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Colorado Water Conservation Board

Water Plan Grant Application

Instructions

To receive funding for a Water Plan Grant, applicant must demonstrate how the project, activity, or process (collectively referred to as "project") funded by the CWCB will help meet the measurable objectives and critical actions in the Water Plan. Grant guidelines are available on the CWCB website.

If you have questions, please contact CWCB at (303) 866-3441 or email the following staff to assist you with applications in the following areas:

Supply and Demand Gap Projects	Gregory.Johnson@state.co.us
Water Storage Projects	Anna.Mauss@state.co.us
Conservation, Land Use Planning	Kevin.Reidy@state.co.us
Engagement & Innovation Activities	Ben.Wade@state.co.us
Agricultural Projects	Brent.Newman@state.co.us
Environmental & Recreation Projects	Linda.Bassi@state.co.us

Applicants interested in submitting an 'Intent to Apply' in the future are encouraged to check here ☐ and fill in all sections with the best information available at the time. Exhibits may be excluded.

This "Intent to Apply" will help CWCB prioritize Projects that are not ready for fully completed Water Plan Grant Application due to the initial timeframe and required deadlines.

FINAL SUBMISSION: Submit all application materials to *waterplan.grants@state.co.us* in the original file formats [Application (word); Statement of Work (word); Budget/Schedule (excel)]. Please do not combine documents.

Water Project Summary

Name of Applicant	Lefthand Watershed Oversight Group
Name of Water Project	Stewardship through Community Science

CWP Grant Request Amount	$36,000.00
Other Funding Sources Gates Family Foundation	$42,503.00
Other Funding Sources: CDBG-DR Planning Grant	$35,000
Other Funding Sources: CDBG-DR Capacity Grant	$10,154.84
Applicant Funding Contribution (LWOG Partners)	$8,000
Total Project Cost	$131,657.84

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Applicant & Grantee Information	
Name of Grantee(s)	Lefthand Watershed Oversight Group
Mailing Address	P.O. Box 1074, Niwot, CO 80544-0210
FEIN	20-1248361
Organization Contact	Jessie Olson
Position/Title	Executive Director
Email	jolson@lwog.org
Phone	(303) 746-7937
Grant Management Contact	Same as Organization Contact above
Position/Title	
Email	
Phone	
Name of Applicant (if different than grantee)	
Mailing Address	
Position/Title	
Email	
Phone	

Description of Grantee/Applicant
Provide a brief description of the grantee's organization (100 words or less).
Since 2005, Lefthand Watershed Oversight Group (LWOG), a nonprofit organization based in Boulder County, has been working to restore and protect Left Hand Creek Watershed for future generations. LWOG was founded as a watershed protection group to implement local mine clean-up activities. Since 2016, LWOG secured over ten million dollars to implement twenty flood recovery projects. These projects were designed to reduce flood risks, stabilize streambeds and banks, restore the ecological health of the watershed, and improve human health and safety. Today, LWOG strives to carry our mission under four programs: Watershed Science, Stewardship, Restoration, and Outreach and Education

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Type of Eligible Entity (check one)	
	Public (Government): Municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities. 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: Private parties may be eligible for funding.
X	**Non-governmental organizations (NGO):** Organization that is not part of the government and is non-profit in nature.
	Covered Entity: As defined in Section 37-60-126 Colorado Revised Statutes.

Type of Water Project (check all that apply)	
	Study
	Construction
	Identified Projects and Processes (IPP)
X	Other

Category of Water Project (check all that apply and include relevant tasks)	
	Supply and Demand Gap - Multi-beneficial projects and those projects identified in basin implementation plans to address the water supply and demand gap. *Applicable Exhibit A Task(s):*
	Water Storage - Projects that facilitate the development of additional storage, artificial aquifer recharge, and dredging existing reservoirs to restore the reservoirs' full decreed capacity. *Applicable Exhibit A Task(s):*
	Conservation and Land Use Planning - Activities and projects that implement long-term strategies for conservation, land use, and drought planning. *Applicable Exhibit A Task(s):*
X	Engagement & Innovation - Activities and projects that support water education, outreach, and innovation efforts. Please fill out the Supplemental Application on the website. *Applicable Exhibit A Task(s):* • Task 1 - Community Science Comprehensive Plan • Task 2 - Community Science Tools • Task 3 - Community Science Implementation
	Agricultural - Projects that provide technical assistance and improve agricultural efficiency. *Applicable Exhibit A Task(s):*
	Environmental & Recreation - Projects that promote watershed health, environmental health, and recreation. *Applicable Exhibit A Task(s):*

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	Other	Explain:

Location of Water Project	
Please provide the general county and coordinates of the proposed project below in **decimal degrees**. The Applicant shall also provide, in Exhibit C, a site map if applicable.	
County/Counties	Boulder County
Latitude	40° 7' 47" N
Longitude	105° 16' 52" W

Water Project Overview
Please provide a summary of the proposed water project (200 words or less). Include a description of the project and what the CWP Grant funding will be used for specifically (e.g., studies, permitting process, construction). Provide a description of the water supply source to be utilized or the water body affected by the project, where applicable. Include details such as acres under irrigation, types of crops irrigated, number of residential and commercial taps, length of ditch improvements, length of pipe installed, and area of habitat improvements, where applicable. If this project addresses multiple purposes or spans multiple basins, please explain. The Applicant shall also provide, in Exhibit A, a detailed Statement of Work, Budget, Other Funding Sources/Amounts and Schedule.

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Water Project Overview

This project aims to develop a Community Science Program to engage our community in watershed stewardship through citizen science using tools/platforms for effective collection, management, and sharing of data. While the focus of this plan is on Left Hand Creek Watershed, we intend to develop it with a goal of scalability and repeatability, so that it may be provided as a "toolbox" that can be applied and modified by other Colorado watersheds. CWP funding will be used to hire a consultant team that will collaborate with LWOG staff to:

1. Design a strategic community science plan that includes approaches for outreach, recruitment, data collection, evaluation, and materials for education, training, and workshops.
2. Develop tools that can be used to collect, store, manage, access, and share data, including mobile applications, data sheets, databases, and online data sharing platforms which will enable knowledge sharing through open access to information. This effort may leverage existing platforms and tools that facilitate custom citizen science project design and data sharing (e.g. citsci.org). Also develop interactive webpage to extend the impact of existing resources.
3. Provide continued oversight, management, training, workshops, and support for community science efforts in order to ensure long-lasting benefits to community.

