CENTER FOR
ReSource Conservation

May 12, 2017

Kevin Reidy and Ben Wade
Office of Water Conservation and Drought Planning Section
Colorado Water Conservation Board
1313 Sherman St, Room 721
Denver, CO 80203

Dear Mr. Reidy and Mr. Wade,

We are excited to present you with a full proposal to request funding from the Water Efficiency Grant Program Fund to support our effort to study turf removal and replacement efforts from the prospective of the homeowner in order to learn tactics and incentives that will help to make landscape change projects feasible and more attractive to Colorado residents. Additionally, funding will contribute to up to 20 residential turf removal projects across the Front Range.

The goal of this project is to identify and educate the conservation community on the most motivating incentives for homeowners related to turf removal. Specifically, the three main goals of this project are:

- To research turf removal and replacement programs across the country in an effort to identify innovative program models, success rates of given models, and feasibility of implementation in Colorado.
- To implement turf removal and replacement projects at up to 20 homes across the Front Range. Each project will remove a minimum of 200 square feet of turf and will include detailed communication and follow-up with participants.
- To provide data and guidance for the conservation community around which barrier, once removed, spurs homeowner action around landscape change the most. Additionally, provide sample program models and details around costs and a framework of each methodology.

The total cost of this project will be $61,169, and CRC is asking for $45,449 in support from the CWCB. As well as CWCB funds, CRC and partnering municipalities will contribute $15,720 of in-kind work.

Sincerely,

Kate Larson
Program Director: Water & Energy
klarson@conservationcenter.org

Morgan Shimabuku
Senior Manager of Sustainability Programs
mshimabuku@conservationcenter.org

Center for ReSource Conservation
2639 Spruce Street
Boulder, CO 80302
303-999-3820

Water Efficiency Grant Program Fund Application:

Version Date: 4/4/2017

Applicant: Center for ReSource Conservation (CRC)

Project Name: Best Practice for Turf Removal and Replacement Project

Goal: To study and implement a variety of turf removal and replacement program models in cities across Colorado's Front Range to determine which barriers to action, once removed, motivate homeowners the most.

Funds Requested: $ 45,449

In-Kind Matching Funds: $ 15,720

Contact: Kate Larson, Program Director: Water & Energy
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Project Summary

Turf Removal and Replacement programs are increasingly part of the long-term water conservation solution for many water providers in Colorado. As new programs continue to emerge, it is important to assess their desirability, effectiveness, and accessibility to residents. What is the optimal design for a Turf Removal and Replacement program? Are the current programs that exist in Colorado built around solving the right problem for the homeowner, or have they developed more from convenience to the water provider or program implementer? The Center for ReSource Conservation (CRC) hopes to answer these questions through an innovative study and implementation pilot that will work with communities and individuals to find the best combination of incentives and program design.

We will begin looking across the state and country at turf removal programs, evaluating which have seen the highest levels of success and water conservation impacts and which have been most cost effective. Based on these findings we will develop at least four different program designs that seek to remove a specific barrier for the homeowner. For example: the

homeowner may not be physically able to do the labor, they may not have the funds, or they may lack design expertise or knowledge about what to replant. We will then implement programs with specific solutions to these barriers in up to four communities across the Front Range. Next we will identify criteria for selecting the ideal landscapes and recruit homeowners from the group of 2017 participants of the Slow the Flow Sprinkler Inspection program. Homeowners who agree to take part in the project will each receive an incentive, with which they will work to complete a landscape transformation. We will monitor participants through email, surveys, and phone interviews to gather data on the responses and actions of these individuals to learn about their process and evaluate key indicators of project success in turf removal and replacement, ease, associated costs, and effort.

Finally, we will compile a report outlining the findings of the research and implementation project providing the pros and cons of the different Turf Removal and Replacement program designs. We will distribute findings to the water conservation community both in Colorado and beyond through sharing the written report, presenting at local conferences and seeking opportunities such as via a webinar or a 'Lunch and Learn' to further share findings.

The results of this project will directly contribute to the notable 400,000 acre-foot water conservation goal outlined in the Colorado Water Plan. Landscape change will be a key part of this savings and establishing best practices and gathering data will help many communities be more successful in implementation. The South Platte/Metro basin has identified a complimentary goal of continuing leadership in water wise use and will work to reduce residential outdoor water use by 15%. Through working with municipalities and individuals directly in the Front Range the results will not only be highly transferable to other water providers but will contribute to the South Platte and Metro basin's efforts to remain on the cutting edge of conservation practices and thought leadership.

