Water Supply Reserve Account – Grant and Loan Program
Water Activity Summary Sheet
November 19-20, 2014
Agenda Item 11(d)

Applicant & Program Sponsor: Rio Grande Watershed Conservation & Education Initiative (RGWCEI)

Water Activity Name: Increasing the Water Holding Capacity of Soil for Agriculture Sustainability in the San Luis Valley

Water Activity Purpose: Agricultural/Education/Implementation

County: Alamosa, Conejos, Costilla, Rio Grande, and Saguache

Drainage Basin: Rio Grande

Water Source: Unconfined Aquifer of the Closed Basin and San Luis Valley

Total Amount Requested: $98,200

Source of Funds: Rio Grande Basin Account

Matching Funds: Applicant & 3rd Party cash & in-kind match ($5,304,964) = 98.2% of total project costs ($5,403,164)
(refer to *Funding Summary/Matching Funds*)

Staff Recommendation
Staff recommends approval of up to $98,200 from the Rio Grande Basin Account to help fund the project titled: Increasing the Water Holding Capacity of Soil for Agriculture Sustainability in the San Luis Valley.

Water Activity Summary: WSRA funds will be expended to conduct a study that will investigate the outcomes of a "biotic" farming project. Biotic farming is defined as an approach that treats the farm as an ecosystem unto itself, mimicking nature as much as possible in the design and management of the farm, keeping as much of the soil food web intact as possible, and taking care of the soil as though it is a living organism. Desired outcomes include: reducing water use by 30-60%; maintaining, or increasing pack out rates; increasing product quality; maintaining, or increasing profitability.

The process begins by establishing a baseline biological profile by gathering soil samples that utilize a variety of testing methodologies to measure the Total Biomass Populations in general categories. The next step is to define a nutrient management plan that will include processed compost applications and a set of biological amendments. The final step will be to develop a crop rotation plan for the three year life of the investigation. Soil types will also be noted and a comprehensive irrigation management program will be implemented. The crop will be monitored throughout the growing season. All amendment applications, water applications (including rain), and tilling passes will be documented. At the end of each growing season tests will be retaken and a portfolio will be developed for each amendment applications, water applications, and tilling efforts.

The purpose of this project is to demonstrate the following:

- Increases in irrigation efficiencies by increasing the soils water holding capacity.
- Increased soil tilth.
- Promoting water quality by reducing fertilizer, herbicide, and pesticide inputs
- Increased crop quality and pack out rate reducing amount of land in production.
- Introduces practices and procedures to meet future water need

By addressing the following questions:

- How long will it take to improve soil health through the use of biologic methods?
- Will biotic system changes increase pack out rates, and if so, can productive land with increased pack out rates be reduced, thus preserving water?
- How long does field rebound from conventional chemical management take and what are the overall water savings through a 2-3 year crop rotation?

Discussion:
No additional discussion is required.

Issues/Additional Needs:
No issues or additional needs have been identified.

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

Tier 1-3 Evaluation Criteria:
n/a

Funding Summary/Matching Funds:

	Cash	In-kind	Total
WSRA Rio Grande Basin Account	$98,200	n/a	$98,200
Participating Landowners	$5,176,364	$0	$5,176,364
NRCS	$0	$31,200	$31,200
Soil Guys	$0	$2,500	$2,500
CSU Graduate Students	$0	$4,100	$4,100
RGWCEI	$0	$90,800	$90,800
Total Project Costs	**$5,274,564**	**$128,600**	**$5,403,164**

All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and will help promote the development of a common technical platform.

In accordance with the revised WSRA Criteria and Guidelines, staff would like to highlight additional reporting and final deliverable requirements. The specific requirements are provided below.

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

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

Engineering: All engineering work (as defined in the Engineers Practice Act (§12-25-102(10) C.R.S.)) performed under this grant shall be performed by or under the responsible charge of professional engineer licensed by the State of Colorado to practice Engineering.

Rio Grande Inter-Basin Roundtable
c/o San Luis Valley Water Conservancy District
623 Fourth Street, Alamosa, CO 81101
Telephone: (719) 589-2230
Email: slvwcco1@qwestoffice.net

September 23, 2014

Mr. Michael King, Executive Director
Colorado Department of Natural Resources

Mr. Craig Godbout, Program Manager, Water Supply Planning Section
Colorado Water Conservation Board

WSRA FUNDING REQUEST
INCREASING THE WATER HOLDING CAPACITY OF SOIL
FOR AGRICULTURE SUSTAINABILITY IN THE SAN LUIS VALLEY, COLORADO

Gentlemen:

The Rio Grande Basin Roundtable (R.G.R.T.) has determined that the single, most critical water issue confronting the Rio Grande Basin (Basin) is the current unsustainable management of surface and ground water. The R.G.R.T. has made the decision that water activities that address this issue be favorably considered for funding from the Water Supply Reserve Account, SB 2005-179 (WSRA Funds), providing the proposed water activities meet the SWSI findings for the Basin and the CWCB & IBCC Criteria and Guidelines for funding.

The Applicant for the WSRA Funding is The Rio Grande Watershed Conservation & Education Initiative (RGWCEI), which meets the criteria for an applicant. The RGWCEI has been a longtime proponent of conservation measures in order to stabilize farming and ranching operations.

The purpose of this proposed Project, *Increasing the Water Holding Capacity of Soil for Agriculture Sustainability in the San Luis Valley*, is to document soil health improvement levels in different areas across the San Luis Valley of Colorado, and the impact of this on crop production rates, water usage, and the overall farm/ranch economics of such activities.

The Project will detail the agronomic feasibility of improved soil health by defining the methods, time frame and economics of adopting these practices while growing a variety of crops in a variety of soil types. The Project will address the issue of whether growers can produce economically profitable yields using less water if they improve the farms' soil health, and determine what water savings are possible given the crop and specific location of crops and soil types across the San Luis Valley. The Project will implement the practices, develop the metrics, analyze the data, and field test the economics of soil health.

The Project will take conventionally farmed fields and establish a base line of their overall soil health and then in place of conventional nutrient management additives (conventional fertilizers), biotic based nutrient management additives will be applied. These biotic based nutrient additives will be used throughout the crop rotation. There will be interim soil health

tests taken at the end of each season that will contribute to the overall understanding of the activities. At the end of the three year trial a final soil health analysis will be completed.