Measurable Results

To catalog measurable results achieved with the CWP Grant funds, please provide any of the following values as applicable:

	New Storage Created (acre-feet)
	New Annual Water Supplies Developed or Conserved (acre-feet), Consumptive or Nonconsumptive
	Existing Storage Preserved or Enhanced (acre-feet)
	Length of Stream Restored or Protected (linear feet)
	Efficiency Savings (indicate acre-feet/year OR dollars/year)
	Area of Restored or Preserved Habitat (acres)
	Quantity of Water Shared through Alternative Transfer Mechanisms
	Number of Coloradans Impacted by Incorporating Water-Saving Actions into Land Use Planning
20,000 water users in Left Hand with potential to provide tools and	Number of Coloradans Impacted by Engagement Activity

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Measurable Results		
extend the reach state-wide.		
	Other	Explain:

Water Project Justification
Provide a description of how this water project supports the goals of Colorado's Water Plan, the most recent Statewide Water Supply Initiative, and the applicable Roundtable Basin Implementation Plan and Education Action Plan. The Applicant is required to reference specific needs, goals, themes, or Identified Projects and Processes (IPPs), including citations (e.g. document, chapters, sections, or page numbers). The proposed water project shall be evaluated based upon how well the proposal conforms to Colorado's Water Plan Framework for State of Colorado Support for a Water Project (CWP, Section 9.4, pp. 9-43 to 9-44;)
This project supports goals within Colorado's Water Plan, Statewide Water Supply Initiative, South Platte Roundtable Basin Implementation Plan, and South Platte Roundtable Basin Education Action Plan related to public outreach, engagement, and education, as well as promoting health and stewardship of water resources. Below we summarize goals achieved in each plan. Colorado's Water Plan *Section 6.2 (Measurable Outcomes for South Platte, pg. 6-50).* 1. *"Protect, Maintain, and Improve Conditions of Streams, Lakes, Wetlands, and Riparian Areas..."* 2. *"Develop tools and methodologies to adequately assess what is needed to protect, maintain or improve conditions of aquatic, riparian, and wetland habitat throughout the basin.* Our project will meet these goals by leveraging the power of community science to assess key parameters to protect, maintain, and improve watershed health. Sample watershed health parameters that may be measured include presence of water, channel geometry, floodplain connectivity, vegetation, invasive plant presence, water quality, water levels, species diversity, channel or bank stability, temperature, etc. To collect, manage, and publically share this information we will develop tools and methodologies such as mobile applications, databases, and protocols. These tools will be used to assess what is needed to protect, maintain or improve watershed health. *Section 6.6 (pg. 6-157) Goals:* 1. *"Support development of multipurpose projects and methods that benefit environmental and recreational water needs as well as water needs for communities or agriculture."* 2. *"Understand, protect, maintain, and improve conditions of streams, lakes, wetlands, and riparian areas to promote self-sustaining fisheries and functional riparian and wetland habitat to promote long-term sustainability and resiliency."* 3. *"Maintain watershed health by protecting or restoring watersheds that could affect critical infrastructure and/or environmental and recreational areas."* Left Hand Creek serves as the primary source of drinking water for 20,000 customers of the Left Hand Water District, as well as a source of irrigation water for farmers and ranchers. Our multipurpose project, which includes strategies for engagement, education, and development of tools, will help ensure continued stewardship in areas of Left Hand Creek which were restored to improve the ecology, health, safety, and quality of life for private landowners. As stated above,

Water Project Justification

community scientists will assess key parameters to protect, maintain, and improve watershed health in these areas.

Section 7.1 (pg. 7-10) Actions:

1. *"Monitor projects to ensure that objectives are met and maintained."*
2. *"Conduct adaptive management as necessary."*
3. *"Coordinate statewide watershed-coalition and partnership plans, projects, monitoring, and adaptive management strategies."*

Our project will directly contribute to these actions, by using an adaptive management framework (completed using separate funding) to guide stewardship of completed watershed restoration projects to ensure that objectives are met using a grassroots, watershed-coalition led approach. Further, we will help coordinate statewide watershed coalition partnerships and methodologies by making our strategic community science plan and tools scalable and repeatable where appropriate, and sharing information publically on our website.

Section 9.5 (pg. 9-53) Goals:

1. *"Colorado's Water Plan provides technical and financial assistance for high-quality, balanced, and grassroots water education and outreach efforts that inform Coloradans about the issues so that they may engage in determining Colorado's water future."*

Our watershed coalition led participatory science approach for water education and outreach is well aligned with the grassroots water education and outreach efforts described in this goal.

Statewide Water Supply Initiative

Section 8 Recommendation (pg. 8-1):

1. *"Support meeting Colorado's non-consumptive water needs by working with Colorado's water stakeholders to help: (1) Protect or enhance environmental and recreational values that benefit local and statewide economies; and (2) Encourage multi-purpose projects that benefit both water users and native species.*

This project will meet these recommendations through implementing watershed stewardship using a coalition-led participatory science approach, and sharing of plans, tools, and information to enable other watersheds and interested groups to implement a similar approach. This project will also provide opportunities to connect community scientists with professional scientists and decision-makers in the community to promote discussion and information sharing.

South Platte Basin Implementation Plan

1. *S.5.5 Protect and enhance environmental and recreation attributes. Recommendation: Fill existing data gaps regarding protection of environmental and recreational attributes in order to better understand the adequacy of existing and future protections.*

2. *S.5.9 Facilitate effective South Platte communications and outreach programs that complement the state's overall program. Recommendation: Design and implement an intensive education, participation and outreach program designed to generate a lasting baseline of public awareness and support.*

Our project meets these goals through implementation of activities that engage, educate, and inform community scientists to become watershed stewards using sound science and tested protocols. As described above, stewardship includes assessment and protection of key watershed health parameters. Our approach to community science, which involves development of a strategic community science plan is especially well aligned with S.5.9. Additionally, by developing a webpage

Water Project Justification

for our existing stewardship and adaptive management resources, we be able to provide these educational resources to a wider and more diverse audience throughout Colorado.

