

GROWING WATER SMART

SAN LUIS VALLEY POLICY SCAN 2022

**OPPORTUNITIES REPORT FOR
WATER AND LAND USE INTEGRATION**



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EXECUTIVE SUMMARY

As part of the preparation for the San Luis Valley Growing Water Smart workshop in the summer of 2022, Del Corazón Consulting was contracted by the Sonoran Institute to conduct an assessment of plans and policy across local governments in the region and to:

- Identify issues or gaps that may need to be addressed with water supply and demand, infrastructure, and water resource management.
- Identify opportunities for improvement to water resource management and/or better integration of water and land use.
- Inform the team discussions at the Growing Water Smart workshop.
- Identify opportunities for enhancing implementation of existing policies and projects.

The San Luis Valley has a history of successful collaboration, innovative problem solving, and natural resource management. This experience, when applied to the challenges of sustainable and resilient municipal water, will no doubt complement the region's broader groundwater and surface water goals and strategies. Adopting a more aggressive water savings vision for the municipal sector will also likely result in long-term savings to water providers and municipalities that will otherwise need to invest in acquisition of future water supplies.

The opportunities provided in this report offer a starting point for conversations about how individual jurisdictions and the region can strengthen the integration of water and land use to secure a vibrant and thriving San Luis Valley into the future. The opportunities are organized by the following overarching themes:

- Water supply
- Compact development
- Outdoor water demand
- River protection
- Stormwater management
- Indoor water demand
- Regulation of areas and activities of state interest

Each theme includes information on current policies and offers high-level recommendations. To learn more about the recommendations listed here, please see the appropriate section in the report.

SAN LUIS VALLEY OPPORTUNITIES

- 1. Update Water Adequacy Standards.** Across the San Luis Valley, the following best practices should be explored to strengthen existing policies:
 - Include a direct citation of state policy and the definition of adequate and sustainable water supply.
 - Specify permitted water sources for development (e.g., wells, renewable water, hauled water, non-potable water, etc.).
 - Include a specific methodology for how to determine the total water demand within a development, including calculations for both indoor and outdoor use.
 - Specify methodology for how water adequacy will be demonstrated.
 - Clarify decision-making criteria for approval and denial.
- 2. Promote Water Efficiency in Economic Development Water Supply Allocations.** The local governments, water providers, and economic development agencies of the San Luis Valley should agree to and adopt policies that determine how to allocate and how to promote water conservation and efficiency for new commercial and industrial businesses.
- 3. Promote Compact Form.** Higher density development uses less water than lower density large-lot single-family home development, primarily due to the reduction in irrigable land area. Promoting this more compact development pattern should be continued as communities redevelop and grow.
- 4. Manage Future Growth Areas and Promote Higher Densities Within Water Service Areas.** Local authorities should carefully consider water service area boundaries, extension of infrastructure, operating costs, and system capacity. Given that infrastructure is expensive,

thoughtfully aligning higher density future growth areas with existing infrastructure helps prevent undercapitalized utilities.

5. **Adopt Statutory Cluster Development for Counties.** In areas where 35 acre or larger subdivisions are common, adoption of this policy can support local governments working with landowners to incentivize their coming through the subdivision review process and enable discussions about sensitive areas to be avoided during the creation of lots.
6. **Day of Week/Time of Day Irrigation Schedules.** Day and time irrigation schedules have been proven to reduce outdoor demand by up to 30 percent and reduce system peak demand pressure. This should be considered a mandatory policy adopted across all the San Luis Valley water providers and municipalities.
7. **Revise Landscape Ordinances.** Local government landscape ordinances should include best practices for plant materials, appropriate for the community, including:
 - Add soil amendments.
 - Specify desired type and amount of plant material.
 - Limit amount of turf.
 - Promote the use of hydrozones.
 - Prohibit adoption of restrictive covenants that prohibit water efficient landscapes.
8. **Promote Outdoor Water Efficiency in Rural Areas.** Counties should consider limits on the size of turf areas and recommend plant types and irrigation system best practices for residential development as part of county regulatory policy.
9. **Minimize Development in the Floodplain.** Many of the community comprehensive plans and nearly all hazard mitigation plans in the San Luis Valley recommend updating floodplain regulations and/or limiting development in the floodplain.

