EL PASO COUNTY

Water Master Plan

An Element of the County Master Plan
for the
El Paso County Planning and Community Development Department

Third Draft / November 6, 2018

Prepared by
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ACKNOWLEDGMENTS

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A big thanks to all citizens who provided comments, asked questions, and raised concerns on our Online (Metroquest) questionnaire and during public meetings."

- Craig Dossey

EXECUTIVE SUMMARY

This Water Master Plan (WMP) was developed for the Board of County Commissioners, El Paso County officials and staff, developers, citizens, and water providers within the County for the purpose of identifying and addressing water supply issues earlier in the land use entitlement process. This WMP contains information to: better understand the present conditions of water supply and demand; identify efficiencies that can be achieved; and encourage best practices for water demand management through the comprehensive planning and development review processes. This WMP is an element of the overall County Master Plan.

Implementing this WMP will help ensure that land use decisions are based on balancing efficient use of limited water supplies with the water needs of current and future residents. The WMP should also be used to promote cooperation among water supply entities in the County with respect to water planning efforts.

The State of Colorado adopted *Colorado's Water Plan* in December 2015, which identifies goals, objectives, and critical actions needed to ensure that Colorado can maintain our state's values related to water into the future.

El Paso County includes approximately 70 water providers and over 21,300 permitted groundwater wells. Much of the County has a semi-arid climate, with high elevations to the west, and the Palmer Divide running along the northern part of the County. Sloping hills direct the majority of the rainfall and snowmelt runoff in a south and southeast direction. The County only has two major streams: Monument Creek with headwaters within the Palmer Divide range; and Fountain Creek with headwaters in Teller County. These creeks join in Colorado Springs and flow on to Pueblo County where Fountain Creek joins the Arkansas River.

Rural subdivisions in El Paso County generally rely on individual domestic or household wells for their water, while suburban and urban developments are typically served by centralized water and sewer services provided by a Colorado Revised Statutes Title 32 special district or a municipality.

El Paso County with a view of Pikes Peak

PUBLIC ENGAGEMENT

In developing this WMP, the Forsgren team reached out to the public through multiple methods, including a web-based program, MetroQuest. Through MetroQuest, the public shared their ideas and concerns regarding water supply strategies and other water-related concerns. The website had over 1,000 visits with a total of 378 responses, providing important feedback from the public regarding water issues in the County. A public open house was held on October 25, 2018 to further engage the public and to answer questions.

WATER SERVICE PROVIDERS

Water service providers were contacted regarding their water supplies and demand commitments to serve their customers. The data collected from the water providers was categorized based on supply and demand locations. For the purposes of this WMP, the County was divided into eight sub-regional areas to analyze current supplies versus current demands, and future demands for the years 2040 and 2060. Results of those analyses are shown in Section 5 of this plan. As water demands increase each year, additional supply sources will need to be acquired to meet those demands. This WMP recognizes that many water providers will need to start incorporating renewable water sources into their portfolios. Some water providers have already begun this process of bringing in renewable water from outside their service areas for their customers.

Arkansas River Diversion Structure near Salida, CO

WATER SUPPLIES

Several different types of water supplies are being used by water providers in the County. Those types are classified as: native renewable water, imported renewable water, designated basin groundwater, and Denver Basin groundwater. The majority of water providers in unincorporated areas rely on Denver Basin aquifers for their supply, which are generally nonrenewable sources. With the exception of Colorado Springs Utilities and their project partners, water providers in the County are relying on 85% supply from Denver Basin and designated basin groundwater.

Although most water providers have sufficient “paper” water rights, economic pumping rates dictate the amount of groundwater that can be withdrawn. A water provider may not be able to economically pump to the limits that their paper water rights indicate. In some cases, there may not be enough reliable “wet water” to serve the buildout of development in specific service areas over the long-term.

PROJECTED WATER SUPPLY NEEDS

Comparing the current water supplies to future projected demands quantifies the water supplies that will need to be added to water supply systems throughout the County. Section 5 identifies the projected needs for the 2040 and 2060 horizons. Water providers will acquire and connect additional supplies incrementally as demands continue to grow. Water providers across the County are implementing water efficiency measures to "do more with less," including use of tiered rate schedules for their customers, and promotion of water-conscious landscaping. Water reclamation or reuse can also help extend supplies for many water providers. But ultimately, a number of water providers will need to diversify their supply portfolios with additional renewable water sources. They can then rely heavily on those limited supplies during wet and average precipitation years, and supplement with drought-proof Denver Basin supplies in drier years.

REGULATORY AMENDMENTS

With the purpose of encouraging water efficiency, conservation and the introduction of additional renewable water supplies to meet projected demands in the County, regulatory amendments are recommended. El Paso County implemented a 300-year water supply subdivision regulation for Denver Basin groundwater in 1986, with the intent, at least in part, of encouraging land developers to bring in additional renewable water sources. But land development continues to occur primarily where Denver Basin water rights can support the water demands of the development.

The WMP project team recommends that the County complete a more detailed analysis of the 300-year rule and available groundwater supplies, possibly leading to revision of this regulatory requirement. Regulatory amendment to the landscaping standards is also recommended to afford more flexibility with landscaping plans, created by a professional landscape architect, as a means of encouraging water conservation.

Drought-resistant landscaping

TABLE OF CONTENTS

1 – Introduction

1 - INTRODUCTION

This WMP was developed for El Paso County elected and appointed officials, County staff, developers, County citizens, and water providers within the County for the purpose of identifying overarching water supply issues earlier in the land use entitlement process. This WMP includes the following key elements:

- the public participation and engagement process;
- mapping and water use data;
- water planning as it relates to future land use;
- demand and supply analysis;
- regionalization alternatives;
- recommended water-conscious landscaping standards;
- water efficiency and water reuse opportunities;
- recommended regulatory modifications; and
- planning for implementation.

GOALS AND POLICIES

Goal 1.1 – Ensure an adequate water supply in terms of quantity, dependability and quality for existing and future development.

