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The Nevada Governor's Office of Economic Development (GOED)

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Executive Summary

Purpose

WaterStart, through the Nevada Governor's Office of Economic Development (GOED), has collaborated with SRI International towards the development of a waterwise economic framework. This framework will help align water resource incentives and policies with economic development and inform future policy recommendations that will enable Nevada to continue sustainable growth into the future. To inform this framework, WaterStart and SRI organized a series of focus groups and conducted individual outreach with state and regional leaders from Nevada to discuss the intersection of economic development and water resource management.

The waterwise economic framework will help align economic development and water resource incentives and policies, and ultimately inform future policy recommendations that will enable Nevada to continue sustainable growth into the future.

Key Takeaways

Through engagement with stakeholders, WaterStart and SRI learned of several key challenges and opportunities related to economic development and water resource management, such as knowledge gaps, procedural and operational barriers, and technology needs and opportunities. To address these and other challenges, WaterStart and SRI developed a series of strategies and accompanying recommendations to help GOED and its partners achieve each strategy. Proposed strategies include:

- Strategy 1: In addition to finding strategic regional alignment, embrace a "not one size fits all" approach
- Strategy 2: Address procedural and knowledge gaps across the economic and water management ecosystem.
- Strategy 3: Grow Nevada's reputation as a leader in water resource management to propel economic development.
- Strategy 4: Build on ongoing initiatives and efforts.

Introduction

On December 14, 2021, the former Nevada Governor signed a proclamation affirming the significant threats to Nevada's economy due to climate change. Specifically, the proclamation mentioned increasing temperatures, reducing flows in the Colorado River, and a reduction in water levels in Lake Tahoe and Rye Patch and Lahontan Reservoirs. At the time of this initiative, the U.S. Drought Monitor classified the majority of Nevada as abnormally dry. These classifications have fluctuated over the past several years between abnormally dry or as experiencing severe to exceptional drought with 14 counties designated by the United States Department of Agriculture as drought areas in 2021 (United States Department of Agriculture, 2022). These conditions impact Nevada's "livelihoods, economies, and lifestyles" across the state. The former Governor also noted in the proclamation Nevada's leadership in responding to climate change, aridification, and drought because of the leadership of Southern Nevada Water Authority's conservation programs; the Nevada Legislature's first-in-the-nation ban on non-functional turf; and the Governor's Office of Economic Development's founding of WaterStart. Additionally, on August 8, 2024, Governor Joe Lombardo announced the launch of Nevada's Climate Innovation Plan, a strategic initiative designed to propel Nevada towards a sustainable future.

Nevada has also received national attention for its efforts to reduce consumptive water use. Through the efforts of WaterStart, Politico Magazine published a wide-ranging article dubbing Las Vegas the *Silicon Valley of Water.* Politico wrote: "If Las Vegas is the most profligate place on earth, where chance is king and the future is routinely gambled away, it is also possibly the most frugal and forward-looking American city in one respect: water" (Goldman, 2016). Despite its innovations in this area, climate change has accelerated Nevada's needs to conserve. In addition to the Governor officially declaring climate change a threat to Nevada in December 2021, the U.S. Bureau of Reclamation announced unprecedented changes in its regulation of the water in Lake Mead (United States Bureau of Reclamation, 2021). In April 2022, federal water managers warned states, including Nevada, that emergency action to hold back water in Lake Powell was being considered in an attempt to stabilize the reservoir at serious risk of losing the ability to generate hydropower for vulnerable residents in the area.

In July 2023, the Nevada Legislature passed Assembly Bill No. 261, developed by the Committee on Natural Resources. This legislation mandates that the State of Nevada's Plan for Economic Development, published by the Governor's Office of Economic Development, must include a statement on initiatives supporting the efficient use of water resources. Additionally, the bill requires certain regional development authorities to integrate water conservation strategies into their economic development plans. Therefore, developing a framework which links economic growth with water resource management statewide would ensure Nevada's economic development aligns with its water conservation goals in a sustainable manner and reinforce the state's competitive edge in attracting future investment.

Who is WaterStart?

Established in 2013, WaterStart is a non-profit organization dedicated to connecting innovative technology companies with global water agencies and major water consumers seeking cutting-edge solutions to improve their operations. Positioned at the intersection of technology, research, and economic development, WaterStart facilitates innovation by providing a platform for stakeholders such as technology firms, management agencies, and policymakers.

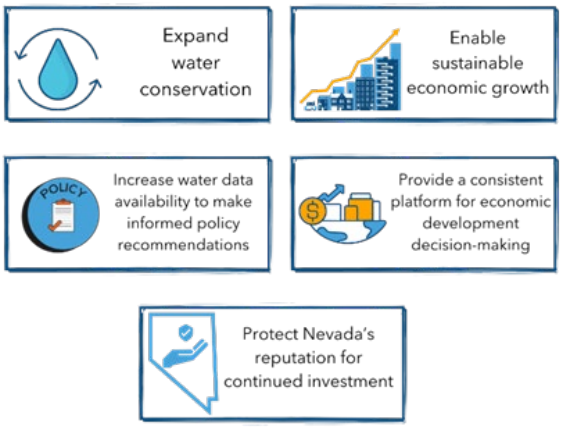
WaterStart manages a global Pilot Program that recruits and co-funds novel technologies. By covering a significant portion of the risk associated with testing new solutions, the program incentivizes innovation and helps companies validate their technologies in a competitive marketplace. Through strategic partnerships worldwide, WaterStart bridges the gap to implementation, enabling technology companies to collaborate with early adopters and accelerate the deployment of effective solutions.

Who is SRI?

A global leader in research and development with deep roots in Silicon Valley, SRI is an independent nonprofit research institute renowned for its long history of supporting both government and industry. For nearly 80 years, SRI has bridged technical and scientific disciplines to discover and develop pioneering products and technologies, translating innovative ideas into market-ready solutions.

SRI has been addressing climate and sustainability challenges for decades, collaborating with clients and leveraging its internal expertise to create cutting-edge technologies. Their work spans energy efficiency, greenhouse gas management and mitigation, industrial decarbonization, circularity, climate resilience, and water management. From carbon capture and clean energy generation to advanced model-predictive control, SRI tackles the most complex issues, positioning its solutions for maximum impact.

Why is this important?