Best practices that should be adopted across the San Luis Valley include:

- Minimize disturbance to the river system and hydrologic cycle.
 - Ensure critical facilities are not placed in the floodplain.
 - Limit the density of development in the floodplain.
 - Prohibit fill in the floodplain.
 - Require additional setbacks from the floodway.
10. **Adopt Site-Scale Stormwater Management Policies.** Stormwater management approaches are undergoing a paradigm shift. Traditional stormwater management focuses on capturing run-off through centralized conveyance systems of curb-gutter-pipe networks. Urban and rural stormwater managers are increasingly adopting green infrastructure approaches that integrate:
 - On-site infiltration through site scale development standards.
 - Creating more space in natural drainage systems to absorb, infiltrate and help restore hydrological functions.
 - Natural (e.g., bioswales, vegetation buffers, etc.) and engineered systems (e.g., storm sceptor) to filter runoff.Given the lack of extensive stormwater management systems across San Luis Valley communities, development of a regional guidance manual for stormwater management may be beneficial and help reduce future expensive infrastructure investments. In particular, the guidance could identify on-site and rainwater harvesting best management practices.
 11. **Adopt WaterSense as the Baseline for Plumbing Fixture Standards.** All communities within the San Luis Valley should adopt policy that requires water-efficient fixtures consistent with the State of Colorado WaterSense rule in their building and plumbing code or through a water conservation ordinance.
 12. **Promote Fixture Retrofits in Existing Water-Inefficient Development.** Given the San Luis Valley is not growing rapidly, existing development could be a target for water savings

through policy or programming. Options include:

- A retrofit-at-resale policy requiring an upgrade of inefficient fixtures.
- A valley-wide retrofit program replacing inefficient fixtures through rebates or a program.

13. Create a Regional Water Conservation &

Efficiency Position. In the San Luis Valley creating a staff position within each individual community or water provider may not be a wise resource expenditure. Rather, the region should adopt a similar approach to other rural parts of the state where a staff position, generally located within a neutral organization or nonprofit, provides regional support with grant writing, planning, program delivery, and monitoring and evaluation.

14. Adopt 1041 Regulations. Of the six counties, only two, Alamosa and Saguache, have adopted 1041 regulations. These powers allow local governments to identify, designate, and regulate areas and activities of state interest through a local permitting process. Rather than each county hiring a consultant to develop 1041 regulations, the counties could collaborate on the development of a high-quality regional model regulation that includes water projects and pays for the code integration into each community. Additionally, counties could develop a regional fund to pay for additional professional expertise when needed to review documents submitted under the 1041 process.

SAN LUIS VALLEY GROWING WATER SMART | RECOMMENDATIONS FOR RESILIENT WATER AND LAND USE MANAGEMENT

INTRODUCTION

As the San Luis Valley works to ensure a sustainable and resilient water supply, the agencies, organizations, and governments across the region have an opportunity to strengthen the integration of water resource management and land use planning to protect the region from the potential threats of:

- Peaks in demand that stress water infrastructure due to increases in seasonal irrigation.
- Need for new supplies from population growth increasing demand.
- Decrease in water supply yields due to prolonged drought and climate change.
- Degradation of water quality from watershed degradation.
- Increasing costs of water and competition as new sources of water become scarcer.

As part of the preparation for the San Luis Valley Growing Water Smart workshop in the summer of 2022, Del Corazón Consulting was contracted by the Sonoran Institute to conduct an assessment of plans and policies across local governments in the region and to:

- Identify issues or gaps that may need to be addressed with water supply and demand, infrastructure, and water resource management.
- Identify opportunities for improvements to water resource management and/or better integration of water and land use.
- Inform the team discussions at the Growing Water Smart workshop.
- Identify opportunities for enhancing implementation of existing policies and projects.

This report is a summary of the opportunities identified by Del Corazón Consulting. The San Luis Valley County-area Growing Water Smart Policy

Scans can be requested by emailing growingwatersmart@sonoraninstitute.org

This report is based on a desk review by Del Corazón Consulting and is intended to be a starting point for a collaborative dialogue about what strategies offer the greatest opportunities to the San Luis Valley to achieve water savings through land and water management best practices. Ultimately, the best ideas will be those identified in the workshop by the Growing Water Smart community teams themselves.

The opportunities are organized by the following overarching themes:

- Water supply
- Compact development
- Outdoor water demand
- River protection
- Stormwater management
- Indoor water demand
- 1041 powers

RIO GRANDE BASIN CONSIDERATIONS

The Rio Grande Basin is a critical water source for three states, twenty-two Native American Tribes, and two nations. As with other western basins, the hydrologic and climate trends and projections from USGS and the Bureau of Reclamation indicate water and natural resource management will only become more challenging.

- Temperatures are projected to increase by an additional 4-10 degrees Fahrenheit across the basin, increasing evaporation from surface reservoirs.
- Annual precipitation will remain variable with changes likely in total volume, spatial distribution, and timing.
- Winter snowpack, which accounts for 74% of the Rio Grande River's flow, is decreasing and runoff will be earlier.
- Increased wildfire severity will impact water quality.