Policy 1.1.1 – Adequate water is a critical factor in facilitating future growth and it is incumbent upon the County to coordinate land use planning with water demand, efficiency and conservation.

Goal 1.2 – Integrate water and land use planning.

Goal 1.3 – Promote awareness of environmental issues associated with water use.

1.1 - BACKGROUND

"Water is life!" This was a common mantra of the early Colorado settlers. The challenge to find water dates back to the earliest settlers of the State and County. Today, El Paso County is one of the fastest growing counties in the United States with an expected influx of over 400,000 residents by 2050, per a Denver Post article: *What Colorado regions will grow fastest through 2050? The answer is not metro Denver*, by Aldo Svaldi, November 7, 2017. The County, founded in 1861, is the second most populated county in Colorado, and its largest city - Colorado Springs – is the second most populated city in the State. The area's rich history in mining created the need for many infrastructure projects as the settlers began addressing water supply as early as the 1870's. The earliest projects collected water from Pikes Peak in a system of reservoirs and tunnels.

El Paso County is now home to many water providers, including Colorado Springs Utilities, Cherokee Metropolitan District, Town of Monument, City of Fountain, Security Water and Sanitation Districts, Meridian Metropolitan District, Woodmen Hills Metropolitan District, Paint Brush Hills Metropolitan District, Widefield Water and Sanitation District, Woodmoor Water and Sanitation District, Triview Metropolitan District, and Donala Water and Sanitation District. Continued growth and need for water supply commitments has led many water providers to acquire additional water rights and supplies. It is important that El Paso County provide a comprehensive plan for integrating land use and water supply planning throughout the County.

Figure 1-1 shows a simple hydrologic cycle for evaporation and precipitation that occurs daily,

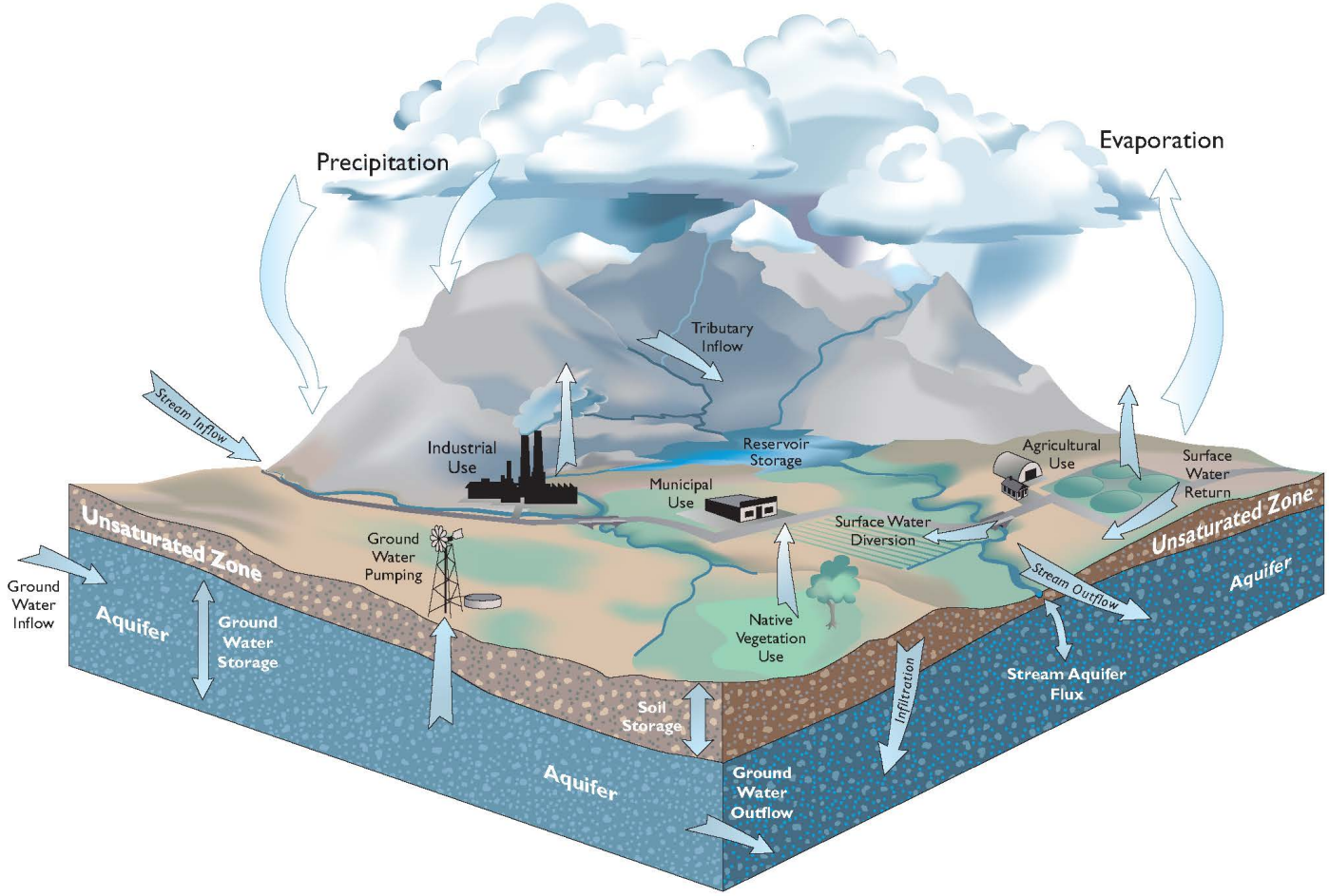


Figure 1-1: Hydraulic Cycle

making water available either as surface or groundwater. Please refer to the report *Where Your Water Comes From*, by Water Education Colorado (WEC), available at www.watereducationcolorado.org for further information.