This effort aims to develop a comprehensive waterwise economic framework. The framework aligns economic development with water resource incentives and policies, guiding future policy recommendations to support Nevada's sustainable growth. Implementing a waterwise economy involves balancing the impact on water resources with the need to attract and retain target industries through appropriate incentives. By doing so, Nevada aims to:

- Expand water conservation efforts
- Facilitate sustainable growth
- Enhance water data availability for informed policymaking
- Provide a consistent framework for economic development decisions
- Safeguard Nevada’s reputation as a prime destination for investment

Research and Methodology

Examples of Water Leadership Across the United States

To determine what existing practices are utilized by economic development agencies and identify what part water sustainability plays in economic development in the southwest, online research and direct outreach was conducted to identify existing policies, procedures and programs that could be leveraged for developing the framework for such a model to be developed in Nevada. This included outreach and research on economic development initiatives from Arizona, California, New Mexico, Utah, Colorado, Oregon, and Massachusetts. Research was also undertaken to identify instances of water leadership across the United States, focusing on cases where innovation and water resource impact are factored into the award process regarding economic development incentives. The outcomes of this research contributed to the recommendations and case studies outlined in the subsequent sections of this report. Presented below are examples of water leadership identified during that research.

The state of Massachusetts provides guidance in its Water Conservation Standards regarding the establishment of a water bank to counterbalance water demand resulting from new developments. A water bank is defined as "a system for tracking and compensating for actions that reduce or alleviate water losses." One key principle outlined in the Massachusetts Water Conservation Standards is to offset the water demand of new developments through off-site efficiency measures (Alliance for Water Efficiency, 2015). In Weymouth, MA, new water usage applications approved by the city must achieve a 2:1 water savings ratio. Contractors and developers can earn credits by upgrading older residential and non-residential buildings with water-saving devices and by adjusting water processes for existing non-residential connections. Alternatively, they can choose to pay a $10/gallon fee, which contributes to a dedicated fund used by the town for implementing mitigation projects. (Alliance for Water Efficiency, 2015).

In Santa Fe, New Mexico, new development projects must address the forecasted water demand to receive a building permit. The Water Budget Administrative Office reviews and approves the water budget calculated for each project before permits are granted. The water budgets are determined using established formulas by the City of Santa Fe, considering historical water usage in acre-feet per year. The offset required includes the water budget and an additional 9.8% for "contingency water," which is used for community health and safety needs like firefighting, fire hydrant testing, and flushing water distribution and sewer lines during production. (Alliance for Water Efficiency, 2015).

The city of Peoria, AZ has adopted an innovative strategy in water policy by connecting land use with water supply. Through the Land Use Management Policy, new assessment criteria were introduced, using economic value per gallon of water. This enables staff, commissions, and elected officials to compare the proposed development's land use, water requirements, and economic impact against the city in a quantifiable manner. This policy empowers Peoria's staff and city council to assess revenues (including direct and indirect economic benefits like impact fees, sales, and property taxes), municipal service expenses (such as police, fire, library, water, sanitation, etc.), and the water consumption for existing and proposed land use. According to insights from Victoria Caster, Sustainability and Water Conservation Coordinator for the City of Peoria, the city has transformed significantly in recent years from a residential area to a key focus in the Phoenix metropolitan region. This shift emphasizes capitalizing on opportunities presented by the nearby

Taiwan Semiconductor Manufacturing Facility. With this development and the associated job prospects, Peoria must carefully manage its water resources to meet future demands effectively.

In 2015, Chandler, AZ city council approved Tier 1 Water Allotments to ensure sustainable water supplies. Tier 1 is the base allocation for non-residential users meeting 99% of new water user's needs. Additional water beyond Tier 1 requires moving to Tier 2 or 3, with specific requirements for each tier. The policy helps manage water impacts of new growth, promoting water conservation, especially seen in data centers using air-cooled systems to stay within Tier 1 allotments (Prigge, 2018).

Additionally, many communities across the southwest have adopted programs that support indoor retrofits and other water savings devices, such as low-flushing toilets, etc. These are not new concepts to Nevada, especially in southern Nevada, a region already recognized as a global leader in water conservation.

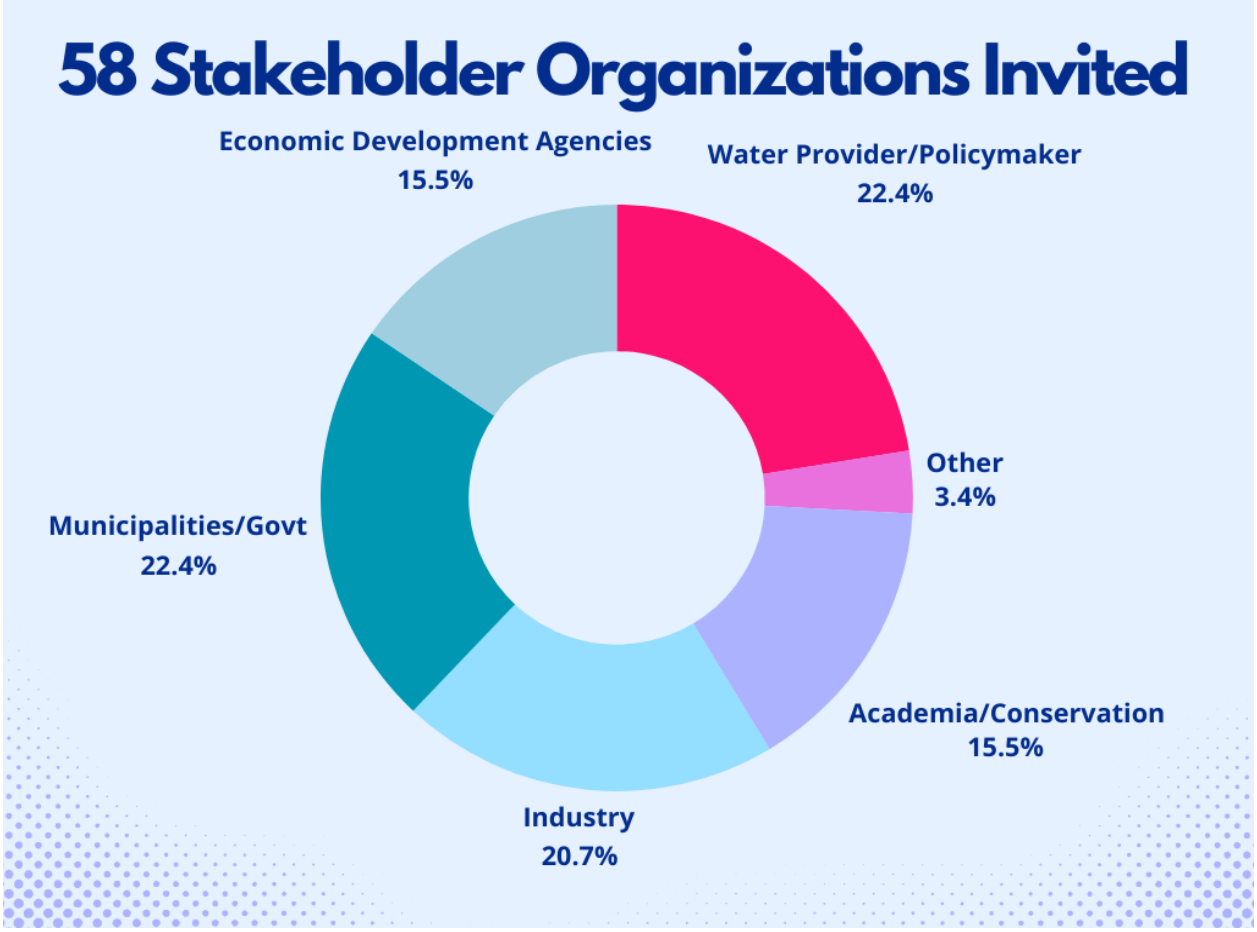
The research indicates the importance in recognizing that in many regions throughout the US water scarcity or the perception of water scarcity continues to play a significant role in future development considerations. Stakeholders across the US Southwest shared concerns as to ensuring that accurate & relevant information is at times difficult to acquire contributing to challenges in building trust and improving transparency with businesses, regulators, legislators, economic development agencies and the public in regard to Nevada's water future.