South Platte Basin Implementation Education Action Plan

1. *Overall goals of the Education and Outreach Committee of the South Platte Basin Roundtable include a focus on educating and engaging the public, decision-makers and elected officials on the scope and purpose of the BIP and the State Water Plan, with an overarching theme of focusing on solutions-oriented water supply planning.*

This project will help achieve this goal by empowering the public with scientific understanding of water issues through learning by doing. Through participation in community science projects, community members without scientific training/credentials will gain an improved understanding of how science can (or cannot) be used to address relevant Colorado water challenges. In turn, decision-makers and elected officials can receive feedback from informed community scientists to better understand their needs, priorities, and unique circumstances. Overall, by working together to collect data and see the resulting scientific outcomes, groups will learn from each other and participate in collaborative and productive dialogue. Also, by developing a webpage for our existing stewardship and new adaptive management resources, we be able to provide these educational resources to a wider and more diverse audience throughout Colorado.

Finally, while the focus of this goal is water supply planning, the South Platte Education Action Plan has been updated by the South Platte Basin Implementation Plan (SPBIP) which expands the scope of the Education Action Plan beyond water supply planning to include environmental and recreation education.

Related Studies

Please provide a list of any related studies, including if the water project is complementary to or assists in the implementation of other CWCB programs.

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Related Studies

This project builds upon LWOG's completed and ongoing restoration and stewardship work throughout Left Hand Creek Watershed, summarized below:

1. Since 2016, LWOG has successfully secured 100% of the funding needed to design and implement restoration projects at twenty sites along Left Hand Creek Watershed. Ten projects are complete, and the rest are on-going. These projects are designed to reduce future flood risks, stabilize the streambed and banks, restore the ecological health of the watershed, and improve the human health and safety for landowners living along Left Hand Creek and its tributaries. Funding for these recently completed projects was awarded through the Natural Resources Conservation Service (NRCS) Emergency Watershed Protection (EWP) Program and the Colorado DOLA Community Development Block Grant – Disaster Recovery (CDBG-DR).
2. In November 2017, LWOG completed a Regional Stream Stewardship & Recovery Handbook funded by CDBG-DR. The purpose of this handbook is to engage our community in stewardship by offering a compelling educational resource using simple flow chart-style tools and workshops. In developing the handbook, LWOG has taken the first step towards demonstrating the value of stewardship practices for a regional network of creek-side landowners through education. While LWOG led this project, it was a collaborative effort with three other watershed coalitions and a consultant team. Creek-side landowners and others interested in stewardship in four Front Range watersheds have responded enthusiastically to this handbook and have begun using it engage in stewardship.
3. In January 2018, LWOG started a new project which includes development of an adaptive management framework and citizen science pilot project. Under this new project funded by CDBG-DR, LWOG is working with a consultant team to frame adaptive management needs and tools for our watershed, and will pilot test this framework using a citizen science approach. The adaptive management framework will include a conceptual model and plan. The model will comprise a visual representation of the channel evolution status in the past, present, and future using a simplified classification of the dominant river styles and incorporate key watershed functions that contribute to watershed resilience. The plan will identify parameters to assess key watershed functions using quantifiable methods that are well suited for dynamic watershed processes. The framework and associated tools will be set up and ready to use by July 2018.
4. In January 2018, LWOG was awarded funding through the CWCB Watershed Restoration Grant Program to use our adaptive management framework (defined in (2) above) to monitor ten recently completed river restoration projects (defined in (1) above) and work with hired consultants and/or volunteers to implement stewardship projects if/when corrective actions are needed. The purpose of this newly funded project is to ensure the long term success of recently restored areas which face on-going maintenance needs and dynamic watershed processes.

The four efforts described above are related and complementary to our Community Science Program because they provide the need, tools, and drivers for our proposed approach. Fundamentally, our need is to ensure the long term success of restoration projects (see 1 above) using adaptive management tools (see 3 above). Currently we have funding to implement adaptive management tools (see 4 above), however through our work completed on the Regional Stream Stewardship & Recovery Handbook (see 2 above) we recognize that community participation, understanding, and buy-in are a critical driver for the long-term success of these projects and watershed resiliency. Therefore, we must develop a robust Community Science Program this is comprehensive, effective, and builds upon lessons from existing citizen sciences efforts worldwide. Using this approach, our Community Science Program will engage, educate, and empower our community members in scientific discovery, monitoring, conservation, and socio-ecological resilience.

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Related Studies

Also, to reach a wider and more diverse audience, this project includes developing a web-version of the handbook and adaptive management framework. It is well understood that tools and technology are providing increasingly more opportunities to collect and share information. By transferring the content of these resources to more user user-friendly, point-and-click interactive format, we will be able to extend their impact to a broader and more diverse audience of readers.

Previous CWCB Grants, Loans or Other Funding

List all previous or current CWCB grants (including WSRF) awarded to both the Applicant and Grantee. Include: 1) Applicant name; 2) Water activity name; 3) Approving RT(s); 4) CWCB board meeting date; 5) Contract number or purchase order; 6) Percentage of other CWCB funding for your overall project.

Lefthand Watershed Oversight Group
Emergency Watershed Protection (EWP) Assistance Phase II – 2013, Colorado Flood Recovery Project: Plains Reaches: N 41st Street, Haystack, N 63rd Street, N 73rd Street, and N 81st Street
CTPDAA2017-1652
CWCB awarded 12.5% of total project funding

Lefthand Watershed Oversight Group
Emergency Watershed Protection (EWP) Assistance Phase II – 2013, Colorado Flood Recovery Project: Foothills Reaches: Upper Left Hand/Streamcrest/Ranch
CTPDAA2017-1635
CWCB awarded 12.5% of total project funding

Lefthand Watershed Oversight Group
PDAA5000 grant fundraising support for watershed
POGG1 PDAA 201700000843
CWCB awarded 10% of total capacity funding

Taxpayer Bill of Rights

The Taxpayer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect your application.

As LWOG is a non-profit organization, TABOR issues will not affect our application.