One of the many benefits of using this whole picture biotic approach in farming and ranching is that nature tends to create a balance that is far more complex and elegant than anything that can be developed conventionally. The methodology of biotic farming means looking at all living things, not just the crop being grown. The success of farmers using this approach has been impressive. Initial results show they have reduced their water use by 30 to 60 percent and maintained or increased crop yields. Such an approach has maintained farm income while allowing for a decrease in production acres, and hence water consumed. If it can be demonstrated that this type of farming were to replace the conventional farming methods the result could be a win-win for everyone: Profitable farms, increased quality of the product produced, and reduced water consumption for the Basin, with the potential to reduce the demand on groundwater withdrawals.

The metrics of the Project include:

- Improved soil health through the use of biologic methods, such as compost, green manure cropping and biologic nutrient management, (ultimately replacing commercially produced chemical compounds) and will this increase soil water holding capacity, and the length of time for this to be accomplished.
- Will these biotic system changes increase field yields or pack out rates? If so, can productive land with increased pack-out be reduced thus reducing irrigated acres and therefore reduced water needs?
- How long do fields rebound from conventional chemical management application and what is the overall water saving through the course of a two/three year crop rotation?

The estimated total cost of the Project is $5,403,164, of which $5,176,364 or 96% will be from the from the landowners participating in the Project. In addition, $31,200 or 1% will come from the NRCS; and $97,400 or 3% from In-kind services. The Applicant is requesting $98,200 from Rio Grande Basin WSRA funds, or 2% of the total project cost.

The following Table details the manner in which the funds will be used:

Summary Budget for the Soil Health Projec t -Increasing the Water Holding Capacity of Soil for Agriculture Sustainability in the San Luis Valley								
Project Tasks	Total			In-Kind				Total
		WSRA	Landowners	NRCS	Soil Guys	Grad Student	RGWCEI	
Task 1: Testing	25,000	10,000	-	15,000			-	25,000
Task 2: Soil Preparation	4,946,844	-	4,946,844	-			-	4,946,844
Task 3: Nutrient Management	299,520	70,000	229,520	-			-	299,520
Task 4: Monitoring	18,600	-	-	15,000		3,600	-	18,600
Task 5: Analysis	7,000	-	-	1,200	2,500	500	2,800	7,000
Task 6: Outreach and Education	13,500	-	-	-			13,500	13,500
Task 7: Administration	92,700	18,200	-	-			74,500	92,700
TOTAL	$ 5,403,164	$ 98,200	$ 5,176,364	$ 31,200	$ 2,500	$ 4,100	$ 90,800	$ 5,403,164
Percent of Project Cost		2%	96%	1%			2%	100%

The enclosed Application details the Tasks included in the above Table.

At a regular R.G.R.T. Meeting on September 9, 2014, the R.G.R.T. Members unanimously passed a motion to recommend to the CWCB that the Project be funded $92,500.00 with WSRA Rio Grande Basin Funds.

The R.G.R.T. appreciates the support of Colorado Water Conservation Board in assisting in this effort to develop a Rio Grande Basin Water Plan that will serve as a guidance document to the Basin as it addresses the critical future water issues of the Basin, which in turn will assist in Colorado meeting its long term water needs and supplies.

Sincerely,

Michael H. Gibson
Chair, Rio Grande Basin Roundtable

Enclosure (1)

Cc: Judy Lopez, The Rio Grande Watershed Conservation & Education Initiative

COLORADO WATER CONSERVATION BOARD

WATER SUPPLY RESERVE ACCOUNT APPLICATION FORM

Today's Date:

Increasing the Water Holding Capacity of Soil for Agriculture Sustainability in the San Luis Valley

Name of Water Activity/Project

Rio Grande Watershed Conservation and Education Initiative

Name of Applicant

Rio Grande Roundtable

Amount from Statewide Account: 0.00

Amount from Basin Account(s): $98,200.00

Total WSRA Funds Requested: $98,200.00

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

FEIN: 27-1157593

Application Content

Required Exhibits

A. Statement of Work, Budget, and Schedule
B. Project Map
C. As Needed (i.e. letters of support, photos, maps, etc.)

Appendices – Reference Material

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

Instructions

To receive funding from the Water Supply Reserve Account (WSRA), a proposed water activity must be approved by the local Basin Roundtable **AND** the Colorado Water Conservation Board (CWCB). The process for Basin Roundtable consideration and approval is outlined in materials in Appendix 1.

Once approved by the local Basin Roundtable, the applicant should submit this application **with a detailed statement of work including budget and schedule as Exhibit A** to CWCB staff by the application deadline.

WSRA applications are due with the roundtable letter of support 60 calendar days prior to the bi-monthly Board meeting at which it will be considered. Board meetings are held in January, March, May, July, September, and November. Meeting details, including scheduled dates, agendas, etc. are posted on the CWCB website at: http://cwcb.state.co.us Applications to the WSRA Basin Account are considered at every board meeting, while applications to the WSRA Statewide Account are only considered at the March and September board meetings.

When completing this application, the applicant should refer to the WSRA Criteria and Guidelines available at: http://cwcb.state.co.us/LoansGrants/water-supply-reserve-account-grants/Documents/WSRACriteriaGuidelines.pdf. In addition, the applicant should also refer to the Supplemental Scoring Matrix applied to Evaluation Criteria Tiers 1-3 for Statewide Account requests .

The application, statement of work, budget, and schedule **must be submitted in electronic format** (Microsoft Word or text-enabled PDF are preferred) and can be emailed or mailed on a disk to:

Craig Godbout - WSRA Application
Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203
Craig.godbout@state.co.us

If you have questions or need additional assistance, please contact Craig Godbout at: 303-866-3441 x3210 or craig.godbout@state.co.us.

