COLORADO WATER CONSERVATION BOARD

ALERNATIVE AGRICULTURAL WATER TRANSFER METHODS COMPETITIVE GRANT PROGRAM

GRANT APPLICATION FORM

Defining water rights in terms of consumptive use to facilitate water transfers

Program/Project Name **River Basin Name**

$25,092	$2,508 cash; (indirect costs to the University of 51.5% of the total grant
Amount of Funds Requested	Amount of Matching Funds

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.

Alternative Agricultural Water Transfer Methods – Grant Application: Mark Squillace

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

1. Applicant Name(s): Mark Squillace, Getches-Wilkinson Center (formerly Natural Resources Law Center), CU Law School

Mailing address: Mark Squillace, University of Colorado Law School
Room 441, Wolf Law Building
Boulder, CO 80309

Taxpayer ID#: 366-56-8775 Email address: mark.squillace@colorado.edu

Phone Numbers: Business: 303-492-1287

Home: 303-443-3938

Fax:

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

Name:

Position/Title

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

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 Getches-Wilkinson Center is the new name for the Natural Resources Law Center, which was founded in 1982 and has been engaged in water resources research from its earliest history. The new Director of the Center is Bradley Udall. He can be reached at the University of Colorado Law School, Wolf Law Building, UCB 401, Boulder, CO 80309-0401; 303-492-1288.

    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.
        - N/A

    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.

        - The Getches-Wilkinson Center has a fairly small staff that includes a Director, two senior research associates, and one administrative support person. In addition, however, several members of the law faculty work closely with the Center on a variety of research projects. The Center's budget is approximately $500,000/year. As noted above, the Center is well-known for its work on water resources issues. In particular, Senior Research Associate Douglas Kenney works on a range of water resource issues through the Center's Western Water Policy Program. His main project currently is the Colorado River Governance Initiative, which is considering different governance structures that might be considered in the face of declining supplies and increased demand in the Colorado River basin.

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

        - Mark Squillace is a professor of law at the University of Colorado Law School. He has taught water resources law for many years and has published numerous articles on the subject of water law. He served as the Director of the Natural Resources Law Center for nearly eight years (2005-2013) and continues to assist the Center in carrying out its research agenda, primarily in the areas of water, public lands, and mineral development policy.

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

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.

Introduction. This project will consider opportunities to facilitate water transfers that could result from defining water rights in terms of consumptive use. In particular, by making modest changes to the current water rights regime, the owner of a water right could be granted a presumptive right to transfer the consumptive use amount, perhaps with some modest adjustment to account for injuries, accounting errors, and losses to the water system. This project will also consider the technical, institutional, and legal constraints to defining water rights by their consumptive use and thereby making it easier to consummate complete or partial water rights transfers. For example, farmers who switch to less water intensive crops, or who agree to fallow all or some portion of their lands, or who agree to limit their production to one or two cuttings of a crop where they could lawfully take three or four cuttings, or who adopt water conservation practices (such as timing their water applications) would be able to reduce their consumptive use and transfer what they have saved. Importantly, they will also be able to continue farming even while substantial water becomes available to serve other important water needs.

Background. Western water law generally allows transfers of water from one use to another so long as the transfer does not cause injury. This "no injury" rule essentially allows existing water users who might be affected by a proposed transfer to block that transfer even for minor injuries that might result from the proposed changes to the water system. The starting point for any proposal to transfer water is the consumptive use of the current user. On its face, transferring the consumptive amount would seem unlikely to cause any significant injury since the quantity of water available in the system is essentially unchanged. But existing water users can nonetheless claim injury where, for example, an existing user demonstrates that the transfer could cause a change in the timing of return flows. Proving an injury or countering any such claim during transfer proceedings imposes enormous transaction costs, primarily in the form of legal and expert fees, and these costs often make otherwise cost-effective transfers difficult to consummate.

