



SOUTHERN NEVADA WATER AUTHORITY®

Boulder City Wastewater Recycling: Research, Planning, & Feasibility Study

(\$1,000,000)

WaterSMART: Water Recycling and Desalination Planning

R23AS00076

February 28, 2023

Applicant:

Southern Nevada Water Authority

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1. Technical Proposal: Executive Summary

Date: February 28, 2023

Applicant: Southern Nevada Water Authority (Funding Group I applicant)

Location: 1001 South Valley View Boulevard, Las Vegas, Nevada 89153 (Clark County)

Project Summary: As climate change continues to contribute to the aridification of the southwest region of the western United States, it is critical for water users in the Colorado River Basin develop projects to improve efficiency through water reuse. The Southern Nevada Water Authority (SNWA) is committed to resource maximization through making existing water use more efficient. In SNWA's service area, nearly all water used indoors is recycled for direct or indirect reuse. With direct reuse, wastewater is captured, treated, and used for non-potable uses like park irrigation. With indirect reuse, wastewater is recycled through treatment and returned to the Colorado River for return-flow credits, which extend the state's Colorado River allocation. SNWA is working to expand reuse by designing a recycling system for the City of Boulder City's (Boulder City) wastewater, which would contribute over 800 acre-feet annually to direct or indirect reuse, instead of loss to evaporation. Requested funds will be used for initial planning and design activities, including research, evaluation, cost estimates, and data collection, as well as project feasibility with intent to meet Title XVI (WTR 11-01) requirements. Wastewater recycling projects are prioritized in stakeholder initiatives such as the Integrated Resources Planning Advisory Committee (IRPAC) 2020 Recommendations Report and in the 2023 SNWA Water Resource Plan.

Length of Time and Estimated Completion Date: The proposed project encompasses activity from March 2024 through February 2026.

Federal Facilities: The proposed project is not located on a federal facility.

2. Technical Proposal: Project Location

A Boulder City map is included as Figure 1 below.

Figure 1. Map of Boulder City



3. Technical Proposal: Detailed Project Description

Applicant Category: SNWA is seeking funding under Funding Group I.

Eligibility of Applicant: SNWA meets eligibility requirements as it is a regional wholesale water provider in Southern Nevada. The organization is responsible for water treatment and delivery for the Las Vegas Valley, as well as acquiring and managing long-term water resources. SNWA is composed of seven member agencies, including the cities of Las Vegas, North Las Vegas, Henderson and Boulder City and unincorporated Clark County, which together deliver drinking water to more than 2.2 million residents and 40 million annual visitors. SNWA diverts 90 percent of its water supply from the Reclamation-managed Colorado River system. SNWA receives delivery of Colorado River water from Reclamation under several contracts held by SNWA or its member agencies, as listed below:

SNWA Contracts:

- Contract Number 2-07-30-W0266, Amendment Number 1, Amended and Restated Contract with the Southern Nevada Water Authority, for the Delivery of Colorado River Water

- Contract Number 7-07-30-W0004, Amendatory and Supplemental Contract between the United States and the State of Nevada for the Delivery of Water and Construction of Project Works

SNWA Member Agency Contracts:

- Contract Number 14-06-300-978, “Boulder Canyon Project Arizona-California-Nevada Contract for the Delivery of Water,” City of Boulder City
- Contract Number 0-07-30-W0246, Contract for Delivery of Water to City of Henderson
- Contract Number 14-06-300-2130, “Boulder Canyon Project Contract for Delivery of Water to Las Vegas Valley Water District”
- Contract Number 2-07-30-W0269, “Boulder Canyon Project Contract with the Big Bend Water District, Nevada, for the Delivery of Colorado River Water”

The water delivered by SNWA under these contracts is diverted at Reclamation-approved diversion points in the Colorado River at Lake Mead and below Hoover Dam. This includes delivery of water through the Robert B. Griffith Water Project (formerly the Southern Nevada Water Project) constructed by Reclamation, as authorized by an Act of the United States Congress.

Goals: This project has an overarching goal, with two sub-goals:

- 1) Expand reuse by designing a recycling system for Boulder City’s wastewater, which would extend Nevada’s Colorado River allocation by more than 800 acre-feet per year (AFY) through the capture of wastewater and utilizing either direct reuse or wastewater recycling, instead of discharging the community’s wastewater to evaporation ponds.
 - a. Complete initial research and planning activities for a recycling system.
 - b. Develop project feasibility study for a recycling system with intent to meet Title XVI (WTR 11-01) requirements.

Approach: The majority of the Las Vegas Valley’s water users discharge wastewater to a municipal sewer that treats the community’s wastewater to highly treated standards and discharges it to the Las Vegas Wash, which flows into Lake Mead. For every gallon of treated wastewater returned to Lake Mead, Nevada received a return flow credit, which allows Nevada to deliver an additional gallon without debit to its Colorado River allocation. The exception to this process is Boulder City, whose residents and businesses are on municipal sewer, but because of their location relative to Lake Mead, do not currently have a way to return its flows to Lake Mead for return flow credits and do not have an existing wastewater reuse system to extend supplies. In 2019, the SNWA convened an advisory committee to make recommendations to: evaluate how to make Nevada’s Colorado River water resources more efficient; the future facilities needed to maintain reliable water supplies, and funding solutions for these recommendations, and present these recommendations to the SNWA Board. In 2020, the advisory committee supported a comprehensive addition to the capital program, which included a recycling project for Boulder City. Since that time the SNWA has engaged with the Boulder City community to begin discussions about maximizing their water resources through additional infrastructure. Outreach efforts have included briefings with Boulder City elected officials, presentations at the Boulder City’s [Utility Advisory Committee](#) and Boulder City Council

meetings. (<https://www.bcnv.org/639/Utility-Advisory-Committee>). This citizen committee is appointed by the council, meets monthly, and makes recommendations to the council, Utilities Director, and City Manager on affairs relevant to municipal utilities operations. Other SNWA member agencies, such as the City of Henderson (COH), have also been included in stakeholder conversations to explore the possibility of expanding existing infrastructure.