Project Background

The Center for ReSource Conservation is a nonprofit organization that works across the state of Colorado in partnership with water utilities to put conservation into action. More specifically, we serve over 30 Colorado communities through implementing residential and commercial, indoor and outdoor, water conservation programs. We bring significant expertise in working with municipalities and homeowners around landscape change. For the past 20 years we have run the very popular Garden In A Box program, supplying over 13,000 garden kits to Colorado residents, and converting more than 1 million square feet of landscape to Xeriscape. Through this program we have worked to understand how homeowners make

decisions about their landscapes and have successfully provided them resources, products, and services to make the xeric perennial garden a staple of Colorado yards.

In 2016 we worked with the City of Lafayette to design and implement a Turf Removal and Replacement pilot program within the community. The program incentivized individuals to remove at least 200 square feet of turf by offering an equivalent sized professionally designed Garden In A Box kit to replace the turf. During the initial year, we saw 26 individuals remove an average of 600 square feet of turf. Through working on this pilot, we gained hands-on knowledge of the inner workings of turf removal and replacement programs and the associated challenges. In 2017, we will run this program again in Lafayette as well as in the City of Thornton.

Another strength we have is in conducting research projects and data analysis. In 2012-2014, the CWCB provided us with funding to study the water saving impact of Slow the Flow, our sprinkler inspection program. In 2016, our staff published the findings from this effort in a peer-reviewed journal[1]. We have also been contracted for data analysis to assess the impact of high-efficiency rotary nozzles for a local Colorado water district, to measure watering efficiency at several major parks in the Town of Castle Rock, and to research the outcomes of the most recent California drought on water savings in order to identify transferrable programs and practices for Colorado communities. During this last effort, we conducted interviews of California based water professionals, issued a community survey to 1,000 randomly selected community members, and led two focus group sessions with citizens in the Colorado community to better understand barriers to participating in water conservation programs.

With years of experience implementing landscape change programs and working with cities and individuals, we are well poised to assist the conservation community in solving the mystery of what really motivates homeowners to tackle turf removal projects. With more and more cities and municipalities looking into landscape change programs, we are uniquely prepared to work on behalf of the entire Front Range community to investigate the topic thoroughly, pilot the implementation of potential solutions in multiple areas, and share results and findings.

[1] Shimabuku M., Stellar D., and Mayer P., 2016, Impact Evaluation of Residential Irrigation Audits on Water Conservation in Colorado. Journal AWWA. http://dx.doi.org/10.5942/jawwa.2016.108.0076

Project Goals

The main goals of the project include:

- To research turf removal and replacement programs across the country in an effort to identify innovative program models, success rates of given models, and feasibility of implementation in Colorado.
- To implement turf removal and replacement projects at up to 20 homes across the Front Range. Each project will remove a minimum of 200 square feet of turf and will include detailed communication and follow-up with participants.
- To provide data and guidance for the conservation community around which barrier, once removed, spurs homeowner action around landscape change the most. Additionally, provide sample program models and details around costs and a framework of each methodology.

Project Scope of Work

The scope of the project includes six tasks, beginning with a research phase in which we will gather data from other Turf Removal and Replacement programs and homeowners. Next we will design and implement four different Turf Removal and Replacement program models, and finally we will analyze data and present findings and recommendations. Details of each task and their associated deliverables are described below.

Task 1: Background Research

To develop a better understanding of what types of turf removal programs already exist and how they function, we will consult with municipalities in Colorado and national leaders in the conservation field from across the country regarding current Turf Removal and Replacement programs to find out how these programs operate, and what challenges and successes they have realized. Additionally, we will learn about the scope and scale of these programs, what is required of homeowners participating in these programs, and associated costs to the homeowners and utilities. We will also do a literature review of the most current studies and reports related to turf removal across the country.

We will then conduct research to develop a better understanding of what the greatest barriers and motivations are for residents participating (or not participating) in turf removal and replacement. CRC will work with Colorado residents to learn more about their unique motivations and hesitancies related to landscape change. We will conduct a focus group and an

online survey to gather this information. Homeowners will be chosen from CRC's program participants and potentially from other groups in CRC's partner cities.