The most recent analysis and technical update for the Colorado Water Plan characterizes the water management challenges for the Rio Grande Basin as:

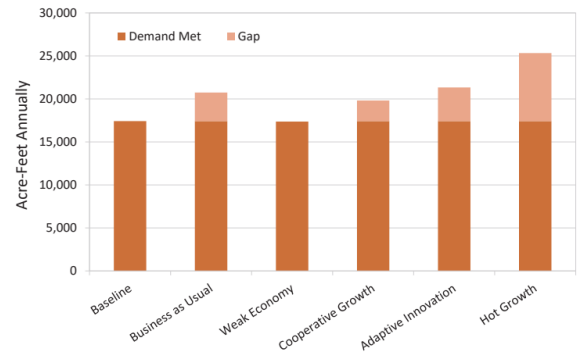
- Sustainability of the groundwater supply.
- Providing a domestic supply for new growth.
- Addressing these two issues within the constraints of the Rio Grande Compact.

The Rio Grande Basin Implementation Plan integrates these future challenges into the plan’s goals and strategies.

Municipal and Industrial (M&I) water demand is a small amount of the total water use in the basin, about one percent of the total, compared to agriculture. However, the Growing Water Smart program in the San Luis Valley is focused on domestic water supply for several important reasons.

First, the agricultural sector is already working to find solutions for sustainable water resource management. Following the passage of the Division of Water Resource’s rules requiring the San Luis Valley to manage and augment groundwater withdrawals, the Rio Grande Water Conservation District has taken the lead in finding collaborative solutions and implementing agricultural demand management. The subdistricts have been funding their own programs to reduce water demand and the State of Colorado recently adopted legislation to fund the retirement of 45,000 acres of agricultural land to meet the goals for groundwater management set by the Division of Water Resources.

Second, in the most recent Colorado Water Plan Technical Update, under every scenario except Weak Economy, there is a projected moderate increase in population and therefore future domestic water demand. The Technical Update assumes there would be no available water to meet increased demand for new uses and therefore, future M&I demand contributes directly to the Rio Grande Basin’s projected water supply gaps. The 2050 projected M&I gap across the different water supply scenarios ranged from a low of 3,300 acre-feet up to 7,900 acre-feet.



Source: Rio Grande Basin Implementation Plan (2022)

The Technical Update also assumes that 4,010 acres of agricultural lands surrounding the municipalities will come out of production due to the pressures of urbanization in all but the Weak Economy scenario. This is in addition to the 45,000 acres of irrigated agriculture that is already targeted for groundwater sustainability. The conversion of agricultural land conflicts with the goals of every comprehensive plan reviewed for the purposes of this report. The region’s comprehensive plans emphasize community desires to sustain the agricultural economy and to work to create vibrant diverse economies in the future.

The Technical Update explored a wide range of population growth scenarios. The 2020 Census shows a modest population increase in three of the valley’s six counties resulting in an overall positive increase in population of 17.8% as a region.

CHANGES IN COUNTY POPULATION 2010-2020 CENSUS			
Increase in Population		Decrease in Population	
Alamosa County	16,376 + 6%	Conejos County	7,461 - 9.6%
Saguache County	6,368 + 4.3%	Costilla County	3,499 - 0.7%
Mineral County	865 + 21.5%	Rio Grande County	11,539 - 3.7%

The Technical Update identifies that there are no new water supplies available to support the projected increase in M&I demand by 2050. The assumptions are that municipal utilities, water providers, and conservation districts will be looking

for agricultural water rights to meet a growing demand for water supplies.

THE GROWING WATER SMART APPROACH

The Rio Grande Basin's efforts to permanently protect river corridors and implement groundwater management solutions is commendable. However, the scope and scale of the challenges Colorado and the San Luis Valley are facing require bolder action.

The Growing Water Smart program aims to create more resilient communities across the West by promoting four key principles that support the integration of the land use and water sectors.

1. We need to reduce the demand for water in our communities.

Local governments need to adopt land use planning policies that require new development be built as water-efficiently as possible while simultaneously supporting retrofitting older, water-inefficient development. This approach is applicable across all communities regardless of whether the population is growing, stable, declining, or churning.

2. We need to shift to harnessing new water supplies from alternative sources.

As new water sources are increasingly harder to acquire and more expensive, water providers and local governments need to harness supplies from water conservation, water reuse and recycling, and rainwater harvesting. Saved water, in most cases, is significantly less expensive than acquiring new water rights.

3. We need to protect river systems and replenish our aquifers.

Paradigms of how to manage river systems and stormwater are changing, with a greater emphasis being placed on the importance of floodplain connectivity and healthy river corridors to aquifer recharge. States and local governments across the West are increasingly pursuing multiple benefit

projects and natural river management approaches as part of integrated water resource management.

4. We need to build greater resiliency into all our governance and community systems.

In addition to needing to be resilient to drought and water shortages, local governments need to be prepared to address the growing uncertainty from the multiple, and now sometimes simultaneous, threats of climate change, natural hazards, public health, cybersecurity, and more. Building resiliency into and across all sectors will help minimize the impact of future crises.

This report offers specific recommendations for the San Luis Valley on how to integrate these principles into plans, policies, and operations of the land use and water sectors.