Overall, four different alternatives for recycling wastewater have been presented as the most viable from a cost and infrastructure perspective. The city council is planning to select an option at a March 2023 meeting; therefore, the final decision is unavailable at the time of this grant application. The options range from a direct reuse wastewater treatment facility located within the community to deliver treated wastewater and utilize it on community turf applications, including their municipal golf course, parks, and other functional turf areas. Other alternatives include constructing a wastewater pipeline from the community to nearby City of Henderson's wastewater treatment plant and another includes discharging treated wastewater to Lake Mead through an abandoned raw water pipeline. Regardless of the option selected, they are all viable and will fully extend the community's water supply. The SNWA will contract with a consultant for concept evaluations, including research, initial planning, and environmental compliance considerations, as well as developing the feasibility study. SNWA anticipates executing this contract pre-award to onboard the consultant, with work described in the proposal beginning in early 2024.

4. Technical Proposal: Evaluation Criteria

E.1.1 Evaluation Criterion 1: Project Planning and Analysis

Subcriterion No.1a-Water Recycling Needs and Opportunities

1. Describe the problems and needs in the project area.

Like the other Colorado River Basin States, Nevada is facing continued threats to its water supply due to severe and ongoing drought within the Colorado River watershed. Southern Nevada depends on the state's Colorado River allocation to meet 90 percent of its demands. Since drought impacts were first seen in the early 2000s, Southern Nevada has made significant investments into water conservation and water efficiency. A comprehensive mix of programs, regulation, pricing and tiered water rates have reduced Nevada's consumptive water use by nearly a third since the drought first began in 2000. As drought continues to plague the watershed, Southern Nevada is continuing to seek opportunities to reduce consumptive water use and make existing water uses more efficient. Water demands are hardening in the community and reducing water use is more expensive and more challenging. While Southern Nevada has been able to stave off impacts of a federally declared Tier Two Shortage on the Colorado River, Lake Mead elevation projections underscore the need that further water efficiencies are needed to maintain a reliable water supply for the community.

In Southern Nevada, a small portion of wastewater is directly reused by being captured, treated, and used for non-potable uses like irrigating parks or golf courses. In most cases, wastewater is highly treated by a local reclamation facility, discharged into the Las Vegas Wash where it eventually returns to Lake Mead. The recycling of Colorado River water used in Southern Nevada is accrued according to the 1984 U.S. Bureau of Reclamation "Procedure for Determining Return-Flow Credits to Nevada from Las Vegas Wash" and subsequent

administrative updates authorized by Reclamation. This process of indirect reuse extends Nevada's Colorado River water supply by nearly 70 percent.

Boulder City is a small community in Southern Nevada, with an [estimated population of just under 15,000](https://www.census.gov/quickfacts/bouldercitynevada). (<https://www.census.gov/quickfacts/bouldercitynevada>). The city was created through the Boulder Canyon Project Act, which also authorized the building of Hoover Dam. Originally, the town was on federally owned land, with the [title to all land retained under the Bureau of Reclamation](https://www.bcnv.org/DocumentCenter/View/106/The-Historic-District-of-Boulder-City-PDF#:~:text=significance%20as%20the%20first%20fully,under%20the%20Bureau%20of%20Reclamation.) (<https://www.bcnv.org/DocumentCenter/View/106/The-Historic-District-of-Boulder-City-PDF#:~:text=significance%20as%20the%20first%20fully,under%20the%20Bureau%20of%20Reclamation.>).

Boulder City is the only SNWA partner agency whose recovered indoor water does not produce return-flow credits. Boulder City staff are working with SNWA on efforts to reduce consumptive water use in the community, through city ordinance and code changes, removal of non-functional turf, efficiencies in landscaping and city-owned parks and golf courses, and public outreach to residents. These efforts have helped reduce Boulder City's water use by nearly 12 percent in recent years; however, nearly all of the community's water use remains consumptive, unlike the remainder of the Las Vegas Valley.

Currently, Boulder City captures wastewater, and the city wastewater facility removes solids and treats the effluent to a level safe enough to be released to ponds in the Eldorado Valley, where it evaporates. Some treated water is sold for use at solar farms or gravel pits, but the city estimates that the vast majority, between [1 million and 1.5 million gallons](https://www.bcnv.org/906/Water-Conservation-Efforts) daily (<https://www.bcnv.org/906/Water-Conservation-Efforts>) is sent to the desert where the community has no benefits of reuse. With current hydrologic projections estimating future declines to Lake Mead, it is imperative that Nevada evaluate every consumptive use and consider opportunities to make it more efficient.

2. Describe the current and projected water supplies and demands in the project area; include a discussion on supply and demand imbalances. Additional consideration will be given to proposals that explain how the problems and needs in the area may be impacted by climate change, and/or if supply and demand projections will include climate change information.

