

Efficient Irrigation Upgrade Project For City of Fountain, Colorado

WaterSMART Grant: Small-Scale Water Efficiency Projects for Fiscal Year 2021

Bureau of Reclamation NOFO No. R21AS00300

March 18, 2021



Applicant: City of Fountain

Project Manager: Katie Helm, Conservation
& Sustainability Program Manager

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TECHNICAL PROPOSAL AND EVALUATION CRITERIA

EXECUTIVE SUMMARY

Date: March 18, 2021

Applicant: City of Fountain (City)

City/County/State: Fountain, El Paso County, Colorado

Project Manager: Katie Helm

Conservation & Sustainability Program Manager

khelm@fountaincolorado.org

(719) 322-2029

Applicant Category: The City of Fountain is a Category A applicant (local government).

Grant Funding Request: \$7,052.80

Non-Federal Matching Funds: \$7,052.80

Total Project Cost: \$14,105.60

Project Duration: 23 months

Estimated Project Start Date: February 2022

Estimated Project Completion Date: December 2023

Located on Federal Facility: This project is not located on a federal facility.

Unique Entity Identifier: 0304417030000

PROJECT SUMMARY

This proposal is seeking funding to upgrade to efficient irrigation in Fountain Mesa Park, located in Fountain, Colorado. This will include retrofitting 210 inefficient irrigation heads with efficient models covering 430,650 square feet of turf. The upgrade will improve distribution of water to the landscape by utilizing higher pressure and optimal droplet size to enable efficient absorption while reducing pooling or excessive runoff reducing in significantly reduced water use on the site. In Fountain approximately 40% of water is used outdoors, and most of that water is used for watering turf landscapes. This results in very high peak seasonal usage and correspondingly high demands. Colorado regularly experiences periods of severe drought, and as the water utility provider for over 32,000 community members, the City of Fountain is dedicated to leading the effort and setting an example for mindful water use both city and state-wide. This project will help reduce water demand during our peak season and increase system resiliency. The proposal aligns with priorities detailed in the City of Fountain's Water Master Plan, Water Efficiency Plan, Sustainable Action Plan, and Strategic Plan. Regionally, it

aligns with goals detailed in the Arkansas Basin Implementation Plan and the Colorado State Water Plan.

PROJECT LOCATION

Fountain Mesa Park is located at 7393 Fortman Avenue in Fountain, Colorado, 80817 in El Paso County. The project latitude is 38°43'24.7"N and longitude is 104°41'42.0"W

Fountain Mesa Park was established in 1979 and is currently equipped with 210 Toro 2001 irrigation heads covering 430,650 square feet of turf. There are 21 zones, each with ten heads per zone. Just northeast of Janitell Junior High School, this popular park is neighbor to the school's baseball field, sports field, and track. It features two pavilions, a basketball court, two soccer fields, a playground and a network of walking paths.

The City of Fountain is located 15 miles South of Colorado Springs in the Colorado Front Range. The City provides water utility services to approximately 32,000 people.



PROJECT DESCRIPTION

This proposal seeks to upgrade 'Toro 2001' series irrigation heads with new, Rainbird 'Falcon 6504' Rotors. The current heads are over 20 years old and operating inefficiently. In 2020, the

City completed a comprehensive irrigation audit of six of its City Parks. Fountain Mesa Park revealed the following inefficiencies that this project proposal would resolve.

Overspray: Fifty irrigation heads demonstrated overspray. Overspray is water that hits areas other than the intended turf and is one of the largest contributors to unnecessary water loss from a sprinkler system. Examples of overspray include water hitting sidewalks or fences. Overspray can be caused by an incorrect head type for the area or unregulated pressure.

Misting: All 21 zones have misting heads. Misting occurs when the water droplets coming from a sprinkler head are too small, creating a mist. This is inefficient because most of the water is blown away by wind or evaporates, resulting in water loss. Misting usually results when water pressure is too high, or unregulated at the irrigation head. This forces longer watering times to ensure an adequate amount of water reaches the turf to maintain health. The current heads have been operating at a pressure beyond their design specifications, which has caused them to wear over time and perform poorly, resulting in severely uneven distribution with some areas overwatered and others under watered.