Water Supply Reserve Account – Application Form
Revised October 2013

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

1.	Applicant Name(s):	Rio Grande Watershed Conservation & Education Initiative		
	Mailing address:	PO Box 1257 0048 CR 10 North Center, Colorado 81125		
	FEIN #:	FEIN: 27-1157593		
	Primary Contact:	Judy Lopez	Position/Title:	Program Director
	Email:	judy.lopez@co.nacdnet.net		
	Phone Numbers:	Cell: 719-580-5300	Office:	719-754-3400 x110
	Alternate Contact:	Brenden Rockey	Position/Title:	Board Secretary
	Email:	brendon rockey @gmail.com		
	Phone Numbers:	Cell:	Office:	719-754-3400 x110

2. Eligible entities for WSRA funds include the following. What type of entity is the Applicant?

	Public (Government) – municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities and the local entity should be the grant recipient. Federal agencies are eligible, but only if they can make a compelling case for why a local partner cannot be the grant recipient.
	Public (Districts) – authorities, Title 32/special districts, (conservancy, conservation, and irrigation districts), and water activity enterprises.
	Private Incorporated – mutual ditch companies, homeowners associations, corporations.
	Private individuals, partnerships, and sole proprietors are eligible for funding from the Basin Accounts but not for funding from the Statewide Account.
XX	Non-governmental organizations – broadly defined as any organization that is not part of the government.

3. Provide a brief description of your organization

The Rio Grande Watershed Conservation & Education Initiative (RGWCEI) is a Colorado tax exempt corporation organized exclusively for conservation and education purposes within the meaning of Section 501(c)(3) of the United States Internal Revenue Code for nonprofit organizations. Nonprofit status was granted effective October 21, 2009.

All of the Board members of RGWCEI except for Heather Dutton are appointed or elected by the five San Luis Valley Conservation Districts, as follows: Center, Costilla, Conejos, Mosca-Hooper, and Rio Grande Conservation Districts – each of which are organizations constituting the Rio Grande Watershed Association of Conservation Districts (RGWACD or the Association).

The Rio Grande Watershed encompasses 7,828,451 acres, approximately 27% of which are farm and crop lands, 13% rangeland, 28% privately held acreages and 32% public lands. RGWCEI is the successor organization, which has taken over the conservation education activities of the Rio Grande Watershed Association of Conservation Districts (RGWACD), a grass roots community organization, which is not incorporated, but consists of various members of natural resources, conservation, and basin-wide watershed groups. RGWCEI now has full responsibility to administer, fund, and expand conservation and education activities throughout the Rio Grande Basin.

RGWCEI offers both education and conservation programs to youth, young adults, landowners and agricultural producers. The producer programs that we have sponsored were to address the San Luis Valley's declining aquifer issues that have occurred since 2002. These programs partnered with the Natural Resources Conservation Service in the development and administration of the Agricultural Water Enhancement Program (AWEP) and the Targeted Conservation Proposal (TCP). Each of these multi-year programs focused on implementing soil and water conservation within the farm unit, and collectively brought 4.2 million to the Rio Grande Basin.

The Problem: Located in the high semi-arid region of the SLV, with only 7" average precipitation on the Valley floor, agricultural output and the Valley's agronomic economy are heavily dependent on center-pivot irrigation. As the Upper Rio Grande Basin struggles with a severe and prolonged drought, groundwater levels continue to drop. The aquifer decline has dropped to an astonishing 1.3 million AF deficit, since they began tracking in 1976. The 2012 and 2013 runoff from snowmelt on the Rio Grande averaged only 60% of long term average (see SNOTEL data). With a very dry growing season, diminished precipitation, and rising temperatures, the Valley's agricultural outlook does not currently appear to be sustainable. This consequence will be devastating to the San Luis Valley economy whose main income base is agriculture.

The Solution: The Rio Grande Watershed (RGW) has long been a proponent of conservation measures in order to stabilize farming and ranching operations. One way to do this is to change farming practices by increasing the farm or ranches soil health. Soil is the base from which all crops are grown, farmers and ranchers who employ methods that improve soil health have been able to enhance water saving and increase crop quality.

The purpose of this project is to document soil health improvement levels in areas across the San LuisValley. The project will detail the agronomic feasibility of soil health by defining the methods, time frame and economics of adopting these practices while growing a variety of crops in a variety of soil types. The question addressed will be - Can growers produce economically profitable yields using less water, if they improve the farms soil health? How much water savings is possible given the crop and location? This Project will implement the practices, develop the metrics, analyze the data, and field test the economics of soil health in the San Luis Valley

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

5. Successful applicants will have to execute a contract with the CWCB prior to beginning work on the portion of the project funded by the WSRA grant. In order to expedite the contracting process the CWCB has established a standard contract with provisions the applicant must adhere to. A link to this standard contract is included in Appendix 3. Please review this contract and check the appropriate box.

[XX] The Applicant will be able to contract with the CWCB using the Standard Contract

[ ] The Applicant has reviewed the standard contract and has some questions/issues/concerns. Please be aware that any deviation from the standard contract could result in a significant delay between grant approval and the funds being available.

6. The Tax Payer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect the applicant. None

Part II. - Description of the Water Activity/Project

1. What is the primary purpose of this grant application? (Please check only one)

[ ] Nonconsumptive (Environmental or Recreational)
[XX] Agricultural
[ ] Municipal/Industrial
[ ] Needs Assessment
[XX] Education
[ ] Other Explain:

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

The project will be to implement soil health practices on conventionally farmed acreages to:

- increase water holding capacity,

- carbon
- the soils chemical, physical, and biological properties in an effort to make landscape farming in the San Luis Valley more sustainable.

The project will also develop a process that gives comprehensive soil baseline data taken both pre and post season using:

- aerial photos
- compost testing
- bulk density & earthworm studies
- soil fertility
- nematode analysis
- soil water holding capacity
- total organic data
- Irrigation water management strategies

The data will be collected and made available to agricultural producers, the Rio Grande Water Conservation District and their accompanying Subdistrict boards and CWCB.

