LAKE CANAL ALTERNATIVE AGRICULTURAL PRACTICES AND IN-STREAM FLOW DEMONSTRATION PROJECT

Submitted to:

Colorado Water Conservation Board
Alternative Agricultural Water Transfer Methods
Competitive Grant Program

Submitted by:

COLORADO
WATER INNOVATION CLUSTER

November 26, 2010

COLORADO WATER CONSERVATION BOARD

ALERNATIVE AGRICULTURAL WATER TRANSFER METHODS COMPETITIVE GRANT PROGRAM

GRANT APPLICATION FORM

Lake Canal Alternative Agricultural Practices and In-stream Flow Demonstration Project

Cache la Poudre River/South Platte River Basin

Program/Project Name | **River Basin Name**

$135,105 ($131,630 in labor plus $3,475 in direct costs)	**$95,000**
Amount of Funds Requested	Amount of Matching Funds

* The deadline for Grant Applications is November 26, 2010 for consideration at the January 2011CWCB meeting. It is anticipated that there will be one round of application submittals, yet if funds are not exhausted, the Board will determine when it will consider the next round of grant applications at their January 2011 meeting.

* In completing the application you may attach additional sheets if the form does not provide adequate space. If additional sheets are attached please be sure to reference the section number of the application that you are addressing (i.e., A.1. etc.).

Instructions: This application form must be submitted in electronic format (Microsoft Word or Original PDF). The application can be emailed or a disc can be mailed to the address at the end of the application form. The Alternative Agricultural Water Transfer Methods Competitive Grant Program, Criteria and Guidelines can be found at http://cwcb.state.co.us/LoansGrants/alternative-agricultural-water-transfer-methods-grants/Pages/main.aspx. The criteria and guidelines must be reviewed and followed when completing this application. You may attach additional sheets as necessary to fully answer any question, or to provide additional information that you feel would be helpful in evaluating this application. Include with your application a cover letter summarizing your request for a grant. If you have difficulty with any part of the application, contact Todd Doherty of the Water Supply Planning Section (Colorado Water Conservation Board) for assistance, at (303) 866-3441 x3210 or email at todd.doherty@state.co.us.

Generally, the applicant is also the prospective owner and sponsor of the proposed program/project. If this is not the case, contact Todd before completing this application.

Part A. Description of Applicant(s) (Program/Project Sponsor);

1. Applicant Name(s): Colorado Water Innovation Cluster

   Mailing Address: c/o Forbes Guthrie
   3801 Automation Way, Suite 200
   Fort Collins, CO 80525

   Taxpayer ID#: | E-mail address: Forbes.Guthrie@stewartenv.com

   Phone Numbers: Business: 970.226.5500

   Home:

   Fax: 970.226.4946

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

   Name: Richard L. Belt, P.E., P.H.

   Position/Title: CWIC Board Member

3. If the Contracting Entity is different than the Applicant, please describe the Contacting Entity here.

   Same.

4. Provide a brief description of your organization. The applicant may be a public or private entity. Given the diverse range of potential applicants, not all of the following information may be relevant. Where applicable and relevant the description should include the following:

   a) Type of organization, official name, the year formed, and the statutes under which the entity was formed, a contact person and that person's position or title, address and phone number. For private entities, a copy of the Articles of Incorporation and By-laws should be appended to the application.

   The Colorado Water Innovation Cluster (CWIC) is an organization of public, academic, and private entities working or with an interest in water resources-related issues. CWIC was formed in early 2010 with the purpose of leveraging the capabilities of member organizations to collaborate to produce project-driven, innovative solutions to global water issues. CWIC will be seeking approval of the Internal Revenue Service as a 501(c)(3) entity during early 2011.

   Contact information for CWIC, pursuant to this grant application:

   Richard L. Belt, Board Member
   4803 Innovation Drive
   Fort Collins, CO 80525
   970.372.6129
   rbelt@aquaengr.com

   For general CWIC inquiries, please contact:

   Forbes Guthrie, Co-President
   3801 Automation Way, Suite 200
   Fort Collins, CO 80525
   970.226.5500
   Forbes.Guthrie@stewartenv.com

   Articles and By-Laws of the CWIC will be provided to CWCB as soon as they are available.

   b) For waters suppliers, information regarding the number of customers, taps, service area, and current water usage, and future growth plans, water related facilities owned or used, funding/revenue sources (existing service charges, tap fees, share assessments, etc.), the number of members or shareholders and shares of stock outstanding or a description of other means of ownership.

   Not applicable.

c) For other entities, background, organizational size, staffing and budget, and funding related to water that is relevant in determining whether the applicant has the ability to accomplish the program/project for which funding is sought.

CWIC is composed of a Board of Directors drawn from the following entities:

- City of Fort Collins
- Colorado State University
- Aqua Engineering, Inc.
- The Bendelow Law Office, LLC
- BHA Design, Inc.
- Hach Company
- In-Situ, Inc.
- Riverside Technology, inc.
- Rubicon Water

CWIC currently has no paid staff and has an annual budget of approximately $50,000 to support activities of the cluster. This budget is developed through assessments of the Board members. Much of the CWIC activity is supported through in-kind contributions of Board members, including project management, accounting, technical/logistical, legal, and marketing support.

The proposed project is led by the Colorado Water Innovation Cluster (CWIC), the Applicant, in conjunction with a number of participants:

- Lake Canal Company
- The Nature Conservancy
- City of Fort Collins Natural Areas
- City of Fort Collins Utilities
- Regenesis Management Group, LLC
- Aqua Engineering, Inc.
- The Bendelow Law Office, LLC
- Colorado Water Institute

The CWIC Board of Directors will provide project oversight, invoice approval, and quality assurance services. Day-to-day project management, project accounting and technical aspects will be managed by Aqua Engineering, Inc. Legal aspects of the project will be coordinated by the Bendelow Law Office. Software and in-field instrumentation acquisition and installation will be coordinated by Regenesis Management Group, LLC. The Colorado Water Institute will be responsible for convening project stakeholders and following up with project participants, regulatory agency staff, and other third parties regarding project performance and ways to improve future efforts.

d) A brief history of the Applicant(s):

The City of Fort Collins is heavily invested in setting the stage for business development, job creation, and a thriving entrepreneurial ecosystem. The Fort

Collins City Council adopted an Economic Action Plan in 2006, emphasizing the need to indentify Targeted Industry Clusters as an essential strategy for job creation. Since 2006, significant effort has been made by the city, Colorado State University, and the private sector to implement a cluster strategy to great success. Over time, the Targeted Industry Clusters have undergone an evolution, and it will be important in the future to continue evolving and improving the approach for supporting target industries. The emergence of CWIC is evidence of the continued evolution of this economic development strategy, beginning in January 2010.

The CWIC's goal is to focus on innovative and entrepreneurial ways to grow the water resource and technology sector of our economy through actionable initiatives. Specifically, the CWIC seeks out initiatives that highlight our region's capabilities, help to address workforce gaps, involve the innovative use of technologies, contribute to the body of research around water, and increase jobs in our region.

e) Please include any relevant Tabor issues relating to the funding request that may affect the Contracting Entity.

None.

Part B. Description of the Alternative Water Transfer Program/Project:

1. Purpose of the Program/Project

Please provide a summary of the proposed program/project, including a statement of what the program/project is intended to accomplish, the need for the program/project, the problems and opportunities to be addressed, the expectations of the applicant(s), and why the program/project is important to the applicant(s). The summary must include a description of the technical, institutional (i.e., how the program/project will be organized and operated), and legal elements that will and/or have been addressed by the applicant and proposed program/project. The summary should also discuss relevant project history, if applicable, and any other relevant issues.

Problem Description

The intent of the project is to provide a demonstration of a number of techniques and technologies which will be useful in addressing the municipal/industrial/environmental water "gap" identified in the previous SWSI studies completed by the CWCB. Briefly, under the proposed project, willing shareholders under the Lake Canal service area will implement fallowing, deficit irrigation, and/or other alternative agricultural practices to lease the saved portion of their direct flow consumptive use for in-stream flows in the Cache La Poudre River between the Lake Canal diversion and the Greeley No. 3 diversion, west of Greeley. This transfer will be facilitated by an Interruptible Water Supply Agreement (IWSA) between the Lake Canal Company, The Nature Conservancy, and the Fort Collins Natural Areas program. As specified by the IWSA statutory rules, the term of the agreement will be 10-years and the option can be

exercised during 3 years of the term. The first option year will be exercised during the 2011 irrigation season, while the second and third years will be at the option of the participants. Lake Canal will accomplish the demonstration using a packaged software/field instrumentation solution, developed by Regenesis Management Group, in concert with research and development agreements with Colorado State University (CSU) and the U.S. Department of Agriculture (USDA)

Problem Importance and Project Benefits

The proposed project will **demonstrate** the following new practices or technologies:

- Rotational fallowing, deficit irrigation, and/or other alternative agricultural practices which can be used to generate water supplies (from saved consumptive use) which can be legally transferred to municipal, industrial, and environmental uses, while preserving and enhancing the existing agricultural use, and without adversely impacting other water rights.
- A package of software and field instrumentation which may prove useful in evaluating, administering, and verifying that alternative agricultural practices can be operated in a manner which delivers proportional consumptive use water to other uses outside the ditch service area and demonstrates that return flows are made to prevent injury to other water rights. A goal of this project is to show, from a technical perspective, that the systems to accomplish the planning, transfer, and monitoring/reporting exist and can perform at a level to meet the administrative requirements of the State Engineer's Office and applicable law (*see Regenesis software modules and related data inputs/outputs graphic in Appendix A*).
- The economics of alternative agricultural water transfers in partnership with willing Lake Canal shareholders and irrigators.
- An IWSA is a temporary water transfer mechanism allowable under Colorado Statute (CRS 37-92-309), but which has not been exercised to date. We believe that this mechanism is an ideal vehicle to support the proposed demonstration because it can be short duration, administratively approved by the State Engineer's Office, and does not require an accompanying Water Court application. While the stated intent of the IWSA mechanism is drought recovery, an additional, unexploited benefit of the statute is that it allows for a short-duration trial period to try new technologies or approaches without the permanency, high transaction cost, and risk associated with more traditional transfer mechanisms.
- CWCB's in-stream flow program typically requires CWCB ownership of dedicated water rights. The proposed demonstration project may illuminate acceptable alternative in-stream flow ownership and utilization methodology for future projects.
- The City of Fort Collins recognizes the increasing interest in understanding, evaluating, and augmenting in-stream flows in the Cache La Poudre River. Historically, water management responsibilities have fallen to the Water Utility.

The primary focus of the Water Utility is the efficient and affordable delivery of clean water for rate payers (e.g. municipal and industrial users). The proposed project will enable another City department to gain water management experience, and will demonstrate how the Natural Areas and Water Utility programs might cooperate to achieve environmental benefits within the City.

The Cache la Poudre basin has a 100-year plus history of cooperation and trust between the principal water users and is an ideal basin in which to implement a demonstration project of this nature. This project will demonstrate how municipal, environmental, and agricultural interests can partner to address difficult issues, while preserving or enhancing the viability of the agriculture community. More importantly, this project will serve as a demonstration project for the key components necessary to implement new, more complicated forms of water transfers in the future, which will be of statewide benefit.

Previous Studies

To the maximum extent possible, the results of any previous studies and investigation should be utilized and incorporated into the proposed program/project. The application for funding should include a brief summary of the results of previous studies and how they will be utilized.