SAN LUIS VALLEY OPPORTUNITIES

A. ADOPT CLEAR ADEQUATE WATER SUPPLY POLICIES

Colorado state statutes place much of the responsibility and onus on local governments to review development to meet the state's adequate water supply requirements. In C.R.S. §29-20-302, adequate water supply is defined as *sufficient for build out of the proposed development in terms of quality, quantity, dependability, & availability*.

Adequate water supply rules should include:

- The amount of water required for a new development.
- The source of where the water is going to come from.
- The legal rights of the water.
- If the water supply is adequate and sustainable for the development type into the future.
- Drinking water quality.
- The treatment and distribution system requirements.
- When proof of supply is required in the development review process.

The state statutes provide local governments with specific guidance on what information should be submitted depending on whether the source of water is a water provider or a well. The state statute also gives local governments the authority to require additional information and/or to negotiate a water conservation and efficiency plan as part of approval.

UPDATE WATER ADEQUACY STANDARDS

Across the San Luis Valley, county and municipal policies include some element of proof of adequate water supply.

- All the counties include a reference or citation consistent with the state statute.
- Conejos, Mineral, and Saguache Counties as well as the Town of South Fork require proof of legal and physical availability.
- Conejos, Mineral, and Saguache Counties as well as the Cities of Del Norte and Monte Vista require information on the total amount of water required.
- Conejos County includes a requirement proving that denser development on wells will not cause well interference.
- Mineral County and the Town of South Fork require augmentation as part of approval.
- Some requirements for submission material are triggered by the size of a subdivision.

The region may benefit from a regional exploration of the best practices of water adequacy rules, what currently works or does not work, and how revised policies can protect the county and homeowners from inadequate water supplies.

The Northwest Colorado Council of Governments created a resource guide, [Water Savings Resource Guide and Model Provisions for the Colorado Headwaters Region](#), that includes a good explanation in *Chapter 2 Water Supply Standards* of best practices as well as model code provisions for ensuring adequate water supply.

Across the San Luis Valley, the following best practices should be explored to strengthen existing policies:

- Include a direct citation of state policy and the definition of adequate and sustainable water supply.
- Specify permitted water sources for development (e.g., wells, renewable water, hauled water, non-potable water, etc.).
- Include a specific methodology for how to determine the total water demand within a development including calculations for both indoor and outdoor use.
- Specify methodology for how water adequacy will be demonstrated.
- Clarify decision-making criteria for approval and denial.

One of the most challenging aspects of the water adequacy rule is determining adequate water supply for development on wells. Proving how much water is available is a challenge when estimating available groundwater. Across Colorado, local governments are innovating different methods to address their unique water supply or hydrogeologic conditions. All county and municipal governments in the San Luis Valley should include a clear process for how, when, and what a developer should submit as proof of adequate and sustainable water supply in their development code.

The state statute provides the following guidance as satisfactory proof of adequate water supply.

- A will serve letter is acceptable when a water provider has a water supply plan on record with a local government. The provider's plan must have been updated within the past 10 years and has a minimum 20-year planning horizon. The plan needs to include a description of the provider's physical water sources and water supply obligations.
- When a water provider *does not* have a water supply plan, the will serve letter must include proof of ability to provide adequate water supply, including the physical source of water to

serve a development's water demand through buildout and proof of a firm yield.

- For development on a well, local government can require a water supply report that includes an assessment of water yield under various hydrological conditions.

For rural development on wells, how to use the water supply report, what it should include, and how to apply it to decision-making is not as well-defined in the state statute. A pump and aquifer yield test are the most common methods for estimating the quantity and sustainability of development on wells. Developers, if not required to do an on-site test, often rely on nearby wells for water yield rates or hire a water engineer to model the water supply sustainability. Given the state statute applies to subdivisions of two units or more, some counties have established graduated requirements with increasing rigor for proof of adequate water supply as the size of the subdivision increases. Creating clarity in the code and developing a clear process should be a priority for all the counties across the San Luis Valley.

PROMOTE WATER EFFICIENCY IN ECONOMIC DEVELOPMENT WATER SUPPLY ALLOCATIONS

The San Luis Valley should also consider how future business recruitment and economic development can be supportive of water resource management given there are significant differences in water demand by business type.

In Arizona, which is facing critical water supply challenges, local governments have adopted policies that prioritize the allocation of their water supplies to better align with their community development goals identified in master plans. These water allocation policies establish tiers for when and how the utility will commit to serve new commercial developments. The basic principles are:

- When a development is consistent with a community plan or has been identified as a community priority, the water provider will

dedicate the total supply to the new development.

- If the development is consistent with the community plan, but not a high priority, the utility will allocate a portion of the water supply to the development and the developer will be required to dedicate the remainder.
- If the development is not consistent with the community plan and not a desired development, the water provider may opt to decline to serve the new development or require the development to dedicate sufficient water rights to meet the new demand.

Optionally, a local government may establish a policy to require high water-use developments, residential or commercial, over a certain threshold to submit a water conservation and efficiency plan to reduce the overall water demand and stay within an approved water budget as part of the application for development approval or water supply.

