COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Water Conservation Board

Water Plan

Water Project Summary

Name of Applicant	University of Colorado Denver
Name of Water Project	Examining the use of recycled water in agricultural production in Colorado
Grant Request Amount	**$150,000.00**
Primary Category	$150,000.00
Conservation & Land Use Planning	
Total Applicant Match	**$50,058.00**
Applicant Cash Match	$25,000.00
Applicant In-Kind Match	$25,058.00
Total Other Sources of Funding	**$0.00**
Total Project Cost	**$200,058.00**

Applicant & Grantee Information

Name of Grantee: University of Colorado Denver
Mailing Address: 13001 E 17th Place, Room W1124, Anschutz Medical Campus, Fitzsimmons Bldg Aurora CO 80045
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Description of Grantee/Applicant

Public Institute of Higher Education
College of Architecture and Planning

Type of Eligible Entity

☐ Public (Government)

- [ ] Public (District)
- [ ] Public (Municipality)
- [ ] Ditch Company
- [ ] Private Incorporated
- [ ] Private Individual, Partnership, or Sole Proprietor
- [ ] Non-governmental Organization
- [ ] Covered Entity
- [x] Other

Category of Water Project

- [ ] Agricultural Projects
  Developing communications materials that specifically work with and educate the agricultural community on headwater restoration, identifying the state of the science of this type of work to assist agricultural users among others.
- [x] Conservation & Land Use Planning
  Activities and projects that implement long-term strategies for conservation, land use, and drought planning.
- [ ] Engagement & Innovation Activities
  Activities and projects that support water education, outreach, and innovation efforts. Please fill out the Supplemental Application on the website.
- [ ] Watershed Restoration & Recreation
  Projects that promote watershed health, environmental health, and recreation.
- [ ] Water Storage & Supply
  Projects that facilitate the development of additional storage, artificial aquifer recharge, and dredging existing reservoirs to restore the reservoirs' full decreed capacity and Multi-beneficial projects and those projects identified in basin implementation plans to address the water supply and demand gap.

Location of Water Project

Latitude	39.742043
Longitude	-104.991531
Lat Long Flag	Municipal centroid: Coordinates based on centroid of municipal boundary
Water Source	Denver municipal water: potable and reclaimed
Basins	Metro
Counties	Denver
Districts	1-South Platte: Greeley to Balzac; 2-South Platte: Denver Gage to Greeley; 8-South Platte Cheesman to Denver Gage; 9-Bear Creek

Water Project Overview

Major Water Use Type	Agricultural
Type of Water Project	Planning (e.g. watershed)
Scheduled Start Date - Design	9/1/2022
Scheduled Start Date - Construction	9/1/2022

Description

This study will compare potable and recycled water irrigation of food crops for the relative impacts on soil health and produce quality in order to examine the safety and benefits of using recycled water as a sustainable water resource for growing edible crops in Colorado.

Agricultural production in the intermountain West faces significant water resource challenges from climate

change, decreasing the available water supply. Recycled water has the potential to provide affordable, consistently available water. Recycled water has also been shown to be safe in other climates and, since early 2020, has been legally available for food production in Colorado. Expanding recycled water use for food production will help reduce pressures on irrigated agriculture. However, to feel confident in this water source, agricultural producers need data generated in real-world growing conditions which are closely their own. Parallel studies of soil health, crop yield, and food safety will be undertaken for potable and recycled water over the course of three growing seasons. The results of the studies will be widely disseminated through producer groups and at stakeholder events. The primary target audience for the resulting material will be agricultural producers, municipal water providers, and the general public.

Measurable Results

New Storage Created (acre-feet)
New Annual Water Supplies Developed or Conserved (acre-feet), Consumptive or Nonconsumptive
Existing Storage Preserved or Enhanced (acre-feet)
New Storage Created (acre-feet)
Length of Stream Restored or Protected (linear feet)
Efficiency Savings (dollars/year)
Efficiency Savings (acre-feet/year)
Area of Restored or Preserved Habitat (acres)
Quantity of Water Shared through Alternative Transfer Mechanisms or water sharing agreement (acre-feet)
Number of Coloradans Impacted by Incorporating Water-Saving Actions into Land Use Planning
Number of Coloradans Impacted by Engagement Activity

Other

Demonstration of the potential for using reclaimed water in agricultural production in Colorado based on real-world growing conditions. If the study indicates that reclaimed water is a valid choice for irrigation, then we expect this to help drive demand and subsequently production of reclaimed water which will impact most of the other results listed above. Without specific final infrastructure and land-use projects in hand to evaluate, we can not offer measurable results in the above categories. That will be contained in our follow up GIS study.

Water Project Justification

The Colorado Water Plan, which provides a policy roadmap for addressing state water resource challenges, highlights the Colorado Department of Public Health and Environment's (CDPHE) commitment to expand "safe and environmentally friendly water reuse" that protects stakeholders' health and the environment and, notably, shares the need for additional funding to research recycled water's use for food production. (pg. 6-76)

This study will compare potable and recycled water irrigation used in food crop production in controlled field conditions for their relative impacts on soil health and produce quality, as well as examine the safety and benefits of using recycled water as a sustainable water resource for growing edible crops in Colorado. The aim is to explore the potential to increase the usage of reclaimed water for food crops which will have significant implications for conservation and land use planning and agricultural water usage while requiring both engagement and innovation.

Related Studies

Review of water quality criteria for water reuse and risk-based implications for irrigated produce under the FDA Food Safety Modernization Act,
produce safety rule. Rock, et al. Environmental Research. 172 (2019) 515-629.

Reclaimed water: A safe irrigation water source?. Chen, et al. Environmental Development. 8 (2013) 74-83

Accumulation of Contaminants of Emerging Concern in Food Crops – Part q: Edible Strawberries and Lettuce Grown in Reclaimed Water. Hyland, et al. Environmental Toxicology and Chemistry. (2015) Vol. 34, No. 10. 2213-2221.

Perfluoroalkyl Acid Uptake in Lettuce (Lactuca sativa) and Strawberry(Fragaria ananassa) Irrigated with Reclaimed Water. Blaine, et al. Environmental Science and Technology. (2014) 48, pp. 14361-14368.

Taxpayer Bill of Rights

n/a