A number of previously-funded CWCB projects (LAVWCD Super Ditch, Parker-Lower South Platte, Colorado Corn, etc.) address many research needs around the proposed alternative agriculture methods under consideration as a part of this project. Regenesis has leveraged the results of these studies, as well as others underway by the USDA and Regenesis itself via partnership with both USDA and CSU, to develop commercial field instrumentation and software which allows farmers to plan, evaluate, monitor, and report on implementation of specific alternative agriculture methods on their farming operations, with the goal of optimizing their economic benefits at a reasonable cost. The proposed project would allow Lake Canal irrigators to select one or more alternate practices to implement in their operation to generate the water needed for the proposed in-stream flow. Regenesis is also developing a package of instrumentation and reporting software which would allow the Lake Canal company (and others, in the future) to deliver the contracted water, while ensuring that participating shareholders are complying with the terms of the lease agreement, and return flows are made in accordance with historic requirements.

Legal and institutional questions regarding alternative transfer mechanisms have similarly been investigated as a part of the previous efforts (Super Ditch, Parker-Lower South Platte, Colorado Corn, FRICO). To-date, no known alternative transfer has been implemented to test their viability; particularly in Division 1 (Super Ditch has announced an IWSA to support a transfer to Aurora in the Lower Arkansas basin). This project proposes to implement an IWSA between Fort Collins Natural Areas/The Nature Conservancy and the Lake Canal Company. The project team has investigated the concerns of the Division Engineer with regard to the IWSA; we feel that this small project will be beneficial in illustrating the IWSA

implementation process and should highlight specific institutional and administrative issues for others in the state who may wish to implement this approach in the future.

2. Study Area/Service Area Description

The study area/service area is generally the geographic area that is the subject of the proposed program/project (include both the source of supply and location and type of new use). The description should include the following items:

a) A narrative description of the study area/service area including: the county, the location of towns or cities, topography, and locations of major surface and ground water features.

b) An area map showing each of the items above, as well as the locations of existing facilities, proposed project facilities and boundaries of lands involved in the proposed program/project.

The proposed project is located in Cache la Poudre watershed, beginning in the City of Fort Collins and extending downstream to the western edge of the City of Greeley, and includes both Larimer and Weld Counties (*see Figure 1 in Appendix A*). The study reach includes a number of surface water diversions, including the Lake Canal, Boxelder Ditch, the Fossil Creek Reservoir inlet and outlet ditches, the Greeley No. 2 ditch, and other small ditches (*see Figure 2 in Appendix A*). The study reach terminates at the Greeley No. 3 diversion structure.

c) Information regarding the irrigated lands that are involved in the program/project. This must include a tabulation of total irrigated acreage, description of cropping types, crop yields, and total average annual water diversions for existing agricultural lands.

The proposed project involves the application of alternative agricultural practices on irrigated farmland under the Lake Canal service area to reduce consumptive use of the direct flow water right with the purpose of leasing that conserved water to an in-stream flow use outside the Lake Canal service area (*see Figure 3 in Appendix A*). The Lake Canal service area includes approximately 6,150 acres. Typical crops grown under the Lake Canal system include alfalfa, pasture and grass hay, corn, small grains, and other crops such as sod, vegetables, sugar beets, and beans. Annual diversions under the Lake Canal direct flow decree are summarized in Table 1.

d) Information regarding the location of the new water use(s) that will be served by transferred water including the estimated number of users/taps and/or uses served.

The consumptive use portion of the water that is conserved and confirmed, as a result of the implementation of alternative agricultural practices under Lake Canal, will be put to an in-stream flow use in the Cache la Poudre River between the Lake Canal diversion and the Greeley No. 3 diversion (approximately 29 miles). The proposed project has targeted a saved consumptive use volume of 200 acre-feet to accomplish the demonstration goal. Future implementation would target larger “blocks” of transferrable water to meet other needs identified by SWSI and other basin planning efforts.

Table 1: Lake Canal Direct Flow Decree – Monthly Diversion Record

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1950	0	0	0	0	2,606	8,081	1,680	0	0	0	0	0	**12,367**
1951	0	0	0	60	3,527	6,202	5,847	272	305	60	0	0	**16,273**
1952	0	0	0	0	1,630	7,484	811	1,337	551	105	0	0	**11,919**
1953	0	0	0	0	1,809	7,811	597	1,142	760	242	0	0	**12,361**
1954	0	0	0	0	3,810	1,789	770	1,067	591	895	0	0	**8,922**
1955	0	0	0	18	1,916	5,970	968	1,394	873	4	0	0	**11,143**
1956	0	0	0	0	4,610	7,141	980	1,051	452	0	0	0	**14,234**
1957	0	0	0	0	294	5,766	6,712	1,509	1,057	0	0	0	**15,338**
1958	0	0	0	0	0	5,020	1,105	1,710	895	30	0	0	**8,759**
1959	0	0	0	0	1,902	7,035	1,958	1,492	615	0	0	0	**13,002**
1960	0	0	0	0	5,028	4,229	972	1,886	440	0	0	0	**12,556**
1961	0	0	0	0	1,230	3,396	2,142	1,025	303	0	0	0	**8,097**
1962	0	0	0	405	5,026	4,149	4,388	1,549	512	0	0	0	**16,029**
1963	0	0	0	0	2,547	1,458	1,736	1,093	776	0	0	0	**7,609**
1964	0	0	0	0	3,606	5,476	1,797	1,311	680	0	0	0	**12,871**
1965	0	0	0	0	2,969	2,341	4,768	1,539	355	0	0	0	**11,972**
1966	0	0	0	0	879	3,392	1,948	1,970	145	0	0	0	**8,333**
1967	0	0	0	0	1,777	2,214	2,503	2,057	756	182	0	0	**9,489**
1968	0	0	0	0	1,458	5,520	2,458	1,230	555	0	4	0	**11,225**
1969	0	0	0	0	3,455	2,704	2,309	1,454	678	0	0	0	**10,600**
1970	0	0	0	0	3,326	2,789	3,969	1,091	603	0	0	0	**11,778**
1971	0	0	0	0	960	5,365	4,629	1,238	212	0	0	0	**12,405**
1972	0	0	0	0	2,563	3,271	1,184	1,511	389	0	0	0	**8,918**
1973	0	0	0	0	2,325	5,179	4,665	1,438	434	0	0	0	**14,041**
1974	0	0	0	0	4,465	4,814	3,898	2,547	1,002	0	0	0	**16,725**
1975	0	0	0	0	2,275	3,259	6,159	3,114	1,248	0	0	0	**16,054**
1976	0	0	0	0	2,051	5,554	2,682	2,555	1,018	0	0	0	**13,859**
1977	0	0	0	0	960	4,522	1,789	2,184	881	0	0	0	**10,337**
1978	0	0	0	0	1,247	5,494	4,950	2,385	625	0	0	0	**14,701**
1979	0	0	0	0	319	2,895	5,667	2,485	897	0	0	0	**12,263**
1980	0	0	0	0	0	5,209	5,136	2,841	1,360	0	0	0	**14,546**
1981	0	0	0	0	2,126	3,090	2,941	2,307	1,200	210	0	0	**11,875**
1982	0	0	0	0	857	2,993	4,727	2,488	390	0	0	0	**11,455**
1983	0	0	0	0	0	1,033	6,306	3,683	1,651	0	0	0	**12,674**
1984	0	0	0	0	1,402	3,697	5,382	2,613	663	0	0	0	**13,757**
1985	0	0	0	0	2,918	5,518	2,099	869	0	0	0	0	**11,403**
1986	0	0	0	0	3,077	5,373	4,404	1,211	169	0	0	0	**14,233**
1987	0	0	0	0	2,282	2,584	1,854	873	0	0	0	0	**7,592**
1988	0	0	0	0	2,167	6,720	1,544	837	35	0	0	0	**11,302**
1989	0	0	0	0	4,110	3,093	1,827	2,254	56	0	0	0	**11,340**
1990	0	0	0	0	3,232	4,580	3,260	1,122	52	0	0	0	**12,245**
1991	0	0	0	0	2,168	4,808	836	1,115	0	0	0	0	**8,926**
1992	0	0	0	0	3,927	3,425	1,206	710	0	0	0	0	**9,268**
1993	0	0	0	0	2,210	3,820	4,897	301	0	0	0	0	**11,229**
1994	0	0	0	0	3,354	3,941	1,049	1,544	0	0	0	0	**9,889**
1995	0	0	0	0	0	961	5,709	1,680	568	0	0	0	**8,918**
1996	0	0	0	0	4,830	5,280	4,818	1,099	191	0	0	0	**16,219**
1997	0	0	0	0	2,920	2,963	2,713	923	365	0	0	0	**9,885**
1998	0	0	0	0	4,183	4,514	4,357	1,721	338	0	0	0	**15,113**
1999	0	0	0	0	174	3,490	4,480	1,312	523	0	0	0	**9,980**
2000	0	0	2,105	438	2,714	3,831	1,355	1,453	515	0	0	0	**12,410**
2001	0	0	0	0	1,871	3,624	1,301	1,247	325	0	0	0	**8,367**
2002	0	0	0	0	0	2,161	370	834	0	0	0	0	**3,365**
2003	0	0	0	0	928	4,800	1,651	0	0	0	0	0	**7,379**
2004	30	1,603	1,140	15	819	4,235	1,005	355	182	0	0	0	**9,385**
2005	0	0	0	0	3,065	4,609	1,753	800	317	1,239	0	0	**11,781**
2006	0	0	0	0	3,584	3,907	673	655	0	0	0	0	**8,819**
2007	0	0	0	0	2,539	4,804	838	733	131	2,136	0	0	**11,181**
2008	0	0	0	0	1,075	4,653	2,947	597	630	0	0	0	**9,902**
2009	0	0	101	0	1,190	1,671	2,272	1,187	504	0	0	0	**6,925**
AVG	**0**	**27**	**56**	**16**	**2,238**	**4,262**	**2,829**	**1,433**	**480**	**85**	**0**	**0**	**11,426**
MAX	**30**	**1,603**	**2,105**	**438**	**5,028**	**8,081**	**6,712**	**3,683**	**1,651**	**2,136**	**4**	**0**	**16,725**
MIN	**0**	**0**	**0**	**0**	**0**	**961**	**370**	**0**	**0**	**0**	**0**	**0**	**3,365**
AVG Daily CFS	**0.0**	**0.4**	**0.9**	**0.3**	**36.4**	**69.3**	**46.0**	**23.3**	**7.8**	**1.4**	**0.0**	**0.0**	
MAX Daily CFS	**0.5**	**26.1**	**34.2**	**7.1**	**81.8**	**131.4**	**109.1**	**59.9**	**26.8**	**34.7**	**0.1**	**0.0**	
MIN Daily CFS	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**15.6**	**6.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	

e) Socio-economic characteristics of the area such as population, employment and land use.

The City of Fort Collins and the Lake Canal service area are located in Larimer and Weld Counties, respectively, while the subject reach of the Cache la Poudre River spans both counties. The population of both counties is 293,000 and 254,759, respectively, based on 2009 estimates. Employment in Larimer County is largely in non agriculture-related industries, while Weld County relies significantly on employment in agriculture and related industries. The Lake Canal service area is located generally in Weld County in an area which may urbanize in coming years because of its proximity to Fort Collins, Greeley, Loveland, Windsor, and several smaller communities located in the area. Currently, the service area is largely agricultural in nature and there is no municipal ownership of the company.

3. Description of the Alternative Water Transfer Method

Please describe the type(s) of water transfers that will be examined/utilized (i.e., conceived transfer methods include, but are not limited to: 1) interruptible water supply agreements; 2) long-term agricultural land fallowing; 3) water banks; 4) reduced consumptive use through efficiency or cropping changes while maintaining historic return flows; and 5) purchase by end users with leaseback under defined conditions). In addition, please describe how the transferable consumptive use will be calculated and quantified, and how return flow patterns will be addressed/maintained.