Finally, local governments may integrate water efficiency requirements into specific zoning requirements for different high water demand land uses such as golf courses, car washes, and data centers. The policy would require the new development to meet requirements for water-efficient plumbing fixtures and appliances, water recycling, landscaping, and more.

B. PROMOTE COMPACT DEVELOPMENT PATTERNS

Research has found that densities, lot sizes, and dimensional standards all play a contributing role in outdoor water demand, along with household income. Higher density development (e.g., 7-10 units per acre) uses less water than lower density large-lot single-family home development, primarily due to the reduction in irrigable land area.

For decades, lot sizes have been increasing in America. The average suburban lot in America is now around 7,200 square feet while traditional urban lot sizes are significantly smaller (between 3,500 to 5,000 square feet).

Across the San Luis Valley, lot sizes for municipalities vary. The lot sizes in historical communities are consistent with more traditional smaller lots. Promoting this more compact development pattern should be continued as communities redevelop and grow. The examples below are provided to illustrate the range of smaller lot size ranges across the valley.

- Creede’s R-2 duplex and multi-family zone has a minimum lot size of 1,500 square feet and the R-1 low density is a minimum of 5,000 square feet.
- Center has a R-2 zone with a minimum lot size of 7,000 square feet for 1-2 units.
- Monte Vista has a Residential Low zone of 1 unit per 7,000 square feet and a Residential Medium zone density of 1 unit per 3,500 square feet.
- City of Alamosa has an Established Neighborhood zone of 1 unit per 4,500 square feet and a Mixed Use zone with a minimum lot size of 7,000 square feet.

When density is not used as a method to limit the size of irrigated area, a local authority must rely on the landscape regulation or a water conservation ordinance to manage outdoor water demand.

MANAGE FUTURE GROWTH AREAS AND PROMOTE HIGHER DENSITIES WITHIN WATER SERVICE AREAS

The comprehensive plans for the City of Alamosa and Alamosa County, Rio Grande County and the municipalities within Rio Grande County include strategies for promoting desired growth around the towns. As these strategies are implemented, local authorities should carefully consider water service area boundaries, extension of infrastructure, operating costs, and system capacity. Given that infrastructure is expensive, thoughtfully aligning higher density future growth areas with existing infrastructure helps prevent undercapitalized utilities.

ADOPT STATUTORY CLUSTER DEVELOPMENT FOR COUNTIES

The 1972 passage of Colorado Senate Bill 35 established that a subdivision which creates lots smaller than 35-acres proceed through a county approval process. This policy exempted any subdivision with lots 35 acres and larger from subdivision regulations. The Division of Water Resources permits domestic wells on 35-acre and larger parcels which allows for up to 1-acre of irrigated land and water for domestic livestock.

The state’s statutory cluster development policy, §30-28-403, aims to incentivize a rural subdivision to come into the county subdivision process by giving a density bonus of a second lot in exchange for setting aside a at least two-thirds of the total area of the tract to be protected from future development for at least 40 years. In areas where 35 acre or larger subdivisions are common, adoption of this policy can support local governments working with landowners to come through the subdivision review process and enable discussions about sensitive areas to be avoided.

C. REDUCE OUTDOOR WATER DEMAND

As a consumptive use, outdoor water demand is the most frequent target for achieving significant water savings in arid areas. The San Luis Valley is technically a desert below 8,000 feet and receives little precipitation. Outdoor water use can account for up to 50 percent of total water demand in summer. Depending on the water portfolio of a water provider, this can place significant pressure on a community’s water supply and system.

There are four proven methods for reducing outdoor water demand.

1. **Reduce the amount of water needed** for irrigation by enhancing soil conditions, requiring appropriate plant types, and designing water-efficient landscapes.
2. **Decrease water waste** by improving site-specific water efficiency through irrigation system design, best management maintenance

practices, and water-efficient irrigation technology.

3. **Establish a maximum amount of water permitted** for a landscape with a water budget.
4. **Limit the use of potable water** as a water source for irrigation by requiring alternative water sources.

Across the San Luis Valley, landscape regulations apply to commercial and multi-family development. While there is not a single comprehensive policy that is a model for the region, the following landscape policies offer examples of these four methods:

- The City of Alamosa, City of Monte Vista, and Town of Del Norte have adopted water waste regulations.
- The City of Alamosa, City of Monte Vista, Town of Del Norte, and the Crestone Baca Water and Sanitation District have adopted watering schedules for day of week and time of day.
- The City of Alamosa is promoting demonstration sites for xeric landscapes.
- Rio Grande County has a strong county policy that includes a purpose statement with water conservation as a goal, recommends climate-adapted plant materials, requires protection of existing trees and shrubs, requires irrigation systems be automated and use moisture sensors, and requires landscape maintenance.

The policy recommendations below should be considered for the region to achieve more efficient outdoor landscapes.