As groundwater is a very important part of many water providers' water sources, various topics related to groundwater supplies are discussed in this WMP. The unique aspects of alluvial vs. Denver Basin groundwater concepts can be referenced at *Citizen's Guide to Denver Basin Groundwater* by Water Education Colorado, which is available online at www.watereducationcolorado.org. The publication contains general groundwater concepts that will help the reader more fully understand the dynamics of groundwater.

The State of Colorado Division of Water Resources (DWR) administers all of the water rights and laws within the State. All well permits need to be approved by the DWR. DWR has divided the State into seven different regions. These region boundaries follow the major river drainage basins (see Figure 1-2). The majority of El Paso County falls within the Arkansas River Basin, or DWR Region 2, with its division headquarters located in Pueblo, Colorado.

1.2 – WATER MASTER PLAN PURPOSE

Colorado is facing a substantial future water supply gap based on demands projected through 2050 and beyond. El Paso County is the "epicenter" of the water supply gap in the Arkansas River Basin. *Colorado's Water Plan* (available online at www.colorado.gov/cowaterplan) points to a possible water supply gap of 560,000 Acre-Feet (AF) statewide by 2050, and officials project as much as 64,000 AF of the gap to be in the Arkansas River Basin, within which most of El Paso County is located. County officials understand the need to approach water supplies in a thoughtful manner to ensure land use and water supplies are appropriately matched. This WMP was developed for the purpose of addressing water supply issues earlier in the land use entitlement process.

El Paso County, through this WMP, seeks to proactively address water supply. This WMP presents an opportunity for El Paso County to become a statewide leader in the integration of land use and water planning.

Suburban economic growth allows for an increased focus on efficient water use in the County. This WMP not only involves guidance from County leadership but also stresses the importance of regional cooperation. Limited local surface water supplies along the Front Range and heavy use of non-renewable groundwater requires the entire region to focus on securing additional future supplies, increased water storage, reuse, and efficiency.

HOW TO USE THIS DOCUMENT?

This Plan will allow a member of the public or anyone who wishes to develop their land to have a better understanding of the following:

- The entity or entities currently providing water in their area;
- The regional water supply partnerships, if any, that exist that could be beneficial to the end-water users, developers and landowners;
- Access to, and understanding of the water service maps available from the water providers;
- Contact information for specific water providers;

The land use review process includes steps that are intended to help a subdivider and County staff gain access to critical information early in the process to help save money, time and construction of infrastructure that could be sized more appropriately to the master planned needs of the area.

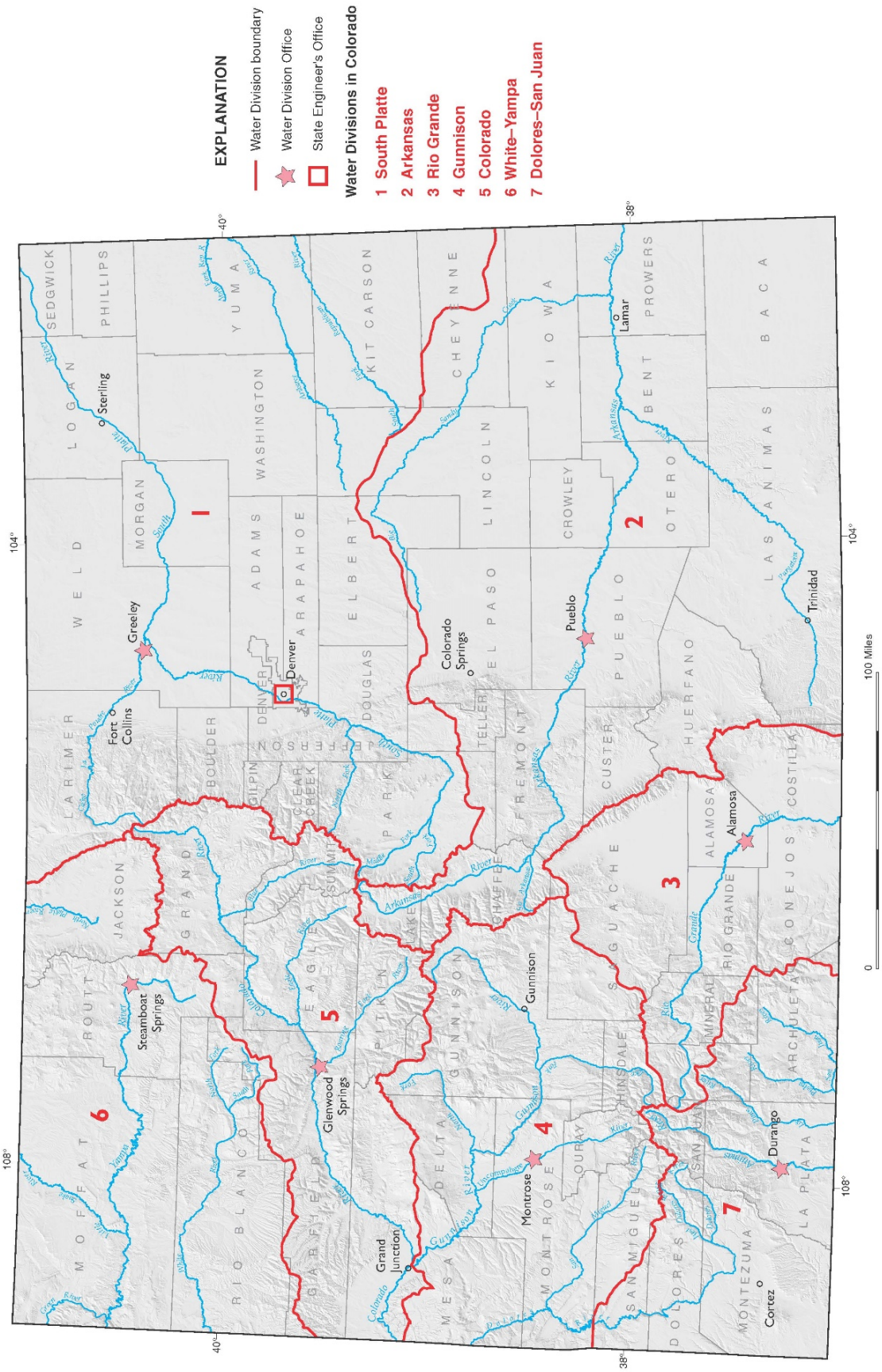


Figure 1-2: Subregions

Figures 1-3 and 1-4 show where in the land-use approval process and the 1041 Permit review and approval process this WMP should be considered. Currently, a finding of water supply sufficiency or conditional sufficiency occurs at the preliminary plan or final plat stages of subdivision. In many cases, a supply for water may not be identified until after a developer has spent time and money going through the County entitlement process, leaving the subdivider in a difficult situation with tens of thousands of dollars already spent on the project. This Plan is intended to identify and address water supply issues earlier in the land use entitlement process.