Over the past two decades, supply and demand changes have occurred in Southern Nevada that create uncertainty. Most significant to the region are increased temperatures and decreased runoff in the Colorado River Basin (Basin). Overall snowfall and runoff into the Basin, combined with warming temperatures, resulted in [the lowest 23-year runoff period on record](https://www.snwa.com/assets/pdf/water-resource-plan-2023-printable.pdf) (<https://www.snwa.com/assets/pdf/water-resource-plan-2023-printable.pdf>). At the end of 2022, the combined water storage in the Colorado River's two primary reservoirs, Lakes Mead and Powell, was 26 percent of capacity. When considering Colorado River projections from [Reclamation's 2012 Colorado River Basin Water Supply and Demand Study](https://www.usbr.gov/lc/region/programs/crbstudy/finalreport/index.html) (<https://www.usbr.gov/lc/region/programs/crbstudy/finalreport/index.html>), the Colorado River is expected to experience a median imbalance of 3.2 million acre-feet per year (MAFY) between supply and demand by 2060 due to climate change coupled with

increased demand. Observations in the past decade suggest that deficit may be reached well before 2060.

SNWA considers the impacts of climate change in the planning environment, the most evident hydroclimatic change in the Basin over the past 40 years has been increased temperatures. Warming temperatures in the Basin have impacted hydrologic conditions, including inflows to the reservoir system. Climate change is linked to the [trend of increasing temperatures](https://wwa.colorado.edu/sites/default/files/2021-06/ColoRiver_StateOfScience_WWA_2020_Chapter_2.pdf) in the region since the 1980s (https://wwa.colorado.edu/sites/default/files/2021-06/ColoRiver_StateOfScience_WWA_2020_Chapter_2.pdf). These impacts are expected to worsen with a warmer, drier future.

SNWA long-range demand projections through 2060 for Boulder City are anticipated to fluctuate between 18 and 21 million gallons per day. Boulder City demands have remained consistent over time due to restrictions on growth, but the proposed project would allow for greater reuse.

3. Describe how the planning activities will investigate potential uses and markets for reclaimed or desalinated water (e.g., environmental restoration, fish and wildlife, groundwater recharge, municipal, domestic, industrial, agricultural, power generation, and recreation).

Current reuse for reclaimed water in Boulder City is limited to industrial use through sales to solar farms and gravel pits. With input from Boulder City government officials, planning activities will investigate potential direct or indirect uses for reclaimed water. Uses for reclaimed water could include direct reuse for municipal and recreation irrigation needs, including irrigation at the Boulder City Golf Course, Boulder Creek Golf Course, Veteran’s Memorial Park and Veteran’s Cemetery. Uses for reclaimed water could include indirect reuse for groundwater recharge by sending highly treated effluent to a recharge well.

4. Describe the source water that will be considered for the project, including location, capacities, existing flows, treatment processes, and quantities of impaired water available to meet the new reclaimed, recycled, or desalinated water demands.

Boulder City’s water supply is purchased from SNWA, which delivers treated surface water from the Colorado River System drawn from SNWA’s intake system within Lake Mead. Boulder City’s potable water comes from the Alfred Merritt Smith Treatment Facility (AMS). Water arrives at AMS and after a complex filtration process and ozonation treatment, water is treated with a disinfectant to protect it on its way to residents. Southern Nevada’s municipal water supply meets or exceeds all federal Safe Drinking Water Act standards, as evidenced in the [AMS 2022 Water Quality Summary](https://www.snwa.com/water-quality/reports/summary-alfred-merritt-smith-treatment-plant.html) (<https://www.snwa.com/water-quality/reports/summary-alfred-merritt-smith-treatment-plant.html>).

SNWA deliveries to Boulder City, including potable and raw water, were 10,075 AF in 2021 and 8,847 AY in 2022. Boulder City’s wastewater treatment facility operates with low seasonal variability. In a five-year snapshot prepared by the SNWA Water Resources Division, from 2018 to 2022, the direct reuse averaged 400 AFY (range 210 AFY to 563 AFY). This has significant and unpredictable variability based on the needs of the businesses purchasing the water for reuse. The amount of water not being recycled during that five-year period averaged 842 AFY (range

637 AFY to 1,044 AFY). The water not being reused is discharged to evaporation ponds, so SNWA can estimate that over 800 AFY of impaired water is available to meet reuse demands.

Subcriterion No.1b-Evaluation of Project Alternatives

1. Describe the objectives that all alternatives will be designed to meet. What other water supply alternatives and project alternatives will be investigated?

Planning activities will support a single objective: Decrease consumptive use from Lake Mead by recycling Boulder City wastewater to support a secondary use, whether direct reuse or indirect reuse. Decreasing consumptive use requires less water to be drawn from Lake Mead, reducing stress on the Colorado River.

Regarding supply alternatives, Boulder City does not draw any water from groundwater wells, all water provided to the city comes from Lake Mead. As stated in the Technical Project Description section above, four different options for recycling wastewater have been considered, while two options have risen to the top after these discussions as the most viable from a cost perspective. As the consultant investigates the proposed projects, additional investigation on alternatives, including connecting the wastewater ponds in the Eldorado Valley to another member agency's treatment system for indirect reuse.

2. Describe how the planning activities will develop project alternatives (water supply sources, reuse strategies, or treatment technologies) that have been or will be investigated.