Stakeholder Engagement

With water as an added factor in target industry identification, an analysis of assets, challenges, and constraints to the development and growth of the economy was critical. WaterStart and SRI International engaged stakeholders throughout Nevada to collect diverse perspectives and input towards the development of a waterwise economic framework.

During 2024, research began to develop a comprehensive list of stakeholders invested in Nevada's economic and water future. This list was developed through input from a steering committee, including representatives from GOED, the Truckee Meadows Water Authority (TMWA), the Southern Nevada Water Authority (SNWA), Las Vegas Global Economic Alliance (LVGEA) and the Economic Development Authority of Western Nevada (EDAWN). A list of over 100 individual stakeholders were identified. These stakeholders represented 58 organizations (Appendix A) representing a wide range of interests and disciplines from academia to the mining industry to rural water providers as well as individuals already conducting water-related outreach initiatives (Figure 1).

Figure 1: Distribution of stakeholders by type invited to support research for the development of Nevada's Waterwise Economic Framework



Many Stakeholders expressed a strong interest in discussing concerns, sharing ideas and having their "voice" heard on the development of a waterwise Nevada economy. This was demonstrated by a highly successful participation rate. More than 62% of invited organizations sent an in-person attendee to one of the four Las Vegas or Reno based focus groups sessions, with many representatives traveling from remote parts of the state to collaborate and show support for the initiative.

In addition to the in-person attendance, another 10% of invited organizations participated via phone interviews or by taking time to complete an in-depth survey-like questionnaire. In total, slightly over 72% of the invited organizations provided feedback (Figure 2).

Figure 2: Distribution of stakeholders by engagement type to support research for the development of Nevada's Waterwise Economic Framework

Qualify Innovative Waterwise Technology Solutions

Adopting new technology can be risky and is sometimes hindered by the responsibilities towards public health and local economies held by those exploring innovative solutions. Understandably, a detailed framework of regulations, procurement processes, and oversight has been established to protect the public interest. However, this elaborate risk management system can inadvertently impede, or even prevent, communities from reaping the rewards of innovation. Introducing new technologies demands substantial support and resources to navigate the intricate landscapes of

public and private certification standards, funding, and agreements. Technical validation frequently poses a significant obstacle to adoption across various economic sectors.

To overcome these challenges, WaterStart, with support from NV GOED, has initiated a pilot program to qualify innovative waterwise technology solutions; including, but not limited to, technologies in the areas of commercial cooling, septic to sewer conversions, irrigation, leak detection and groundwater optimization.

As seen through the success of existing similar programs, technology solutions that have been proven effective are instrumental in shaping water efficiency programs. These programs, such as the Southern Nevada Water Authority's Water Efficient Technologies Program (WET), not only serve as

wise long-term investments for Nevada's environment but also offer significant economic advantages in the short term. According to a 2017 report by the Alliance for Water Efficiency, modeling has shown that for every $1 billion invested directly in national water efficiency programs, there could be economic output benefits ranging from $2.5 billion to $2.8 billion, GDP benefits ranging from $1.3 billion to $1.5 billion, and employment opportunities ranging from 12,000 to 26,000. These investment initiatives include rebate programs, landscape assessments, upgrades for outdoor equipment, retrofits for commercial/industrial cooling towers, improvements in industrial process water systems, and leak detection programs for water utilities.

SNWA's WET program offers financial incentives to commercial and multi-family property owners who install water-efficient devices with predictable savings and a defined monetary incentive, such as retrofitting standard cooling towers with high efficiency drift elimination technologies (Southern Nevada Water Authority, n.d.). Allowing businesses to take advantage of vetted and incentivized technologies, through programs such as WET, could be a key factor in getting businesses to commit to water efficient practices.

The WaterWise Pilot Fund Program is ongoing and actively seeking innovation partners to participate in the trials and testing of novel technologies. Sustained engagement with stakeholders will be critical for the success of the pilot program. Persistent strategic outreach to municipalities and regional development agencies to raise awareness of the Waterwise Pilot Fund Program's existence, and in turn asking for their assistance in publicizing the opportunities afforded by this program amongst their new and existing business networks will be vital in creating an additional vetted portfolio of approved technologies. Once successfully piloted, these approved technologies can then be incentivized to encourage businesses to proactively engage in water conservation efforts.

Focus Group Outcomes and Key Takeaways

For the focus groups conducted by WaterStart and SRI, questions were developed by SRI and WaterStart and tailored to the various stakeholder groups described earlier. During these discussions, there were core questions related to the development of the recommendations outlined in the following section. Those core questions are:

- What are the key challenges you encounter in regulating water use to support economic development?
- Do you have concerns with NV's ability to meet current and future water demands?
- How effective do you believe current water management policies are in Nevada or your regions?
- Do you think that the management of water resources are properly prioritized when considering new development opportunities?
- What industries within your service areas and even the state would benefit the most from better water resource management practices or technologies?
- What water management technologies are you aware of that are effective but not widely implemented due to costs?

Stakeholders shared thoughtful, nuanced answers and insights to these questions. Their responses are synthesized below to capture key insights from focus group discussions. To protect the confidentiality of participants, WaterStart and SRI are only providing key takeaways from stakeholder input.

What are the key challenges you encounter in regulating water use to support economic development?