Importantly, this problem does not manifest itself with storage water rights, which is why successful water markets are almost always associated with stored water. Since stored water in the western United States is typically collected in the spring as snow melts in the mountains, the owner's priorities are satisfied at the time of storage. Once the water is stored, it is free from the "call of the river," and it can be quickly and easily sold within the project area for the types of uses for which is was originally approved, without review by state officials, and without concern about injury. Most of the large storage projects are owned and managed by special purpose water districts and mutual ditch companies, which is

one reason that these agencies have proved more capable of transferring water efficiently.

Storage rights are easily transferred because they are *fungible* or interchangeable. Non-storage water rights lack this characteristic because they are defined solely in terms of the diversion right, which does not bear any particular relationship with the amount of water that the user permanently takes from the system. By defining water rights in terms of consumptive use, and by making these consumptive rights more freely transferable within the water basin, non-storage water rights could function much more like storage rights in terms of their transferability.

Of course, merely defining water rights in terms of consumptive use will not by itself make transfers any easier. As noted above, current law explicitly recognizes the right of existing water users to block transfers if they suffer injuries, even where the transfer amount is limited to consumptive use. Nonetheless, in the search for better ways to promote water marketing, it may be time to also consider a modest change to the existing law that would allow water rights to be defined both in terms of their consumptive use and diversion amount, and that would presumptively allow the consumptive amount to be transferred, less perhaps some small percentage of the total right (e.g., 10%) to address minor errors in accounting for consumptive use and minor impacts on the water system. Such a change would be easy to accommodate under the current legal regime, would likely cause no greater injury than is already tolerated under the law, and could potentially limit other forms of injury.

In order to achieve the institutional support needed to adopt such a change, it could be limited to farmers who propose to continue farming but who choose to alter their practices to consume less water. For example, farmers could choose to change crops from one that consumes less water than the crops they have historically grown; they could consume less water by using sophisticated water timing application practices (e.g., Regnesis); they could agree to fallow some portions of their land each year; or they could agree to limit their harvest to one or two cuttings when they would otherwise be lawfully allowed to take three or four cuttings of a crop.

As an example of the amount of water savings that could be achieved through this change, consider an alfalfa farmer. In Colorado, alfalfa typically consumes 1.93 acre-feet of water per acre. By contrast, sunflowers typically consume 1.34 acre-feet of water per acre. Under current law, the water saved by this change of crop would not be available for transfer. Nonetheless, over 100 acres, 59 acre-feet of water could be saved. By allowing the farmer to transfer this water while minimizing transaction costs, the law would incentivize such changes and free up substantial water for other uses.

The chief objection to this idea is that it flies in the face of the no injury rule. The best response to this argument is that the system tolerates all types of minor injuries that are not actionable and any minor injury that might result from such transfers should likewise be tolerated. Consider, for example, that, a sunflower farmer can freely switch from sunflowers to alfalfa, even if such a change causes a significant injury to existing users. Likewise, in most Western states agricultural users are free to recapture and reuse water, so long as they recapture and reuse the water for the same purpose, and on the land for which the rights were appropriated. Users are free to reuse the water even if such reuse increases the amount of water consumed. Finally, measuring the amount of water diverted through a ditch is far from an exact science, and measurement errors are routinely tolerated, even if they might cause injury to existing users. Beyond facilitating transfers, defining water rights in terms of consumptive use could also be deployed to ensure that efforts to recapture and reuse water or to change to more water-intensive crops would not result in the consumption of water resources in excess of legal allotment.

Technical, Institutional, and Legal Elements of the Project. To make the case for defining water rights in terms of consumptive use to facilitate water transfers various technical, institutional, and legal issues must be addressed.

Technical Elements. On the technical side, the key question to be addressed involves the practical difficulty and cost of ascertaining consumptive use data for various crops in various soil types. This part of the project will focus on the South Platte where consumptive use data is more readily available. It is not expected that the project will involve new field research. Rather, the project will consult with experts such as those at CSU and the USDA's agricultural research station in Fort Collins, to identify and analyze existing research to determine what is known about consumptive use and what possible obstacles exist to developing additional information inexpensively and on a wider scale as may be necessary to implement a consumptive use quantification program.