Planning activities will include an analysis on the best cost value of the water. The proposed planning project will use existing treatment technology. Different levels of treatment will be required, depending on whether the project utilizes direct or indirect reuse, so additional analysis on upgrades or replacement needed at the Boulder City treatment plant for improved water quality effluent. Since the project may include significant environmental permitting, investigating compliance is crucial in the planning process, as well as projecting future operating costs on alternatives.

3. Provide a general description of the selected project, including project features, benefits, anticipated costs, and analyses conducted.

Alternative A: Direct Reuse for Boulder City Irrigation would provide 100 percent utilization of treated effluent and would not require operating agreement with any other member agency. It is anticipated that wastewater treatment plant upgrade/replacement at the Boulder City plant would be required to improve the water quality effluent needed for irrigation. This alternative would involve repurposing an existing raw water line and blending potable and treated wastewater for irrigation. Water quality implications of using high total dissolved solids (TDS) treated wastewater during winter require monitoring and management. Increased operating costs are anticipated for this alternative.

Alternative B: Treated Wastewater to Discharge Well would also provide 100 percent utilization of treated effluent and would not require operating agreement with any other member agency. This alternative is also expected to require wastewater treatment plant upgrade/replacement to improve effluent quality for release). Significant environmental permitting is expected with this alternative, as well as increased operating costs. An alternative like this could have the potential for return-flow credits, which would require special dispensation from Reclamation.

Regardless of the project selected, costs are expected to exceed \$30 million. SNWA has \$26 million available in its Major Construction and Capital Plan for project construction.

4. Include a preliminary schedule showing major tasks, milestones, and dates for the planning, design, and construction activities related to the project.

Table 1. Projected Milestones

Task/Activity	Planned Start Date	Planned Completion Date
Consultant onboarding and scoping initial efforts associated with the Boulder City Effluent Reuse Concept Evaluations	Pre-award 2023	Pre-award 2023
<ul style="list-style-type: none"> • Research existing Boulder City treatment facility • Permit requirements • Right-of-way (ROW) • Permit approvals • Stakeholder coordination • Environmental compliance 	March 2024	December 2024
Development and evaluation of concepts	January 2025	December 2025
Selection of final concept	January 2026	February 2026
Construction	Post-project period for the planning project	Post-project period for the planning project (2028 to 2030, depending on the alternative selected.)

E.1.2 Evaluation Criterion 2 - Stretching Water Supplies

1. Describe the potential for the project to reduce, postpone, or eliminate the development of new or expanded non-recycled water supplies.

As additional shortages may be declared and conservation yields less gains, Nevada could approach the state’s allocation or allowable use under shortage. The SNWA maintains a Water Resource Plan that projects water demands and supplies under a variety of different hydrologic scenarios for the next 50 years. In every scenario, if Southern Nevada is unable to meet its conservation goal, the need for new, permanent water supplies is needed earlier. The SNWA does not have any definitive plans for what those supplies are at this time, making the development of a new permanent supply for the community a costly and challenging endeavor. Meeting the conservation goal pushes the need to postpone, and in some scenarios, eliminate the development of new water supplies. Therefore, any effort to reduce consumptive water uses, including the proposed water recycling project for Boulder City, will reduce, postpone, and in some hydrologic scenarios, eliminate the development of new non-recycled water supplies.

2. Describe the potential for the project to alleviate pressure on existing water supplies and/or facilities. Please describe the existing water supplies, identify the supplies and/or facilities that will be impacted and explain how they will be impacted by the Project, including quantifications where applicable.

All of Boulder City's potable water is treated and delivered through SNWA's Alfred Merritt Smith Water Treatment Facility located on the shore of Lake Mead. Reuse projects that result in drawing less water from the lake, such as the proposed Boulder City recycling project, can reduce impacts to the existing intakes in Lake Mead and treatment plants.

As discussed in subcriterion 1a, Boulder City's finished water comes from AMS. AMS has the capacity to treat 600 million gallons a day, and while Boulder City's long-term demands may seem small at 18 to 21 million gallons a day, any savings to AMS are valuable.

3. Describe the potential for the project to make water available to address a specific concern. Explain the specific concern and its severity. Also explain the role of the project being investigated in addressing that concern and the extent to which the project will address it.

The proposed project has the potential to keep water in the system and address numerous concerns, including water supply shortages, water supply reliability, water quality issues, and a slow-moving natural disaster: the aridification of the desert Southwest.

Water supply shortage risk remains high in future years. The Basin is experiencing the worst drought in 1,000 years, with snowfall and runoff well below normal, causing significant declines at Lake Mead. The tier two shortage declared by Reclamation for 2023 reduced the amount of water from the Colorado River available to Nevada, from 300,000 AFY to 275,000 AFY. To assist with water supply reliability, SNWA employs numerous adaptive management strategies, including the third intake and a low-level pumping station at Lake Mead, water banking, and comprehensive conservation programs.

According to SNWA researchers, lower lake volume may impact water quality as less volume in the lake is available for dilution of constituents, coupled with increases in summer temperatures. [Researchers utilize a three-dimensional hydrodynamic and water quality model](https://www.frontiersin.org/articles/10.3389/frwa.2022.983257/full) for Lake Mead, which shows that loss of volume has the potential to significantly increased recycled water concentration (RWC) at the drinking water intake (<https://www.frontiersin.org/articles/10.3389/frwa.2022.983257/full>). RWC is significantly higher in nutrients than the ambient Lake Mead water. Further, reduced lake volumes may lead to total organic carbon accumulation in upper Lake Mead, which could enter the drinking water intake as an interflow and is potentially concerning as a precursor for disinfection byproduct formation.