Stakeholders highlighted several challenges during the focus groups. First, and foremost, it is crucial to understand that water challenges and needs vary across the different regions of the state. While some portions of Nevada have severe water scarcity issues, others do not. There is not a one-size-fits-all approach to the intersection of water resource management and economic development that will work across the state. In addition to regional differences across Nevada, regulating water use, especially from industry to industry where usage needs vary so greatly, can be tricky because taxonomies are not well-defined. For example, "water efficiency" in agriculture, manufacturing, and recreation might all mean very different things.

Considering these differences, one common challenge related to water resource management and economic development is that there is a perception that policy and activities that support water conservation are bad for short-term economic growth. There is also a false perception from some businesses and investors outside of the state that Nevada is running out of water. These prejudices make connecting water resource management to economic development initiatives challenging. Another commonly shared challenge across the water industry is workforce and skills shortages. Over the past 10-15 years the water & wastewater industry has faced challenges with the retirements of an aging workforce, reductions or eliminations in apprenticeship programs and increased competition stemming from the increased demand for the highly skilled experienced professionals for manufacturing applications specifically within the advanced technologies sector. A new generation of operator training and apprenticeship programs are desperately needed throughout the country and specifically within Nevada. If present trends continue and young people

stay away from the water and wastewater operator profession, small systems will be particularly vulnerable to the insecurities and increased costs associated with the staffing shortage.

Do you have concerns with NV's ability to meet current and future water demands?

Stakeholders' degree of concern related to water supply and demand varies across each of the state's major water basins. For example, smaller regions (by population) have less water resource confidence compared to Nevada's larger municipal areas. These concerns were driven by multiple factors. First, many stakeholders acknowledge that several existing surface and groundwater water resources are over-appropriated, either slightly or significantly. Additionally, several stakeholders highlighted climate change as a major driver for concern related to Nevada's water resources. There is a lot of uncertainty about how severely climate change will impact the state's access to water, but many stakeholders feel concerned about the most direct climate-related predictions that will impact the state's water supply. In addition to water access, stakeholders highlighted that their concerns related to water demand went beyond quantity, but also were concerned with quality.

Despite these concerns, many stakeholders believe the state and other stakeholders within each of the state's distinctive regions have taken several significant steps in recent history to improve water conservation and resource management, such as advancements in wastewater treatment and other water recycling and reclamation strategies.

How effective do you believe current water management policies are in Nevada or your regions?

Stakeholders had varied opinions on the efficacy of existing water resource management policies and resources. In terms of the overall impact of policy, stakeholders believe that residential water management policies are effective, some commercial rules/policies are too restrictive, and that industrial water management policies are less effective. This dynamic exists because setting water-use policies and efficiency targets for industry can be hard because of conflicts with building codes, municipal codes, and zoning laws.

In addition to these challenges, stakeholders shared concerns about the state's ability to adequately manage water resources across the state's diverse regions because of staffing challenges. Furthermore, existing state-level information and resources are outdated. Stakeholders expressed a need for current data and more data in general about the availability and quality of water resources across the state.

Do you think that the management of water resources are properly prioritized when considering new development opportunities?

Stakeholders acknowledged that water use is typically considered for new economic development projects across all regions in the state, but the level of prioritization varied greatly. For example, the management of water resources are highly prioritized when considering new development opportunities in Las Vegas. The SNWA has a water investment rating tool, which is widely adopted by LVGEA, that evaluates new developments by ranking the business' annual water consumption against economic benefits to the community.

In addition to AB261, the Nevada Legislature in 2023 also passed AB220. The legislation mandates water agencies to assess water availability for new developments, bans new septic tanks for properties linked to municipal water in the Las Vegas Valley, and establishes a financial aid initiative for current septic users transitioning to the sewer system. Additionally, it mandates water-efficient irrigation fixtures for new developments, prohibits grass in new projects, and enforces efficient watering practices for significant functional grass areas (Southern Nevada Water Authority, 2024).

In 2008, Washoe County voters approved a ballot initiative that required the Truckee Meadows Regional Plan be amended to reflect and include a policy or policies requiring local government land use plans be based upon and in balance with sustainable resources. As a result, the Regional Planning Governing Board adopted amendments to the Regional Plan. These amendments require the Northern Nevada Water Planning Commission and the Western Regional Water Commission to include population projections that can be supported by the estimated sustainable water resources (Truckee Meadow Water Authority, 2020).

What industries within your service areas and even the state would benefit the most from better water resource management practices or technologies?

Stakeholders highlighted several industries across the state that would benefit from better water resource management practices and technologies. Many stakeholders believe that agriculture would benefit greatly, but there is tension there because farmers are worried that water conservation efforts could potentially impact their allocations and livelihoods, such as the loss of unused water allocations. While the resorts and recreation industry are already very proactive in water conservation initiatives, some stakeholders think that resort and recreation properties would likely benefit from exploring more opportunities for water reclamation and reuse. Furthermore, industries that rely on cooling would benefit from increased utilization of air cooling as a replacement to water cooling. Improved cooling technology could have significant impacts on Nevada's energy, information technology (data centers), manufacturing, mining, and recreation industries. There is also an opportunity to incentivize industry to move to NV that can use/reuse byproducts of existing industry- like brine, biomass or effluent for water production.

What water management technologies are you aware of that are effective but not widely implemented due to costs?

Stakeholders recognize and understand the potential and value of advanced metering infrastructure (AMI) systems, the ability to identify and respond to high usage from leaks. However, cost related to replacing meters is slowing deployments. Stakeholders, specifically water providers, raised concerns regarding aging infrastructure and deferred maintenance adding to increased water loss risks. Cooling technologies are another opportunity for improved water resource management; however, air-cooling is much more costly compared to water-cooling. Advanced soil science and technologies can also help farmers conserve water resources; however, these soils are more expensive. In addition to cost-related challenges for implementing water technologies, stakeholders also shared that finding and retaining trained licensed water operators to implement and manage advanced water technologies is extremely difficult.

Recommendations

WaterStart and SRI are providing the below strategies and recommendations that align with GOED's goals for developing a waterwise economy. These recommendations are not designed to conflict with Nevada or federal law. These recommendations primarily focus on how water resource management information is shared with businesses and RDAs, and how economic developers make decisions. In total, there are four strategies with nine accompanying recommendations, as outlined below:

Strategy 1: In addition to finding strategic regional alignment, embrace a "not one size fits all" approach

- Recommendation 1: Define "water efficiency", regionally, for incentive programs and other economic development initiatives, while delivering a policy framework that considers each unique basin.
- Recommendation 2: Create more rural testbed space for piloting new water technologies and management practices.

Strategy 2: Address procedural and knowledge gaps across the economic and water management ecosystem.

- Recommendation 3: Work with regional water providers to create information guides for businesses looking to potentially move into the state about available water resources throughout the state and best practices for water resource management.
- Recommendation 4: Create a more transparent approach/procedure to evaluate water use before deals are made.