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

	Study	XXX	Implementation

4. To catalog measurable results achieved with WSRA funds can you provide any of the following numbers?

	New Storage Created (acre-feet)
	New Annual Water Supplies Developed, Consumptive or Nonconsumptive (acre-feet)
	Existing Storage Preserved or Enhanced (acre-feet)
	Length of Stream Restored or Protected (linear feet)
	Length of Pipe/Canal Built or Improved (linear feet)
7 to 20%	5. To help us map WSRA projects please include a map (Exhibit B) and provide the general c Efficiency Savings (acre-feet/year OR dollars/year – **circle one**)
	Area of Restored or Preserved Habitat (acres)
	Other -- Explain:

Latitude: 37 to 38.5° N Longitude: 106 to 105° W

5. Please provide an overview/summary of the proposed water activity (no more than one page). Include a description of the overall water activity and specifically what the WSRA funding will be used for. A full **Statement of Work** with a detailed budget and schedule is required as **Exhibit A** of this application.
The project will give solid data that quantifies the benefits of soil health on soil water holding capacity

Overall Water Activity: Increasing the Water Holding Capacity of Soil for Agriculture Sustainability in the San Luis Valley is a project that takes conventionally farmed fields and establishes a base line of their overall soil health and then in place of conventional nutrient management additives uses biotic based nutrient management additives. These additives will be used throughout the rotation. There will be interim soil health tests taken at the end of each season that will contribute the field portfolio; at the end of the three year trial a final analysis will be completed.

One of the many benefits of using this whole picture biotic approach in farming and ranching is that nature tends to create a balance that is far more complex and elegant than anything we could come up with on our own. The methodology Biotic farming means looking at all living things, not just the crop being grown. The success of farmers using this approach has been impressive. They have reduced their water use by 30 to 60 percent and maintained or increased pack out rates. This maintains a farm income subsequently allowing for a decrease in production acres. If this type of farming were to replace the conventional standard we have gotten accustomed to, the result could be a win-win for everyone: Profitable farms , increased quality of the product produced, and reduced water consumption for all of us. The study would look at few basic tenant's:

1. Soil health through the use of biologic methods, such as compost, green manure cropping and biologic nutrient management, (ultimately replacing commercially produced compounds)will increase soil water holding capacity. How long does this take?
2. Will these biotic system changes increase pack out rates? If so, can productive land with increased pack-out be reduced thus preserving water?
3. How long does field rebound from conventional chemical management take and what are the overall water saving through the course of a two/three year crop rotation?

Use of Funds: The Watershed is requesting $98,200 from Rio Grande Basin WSRA funds. WSRA funds, or 2% of the total project cost of $5,403,164. Matching funds are as follows: $5,176,364 or 96% from the landowners;$31,200 or 1% from NRCS; $97,400 or 3% from In-kind services.

Part III. – Threshold and Evaluation Criteria

1. Describe how the water activity meets these **Threshold Criteria.** (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines.)

a) The water activity is consistent with Section 37-75-102 Colorado Revised Statutes.

By performing the field tests and monitoring studies proposed in this Project, this water activity has no effect whatsoever on Colorado's current system of allocating water, nor does it in any manner affect the existing water rights adjudication system. The purpose of this study is rather to support those systems and those rights, providing valuable processes and procedures for creating a sustainable water delivery system for irrigation. Rather than causing any injury to vested water rights or decreed conditional water rights, this Project seeks new ways to protect water supplies and improve water quality by reducing deep percolation of chemicals.

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

Please see letter from Mike Gibson, Chair of the Rio Grande Basin Roundtable.

a) The water activity meets the provisions of Section 37-75-104(2), Colorado Revised Statutes.[1] The Basin Roundtable Chairs shall include in their approval letters for particular WSRA grant applications a description of how the water activity will assist in meeting the water supply needs identified in the basin roundtable's consumptive and/or non-consumptive needs assessments.

Please see letter from Mike Gibson, Chair of the Rio Grande Basin Roundtable.

[1] 37-75-104 (2)(c). Using data and information from the Statewide Water Supply Initiative and other appropriate sources and in cooperation with the on-going Statewide Water Supply Initiative, develop a basin-wide consumptive and nonconsumptive water supply needs assessment, conduct an analysis of available unappropriated waters within the basin, and propose projects or methods, both structural and nonstructural, for meeting those needs and utilizing those unappropriated waters where appropriate. Basin Roundtables shall actively seek the input and advice of affected local governments, water providers, and other interested stakeholders and persons in establishing its needs assessment, and shall propose projects or methods for meeting those needs. Recommendations from this assessment shall be forwarded to the Interbasin Compact Committee and other basin roundtables for analysis and consideration after the General Assembly has approved the Interbasin Compact Charter.

b) Matching Requirement: For requests from the **Statewide Fund**, the applicants will be required to demonstrate a **25 percent** (or greater) match of the total grant request from the other sources, including by not limited to Basin Funds. A minimum match of 5% of the total grant amount shall be from Basin funds. A minimum match of 5% of the total grant amount must come from the applicant or 3rd party sources. Sources of matching funds include but are not limited to Basin Funds, in-kind services, funding from other sources, and/or direct cash match. Past expenditures directly related to the project may be considered as matching funds if the expenditures occurred within 9 months of the date the contract or purchase order between the applicant and the State of Colorado is executed. Please describe the source(s) of matching funds. (NOTE: These matching funds should also be reflected in your Detailed Budget in **Exhibit A** of this application)

The Watershed is requesting $98,200 from WSRA basin account funds. WSRA funds are 2% of the total project cost of $5,403,164. Matching funds are as follows: $5,176,364 or 96% from the landowners; $31,200 or 1% from NRCS; $97,400 or 2% from In-kind services.

2. For Applications that include a request for funds from the **Statewide Account**, describe how the water activity/project meets all applicable **Evaluation Criteria.** (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines and repeated below.) Projects will be assessed on how well they meet the Evaluation Criteria. **Please attach additional pages as necessary.**

Evaluation Criteria – the following criteria will be utilized to further evaluate the merits of the water activity proposed for funding from the Statewide Account. In evaluation of proposed water activities, preference will be given to projects that meet one or more criteria from each of the three "tiers" or categories. Each "tier" is grouped in level of importance. For instance, projects that meet Tier 1 criteria will outweigh projects that only meet Tier 3 criteria. The applicant should also refer to the Supplemental Scoring Matrix applied to Evaluation Criteria Tiers 1-3 for Statewide Account requests. WSRA grant requests for projects that may qualify for loans through the CWCB loan program will receive preference in the Statewide Evaluation Criteria if the grant request is part of a CWCB loan/WSRA grant package. For these CWCB loan/WSRA grant packages, the applicant must have a CWCB loan/WSRA grant ratio of 1:1 or higher. Preference will be given to those with a higher loan/grant ratio.

