWP) and the Arkansas Basin Implementation Plan (ArkBIP)

Continued: Explanation of how the water activity/project meets all applicable **Evaluation Criteria**.
**Please attach additional pages as necessary.**

## 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.

   This is a study and will not affect any sources of water. The study will take place in the Wet Mountain Valley in Fremont and Custer Counties and focus on the Arkansas River, Grape, and Taylor Creeks.

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

   **2000 to 2003- Sustainability of Groundwater Resources in the Upper Arkansas River Basin between Buena Vista and Salida- Final Report**

   **2009-2011- Groundwater and Surface-Water Interaction and Potential for Underground Storage: Phase 1**
   The Upper Arkansas Water Conservancy District in partnership with the US Geological Survey (USGS) and local partners, completed Phase 1 of the water balance study to quantify surface water and ground water and characterize the interaction between them in the Upper Arkansas River Basin. The final draft of the study titled *Groundwater and Surface-Water Interaction and Potential for Underground Water Storage in the Buena Vista-Salida Basin, Chaffee County, Colorado, 2011* was distributed in 2014. This report documented gaining and losing segments of selected tributaries, water budgets for selected areas for 2011, results from hydraulic testing of the alluvial-outwash and basin-fill aquifers, identification of areas with hydrologic characteristics suitable for development of underground water-storage projects, and estimates of stream-accretion response-time factors for the alluvial-outwash aquifer.

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.

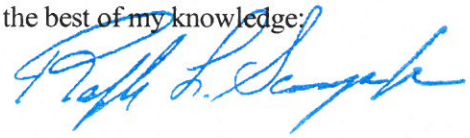
Final Deliverable: At completion of the project, the applicant shall provide the CWCB with a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

## 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.

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

**Signature of Applicant**:



**Print Applicant's Name**: Ralph "Terry" Scanga

**Project Title**: Groundwater and Surface-Water Interaction Potential for Underground Water Storage: Phase 2

**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: 7/27/16

**WATER ACTIVITY NAME – Groundwater & Surface-Water Interactions and Potential for Underground Water Storage: Phase 2**

**GRANT RECIPIENT – Upper Arkansas Water Conservancy District**

**FUNDING SOURCE – WSRA- State and Basin Funding**

## INTRODUCTION AND BACKGROUND

The *Groundwater and Surface-Water Interaction and Potential for Underground Water Storage* study will address the 'gap' through the evaluation of the available supply of water and the water balance of the Upper Arkansas Basin. This study will provide the tools necessary to manage future water supplies and will offer insight on the potential for alluvial aquifer storage, and create a mechanism for evaluating and implementing efficient irrigation practices. This study will quantify surface-water and groundwater, including recharge rates, and characterize the interactions between them in order to estimate the availability and sustainability of water resources and the effects that changes in water use or climate might have on water supplies. Agriculture represents the largest user group in the upper basin and agricultural water management will be evaluated through field-scale irrigation management data collection to create an agricultural water balance. Study results will meet both Basin and State needs for consumptive and non-consumptive use. Study results can be used for both water and land use planning and will provide important data for future water management and storage options. This study will provide data for multiple purposes through a collaborative approach to meet future water challenges and addresses all measurable objectives identified in Colorado's Water Plan.

## MEETING THE NEEDS OF THE COLORADO WATER PLAN

### Critical Action Plan Implementation Goals Met:

1. **Supply & Demand (A)**- Data generated from the study will help meet the supply & demand gap by quantifying the water supply availability in the upper basin. It will also will allow for better management practices and an understanding of the groundwater & surface-water interactions. Data can be used to plan for increased demands, drought scenarios, and potential for aquifer storage;
2. **Conservation (B) -** This project will address conservation through the future development of aquifer storage. Storage is essential for the success of conservation and data from this study will provide insight on possible underground storage sites. Aquifer storage will promote conservation by placing stored water underground and reducing evaporative loss associated with traditional surface storage vessels;
3. **Land Use (C)**- The study will promote land use planning in the upper basin. Data from this study will help land use planners strategically plan for expected growth. Understanding the availability of water resources will be critical in future land use planning and will allow for accurate management of land and water in the upper basin.
4. **Agriculture (D)**- – An agricultural water balance will be produced for a number of study sites using sprinkler irrigation. Knowledge of the different water balance components will help irrigators reduce costs and increase water efficiency through the use of irrigation scheduling. Information from this study will include baseline P/ET data, contour maps of groundwater levels and flow directions, and groundwater

recharge data that can help manage reservoir operations including flood control and drought storage to help meet irrigation needs;