Strategy 3: Grow Nevada's reputation as a leader in economic development and water resource management.

- Recommendation 5: Create incentives for stable incumbent businesses in addition to new and expanding businesses.
- Recommendation 6: Consider incentivizing companies that can use/reuse the materials existing industries are creating- like brine, wood biomass, effluent.
- Recommendation 7: Consider incentives for businesses that will partner and provide "real world" operational facilities to evaluate new technologies.

Strategy 4: Build on ongoing initiatives and efforts.

- Recommendation 8: Continue to invest into building and growing the waterwise framework that has been started by leveraging WaterStart to continually monitor, implement, update, train and engage stakeholders into the future.
- Recommendation 9: Create a centralized website or platform to house knowledge sharing from various agencies and regions that serves as a "one stop shop" for the waterwise economic framework.

For each recommendation, additional information regarding implementation, intended impacts, and, where possible, best practices are provided below.

Strategy 1: In addition to finding strategic regional alignment, embrace a "not one size fits all" approach

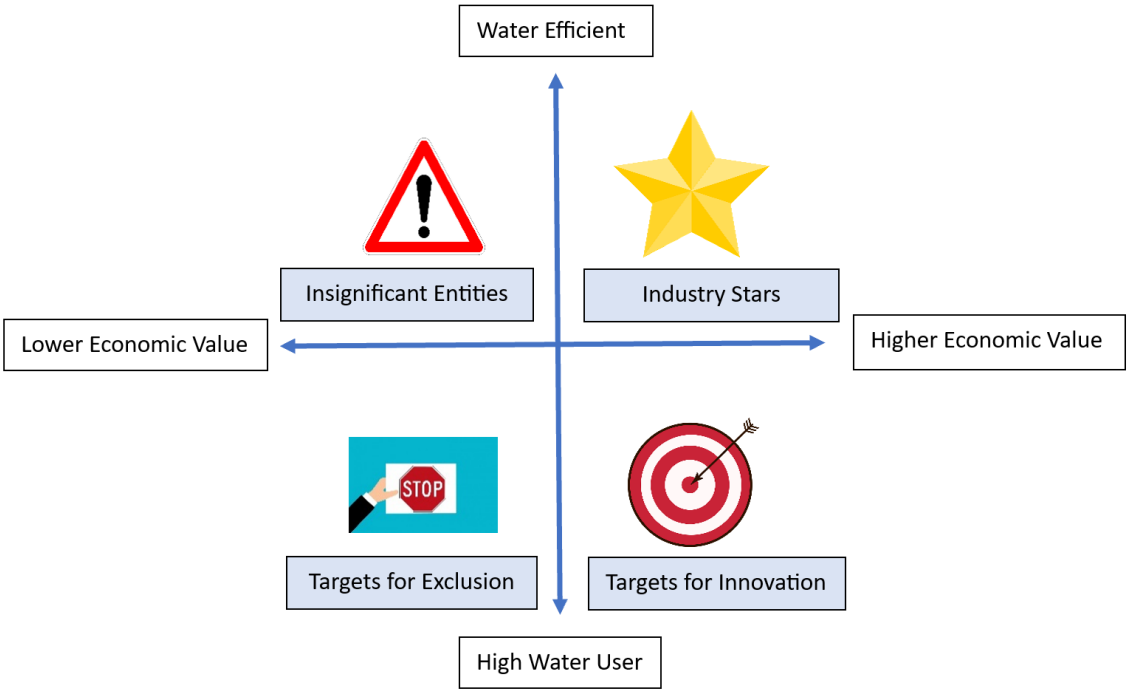
Recommendation 1: Define "water efficiency", regionally, for incentive programs and other economic development initiatives, while delivering a policy framework that considers each unique basin.

Owners/Supporters: Regional Water Providers, GOED, RDAs

Desired Outcomes: Development and implementation of regionally specific and industry-specific definitions and frameworks for water efficiency.

A framework linking economic growth and water management when evaluating businesses for incentives and other economic development benefits is needed in Nevada. The below proposed framework involves weighting water efficiency against expected economic value (see Figure 3). This proposed framework has significant potential to guide the state's decision-making; however, within this framework there is opportunity for flexibility based on regional and industry differences.

Figure 3: Proposed Waterwise Economic Framework



Historically, a highly water consuming industry such as textile manufacturing may have not fit the criteria to be incentivized at the state-level. When considering regional differences, the same could hold true in water scarce Southern Nevada, but the business may provide enough economic worth to qualify in the communities of Northern Nevada, where water availability is less of a concern. What is ideally required is a deep dive into the cost/benefit analysis of prospective business opportunities, with weight given to each driver within a specific basin. To formulate a fair benchmark for potential incentive consideration, the variables in any equation need to be clearly defined.

Nevada's definition of water efficiency, based upon specific regions within the state, must be an initial step in streamlining the process of evaluating prospective development. This will allow for variations of water consumption, or the true cost of water, in relation to regional needs for economic boosters. Ultimately, this could be a way to measure the true economic value of proposed growth more consistently. To accomplish this, GOED should work together to strengthen connections between RDAs and local and regional water providers to collaborate on developing regional and local definitions for water efficiency when developing frameworks and formulas for economic development programs and incentives.

While regional context is highly important when considering water efficiency, the standardization and quantification of water efficiency can be powerful in demonstrating to stakeholders that economic development recognizes the importance of responsible water resource management when evaluating future economic incentives. To achieve this, GOED and regional water providers can partner to develop some sort of baseline guidance around the defining water efficiency.

There are tools available to state, regional, and local decisionmakers for economic impact modeling, like IMPLAN, and frameworks for evaluating sustainable developments, like LEED. These tools do not currently meaningfully consider water; however, they can serve as models for state and local frameworks developed by GOED, DWR, RDAs, and water providers.

Recommendation 2: Create more rural testbed space for piloting new water technologies and management practices.

Owners/Supporters: State universities; GOED; RDAs; rural municipal governments

Desired Outcomes: Increased rural patent generation and rural patent intensity of R&D spending for water technologies

While many water technology companies and water conservation efforts are focused on urban or metropolitan solutions, rural communities and innovators can provide high-impact, industry-driven solutions that can be scaled across both other rural and urban communities. However, rural inventors and researchers lack consistent access to R&D spaces and tools like testbed space. WaterStart and SRI recommend that GOED partner with University of Nevada, Nevada State, Great Basin College, and other relevant postsecondary partners to identify rural satellite campuses that can host and manage testbed space and equipment. Nevada, being made up of mainly rural counties with only two main metropolitan hubs, has the opportunity to capitalize off of the potential investment opportunities in the rural areas. For example, the mining industry relies heavily on water for several of its processes. Great Basin College has a partnership with the Nevada Mining Association to support a Mine Maintenance Assistance Program. Great Basin College has branch campuses in Elko, Battle Mountain, Pahrump, and Winnemucca and satellite facilities that are located in over a dozen communities across the college's service area (Nevada Mining Association, n.d.). Any of these rural campuses have potential as hosts of rural testbed space to trial innovative mining technologies that reduce water loss. Some campuses may have facilities that can be easily converted into a testbed facility; however, some campuses in rural areas may require additional capital and infrastructure investments.