• **This Project only requests Rio Grande Basin funds, so this grant application requirement does not apply**.

Tier 1: Promoting Collaboration/Cooperation and Meeting Water Management Goals and Identified Water Needs

a. The water activity addresses multiple needs or issues, including consumptive and/or non-consumptive needs, or the needs and issues of multiple interests or multiple basins. This can be demonstrated by obtaining letters of support from other basin roundtables (in addition to an approval letter from the sponsoring basin).
b. The number and types of entities represented in the application and the degree to which the activity will promote cooperation and collaboration among traditional consumptive water interests and/or non-consumptive interests, and if applicable, the degree to which the water activity is effective in addressing intrabasin or interbasin needs or issues.

c. The water activity helps implement projects and processes identified as helping meet Colorado's future water needs, and/or addresses the gap areas between available water supply and future need as identified in SWSI or a roundtable's basin-wide water needs assessment.

Tier 2: Facilitating Water Activity Implementation

d. Funding from this Account will reduce the uncertainty that the water activity will be implemented. For this criterion the applicant should discuss how receiving funding from the Account will make a significant difference in the implementation of the water activity (i.e., how will receiving funding enable the water activity to move forward or the inability obtaining funding elsewhere).
e. The amount of matching funds provided by the applicant via direct contributions, demonstrable in-kind contributions, and/or other sources demonstrates a significant & appropriate commitment to the project.

o **This Project includes a matching component of 98% of Total Project Costs. This amount is currently committed and in place, as described in the Budget.**

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

f. The water activity helps sustain agriculture & open space, or meets environmental or recreational needs.
g. The water activity assists in the administration of compact-entitled waters or addresses problems related to compact entitled waters and compact compliance and the degree to which the activity promotes maximum utilization of state waters.
h. The water activity assists in the recovery of threatened and endangered wildlife species or Colorado State species of concern.
i. The water activity provides a high level of benefit to Colorado in relationship to the amount of funds requested.
j. The water activity is complimentary to or assists in the implementation of other CWCB programs.

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

Although Basin fund requests do not require this application to provide the above details, this Project accomplishes the following:

Tier 1 - Participation in this Project includes Agro Engineering, Compost Technologies, Rio Grande Watershed Conservation and Education Initiative, Rio Grande Watershed Association of Conservation Districts, Soil Guys, CPAC, and Monte Vista Co-op.

Tier 2 - The budget for this Project is sufficient to implement the Project, with a major proportion of the total Project costs borne by RGWCEI and participating landowners.

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

If this Project is successful, it will demonstrate the following:

- **Increases in irrigation efficiencies by increasing the soils water holding capacity.**
- **Increased soil tilth.**
- **Promotes water quality by reducing fertilizer, herbicide, and pesticide inputs**
- **Increases crop quality and pack out rate reducing amount of land in production.**
- **Introduces practices and procedures to meet future water needs**

- **Decreases groundwater use by reducing the amount of well pumping**

Part IV. – Required Supporting Material

1. **Water Rights, Availability, and Sustainability** – This information is needed to assess the viability of the water project or activity. Please provide a description of the water supply source to be utilized, or the water body to be affected by, the water activity. This should include a description of applicable water rights, and water rights issues, and the name/location of water bodies affected by the water activity.

The Rio Grande enters the San Luis Valley, the largest intermountain basin in Colorado, at the town of South Fork. The river then flows southeast for approximately 65 miles through Del Norte and Monte Vista to Alamosa, the largest city in the watershed, at an elevation of approximately 7,550 feet. The river turns to the south and flows for another 40 miles to the New Mexico border. The elevation at the New Mexico border is approximately 7,400 feet.
The water supply source to be utilized will be a combination of surface water and groundwater.
Name and location of water bodies affected by the water activity – Unconfined Aquifer of the Closed Basin and San Luis Valley; Subdistrict #1 and Proposed Subdistricts 2,3,4,5 and 6.
Applicable water rights, water rights issues - The State will soon implement rules and regulations within the SLV that will impact how much a well owner will be able to pump from their well. This will, in effect, restrict their water use in the future. For this trial, farmers will use their existing water rights. The intent is not to increase consumptive use but to maintain or to reduce overall consumptive use while maintaining similar or improved pack out rates, thus maximizing efficiencies of water used. This Project continues a long history of scientific and academic collaboration between agricultural partners. The final analysis will have the benefit of many years of research and data generated in the field of soil health**.**

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

No permitting issues are involved in this Project.

Related studies include the following:

Arbuscular Mycorrhizal Fungi and their Roles in the Enhancement of Crop Growth and Soil Quality

This 20-year collaboration with USDA Agricultural Research Service (ARS), Microbiologist Dr. Dave Douds explores the benefits of using arbuscular mycorrhizal (AM) fungi in crop production, using both indigenous fungi present in the soil as well as mycorrhiza inoculum produced using on-farm technology. The work is divided into two types of experiments: 1) optimizing greenhouse culture regimes to produce vegetable seedlings that are well colonized by arbuscular mycorrhizal (AM) fungi and are of sufficient size and vigor for outplanting, and 2) monitoring the growth and yield of AM fungus inoculated vs. uninoculated vegetable seedlings grown to maturity under field conditions.

Project outcomes include development of organic greenhouse inoculum medium that enables farmers to easily and economically integrate mycorrhiza inoculum into their existing practices, along with management guidelines for

propagation of native mycorrhiza populations.

Path to Organic Soil Sampling and Analysis to Determine Carbon Sequestration

The purpose of this project is to conduct soil sampling to collect and analyze data to determine carbon sequestration in the soil on nine farms in the Path to Organic Program. The Path to Organic Program provides grants to farmers switching to certified organic production practices, evaluating those practices as tools to improve soil health, protect water quality, and gather atmospheric carbon on a pilot basis outside of the traditional research environment. The goal of the Path program is to: 1) provide an incentive for farmers to make the transition to certified organic production practices; and 2) evaluate organic production practices as tools in improving soil health, protecting water quality and sequestering atmospheric carbon on a pilot basis outside of the traditional research environment. Potential changes in soil carbon at the farm sites relative to their changes in management practices (from conventional to organic) will be measured and reported. Soil carbon data will be shared with the participating farmers, giving them a better understanding of their soil carbon stocks and giving them baseline data to use for potential future carbon crediting programs.