The research will help us learn how to approach irrigation systems relative to removing turf – what works and what does not, what has been tried and what has not. We will also attempt to understand the methods that residents have used to remove turf (e.g. a sod cutter, solarization, physical digging, sheet covering, Round Up, etc). By the end of this task we seek to have a better idea of what program structures and barriers to residents exist, in order to inform program design for the implementation phase.

Task 2: Program Design

Based on findings from Task 1, we will select 3-4 program implementation methods for orchestrating a turf removal program. These methods will eliminate the largest barriers keeping residents from removing their turf and replacing it with water-wise landscaping; for example: cost, picking the plants, changing irrigation, physically removing the turf, etc. For each of these 3-4 methods, we will design a unique turf removal and replacement program structure.

Each program structure will include detailed documentation of what CRC's role will be in each process and associated costs and staffing. For example, if a turf cutter and associated labor are selected, we will document costs of a rental agreement, transportation of equipment, labor needs, additional tools required, role of CRC, role of homeowner, timeline of project, and expected outcomes.

The goal of this task is to create a balanced variety of program structures to experiment with. Each of the 3-4 program design methods will remove a different barrier(s) for the resident, which will allow us to gauge the effectiveness of each method. Additionally, we will have all processes and roles documented in order to properly communicate with participants around expectations.

Task 3: Recruitment and Surveys

The Center for ReSource Conservation will select up to 20 homeowners from four or five different municipalities to participate in one of our program designs from Task 2. All participants will start by receiving a Slow the Flow sprinkler inspection funded by our water provider partners. As part of this service, staff will be trained to select and engage eligible candidates for this turf removal study program ensuring that we find a qualified pool of homeowners, based on the key aspects of landscape transformation (criteria may include irrigation system specifications, size of turf area, etc.), and who have an interest in landscape change. Also, based on our background research, we will be able to come up with more specific

criteria/requirements for selecting an ideal candidate that the Slow the Flow auditor can use in making their recommendation. All recruits must be willing to participate in follow-up surveys, phone calls, visits, and will be expected to perform a varying amount of labor and incur associated costs.

Included in the recruitment, we will provide all participants with an intake form that details all of the requirements, timeline, rules and regulations, potential costs, and a liability waiver. Additionally, we will require images of the landscape and a site drawing for what changes the homeowner plans on making with the help of the program. Our staff will provide guidance and necessary assistance with this step.

We will also design surveys that assess the 16-20 participant's progress, challenges, and successes before, during, and after the program has been implemented. These surveys will especially focus on which program components and/or incentives lead to the greatest program success with questions geared at comparing the experiences of the participants in a methodical way. These surveys will be strategically designed based on all of our background research to help us uncover what makes a turf replacement program successful. We want to select ideal candidates that will supply us with the data that we need to assess the success of each of the 3-4 program designs.

Task 4: Program Implementation

Working within our program designs from Task 2, we will begin the exciting phase of landscape transformations by guiding the participants through the turf removal process. Our staff involvement will vary based on the design of the particular program. We anticipate that for some program designs we will need to consult with local landscape designers or sprinkler companies in order to provide participants with a complete service.

CRC's responsibilities in this task include customer service, scheduling, labor (if applicable), and providing the homeowners with relevant information to ensure project completion. CWCB funds will be used directly on labor costs and the identified barrier removal. Each homeowner will be responsible for any labor or material costs not associated with the identified barrier. At the close of this task item the goal is for there to be 16-20 homes in the Front Range of Colorado that have removed at a minimum 200 square feet of turf following 3-4 different program designs that each tackle a unique barrier to turf removal.

Task 5: Follow-Up Surveys and Information Gathering

The Center for ReSource Conservation will send out the pre-designed follow up surveys to gather information from participants that will help us to assess the success and effectiveness of each program design model. This may also include home visits, interviews, and water usage

analysis. We will also complete an internal program evaluation which will summarize with how much difficulty or ease our program staff were able to orchestrate each program model. We will compare programs using both qualitative and quantitative means.

The goal of this task item is to better understand which program design(s) is (are) the most effective when it comes to actually getting residents to remove their turf and replace it with low water landscaping.

