Fall 2023

OneWater Nevada
Our Sustainable Water Future

The Challenge

As a high-desert community, we have a deep and enduring appreciation for the value of water in the Truckee Meadows and surrounding region. This appreciation has led to our focus on sustainable water management practices — conserving, recycling, and storing water for the future. Developing solutions to protect water quality and availability for tomorrow's generations, while serving today's needs, has become a hallmark of our community's **comprehensive water resource management** approach.

Today, we face challenges related to growth, drought, and weather-pattern variability. With a research-driven focus, OneWater Nevada leads the region in developing innovative solutions for a resilient water future.

What is Advanced Purified Water?

Nevada has decades of experience producing recycled, or reclaimed, water, which can be used for irrigating crops and landscapes, as well as construction and industrial applications. The Nevada Division of Environmental Protection regulates recycled water under various categories that are based on the level of treatment and water quality.

In 2016, new regulations were adopted to permit the use of Category A+ reclaimed water, or Advanced Purified Water, for groundwater augmentation (also known as aquifer storage and recovery). Advanced Purified Water quality is achieved through a combination of advanced water treatment processes and natural groundwater filtration during storage.

What Is OneWater Nevada?

OneWater Nevada is a collaborative effort of regional agencies exploring a comprehensive approach to extending the resiliency and sustainability of local water resources for future generations. This approach takes into account the interconnected nature of water systems and seeks to balance our community's needs with the protection and preservation of natural resources. Through this effort, OneWater Nevada seeks to implement water practices, such as:

- Exploring ways to both conserve and extend the use of existing water resources
- Considering long term water-resource and water-quality management issues
- Helping protect the environmental integrity of our watersheds
- Developing technologies and practices that sustain our quality of life

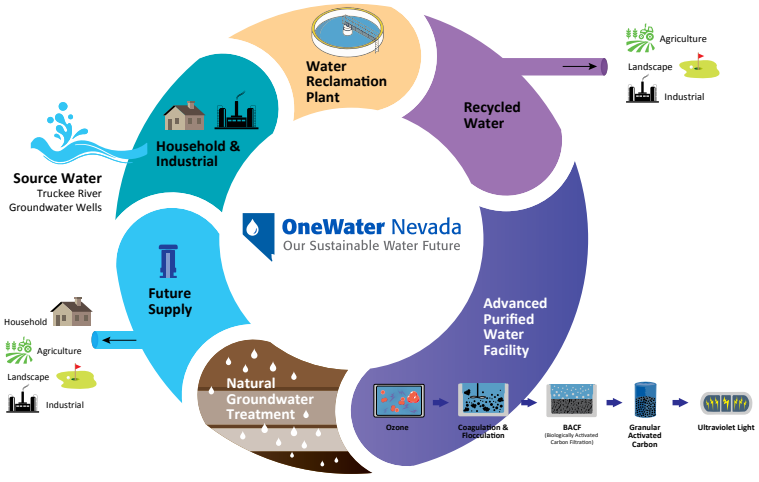
OneWater Nevada's primary goal is to ensure there is enough water available to meet the needs of all users while protecting, and even improving, the region's water quality and environmental integrity. This involves careful monitoring of water supplies, assessing future water demands, and developing strategies to meet those demands while minimizing the impact on the natural environment.

A current step in this effort is to evaluate the potential for improving efficiency, drought flexibility, and diversification of the region's water supply by using Nevada's category A+ "Advanced Purified Water." OneWater Nevada's research indicates Advanced Purified Water represents an opportunity to create an entirely new water resource. A 2019 feasibility study rigorously examined the key components of producing Advanced Purified Water; including technical, environmental, financial, and regulatory factors. We also conducted advanced-treatment pilot testing, geotechnical investigations, and field-scale treatment demonstration projects where Advanced Purified Water was successfully produced and recharged into an aquifer. Our results point to a substantial potential benefit for our regional groundwater sustainability.

OneWater Nevada participants include Truckee Meadows Water Authority, Washoe County, City of Reno, City of Sparks, Western Regional Water Commission, Northern Nevada Water Planning Commission, Truckee Meadows Water Reclamation Facility, and the University of Nevada, Reno.

What is Comprehensive Water Resource Management?

Comprehensive Water Resource Management optimizes and protects water sources through regional coordination of agency and municipal water operations and planning efforts.



Quality and Safety of Advanced Purified Water

Advanced Purified Water has been used to replenish underground aquifers and surface reservoirs in the U.S. for over 50 years. Like Truckee Meadows, these other communities have a strong desire to conserve and recycle water resources.

The State of Nevada regulates the treatment of groundwater and surface water, and the production of Category A+ Advanced Purified Water. State regulations require treatment to drinking water standards and allow for direct injection into groundwater aquifers, intended for aquifer storage and recovery.

In 2016, a third-party, technical panel of water experts was commissioned by the National Water Research Institute (NWRI) to evaluate and review the Project. The expert panel concluded that it was, "plausible, feasible and protective of public health." Water quality sampling confirms purified water that undergoes this level of treatment has an equal or higher level of water quality than treated groundwater or surface water. Follow-up reviews by NWRI panels of experts were conducted in 2022 and 2023 to confirm its earlier findings as the Project has progressed and seeks official permitting from the Nevada Division of Environmental Protection (NDEP) to allow construction to begin in 2024.