5. **Storage (E)-**A main objective of this study is to identify potential areas for alluvial aquifer storage. Phase 1 of this study helped identify areas in the Buena Vista-Salida region that are expected to provide approximately 20,000 acre-feet of underground storage. Areas in the Wet Mountain Valley have been previously identified as having high potential for aquifer storage. Aquifer storage reduces the need for traditional surface storage and conserves water by reducing evaporative loss;
6. **Watershed Health, Environment, and Recreation (F)** – An understanding of groundwater surface-water interactions can assist in the future water supply availability and the future management of the flows that recreation and the environment depend on. Data generated regarding the level of the water table can be used to protect lake and stream levels and help develop management strategies that balance water needs for consumptive and non-consumptive uses;
7. **Funding (G)** – This project uses a variety of funding mechanisms through multiple partnerships and matching funds. The Upper Arkansas Water Conservancy District (UAWCD) will be working in partnership with the United States Geological Survey (USGS) and Colorado State University (CSU) to provide matching funds. Local City and County officials are being asks to provide support for this study that will benefit the entire upper basin; and,
8. **Education, Outreach, and Innovation (H)** – The final report and study results will be presented at several meetings and conferences throughout the basin. The USGS and CSU, when appropriate, will produce journal articles on their findings and provide data and maps on their website for public viewing. Educational materials will also be produced and delivered to interested parties throughout the basin.

## OBJECTIVES

1. Design, install (as appropriate), and monitor a surface and groundwater network and soil moisture network suitable to create an accurate water budget for the study area.
2. Determine the hydraulic properties of the alluvial aquifer within the study area.
3. Estimate stream-accretion response-time factors of the alluvial aquifer to hypothetical recharge scenarios for the Arkansas River, Grape and Texas Creeks within the study area.

## TASKS

## TASK A – Hydraulic Properties of Aquifers

Description of Task

This task will determine the hydraulic properties of the principal aquifers. Pumped-well aquifer or specific-capacity tests of large-capacity wells and instantaneous change (slug) tests of small-capacity wells will be done to determine hydraulic properties of the alluvial and basin-fill aquifers.

Method/Procedure

1. Discharge aquifer tests (pumped-well tests)- This testing will be done using available public-supply wells or well fields as control wells and available nearby wells as observation wells. Where depth to water is near land-surface, temporary piezometers may be installed for use as water-table observation wells. If observation wells are not available and it is impractical to install temporary piezometers, then specific-capacity tests will be used to estimate transmissivity. Success of this task assumes cooperation from well owners.
2. Slug tests or specific-capacity tests- These tests will be done in at least 50 small-capacity wells (domestic) wells to determine spatial variability of hydraulic properties of the alluvial and basin-fill aquifers.

3. Results from aquifer, specific-capacity, and slug tests – Test results will be submitted for approval to the Regional Groundwater Specialist.

## Task B — Stream-Aquifer Interaction

Description of task
Multiple methods will be used to evaluate stream-aquifer interaction for perennial streams, including the Arkansas River, Grape and Texas Creeks.

Method/Procedure
1. Compile Data- Streamflow and diversion data will be compiled from the Colorado Division of Water Resources (CDWR), the Upper Arkansas Water Conservancy District (UAWCD), and the USGS National Water Information System (NWIS). [Data compiled for this task will also be used for Task 3—Water Budget]
2. Evaluate Data -Streamflow and diversion data will be evaluated to estimate magnitude and seasonality of gains or losses and to define stream reaches in which stream-aquifer interaction is substantial (greater than 5-10 percent of seasonal flow).
3. Gain-loss investigations – Conduct seepage runs or tracer-injection tests will be done on selected stream reaches which are suspected of having substantial gains or losses.
4. Monitor- Continuously monitor stream stage and shallow groundwater levels and surface-water and groundwater temperatures will take place at selected sites.
5. Flux Estimates- Use heat-transport methods as described in Rosenberry and LaBaugh (2008), to estimate flux between streams and shallow aquifers.

