

# TUOLUMNE – STANISLAUS INTEGRATED REGIONAL WATER MANAGEMENT REGION

2015 IRWM IMPLEMENTATION GRANT PROPOSAL

## ATTACHMENT 2 – PROJECT JUSTIFICATION

Integrated Regional Water Management Program  
Applicant: Tuolumne-Stanislaus Integrated Regional Water Management Authority

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## INTRODUCTION

The Tuolumne-Stanislaus 2015 IRWM Implementation Grant Proposal includes a single project which is the Water Treatment Plant Recycle Project for the City of Angels. The proposed project provides increased water supply for a Disadvantaged Community in Calaveras County and improves the water quality in both the Tuolumne-Stanislaus (T-S IRWM) and Mokelumne/Amador/Calaveras (MAC) IRWM Regions.

The Historic City of Angels (Angels Camp) is located within Calaveras County situated on the eastern side of the Central Valley, east of Stockton, in the Sierra Foothills. The water system for the City was developed during the gold rush and is primarily a network of ditches and flumes. The system reached the City in 1853 and since then has changed ownership many times. Most recently it was acquired from Pacific Gas & Electric (PG&E) by a consortium that includes the City of Angels.

The project proposed by the City has been vetted by the T-S IRWM Watershed Advisory Committee, as well as the Highway 4 Corridor group which includes the Union Public Utility District (UPUD), Utica Power Authority (UPA), Calaveras County Water District (CCWD), Murphys Sanitary District (MSD) and the City of Angels.

### City of Angels: Water Treatment Plant Recycling Project (T-S IRWM Project No. 24)

#### I. Project Summary Table

Table 4 – 2015 IRWM Grant Solicitation Project Summary Table		
IRWM Project Element		T-S IRWM No. 24
IR.1	Water supply reliability, water conservation, and water use efficiency	Yes
IR.2	Stormwater capture, storage, clean-up, treatment, and management	
IR.3	Removal of invasive non-native species, the creation and enhancement of wetlands, and the acquisition, protection, and restoration of open space and watershed lands	
IR.4	Non-point source pollution reduction, management, and monitoring	
IR.5	Groundwater recharge and management projects	
IR.6	Contaminant and salt removal through reclamation, desalting, and other treatment technologies and conveyance of reclaimed water for distribution to users	
IR.7	Water banking, exchange, reclamation, and improvement of water quality	Yes
IR.8	Planning and implementation of multipurpose flood management programs	
IR.9	Watershed protection and management	Yes
IR.10	Drinking water treatment and distribution	Yes
IR.11	Ecosystem and fisheries restoration and protection	

## II. Project Description

### *Brief Project Description:*

City of Angels Water Treatment Plant Recycling Project consists of recycling backwash water providing increased water supply and improving water quality.

*Implementing Agency:* City of Angels

### *Expanded Project Description:*

The proposed project is an opportunity to recycle lost backwash water increasing the water supply available to the water treatment plant and improving the water quality of Cherokee Creek, a tributary to the Calaveras River.

The water treatment plant inflow is raw surface water that contains all the typical contaminants, these contaminants are removed by sedimentation, flocculation, and filtration. Currently, the sedimentation, flocculation, and filtration devices are cleaned with potable or raw water and the resulting backwash water is disposed to an irrigation ditch adjacent to the water treatment plant. The backwash water presently contains organic materials and flocculation and sedimentation chemicals. The intent of this project is to filter the backwash water and to safely dispose of the resulting byproduct waste. The recycled water produced from the completion of the proposed project will be reintroduced back into the beginning of the raw water intake to be treated again for consumptive purposes.

The City of Angels, and the Disadvantaged Community Block Group that is a part of its service area, will benefit from increased water supply to its water treatment plant, which is especially beneficial during drought conditions. The improved water quality from the project will benefit both the downstream users, which include local agricultural producers, and the environment.