The proposed project will utilize the following alternative transfer methodologies:

- Interruptible water supply agreements
- Short-term agricultural land fallowing (consistent with the duration of the project)
- Reduced consumptive use through alternate agricultural practices, potentially including deficit irrigation, while maintaining historic return flows.

One of the initial tasks under the proposed project will be to quantify the historic consumptive use associated with the Lake Canal direct flow water right, based on the physical, hydrologic, and climatic characteristics of the Lake Canal service area, the historic Lake Canal water supply and diversion pattern, and the cropping pattern of participating farms under the Lake Canal over a representative study period (*see consumptive use graphic in Appendix A*). We propose using the ASCE standardized evapotranspiration equation, including consideration of effective precipitation, soil moisture storage, and appropriate crop coefficients for the area. The conserved consumptive use resulting from changed agricultural practices will be bypassed and measured back to the river via the Lake Canal sand-out channel at the diversion structure.

Surface return flows will be maintained through a combination of on-farm tailwater measurement devices and a surface return flow station located along the Lake Canal ditch. The on-farm tailwater measurements will be provided on fields which utilize deficit irrigation practices to assist with quantification of the on-farm water balance required as a part of the accounting to the Division 1 Engineer's Office. A surface return flow station will be

identified and constructed along the Lake Canal to replace surface return flows upstream of downstream calling water rights, anticipated to be the Greeley No. 2 ditch in this case.

Subsurface return flows will be maintained through a variety of techniques, including placement of water in the Lake Canal Reservoir No. 1, running water onto fallowed fields, or replacement by other fully-consumable sources. Given the short anticipated duration of the proposed project, we do not propose constructing a recharge pond or other permanent facility to replace these flows, assuming that the proposed replacement methodology is acceptable to the SEO. Subsurface return flows will be affirmed through the use of a vertical array of soil moisture sensors (a technology currently being researched by the USDA ARS at their Greeley research farm).

4. Program/Project Eligibility

Please describe how the proposed program/project meets each of the following eligibility requirements (please see Criteria and Guidelines for additional information regarding the alternative water transfer methods/strategies that qualify for funding). Note: If these requirements are addressed in other parts of the application you may simply reference the applicable section(s).

a) A description of how, if implemented, the proposed program/project will protect property and water rights.

The proposed project will protect property and water rights for the participating Lake Canal shareholders through measurement of the consumptive use conserved through alternative agricultural practices and placing that water to beneficial use as an in-stream flow. The property and water rights of non-participating Lake Canal shareholders will be contractually protected by maintaining the canal conveyance loss and surface return flows in the ditch as long as practical (driven by the location of a surface return flow station) so that excess conveyance losses are minimized. Additionally, headgate deliveries to participating shareholders will be measured during the operation of the program to ensure that appropriate, pro-rata deliveries are made.

The water rights of others in the basin will be maintained through the replacement of surface and subsurface return flows in the quantity, time, and location as they have historically, and through review of the IWSA application by the State and Division Engineers, and others via the Division 1 SWSP Notification list.

b) Identified group(s) of agricultural users that are or may be willing to transfer a portion of their water and identified entity(s), group(s) or area(s) where the transferred water could or would be put to the new use and a description of the new use.

The Lake Canal Board of Directors has expressed a willingness to participate in the proposed program. Lake Canal is a relatively small company, and the Board of Directors represents a significant proportion of the shareholders under the system. The location of the service area is shown on Figure 3, above. During the initial phase of the project, the team will identify willing shareholders to participate as a part of the project.

The transferred water will be leased to the Nature Conservancy and the City of Fort Collins Natural Areas program via an IWSA. The transferred water will be put to an in-stream flow beneficial use between the Lake Canal and the Greeley No. 3 diversions from the Cache la Poudre River, a stream length of approximately 29 miles.

c) The program/project must at a minimum conceptually describe the technical, institutional, and legal elements of the water transfer. Grant monies may be used to address one or more of these elements. If grant monies are not requested for all three elements, the grant applicant must describe how the applicant has or intends to address the elements, which are not included in the grant request, through other efforts.

Technical Elements:

The proposed project includes the following technical elements:

- Quantification of the historic consumptive use and return flow pattern of the Lake Canal direct flow water right for participating shares/shareholders (parcel-by-parcel analysis; *see depiction of river diversion, canal, and elements of on-farm water delivery in Appendix A, attached*).

- Establishment of cost-effective, temporary flow measurement structures at the canal diversion (to measure water delivered to the in-stream flow use), at a surface water return flow station (to measure surface return flows back to the river), at the headgates of Lake Canal shareholders participating in the project (to protect non-participating shareholders and to assist with the development of a water balance for farms implementing deficit irrigation practices), at the Lake Canal Reservoir No. 1 and fallowed fields where subsurface return flows will be placed, and at other locations as may be required by the Division Engineer or Water Commissioner.

- Measurement of low flows in the Cache la Poudre River at the USGS Cache la Poudre at Boxelder gaging station. This gaging station is not accurate at flows below 10 cfs, so the Water Commissioner will require direct flow measurements at this location 2 to 3 times per month in order to shepherd Lake Canal bypassed flows through this reach to the Greeley No. 3 diversion structure.

- Weekly accounting of water delivered under this program pursuant to the requirements of the Division 1 Engineer. This accounting will require documentation of the canal diversions, headgate deliveries, consumptive use calculations and tailwater return flows (farms implementing deficit irrigation), surface and subsurface return flow deliveries, subsurface return flow lagged accretions, etc. It is anticipated that these data will be collected on a near-real time basis, aggregated on a daily basis and reported to the Division 1 Engineer on a weekly basis for the duration of the program. It is anticipated that accounting will be required during the period of project operation (anticipated to

be May through July) and during the remainder of the year following operation to demonstrate the required accretion of lagged subsurface return flows (*see characterization of a full, single-farm system employing changed practices with measurement and monitoring in Appendix A*).

- Computation of evapotranspiration rates to support on-farm irrigation scheduling for participating farmers employing deficit irrigation practices under the program.

Legal Elements:

- Under the proposed IWSA, there is no permanent legal transfer of water between the parties, rather the transfer is facilitated by the IWSA lease agreement between the parties and the statutory authority granted the State Engineer to approve these temporary transfers.

- Legal services proposed under this project are generally limited to development of the form and terms of the IWSA between Lake Canal and Fort Collins Natural Areas and the Nature Conservancy.

- The basic goal of these efforts is to establish collaborative efforts between all the participants. In so doing, it is not solely advancing the cause of the project proponents, but rather demonstrating that a vertical and horizontal collaborative effort is not only possible but productive. The nature and willingness of all participants has been identified. It is not believed to be the case, but it will be confirmed that there are no contractual or other prohibitions against the participation by any of the parties.

Institutional Elements:

The proposed project includes the following institutional elements:

- Meeting with project participants (Lake Canal Board, shareholders, staff; Fort Collins staff and elected/appointed officials; Nature Conservancy staff), regulatory authorities (Division 1 and State Engineer's Office staff; CWCB staff), Opposers (if any), and interested third parties (environmental groups, NCWCD, others) to gain insight on the project, its benefits/problems, ways to improve elements of the project, etc. It is believed that this effort will provide insight and improvements to future projects throughout the state which may seek to employ these methodologies in the future.

- Submittal of the IWSA to the State Engineer's Office, Division Engineer's Office, and the Division 1 SWSP Notification List. While the IWSA is envisioned as a largely administrative process, the fact that this is the first IWSA completed in Division 1 and the innovative technical elements of the project may require addressing both technical and legal comments from the State, Opposers, and

other interested parties who may comment on the IWSA application.

- Project management and information transfer between the participating parties and the CWCB, Division Engineer's Office, the Water Commissioner, and other interested participants.

- Project accounting for grant funds and other expenditures to the CWCB.

- Preparation of status updates and a final report, in accordance with CWCB requirements.

d) If grant monies are proposed for use for legal assistance then the use of those funds shall be oriented toward advancing the knowledge of alternative agricultural water transfer methods and techniques; not for preparation of a specific water court case. The total requested funds for legal assistance shall not exceed 40 percent of the total grant request. In addition, grant monies proposed for use for legal assistance must be used to collaboratively address issues and concerns related to agricultural water transfer. Funds shall not be used to solely advance the cause of the project proponents.

It is anticipated that the legal assistance funded by the grant funds will be directed toward preparation of the IWSA agreements between the Lake Canal and the Nature Conservancy and City of Fort Collins Natural Areas Program. It is anticipated that this work will form the basic terms and conditions of the agreement (including the IWSA regulations required by statute). Lessee and Lessors are anticipated to have individual legal costs that will not be covered by grant funds.

Legal fees associated with these tasks will not exceed 40 percent of the total grant request, as required.

This project assumes that there will not be significant opposition to the proposed IWSA, either directed specifically at this demonstration, or generally toward the IWSA mechanism or SEO review process. In the event that significant opposition is encountered which cannot be addressed through engineering or other, technical means, the CWIC will immediately confer with CWCB staff regarding available options.

e) A minimum of a 10 percent cash match of total project cost (past expenditures and "in kind" cannot be counted toward the 10 percent match).

The budgetary commitment by the parties involved in the development and operation of this project are as follows:

- City of Fort Collins Natural Areas Program - $10,000 (to Lake Canal lease)
- The Nature Conservancy - $10,000 (to Lake Canal lease)
- Regenesis Management Group, LLC – estimated at $75,000 (to the purchase and installation of measurement devices, instrumentation, software, and other technology necessary to collect data and assist with the administration of the

program). The ultimate match total depends on the number of participating farms, structures, as well as input from the Division Engineer. We will update CWCB when this figure is finalized.

While not counted toward the match required under this grant, Regenesis is currently contracted with the USDA Agricultural Research Service (ARS) and Colorado State University to study issues related to deficit irrigation, farm optimization, and the potential to generate water supplies for municipal, industrial, and environmental uses while preserving and enhancing the viability of agricultural producers in Colorado and throughout the western United States. Toward this end, and exclusive of development and commercialization of their software products, Regenesis has spent approximately $700,000 to-date, and anticipates an additional expenditure of $1,000,000 over the next two years. This previous expenditure has allowed for the development of the science and technological resources which will be demonstrated in this project (*see instrumentation and research site where crop optimization routines are being developed graphics in Appendix A*).

5. Program/Project Evaluation Criteria

The following grant evaluation criteria will be used by the CWCB to evaluate and make recommendations to fund, partially fund or not fund a grant application. The criteria are aimed at advancing alternative transfer methods from the literature and studies to actual on the ground projects/programs that provide reliable water supply and sustain key elements of the agricultural area from which the water is transferred. The applicant should fully address and explain in detail in the application how, and the extent to which, the proposed project/program meets each of the criteria. However, it should be noted that the project does not have to meet all of the criteria to be eligible to receive funding and the criteria below are not listed in any order of important or priority.

a) The proposed project/program builds upon the work of former alternative water transfer methods efforts and addresses key areas that have been identified (e.g. reduced transaction costs, presumptive consumptive use, and verification/administration issues). For more detailed information on this work, please refer to the draft technical memorandum, "*Alternative Agricultural Transfer Methods Grant Program Summary of Key Issues Evaluation," July 16, 2010.*

The proposed project builds upon previously-completed/ongoing CWCB projects including:

- Lower Arkansas River Rotational-Fallowing (Super Ditch)
- Parker Water and Sanitation District Lower South Platte Project
- Colorado Corn Growers Project

Many of these projects have identified alternative agricultural practices which may be considered here, as well as legal and institutional mechanisms to support their application.