DAY OF WEEK/TIME OF DAY IRRIGATION

Day and time of week irrigation schedules have been proven to reduce outdoor demand by up to 30 percent and reduce system peak demand pressure. This should be considered a mandatory policy adopted across all the San Luis Valley water providers and municipalities. These requirements can be included within a municipal water utility code, a landscape code, or a water conservation ordinance.

REVISE LANDSCAPE ORDINANCES

The municipalities in the San Luis Valley should review and revise their landscape regulations to better reflect the regional climate and landscape. The Northwest Colorado Council of Governments created a resource guide, [Water Savings Resource Guide and Model Provisions for the Colorado Headwaters Region](#), that includes a thorough explanation in *Chapter 3 Reducing Outdoor Water Demand* of best practices as well as model code provisions for water-efficient landscape regulations.

The San Luis Valley should adopt best practices for water efficient landscaping including:

- Add soil amendments.
- Specify desired type and amount of plant material.
- Limit amount of turf.
- Promote the use of hydrozones.
- Prohibit adoption of restrictive covenants that require turf.

Rather than being included as broad principles in the code, landscape standards should be more specific and address site coverage, plant combinations, and minimum to maximum amount of plant material.

Another opportunity for regional collaboration is the development of a regional plant list appropriate for the higher montane and valley floor ecosystems. The Colorado Native Plant Society has a [plant list](#), but is limited to only native plants. The creation of a regionally-appropriate landscape plant list that includes water usage and hydrozones could aid in water-wise landscape installation.

Adoption of limitations to the total amount of turf are strongly recommended. Across the West, prohibition of the use of cool-season turf grasses in arid landscapes is increasingly becoming a requirement in landscape regulations. In 2022, the State of Colorado passed House Bill 22-1151 to fund a turf buyback program to incentivize water-efficient landscape conversions. Ensuring new development is water efficient and does not require future

allocations of tax dollars for turf retrofits should be a priority for all Colorado communities.

The promotion of natural landscapes is another tactic communities are adopting, in particular the use of native and xeric plant systems in parking areas, street medians, buffers, and yards.

Finally, for landscapes where irrigation systems are required, best management practices should be recommended for irrigation design and operation with smart controllers required.

PROMOTE OUTDOOR WATER EFFICIENCY IN RURAL AREAS

In counties homes with irrigated yards can be up to an acre on groundwater wells and require augmentation. Outdoor landscaping is not necessarily the wisest use of water. The San Luis Valley policy scan showed that most development in the unincorporated areas of the San Luis Valley is on domestic wells, which allow for up to three single-family dwellings, irrigation of up to one acre of lawn and garden, and provide water for domestic animals and livestock. This is in contrast to household-use only wells which allow for use only inside the home.

While counties may adopt landscape regulations, an optional tool to promote water conservation is a water conservation ordinance. Limits on the size of turf areas, recommended plant types, and water-efficient irrigation systems can be required regardless of the water source. If a county already has landscape regulations, making certain sections such as turf limitations or requirements for xeric plant materials, applicable to residential development can support water-efficient new development.

D. PROTECT THE RIVER CORRIDOR, PUBLIC SAFETY, AND WATER QUALITY

The rivers in the San Luis Valley and Rio Grande Basin have less development pressure than many other river corridors around the state. The exception is where recreation and amenity development are

occurring. Local organizations and governments have a record of collaboration on river protection, applying tools such as the Rio Grande Habitat Conservation Plan (HCP), permanent land protection, stream management plans, and collaborative land stewardship.

While the HCP is an excellent tool, the HCP does not cover development. The HCP encourages “landowners and local units of government ...to avoid and minimize impacts to riparian habitat areas.” Most local governments in the San Luis Valley have some minimal standards for erosion and stormwater runoff, but policies for river protection are less common. Government policies across the region that support river protections include:

- Alamosa County, Rio Grande County, the City of Alamosa, and Town of South Fork all cite compliance with the HCP in their development code.
- Conejos County has a riparian protection overlay that prohibits development or construction of an impervious area within 75 feet of the highwater mark of intermittent streams and 100 feet of perennial streams. It also requires a 25 foot setback on the streambank for major subdivisions and PUDs. It also limits disturbance of the water way and establishes a 150 foot setback for potential pollutants.
- Costilla County requires riparian vegetation protection and a 50 foot setback from the mean identifiable high water mark, and within the Watershed Overlay District, prohibition of impervious areas within 75 feet of intermittent streams and 100 feet of perennial streams.

From a land use perspective, river corridors remain vulnerable in most locations if development pressures were to increase, or ranchland were to be subdivided.

MINIMIZE DEVELOPMENT IN THE FLOODPLAIN

Even though flood risks vary across the region, ranging from low to high, a valley-wide dialogue

about floodplain management and river protection may yield lessons learned and best practices for the San Luis Valley. These could be incorporated into regional recommendations for how to strengthen policies to achieve multi-benefit floodplain management goals and better integrate floodplain best management practices.