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Submittal Checklist	
✓	I acknowledge the Grantee will be able to contract with CWCB using the Standard Contract.
Exhibit A	
✓	Statement of Work(1)
✓	Budget & Schedule(1)
	Letters of Matching and/or Pending 3rd Party Commitments(1) See budget worksheet for pending match funding. We've been invited to submit funding proposals to Gates Family Foundation and CDBG-DR Planning grant for this proposed project. Letters of commitment/award are expected by March/April.
Exhibit C	
✓	Map (if applicable)(1)
	Photos/Drawings/Reports
✓	Letters of Support (Support letter from Basin Roundtable encouraged) **LWOG has reached out to the South Platte Basin Roundtable and will present this project at the March meeting to request a letter of support.
	Certificate of Insurance (General, Auto, & Workers' Comp.) (2)
	Certificate of Good Standing with Colorado Secretary of State(2)
	W-9(2)
	Independent Contractor Form(2) (If applicant is individual, not company/organization)
Engagement & Innovation Grant Applicants ONLY	
✓	Engagement & Innovation Supplemental Application(1)

(1) Required with application.
(2) Required for contracting. While optional at the time of this application, submission can expedite contracting upon CWCB Board approval.

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

ENGAGEMENT & INNOVATION GRANT FUND SUPPLEMENTAL APPLICATION

Introduction & Purpose

Colorado's Water Plan calls for an outreach, education, public engagement, and innovation grant fund in Chapter 9.5.

The overall goal of the Engagement & Innovation Grant Fund is to enhance Colorado's water communication, outreach, education, and public engagement efforts; advance Colorado's water supply planning process; and support a statewide water innovation ecosystem.

The grant fund aims to engage the public to promote well-informed community discourse regarding balanced water solutions statewide. The grant fund aims to support water innovation in Colorado. The grant fund prioritizes measuring and evaluating the success of programs, projects, and initiatives. The grant fund prioritizes efforts designed using research, data, and best practices. The grant fund prioritizes a commitment to collaboration and community engagement. The grant fund will support local and statewide efforts.

The grant fund is divided into two tracks: engagement and innovation. The Engagement Track supports education, outreach, communication, and public participation efforts related to water. The Innovation Track supports efforts that advance the water innovation ecosystem in Colorado.

Application Questions

*The grant fund request is referred to as "project" in this application.

Overview (answer for both tracks)
In a few sentences, what is the overall goal of this project? How does it achieve the stated purpose of this grant fund (above)?
Our Stewardship through Community Science project aims to improve the stewardship ethic in our community. This will occur through participatory learning with the convenience of accessible tools and technology that will help our community better understand our watershed. While the focus of this project is the Left Hand Creek Watershed, our aim is to develop this project to be scalable and repeatable to other Colorado watersheds where appropriate. Our project will advance the stated purpose of the Engagement & Innovation Grant Fund by providing a way to inform watershed management and protection in Colorado while fostering public input, engagement, and education through direct involvement in data collection and information sharing. Additionally, this approach will be rooted in sound science, which is necessary for quantifying change and making evidence-based decisions about watershed management and protection. Lastly, our project will extend the impact of newly developed educational resources so that they may reach more diverse audiences throughout Colorado.
Who is/are the target audience(s)? How will you reach them? How will you involve the community?
In the broadest sense, our target audience is community members that can have access to mobile applications or data collection sheets, and spend time in Left Hand Creek Watershed. However, a key project task is to establish a targeted engagement strategy appropriate for the diverse interests, motivations, and commitment abilities of community members. For example, engagement strategies will be different for a single individual who visits the creek monthly compared to a landowner who lives on the creek, or a K-12 student group that participates in an annual event. However, each type of community scientist can contribute valuable data for understanding our watershed and each requires a different and unique engagement strategy. Involving the community will include developing

Overview (answer for both tracks)
a thoughtful engagement strategy that matches the need for science and adaptive management with the appropriate type of community scientist.
Describe how the project is collaborative or engages a diverse group of stakeholders. Who are the partners in the project? Do you have other funding partners or sources?
This project is inherently collaborative because it provides a way to get people connected and informed through hands-on data collection and information sharing. Through participation in community science projects, trainings, and workshops, community members without scientific training/credentials will gain an improved understanding of how science can (or cannot) be used to address relevant Colorado water challenges. In turn, scientists, resource managers, and professionals can receive feedback from community scientists to better understand their needs, priorities, and unique circumstances. Overall, by working together to collect data and see the resulting scientific outcomes, groups will learn from each other and work together towards collaborative solutions. Example opportunities for collaboration that will be developed as part of the plan include: trainings, workshops, and presentations to get the public educated and involved in data collection and interpretation. Additionally, by including tools/technology as part of the process, this project will reach individuals who are less inclined to attend events, but are happy to collaborate from the comfort of their smartphone or computer. Lastly, our targeted engagement approach (see target audience question above) will ensure that appropriate engagement strategies are matched to specific and diverse stakeholder groups. In this way, anyone interested in or concerned about watershed issues is able to become involved and learn by doing, resulting in inclusive and educational community learning. Furthermore, LWOG's commitment to collaboration is demonstrated in our mission "…to assess, protect, and restore the quality of our watershed, and to serve as a hub for watershed issues through the fostering of stakeholder collaboration." As a coalition of watershed stakeholders, LWOG has partnerships with many individuals and organizations with an interest in water resources along Left Hand Creek. Some of our significant relationships are with the landowners and residents who live along the creek, Left Hand Water District, Boulder County, City of Longmont, St. Vrain and Left Hand Water Conservancy District, Town of Jamestown, Town of Ward, James Creek Watershed Initiative, U.S. Forest Service, and Left Hand Ditch Company. All of these entities are represented on LWOG's Board and are involved in attending meetings, commenting on project plans, and coordinating LWOG's efforts with their own related stewardship efforts. LWOG also partners with academic institutions such as CU-Boulder and CSU-Fort Collins. Our other funding sources for this project include the Gates Family Foundation; Department of Local Affairs (DOLA) Community Development Block Grant – Disaster Recovery (CDBR-DR) Planning Grant; DOLA CDBG-DR Capacity Grant; Lefthand Watershed Oversight Group Stewardship Partners; and the Longmont Community Foundation Live and Give Longmont Grant. Commitment levels and status are provided in the budget.
Describe how you plan to measure and evaluate the success and impact of the project?
Measurement and evaluation will be accomplished with (1) quantitative analysis of data collected according to recommendations in LWOG's adaptive management plan and (2) qualitative evaluation of outcomes from community science efforts. Results for both types of measurement will be provided in annual summary reports, and at the conclusion of the project. 1. LWOG's adaptive management framework, which is developed as a separately funded project (see Related Studies question in general application), will provide guidance for the