The ongoing effects of climate change are leading to the permanent aridification of the Southwest and the Colorado River; the drying conditions that result from warming temperatures will impact our future. Simply, this means that less water will flow into Lake Mead in the future, so residents will have conserve water and stretch resources.

The project being investigated addressed these concerns by stretching water resources through reuse of water that was previously consumptively used only once.

4. Describe the potential for the project to help create additional flexibility to address drought. Will water made available by the project being investigated continue to be

available during periods of drought? To what extent is the water made available by the project being investigated more drought resistant than alternative water supply options? Water made available by the proposed planning project will continue to be available during periods of drought. Since Lake Mead is Boulder City's sole source of water, the project being investigated will help stretch the resource and work toward the fullest use of every million gallons per day delivered to the city. The recycled water is more drought resistant using the existing SNWA raw water delivery and treatment plants that allows water to be withdrawn from Lake Mead below elevation 1000 feet.

E.1.3 Evaluation Criterion 3-Environment and Water Quality

1. Describe the potential for the project to improve the quality of surface water or groundwater.

Whether the project contributes to direct or indirect reuse, less water will be drawn from the lake helps maintain the lake level. As the lake draws down and intake is lower to the surface, water temperatures can increase, especially with the variability of seasons, which is cause for concern for water quality.

Reclamation's most probable flow scenario for the Lower Colorado River Basin projects a potential low elevation of 1016 feet above sea level [over the next 24 months](https://www.usbr.gov/lc/region/g4000/24mo.pdf) (at the time of writing in February 2023) (<https://www.usbr.gov/lc/region/g4000/24mo.pdf>). Lower lake levels coupled with summer air temperature will move SNWA's third intake into the stratified portion of the lake, with a potential maximum projected raw water temperature of 20 degrees Celsius. SNWA researchers have conducted [studies using regression models](https://www.frontiersin.org/articles/10.3389/frwa.2022.983257/full) to better understand how lower lake levels can impact water quality (<https://www.frontiersin.org/articles/10.3389/frwa.2022.983257/full>). Warmer raw water temperatures will yield increased treatment cost and potential for modifications to treatment infrastructure.

2. Describe the potential for the project to improve effluent quality beyond levels necessary to meet State or Federal discharge requirements.

Currently, effluent treated at the Boulder City plant is treated to the minimum requirements to allow for discharge. With higher standards due to reuse, this project could get Boulder City's effluent to the same above standard quality as other SNWA member agencies.

3. Describe the potential for the project to improve flow conditions in a natural stream channel.

Although this project does not directly improve flow conditions because the considered options would at most return water into Lake Mead, the returned flow does provide for this water to flow downstream of Hoover Dam in the Colorado River and would serve as a base load supply to maintain water flows for lake elevations above 985 feet.

4. Describe the potential for the project to restore or enhance habitat for non-listed fish and wildlife species.

With reuse, less water is pulled from the Lake Mead, which helps protect lake volume and protect the homes of the variety of animals who live there. Lake Mead and the surrounding recreation area is home to many types of birds, mammals, and fish. More than 240 types of birds

have been recorded in the recreation area, like bald eagles, peregrine falcons, and borrowing owls. Vegetation around the shore of the Hoover Dam is feeding grounds for insect-eating birds. Mammals in the area vary from coyotes and rabbits to big horn sheep and mountain lions. At least 19 species of bats have been found within the recreation area. Sport fish in Lake Mead include varieties of bass, rainbow trout, channel catfish, black crappie, and varieties of sunfish.

5. Describe the potential for the project to provide water or habitat for federally listed threatened or endangered species.

With reuse, less water is pulled from the Lake Mead, which helps protect lake volume and protect the homes of the threatened or endangered species who live there. The extreme, persistent drought in the West has significantly affected water levels in Lake Mead; conservation measures that reduce consumptive use of Lake Mead supplies help improve conservation efforts for endangered species and support continued Endangered Species Act (ESA) compliance. Federally endangered fish species at Lake Mead include the bonytail chub (*Gila elegans*) and razorback sucker (*Xyrauchen texanus*). The Lower Colorado River Multi-Species Conservation Program (LCR MSCP) was created to provide ESA compliance for the use of Colorado River water resources while conserving native species and their habitats. This 50-year program provides regulatory coverage for water diversions and power production, including the water supply to nearly 40 million people across seven states. Reclamation is the implementing agency for the LCR MSCP, in partnership with 57 entities including state and federal agencies, water and power users, municipalities, Native American tribes, conservation organizations, and other interested parties. SNWA and the Nevada Department of Wildlife (NDOW) are active participants in the implementation of the program. A key component of the LCR MSCP is the production of over 1.2 million native fish to augment existing populations.

E.1.4 Evaluation Criterion 4—Department of the Interior Priorities Climate Change

Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis. Does this proposed project strengthen water supply sustainability to increase resilience to climate change?

Southern Nevada's biggest threat from the climate crisis is reduced water availability due to severe, persistent drought in the Colorado River Basin and throughout the Southwest. Conservation is a key tool in managing our shrinking water supply. Activities designed in the proposed project would strengthen water supply sustainability to increase resilience to climate change by reusing water, either directly or indirectly, and potentially creating permanent water savings.