Institutional Elements. Even assuming that the technical problems can be overcome, some government agency will have to take on the responsibility for quantifying consumptive use. That agency (probably the Division of Water Resources) will have to have sufficient credibility such that its findings will gain general acceptance within the affected communities. The project will outline an institutional framework for implementing a program of quantifying consumptive use for water rights. The project will also consider options for designing one or more pilot programs that could test the practical, real world problems that might arise from defining particular water rights in terms of consumptive use.

Legal Elements. In order to fully implement a program to define water rights by their consumptive use, modest regulatory and/or legislative changes may be necessary. The project will outline and analyze changes that may be necessary to the existing legal regime to define water rights in terms of consumptive use and to allow presumptive transfers of the consumptive use amount. The project will also outline a possible scheme for processing consumptive use transfer applications, perhaps suggesting limited application until the issues and problems are more fully understood.

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.

The research and report for Task 1 (identifying and reporting on consumptive use) will rely entirely on existing work. Much of the data is available on the CWCB/DWR website called StateCU. http://cdss.state.co.us/Modeling/Pages/ConsumptiveUseStateCU.aspx. In addition, the following articles, studies, and reports will be used to elucidate the issues associated with Task 1.

- *Using the Best Science to Estimate Consumptive Use*, (CDSS, StateCU, 2010), *PowerPoint presentation available at,* http://ccc.atmos.colostate.edu/ET_Workshop/pdf/5_Alvarado.pdf

- J. Schneekloth and A. Andales, *Seasonal Water Needs and Opportunities for Limited Irrigation for Colorado Crops* (2009), *available at*, http://www.ext.colostate.edu/pubs/crops/04718.html

- Antony Frank & Dr. David Carlson, Colorado's Net Irrigation Requirements for Agriculture, Colorado Department of Agriculture (December 1999), http://cospl.coalliance.org/fedora/repository/co:3072/ag92ir71999internet.pdf

- Craig L. Westenburg, Donald P. Harper, and Guy A. DeMeo, *Evapotranspiration by Phreatophytes Along the Lower Colorado River at Havasu National Wildlife Refuge, Arizona* (USGS, Scientific Investigations Report 2006–5043), *available at*, http://pubs.usgs.gov/sir/2006/5043/

- Israel, Broner, CSU Extension Service, *Seasonal Water Needs for Colorado Crops*, *available at,* http://www.a-campo.com.ar/ingles/gest_tec/seasonal.htm

- *Water as a Crop: Limited Irrigation and Water Leasing in Colorado*, 30 Rev. of Applied Ag. Econ. No. 3, 435-444. (2008), *available at*, http://intl-aepp.oxfordjournals.org/content/30/3/435.full

- *Historic crop consumptive use analysis South Platte decision support system final report,* (Leonard Rice Engineers), 2008, *available at,* http://cdm16658.contentdm.oclc.org/cdm/singleitem/collection/p267501ccp2/id/2557/rec/14

- Kelly DiNatale, Todd Doherty, Reagan Waskom, Rick Brown, *Meeting Colorado's Future Water Supply Needs Opportunities and Challenges Associated with Potential Agricultural Water Conservation Measures*, (Colorado Water Alliance, 2008), *available at*, http://www.cwi.colostate.edu/publications/sr/20.pdf.

- Blaney, H.F. & Criddle, B.D., *Consumptive Use and Irrigation Water Requirements for Crops in Colorado*, USDA, (1949)

In addition, the applicant for this grant, Mark Squillace, recently completed a major project for NOAA-SARP on agricultural to urban water transfers. That project resulted in two substantial publications: *The Water Marketing Solution*, 42 ENVTL L. REP. 10800 (2012), and *Water Transfers for a Changing Climate*, 53 Nat. Res. J. ____ (2013). These two articles first identified the potential for redefining water rights in terms of consumptive use as a strategy for facilitating water transfers. The proposed project seeks to flesh out that idea and test its potential viability. Professor Squillace has also written a chapter for a book on *Water Accounting* that considers the accuracy of water diversion measurements. Mark Squillace, *Accounting for Water Rights in the Western United States*, *in* WATER ACCOUNTING (Edward Elgar, 2012)

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.