Transaction costs have been cited as a hurdle to implementation of these approaches. Though small, this project proposes a limited-transaction cost approach to demonstrating the utility of some of these alternative agricultural practices at low risk to the project participants and third-parties in the basin. This allows the Division Engineer, the State Engineer, Opposers, and potential future users of these technologies to see them enacted in real-time. This effort should improve future efforts because the technical, administrative, and institutional processes will be tried and established, improving the level of certainty for others.

Verification/administration issues are directly addressed by the software under development by Regenesis, through support of its research partners (USDA/CSU). This software and the accompanying instrumentation is intended to collect administrative data in near-real time, which should support this and future alternative transfer efforts, while reducing the cost and effort of collecting and analyzing these data. It is envisioned that the software should assist both project proponents and Division Engineer staff in operating and administering these complex transfers, and the utility of this software will be demonstrated as a part of this project.

b) Preference will be given to projects that provide additional matching resources in the form of cash, past expenditures and in-kind contributions that are in addition to the required 10% cash match.

The proposed project has matching and in-kind contributions of approximately $95,000, which is approximately 70% of the requested grant amount and exceeds the minimum 10% match requirement.

c) The proposed project/program has the ability/potential to produce a reliable water supply that can be administered by the State of Colorado, Division of Water Resources.

This project will **demonstrate**, through diversion records and accounting submitted to the Division 1 Engineer, that a transferrable water supply can be produced and dedicated to a new use outside the Lake Canal service area. Further, the project will show, in conjunction with the Division 1 Engineer and Water Commissioner, that the water supply and historic return flow pattern can be administered and an IWSA can be operated in a manner that is non-injurious to other water rights holders in the basin. The project will also demonstrate that these near-real time data can be provided economically and efficiently, to mitigate the high transaction costs associated with these efforts. It will also show that there is an economic incentive to farmers and ditch companies to utilize alternative agricultural practices, such as those demonstrated in this project.

d) The proposed project/program produces information that is transferable and transparent to other users and other areas of the state (i.e., would provide an example "template" or

roadmap to others wishing to explore alternate transfer methods).

The proposed project will provide the following transferrable benefits:

- The project will report all results and data to the CWCB for distribution to others wishing to implement a similar program in the future.
- The project will develop template IWSA documents (plan of operation and template legal agreements) which may be useful to others contemplating a transfer under similar terms.
- This program will provide a vehicle for the State and Division Engineers to review an IWSA application in Division 1 which should raise/address internal or administrative concerns and simplify future applications.
- The project will demonstrate that the consumptive use savings and required return flows can be measured and monitored for use by farm managers, ditch companies, the State Engineer's Office, and other water rights holders in the basin.
- This project will supply in-stream flows for environmental benefit in the Cache la Poudre basin on a temporary basis. This may open a discussion of alternative approaches of generating and administering in-stream flows under the CWCB in-stream flow program.
- This project will demonstrate the real economics and application of an alternative agricultural water transfer.
- This project will demonstrate the effectiveness of partnerships between public, private, and environmental entities to address significant water resources challenges.

e) The proposed project/program addresses key water needs identified in SWSI or as identified in a basin's needs assessment.

The proposed project is a demonstration project which will show how a variety of methodologies and tools can be implemented, on a larger scale, to address the water needs identified by SWSI. These approaches have application throughout the state, but we believe that they require demonstration before application on larger scales. This demonstration will be beneficial in addressing the technical, legal, and administrative questions that surround these issues and methodologies, and will do so in a way that minimizes the demonstration project transaction costs.

f) The proposed project/program advances the preservation of high value agricultural lands. Value can be viewed as: the value of crops produced, the value the agriculture provides to the local community, and the value the agricultural area provides for open space and wildlife habitat.

The agricultural land specifically involved in this application is of high-value, in terms of the crops produced, but also in terms of the open space buffer and wildlife habitat provided between the numerous cities, towns, and suburban developments in the general vicinity. As this project is envisioned as a relatively short-term demonstration project (unless future option years are exercised by project participants), its true value is in application in other projects throughout the state. The practices and techniques have tremendous potential for application in existing, larger projects, such as Super Ditch, but also in unidentified, future projects throughout the state.

g) The proposed project/program addresses water quality, or provides other environmental benefits to rivers, streams and wetlands.

The project provides in-stream flows during the 2011 irrigation season in a reach of the river which is subject to very low flows due to historic irrigation and water supply diversions. Additionally, it provides a framework for future leases for in-stream flow purposes during the next 10 years, if parties are willing to participate.

h) The proposed project/program increases our understanding of and quantifies program/project costs. This could include: institutional, legal, technical costs, and third party impacts.

The proposed project will generate actual technical, legal, and institutional costs associated with the following activities:

- IWSA preparation and approval
- Implementation of alternative agricultural practices and a resulting water transfer outside the ditch service area
- IWSA operations and accounting

The project will account for these costs directly, where part of the project, and will account for them indirectly or anecdotally, where incurred by third-parties through the proposed interview process.

i) The proposed project/program does not adversely affect access to other sources of water (not subject to/participating in the program) where owners of these water rights may wish to pursue traditional transfer of their rights to other users.

The proposed project is temporary, unless parties are willing to continue participation in the future option years established by the IWSA. Further, the transfer will operate under terms and conditions specifically designed to protect non-participating Lake Canal shareholders and other water rights in the vicinity of the project. Finally, the proposed transfer is relatively small compared to the overall decreed diversion rate at Lake Canal, suggesting that other shareholders would be free to transfer their water in a manner of their choosing without adversely impacting the proposed project or other shareholders under the system.

j) The proposed project/program provides a perpetual water supply for the new and/or alternate use and preserves agricultural production and/or helps sustain the area's economy from which the transfer is occurring.

The proposed project is temporary, as described above, but demonstrates a method which could be used to provide a long-term or perpetual water supply for municipal, industrial, or environmental uses while preserving/sustaining the agricultural producers under a ditch system.

k) The quantity of water produced by the proposed project/program. Preference will be given to programs that can address larger water supply needs.

The proposed project addresses a relatively small quantity of water as a demonstration project. If successful, the methodology and practices demonstrated under this project could be scaled up in a manner which could address larger water supply needs.

6. Statement of Work

Provide the proposed statement of work. On the following page there is an example format for the statement of work. You can use the example format or your own format, provided that comparable information is included. The statement of work should outline by task how the proposed program/project will be accomplished. It is important that the statement of work detail the specific steps, activities/procedures that will be followed to accomplish each individual task and the overall program/project and the specific products/deliverables that will be accomplished. The statement of work must include but not be limited to: task description, key personnel, budget, schedule and deliverables and the final report/project documentation upon completion of the water activity.

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.

Please provide a detailed statement of work using the following template. Additional sections or modifications may be included as necessary. Please define all acronyms. If a grant is awarded an independent statement of work document will be required with correct page numbers.

Statement of Work

WATER ACTIVITY NAME – Lake Canal/Nature Conservancy/Fort Collins Natural Areas In-stream flow Demonstration Project

GRANT RECIPIENT – Colorado Water Innovation Cluster

FUNDING SOURCE -

INTRODUCTION AND BACKGROUND

OBJECTIVES

1. Provide a technical, operating proof-of-concept (POC) demonstration of Regenesis technology which supports alternatives to permanent buy and dry agricultural water transfers.
2. Provide a water supply for in-stream flows in the Poudre River from approximately the Lake Canal diversion to the Greeley No. 3 diversion, west of Greeley.
3. Demonstrate an IWSA agreement which could be used in the future to provide water for a variety of other uses outside the ditch service area. Show that an IWSA can be used to reduce transaction costs to lower the risk of pilot or demonstration projects involving alternate water uses or transfers.
4. Demonstrate the economics of alternative agricultural water transfers in partnership with willing Lake Canal irrigators.
5. Demonstrate that alternatives to permanent agricultural water transfers, such as fallowing and deficit irrigation, can be completed in a manner which does not adversely impact other water rights holders.

6. Demonstrate how collaborative partnerships between public, private, agricultural, and environmental entities can be built and sustained for joint problem solving to further the goals of the partnering entities.
7. Determine which factors contribute to or detract from participation in alternative transfer methods on the part of agricultural producers, municipal utilities, environmental groups, and others, including State regulatory agencies.

TASK 1 – Lake Canal Direct Flow Historic Use Analysis

Description of Task

Identify individual Lake Canal shareholders who wish to participate in temporary fallowing and/or deficit irrigation practices to conserve consumptive use water for use outside the ditch company service area. Identify a representative study period for the Lake Canal system for the purpose of determining the historic consumptive use of the crops grown under that system, as well as the surface and subsurface return flow pattern.

Method/Procedure

1. Coordinate with the Lake Canal Board of Directors to identify willing participants in the study.
2. Determine the historic conveyance loss for the Lake Canal direct flow right. This volume will be maintained in the canal for the benefit of non-participating shareholders.
3. Establish the historic consumptive use and return flow pattern associated with the Lake Canal direct flow right. It is anticipated that climate data from the Northern Colorado Water Conservancy District will be used, in conjunction with the ASCE standard ET methodology. Diversion data will use information available through the State CDSS database.

Deliverable

Memo report to CWCB, Division 1, the SEO, and the other study partners. Will serve as the basis of the IWSA plan of operation.

TASK 2 – IWSA Plan of Operation

Description of Task

The IWSA plan of operation will detail how the proposed water transfer will operate, including daily diversion rate, planned timing and location of surface return flow replacement operations, and the planned timing and location of subsurface return flow replacement operations, including facility locations, Glover parameters, and a schedule of lagged accretions back to the river. This plan will set forth an accounting form and procedure necessary to document the operation of the plan and to demonstrate that plan operations are non-injurious to other water rights in the basin.

Method/Procedure

The IWSA plan of operation will be prepared in accordance with the IWSA regulation and the standard set by substitute water supply plans routinely submitted to the State and Division Engineers for review.

1. Identify and map participating farms, alternative agricultural practices, and the locations of measurement devices.
2. Forecast the proposed operations during the 2011 irrigation season, including:
    a. Anticipated total diversions at Lake Canal, based on historic data.
    b. Proposed in-stream flow rate/volume, and river conveyance loss calculations to calling water rights between the Lake Canal and Greeley No. 3 diversions.
    c. Anticipated surface and sub-surface delivery schedule and projected accretions to the river during 2011.
    d. Anticipated schedule for flow measurement at Cache la Poudre at Boxelder gaging station
3. Develop a weekly accounting methodology for submittal to the Division 1 Engineer during the 2011 irrigation season.

Deliverable

An IWSA plan of operation, prepared in accordance with the IWSA rules and requirements. This document will be submitted to the State and Division Engineers, as well as the Division 1 SWSP notification list, in accordance with the IWSA requirements.

TASK 3 – Evaluation of Alternative Agricultural Practices and Instrumentation of Lake Canal infrastructure and farms to support IWSA operations

Description of Task

The Lake Canal diversion, surface return flow station, and subsurface return flow recharge location(s) will be instrumented in accordance with Division Engineer and Water Commissioner requirements. Additionally, on-farm instrumentation will be provided, as needed, according to the alternative agricultural practices proposed for the 2011 season.

Method/Procedure

1. Alternative agricultural practices:
    a. Farm optimization software will be provided to Lake Canal shareholders to evaluate whether they will participate in the program, and what alternative agricultural practices they may wish to utilize.
2. Provide and install on-farm instrumentation, in accordance with the proposed agricultural practices and the requirements of the Division Engineer.
3. Provide and install in-stream flow bypass, surface water return, and sub-surface return flow recharge instrumentation, in accordance with Division Engineer requirements.