Despite the costs associated with converting or creating new testbed space, there are significantly high potential returns for investing in R&D in rural communities. Although high-tech innovation is more common in urban counties, evidence suggests that innovation absorption, which drives productivity growth, is more effective in rural and non-metropolitan counties. Metropolitan counties have an average of 13.2 patents per 1,000 innovative occupations, compared to 5.6 in rural counties. Yet nearly two-thirds of the overall productivity growth from 2010 to 2020 can be attributed

to innovation absorption (innovation adoption) in non-metropolitan areas. This indicates there is still significant potential for investment and more room for gains from innovation in rural counties. On average, rural and non-metropolitan counties have lower patent intensity compared to metropolitan counties. However, patent intensity in non-metropolitan areas is still positively related to R&D spending, business density, and investment in education, whereas this correlation is weaker in metropolitan areas. Specifically, in non-metropolitan counties, a 1% increase in R&D spending leads to a 0.7 unit rise in patent intensity, while the effect in metropolitan counties is close to zero (OECD, 2023). In addition to innovations in water technology, these testbeds create opportunities to support education, training, and other workforce development opportunities for rural Nevadans.

Strategy 2: Address procedural and knowledge gaps across the economic and water management ecosystem.

Recommendation 3: Work with regional water providers to create information guides for businesses looking to potentially move into the state about available water resources throughout the state and best practices for water resource management.

Owners/Supporters: Water Providers & Regional Development Agencies

Desired Outcomes: Development and implementation of water resource information guides available to prospective businesses and the public; improved water management outcomes; businesses adopting water technologies

Water providers are often challenged to maintain the difficult balance of promoting the responsible use of water while supporting development. The inverse is true for economic development agencies having to make decisions around development while having to balance an understanding of the water resources in the region. Stakeholders shared concerns regarding the challenges related to navigating potentially conflicting messaging. Improved communications regarding how water resources are allocated and permitted throughout the state can play an important part in managing such communications. Leveraging the availability of existing guidance documents, such as the Southern Nevada Water Authority's and the Truckee Meadows Water Authority Water Resource Plans, and best management practices by the regional economic development agencies and water providers can play an important part in the development of a comprehensive business guide, inclusive of regional variations, to communicate resource availability to prospective businesses.

A guide for businesses inclusive of an overview of the state's regional differences, links to regional water resource plans, and guidance on how to employ water smart technologies to reduce water consumption or improve water quality through the many already existing incentive programs, might alleviate misconceptions and would help streamline communication.

The EPA's WaterSense initiative, which is a voluntary partnership program for those seeking to advance water smart technologies, has a guidance document for commercial and institutional facilities seeking to implement best practices in water management (United States Environmental Protection Agency, 2012). TMWA is a partner in the WaterSense program. This is a good example of a tool that could be included in a comprehensive business guide.

The East Bay Municipal Utility District has developed a guidebook for incoming businesses to use when evaluating best practices for establishing their business in a new region. This guidebook serves as a resource for businesses, developers, consultants, planning agencies, and water providers and is inclusive of 19 business-type summaries with each summary detailing water end uses, water-saving technologies, potential costs and savings, technology savings, costs, and

potential payback. The guidebook also emphasizes the importance of a well-implemented plan-review process, including resource allocation and communication between planning agencies and water providers (Brown, C; et al., 2008). Showcasing examples of successes ultimately reduces apprehension and illustrates the ability for corporations to expand their business into drier regions of the U.S.

Recommendation 4: Create a more transparent approach/procedure to evaluate water use before deals are made.

Owners/Supporters: GOED, RDAs, regional water providers, local municipalities

Desired Outcomes: Improved water management outcomes; businesses adopting water technologies

Assessing the economic impact of new businesses on a community requires a thorough evaluation process that considers several factors and requires input from numerous community stakeholders and decision makers. In many cases, ineffective, incomplete or misinformation in communication can result in unsuccessful business agreements and a lack of trust among agencies. By involving all parties as early as possible in the early stages of assessing a new business, a mutually beneficial outcome can often be reached, as is the case with the Apex Industrial Park (Apex) project in North Las Vegas.

Located in a highly desirable logistical location, the Apex team worked closely with local agencies to reduce water demand to the facility requirements by modifying landscape requirements and optimizing the use of treated potable water only at locations that require its use, leveraging the use of non-treated water at all non-potable locations. The parties to this project have shared those discussions, at first, were uncomfortable but when everyone came to table with open minds and the willingness to find a solution, a win-win scenario was identified, which ultimately reduced water loss related to the treatment process.

It was highlighted that opportunities exist to develop formal procedures between water providers and RDAs when assessing new businesses. Regional development agencies were surveyed about their approaches to water use when evaluating new businesses. While annual water consumption was acknowledged as a factor, there was no consistent or formalized approach across the RDAs in determining whether to approve or incentivize a business. Some agencies inquired not only about annual water use but also about annual water discharge and seasonal demand. For instance, GOED asked heavy water users about adopting water-saving technologies, while TMWA required Board approval for businesses using over 100 acre-feet of water annually. SNWA introduced a water investment rating tool, in collaboration with GOED and LVGEA, to evaluate water impacts on economic development by rating new businesses on a scale of 1 to 5 based on their annual water consumption. To address the lack of uniformity, a standardized form or tool should be developed to evaluate new businesses, incorporating region-specific priorities and considerations for water use and impact. Businesses falling within a certain scoring range or selecting specific criteria would then be offered consultation and potential cost savings for improved measures by the water provider. The below list are considerations that could be included in such a standardized form or tool:

- Does the water provider have existing reliable capacity available?
- Does the project owner have water rights associated with the project that will improve the reliability of the water provider?
- Will water utilized within the project be recycled?

- Does the new business maintain an Environmental, Social and Governance (ESG) Matrix that proactively addresses water consumption, waste generation, energy and emissions for the facility?
- How does the facility monitor and track environmental impacts to the community?
- What continuing efforts are in place to identify and eliminate waste?
- Does the business intend to significantly expand into the future, so that demand is impacted?