Precipitation Rate: The precipitation rate of this area from the current heads range from .20-.49 inches/hour, further demonstrating a large amount of water lost due to misting. As a result, watering times were increased to compensate for water loss. The improved droplet size of the Falcon 6504 allows for a precipitation rate between .37 and 1.14 which will allow for improved and even coverage, keeping the water on the landscape.

Low Pressure: The pressure among these zones averaged 31 PSI where the current heads require a minimum of 40 PSI to operate as intended. The proper amount of water is not being applied to the turf, with some areas receiving no water. The upgraded valves operate at a minimum of 30 PSI, meeting the needs of the area.

Distribution Uniformity: Distribution uniformity (DU) for the site averages 67%. DU is a measure of how evenly water is applied over a defined area with a range of 75% and higher generally being considered strong distribution uniformity by irrigation professionals. Rotors are typically able to achieve higher DU than spray sprinklers because the head is larger and provides more coverage.

These irrigation inefficiencies and problems demonstrate the benefits of a full retrofit to the site.

Project Approach

Prior to beginning work, the City will request locates through 811, 'call before you dig' services. City Park's Department staff will excavate sunken irrigation heads that have depressed over time due to erosion caused by poor drainage. Soil will be added to the eroded areas to make certain that the newly installed irrigation heads are able to broadcast moisture efficiently. Following correction of the head elevations at all zones, Park's Department staff will remove the existing irrigation heads and retrofit with the upgraded bodies. Staff will adjust the degree

of each rotor head arc to confirm accurate distribution, eliminate overlap, eliminate overspray and verify all devices are operating as designed. The watering schedule will be adjusted, monitored and updated as needed throughout the irrigation season based on turf health observations.

Materials & Equipment

Materials that must be purchased to complete the project include upgraded irrigation heads and soil. The handheld tools required for excavation and retrofit install are maintained in house by the Park's Department. Heavy duty equipment or machinery is not required for this project.

E.1.1 EVALUATION CRITERIA A - PROJECT BENEFITS

Describe the expected benefits and outcomes of implementing the proposed project

Water Savings: Through this grant, 210 inefficient irrigation heads will be replaced by more efficient models covering 430,650 square feet of turf. The upgrade will improve distribution of water to the landscape by utilizing higher pressure and optimal droplet size to enable efficient absorption while reducing pooling or excessive runoff. The project will result in significantly reduced water use on the site.

Water Supply Reliability: Prolonged periods of drought and a growing community affirm the importance of maximizing our existing water resources. In Fountain, ~40% of the City's water supply is used outdoors, with the peak season being May through September. This project will lessen the strain on the delivery system during peak irrigation season, reduce reliance on potable water for irrigation purposes, and reduce the City's need for purchasing additional water supply. Continued water conservation is necessary to meet current and future demands.

Geographic Scope: The City of Fountain is within the Arkansas River Basin and a part of the Southeastern Water Conservancy District. As a water provider that is committed to serving as a leader in water efficiency in our community, region and state-wide, the City has a responsibility to proactively identify and implement solutions that reduce reliance on potable water.

Upgrading our irrigation to water efficient retrofits reinforces our ongoing commitment to sustainability and proactive planning for a growing community and variable climate.

Increased Collaboration & Information Sharing: As with all water conservation initiatives, the City will share all aspects of the project process including planning, execution, lessons learned and deliverables. This will be shared with Colorado WaterWise, Pikes Peak Leaders in Sustainability, Arkansas Basin Roundtable, the Lower Fountain Water Quality Management Association, Colorado Water & Land Use Planning Alliance, and reported to the Colorado Water Conservation Board and EPA WaterSense Program.

The City of Fountain will prepare professional presentations and reach out to established water partnerships such as the Fountain Valley Authority, the Pikes Peak Regional Water Authority,

and the Upper District 10 Water Users Association. Other professional organizations who support sustainability efforts and who conduct regular continuing education efforts include the Arkansas River Water Forum, the National Society of Professional Engineers (Pikes Peak Chapter), American Society of Civil Engineers (Southern Colorado Section), the United States Green Building Council (Colorado Section) and the Society of Women Engineers (Pikes Peak Section).