RELATED PLANS AND STUDIES

Several related plans, studies and reports have been reviewed and evaluated as part of this WMP. References to those documents can be found in appendices of this report.

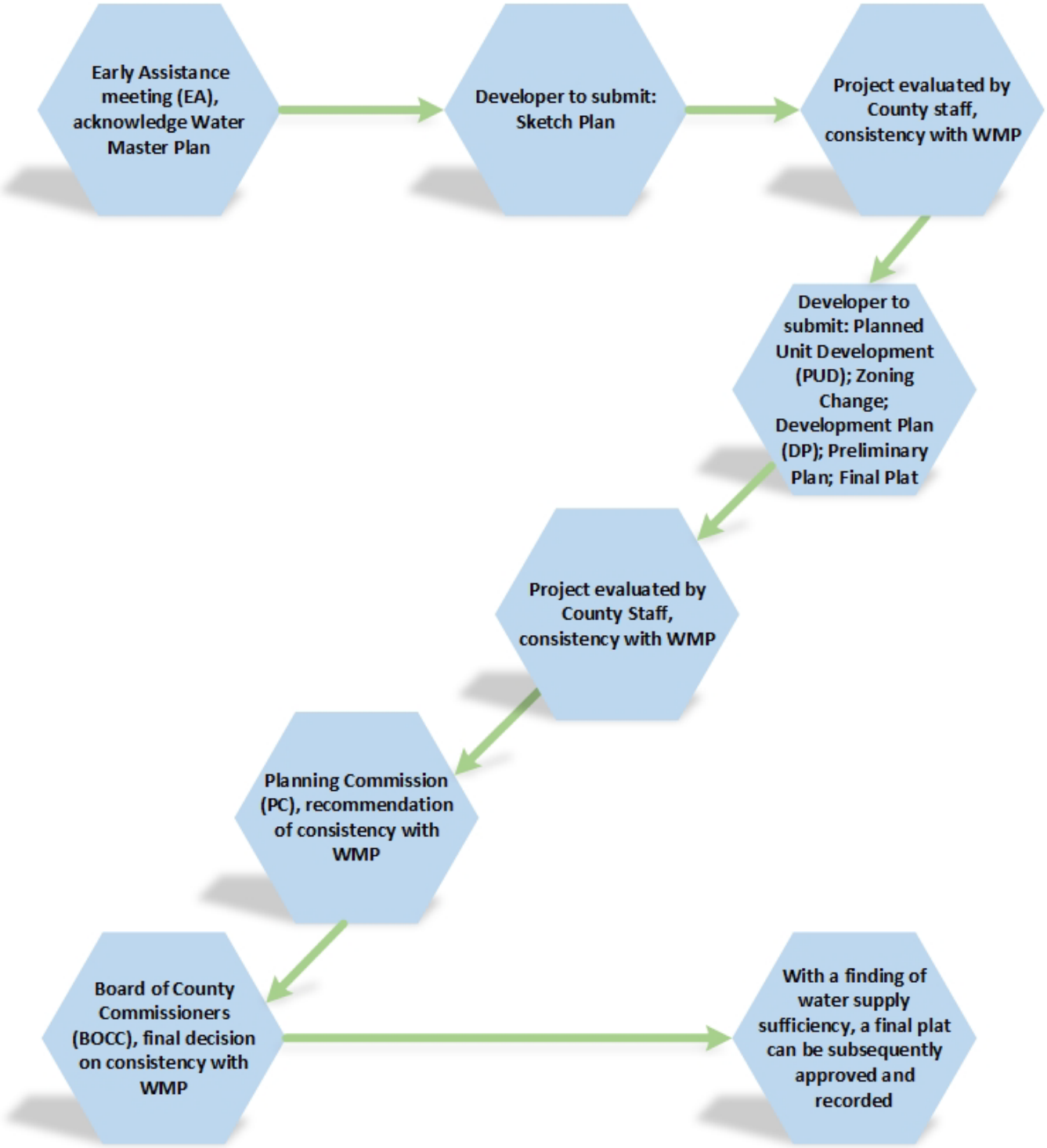


Figure 1-3: Typical Land-Use Entitle Process

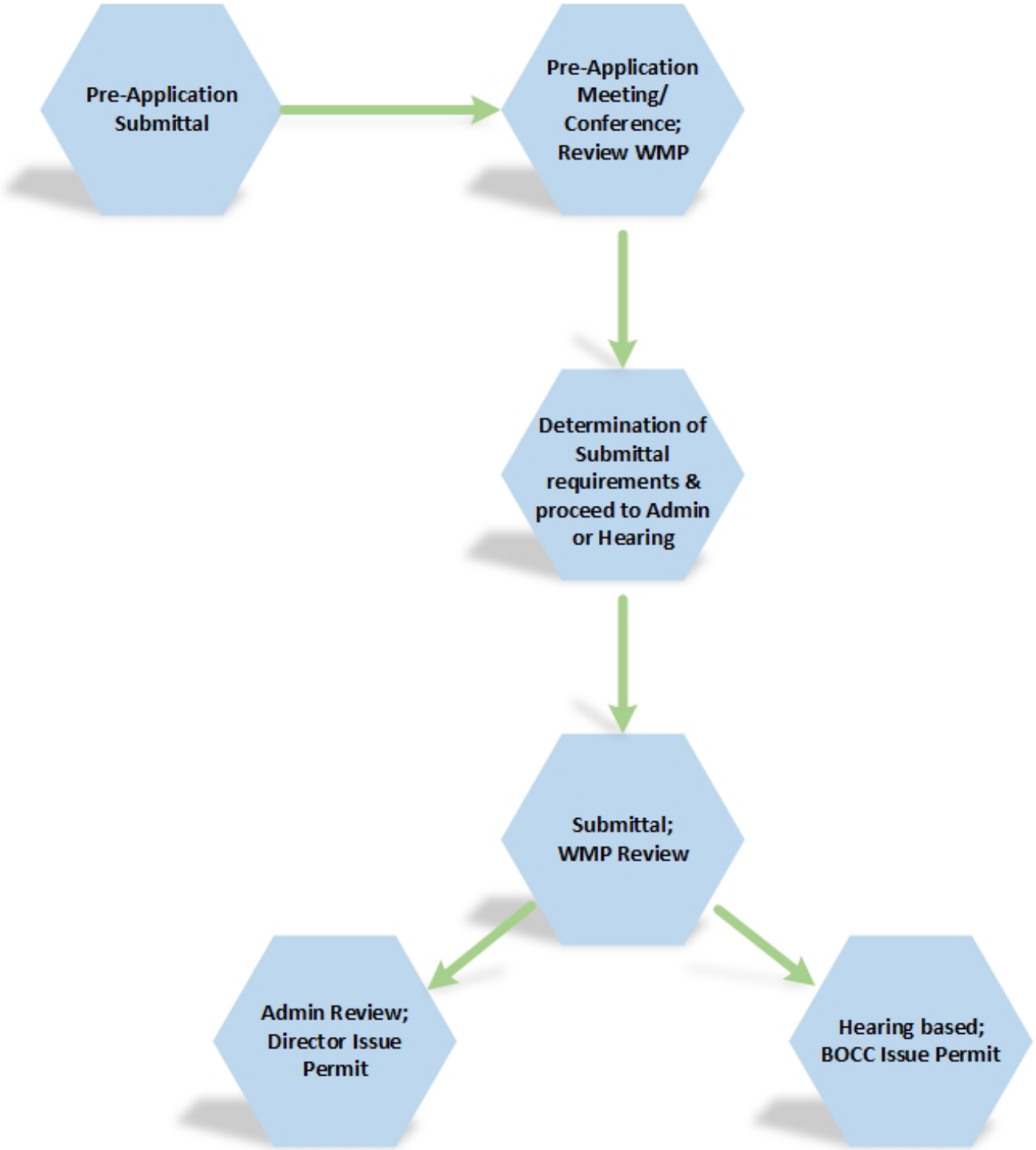


Figure 1-4: 1041 Permit Application & Review Process

2 – Public Engagement

2 - PUBLIC ENGAGEMENT

Engaging with County leaders, water providers, developers, homeowner's associations and the general public to learn their ideas and concerns about water supply was part of the overall strategy for this WMP, and vital to the concepts and recommendations of this report. One aspect of public engagement was to identify outreach strategies that the County may consider to educate people about water supply and demands. Where does our water come from? How does it get treated? Where does it go after we use it? This WMP was created through listening to the ideas of the Steering Committee, the public, reviewing MetroQuest results, and through discussions with the Housing and Building Association of Colorado Springs and other stakeholders.

GOALS AND POLICIES

Goal 2.1 – Reach a broad geographic and socioeconomic range of community members and gather feedback from stakeholders on location-specific input, strategy preferences, and open-ended feedback.

Policy 2.1.2 – Share educational and project specific materials

Policy 2.1.2 – Educational campaigns should be pursued to involve the community and provide a broader basis of understanding regarding water supplies and conservation strategies

Policy 2.1.3 – Communicate and gather input on complex, and at times, contentious water and land use considerations.

2.1 - STEERING COMMITTEE

A Steering Committee representing a range of stakeholders in the El Paso County community was formed to ensure public engagement, and to share ideas about different water supply strategies, and overall water concerns. Those members included representatives from: the various local water providers, home builders, cities, the El Paso County Planning Commission, water district board members, land developers, Colorado Springs Utilities, private citizens and a representative from one of the designated groundwater basin boards.