Another procedural example that could be emulated, as appropriate, across the state is the Water Efficiency Resort Plan. Although no longer in use because laws and/or moratoriums related to turf, irrigation and cooling have superseded the need in southern Nevada, these resort plans detailed the total size of the resort, estimated water use, description of water using features and equipment and plans for incorporating water conserving technologies and practices. The resort plans were reviewed by SNWA, who then provided a letter to Clark County with feedback on the plan and a list of any recommendations for additional water conservation opportunities. SNWA did not have any authority to approve or deny plans, but rather provided feedback and analysis to the county.

In Santa Fe, New Mexico, the forecasted water demand for new development projects must be offset before a building permit is granted. Building permits are not issued until a water budget is calculated for the new development and approved by the Water Budget Administrative Office. Water budgets are calculated using standard formulas created by the City of Santa Fe based on historical acre-feet per year of water use. The offset amount is equal to the water budget plus an additional 9.8%, “contingency water” comprised of water used for community health and safety purposes, such as firefighting and fire hydrant testing, and water used in production for flushing of water distribution and sewer lines (Alliance for Water Efficiency, 2015).

These types of processes for evaluating new businesses and the potential impact on water resources facilitates a decision-making process inclusive of all stakeholders, as well as the business itself that might consider adopting more water efficient technologies. Currently, GOED does not have the authority to “consider” water in any tool for evaluating economic development opportunities, like the SNWA water investment rating tool. GOED also lacks the authority to deny application for an abatement if the company currently meets requirements. While local municipalities and RDAs are critical to the evaluation process, allowing GOED this discretion will be important for enabling the office to dually promote economic development and smart water resource management, as well as secure the state’s reputation as a leader in these areas.

Strategy 3: Grow Nevada’s reputation as a leader in economic development and water resource management.

Recommendation 5: Create incentives for stable incumbent businesses in addition to new and expanding businesses.

Owners/Supporters: Water providers; Department of Business and Industry; GOED; RDAs; NV WaterStart; Local Governments (business licensing entities); Industry Associations

Desired Outcomes: Increase the number of incentive program applications by existing businesses; Improved water management outcomes; businesses adopting water technologies

Traditionally, economic development business incentives are thought of as a tool used to support businesses that want to relocate or expand their businesses in a state or region. Despite this norm, stakeholders expressed significant desire to partner on solutions with incumbent small businesses in addition to relocating and expanding businesses. WaterStart and SRI recognize the opportunity to improve conservation and increase the state’s potential water service capacity by additionally

targeting businesses that are Nevada-based (incumbent) and are stagnant or not expecting to expand. GOED and RDAs can leverage existing or create new incentive opportunities for incumbent businesses to support water conservation efforts. For example, incumbent businesses that rely on water cooling can be targeted for the WaterWise Pilot Program. Historically, WaterStart has targeted expanding businesses or businesses outside of Nevada for the pilot program, promoting participation in the pilot program to drive support for a company's relocation to the state. Similarly, the pilot program can be pitched to existing businesses to save residents on utility costs, ensuring the viability of Nevada communities, and ultimately promoting social entrepreneurship. Enough participation in water-conscious economic development incentives from incumbent businesses allows water providers to increase their capacity for the number of businesses they can service, further expanding economic development opportunities for Nevada. There are several incumbent industries within the state that use water as part of its cooling production process that could be targets for such incentives, including data centers, mining, agriculture, fabricated metals, paper and pulp, textile industry, petroleum refining, and other manufacturing industries.

Recommendation 6: Consider incentivizing companies that use nature-based solutions and can use/reuse the materials existing industries are creating–like brine, wood biomass, effluent.

Owners/Supporters: GOED, RDAs, Municipalities

Desired Outcomes: Increased engagement with and the relocation of companies that use/reuse leftover materials created by other industries to Nevada

There is high value potential to leverage the benefits related to reusing and reducing waste streams from byproducts of existing Nevada businesses. The shift in thought and practice from a current linear to a more circular economy, one that aims to minimize waste and promote the sustainability of natural resources, is worth exploring and supporting through economic development programs throughout the state. In buildings and construction, for example, circular solutions could potentially include reducing virgin material use or re-using existing materials in circulation (United Nations Development Programme, 2023). The reuse of waste streams, and incentivizing businesses with an appetite to participate in such projects, including those companies with rich ESG goals, could prove to be a ripe opportunity for Nevada development. Additionally, companies should be incentivized to explore and implement innovative nature-based solutions for water conservation and resource management. Nature-based solutions rely on features from natural landscapes and local wildlife to develop solutions. For example, in the United State mid- and southern-Atlantic coats, wetlands are being developed to prevent or mitigate the impacts of flooding from heavy rain and hurricanes.

Within Nevada, there are facilities that are already taking steps to reuse water byproducts to offset net consumption, and who's model can be used as precedent for paving a successful pathway forward. The Tahoe-Reno Industrial Center (TRI) is home to facilities including the Tesla Gigafactory, Google and Switch data center and uses three sources of water. The smallest source involves water rights from the Truckee River via an induction well. The largest source involves an aquifer 1,000 feet below the ground and serves only the TRI. The third source involves reclaimed water via the park's water recycling system. The park's used water gets treated and sent to an above-ground reservoir, which is then reused in manufacturing for concrete and cooling processes (Prigge, 2018). TRI has also invested in a partnership with Northern Nevada municipalities to build a pipeline from the Truckee Meadows Water Reclamation Facility to their industrial park with the goal of reusing treated effluent water for use in their mechanical operations (Judge, 2021).

Recommendation 7: Consider incentives for businesses that will partner and provide "real world" operational facilities to evaluate new technologies.

Owners/Supporters: GOED, RDAs, regional water providers, WaterStart

Desired Outcomes: Improved water management outcomes; businesses adopting water technologies that have been successfully piloted

Economic development incentives are more times than not associated with the idea of new development, new industries, new job creation, etc. There are many existing thriving businesses that may be enticed to partner with tech solution providers, while benefiting from the financial de-risking if the technology does indeed prove successful. These companies could demonstrate their devotion to corporate social responsibility by offering their facilities to participate in pilot project test sites. One such example is the ongoing partnership between MGM Grand, Las Vegas Grand Prix and Southern Nevada Water Authority.

In an effort to host a net-neutral water consumption motocross sporting event, the Las Vegas Grand Prix, Formula 1®, MGM Grand Resorts, the SNWA, and WaterStart (through the WaterWise Pilot Program) partnered in the evaluation of an atmospheric water generator (AWG). MGM offered to provide one of their cooling tower systems on a rooftop at one of their properties as the testbed. The volume of "recovered" water produced by the AWG unit was used to offset the track cleaning and maintenance needs. An additional objective was to determine the improvement in AWG production efficiency associated with drawing exhaust air from a cooling tower. If the improvement is found significant, this technology could prove to be a potentially viable source of makeup water for existing evaporative cooling towers, helping to reduce the consumptive water use of those systems.