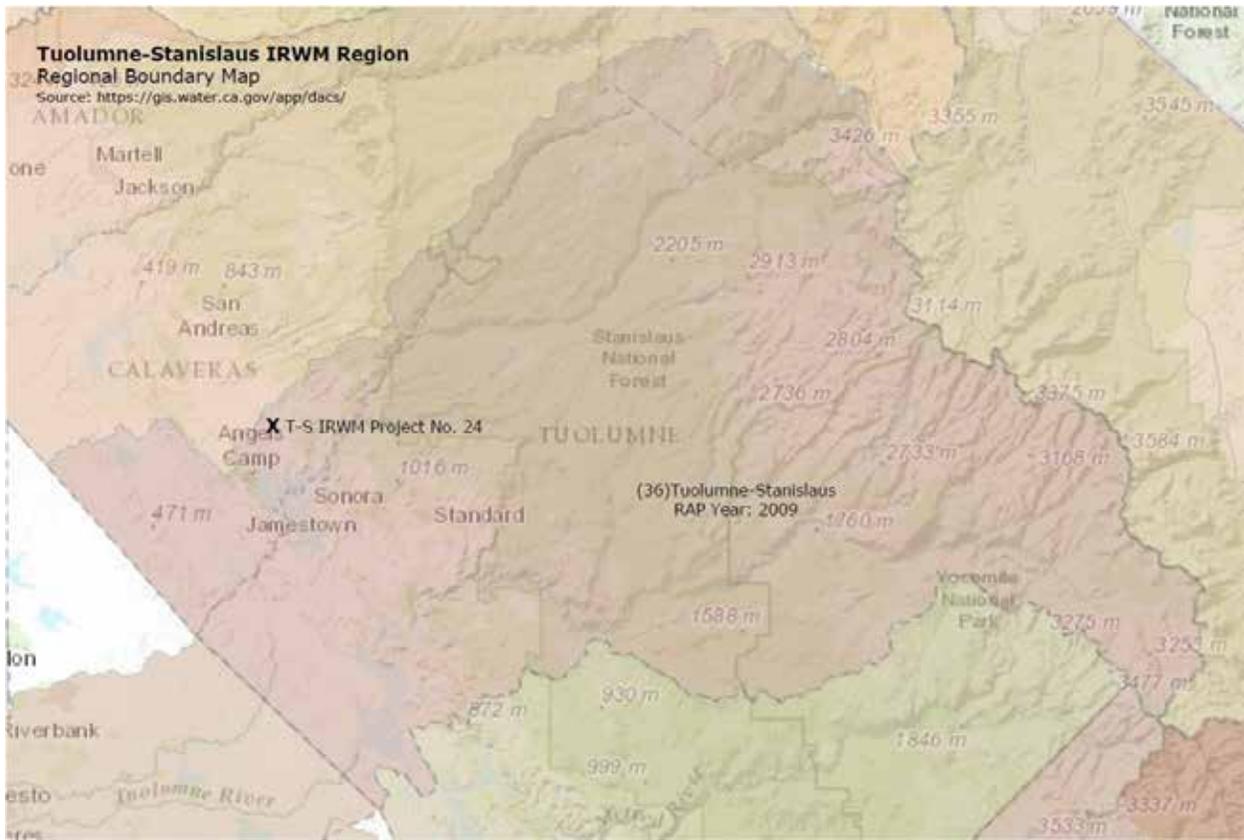
The City of Angels has adopted a master planning document for the water treatment plant which places this project as a high priority.

The proposed project was a part of the initial call for projects during the creation of the Tuolumne-Stanislaus IRWM Plan. The Region completed its IRWM Plan in the fall of 2013 and the City of Angels adopted the Plan and formally joined the Tuolumne-Stanislaus IRWM Authority in 2014. The City of Angels is a member of the Regional Water Management Group, which is the Board of Directors of the Joint Powers Authority.