Input from the Steering Committee formed the outline for questions posed on the project's on-line public engagement platform. The Steering

Steering Committee Meeting

Committee also gave input on how the County regional maps were created. The Steering Committee was routinely updated on all aspects of the topics and process involved in developing this study.

2.2 - SURVEY AND WEBSITE: METROQUEST

MetroQuest, a digital engagement platform, was used to gather and analyze public input for the El Paso County WMP. Respondents were given basic information about the Plan, then asked a series of questions regarding location-specific topics and strategy preferences, and were also given the opportunity for open-ended, non-location specific, feedback. The Goals and Policies at the beginning of this section reflect the priorities of El Paso County's community engagement process, and the results briefly describe the feedback provided by the community, highlighting key insights extrapolated from the data. Links to the platform were placed on the County and department websites, as well as the websites for a number of water suppliers. Announcements were made at Planning Commission and Board of County Commissioners hearings, and by County staff at various community events.

Figure 2-1: MetroQuest Screenshot

RESULTS

The web platform was open for comments from the beginning of March until June 2018 and welcomed 2,089 total online visitors (visits included people looking at it, closing and revisiting to complete). Of the total visits, there were 378 unique survey respondents of whom 49% provided feedback about their specific water source in El Paso County. Of the 49% that

provided feedback, 62% indicated that they receive water from a central provider, 34% receive water from a well, and 4% either identified an aquifer or did not know the source of their water. The largest group of responders were between the ages of 50 and 69 years.