The project will focus on the South Platte River Basin, but will also look more generally at the data available on consumptive use throughout the region. Since the study will not develop new field research but will simply identify and report on existing research the emphasis on any particular region or location is less important. The South Platte Basin is mentioned primarily because data is available for the Basin and it offers some significant potential for agricultural to urban water transfers.

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.

N/A

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.

N/A (Some of this information will be generated in the course of identifying consumptive use information.)

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.

N/A

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

N/A (Some of this information will be generated in the course of identifying consumptive use information.)

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 project will consider both long- and short-term transfers that might be facilitated through redefining water rights in terms of consumptive use.

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 project seeks to work within the existing water rights system to facilitate water transfers. While a modest change in our understanding of "injury" may be necessary to accommodate the

proposal the essential rights of property and water rights holders are protected. Indeed, the proposal has the potential to afford farmers more flexibility in using their water rights to continue farming even while realizing revenue from the temporary or permanent sale of some portion of their pre-existing water right.

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.

No particular groups of agricultural users have been identified at this point in the project.

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, institutional, and legal elements of the project are described in the proposal above.

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.
N/A

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

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. For more detailed information on this work, please refer to the draft report: *Alternative Agricultural Water Transfer Methods Grant Program Summary and Status Update*, November 2012.

b. The proposed project addresses one or more key recommendation(s) in the report: *Alternative Agricultural Water Transfer Methods Grant Program Summary and Status Update*, November 2012.
c. 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.
d. 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.
e. 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).
f. The proposed project/program addresses key water needs identified in SWSI 2010 or as identified in a basin's needs assessment.
g. 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.
h. The proposed project/program addresses water quality, or provides other environmental benefits to rivers, streams and wetlands.
i. The proposed project/program increases our understanding of and quantifies program/project costs. This could include: institutional, legal, technical costs, and third party impacts.
j. 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.
k. 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.
l. The quantity of water produced by the proposed project/program. Preference will be given to programs that can address larger water supply needs.
m. Applicants are encouraged to develop projects demonstrating participation and/or support from a diverse set of stakeholders and interests.

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 - Defining water rights in terms of consumptive use to facilitate water transfers

GRANT RECIPIENT – Professor Mark Squillace, University of Colorado Law School

FUNDING SOURCE – Colorado Water Conservation Board/University of Colorado

INTRODUCTION AND BACKGROUND

Provide a brief description of the project. (Please limit to no more than 200 words; this will be used to inform reviewers and the public about your proposal)

This project will consider opportunities to facilitate water transfers that would result from defining water rights in terms of consumptive use. By making modest changes to the current water rights regime, the owner of a water right could be granted a presumptive right to transfer the consumptive use amount, perhaps with some modest adjustment to account for injuries, accounting errors, and losses to the water system. This project will also consider the technical, institutional, and legal constraints to defining water rights by their consumptive use and thereby making it easier to consummate complete or partial water rights transfers. For example, farmers who switch to less water intensive crops, or who agree to fallow their lands for a portion of the growing season, or who adopt water conservation practices (such as timing their water applications) would be able to reduce their consumptive use and transfer what they have saved. Importantly, they will also be able to continue farming even while substantial water becomes available to serve other important water needs.

OBJECTIVES

List the objectives of the project

- To review and report on our current understanding of consumptive use by crop, region, and soil type;
- To consider institutional arrangements that would have to be made to quantify consumptive use in anticipation of a possible transfer;
- To address possible changes to regulatory and legal schemes that may be necessary or helpful in facilitating the transfer of consumptive use amounts.