Since 2017, OneWater Nevada has been studying various advanced water treatment technologies at a pilot-scale level in collaboration with the Nevada Water Innovation Institute. An Advanced Purified Water demonstration study at RSWRF was completed in 2020, which successfully achieved Advanced Purified Water quality, demonstrated groundwater injection and recovery, and validated the capabilities of advanced water treatment technologies used in the Project.

OneWater Nevada's Principal Project:

The Advanced Purified Water Facility at American Flat

The Advanced Purified Water Facility at American Flat (Project) offers regional long-range water resource benefits. This will include use of Advanced Purified Water initially for agricultural irrigation, followed by long-term aquifer storage and recovery, and—after further extensive testing and evaluation—inclusion in our regional, potable water supply.

For this Project, recycled water from the Reno-Stead Water Reclamation Facility (RSWRF) will go through multiple, additional treatment steps before being sent to the planned Advanced Purified Water Treatment Facility for further purification. Through this process, it is transformed into water which meets or exceeds Federal and State drinking water standards. The purified water will be used to replenish an aquifer, where it will blend with existing groundwater and then be extracted. Initially, the extracted water will be used for irrigating the American Flat alfalfa fields and later will be used to augment regional drinking water supplies. Once Advanced Purified Water is proven successful at American Flat, the technology may be implemented at other water reclamation facilities in the region.

The Project will include upgraded treatment facilities at RSWRF, an advanced purified water treatment facility (to be built near the RSWRF site), conveyance pipelines, pump station improvements, and injection and extraction wells.

Project Benefits

The potential benefits from an advanced purified water system within the Truckee Meadows service area include:

- Providing a local, reliable, drought-proof water source
- Reducing reliance on the Truckee River water supply
- Enhancing the region's water supply resiliency to help address the future uncertainties of changing weather patterns, such as longer growing seasons, snowpack changes, and water runoff timing

The NWRI expert panel concluded that the Project was, "plausible, feasible and protective of public health."

Project Status

Approvals for project funding were made in 2022 by partner agencies, and facilities and systems design are underway. The project team has evaluated responsibilities, staffing, and completed cost-sharing agreements developed to achieve optimal long-term operating systems. These include construction, startup, and preparing for future irrigation and potential potable reuse in the next ten years.

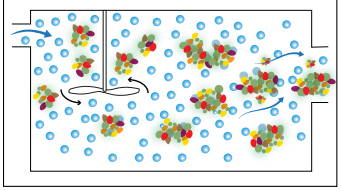
Project Cost

The current (2023) cost estimate for the Advanced Purified Water Facility at American Flat is approximately $125 million+. It will be funded by the OneWater Nevada partners, who have been pursuing State and Federal grants and low-interest loans to help offset costs.

A+ Advanced Purified Water Treatment Steps

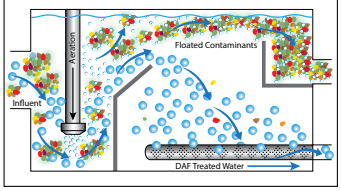
Reno-Stead Water Reclamation Facility Enhancements

1 Coagulation and Flocculation



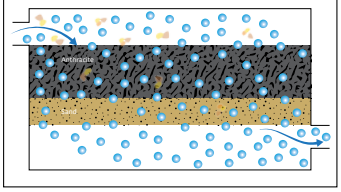
Safe, chemical coagulants are added, causing particles to stick together (floc) and form larger particles, which are more easily removed by subsequent treatment steps.

2 Dissolved Air Flotation (DAF)



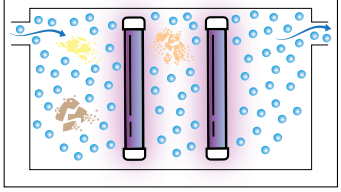
DAF systems introduce micron-sized bubbles that attach to the floc and rise to the surface. This floating bed of particles is removed by a skimmer.

3 Dual Media Filtration



Dual media filtration removes small solids and pathogens.

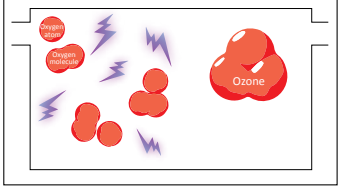
4 Ultraviolet Disinfection



High-intensity ultraviolet light kills most pathogens and viruses.

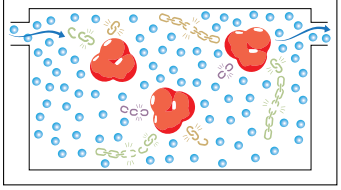
Advanced Purified Water Facility

5 Ozone Generation



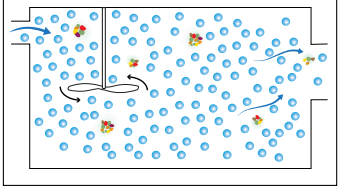
Because of its short life, ozone is generated on-site. Oxygen atoms and molecules are bonded using an electric field to create ozone.