Positive Benefits to Local Sectors (Recreational, Municipal): During periods of extreme, prolonged drought, the city may have to limit or eliminate outdoor irrigation to maintain a stable water supply. The conversion to efficient irrigation will promote deep root growth throughout the landscape, making it drought resilient during times of climatic stress. Maintaining healthy turf is important in providing optimal recreational opportunities to our community members. This is especially important as the pandemic has severely limited social and recreational opportunities. Reduced water demand from this project will also result in cost savings for the City, money that can be used to support other important community initiatives.

Reduced labor: By upgrading to new, water efficient irrigation heads that are uniform throughout the park, the City will be able to maintain an inventory and maintenance knowledge specific to the new equipment. This will reduce staff time spent on searching for replacement parts and troubleshooting.

E.1.2 EVALUATION CRITERION B - PLANNING EFFORTS SUPPORTING THE PROJECT

Alignment with existing local and regional planning efforts

This project has been prioritized, and is supported, by the following local, regional, and statewide planning efforts:

Adopted Municipal Water Efficiency Plan: This project proposal supports Fountain's goal to reduce system-wide demand by 71 AF annually through 2028 as outlined in the City's Water Efficiency Plan.

Adopted Water Master Plan: This project supports objectives in the City's Water Master Plan including ongoing evaluation of water supply, analysis of potential improvements/modifications and pursuit of long term capital improvements to make certain we meet projected water demands and enhance operational flexibility.

Adopted City Strategic Plan: Completion of this project aligns with the strategic priority to *"complete necessary coordination and initiate plans to improve the availability of venues which support a variety of community activities to include athletics, recreation, youth programs and gatherings. Whenever possible, pursue funding for these activities that leverage a variety of resourcing opportunities, minimizing cost to the Community"*. Additionally, this priority states

that the utility will continue to work with the Park’s Department to pursue conservation projects that yield a cost savings.

Sustainable Action Plan: This proposal supports the key initiative detailed in the City’s Sustainable Action Plan to “*build and operate high performance properties*”. This initiative integrates conservation measures and sustainability strategies into all City maintained properties and ongoing operations including capital improvements.

Arkansas Basin Implementation Plan: This project aligns with goals outlined in the Arkansas Basin Implementation Plan goals including “*Support projects that increase efficiency on current supplies*”.

Colorado State Water Plan: This project aligns with the ideologies throughout the Colorado State Water Plan. The goals in this plan support and improve upon the wise use of water resources through proactive planning, strategy and collaboration so that Colorado has sufficient water to meet its future needs.

E.1.3. EVALUATION CRITERION C - PROJECT IMPLEMENTATION

Describe how your project is supported by an existing planning effort.

The project implementation schedule is detailed in Table 1 below. Fountain expects this project to span 16 months, from February 2022 to June 2023. Timelines may shift slightly due to material availability or weather.

Table 1. – Project Implementation Schedule

PROJECT IMPLEMENTATION SCHEDULE		
Project Stage	Milestone / Task	Start & Completion Dates
Funding Award	<ul style="list-style-type: none"> Receive award letter Respond to request for information Submit application and financial agreement to attorney for final review and approval. Provide complete packet to City Manager for final signature. 	1/1/22 – 1/31/22
Phase 1: Pre-Installation	<ul style="list-style-type: none"> Gather quotes from three vendors for 210 Rainbird Falcon 6504 Rotors. Assure quantity is available for timely shipment. Timeline may adjust due to availability. Contact 811 for utility locates prior to beginning work. Park Worker 2, Park Worker 1 and Park Worker PT perform site evaluation. 	2/1/22 – 6/30/22
Progress Report	Interim performance report submitted to the Bureau of Reclamation.	7/1/22 – 8/31/22

<p>Phase 2: Installation</p>	<ul style="list-style-type: none"> • Excavate and level sunken heads, Remove Toro hardware, replace with Rainbird Falcon 6504 Rotors. • Adjust arc and degree of rotation. • Update watering schedule based on observed rate of water distribution and current weather patterns. <p>(To be completed one zone at a time.)</p>	<p>7/1/22 – 9/30/22</p>
<p>Phase 3: Post Installation</p>	<ul style="list-style-type: none"> • Perform final irrigation evaluation. • Adjust arc and degree of rotation for each head as appropriate based on observation. • Continue to monitor turf health and soil saturation. • Adjust watering schedule as needed based on observation. 	<p>10/1/22 – 10/8/22</p>
<p>Final Report</p>	<p>Final financial and performance reports submitted to the Bureau of Reclamation summarizing the entirety of the project.</p>	<p>6/15/23</p>

Required Permits:

No permits will be required for the implementation of this project.