WATER QUALITY, SUPPLY, AND INFRASTRUCTURE FEEDBACK MAPS

The opening section of the web platform allowed residents to provide specific feedback by selecting a location within El Paso County on a map and providing a comment regarding water quality, water supply, infrastructure, water conservation, non-potable water, or any other general feedback.

The maps on the next three pages show representative samples of mapped feedback by type (negative, positive, question, suggestion, other) for input regarding the topics of water quality, water supply, and infrastructure. The full exported report of comments is on file at the County's Development Services Department.

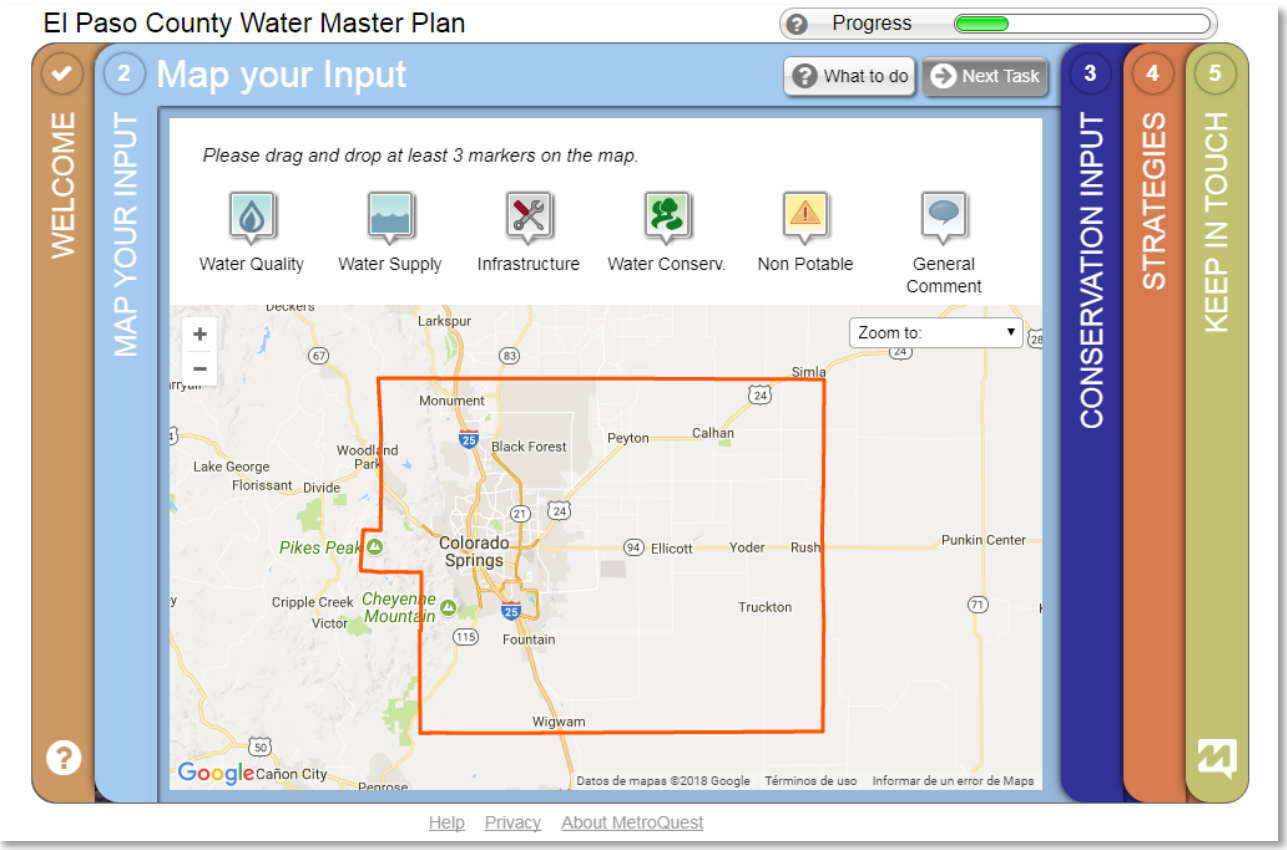


Figure 2-2: MetroQuest Screenshot

WATER QUALITY COMMENTS SUMMARY

Some community members who mapped comments for water quality described an area where water quality is an issue, or where there are concerns about contamination or the possibility of a decrease in water quality.

WATER SUPPLY COMMENTS SUMMARY

Mapped community feedback regarding water supply was largely a mix between general comments about water supply (the blue dots), or questions about general or specific areas.