Overview (answer for both tracks)
type and frequency of data that needs to be collected to ensure the long-term success of recently implemented restoration projects and will provide recommendations if/when corrective actions are needed. While this framework will be used to guide all of LWOG's adaptive management efforts, it can also be used as a means to validate the success and impact of our community science plan. To measure and demonstrate effectiveness, we will identify which parameters within the adaptive management plan are appropriate for community science, and track whether we meet the required monitoring frequencies to provide sufficient information to support decisions about the need for management actions/stewardship activities. 2. The growing popularity of community (citizen, contributory, participatory, etc.) science efforts has resulted in the development of vetted evaluation rubrics that are used to recognize this approach as a valid means to inform natural resource monitoring (see "evidence, research, and data" question below). As a key task within the community science plan, we will develop an evaluation rubric based on existing work (see references below) to assess the effectiveness of the plan in increasing indicators such as participant attitude, skills, knowledge, interest, self-efficacy, and motivation among participants with regard to watershed stewardship, science, and resource management. References for community science evaluations: Phillips, T. B., Ferguson, M., Minarchek, M., Porticella, N., and Bonney, R. 2014 User's Guide for Evaluating Learning Outcomes in Citizen Science. Ithaca, NY: Cornell Lab of Ornithology. Tredick, Catherine A., Lewison, Rebecca L., Deutschman, Douglas H., Hunt, Timothy, Gordon, Karen L., Von Hendy, Phoenix. 2017. A Rubric to Evaluate Citizen-Science Programs for Long-Term Ecological Monitoring, BioScience, 67(9): 834–844.
What research, evidence, and data support your project?
Shirk et al., 2012 describe some of the demonstrated benefits that can be achieved with a robust citizen (or community) science program. These include broad collection of landscape-scale data which can be used to inform restoration efforts (Devictor et al. 2010); influence on natural resource management decisions (McKinley et al. 2015); increased public understanding, awareness and support for conservation and stewardship (Bonney et al. 2014); and cost-efficiencies in open-source data access (Conrad and Hilchey 2011). Generally, research shows that this approach, when strategically designed, is effective to collect and share information, and improve public participation in the planning and management of local ecosystems (Tredick et al., 2017). Most importantly, a robust community science program builds socio-ecological resilience required for facing current and future complex water challenges. References: Bonney R, Shirk JL, Phillips TB, Wiggins A, Ballard HL, Miller-Rushing AJ, Parrish JK. 2014. Next steps for citizen science. Science, 343(6178): 1436-1437. Conrad CC, Hilchey KG. 2011. A review of citizen science and community-based environmental monitoring: issues and opportunities. Environmental monitoring and assessment 176(1-4):273-291. Devictor V, Whittaker RJ, Beltrame C. 2010. Beyond scarcity: citizen science programmes as useful tools for conservation biogeography. Diversity and distributions 16(3):354-62. McKinley D, Miller-Rushing A, Ballard H, Bonney R, Brown H, Evans D, French R, Parrish J, Phillips T,

Overview (answer for both tracks)
Ryan S, Shanley L, Shirk J, Stepenuck K, Weltzin J, Wiggins A, Boyle O, Briggs R, Chapin III S, Hewitt D, Preuss P, Soukup M. 2015. Can investing in Citizen Science improve natural resource management and environmental protection? Issues in Ecology 19. Shirk J, Bonney R. 2015. CitizenScience Framework Review: Informing a Framework for Citizen Science within the US Fish and Wildlife Service. Cornell Lab of Ornithology, Ithaca, NY. Tredick, Catherine A., Lewison, Rebecca L., Deutschman, Douglas H., Hunt, Timothy, Gordon, Karen L., Von Hendy, Phoenix. 2017. A Rubric to Evaluate Citizen-Science Programs for Long-Term Ecological Monitoring, BioScience, 67(9): 834–844.
Describe potential short- and long-term challenges with this project.
Generally, a short term challenge of any community science project is data reliability. Quality control and data validation protocols will need to be developed to catch mistakes and erroneous data. We can address this challenge with targeted engagement and simplicity of protocols. We can also get ahead of this challenge with strategic planning of training and workshops to anticipate and address potential pain points (e.g. species identification, complex protocols). Another challenge is repeatability and scalability. While we intend to develop this plan with a goal of providing it as a "toolbox" that can be applied and modified as needed by other Colorado watersheds, we recognize that use of a "one-size" approach for all watersheds is not possible or wise. To address this challenge we plan to identify key areas where scalability and repeatability are practical and provide recommendations regarding how to best use and adapt the plan to different needs. A long-term challenge associated with using a platform for data collection is the need for managing the mobile application, database, and associated data. This will require that LWOG continue to financially support these platforms throughout the life of this project. In developing these platforms we will work with the consultant team to make them as simple, straightforward, and user-friendly as possible. However we recognize that some maintenance will be required and have accounted for these costs in our long term budget.

Please fill out the applicable questions for either the Engagement Track or Innovation Track, unless your project contains elements in both tracks. If a question does not relate to your project, just leave it blank. Please answer each question that relates to your project. Please reference the relevant documents and use chapters and page numbers (Colorado's Water Plan, Basin Implementation Plan, PEPO Education Action Plan, etc.).

Engagement Track
Describe how the project achieves the education, outreach, and public engagement measurable objective set forth in Colorado's Water Plan to "significantly improve the level of public awareness and engagement regarding water issues statewide by 2020, as determined by water awareness surveys."
Section V (pg. 1) of the water awareness surveys identified seven key awareness topics from the Northeast Region. Among these key topics, knowledge of Colorado water use and awareness of water issues; water related concerns; and need for more information and most trusted sources will all be addressed by this project. This project will help achieve an improved level of public awareness in these three key areas by providing opportunities for community members to learn by doing. Similarly, by participating in trainings and workshops with scientists, resource managers,

professionals, and community scientists will have opportunities to discuss their concerns, needs, priorities, and unique circumstances.

Describe how the project achieves the other measurable objectives and critical goals and actions laid out in Colorado's Water Plan around the supply and demand gap; conservation; land use; agriculture; storage; watershed health, environment, and recreation; funding; and additional.