Project Engineering & Design Work:

No engineering and design work will be performed specifically in support of this project.

Policies & Administrative Actions:

There are no new policies or administrative actions required to implement this project.

Environmental Compliance:

The proposed project is expected to fall within a Categorical Exclusion to NEPA pursuant to the Categorical Exclusion Checklist published by the Council for Environmental Quality in June of 2020. The project will not impact the surrounding environment. The work will be completed within the City’s service area.

E.1.4. EVALUATION CRITERION D - NEXUS TO RECLAMATION

Connection to a Reclamation Project or Activity

The proposed work will contribute water to the Arkansas Basin where the Fryingpan-Arkansas Reclamation Project is located.

- **Does the applicant receive Reclamation project water?** The City receives water through the Fryingpan-Arkansas Project and the City lies within the boundaries of the Southeastern Water Conservancy District
- **Is the project on Reclamation lands or involving Reclamation facilities?** No, the project is not located on Reclamation lands. However, the City uses Pueblo Reservoir to store

water, and the Fountain Valley Authority System to deliver most of its water supply. Both are Reclamation facilities.

- **Is the project in the same basin as a Reclamation project or activity?** The Fryingpan-Arkansas Project and the proposed project are both located in the Arkansas Basin.
- **Will the project benefit any tribes?** No.

PROJECT BUDGET

FUNDING PLAN & LETTERS OF COMMITMENT

Funding Plan: The City of Fountain is contributing \$7,052.80 to the non-federal share of project costs. This funding is included in the City’s approved 2022 budget and a resolution committing to this funding is scheduled for consent on the April 13, 2021 City of Fountain council agenda. These funds are sourced by tax revenue and will be available January 1, 2022. No in-kind or third party funds will be used towards this project. We do not anticipate any project costs for environmental and cultural compliance or engineering/design work.

Funding Contingencies: There are no contingencies associated with this funding commitment.

Letters of Commitment: Project funding is not supplied by any source other than the applicant.

Costs Incurred Prior to Award: There are no project costs to be incurred prior to award.

Table 2. – Total Project Cost Table

TOTAL PROJECT COST TABLE	
SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal Funding	\$7,052.80
Costs to be paid by the applicant	\$7,052.80
Value of third-party contributions (if applicable)	\$0.00
TOTAL PROJECT COST	\$14,105.60

BUDGET PROPOSAL

Table 3. – Budget Proposal

BUDGET PROPOSAL				
BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	\$/Unit	Quantity		
Salaries and Wages				
Park Worker II	\$21.16	80	Hours	\$1,692.80
Park Worker I	\$20.15	80	Hours	\$1,612.00
Park Worker PT	\$17.16	80	Hours	\$1,372.80
Project Manager	\$37.12	15	Hours	\$556.80
Travel				
Not applicable	-	-	-	\$0.00
Equipment				
Not applicable	-	-	-	\$0.00
Supplies & Materials				
Soil	\$1.78	Cubic feet	50	\$89.00
Falcon 6504 Rotor	\$41.82	210	Units	\$8,782.20
Contractual/Construction				
Not applicable	-	-	-	\$0.00
Other				
Not applicable	-	-	-	\$0.00
TOTAL DIRECT COSTS				\$14,105.60
Indirect Costs				
Type of Rate	Percentage	\$base		\$
Total Estimated Project Costs				\$14,105.60

BUDGET NARRATIVE

Salaries and Wages: All staff assigned to this project are directly employed by the City of Fountain. A ‘Certification of Wages’ is included in the attachments submitted through Grants.gov.

Project Manager: The Project Manager is responsible for compliance with reporting requirements including the final financial and performance reports. They will maintain that the project adheres to its timeline as specified in this proposal through regular site visits and meetings to discuss project developments and milestones.

