**Water Supply Reserve Account – Grant and Loan Program**
**Water Activity Summary Sheet**
**September 11-12, 2014**
**Agenda Item 13(l)**

**Applicant:** Colorado Climate Center

**Program Sponsor:** Colorado State University

**Water Activity Name:** Re-establishment of Lysimeters in North Park to Determine High Altitude, Hay Meadow Crop Coefficients.

**Water Activity Purpose:** Agricultural Needs Assessment

**County:** Jackson

**River Basin:** North Platte

**Water Source:** North Platte

**Total Amount Requested:** $194,102

**Source of Funds:** $97,051 North Platte Basin Account; $97,051 Statewide Account

**Matching Funds:** Basin Account Match ($97,051) = 50% of total grant request
Basin Account & Applicant Match ($134,647) = 69% of total grant request
Applicant Match ($37,596) = 16% of total project costs ($231,698)
(refer to *Funding Summary/Matching Funds*)

| **Staff Recommendation:** |
|---|
| Staff recommends approval of up to $97,051 from the North Platte Basin Account; and $97,051 from the Statewide Account to help complete the project titled: Re-establishment of Lysimeters in North Park to Determine High Altitude, Hay Meadow Crop Coefficients. |

**Water Activity Summary:** The funding requested is to further study crop consumptive use to provide additional information for the North Platte Basin Needs Assessment as well as various educational opportunities focused on agricultural water use, weather and climate. The project aims to re-establish lysimeter measurements in the high altitude, hay meadow environment of North Park. Although lysimeters have been historically operated in the basin, the data collected has been deemed questionable due to site exposure, infrequent watering and possible equipment failures. The project will build upon 5 years of data from three existent weather stations by providing ongoing support for the weather stations and installing and running two new lysimeters. Once fully installed the system is almost completely automated, and will mimic operations in the hay meadows (irrigation and cutting) to get an actual crop consumptive use to be used to calculate crop coefficients. The project will provide quantitative assessments of irrigated hay meadow consumptive use and its relationship to local weather conditions. The bulk of project costs will be installation and operation of the lysimeters.

**Discussion:**
WSRA Grant funds of $100,694 were expended from 2008 through 2014 to fund an earlier attempt to quantify crop consumptive use.

**Issues/Additional Needs:**
No additional issues or needs were identified.

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

**Tier 1-3 Evaluation Criteria:**

Tier 1: (a) The project is supported by the North Platte Basin Roundtable.

(b) The water activity has committed support from the Division of Water Resources Division 6 Office. The entities represented in the application include Colorado State University (CSU) and CoAgMet. The water activity is effective in addressing intrabasin or interbasin needs because the Yampa-White roundtable has a similar project to quantify consumptive use near Hayden. The combined results will cover a range of elevations in the two basins and could possibly be extended to other Colorado basins.

(c) This project will provide quantitative assessments of irrigated hay meadow consumptive use and its relationship to local weather conditions. This type of information is essential for the basin's on-going needs assessment and to better quantify consumptive water needs.

Tier 2: (d) This project will likely not be funded by any other entity but the Roundtable and Statewide funds. If this new lysimeter technology works as expected, other basins could benefit from this reach and perhaps invest in the technology.

(e) 16% of the total grant request has been contributed through the CSU's Unrecovered Indirect Costs.

Tier 3: (f) The project will help sustain agriculture in the basin by better understanding the crop water use requirements from irrigated hay meadows in North Park.

(g) This project has the potential to impact the interstate compact on the North Platte by quantifying actual crop consumptive use in the North Platte Basin. Once a better handle on crop consumptive use is understood, it may have an impact on the compact with Wyoming about the consumptive use of irrigated hay meadows in the Basin.

(h) n/a (not addressed)

(i) This project has a high cost/benefit for Colorado because lysimeter studies have been performed in the past, however methods and systems differ. The Rocky Ford

lysimeter that CSU installed was very expensive and requires a full-time staff person to operate and maintain, which is not feasible for many basins. If this smaller, lower cost system is proven to give reliable data, the state can benefit from this knowledge by using this system across Basins to quantify consumptive use. Additionally, if lysimeters cannot be funded in other Basins, relationships between the CoAgMet stations can be assessed and perhaps aid in transferring results based on the weather data and reported reference evapotranspiration.

(j) n/a

**Funding Overview/Matching Funds:**

| | **Cash** | **In-kind** | **Total** |
|---|---|---|---|
| WSRA Statewide Basin Account | $91,051 | n/a | $91,051 |
| WSRA Arkansas Basin Account | $91,051 | n/a | $91,051 |
| CSU Cost-share | $37,596 | $0 | $37,596 |
| **Total Project Costs** | **$231,698** | **$0** | **$231,698** |

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 and Final Deliverable:** 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. 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.