Disadvantaged or Underserved Communities

Will the proposed project serve or benefit a disadvantaged or historically underserved community?

The [Nevada median household income is \\$65,686](https://www.census.gov/quickfacts/NV) in 2021 dollars, per the U.S. Census Bureau (<https://www.census.gov/quickfacts/NV>). In looking at a breakdown of median household income by race in Las Vegas and surrounding cities or areas of unincorporated Clark County in the SNWA service, it can be surmised that households earning less than 100 percent of the statewide median household income will indirectly benefit from the proposed project.

Table 2. Median Household Income by Race: Cities in Las Vegas MSA and Boulder City

	Las Vegas	Henderson	North Las Vegas	Enterprise	Spring Valley	Sunrise Manor	Boulder City
American Indian or Alaska Native	\$36,574	\$58,953	\$58,333	\$61,596	\$86,484	\$48,221	N/A
Asian	\$67,142	\$76,006	\$82,302	\$83,644	\$65,949	\$66,250	N/A
Black or African American	\$36,153	\$53,828	\$49,414	\$62,698	\$48,701	\$28,837	N/A
Hispanic or Latino	\$50,111	\$70,451	\$56,034	\$78,213	\$57,189	\$48,332	\$57,750
Native Hawaiian or Pacific Islander	\$53,000	\$57,083	\$63,750	\$108,160	\$72,054	\$43,704	N/A
White	\$65,875	\$78,371	\$65,606	\$83,429	\$61,417	\$45,170	\$63,019

Groups highlighted in yellow have a median household income below Nevada’s state median household income. City median household data from Data Commons for [cities near Las Vegas](https://datacommons.org/place/geoId/3240000) and [Boulder City](https://datacommons.org/place/geoId/3206500), utilizing U.S. Census data (<https://datacommons.org/place/geoId/3240000> and <https://datacommons.org/place/geoId/3206500>).

If the proposed project is providing benefits to an underserved community, provide sufficient information to demonstrate that the community meets the underserved definition in E.O. 13985, which includes populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.

To see which underserved communities will indirectly benefit from the proposed project, consider a snapshot of population demographics in the county. Table X below outlines these demographics. Additionally, 32.3 percent of residents in Clark County identify as Hispanic or Latino. ([U.S. Census Bureau Quick Facts, Clark County, Nevada](https://www.census.gov/quickfacts/fact/table/clarkcountynevada/RHI225219#RHI225219) <https://www.census.gov/quickfacts/fact/table/clarkcountynevada/RHI225219#RHI225219>)

Table 3. Underserved Populations by Race, Percentage of Clark County Population

Black or African American, alone	13.6%
American Indian and Alaska Native, alone	1.3%
Asian, alone	10.9%
Native Hawaiian or Other Pacific Islander, alone	1.0%
Two or More Races	5.3%

Tribal Benefits

Does the proposed project directly serve and/or benefit a Tribe?

The proposed project will not directly serve or benefit a Tribe. However, the project will indirectly benefit Indian tribes by reducing consumptive use on the Colorado River, to which Indian tribes have rights, including the Fort Mojave Indian Tribe, Colorado River Indian Tribes, Chemehuevi Indian Tribe, Quechan Indian Tribe, and Cocopah Indian Tribe in the Lower Basin. Additionally, the Southern Paiute Tribe will indirectly benefit as the nation is in an SNWA member agency service area.

E.1.5 Evaluation Criterion 5—Watershed Perspective and Stakeholder Involvement

Will the proposed project implement a regional or state water plan or an integrated resource management plan? Explain.

Wastewater recycling projects are prioritized in stakeholder initiatives such as the Integrated Resources Planning Advisory Committee (IRPAC) [2020 Recommendations Report](https://www.snwa.com/assets/pdf/irpac-2020-recommendations-report.pdf) (<https://www.snwa.com/assets/pdf/irpac-2020-recommendations-report.pdf>) and the [2023 SNWA Water Resource Plan](https://www.snwa.com/assets/pdf/water-resource-plan-2023-printable.pdf) (<https://www.snwa.com/assets/pdf/water-resource-plan-2023-printable.pdf>).

IRPAC is an advisory committee convened in 2019 to evaluate and make recommendations on issues of interest to SNWA’s long-term planning efforts. Meetings were coordinated and managed by an independent facilitator who was familiar with local utility matters. The committee included 11 members representing diverse stakeholder groups, such as the Urban Chamber of Commerce, Laborers Local 872, the Nevada Resort Association, the Nevada Conservation League, and various economic-focused groups, within the SNWA service area. The committee followed state Open Meeting Law and provided a list of 22 recommendations after a course of meetings over 10 months. One of the committee’s recommendations was to move forward with the projects proposed for SNWA’s Major Construction and Capital Plan (MCCP), which included resource maximization projects, including a conveyance system to recycle Boulder City’s wastewater that is currently being sent to evaporation ponds.

To support its water planning and management responsibilities, SNWA develops and maintains a Water Resource Plan. The Water Resource Plan projects demand and identifies a portfolio of existing and planned water supply options available to meet demands over time. The 2023 Resource Plan prioritizes recognizes water reuse as critical to lower pumping costs through direct reuse and extending the state’s Colorado River supply with return-flow credits through indirect reuse. First developed in 1996, the Water Resource Plan is reviewed annually and updated as needed. As demonstrated in previous revisions, adjustments to the plan are made to account for uncertainties such as drought, conservation achievements, resource availability, and changes in population and demand projections.