6 Ozonation



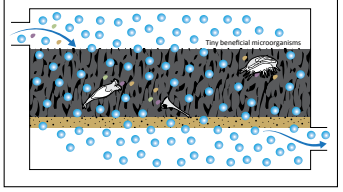
Ozone is a powerful oxidant used to break down organic constituents into smaller, more readily biodegradable molecules.

7 Additional Coagulation and Flocculation



Coagulants are again added to the water, causing impurities to stick together for easier removal (see step 1).

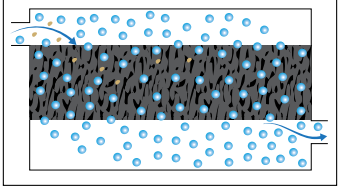
8 Biological Activated Carbon Filtration



Microbiologic organisms and carbon adsorption aid in the biodegradation and removal of dissolved organic constituents.

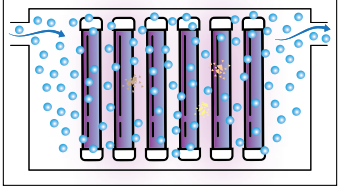
Polishing Steps Before Groundwater Injection

9 Granular Activated Carbon



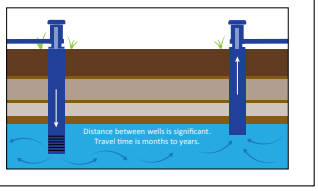
Polishing step for further removal of trace amounts of dissolved organic constituents, such a pharmaceuticals, PFAS, and disinfection byproducts.

10 Additional Ultraviolet Disinfection



High-intensity ultraviolet light kills any remaining pathogens and viruses.

11 Groundwater Injection



Finished, treated water is injected into the groundwater aquifer, where further natural treatment occurs before extraction.

Advanced Purified Water is a Local, Reliable, Drought-Proof Water Source

A clean, safe, drought-resilient water resource for today and generations to come.

A safe, reliable water supply
Advanced Purified Water uses proven, state-of-the-art technology that purifies water to a level that tests cleaner than most bottled waters.

Sustainable water supply option
Advanced Purified Water will diversify the region's water portfolio by adding an option that is resilient, sustainable, and energy-efficient.

Environmental benefits
Advanced Purified Water will reduce reliance on the Truckee River, leaving water in the river for aquatic life and recreation.

Drought-proof water supply
Having a safe, sustainable water supply ensures water is available even during periods of drought.

Independent of weather variability
Advanced Purified Water may enhance the region's water supply resiliency to help address future uncertainties of changing weather patterns, such as longer growing seasons, snowpack changes, and runoff timing.

OneWater Nevada Innovation and Education Center

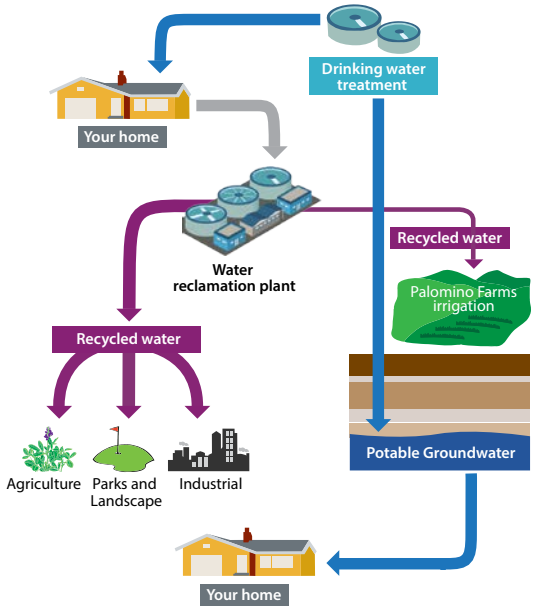
This Center, a collaboration between the University of Nevada, Reno and local agencies, will be located within the new Advanced Purified Water Facility. Through real-time research, students will explore how to improve water-resource sustainability, and this effort will contribute to training tomorrow's workforce in innovative water purification technologies.

For more information, visit OneWaterNevada.com

This facility will also be used to welcome visitors and show them how treated water is further purified. They will see firsthand and learn about the advanced water treament steps used at this unique facility.

Looking to the Future: Palomino Farms Sustainable Water Feasibility Study

OneWater Nevada's Palomino Farms Sustainable Water Resource Feasibility Study (Study) is part of a regional effort to identify ways we might expand water-resource availability in the future. The Study explores how the coordinated use of surface water, groundwater, and recycled water might help meet our regional water supply needs. This includes examining the viability of bringing water to the Palomino Farms and Warm Springs areas as part of a long-term sustainable water management plan. The intent is to determine if the aquifer can eventually be utilized to store large quantities of water for drought protection and possibly help meet demand during the peak summer water-use season in the region. Potential benefits could also include reducing the need for groundwater pumping by the agricultural wells in the area, supporting groundwater levels and storage, helping to preserve farmland and open space, and aiding in maintaining the rural lifestyle and character of the region.



For more information, visit Palomino-Farms.com

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For more information, visit:
OneWaterNevada.com

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