The SNWA and TMWA have successful incentive and rebate programs already in place. Further collaborating with these existing programs and offering additional incentives for testing water reduction practices and technologies beyond what the company originally planned for their facilities, either through the WaterWise Pilot Program or through other types of incentives, will assist in developing more technologies that can be added to enhance the existing rebate programs.

Strategy 4: Build on ongoing initiatives and efforts.

Recommendation 8: Continue to invest into building and growing the waterwise framework that has been started by leveraging WaterStart to continually monitor, implement, update, train and engage stakeholders into the future.

Owners/Supporters: GOED & WaterWise/WaterStart Team

Desired Outcomes: Ongoing stakeholder and community involvement for the design, development, delivery, and execution of a sustainable water approach to Nevada's Economy well into the future

Ongoing engagement is critical to the successful implementation and buy-in of any new program, including a waterwise economic framework. Strategic steps must be taken to ensure the sustainability of WaterWise. One way to perpetually engage stakeholders would be to have a semi-annual or, at a minimum, an annual conference on the matter. Not only would this keep the work alive, well and moving forward, it can be an opportunity to showcase all the efforts that have been done thus far, celebrate successes, while also used to highlight what areas still need attention. Technology is always changing, and knowledge sharing and training is key to being on the pulse of a forward-thinking program such as WaterWise. Bringing the invested community together will reignite the enthusiasm, remind the audience why this initiative is important, and keep the ideas fresh amongst the parties that ultimately will be on the front line of success. A shift in mindset about the need to consider water while discussing development can be a change to some. The most efficient

way to harness support for change in mindset is to continue to build relationships with those who will guide and implement that change, while empowering them to feel open to be part of an innovative culture and the ultimate success of Nevada's WaterWise initiative.

Recommendation 9: Create a centralized website or platform to house knowledge sharing from various agencies and regions that serves as a "one stop shop" for the waterwise economic framework.

Owners/Supporters: WaterStart; GOED; DWR; RDAs; water providers

Desired Outcomes: Execution of clearinghouse website/platform; execution of data collection and sharing framework; increased generation of website traffic and activity

Focus group participants expressed a strong desire for better access to and more current information regarding Nevada water law (including water rights); resources on incentives, grant opportunities, education programs, networking opportunities, research, news, uses cases, and other key information to support the development of a waterwise economy. To this end, WaterStart and SRI recommend that a centralized website serve as a clearinghouse or repository of all relevant information and resources that support the implementation of a waterwise economic framework. This website will also link out to other key websites and provide contact information for relevant partners including GOED, DWR, RDAs, water providers, and other relevant partners and programs. WaterStart is well-situated to administer this website, as it is leading the development of the waterwise economic framework and is well-connected to all relevant stakeholders in the ecosystem.

Several stakeholders also identified challenges with data currency, quality, and sharing. GOED and DWR should both champion regular data collection and sharing to track progress, inform decision making, and improve outcomes. Recognizing that different communities have different capacities for rigorous data collection, WaterStart and SRI recommend that a framework for voluntary collection be provided on the aforementioned website. This framework should outline what metrics are to be collected and who can support data collection.

WaterStart and SRI recommend this website or platform be modeled after the H20 Tech Connect/CHANNELS knowledge sharing platform. WaterStart and the Metropolitan Water District of Southern California (MET) have forged a strong partnership since 2020. A key aspect of this partnership is combining MET's H20 Tech Connect community and WaterStart's CHANNELS members-only knowledge sharing platform. H20 Tech Connect is an online community that brings water industry experts, academia, entrepreneurs, and investors together. This platform focuses on areas such as energy, wastewater, stormwater, and watershed management. H20 Tech Connect is open to the public, fostering knowledge exchange and collaboration. CHANNELS, a members-only community, complements this effort by providing a platform for evaluating, educating, and promoting viable technology solutions among a growing list of utilities and other large consumers of water. This resource-rich and fully functional platform has the potential to expand to support WaterWise. A login to explore the platform can be created here.

Conclusion

Nevadans have long understood that water is a crucial economic asset and resource. That's why Nevadans across the state have already taken action to improve water conservation and resource management efforts. Despite the success of these efforts, research has indicated that there are still opportunities to improve and grow. WaterStart and SRI's recommendations are designed to support the advancement of AB261 and Nevada's goals for the continued development and implementation of waterwise economic framework that expands water conversation, facilitates sustainable economic growth, enhances access to water data, improves decision making, and elevates Nevada's reputation as a prime destination. If Nevada state, regional, and local leaders fail to adequately leverage economic development to support better water conservation and resource management, the state will miss opportunities for sustainable economic growth and innovation. A failure to adequately secure the state's water resources will create risks, not just for industry within the state but for families too.

Appendix A

Organizations represented by stakeholders who participated in the research for this report:

Brookings Mountain West, UNLV
Carson River Subconservancy District
Churchill Fallon Economic Development (CFED)
City of Henderson
City of Las Vegas
City of North Las Vegas
City of Reno
City of Sparks
Clark County
Clark County Water Reclamation District
Department of Agriculture
Desert Research Institute
Economic Development Authority of Western Nevada (EDAWN)
Eureka Co. Department of Natural Resources
GOED
Great Basin Water Company
Great Basin Water Network
Humboldt County
Humboldt River Basin Water Authority/ Central Nevada Regional Water Authority
Land Development Associates
Las Vegas Economic Development Authority (LVGEA)
Lincoln county Regional Development Agency
Manufacture Nevada
Moapa Valley Water District
NAOIP
NDOT
Nevada Cattlemen's Association
Nevada Indian Commission
Nevada Resorts Association
Nevada State University
Nevada Water
Northeastern Nevada Regional Developments Authority (NNRDA)
Northern Nevada Development Authority (NNDA)
Northern Nevada Water Planning Commission/ Western Regional Water Commission
NV 95-80
NV Division of Water Resources
NV Energy
NV Farm Bureau
NV Mining Association
NV Water Resources Association
Nye County Water District
Pershing County
Sierra Club
SNWA/LVVWD
Society of Industrial and Office Realtors (SIOR)- So. NV Chapter
Southwest Central Regional Development Authority (SWCREDA)
SRI
Tahoe Regional Industrial Center
The Nature Conservancy
TMWA
Truckee Meadows Regional Planning Agency
UNLV
UNR
Virgin Valley Water District
Walker Basin Conservancy
Walker River Irrigation District
Washoe County
WaterStart

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