Colorado's Water Plan

Section 6.2 (Measurable Outcomes for South Platte, pg. 6-50).

1. *"Protect, Maintain, and Improve Conditions of Streams, Lakes, Wetlands, and Riparian Areas..."*
2. *"Develop tools and methodologies to adequately assess what is needed to protect, maintain or improve conditions of aquatic, riparian, and wetland habitat throughout the basin.*

Our project will meet these goals by leveraging the power of community science to assess key parameters to protect, maintain, and improve watershed health. Sample watershed health parameters that may be measured include presence of water, channel geometry, floodplain connectivity, vegetation, invasive plant presence, water quality, water levels, species diversity, channel or bank stability, temperature, etc. To collect, manage, and publically share this information we will develop tools and methodologies such as mobile applications, databases, and protocols. These tools will be used to assess what is needed to protect, maintain or improve watershed health.

Section 6.6 (pg. 6-157) Goals:

1. *"Support development of multipurpose projects and methods that benefit environmental and recreational water needs as well as water needs for communities or agriculture."*
2. *"Understand, protect, maintain, and improve conditions of streams, lakes, wetlands, and riparian areas to promote self-sustaining fisheries and functional riparian and wetland habitat to promote long-term sustainability and resiliency."*
3. *"Maintain watershed health by protecting or restoring watersheds that could affect critical infrastructure and/or environmental and recreational areas."*

Left Hand Creek serves as the primary source of drinking water for 20,000 customers of the Left Hand Water District, as well as a source of irrigation water for farmers and ranchers. Our multipurpose project, which includes strategies for engagement, education, and development of tools, will help ensure continued stewardship in areas of Left Hand Creek which were restored to improve the ecology, health, safety, and quality of life for private landowners. As stated above, community scientists will assess key parameters to protect, maintain, and improve watershed health in these areas.

Section 7.1 (pg. 7-10) Actions:

1. *"Monitor projects to ensure that objectives are met and maintained."*
2. *"Conduct adaptive management as necessary."*
3. *"Coordinate statewide watershed-coalition and partnership plans, projects, monitoring, and adaptive management strategies."*

Our project will directly contribute to these actions, by using an adaptive management framework (completed using separate funding) to guide stewardship of completed watershed restoration projects to ensure that objectives are met using a grassroots, watershed-coalition led approach. Further, we will help coordinate statewide watershed coalition partnerships and methodologies by making our strategic community science plan and tools scalable and repeatable where appropriate, and sharing information publically on our website.

Section 9.5 (pg. 9-53) Goals:

1. *"Colorado's Water Plan provides technical and financial assistance for high-quality, balanced, and grassroots water education and outreach efforts that inform Coloradans about the issues so that they may engage in determining Colorado's water future."*

Our watershed coalition led participatory science approach for water education and outreach is well aligned with the grassroots water education and outreach efforts described in this goal.

Describe how the project achieves the education, outreach, and public engagement goals set forth in the applicable Basin Implementation Plan(s).

South Platte Basin Implementation Plan

1. *S.5.5 Protect and enhance environmental and recreation attributes. Recommendation: Fill existing data gaps regarding protection of environmental and recreational attributes in order to better understand the adequacy of existing and future protections.*

2. *S.5.9 Facilitate effective South Platte communications and outreach programs that complement the state's overall program. Recommendation: Design and implement an intensive education, participation and outreach program designed to generate a lasting baseline of public awareness and support.*

Our project meets these goals through implementation of activities that engage, educate, and inform community scientists to become watershed stewards using sound science and tested protocols. As described above, stewardship includes assessment and protection of key watershed health parameters. Our approach to community science, which involves development of a strategic community science plan is especially well aligned with S.5.9. Additionally, by developing a webpage for our existing stewardship and adaptive management resources, we be able to provide these educational resources to a wider and more diverse audience throughout Colorado.

Describe how the project achieves the basin roundtable's PEPO Education Action Plans.

South Platte Basin Implementation Education Action Plan

1. *Overall goals of the Education and Outreach Committee of the South Platte Basin Roundtable include a focus on educating and engaging the public, decision-makers and elected officials on the scope and purpose of the BIP and the State Water Plan, with an overarching theme of focusing on solutions-oriented water supply planning.*

This project will help achieve this goal by empowering the public with scientific understanding of water issues through learning by doing. Through participation in community science projects, community members without scientific training/credentials will gain an improved understanding of how science can (or cannot) be used to address relevant Colorado water challenges. In turn, decision-makers and elected officials can receive feedback from informed community scientists to better understand their needs, priorities, and unique circumstances. Overall, by working together to collect data and see the resulting scientific outcomes, groups will learn from each other and participate in collaborative and productive dialogue. Also, by developing a webpage for our existing stewardship and new adaptive management resources, we be able to provide these educational resources to a wider and more diverse audience throughout Colorado.

Finally, while the focus of this goal is water supply planning, the South Platte Education Action Plan has been updated by the South Platte Basin Implementation Plan (SPBIP) which expands the scope of the Education Action Plan beyond water supply planning to include environmental and recreation education.

Innovation Track
Describe how the project enhances water innovation efforts and supports a water innovation ecosystem in Colorado.
Describe how the project engages/leverages Colorado's innovation community to help solve our state's water challenges.
Describe how the project helps advance or develop a solution to a water need identified through TAP-IN and other water innovation challenges. What is the problem/need/challenge?
Describe how this project impacts current or emerging trends; technologies; clusters, sectors, or groups in water innovation.

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Colorado Water Conservation Board
Water Plan Grant - Exhibit A

Statement Of Work	
Date:	2/1/2018
Name of Applicant:	Lefthand Watershed Oversight Group
Name of Water Project:	Stewardship through Community Science
Funding Source:	• Gates Family Foundation • Department of Local Affairs (DOLA) Community Development Block Grant – Disaster Recovery (CDBR-DR) Planning Grant • DOLA CDBG-DR Capacity Grant • Lefthand Watershed Oversight Group Partners • Longmont Community Foundation Live and Give Longmont Grant

Water Project Overview: Please provide a summary of the proposed water project (200 words or less). The same summary can be used from Page 5 of the CWP Grant Application.