Task 6: Report and Recommendations

The Center for ReSouce Conservation will compile all of the results of our background research, program design, program implementation, surveying, and information gathering into a formal report that makes recommendations as to which turf removal program designs are likely to be the most effective overall. We will specifically address which barrier, once removed, seemed to make turf removal easy and appealing to homeowners. We will also look at costs incurred by the homeowner as well as return on investment information from the program implementer perspective. Once the study is complete, we will formally share the findings with other Colorado communities at 'Lunch and Learn' events, conferences, and other similar venues. Additionally, we will share the findings with our 30+ Colorado municipal partners.

The aim is to expand our current Turf Removal and Replacement program to have a greater impact, as well as to share our findings with other Colorado communities. The results of this study will give a better idea of how to structure a successful Turf Removal and Replacement program moving forward – where to invest money, which program elements to keep and which to abandon, how to meet residents where they are, etc. We want to make the findings available to other communities to help increase the impact of turf removal programs around the state.

Project Tasks and Timeline

The scope of work includes six steps, described below, that will lead us and our partners to achieving the three main goals of the project. The tasks, deliverables, and deadlines are summarized in Table 1.

Table 1: Summary of Tasks, Deliverables, Deadlines, and Billable Amount

Tasks	Deliverables	Deadline	Billable Amt.
Task 1: **Background Research**	Summary of Colorado and national turf removal and replacement programs with pros and cons of models Results from focus group and survey of Colorado residents related to turf removal and landscape change	6/12/2017	$4,299
Task 2: **Program Design**	4 comprehensive program models developed from research Guidelines for identifying participating homes Program rules and procedures	6/30/2017	$2,200
Submit progress report for Task 1 and 2 (50% completion) – Deadline 7/31/2017			
Task 3: **Recruitment and Surveys**	Communication plan for Slow the Flow participants in selected cities Training for Slow the Flow auditors around identifying participating homes Before, during, and after online surveys created Up to 20 Interested homeowners registered for the program	8/15/2017	$4,550
Task 4: **Program Implementation**	Up to 20 homes removing at least 200 square feet of turf $200-$1,000 passed through to each homeowner in the form of financial incentives, landscaping labor, irrigation assistance, professional design assistance, etc. Actual values vary based on program model designs	8/15/2017-9/30/2017	$28,200

	4 program models used to remove a specific barrier		
Submit progress report for Task 3 and 4 (75% completion) – Deadline 11/1/2017			
Task 5: **Follow-Up Surveys and Information Gathering**	Results from surveys and conversations with all participating homes Findings from program implementation around pros and cons of each barrier removal model	11/30/2017	$3,400
Task 6: **Report and Recommendations**	Final report detailing all findings and results including anticipated water savings Final recommendation on which barrier once removed enables homeowner task	2/15/2018	$2,800

Project Team and Partners

This program represents a partnership between CRC and four Colorado municipalities. An initial letter of support has been included along with the grant application from each community that has committed to work with CRC should we be awarded the grant. Our staff members who will work on the project are listed below.

Center for ReSource Conservation Team

Kate Larson, Program Director: Water & Energy
Kate Larson joined CRC in 2009 as a Water Programs Manager. Over the past seven years, Kate has worked closely with CRC's 30 water provider partners to bring innovative conservation programs to individuals throughout the state. She has a wide range of professional experience from day to day program management of many of Colorado's most well know conservation programs to providing strategic oversight and organizational leadership. Kate also has worked at the Colorado Alliance for Environmental Education and holds a Bachelor's degree in Business Administration from CU Boulder.

Morgan Shimabuku, Sr. Manager of Sustainability Programs
Since 2013 Morgan has worked to initiate new water conservation programs for Colorado homeowners and businesses for CRC. She has overseen over 1000 high-efficiency toilet installations, identified millions of gallons of water saving opportunities for local businesses and implemented quick and easy fixture swapping services for restaurants to help them save water

and energy. The skills and expertise she gained during her undergraduate studies in geology, graduate work at University of Colorado on a Masters in Geography, and as a staff scientist at a water resources consulting firm, have allowed her to lead CRC's impact analysis, quantifying their water, energy and waste-reduction efforts that are put into task across the state. Most recently, her work analyzing the impact of CRC's sprinkler inspection program, Slow the Flow, was published in a peer-reviewed journal.