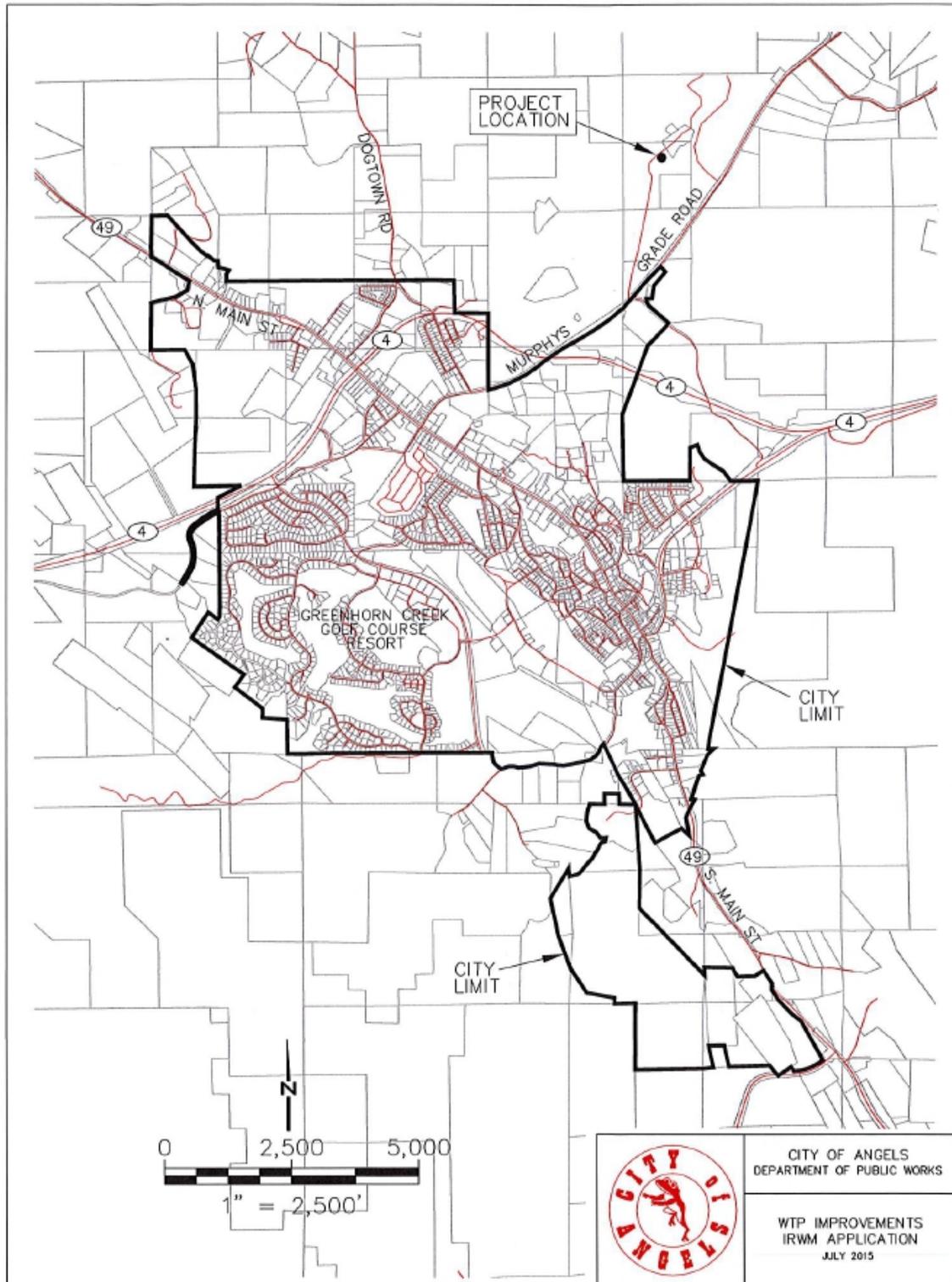
The project addresses a current need of the Region as it meets the T-S IRWM Plan Objective of “Improving water supply and/or distribution within DAC and urban areas that have declining water quantity/quality or other water system reliability issues.” It also meets the Measurable Planning Target for this objective of “Improvement of water supply and/or distribution for a DAC and/or urban communities within the planning horizon.”

### III. Regional and Project Map

*Regional Map:*



Project Map:



#### IV. Project Physical Benefits

*Primary Physical Benefit:*

The primary measurable physical benefit (table 5.1) of the proposed project is increased water supply for the City of Angels through water recycling. The additional water supply is especially important to the City during drought conditions.

Table 5.1 – Annual Project Physical Benefits			
Project Name: Water Treatment Plant Recycling Project (T-S IRWM Project No. 24)			
Type of Benefit Claimed: Increased Water Supply through Water Recycling			
Units of the Benefit Claimed: Million Gallons of Water Recycled			
Anticipated Useful Life of Project (years): 30 Years			
(a)	(b)	(c)	(d)
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project (c) – (b)
<b>Years of Project Life</b>	0	2.18	2.18 MG
<b>Comments:</b> Total Saved over Useful Life is 65.4 MG.			

*Secondary Physical Benefit:*

The secondary measurable physical benefit (table 5.2) is the improvement to the water quality of Cherokee Creek which is a tributary of the Calaveras River, the San Joaquin River, and the Bay Delta. Eliminating the disposal of backwash water to the adjacent irrigation ditch and Cherokee Creek reduces the level of contaminants in the waterways.

Table 5.2 – Annual Project Physical Benefits			
Project Name: Water Treatment Plant Recycling Project (T-S IRWM Project No. 24)			
Type of Benefit Claimed: Improved Water Quality			
Units of the Benefit Claimed: Million Gallons of Water Recycled			
Anticipated Useful Life of Project (years): 30 Years			
(a)	(b)	(c)	(d)
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project (c) – (b)
<b>Years of Project Life</b>	0	2.18	2.18 MG
<b>Comments:</b> Backwash water not disposed of in irrigation ditch, Cherokee Creek over life of project is 65.4 MG.			

## V. Technical Analysis of Physical Benefits Claimed

1. *Explanation of need for project:*

The goal of the proposed project is to recycle lost backwash water thereby increasing the water supply available to the water treatment plant and improving the water quality of Cherokee Creek, a tributary to the Calaveras River.