4. Reporting and administration software will be provided to collect/collate data on a near real-time basis to support verification and weekly accounting requirements to the Division Engineer.
5. Mapping to support Task 2.

Deliverable

Installed software and hardware. A status memo to the Division Engineer, CWCB, and project participants detailing the installed measurement equipment, locations, and operational protocol.

TASK 4 – Preparation of a Template IWSA agreement

Description of Task

An IWSA template agreement will be prepared and distributed to the project participants, Lake Canal Company, Fort Collins Natural Areas, and the Nature Conservancy. The template will specifically address the terms and conditions of performance, in addition to the general requirements of the IWSA relative to statute.

Individual legal counsel for the participants will review and modify the agreement, as needed, but these fees are not included in the grant request.

Deliverable

A template IWSA agreement will be provided to the parties in the proposed lease, in addition to the CWCB and the State and Division Engineers, in conjunction with the IWSA plan of operation. The parties to the proposed lease will negotiate the final terms of the agreement, and this final document will be similarly distributed.

TASK 5 – IWSA Operations

Description of Task

The Lake Canal diversion will be operated to bypass a portion of the consumptive use associated with the direct flow water right

Method/Procedure

1. At the start of the 2011 direct flow irrigation season, Lake Canal will bypass a portion of their diversion in accordance with the IWSA plan of operation prepared in Task 2.
2. Climate data will be collected and ET data will be reported on a daily basis to support both deficit irrigation planning and accounting for Lake Canal deficit irrigators.
3. Using the reporting/administration software, diversion, headgate, surface return, and subsurface return flow deliveries will be reported on a near-real time basis.
4. Weekly accounting will be prepared and submitted to the Division Engineer.
5. Flow measurements will be conducted 2 to 3 times per month, in conjunction with the Water Commissioner's needs, to provide flow and rating curve information sufficient to allow bypassed flows to be shepherded to the Greeley No. 3 diversion.

6. Lease payments will be made directly from Fort Collins Natural Areas and the Nature Conservancy to the Lake Canal Company for distribution to participating shareholders.

Deliverable

In-stream flow deliveries to the Cache la Poudre River, with accompanying lease payments to the Lake Canal Company. Daily ET computations and weekly accounting reports to the Division Engineer, in accordance with the requirements of the Task 2 IWSA plan of operation.

TASK 6 – Identification of Positive and Negative Program Characteristics from Farmers and Institutional Participants and Partners

Description of Task

A key consideration in the success of this program and the ability to scale this effort to larger, long-term transfers in the future is understanding and communicating the positive attributes of the project, while revising the process to address negative impressions or outcomes which may result. This task will involve interviews with key project participants and regulatory authorities to discover what elements of the program were positive, to determine what issues and concerns were discovered during the process, and to gain suggestions about what improvements could be made to the process to enhance the success of future efforts.

As discussed above, we believe that this project has the potential to spin off a number of subsequent efforts. In particular, the project may illustrate a way for the City of Fort Collins to consider a "check-off" program to support the acquisition or lease of water to dedicate to in-stream flow uses. A 2008 study funded by USDA and conducted by CSU researchers found that citizens in 17 western states are willing to pay more for household water if it means avoiding the displacement of agriculture.

Method/Procedure

The Colorado Water Institute will engage with the direct and peripheral project participants to address these issues. It is anticipated that this engagement will occur via a series of meetings or teleconference calls, either individually or in small groups, as appropriate. The issues interviews will include the following people, at a minimum:

- The Lake Canal Board of Directors – representing the Company and non-participating shareholders
- Participating Lake Canal shareholders
- Lake Canal superintendent and operations personnel
- Lake Canal legal counsel
- The Nature Conservancy and legal counsel
- City of Fort Collins Natural Areas
- City of Fort Collins Utilities

- City of Fort Collins City Manager's Office and Attorneys Office
- Division 1 Engineer and staff
- Division 1 - District 3 Water Commissioner
- State Engineer and/or staff
- CWCB Project Manager
- CWCB In-stream Flow Program staff
- Opposers to the IWSA, if applicable.
- Interested parties – Environmental groups or others

Deliverable

Meeting notes and a final report to CWCB and the project participants will summarize the results of the interviews, as well as identify common trends or traits in participant impressions.

TASK 7 – Reporting and Final Deliverable

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

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

BUDGET

Provide a detailed budget by task including number of hours and rates for labor and unit costs for other direct costs (i.e. mileage, $/unit of material for construction, etc.). A detailed and perfectly balanced budget that shows all costs is required for the State's contracting and purchase order processes. Sample budget tables are provided below. Please note that these budget tables are examples and will need to be adapted to fit each individual application. Tasks should correspond to the tasks described above.

Total Costs				
	Labor	Other Direct Costs	Matching Funds	Net Project Costs
Task 1 – Historic Use Analysis	$28,480	$500		**$28,980**
Task 2 – IWSA Operation Plan	$20,080	$250		**$20,330**
Task 3 – Instrumentation	$30,080	$75,000	($75,000)	**$30,080**
Task 4 – IWSA Agreement	$10,580	$500		**$11,080**
Task 5 – IWSA Operations	$11,680	$21,250	($20,000)	**$12,930**
Task 6 – Feedback	$11,860	$475		**$12,335**
Task 7 – Reporting	$18,870	$500		**$19,370**
Total Costs:	**$131,630**	**$98,475**	**($95,000)**	**$135,105**

Project Personnel:	Project Manager	SR Project Engineer	GIS Tech.	Instr. & Software Engr.	Attorney	Social Scientist	Clerical		Total Costs
Hourly Rate:	$150	$125	$85	$125	$350	$75	$60		
Task 1 – Historic Use	8	160	80				8		**$28,480**
Task 2 – IWSA Ops Pln	8	60	40	60			8		**$20,080**
Task 3 – Instrmntion	8	20	40	180			8		**$30,080**
Task 4 – IWSA Agrmnt	8	4			24		8		**$10,580**
Task 5 – IWSA Ops	8	80					8		**$11,680**
Task 6 – Feedback	8	4	8			120	8		**$11,860**
Task 7 – Reporting	8	80	24		4	50	8		**$18,870**
Total Hours:	56	408	192	240	28	170	56		1,150
Cost:	**$8,400**	**$51,000**	**$16,320**	**$30,000**	**$9,800**	**$12,750**	**$3,360**		**$131,630**

Other Direct Costs						
Item: Units: Unit Cost:	Copies No. $0.10	Materials	Equipment/ Supplies	Mileage Miles $0.50		Total
Task 1 – Historic Use	$50	$325		$125		**$500**
Task 2 – IWSA Ops Pln	$100	$25		$125		**$250**
Task 3 – Instrmntion			$75,000			**$75,000**
Task 4 – IWSA Agrmnt	$250	$100		$150		**$500**
Task 5 – IWSA Ops	$50	$1,000	$20,050	$150		**$21,250**
Task 6 – Feedback	$75	$150		$250		**$475**
Task 7 – Reporting	$250	$100		$150		**$500**
Total Units:	7,750			1,900		
Total Cost:	**$775**	**$1,700**	**$90,050**	**$950**		**$98,475**

SCHEDULE

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

Task	First 6 Months						Second 6 Months					
	1/11 – 3/11			4/11 – 6/11			7/11 – 9/11			10/11 - 12/11		
Task 1 – Historic Use												
Task 2 – IWSA Ops Pln												
Task 3 – Instrmntion												
Task 4 – IWSA Agrmnt												
Task 5 – IWSA Ops												
Task 6 – Feedback												
Task 7 – Reporting												
Final Reports												

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 the public and help promote the development of alternative agricultural transfer methods.

Additional Information – If you would like to add any additional pertinent information please feel free to do so here.

See attached Appendix A for graphics referenced in the body of the application. Letters of support from principal project participants are included in Appendix B.

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

Signature of Applicant: 

Print Applicant's Name: Forbes Guthrie, CWIC Co-President

Project Title: Lake Canal Alternative Agricultural Practices and In-stream Flow Demonstration Project

Return this application to:

Mr. Todd Doherty
Colorado Water Conservation Board
Water Supply Planning Section
1580 Logan Street, Suite 200
Denver, CO 80203
Todd.Doherty@state.co.us