Many of the community comprehensive plans and nearly all hazard mitigation plans recommend updating floodplain regulations and/or limiting development in the floodplain. Some jurisdictions have since updated their floodplain regulations. The City of Alamosa, Rio Grande County, City of Del Norte, and Town of South Fork have the strongest floodplain ordinances in the region. However, there are still differences in the quality and content of the floodplain management policies across all jurisdictions in the region.

Best practices that should be adopted across the San Luis Valley include:

- Minimize disturbance to the river system and hydrologic cycle.
- Ensure critical facilities are not placed in the floodplain.
- Limit the density of development in the floodplain.
- Prohibit fill in the floodplain.
- Require additional setbacks from the floodway.

ADOPT SITE-SCALE STORMWATER MANAGEMENT POLICIES

Stormwater management approaches are undergoing a paradigm shift. Traditional stormwater management focuses on capturing run-off through centralized conveyance systems of curb-gutter-pipe networks. More recent science and evaluation of practices show that this approach has unfortunately had negative impacts on both ecological and public safety, including:

- Disruption of the hydrological cycle contributing to groundwater depletion.

- Increases in downstream flooding as stormwater is diverted from one community into another.
- Water quality degradation from failure to filter out stormwater debris and pollution.
- Increased natural channel erosion and stream ecosystem degradation due to increased unnatural flows.

Urban and rural stormwater managers are increasingly adopting green infrastructure approaches that integrate:

- On-site infiltration through site scale development standards.
- Creating more space in natural drainage systems to absorb, infiltrate, and help restore hydrological functions.
- Natural (e.g., bioswales, vegetation buffers, etc.) and engineered systems (e.g., storm sceptor) to filter runoff.

These principles can also be integrated into parking lot and streetscape design, such as requirements for:

- Islands and street frontages to incorporate rain gardens with curb cuts, vegetated buffers, and bioswales to receive stormwater runoff.
- A percent of total parking lot to drain to landscaped areas including trees, vegetated islands, vegetated buffers, bioswales, and rain gardens rather than into the stormwater system.

Given the lack of extensive stormwater management systems across San Luis Valley communities, development of a regional guidance manual for stormwater management may be beneficial and help reduce future expensive infrastructure investments. In particular, the guidance could identify onsite and rainwater harvesting best management practices.

The Mile High Flood District has been a regional leader on Colorado's Front Range through their best practices, stormwater manuals, and working with local governments. However, the scale of the design requirements in their manuals likely exceed the infrastructure needs of smaller rural communities

like those in the San Luis Valley. Development of scale-appropriate guidance for the climate and rural nature of the San Luis Valley could benefit under-resourced communities with current and future stormwater management needs.

E. PROMOTE MORE EFFICIENT INDOOR WATER USE

Of all indoor water uses, toilets account for about 30 percent of household water demand, followed by the shower, faucets, and then appliances. The Energy Act of 1992 raised the national efficiency standards for toilets and fixtures. Toilet efficiency dramatically increased from 3.5 gallons per flush in the eighties to 1.6 gallons per flush in the nineties. This is still the federal plumbing standard today.

An EPA-designated WaterSense toilet, by comparison, uses only a third of the water of toilets that were installed pre-1993 and is 20 percent more efficient than the current federal standard. Replacing older inefficient toilets with a WaterSense toilet can result in a reduction of water use between 20 to 60 percent, depending on whether the existing toilet is 1.6 gallons per flush or 3.5 gallons per flush.

ADOPT WATERSENSE AS THE BASELINE FOR PLUMBING FIXTURE STANDARDS

The State of Colorado adopted a policy to phase in WaterSense plumbing fixtures in 2016 and expanded it in 2019, with full implementation by 2021. For the specified fixtures and appliances, manufacturers who sell to distributors, wholesalers, retailers, developers, and homebuilders are required to sell only those labeled *WaterSense*. This does not prohibit a homeowner or developer from installing other types of fixtures purchased outside Colorado or online, although it does effectively limit the market availability within the state, resulting in more water-efficient new construction.

The State of Colorado Plumbing Code is still aligned to the Federal Plumbing Standard which is less efficient than the WaterSense rule.

WATER SENSE STANDARDS COMPARED TO FEDERAL PLUMBING STANDARDS		
Fixture	Federal Standard	CO WaterSense Policy Standard
Toilets, private	1.6 gpf	1.28 gpf
Urinal	1.0 gpf	
Lavatory, public metered	.5 gpm	
Showerheads	2.5 gpm	2.0 gpm
Faucets (bathroom and kitchen)	2.2 gpm	1.5 – 1.8 gpm

With a state market that is dominated by water-efficient fixtures, local governments should adopt matching regulations to ensure those fixtures are installed in new development. All communities within the San Luis Valley should adopt policy that requires water-efficient fixtures consistent with the State of Colorado WaterSense rule in their building and plumbing code.