Farming Systems Trial

The Farming Systems Trial began in 1981 as a 5-year controlled study of what a typical American grain farmer would go through to give up chemical fertilizers and pesticides, and it has matured into a complex, interdisciplinary, collaborative project. The Farming Systems Trial (FST) has provided fundamental research data on topics ranging from drought-tolerance to yield potential to water quality to economic viability, and has inspired similar long-term trials at research institutions nationally and internationally.

The trial is a 12-acre, 72 plot trial that currently compares four replications of six farming systems. The farming systems vary in their crop rotations, inputs and tillage practices. The goal of FST is to demonstrate sustainable, consistent yields in the organic systems while building ecosystem services.

So far, FST has demonstrated that, compared to conventional farming systems, organic systems can:
produce competitive crop yields, improve soil and water quality, reduce crop damage in drought years, and sequester more carbon in the soil.

- Advancing biological farming: practicing mineralized balanced agriculture to improve soils & crops Gary F.Zimmer - Leilani Zimmer-Durand - Acres U.S.A. – 2011
- Biological diversity and function in soils. Richard D.Bardgett - David W.Hopkins - Michael B.Usher -

Cambridge University Press - 2005

- The biological farmer: a complete guide to the sustainable & profitable biological system of farming

  Gary F.Zimmer - Acres U.S.A. – 2000

- Building soils for better crops: sustainable soil management

  Fred Magdoff - Harold VanEs - SARE - 2009

- Farming Systems Trial. Rodale Institute.
- Nutrient Management in Organic No-Till Systems (CIG Nutrient Management) . Zinati, Dr. Gladis. and Moyer Jeff. Rodale Institute.
-

The statement of work will form the basis for the contract between the Applicant and the State of Colorado. In short, the Applicant is agreeing to undertake the work for the compensation outlined in the statement of work and budget, and in return, the State of Colorado is receiving the deliverables/products specified. **Please note that costs incurred prior to execution of a contract or purchase order are not subject to reimbursement**. All WSRA funds are disbursed on a reimbursement basis after review invoices and appropriate backup material.

Please provide a detailed statement of work using the template in Exhibit A. Additional sections or modifications may be included as necessary. Please define all acronyms and include page numbers.

(Exhibit A follows the signature page)

REPORTING AND FINAL DELIVERABLE

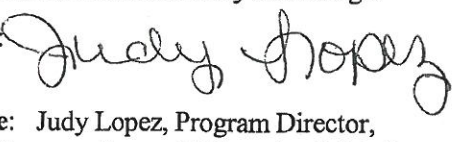
Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that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

PAYMENT

Payment will be made based on actual expenditures and invoicing by the applicant. Invoices from any other entity (i.e. subcontractors) cannot be processed by the State. The request for payment must include a description of the work accomplished by major task, and estimate of the percent completion for individual tasks and the entire water activity in relation to the percentage of budget spent, identification of any major issues and proposed or implemented corrective actions. The last 10 percent of the entire water activity budget will be withheld until final project/water activity documentation is completed. All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and help promote the development of a common technical platform.

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

Signature of Applicant: 

Print Applicant's Name: Judy Lopez, Program Director,
Rio Grande Watershed Conservation and Education Initiative

Project Title: Increasing the Water Holding Capacity of Soil for Agriculture Sustainability in the San Luis

Return an electronic version (hardcopy may also be submitted) of this application to:

Craig Godbout – WSRA Application
Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203
303-866-3441, ext. 3210 (office)
303-547-8061 (cell)
craig.godbout@state.co.us

Statement of Work

Increasing the Water Holding Capacity of Soil for Agriculture Sustainability in the San Luis Valley

OBJECTIVES/TASKS and DELIVERABLES

The study objectives are:

1. How long does it take to achieve soil health through the use of biologic methods, such as compost, green manure cropping and biologic nutrient management, (ultimately replacing commercially produced compounds) will increase soil water holding capacity.

2. Will these biotic system changes increase pack out rates? If so, can productive land with increased pack-out, reduce acres farmed thus preserving water?

3. How long does field rebound from conventional chemical management take and what are the overall water saving through the course of a two/three year crop rotation?

TASKS

TASK 1 – Testing

NRCS District and Area Technicians (District Conservationist and Program Specialist) - in-kind contribution is a NRCS estimate for cost and time. Soil tests will be collected by technicians and performed at Earthfort and Haynie labs.

Description of Task: Field technician will collect samples and send them to lab.

Method/Procedure: Samples will be collected post season, with initial samples fall 2014. Tests used will be the industry standard Earthfort and Haynie. Soil water holding capacity tests will be done locally.

Deliverable: Annual test data will be supplied to CWCB in the annual report; compilation and final analysis summary will be provided at project completion.

TASK 2 – Soil Preparation, planting, growing and harvest.

Description of Task: Farm each season as follows: Initial application of compost, develop Irrigation water management plan, monitor field preparation and tillage practices. Plant rotational crops as noted below and harvest.

Method/Procedure: Initial Application of Compost provided by Compost Technologies, Center, CO. Application rate for compost will be 2 tons per acre. Develop Irrigation water management plan with technical support from NRCS and input from participating Farmer. Do field preparation and tillage. Plant rotational crops as noted: Potatoes 30 sacks of seed per acre; Green manure $32.50 an acre; Barley (Coors) $22.00 per acre; Alfalfa $90.00 per acre. Harvest the crop and determine pack out rates.

Deliverable: This task will track the amendments applied to field, track water application and management, record seeding rates and quantify pack out rates.

TASK 3 – Nutrient Management

Description of Task: Application of Bio-blend nutrients.

Method/Procedure: Technicians will monitor and track nutrient application to crop.

Deliverable: Analysis of nutrient management changes and their effects on soil health, pack out rates and soil water holding capacity. Annual test data will be supplied to CWCB in the annual report; compilation and final analysis summary will be provided at project completion

TASK 4 – Monitoring

Description of Task: Crop, water and soil monitoring visits.