Appendix A

Graphics and Maps

Regenesis software modules and related data inputs/outputs

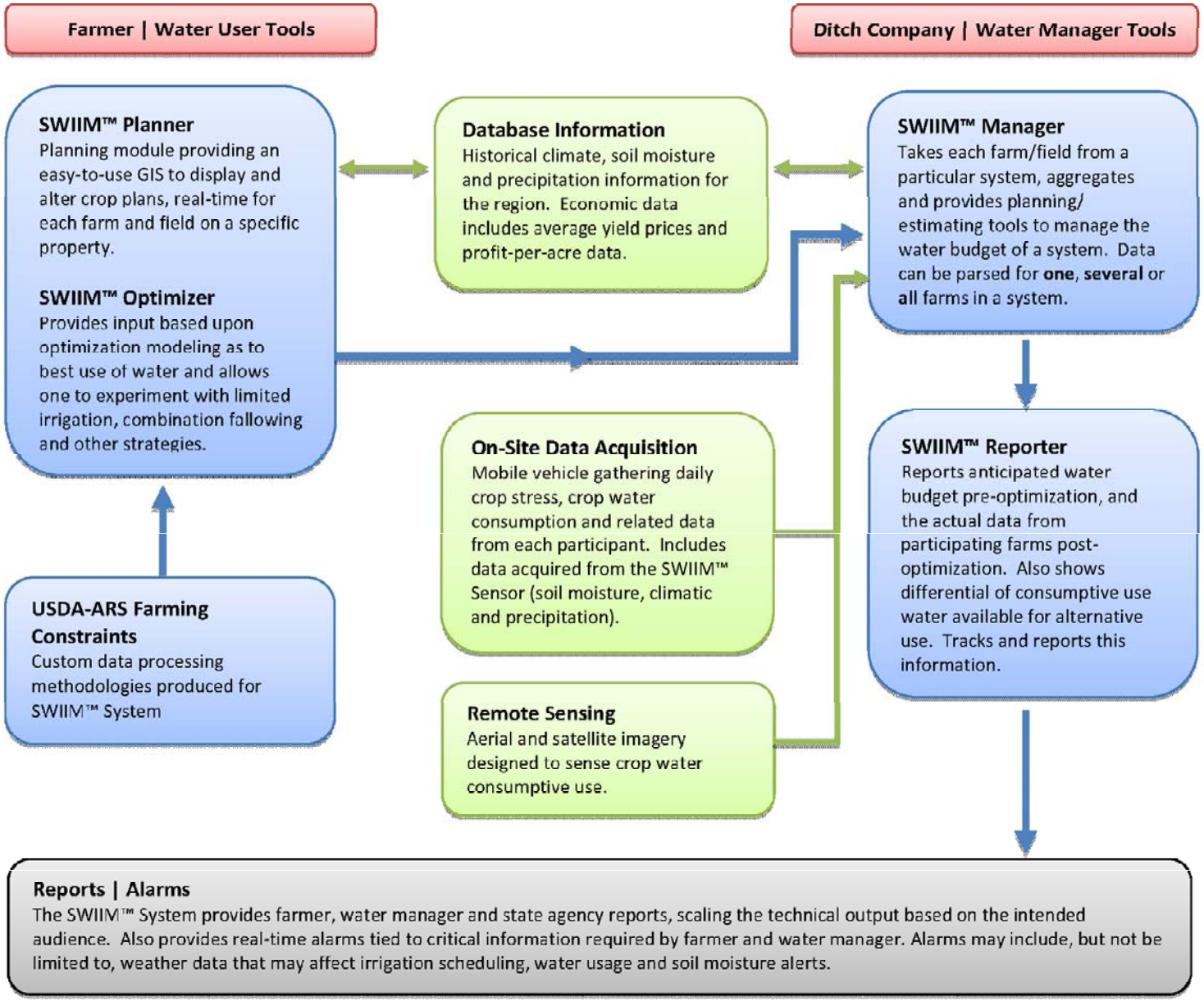
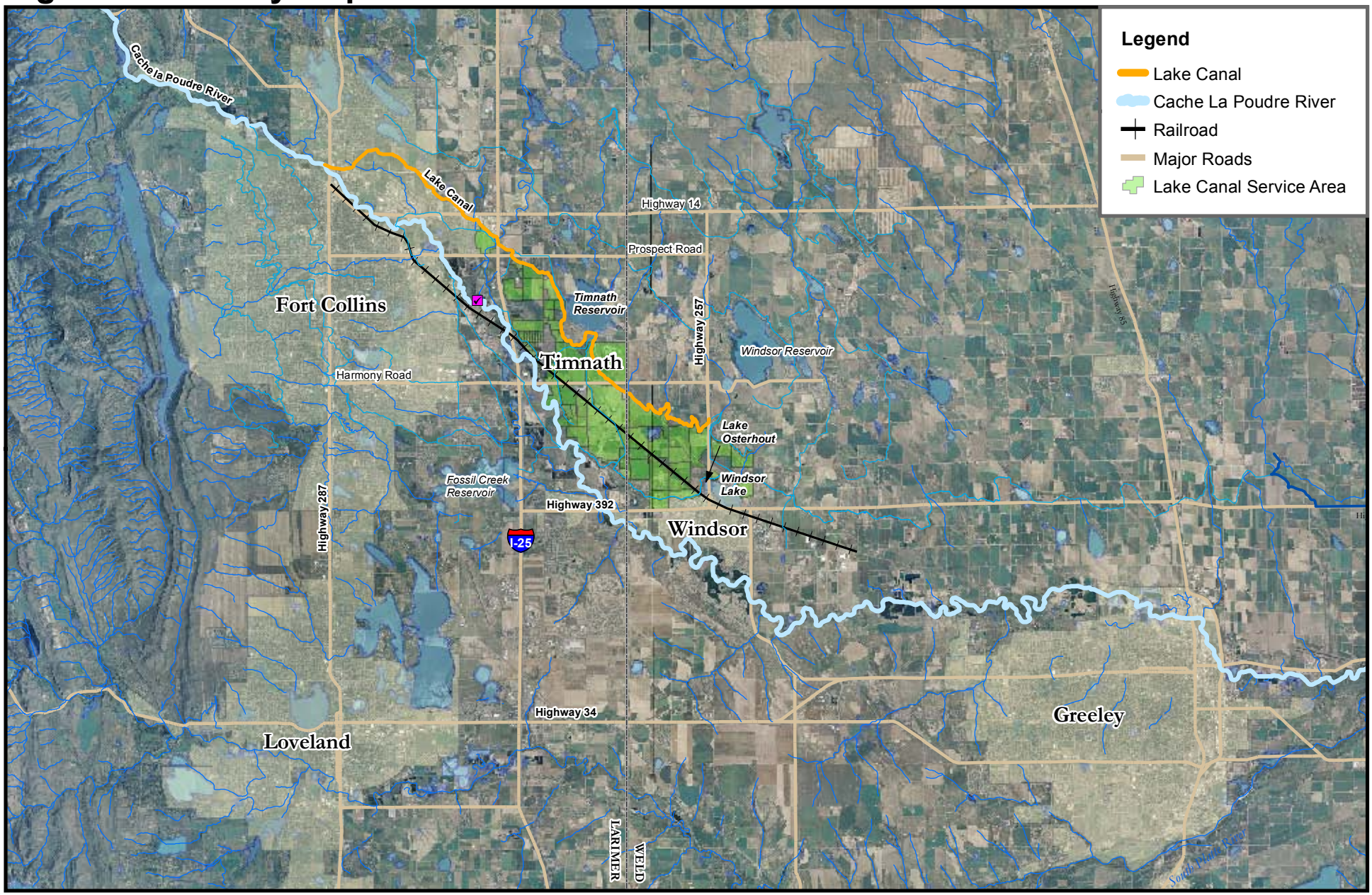


Figure 1: Vicinity Map



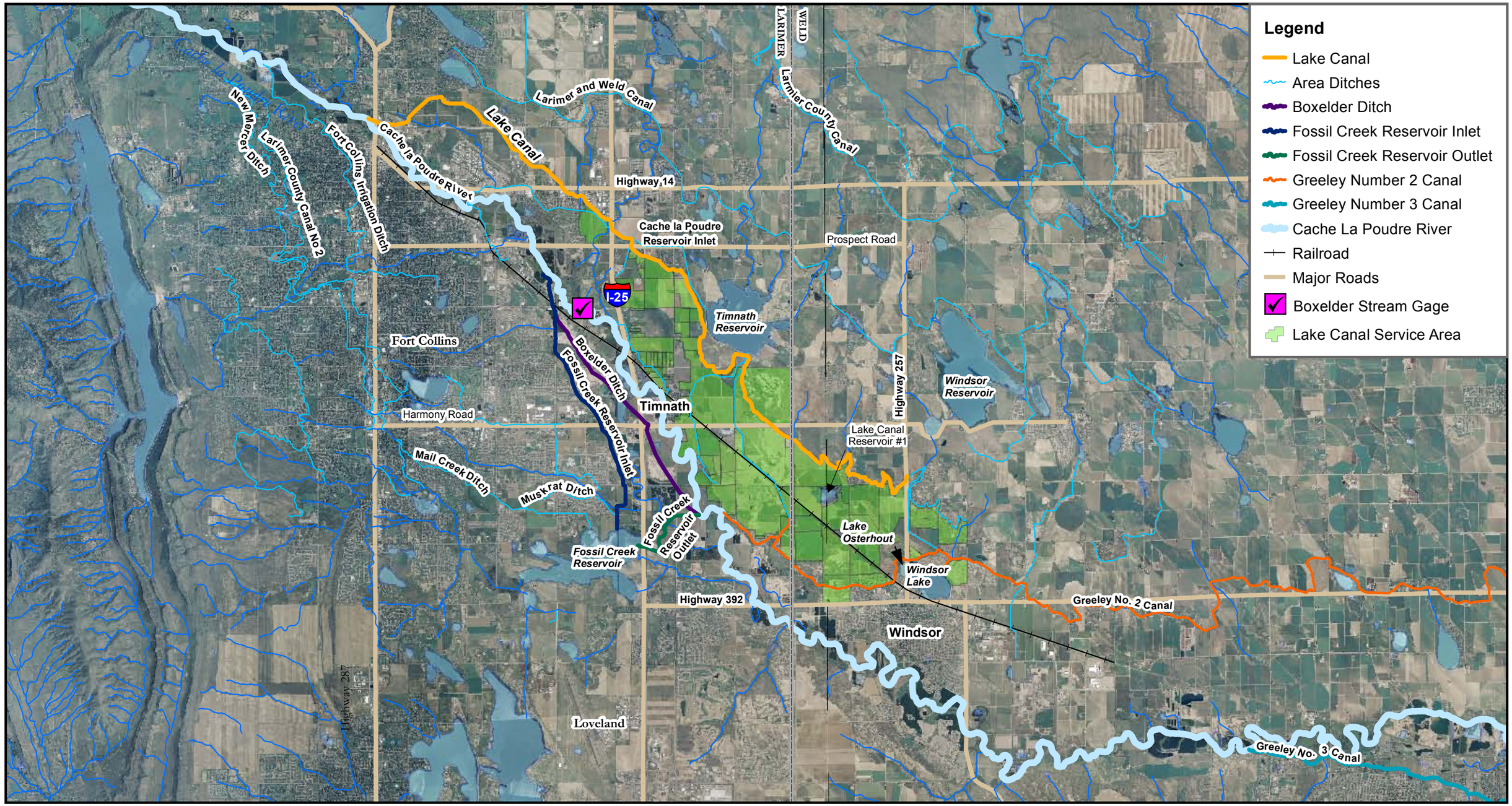
Aqua Engineering Inc.

Plot Date: Nov, 2010
Aerial - 2009 NAIP

N W E S

0 1 2 4
Miles

Figure 2: Proposed Lake Canal In-Stream Flow Reach



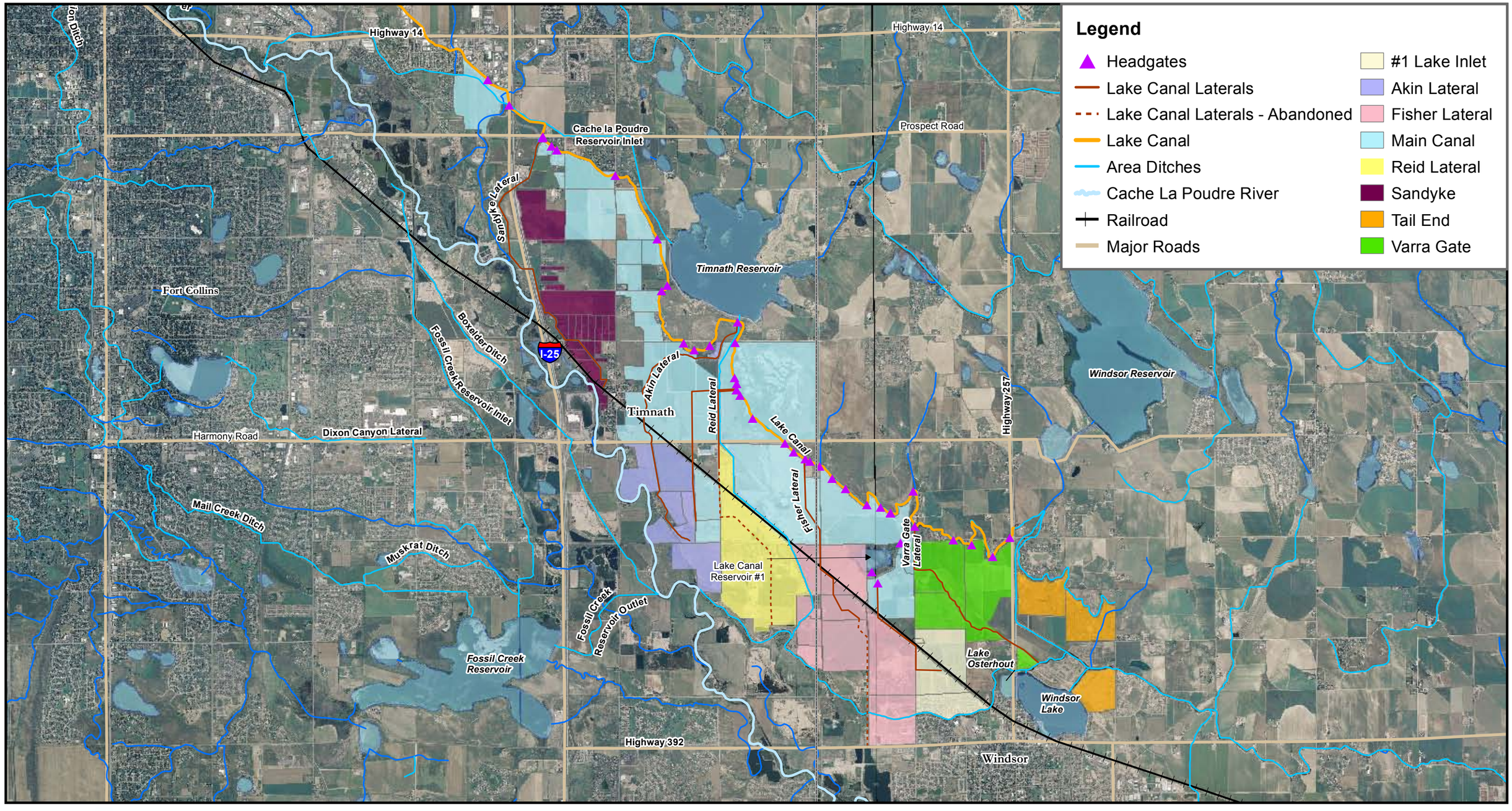
Aqua Engineering Inc.
Innovative Water Solutions