2. Will the proposed project help meet the water supply needs of a large geographic area, region, or watershed? Explain.

The proposed planning project will help meet the water supply needs of SNWA's service area. Collectively, SNWA member agencies (Big Bend Water District, Boulder City, COH, City of Las Vegas, City of North Las Vegas, Clark County Water Reclamation District, and the Las Vegas Valley Water District) serve 2.3 million residents in Southern Nevada. Southern Nevada depends on the Colorado River for approximately 90 percent of its water supply, so projects that help reduce the amount of water pumped from Lake Mead or contribute to return-flow credits lessen stress on the river and extend the resource to help meet the needs of the service area and beyond.

3. Will the proposed project promote collaborative partnerships to address water-related issues? Explain. Describe stakeholder involvement in the project planning process.

Since 2019, SNWA leaders have had discussions and given presentations to Boulder City elected leaders and residents, including city council members and members of the [Utility Advisory Committee](https://www.bcnv.org/639/Utility-Advisory-Committee) (<https://www.bcnv.org/639/Utility-Advisory-Committee>). This citizen committee is appointed by the council, meets monthly, and makes recommendations to the council, Utilities Director, and City Manager on affairs relevant to municipal utilities operations. Other SNWA member agencies, such as the City of Henderson (COH), have also been included in stakeholder conversations to explore the possibility of expanding existing infrastructure.

Overall, four different options for recycling wastewater were considered, and two options have risen to the top after these discussions as the most viable from a cost perspective. The city council is planning to select an option at a March 2023 meeting, which will be the alternative that the SNWA explores and ultimately constructs to capture and recycle the community's wastewater.

4. Will the proposed project include public outreach and opportunities for the public to learn about the project? Explain.

SNWA staff have been working with Boulder City officials to several years to find a solution for recycling the city's wastewater. Both the City Council and Utility Advisory Committee will be regularly apprised on planning progress. Meeting agendas for both groups are posted in [Boulder City's Agenda Portal](https://bcnv.primegov.com/public/portal/) (<https://bcnv.primegov.com/public/portal/>) and citizens can make public comment at any meeting. Additionally, Boulder City shares conservation information through a variety of methods including bill inserts, social media, local newspapers and television, and the City's website.

5. Project Budget: Funding Plan

SNWA as is funded by diverse sources, including a quarter-cent sales tax, connection fees, commodity fees, and reliability charges. The matching contribution of \$1,660,000 will be provided by SNWA. Since no matching funding will be provided by a source other than the applicant, no letters of commitment are required.

6. Project Budget: Budget Proposal

Table 4. Summary of Non-Federal and Federal Funding Sources

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
1 SNWA	\$1,660,000
2 N/A	\$0
Non-Federal Subtotal	\$1,660,000
REQUESTED RECLAMATION FUNDING	\$1,000,000

Table 5. Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	\$1,000,000
Costs to be paid by the applicant	\$1,660,000
Value of third-party contributions	\$0
TOTAL PROJECT COST	\$2,660,000

Table 6. Budget Proposal

Summary			
6. Budget Object Category	Total Cost	Federal Estimated Amount	Non-Federal Estimated Amount
a. Personnel	\$0		
b. Fringe Benefits	\$0		
c. Travel	\$0		
d. Equipment	\$0		
e. Supplies	\$0		
f. Contractual	\$2,660,000		
g. Construction	\$0		
h. Other Direct Costs	\$0		
i. Total Direct Costs	\$2,660,000		
i. Indirect Charges	\$0		
Total Costs	\$2,660,000	\$1,000,000	\$1,660,000
Cost Share Percentage		38%	62%

7. Project Budget: Budget Narrative

All costs included in this proposal are directly related to the project and necessary for its implementation. The non-federal contribution is 62 percent; the federal contribution is 38 percent.

Personnel Salaries and Wages/Fringe Benefits/Travel/Equipment/Supplies/Construction: Not applicable to the proposed planning project.

Contractual: A consultant contract is required for the proposed project. Brown & Caldwell has been pre-selected based on knowledge of the area and subject expertise. The firm's work is focused solely on water and environmental projects. Concept evaluation tasks to be completed by this contract include environmental compliance reviews, ROW mapping, Nevada Department of Transportation coordination, permitting and approval research, groundwater modeling, wastewater treatment plant research, hydraulic modeling, and outreach/stakeholder coordination with Boulder City and possibly National Park Service. Average fees of consultants in the area are \$190/hour and it is estimated that 14,000 of work will be completed, between consultant internal engineers and subconsultant engineers. Costs were generated based on engineer experience with similar contracts.

Environmental and Regulatory Compliance Costs: Depending on the final concept, these costs could be significant in later construction phases. Research for concept environmental and regulatory costs is included in the contractual line item.

Other Expenses: Not applicable to the proposed planning project.

Total Direct Costs: Reclamation is requested to contribute \$1,000,000 toward direct costs. SNWA will provide non-federal cost share of \$1,660,000.

Indirect Costs: All direct costs align with eligible categories. SNWA does not have a federally negotiated indirect cost rate agreement. No funds are requested for indirect costs.

8. Environmental and Cultural Resources Compliance

If awarded funding, SNWA and any consultants working for SNWA will work with the local Reclamation office to ensure that all necessary compliance is met if any planning work may be ground disturbing. No ground-disturbing work would begin prior to the Notice to Proceed being issued.