Method/Procedure: NRCS District and Area Technicians, CSU Grad Student, Soil Guys Technicians and Project manager will conduct bi-weekly monitoring of project sites during growing season. For the three years of project implementation. Monitoring will consist of several assessments that include documenting changes in water use, soil health, water holding capacity of soil and soil nutrient values.

Crop pack out rates the include a cost analysis to operation will also be tracked and compared.

Deliverable: Detailed analysis of progress and processes.

TASK 5 – Analysis

Description of Task: Monitor the site for two years using the RGHRP Sampling and Analysis Plan (SAP).

Method/Procedure: Analysis will be done by field personnel – NRCS – water management and practices used. Soil Guys and CSU Grad Student will ensure the timing and taking of samples is done and in line with industry standards. Testing will be done by Earthfort, Haynie and Agro Engineering.

Final analysis -NRCS, Soil Guys, CSU Grad student

Deliverable: Annual reports will compare and collect seasonal data and compile data to looking at soil nutrient value, microbial counts, water holding capacity, tilth and pest pressure. The annual data will then be used to form a timeline of outcomes.

TASK 6 – Outreach and Education

Description of Task: Conduct a public outreach and education program to raise awareness of soil health benefits.

Method/Procedure: Develop visual aids and written materials that discuss the process and ourcomes of soil health. Conduct field tours that present process and progress, while demonstrating the applied techniques. Present progress reports to Rio Grande Inter-basin Roundtable; quarterly Board Meetings of

the Rio Grande Water Conservancy District; Board Meetings of the San Luis Valley Water Conservancy District, and to specific public meetings. In addition, give interviews and status reports on local radio stations. Conduct an annual soil health conference for producers that provide the latest science in soil health. These will be held each January/February.

Deliverable: A public that is better informed and more aware of agriculture issues, especially regarding soil health and best managements practices, including site-specific methodologies used to achieve Project objectives. Outreach and education efforts will impress upon the public the importance of agriculture sustainability, awareness of farm/ranch conservation practices, and gain support and increase participation in future projects.

TASK 7 – Project Administration

Description of Task: Complete all necessary contracts, status reports, and internal and external documents. Ensure Tasks are completed within approved costs and timelines. Ensure complete analysis is prepared.

Method/Procedure: The RGWCEI will administer the Soil Health Sustainability Project. This includes completing contracts with the CWCB, NRCS, Project partners, landowners, and producers; insuring necessary environmental precautions are taken; managing budgets and reimbursement requests; and completing semi-annual and final reports. Additionally, the RGCEI will perform Project oversight making certain project implementation is timely and accurate. The RGWCEI will organize outreach and education efforts and complete site monitoring.

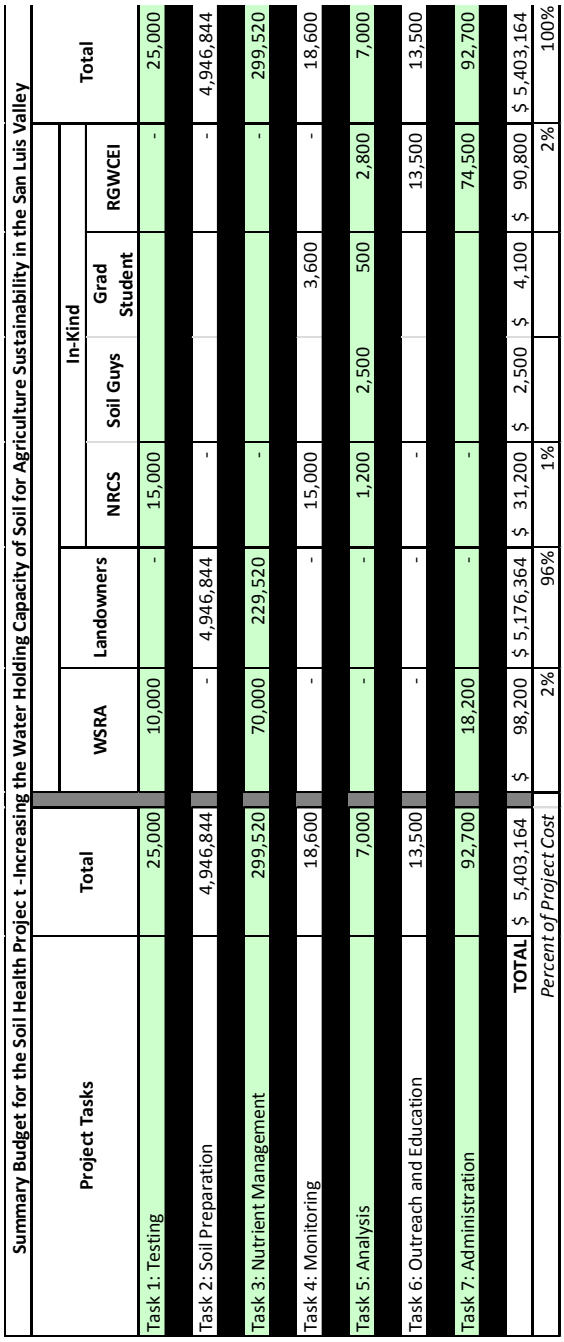
Deliverable: All appropriate contracts, external and internal reports, and on-site Project activities completed within planned period and anticipated costs.