PROMOTE FIXTURE RETROFITS IN EXISTING WATER-INEFFICIENT DEVELOPMENT

Based on product replacement studies completed by the National Association of Home Builders (NAHB) and the International Association of Certified Home Inspectors (InterNACHI), bathroom fixtures can be expected to be replaced as follows:

- A residential tank-type toilet has an average life expectancy of 30 years.
- Bathroom sink faucets have an average life expectancy of 15 years.
- Showerheads have an average life expectancy of 12 years.

Theoretically, this means that houses built between 1990 and 1992, which may have these older inefficient toilets, are reaching the end of their product life expectancy between 2020 and 2022. This 30-year life cycle would also assume that most of the housing remodeled between 1980 to 1990 have likely replaced an older toilet with a toilet that likely uses 1.6 gpf, prior to the adoption of the Colorado WaterSense rule. This means these homes may also benefit from an upgrade to a WaterSense toilet.

Given the San Luis Valley is not growing rapidly, existing development could be a target for water savings through either policy or a program. Options include:

- A local water conservation ordinance that requires water-efficient fixtures consistent with the State of Colorado’s WaterSense rule for not only new construction but remodels. This is administered through the building permit process.
- A retrofit-at-resale policy requiring an upgrade of inefficient fixtures. This is administered through a program or local government and requires submission of compliance at the transfer of title.
- A valley-wide retrofit program replacing inefficient fixtures through rebates or a voluntary program. For a valley wide program, it would require an entity to run the program for the benefit of the region.

An internet scan of the age of the housing stock across the San Luis Valley indicates an older housing stock with 50% or more of all structures built before 1992. To assess the potential water savings of a valley-wide retrofit program, an assessment should be done that gathers finer-scale data, including:

- Number of single family residential (SFR) and number of multifamily residential (MFR) pre-1993 and post-1993.
- Average number of toilets (and fixtures) per SFR and MFR.
- Average persons per household for SFR and MFR.
- Resale rate for SFR and MFR.

This data could inform a costs-benefit analysis of the potential quantity of water savings, estimated market value of the water saved, and the estimated costs of a program (staff, materials, etc.).

CREATE A REGIONAL WATER CONSERVATION & EFFICIENCY POSITION

The State of Colorado requires water providers that provide more than 2,000 acre feet of water annually to complete water efficiency plans. Across the valley, of the sixteen or so water providers, only the City of Alamosa and the City of Monte Vista have adopted water efficiency plans. Water Efficiency Plans, or WEPs, establish a water savings target and the specific strategies to achieve the target within a given time period. Both the City of Alamosa and the City of Monte Vista are moving forward with implementation of their plans. The City of Alamosa has established a water conservation target of 4 percent annual savings over an 8-year period with a residential use per capita target of 100 gallons per day. The City of Monte Vista adopted a target of reducing overall water consumption by 10 percent across all sectors over a decade. These two communities may be able to offer smaller water providers with lessons learned on how to identify and implement water efficiency practices.

While the targets and strategies in the WEPs are well considered, getting any water conservation program to achieve water savings at a scale that may have a significant impact requires capacity – human, financial, and organizational. In the San Luis Valley, creating a staff position within each individual community or water provider may not be a wise resource expenditure. Rather, the region should adopt a similar approach to other rural parts of the state where a staff position, generally located within a neutral organization or nonprofit, provides regional support with grant writing, planning, program delivery, and monitoring and evaluation.

F. ADOPT 1041 REGULATIONS

Of the six counties in the Valley, only two, Alamosa and Saguache, have adopted 1041 regulations. These powers allow local governments to identify, designate, and regulate areas and activities of state interest through a local permitting process. The recent decision of Douglas County not to grant American Rescue Plan Act funds to the Renewable

Water Resources (RWR) project keeps groundwater in the San Luis Valley for the time being. However, it does not preclude RWR from attempting to use the water rights it owns in the San Luis Valley in the future. As water resources become scarcer and water more expensive, projects like RWR could become more frequent. 1041 Regulations are an essential tool for addressing local impacts to proposed water projects.

Rather than each county hiring a consultant to develop 1041 regulations, the counties could collaborate on the development of a high-quality regional model regulation that includes water projects and pays for the code integration into each community. Additionally, counties could develop a regional fund to pay for additional professional expertise when needed to review documents submitted under the 1041 process.

CONCLUSION

The San Luis Valley has a history of successful collaboration, innovative problem solving, and natural resource management. This experience, when applied to the challenges of sustainable and resilient municipal water, will no doubt complement the region's broader groundwater and surface water goals and strategies. Adopting a more aggressive water savings vision for the municipal sector will also likely result in long-term savings to water providers and municipalities that will otherwise need to invest in acquisition of future water supplies. The opportunities provided in this report offer a starting point for conversations about how individual jurisdictions and the region can strengthen the integration of water and land use to secure a vibrant and thriving San Luis Valley into the future.