This project aims to develop a Community Science Program to engage our community in watershed stewardship through citizen science activities using tools/platforms for effective collection, management, and sharing of collected data. Our goal is to engage, educate, and empower our community members in scientific discovery, monitoring, conservation, and socio-ecological resilience. This will help determine the effectiveness of post-flood stream restoration projects and mine clean-up activities. To accomplish this goal we must develop a robust community science plan that is comprehensive, effective, builds upon lessons from existing citizen science efforts worldwide. While the focus of this program is on Left Hand Creek Watershed, we intend to develop it with a goal of scalability and repeatability, so that it may be provided as a "toolbox" that can be applied and modified as needed by other Colorado watersheds. Also, this project aims to extend the impact of our Regional Stream Stewardship and Recovery Handbook and Adaptive Management Framework through the development of an interactive webpage so that theses educational resources may reach a wider and more diverse audience throughout Colorado.

Objectives: List the objectives of the project.

Objective 1. Design a strategic community science plan that includes approaches for outreach, recruitment, data collection protocols, evaluation, and materials for education, training, and workshops.

Objective 2. Develop tools that can be used to collect, store, manage, access, and share data, including mobile applications, data sheets, databases, and online data sharing platforms which will enable knowledge sharing through open access to information. This effort may leverage existing technology platforms and tools that facilitate custom citizen science project design and data sharing (e.g. citsci.org).

Objective 3. Provide continued oversight, management, training, workshops, and support for community science efforts in order to ensure long-lasting benefits to community.

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Tasks
Provide a detailed description of each project task using the following format:
Task 1 – Community Science Strategic Plan
Description of Task:

The purpose of this task is to develop a strategic community science plan using best management practices for citizen science. The plan will include detailed strategies for all aspects of a successful community science program from initial outreach and recruitment strategy all the way to open-source sharing of data. While this plan will be developed for Left Hand Creek Watershed, our intent is for this to be transferable and repeatable across watersheds and used on restoration projects throughout the region.

- Subtask 1.1: Program Strategy
  - Develop an overall program strategy identifying key elements necessary for a successful community science program using best management practices for citizen science.
  - Complete research and outreach to other experts and review literature to leverage recommendations and experience from existing citizen science programs.
- Subtask 1.2: Outreach and Engagement Strategy
  - Identify and develop specific outreach strategies for a community science program.
  - Consider unique approaches for diverse potential community science groups including youth, private landowners, school groups, recreational users (cyclists, fisher people, etc.), or those who prefer not to attend workshops but want to participate using mobile applications.
  - Consider and incorporate approaches for opportunities to connect community scientists with professional scientists and decision-makers in the community to promote discussion and information sharing.
- Subtask 1.3: Community Science Data Collection Protocol Development
  - Using LWOG's adaptive management framework, identify parameters that are appropriate for a community science approach and develop protocols and datasheets to measure and record these parameters. Protocols should be developed for targeted community scientists (as identified in Subtask 1.2).
  - Protocols must be new and different from those developed as part of LWOG's currently funded CDCB-DR citizen science pilot project.
- Subtask 1.4: Develop Educational Materials and Strategy for Workshops and Trainings
  - Develop strategy and materials for community science workshops and trainings so that LWOG staff can lead future workshops and training for community science groups.
  - Consider and incorporate approaches for opportunities to connect community scientists with professional scientists and decision-makers in the community to promote discussion and information sharing.
- Subtask 1.5: Host workshop
  - Consultants will host one informational workshop to kick off implementation of the community science program and provide training for community scientists.
- Subtask 1.6: Final report
  - Develop final report for a strategic community science plan that LWOG staff can implement to build our community science program.
  - Final report should identify key areas where scalability and repeatability are practical and provide recommendations regarding how to best use and adapt the plan to the needs of other watersheds.
  - Final report should also include evaluation rubric to measure the effectiveness of the plan in achieving enhanced scores for indicators such as participant attitude, skills, knowledge, interest, self-efficacy, and motivation among participants with regard to

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Tasks
watershed stewardship, science, and resource management. This should leverage existing evaluation resources (e.g. Phillips, et al., 2014 User's Guide for Evaluating Learning Outcomes in Citizen Science. Ithaca, NY: Cornell Lab of Ornithology; Tredick et al., 2017, A Rubric to Evaluate Citizen-Science Programs for Long-Term Ecological Monitoring).
Method/Procedure:
LWOG will lead and manage consultants in the development of the strategic community science plan. This will start with development of an overall strategy for the plan (as defined in subtask 1.1), with particular emphasis on specific strategies for each element defined in subtasks 1.2 – 1.5. LWOG staff with work closely with the consultant team to develop each part of the plan to ensure that is workable and usable for staff to implement and modify as needed (as defined in task 3). To address our goal of repeatability and scalability, so that this plan is transferable to other watersheds where appropriate, LWOG staff will work with consultants to invite participation from other watershed groups, stakeholders, and interested parties.
Grantee Deliverable: Describe the deliverable the grantee expects from this task
The deliverable will be a strategic community science plan provided in final report format that LWOG can implement for the long-term benefit of our community, provide to other watersheds or interested groups, and share on LWOG's website. The plan will be provided in an editable format so that it may be modified and updated as needed by LWOG staff or other users.
CWCB Deliverable: Describe the deliverable the grantee will provide CWCB documenting the completion of this task
LWOG will provide CWCB with a memorandum describing accomplishments, challenges, and lessons learned associated with this task, as well as a copy of the completed plan.

Tasks
Provide a detailed description of each task using the following format:
Task 2 – Community Science Tools
Description of Task:
The purpose of this task is to develop tools that can be used to collect, edit, review, publish, and share data collected by community scientists, and to develop an interactive webpage to extend the impact of existing educational resources. • Subtask 2.1: Develop tools that can be used to collect, edit, review, publish, and share data collected by community scientists.   ○ This will primarily include a mobile application that can be used on smartphones for data collection. This will also include an integrated database where data will be stored and checked for quality control. Lastly, this will include a way to share this data online so that it is publically available to any interested users. Work on this task should leverage existing resources such as CitSci.org which provide an existing platform that includes tools for building custom data sheets, analyzing collected data, and gathering participant feedback for citizen science projects. This task also includes fees and work associated with platform maintenance over a three-year period, including basic bug-fixes and hosting fees.