Natalie Antonucci

Natalie began her journey with CRC as a Water Conservation Specialist with the Slow the Flow outdoor irrigation assessment program in the summer of 2014. By the end of that year, she transitioned into the role of Water Programs Manager for CRC's landscape programs, which include the Garden In A Box program, Water-Wise Landscape Seminar Series, Turf Removal and Replacement program, and Landscape Consultation program. She works intimately with over 20 Front Range water utilities to offer this unique array of utility-subsidized water conservation programs that make water-wise landscape change easy, affordable, and accessible to community members. Natalie has a MA Environmental Leadership from Naropa University, and she is dedicated to helping residents preserve Colorado's most precious resource: water.

Water Conservation Technical Staff

The water conservation technician will be responsible for performing indoor and outdoor water audits. He or she will be required to prove responsibility and proficiency in conducting a high-quality indoor and outdoor water audit and working with customers. He or she will also be involved with implementation of the upgrades to the schools through some labor and coordination of the project.

Water Conservation Associate

The water conservation associate will be responsible for coordinating with the school district staff to schedule indoor and outdoor water audits. He or she will be required to demonstrate exceptional customer service and organizational skills in order to schedule audits effectively.

Program Budget							
Task 1: Background Research	**CRC Hours**	**CRC Miles**	**CRC Rate**	**Total**	**CWCB Request**	**Partner Municipality In-Kind**	**CRC In-Kind**
Review of Turf Removal Programs (CO and Nationwide)	40		$55	$2,200	$1,500	$700	
Literature Review	20		$55	$1,100	$1,100		
Market Research with Colorado	45		$55	$2,475	$1,475	$1,000	
Mileage for Meetings with Municipalities and Residents		400	$0.56	$224	$224		
Total for Task 1				**$5,999**	$4,299	$1,700	$0
Task 2: Program Design	**Hours**	**Miles**	**Rate**	**Total**			
CRC Program Management Time	60		$55	$3,300	$2,200		$1,100
Total for Task 2				**$3,300**	$2,200	$0	$1,100
Task 3: Recruitment and Surveys	**Hours**	**Miles**	**Rate**	**Total**			
Creating Marketing Materials for Recruitment	20		$55	$1,100	$600		$500
Training Slow the Flow Staff	10		$55	$550			$550
Creating Surveys for Participants	30		$55	$1,650	$1,650		
Slow the Flow Audits on 25 homes			$118	$2,950		$2,950	
Slow the Flow Staff Time Communicating with Homeowners	50		$30	$1,500	$1,500		
Mileage of Slow the Flow Staff		1000	$0.56	$560			$560
Customer Service, Tracking and	40		$30	$1,200	$800		$400
Total for Task 3				**$9,510**	$4,550	$2,950	$2,010
Task 4: Implementation	**Hours**	**Miles**	**Rate**	**Total**			
15-20 Homes Remove 200+ Square Feet of Turf Staff Time	140		$55, $30	$5,700	$3,000		$2,700
Homeowner Incentives				$25,000	$23,000		$2,000
Scheduling and Customer Service	40		$30	$1,200	$1,200		
Mileage of CRC Staff		1000	$0.56	$560			$560
Printed Materials for Homeowners	30		$55	$1,650	$1,000		$650
Total for Task 4				**$34,110**	$28,200	$0	$5,910
Task 5: Follow-up Surveys and Information Gathering	**Hours**	**Miles**	**Rate**	**Total**			
Administering Surveys	40		$55	$2,200	$1,700		$500
CRC Program Management Time for Analysis	40		$55	$2,200	$1,700		$500
Total for Task 5				**$4,400**	$3,400	$0	$1,000
Task 6: Report and Recommendations	**Hours**	**Miles**	**Rate**	**Total**			
CRC Program Management Time	50		$55	$2,750	$2,000		$750
Report and Infographic Graphic	20		$55	$1,100	$800		$300
Total for Task 5				**$3,850**	$2,800	$0	$1,050
				Total Project	CWCB Request	Partner In-Kind	CRC In-Kind
Summary							
Totals				**$61,169**	**$45,449**	**$4,650**	**$11,070**
Total CWCB Request					**$45,449**		