## Task C — Water Budget

Description of Task
Available climate, geologic, geospatial, hydrologic, well, and water-use data from local, State, and Federal agencies, educational institutions, water conservancy districts, and water providers will be reviewed and compiled in a relational database. Data gaps will be documented during the data compilation and review and will be considered during selection of data-collection sites (Healy and others, 2007).
Method/ Procedure
1. Measurements- Water levels will be measured periodically (four to six times per year for two years) in at least 50 selected wells to define regional water-level surfaces and to monitor seasonal fluctuations of water levels. Wells included in the monitoring network will be selected to compliment those in an existing long-term network, operated by the USGS, and with those that will be installed and measured by Colorado State University. Water-level recorders (submersible pressure transducers) will be installed in selected wells during the study to evaluate short-term and seasonal changes in water levels.
2. Evapotranspiration (ET)- ET from irrigated land will be estimated continuously at for sites, using the radiation energy balance (REB) method. Instantaneous ET rates will be measured monthly at multiple sites in four selected irrigated fields during May-September, using a hemispherical chamber (Stannard, 1988). Instantaneous ET measurements will be correlated with the estimates from the REB method to estimate daily evapotranspiration rates for irrigated pasture and cropland. Precipitation and air temperature also will be measured continuously at four sites for use in estimating the local water balance.
3. Stream-Aquifer Testing- Stream stage and groundwater levels and surface (stream) and subsurface temperatures will be measured at two sites each on four perennial mountain-front streams to estimate mountain-front seepage losses (groundwater recharge, where streams flow across permeable alluvial and basin-fill deposits near the mountain front). If suitable sites are accessible, additional sites will be similarly instrumented on selected intermittent mountain-front streams.

4. Stream-Aquifer Interchange- Hydraulic connection between groundwater and surface water (stream-aquifer interchange) of the Arkansas River and its major tributaries will be determined using aquifer-test and/or heat-transport methods (Rosenberry and LaBaugh, 2008). [See Task 2.]
5. Ditch-Aquifer Testing- Canal (ditch) stage, groundwater levels, and surface (canal) and subsurface temperatures will be measured for selected irrigation canals or ditches to estimate conveyance losses. Conveyance losses will be determined using mass-balance and heat-transport methods (Rosenberry and LaBaugh, 2008). Not all sites in the study area can be instrumented however, no less than five percent of all diversion structures will be instrumented and measured periodically to estimate errors in reported diversions.
6. Water Budget- A water budget will be developed using data from existing and planned data-collection networks and data collected during this study. Some components of the water budget may be estimated using analytical or numerical models. Major components of the water-budget for the study area that are difficult or impossible to measure directly and that may be estimated using analytical or numerical models include:
    - Subsurface inflow along the mountain front will be estimated for selected drainage basins using available geospatial, meteorological, and streamflow data and a precipitation-runoff-groundwater-flow model (GSFLOW; Markstrom and others, 2008).
    - Recharge from precipitation on non-irrigated land and from precipitation and applied water on irrigated land will be estimated from metrological data and land- and water-use data, using the Farm Package of MODFLOW (FMP; Schmid and others, 2006).

## Task D — Irrigation Water Management

Description of Task

Agricultural contributions to a water balance model are critically important for understanding surface and groundwater interactions. A network of monitoring sites will be installed along an elevational gradient and will include fields in Custer, Fremont, and Chaffee counties. Data collected at the sites will contribute to a surface and groundwater balance model and provide data for validating an irrigation scheduling tool. The data will be used to validate the Water Irrigation Scheduler for Efficient Application (WISE) which has built-in assumptions for high mountain hay crops. Data will also be used to better understand hydrologic fluxes under a variety of irrigation conditions.

Method/ Procedure

1. Data Collection Through Measurement - Soil moisture will be measured continuously at three locations and three depths (for a total of nine measurements) at each field site. Irrigation amounts will be measured using a tipping bucket rain gauge. Soil hydraulic properties will be measured through field and lab procedures.
2. External Data Compilation- Data collection from existing data sources will be compiled for use in an agricultural water balance equation. Evapotranspiration data will be compiled from the Colorado Agricultural Meteorological Network (CoAgMet) and previous studies by the USGS. Soil classification data will be collected from the NRCS SSURGO dataset and used in the irrigation scheduling tool.
3. Irrigation Scheduling Tool Validation – Field data will be used to test the assumptions of the model including: volumetric water content, soil moisture deficit, rooting depth, field capacity, and permanent wilting point.

## Task E— Potential for Aquifer Storage and Recovery

Description of Task

Data collected and analyzed for Tasks A-C will be used to evaluate potential for aquifer storage and recovery in the study area.