The City of Angels water treatment plant is an old PG&E plant that is typical in the Sierra foothills and has had continual improvements done to meet current standards and practices. Two of the operations, sedimentation basin cleaning and filter backwashing, discharge to an irrigation ditch that leads to a ranch stock pond and Cherokee Creek. Since the plant uses raw surface water, the discharge is a concentrated mixture of organic material and flocculation and sedimentation chemicals. It is the intent to stop the discharge and recycle the backwash water, with the resulting byproduct waste of the proposed project being safely disposed of. The amount of savings is based on the frequency of the cleanings. The filters are backwashed dependent on water produced; in 2012/13 the total backwash volume was 0.93 million gallons (MG). The sedimentation basin is cleaned about 4 times per year and that volume is 0.312 MG per cleaning, or a yearly total of 1.25 MG. Operationally, the sedimentation can be cleaned more often to reduce the volume of organics, which will reduce the volume of treating chemicals, but presently the cleaning is avoided to reduce the water loss.

2. *Estimates of without-project conditions:*

The current operation of the water treatment plant is the without project condition, as the plant would continue to be operated in the current manner without the implementation of the proposed project, resulting in the continued loss of approximately 2.18 MG of water each year.

3. *Description of methods used to estimate physical benefits:*

The water available to be recycled is from two different treatment processes. The first process is the filter tank backwash and that process is metered. The amount of backwash used in the year 2012/13 was 0.93 million gallons (MG). The frequency of when the filters are cleaned is dependent on the amount of water treated and so the yearly amount of backwash can vary from the amount stated.

The sedimentation basin cleaning is not metered and so the volume of water available to be recycled has to be estimated. The volume of the sedimentation basin is 311,000 gallons, plus approximately 1,000 gallons of water to wash down the walls, resulting in approximately 0.312 MG used for cleaning. During the 2012/13 the basin was cleaned four times producing approximately 1.25 MG of backwash water.

4. *Identification of all new facilities, policies, and actions required to obtain the physical benefits:*

All improvements will be made to existing facilities and are allowed under existing policies. The proposed project includes the design and development of plans.

5. *Description of any potential adverse physical effect and what is being done to mitigate those impacts:*

The only potential adverse physical effects anticipated will be those associated with the construction and installation of the water recycling devices. These impacts, if any, will be mitigated by the requirements listed in the environmental documents developed for the

project. While the documentation has not been prepared it will be done in compliance with all local and state regulations. The project site is a working water treatment facility and has undergone prior project assessment.

6. *Description of whether the proposed project effectively addresses long-term drought preparedness:*

The component of this project that affects water supply reliability is the simple recycling of backwash water that increases the efficient use of the incoming raw water, water is not wasted and it is used to make potable, consumable water. This is a physical improvement that makes the best use of the available water.

**VI. Direct Water-Related Benefit to a DAC**

This project is located within a Disadvantaged Community (DAC) census tract and serves a DAC Block Group located within the service area of the City of Angels. The proposed project would improve the City's infrastructure which is a public water supply system. Additionally, it would provide an increased quantity of water for the City assuring the continued reliability of the City and DAC's water supply.

DAC communities, such as the City of Angels, are less likely to afford the cost of major infrastructure improvements, grant funding for this project would improve operational and planning deficiencies without adversely impacting the community.

**VII. Project Performance Monitoring Plan**

Table 6 – Project Performance Monitoring Plan		
Project: Water Treatment Plant Recycling Project (T-S IRWM Project No. 24)		
Proposed Physical Benefits	Targets	Measurement tools and methods
Increased Water Supply through Water Recycling	Approximately 2.18 MG (Million Gallons) of recycled water utilized by the City each year.	Measure water recycled at the water treatment plant with the installation of meters.
Improved Water Quality	Elimination of the disposal of approximately 2.18 MG of backwash water into irrigation ditch and Cherokee Creek.	Measure water recycled at the water treatment plant with the installation of meters. Estimate the quantity of byproduct waste disposed of safely.

The performance of this project will be monitored by the installation of water meters at the water treatment plant to measure the quantity of water that is recycled back into the plant. Water meters will provide for an actual measurement of the water being recycled which can be compared to the projected benefits. Additionally, the City will estimate the quantity of byproduct waste being disposed of after the implementation of the proposed project in comparison to the quantity of backwash water previously disposed of in the adjacent irrigation ditch and Cherokee Creek.

**VIII. Cost Effectiveness Analysis**

<b>Table 7 – Cost Effective Analysis</b> Project name: Water Treatment Plant Recycling Project (T-S IRWM Project No. 24)	
Question 1	Types of benefits provided as shown in Table 5: 1. Increased Water Supply through Water Recycling 2. Improved Water Quality
Question 2	Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified? <b>No.</b>
	If no, why? Alternative methods to achieve the same types and amounts of physical benefits will be analyzed during the project scoping process.
	If yes, list the methods (including the proposed project) and estimated costs. <b>N/A.</b>
Question 3	If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods. The least cost alternative would be to not implement the proposed project and continue operating the water treatment plant in the current manner. This alternative would negatively impact the environment and would be an inefficient use of water.
<b>Comments:</b> None.	