Complete Budget By Task

Detailed Budget for the Soil Health Project - Increasing the Water Holding Capacity of Soil for Agriculture Sustainability in the San Luis Valley														
Project Tasks	Year 1*: 2014 -15	Year 2**: 2015-16	Year 3***: 2016-17		Total	Sources of Funds							Total
						Cash Contribution			In-Kind Contribution				
							WSRA	Landowners	NRCS	Soil Guys	Grad Student	RGWCEI	
Task 1: Testing													
NRCS District and Area Technicians (District Conservationist and Program Specialist) - in-kind contribution is a NRCS Estimate.	5,000	5,000	5,000	-	15,000	-	-	-	15,000			-	15,000
Soil tests performed by Earthfort and Haynie	2,000	4,000	4,000		10,000		10,000						10,000
Total Task 1	7,000	9,000	9,000	-	25,000	-	10,000	-	15,000			-	25,000
Task 2: Soil Preparation (all items based on a 120 acre circle)													
Initial Application of Compost (Compost Technologies, Center, CO) 2 tons per acre 2 $57 per ton =$ 114.00 per acre	9,120	18,240	18,240	-	45,600	-	-	45,600	-			-	45,600
Develop Irrigation water management plan in-kind technical support and Paricipatitng Farmer. (10 hours per week at $35 May - Sept)	14,000	28,000	28,000	-	70,000	-	-	70,000	-			-	70,000
Field Preparation and Tillage $120 per acre	57,600	115,200	115,200	-	288,000	-	-	288,000	-			-	288,000
Planting Potatoes 30 sacks per acre $412 an acre; Green manure $32.50 an acre; Barley (Coors) $22.00 per acre: Alfalfa $90.00 per acre	197,760	58,560	58,560	-	314,880	-	-	314,880	-			-	314,880
Harvest $400 pr acre potatoes; $250 pr acre Barley and Alfalfa; $12 pr acre green manure	192,000	182,880	241,160	-	616,040	-	-	616,040	-			-	616,040
Irrigation 1810.82 pr/ac potato; 452.72 pr/ac barley; 2710.85 pr/ac alfalfa; 287.70 pr/ac green manure	869,208	1,154,256	1,588,860	-	3,612,324	-	-	3,612,324	-			-	3,612,324
						-	-		-			-	-
Total Task 2	1,339,688	402,880	461,160	-	4,946,844	-	-	4,946,844	-			-	4,946,844
Task 3: Nutrient Management													
Bio blend products	99,840	99,840	99,840	-	299,520	-	70,000	229,520	-			-	299,520
Total Task 3	99,840	99,840	99,840	-	299,520	-	70,000	229,520	-			-	299,520
Task 4: Monitoring													
NRCS District and Area Technicians (District Conservationist and Program Specialist) - in-kind contribution is a NRCS Estimate.	5,000	5,000	5,000	-	15,000	-	-	-	15,000			-	15,000
CSU Grad Student Crop Monitor Visits $40 pr hour 1/2 in-kind-1/2 paid	1,200	1,200	1,200	-	3,600	-	-	-	-	-	3,600	-	3,600
Total Task 4	6,200	6,200	6,200	-	18,600	-	-	-	15,000	-	3,600	-	18,600
Task 5: Analysis													
Field Personnel - NRCS, Soil Guys, CSU Grad Student	2,500	1,500	1,500		5,500	-	-	-	1,200	1,500	500	2,300	5,500
Final analysis -NRCS, Soil Guys, CSU Grad student	-		1,500	-	1,500	-	-	-	-	1,000		500	1,500
Total Task 6	2,500	1,500	3,000	-	7,000	-	-	-	1,200	2,500	500	2,800	7,000
Task 6: Outreach and Education													
Project Outreach and Education; press, tours, production of materials, and volunteer coordination by the RGWCEI.	4,500	4,500	4,500	-	13,500	-	-	-	-			13,500	13,500
Total Task 7	4,500	4,500	4,500	-	13,500	-	-	-	-			13,500	13,500
Task 7: Administration													
Cost for the RGWCEI to administer the Project at the average rate of $32.50.	8,900	8,900	8,900		26,700	-	18,200	-	-			8,500	26,700
Office Support In-Kind Match: Vechicle use, office space and utilities are donated by the Natural Resources Conservation Service (NRCS). The value is $2,500 annually. Because the RGwcie has 4 active Projects, the in-kind match for the Project is 1/4 of total office support.	2,500	2,500	2,500		7,500	-	-	-	-			7,500	7,500
Project Administration In-kind Match: TheSecretary of the Rio Grande watershed Conservation and Education Initiative contributes 5 volunteer hours per week each to assist in Project Administration. The value of this time is $75.00 per hour at 260 hours per year.	19,500	19,500	19,500		58,500	-	-	-	-			58,500	58,500
Total Task 8	30,900	30,900	30,900	-	92,700	-	18,200	-	-			74,500	92,700
TOTAL	$ 1,490,628	$ 554,820	$ 614,600	$ -	$ 5,403,164	$ -	$ 98,200	$ 5,176,364	$ 31,200	$ 2,500	$ 4,100	$ 90,800	$ 5,403,164
					Percent of Project Cost	0%	2%	96%	1%	0%	0%	2%	100%

*** Year 1: 4 producers with potatoes**
**** Year 2; 4 producers barley; 2 producers alfalfa: 2 green manure**
***** Year 3: 4 producers potatoes; 2 producers alfalfa; 2 producers barley**

Summary of Project Budget



Summary Budget for the Soil Health Project -Increasing the Water Holding Capacity of Soil for Agriculture Sustainability in the San Luis Valley								
Project Tasks	Total	WSRA	Landowners	In-Kind				Total
				NRCS	Soil Guys	Grad Student	RGWCEI	
Task 1: Testing	25,000	10,000	-	15,000			-	25,000
Task 2: Soil Preparation	4,946,844	-	4,946,844	-			-	4,946,844
Task 3: Nutrient Management	299,520	70,000	229,520	-			-	299,520
Task 4: Monitoring	18,600	-	-	15,000		3,600	-	18,600
Task 5: Analysis	7,000	-	-	1,200	2,500	500	2,800	7,000
Task 6: Outreach and Education	13,500	-	-	-			13,500	13,500
Task 7: Administration	92,700	18,200	-	-			74,500	92,700
TOTAL	$ 5,403,164	$ 98,200	$ 5,176,364	$ 31,200	$ 2,500	$ 4,100	$ 90,800	$ 5,403,164
Percent of Project Cost		2%	96%	1%			2%	100%

Project Schedule

Milestone Table for the Soil Health Project-Increasing the Water Holding Capacity of Soil for Agriculture Sustainability in the San Luis Valley												
Project Tasks	**Year 1 - 2014-15**				**Year 2 - 2015-16**				**Year 3 - 2016-17**			
	Quarter 3	**Quarter 4**	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**	**Quarter 1**	**Quarter 2**
Task 1: Test												
Task 2: Soil Preparation												
Task 3: Nutrient Management												
Task 4: Monitoring												
Task 5: Analysis												
Task 6: Outreach and Education												
Task 7: Administration												

Increasing Water Holding Capacity of Soil for Agriculture Sustainability in the SLV
(Trial Location Map)