Method/ Procedure

- Data and Analysis- Data will be compiled and analyzed from all previous tasks to identify potential areas for aquifer storage. Hydraulic properties of the aquifers, determined in Tasks A and B, will be used to identify these areas.
- Mapping- Maps (GIS layers) will be prepared showing the altitude and depth of the water table of seasonal changes in water levels, potential areas for aquifer storage, and geologic features.
- Models- Analytical and numerical models may be used to demonstrate methods of estimating the residence times for hypothetical aquifer-storage and recovery projects.

## Task F - Deliverables for Tasks A- E and Final Reporting

USGS

Study results and data from all tasks will be published in a comprehensive USGS Scientific Investigations Report. As funding permits, the USGS may publish journal articles using study results in order to advance scientific knowledge. Results from approved aquifer, specific-capacity, and slug tests in the study area will be available for release to the public through various USGS portals. Data, mapping and reporting will also be made available to the public through USGS portals. Presentations of Phase 2 results will be conducted throughout the Basin and for all participating agencies.

CSU

CSU will provide an outreach and education campaign, that will be formulated to deliver the results to the public. Appropriate formats will include oral presentations, published reports, and field demonstrations. Data will be made available through peer reviewed literature and stakeholder publications. The WISE irrigation scheduling tool will be refined using the observed data and tested. Presentations of Phase 2 results will be conducted throughout the Basin and for all participating agencies.

UAWCD

UAWCD will provide progress reports and final reporting to the CWCB, Arkansas Basin Roundtable, Participating Entities, and the Public.

# Water Balance Budget and Schedule

| Task | Description | Start Date | Finish Date |
|---|---|---|---|
| **A** | Hydrolic Data Collection | Upon NTP | NTP + 2yrs |
| **B** | Stream-Aquifer Data Collection | Upon NTP | NTP + 2yrs |
| **C** | Water Budget | NTP+1yr | NTP + 2yrs |
| **D** | Agricultural Water Budget | Upon NTP | NTP+3yrs |
| **E** | Potential for Aquifer Storage | NTP+ 2yrs | NTP +1 yr |
| **F** | Reporting | NTP+ 2yrs | NTP +1yr |

| Water Balance Study- Phase 2 Budget (Over a 3-Year Period) | | | | | |
|---|---|---|---|---|---|
| **Total Personnel Cost by Task** | | | | | |
| **Tasks** | **Description** | **USGS** | **CSU** | **UAWCD Project Management** | **Total** |
| A- Hydraulic Properties of Aquifers | Determine hydraulic properties of principal aquifers | $ 134,700 | | $ 9,429 | $ 144,129 |
| B- Stream Aquifer Interactions | Evaluate stream-aquifer interactions for perennial streams | $ 141,300 | | $ 9,891 | $ 151,191 |
| C- Water Budget | Available data will be reviewed and compiled in a relational database | $ 106,700 | | $ 7,469 | $ 114,169 |
| D- Irrigation Water Management | Network of soil moisture monitoring sites and data | | $ 74,117 | $ 5,188 | $ 79,305 |
| E- Aquifer Storage & Reporting | Analyze and evaluate data for potential for aquifer storage and reporting | $ 166,600 | | $ 11,662 | $ 178,262 |
| | **Totals** | **$ 549,300** | **$ 74,117** | **$ 43,639** | **$ 667,056** |
| | **Percent Totals** | **82%** | **11%** | **7%** | **100%** |