Plot Date:
Nov, 2010
Aerial - 2009 NAIP

N
W E
S

0 0.5 1 2
Miles

Figure 3: Lake Canal Service Area



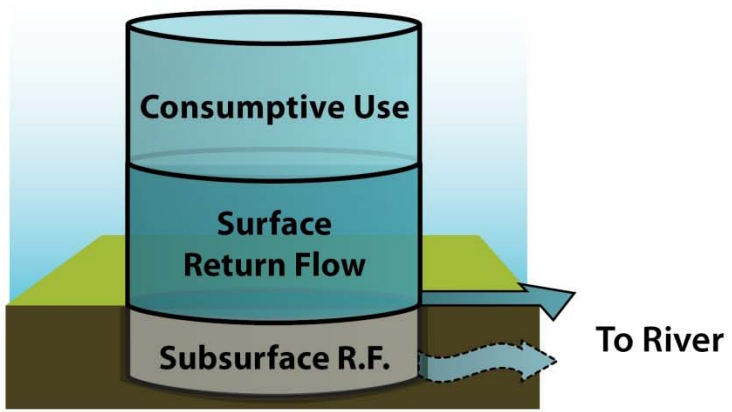
Aqua Engineering Inc.
Innovative Water Solutions

Plot Date:
Nov, 2010
Aerial - 2009 NAIP

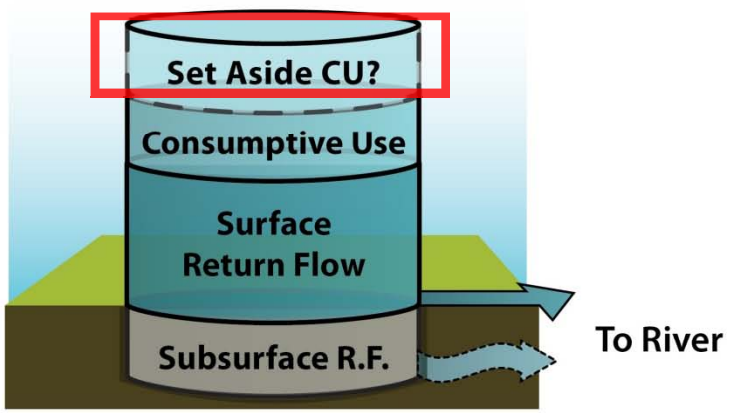
Consumptive Use - The True Barometer as to the Value of a Water Right

Consumptive Use (CU) is the amount of water taken by the plants during growth, plus what evaporates from the soil surface and foliage in the crop area.

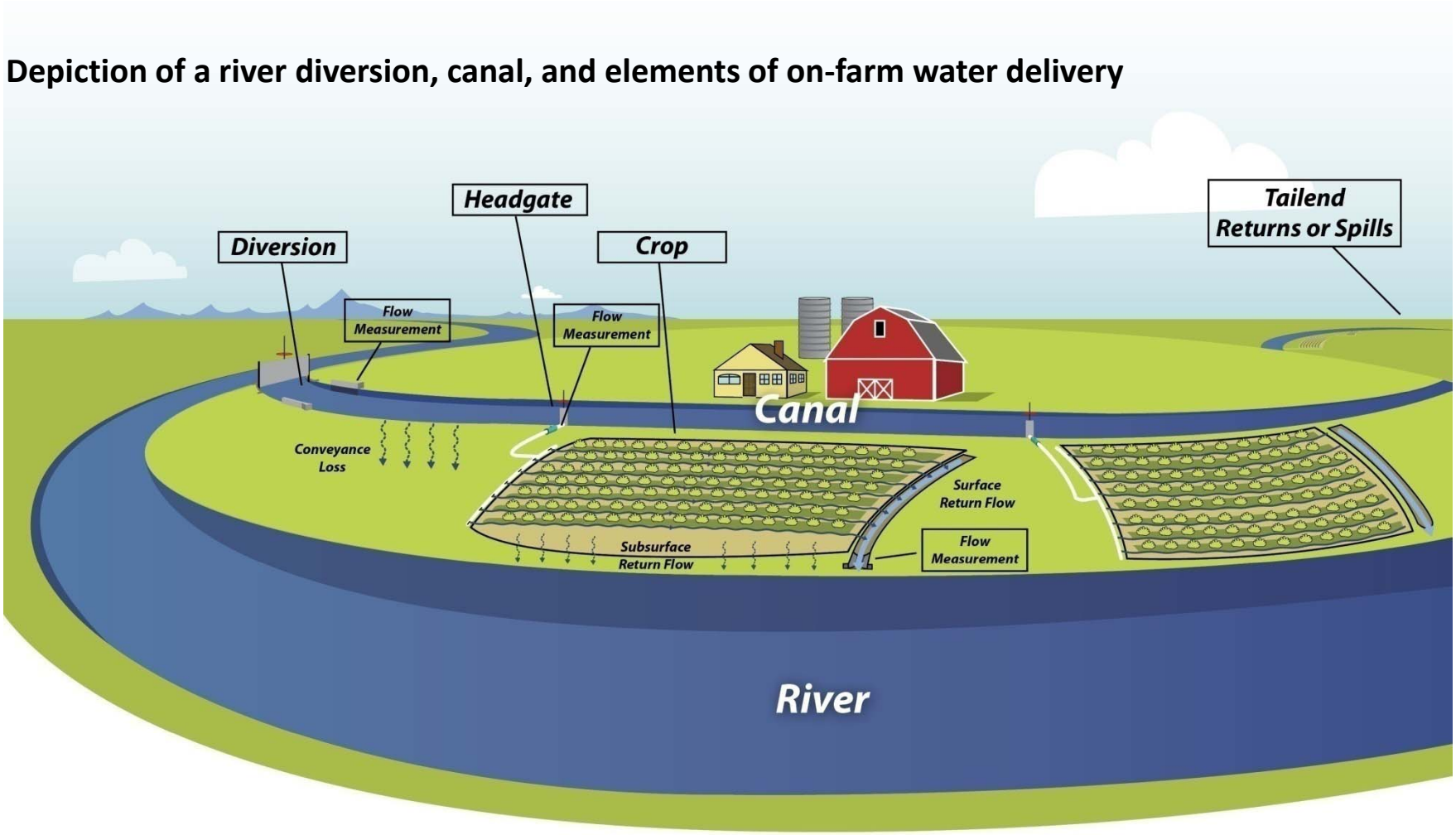
Historic
Crop Water Allocation



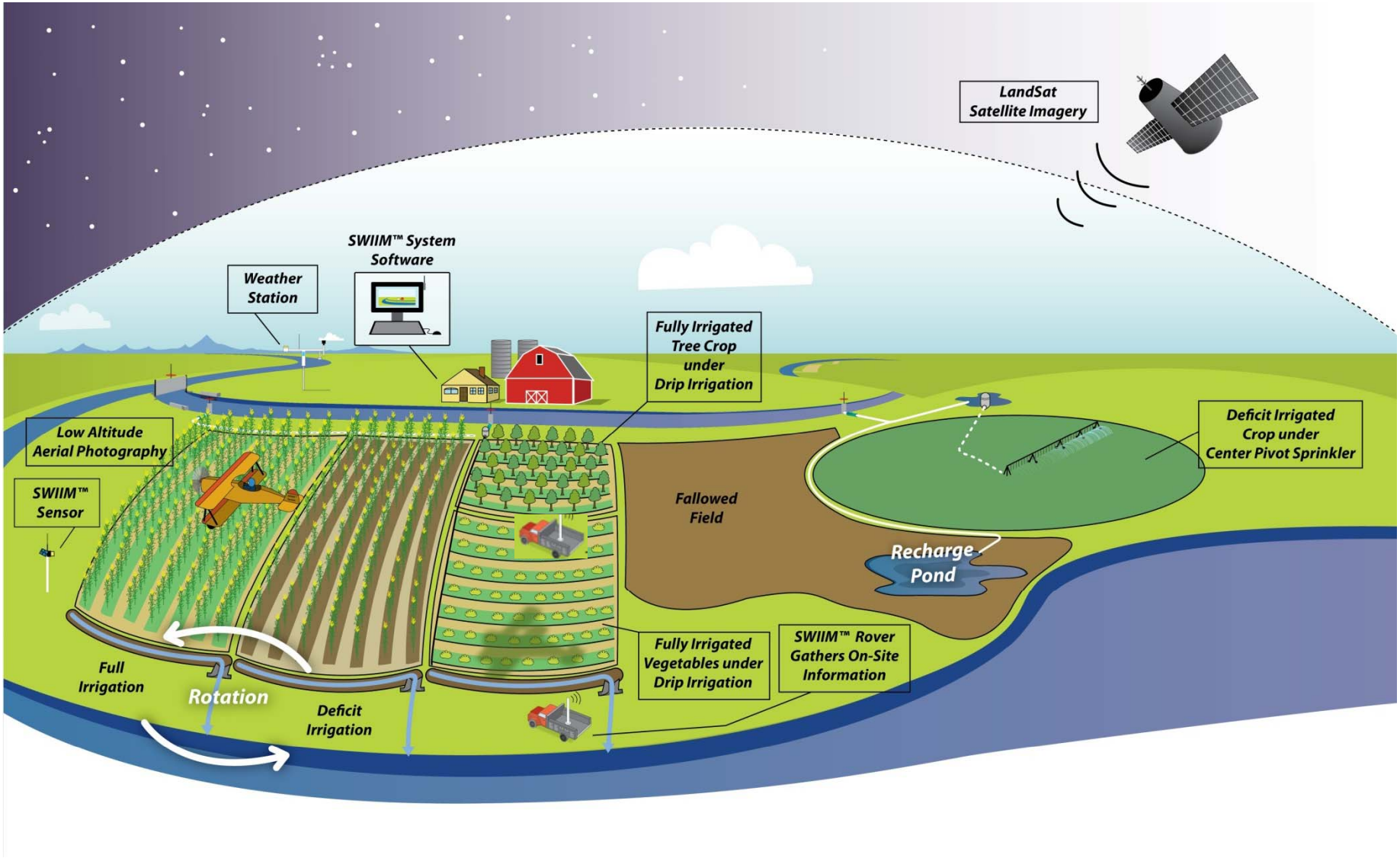
Alternative Practices
CU Water Allocation