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• Subtask 2.2: Develop interactive webpage for LWOG's existing Regional Stewardship and Recovery Handbook and Adaptive Management Framework.   ○ Develop webpage on LWOG's website which converts handbook and framework materials into website format that is more interactive and accessible to extend the impact of both resources. Include subpages for specific sections that are more easily searchable and optimize search engine recognition.
Method/Procedure:
LWOG will oversee consultants that will convert datasheets developed under task 1.3 for use on a mobile application which allows community scientists to download the application on their smartphones, input data into selected datasheets, and upload data to online databases. LWOG will also work with consultants to develop and implement protocols for quality control, management, and sharing of collected data. This task will rely heavily on existing tools and technologies for citizen science, such a Colorado State University based CitSci.org, which has a developed platform of tools to support building custom datasheets, managing users, analyzing collected data, and gathering participant feedback. Using an existing platform will eliminate much of the need for back end application development and will allow focus of efforts on front end datasheet and sharing methods and goals. LWOG will oversee consultants in developing a webpage as described in subtask 2.2 and review content.
Grantee Deliverable: Describe the deliverable the grantee expects from this task
At the completion of this task LWOG will receive a custom mobile application that can be used by community scientists to collect data, which is uploaded to LWOG databases, and shared publically on LWOG's website after ongoing quality control procedures. LWOG will also receive an interactive webpage, which will be available to all website visitors, featuring the Regional Stewardship Handbook and Adaptive Management Framework in more accessible and user-friendly formats.
CWCB Deliverable: Describe the deliverable the grantee will provide CWCB documenting the completion of this task
LWOG will provide CWCB with a memorandum describing accomplishments, challenges, and lessons learned associated with this task, and CWCB will be able to use the completed application and interactive webpages.

Tasks
Provide a detailed description of each task using the following format:
Task 3 – Community Science Implementation
Description of Task:
The purpose of this task is for LWOG staff to implement, oversee, manage, and support the Community Science Program for three years using the plan and tools developed under the first two tasks. LWOG staff will retain contracts with the consultant team to provide as-needed support with training sessions and data management, analysis, and sharing. • Subtask 3.1: Recruit community scientists   ○ Implement outreach and recruitment strategies developed under task one. • Subtask 3.2: Train community scientists

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- Implement training and workshop strategies developed under task one.

- Subtask 3.3: Oversight and management of community scientists
  - Working directly with community scientists to provide support and oversight as needed
- Subtask 3.4: Data management, analysis, and sharing
  - Quality control, management, analysis, summaries, interpretation, graphical presentation, online sharing, and providing support to data users.
- Subtask 3.5: Annual Report
  - Develop report describing accomplishments, challenges, and lessons learned associated with this task, as well as a report summarizing how data collected was used to inform stewardship and effectiveness of community science approach.
- Subtask 3.6: Other direct cost
  - Office supply, printing, and poster board materials.

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Method/Procedure:

LWOG staff will implement plan strategies described in subtasks 1.2 – 1.4 based on best management practices for citizen science identified under subtask 1.1, engaging consultants as needed to provide technical support. While the specific strategies involved in coordinating the Citizen Science Program will be developed in the first task, LWOG anticipates:

- Hosting up to four targeted (for specific groups such as K-12 classrooms or local farm) workshops/training sessions annually for three years;
- Disseminating educational materials developed under subtask 1.4 to local schools, teacher training programs, and existing environmental education groups;
- Implementing and gaining expertise in community science protocols so that staff can oversee community scientists and troubleshoot protocols and tools as needed;
- Providing opportunities, as needed or requested, to support community scientists through small informal meetings, check-ins, and regular communication;
- Presenting Community Science Program at conferences, such as the Colorado Watershed Assembly;
- Providing the Community Science Program as a "tool box" for other interested watersheds;
- Evaluating and measuring the effectiveness of the Community Science Program using rubrics develop under subtask 1.6 and guidance in the adaptive management plan (separately funded).

LWOG staff will also leverage knowledge using Microsoft Excel and Access, and Program R to maintain and manage databases, quality control data using protocols established under task two, share data online, provide support for data users and interested parties, and analyze data to report findings.

Grantee Deliverable: Describe the deliverable the grantee expects from this task

At the completion of this task LWOG will be managing an effective Community Science Program with a network of participants engaged in stewardship through citizen science activities using tools/platforms for collection, management, and sharing of collected data.

CWCB Deliverable: Describe the deliverable the grantee will provide CWCB documenting the completion of this task

LWOG will provide CWCB with a memorandum describing accomplishments, challenges, and lessons learned associated with this task, as well as a report summarizing how data collected was used to inform stewardship and effectiveness of community science approach.

Budget and Schedule

This Statement of Work shall be accompanied by a combined Budget and Schedule that reflects the Tasks identified in the Statement of Work and shall be submitted to CWCB in excel format.

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Reporting Requirements

Progress Reports: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of issuance of a purchase order, or the execution of a contract. The progress report shall describe the status 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. The CWCB may withhold reimbursement until satisfactory progress reports have been submitted.

Final Report: At completion of the project, the applicant shall provide the CWCB a Final Report on the applicant's letterhead that:

- Summarizes the project and how the project was completed.
- Describes any obstacles encountered, and how these obstacles were overcome.
- Confirms that all matching commitments have been fulfilled.
- Includes photographs, summaries of meetings and engineering reports/designs.

The CWCB will withhold disbursement the last 10% of the budget until the Final Report is completed to the satisfaction of CWCB staff. Once the Final Report has been accepted, and final payment has been issued, the purchase order or grant will be closed without any further payment.

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Water Conservation Board

Water Plan Grant - Exhibit B
Budget and Schedule

Date: 2/1/2018

Name of Applicant: Lefthand Watershed Oversight Group

Name of Water Project: Stewardship through Community Science

Task No.	Task Description	Start Date	End Date	Grant Funding Request	Match Funding	Total
1	Community Science Comprehensive Plan	7/15/2018	11/15/2018	$ 10,740.00	$ 16,710.28	$27,450.28
2	Community Science Tools	7/15/2018	1/15/2019	$ 10,260.00	$ 53,444.56	$68,444.56
3	Community Science Implementation	1/15/2019	7/15/2021	$ 15,000.00	$ 25,503.00	$40,503.00
			Total	**$36,000**	**$95,658**	**$131,657.84**