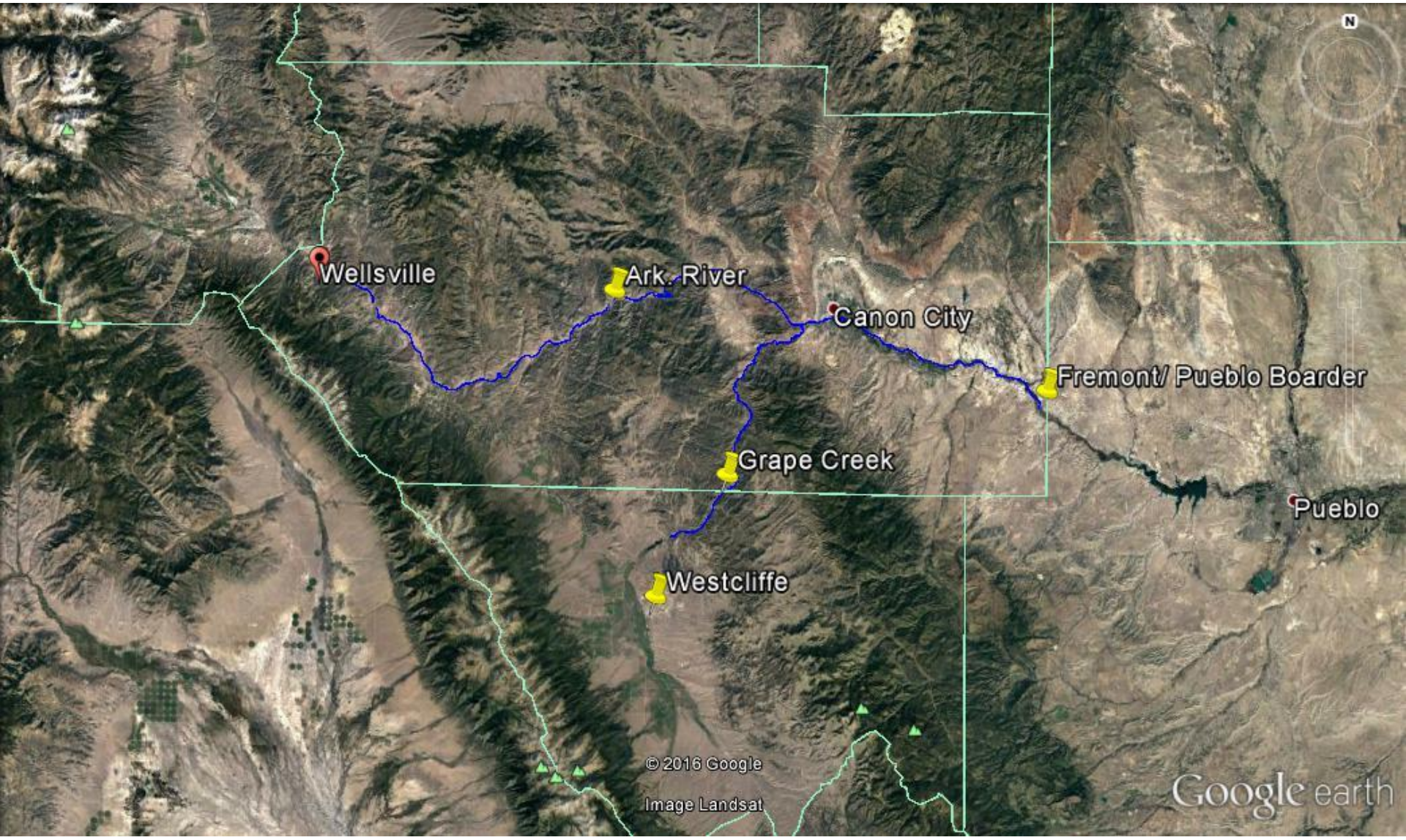
| Water Balance Study- Phase 2 Budget (Over a 3-year Period) | | | | | | |
|---|---|---|---|---|---|---|
| Funding Request and Cost Share By Task | | | | | | |
| **Tasks** | **USGS Cost Share** | **CSU Cost Share** | **UAWCD & Local Cost Share** | **WSRA Basin Funds** | **WSRA State Funds** | **Total** |
| Task A | $ 47,100 | | $ 27,727 | $ 10,000 | $ 51,324 | $ 136,151 |
| Task B | $ 49,500 | | $ 27,727 | $ 10,000 | $ 51,324 | $ 138,551 |
| Task C | $ 37,400 | | $ 27,727 | $ 10,000 | $ 51,324 | $ 126,451 |
| Task D | $ - | $ 29,503 | $ 27,727 | $ 10,000 | $ 51,324 | $ 118,554 |
| Task E | $ 58,300 | | $ 27,727 | $ 10,000 | $ 51,324 | $ 147,351 |
| Totals | $ 192,300 | $ 29,503 | $ 138,635 | $ 50,000 | $ 256,618 | $ 667,056 |
| % | **29%** | **4%** | **21%** | **7%** | **38%** | **100%** |

| | Total Amount | % of Total |
|---|---|---|
| **Total Cost Share Match=** | **$ 410,438** | **62%** |
| **State Funds Requested=** | **$ 256,618** | **38%** |

*UAWCD = $25,000 Cash Match
$43,639 In-Kind Match (Project Management 7% Project Total)

*Local Match = $30,000 Chaffee County & Municipalities
$30,000 Fremont County & Municipalities
$10,000 Custer County & Municipalities

# Phase 2 Water Balance Study Map- General Area




Study Area includes Fremont and Custer Counties. Specifically the Arkansas River from Wellsville to the Fremont/Pueblo Boarder and the Wet Mountain Valley drainage ( Grape, Texas, and Haden Creeks).