Depiction of a river diversion, canal, and elements of on-farm water delivery



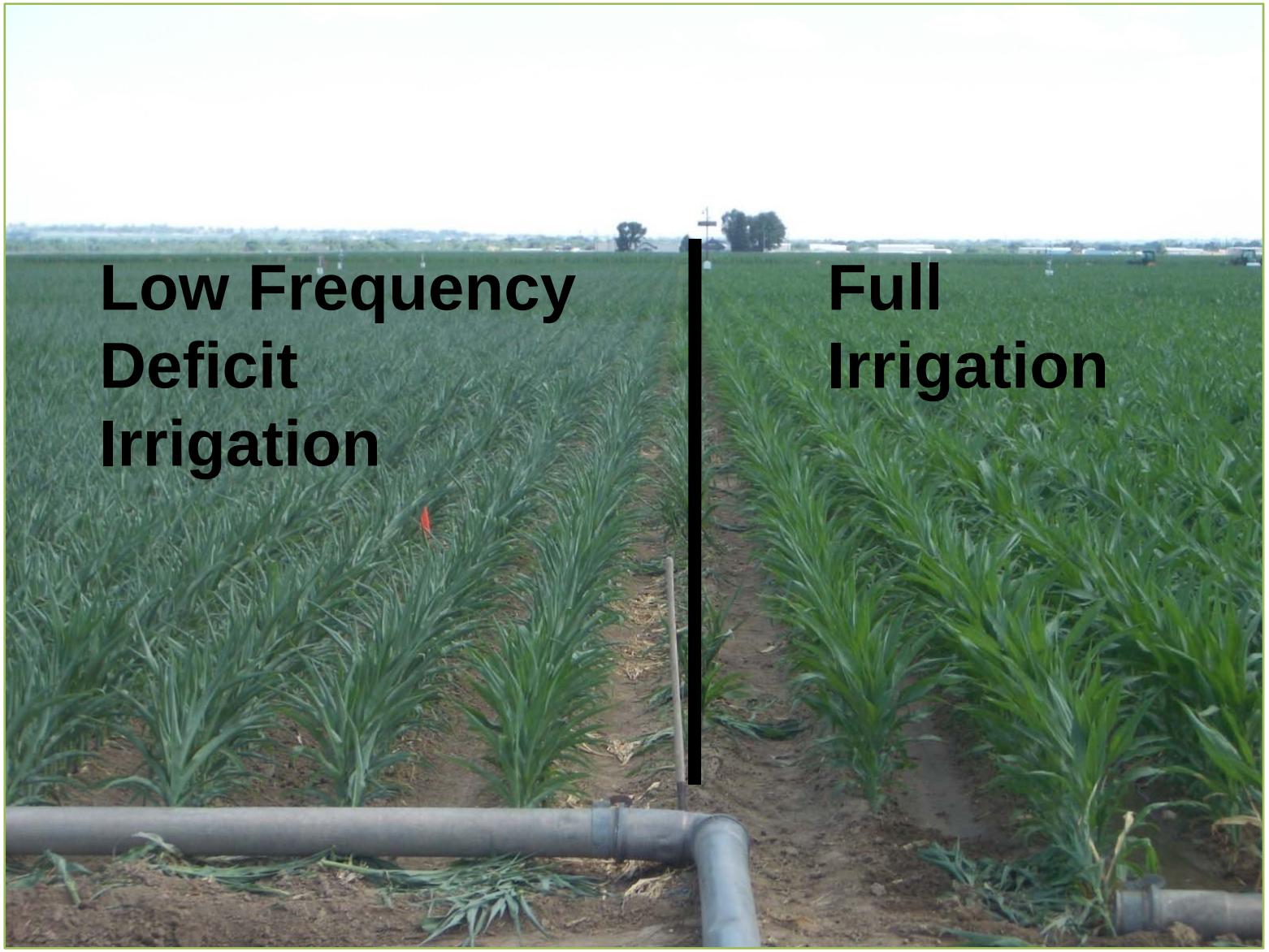
Characterization of a full, single-farm system employing changed practices with measurement and monitoring to support a water right change case



Instrumentation

- Weather stations
- Soil moisture monitoring
- Ground truth for stress conditions
- Aerial and Satellite Data
- Flow meters

Research site where crop optimization routines are being developed

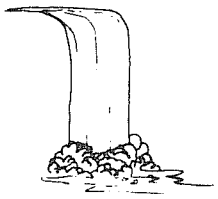


Appendix B

Letters of Support

THE LAKE CANAL COMPANY
THE LAKE CANAL RESERVOIR COMPANY

(970) 352-0222



November 22, 2010

Mr. Todd Doherty
Program Manager
Alternative Agricultural Water Transfer Methods Grants
Colorado Water Conservation Board
1580 Logan Street, Suite 200
Denver, Colorado 80203

Dear Mr. Doherty:

On behalf of The Lake Canal Company, the Board of Directors wishes to express their support the Lake Canal Company, City of Fort Collins Utilities and Natural Areas, and The Nature Conservancy proposal to the Colorado Water Conservation Board – Alternative Agricultural Water Transfer Methodology Grant.

The Proof of Concept Lease project proposed by the applicants will achieve the following purpose and goals:

- Provide a proof-of-concept demonstration of Regenesis technology that supports alternatives to permanent agricultural water transfers;
- Provide a water supply for in-stream flows in the Poudre River downstream of the Lake Canal diversion;
- Demonstrate an alternative agreement (Interruptible Water Supply Agreement) that could be used in the future to provide water for in-stream flow uses;
- Demonstrate the economic of alternative agricultural water transfers in partnership with willing Lake Canal irrigators;
- Demonstrate that alternatives to permanent agricultural water transfers can be completed in a manner that does not adversely impact other water right holders; and
- Demonstrate the effectiveness of partnerships between public, private, and environmental advocacy entities to address significant water resource challenges.

We, therefore, encourage the support of this grant proposal by the Colorado Water Conservation Board, in order to further the understanding of alternative agricultural water transfer methodologies.

Sincerely,

Don

Don Magnuson
Superintendent

33040 Railroad Avenue • P.O. Box 104 • Lucerne, Colorado 80646

City of Fort Collins

Natural Resources
215 N. Mason
PO Box 580
Fort Collins, CO 80521
970.221-6600
970.224-6177 - fax
fcgov.com

November 22, 2010

Mr. Todd Doherty
Program Manager
Alternative Agricultural Water Transfer Methods Grants
Colorado Water Conservation Board
1580 Logan Street, Suite 200
Denver, Colorado 80203

Dear Mr. Doherty:

On behalf of the City of Fort Collins Natural Resources Department, we support the Colorado Water Innovation Cluster, Lake Canal Company, City of Fort Collins Utilities and Natural Areas, and The Nature Conservancy proposal to the Colorado Water Conservation Board – Alternative Agricultural Water Transfer Methodology Grant.

The Proof of Concept Lease project proposed by the applicants will achieve the following purpose and goals:

- Provide a proof-of-concept demonstration of Regenesis technology that supports alternatives to permanent agricultural water transfers;
- Provide a water supply for in-stream flows in the Poudre River from approximately the Lake Canal diversion;
- Demonstrate an alternative agreement (Interruptible Water Supply Agreement) that could be used in the future to provide water for in-stream flow uses;
- Demonstrate the economic of alternative agricultural water transfers in partnership with willing Lake Canal irrigators;
- Demonstrate that alternatives to permanent agricultural water transfers can be completed in a manner that does not adversely impact other water right holders; and
- Demonstrate the effectiveness of partnerships between public, private, and environmental advocacy entities to address significant water resource challenges.

The purpose and goals of this proposal align with the interests, mission, and goals of our group, in the following ways:

- Support our community's strong commitment to the environment and our recognition that environmental protection is directly related to protecting human health and maintaining a high quality of life;
- Supports the many programs that enhance and protect the land, the water, and the air, from pollution prevention to wildlife habitat enhancement;

We, therefore, encourage the support of this grant proposal by the Colorado Water Conservation Board, in order to further the understanding of alternative agricultural water transfer methodologies.

Sincerely,

John Stokes
Natural Resources Director
City of Fort Collins

City of Fort Collins

Utilities Executive Director
electric • stormwater • wastewater• water
700 Wood St.
PO Box 580
Fort Collins, CO 80522

970.221.6702
970.416.2208
970.224.6003 TDD
utilities@fcgov.com
fcgov.com/utilities

November 19, 2010

Mr. Todd Doherty
Program Manager
Alternative Agricultural Water Transfer Methods Grants
Colorado Water Conservation Board
1580 Logan Street, Suite 200
Denver, Colorado 80203

Dear Mr. Doherty:

On behalf of the City of Fort Collins Utilities, we support the Lake Canal Company, City of Fort Collins Utilities and Natural Areas, and The Nature Conservancy proposal to the Colorado Water Conservation Board regarding the Alternative Agricultural Water Transfer Methodology Grant.

The Proof of Concept Lease project proposed by the applicants will achieve the following purpose and goals:

- Provide a proof-of-concept demonstration of Regenesis technology that supports alternatives to permanent agricultural water transfers;
- Provide a water supply for in-stream flows in the Poudre River from approximately the Lake Canal diversion;
- Demonstrate an alternative agreement (Interruptible Water Supply Agreement) that could be used in the future to provide water for in-stream flow uses;
- Demonstrate the economics of alternative agricultural water transfers in partnership with willing Lake Canal irrigators;
- Demonstrate that alternatives to permanent agricultural water transfers can be completed in a manner that does not adversely impact other water right holders; and
- Demonstrate the effectiveness of partnerships between public, private, and environmental advocacy entities to address significant water resources challenges.

The purpose and goals of this proposal align with the interests, mission, and goals of our group, in the following ways:

- They support the Utilities' work to transform community sustainability into a mainstream consideration;
- They support the Utilities' work on behalf of our customers, employees and community of seeking better approaches and solutions for the management and beneficial use of our precious water resources;
- They support the City's efforts of reducing environmental impacts while benefiting the community and the economy.

We, therefore, encourage the support of this grant proposal by the Colorado Water Conservation Board, in order to further the understanding of alternative agricultural water transfer methodologies.

Sincerely,

Brian Janonis, P.E.
Utilities Executive Director

November 24, 2010

Mr. Todd Doherty
Program Manager
Alternative Agricultural Water Transfer Methods Grants
Colorado Water Conservation Board
1580 Logan Street, Suite 200
Denver, Colorado 80203

Dear Mr. Doherty:

On behalf of The Nature Conservancy, we support the Lake Canal Company, City of Fort Collins Utilities and Natural Areas, and Colorado Water Innovation Cluster's proposal to the Colorado Water Conservation Board – Alternative Agricultural Water Transfer Methodology Grant.

The Proof of Concept Lease project proposed by the applicants will achieve the following purpose and goals:

- Provide a proof-of-concept demonstration of Regenesis technology that supports alternatives to permanent agricultural water transfers;
- Provide a water supply for in-stream flows in the Poudre River from approximately the Lake Canal diversion;
- Demonstrate an alternative agreement (Interruptible Water Supply Agreement) that could be used in the future to provide water for in-stream flow uses;
- Demonstrate the economic of alternative agricultural water transfers in partnership with willing Lake Canal irrigators;
- Demonstrate that alternatives to permanent agricultural water transfers can be completed in a manner that does not adversely impact other water right holders; and
- Demonstrate the effectiveness of partnerships between public, private, and environmental advocacy entities to address significant water resource challenges.

The purpose and goals of this proposal align with the interests, mission, and goals of our group, in the following ways:

- The Nature Conservancy is supportive of this innovative concept that may yield new collaborative options for providing water for multiple purposes, including environmental and municipal needs. The Nature Conservancy supports the continuation of a viable, and thriving, agricultural community in Colorado. The Conservancy believes the concepts in this study hold the promise of allowing for continued agricultural use of Colorado's water, while still providing for the needs of the environment and our growing cities.

We, therefore, encourage the support of this grant proposal by the Colorado Water Conservation Board, in order to further the understanding of alternative agricultural water transfer methodologies.

Sincerely,
Adam Bergeron
Water Project Director
On behalf of The Nature Conservancy