TASKS
Provide a detailed description of each task using the following format

TASK 1 – Identify and analyze data on consumptive use

Description of Task

To begin this project it will be important to identify, analyze, and report on our current understanding of consumptive use. Among the questions to be considered and answered are – (1) How well can we measure consumptive use given our knowledge of crop, soil type, and geographic region; (2) What data is currently available about consumptive use and how reliable is that data; (3) What are the prospects for establishing an efficient, cost-effective system that can accurately predict consumptive use given the parameters of crop, soil type, and geographic region.

Method/Procedure

This task will largely involve a survey and analysis of the existing literature. In addition, this task will identify gaps in information and areas for possible future research that could help agencies accurately predict consumptive use at a reasonable cost and in a reasonable period of time.

Deliverable

A draft and final report will be prepared that includes a discussion of the results of this research.

TASK 2 – Institutional arrangements to facilitate consumptive use transfers

Description of Task

This part of the project will consider the role of the State Engineer and the Division of Water Resources in quantifying consumptive use. It will also look at the practical and political feasibility of establishing one or more pilot programs to test the viability of defining consumptive use for purposes of transfer.

Method/Procedure

The Colorado Division of Water Resources, working alongside Colorado's research Universities, has the capability to quantify the consumptive use of particular water users with a reasonable degree of accuracy. Nonetheless, this task will impose costs on the agency that must be covered either by the State or private parties. The project will consider various models that might be used to quantify consumptive use,

their accuracy, and what it might cost to use them. It will also consider how those costs might be covered including, for example, by imposing applicant fees.

Deliverable

A draft and final report will be prepared that includes a description and analysis of different institutional models for quantifying consumptive use.

TASK 3 – Identify changes to the regulatory and legal regime to facilitate consumptive use transfers

Description of Task

This task involves the identification and analysis of legal standards could limit or prevent efforts to allow the transfer of consumptive use amounts.

Method/Procedure

The project will review legal and regulatory requirements that might limit or prevent the transfer of consumptive use amounts and consider how these requirements might be changed to accommodate such transfers. The project will consider not only permanent changes to the law but also the feasibility of establishing a pilot program that could be used to test the efficacy of the proposal and issues or problems that could arise during its implementation.

Deliverable

The project report will recommend changes to the legal regime that might be carried out on a trial or permanent basis that would accommodate cost-effective consumptive use transfers.

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.

In addition to the required report, the project proponents will prepare an article suitable for publication that addresses the project's findings and conclusions.

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

Task	Labor	Matching Funds (If Applicable)	Total Project Costs
Task 1 – Identify and Report data	$8,364	$836	$9,200
Task 2 - Institutional arrangements	$8,364	$836	$9,200
Task 3 – Regulatory/Legal Reforms	$8,364	$836	$9,200
Total Costs:	$25,092	$2,508	$27,600

Breakdown of Costs

Project Personnel:	**Project Manager**	**Students research assistant**	**Administrative support**	**Total Costs**
Hourly Rate:	$125/hour	$15/hour	$40/hour	
Task 1 - Identify and Report data	Mark Squillace $7500 60 hours	60 hours/$900	20 hours/$800	$9,200
Task 2 - Institutional arrangements	Mark Squillace $7500 60 hours	60 hours/$900	20 hours/$800	$9,200
Task 3 - Regulatory/Legal Reforms	Mark Squillace $7500 60 hours	60 hours/$900	20 hours/$800	$9,200
Total Hours:	180	180	60	420
Total Cost:	$22,500	$2,700	$2,400	$27,600

SCHEDULE

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

Task	Start Date	Finish Date
1	Upon NTP	NTP + 120 days
2	Upon NTP	NTP + 120 days
3	Upon NTP	NTP + 120 days

NTP = Notice to Proceed

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.

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

Signature of Applicant:

Print Applicant's Name: **Mark Squillace**

Project Title: **Defining water rights in terms of consumptive use to facilitate water transfers**

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