9. Required Permits or Approvals

Determining the required permits or approvals will take place through the planning activities outlined in this proposal.

10. Letters of Support

Letters of Support from Boulder City and the Clark County Board of Commissioners are included in Appendix A.

11. Overlap or Duplication of Effort Statement

There is no known overlap between the proposed project and any other active or anticipated proposals or projects. This project proposal has not been submitted for funding consideration to any other potential funding source.

12. Official Resolution

An official resolution authorizing the submission of this proposal and confirming the subject matching requirements will go before the SNWA Board of Directors at its March 16, 2023, meeting. A copy will be forwarded to Reclamation at that time, as communicated to the program director.

13. Conflict of Interest Disclosure

To the best of our knowledge, no actual or potential conflict of interest exists at the time of submission. If awarded, SNWA will disclose, in writing, any conflicts of interest that may arise during the life of the award.

14. Uniform Audit Reporting Statement

SNWA was required to complete a Single Audit for the fiscal year ending June 30, 2021. SNWA's EIN is 88-0278492 and the report is available through the Federal Audit Clearinghouse website.

15. Certification Regarding Lobbying

As this application requests more than \$100,000 in Federal funding, the applicant certifies the statements in 43 CFR Part 18, Appendix A. Standard Form-LLL, "Disclosure Form to Report Lobbying" was submitted with this application.

16. Unique Entity Identifier

SNWA maintains an active registration in SAM.gov. Its Cage Code is 3NRT9. SNWA's SAM Unique Identifier is SM1CPB4X7E88.

17. Supporting Documents: Appendix A and Attachment A

Appendix A Letters of Support and Attachment A Budget Detail are included as attachments via grants.gov.

Appendix A
Letters of Support

Southern Nevada Water Authority
Boulder City Wastewater Recycling: Research, Planning, & Feasibility Study



CITY OF BOULDER CITY

Mayor Joe Hardy
401 California Avenue
Boulder City, NV 89005
(702) 525-1108
Joehardy@bcnv.org

February 28, 2023

Bureau of Reclamation
Attn: Maribeth Menendez
PO Box 25007, 86-63000
Denver, CO 80225

RE: Letter of Support for the Southern Nevada Water Authority's Grant Application

Dear Ms. Menendez:

The City of Boulder City is pleased to support the Southern Nevada Water Authority's (SNWA) grant application to the Bureau of Reclamation's WaterSMART Water Recycling and Desalination Planning funding opportunity to explore solutions for reuse of Boulder City wastewater.

As an SNWA member agency, Boulder City is working to achieve conservation goals described in the 2023 SNWA Water Resource Plan. Unlike the majority of the Las Vegas Valley, Boulder City lacks the infrastructure to recapture and treat its wastewater. Instead, the majority of Boulder City's wastewater is discharged to evaporation ponds, representing nearly a full consumptive use of those resources. Boulder City, in partnership with the SNWA, has been exploring a recycled water solution for its community for a while.

Continuing to reduce consumptive use of Colorado River water offers benefits not only to our community, but the state of Nevada and the entire Colorado River Basin. In 2020, the Integrated Resource Planning Advisory Committee (IRPAC) – an advisory committee comprised of a broad section of community representatives – supported the idea that Boulder City find a solution for wastewater within their 2020 recommendations.

Improving infrastructure is key to reaching our conservation goals in Southern Nevada as we continue to face severe, persistent drought and climate change. Boulder City appreciates SNWA's efforts to pursue and evaluate the feasibility of this project.

Thank you for your consideration.

Sincerely,

Mayor Joe Hardy
City of Boulder City



JIM GIBSON
Chairman

Board of County Commissioners

CLARK COUNTY GOVERNMENT CENTER
500 S GRAND CENTRAL PKY
BOX 551801
LAS VEGAS NV 89155-1601
(702) 455-3500 FAX: (702) 383-6041

February 22, 2023

Bureau of Reclamation
Attn: Maribeth Menendez
Denver, CO

RE: Letter of Support for the Southern Nevada Water Authority's Grant Application

Dear Ms. Menendez:

As Chairman of the Clark County Board of County Commissioners, which oversees the activities of Southern Nevada and encompasses more than 2 million residents, I am pleased to offer my support of the Southern Nevada Water Authority's (SNWA) grant application to the Bureau of Reclamation's WaterSMART Water Recycling and Desalination Planning funding opportunity to explore solutions for reuse of Boulder City wastewater.

Within Clark County, Colorado River water resources meets the majority of our community's drinking water demands. While the majority of the county's developed communities are able to return wastewater to a municipal sewer where it is highly treated and returned to Lake Mead for return flow credits, Boulder City lacks the infrastructure to recapture and treat its wastewater. Instead, the majority of Boulder City's wastewater is discharged to evaporation ponds, representing nearly a full consumptive use of those resources.

As an SNWA member agency, Clark County plays an important role in maximizing wastewater effluent recovery to expand Southern Nevada's Colorado River supply. As severe drought continues to affect the entire Colorado River Basin, maximizing water resources and reducing consumptive water use must remain a priority for all users.

Improving infrastructure is key to reaching our conservation goals in Southern Nevada as we adapt to climate change while working to maintain a healthy, vibrant community. The Board of Commissioners appreciates SNWA's efforts to pursue this project.

Thank you for your consideration.

Sincerely,

Chairman James B. Gibson
Board of County Commissioners
Clark County, Nevada