Park Worker II: Park Worker II specializes in irrigation and is the on-site project lead. They are responsible for communicating project needs and developments to the project manager. They are responsible for the project logistics including 811 contact, system evaluation, support staff work schedule, delegating tasks, and project oversight. They

will work alongside Park Worker I and Park Worker PT throughout the project. They will continue to monitor soil and turf health throughout the project, updating the watering schedule as appropriate to achieve maximum efficiency with the new equipment.

Park Worker I, Park Worker PT: Both staff fulfill daily tasks on site as directed by Park Worker II. They will assist in the irrigation evaluations. They are responsible for excavating and leveling sunken heads. They are responsible for removing the inefficient irrigation heads and installing the upgraded Rainbird Falcon 6504 Rotors. They will alter the arc and degree rotation of the heads and maintain communication with Park Worker II regarding project development, issues or material and equipment needs.

Fringe Benefits: Fringe benefits are included in the hourly wage of staff assigned to this project.

Travel: Does not apply.

Equipment: Does not apply.

Materials and Supplies:

Costs estimated by gathering quotes.

- Falcon 6504 Rotor: Needed for retrofit.
- Soil for ground leveling around sunken irrigation heads. After excavation, soil will be added to correct the area directly around the irrigation head that eroded over time.

Note: While the materials needed for this project were priced for this proposal, the City will gather new quotes prior to product purchase to confirm item availability and to secure the lowest cost available.

Contractual and Construction: Does not apply.

Third Party Contributions: Does not apply.

Environmental and Regulatory Compliance Costs: No budget is included for this category. This project is anticipated to fall within a Categorical Exclusion to NEPA. Costs associated with filing associated documentation are expected to be minimal and the City will not seek funding related to those efforts.

Other Expenses: Does not apply.

Indirect Costs: Does not apply.

Environmental and Regulatory Compliance: Not anticipated for this project.

Conflict of Interest: The City has no actual or potential conflicts of interest.

ENVIRONMENTAL & CULTURAL RESOURCES COMPLIANCE

Will the proposed project impact the surrounding environment?

There will be minimal excavating around a portion of the irrigation heads that need leveling prior to installation of the upgraded retrofits. This is not anticipated this to be more than a foot in depth or more than a two foot radius around each irrigation head. Compact soil will be added to these areas to compensate for any depth discrepancy. Added dirt will be tampered to prevent drifting.

Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area?

No.

Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States?"

No.

When was the water delivery system constructed?

The water delivery system in this area was constructed in the mid 1970's.

Will the proposed project result in any modification of or effects to, individual features of an irrigation system?

Yes, the proposed project includes modification to individual features of a municipal irrigation system. The original irrigation system of this area was installed in the 1970s. In 2001 the area was retrofitted with TORO 2001 irrigation heads. This project would upgrade the TORO 2001 irrigation heads to a more efficient model.

Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?

No.

Are there any known archeological sites in the proposed project area?

No.

Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?

No.

Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?

No, this project is not on tribal lands.

Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

No.

REQUIRED PERMITS OR APPROVALS

There are no permits or approvals required to move forward with this project.

LETTERS OF PROJECT SUPPORT

Does not apply. There are no third-party funding sources for this project.

OFFICIAL RESOLUTION

This grant application is on the April 13, 2022 council agenda for consent. Official resolution will be sent immediately to follow.

UNIQUE ENTITY IDENTIFIER

The City of Fountain is registered with SAM. 0304417030000

ATTACHMENTS

Submitted through Grants.gov

- Certification of Wages
- SF-424 Application for Federal Assistance
- SF-424 Budget Information
- SF-424 Assurances



March 10, 2021

Bureau of Reclamation
Reference Grant Application Opportunity No. R21AS00300

To Whom It May Concern:

The City of Fountain (City) certifies that the salaries and wages charged by the City are consistently applied across federal and non-federal activities. If you have any questions, please do not hesitate to contact me directly.

Sincerely,

John S. Lewis, CPA, CHAE, CGMA
Finance Director
City of Fountain
116 South Main Street
Fountain, CO 80817
719-322-2033