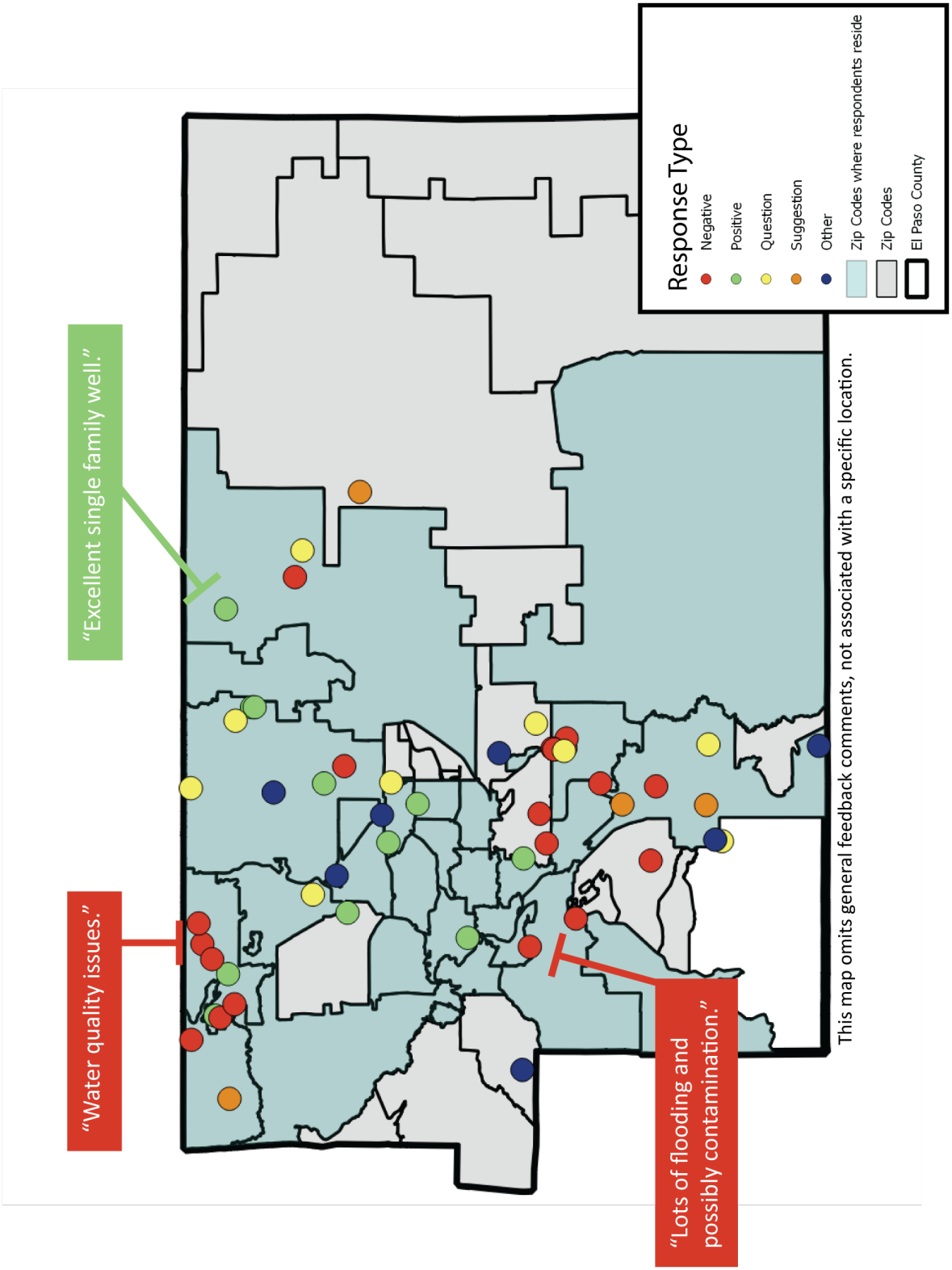


Figure 2-3: MetroQuest Water Quality

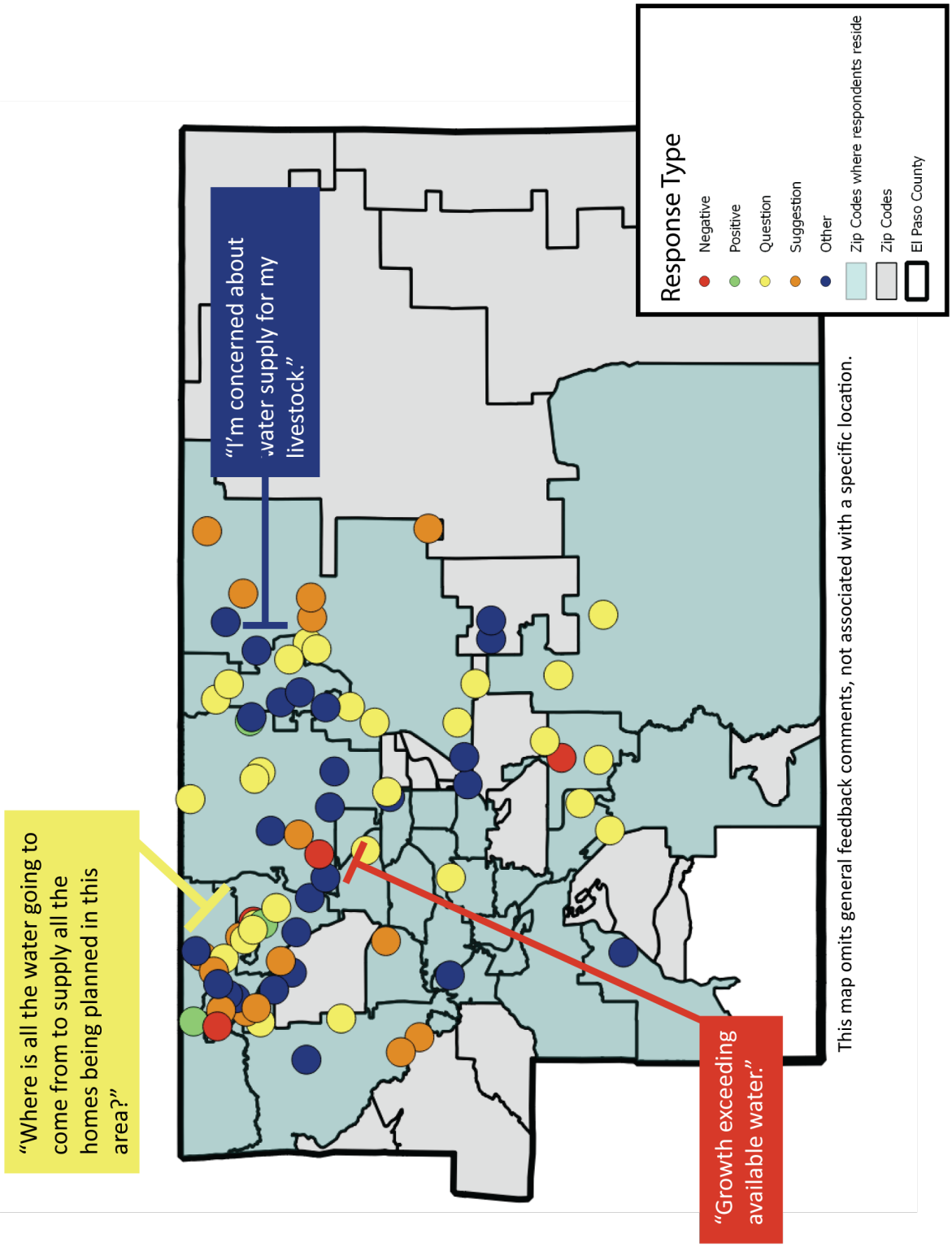


Figure 2-4: MetroQuest Water Supply

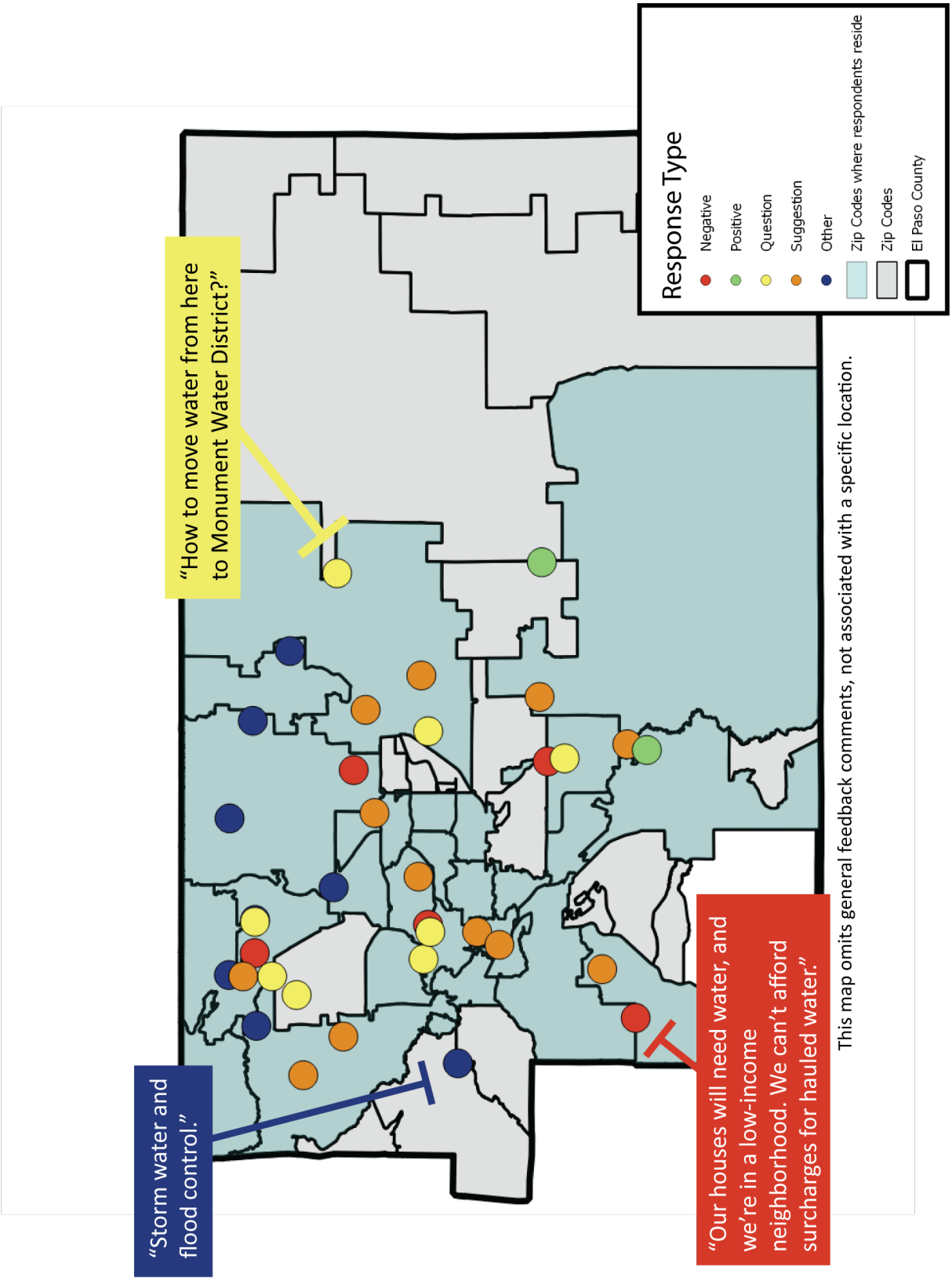


Figure 2-5: MetroQuest Infastructure

INFRASTRUCTURE COMMENTS SUMMARY

The infrastructure category had fewer responses than other categories, but did include a range of concerns and questions. Particularly, people asked questions about how specific areas will be getting water as demands increase.

WATER CONSERVATION COMMENTS SUMMARY

Generally, people want to see more done in the County to encourage water conservation. Some community members are worried that water could be restricted.

NON-POTABLE COMMENTS SUMMARY

People want to see more done in the County to encourage non-potable water used for irrigation and open space. Overall, people had a good understanding of what non-potable water is and ways to use it.

GENERAL FEEDBACK RESULTS

The following quotations are representative of the responses collected from the mapping section that were not related to a specific location:

Water Conservation	**"I think people use water without regard for the fact that it is a scarce resource in our area.** **"Will water use be restricted at some point?"** **"Create ad campaigns that dissuade the residential proliferation of lawns/Kentucky Bluegrass. Campaigns to bolster xeriscaping."**
Non-Potable	**"Non-potable water, especially rainwater, should be used for irrigation whenever possible."** **"I would like to make use of all opportunities to use non-potable water in city and county parks and other locations as appropriate."**
General Comments	**"Very concerned about water usage outside the permitting process and [on] golf courses."** **"Thanks for the ability to position the location of wells and concerns about our county water supply."**

STRATEGY RATINGS

The next portion of the website asked the community to rate strategies for water conservation related to five different categories:

- Building/Landscaping
- Regionalization
- Land Use and Infrastructure
- Renewable Water
- Water Sources/Quality

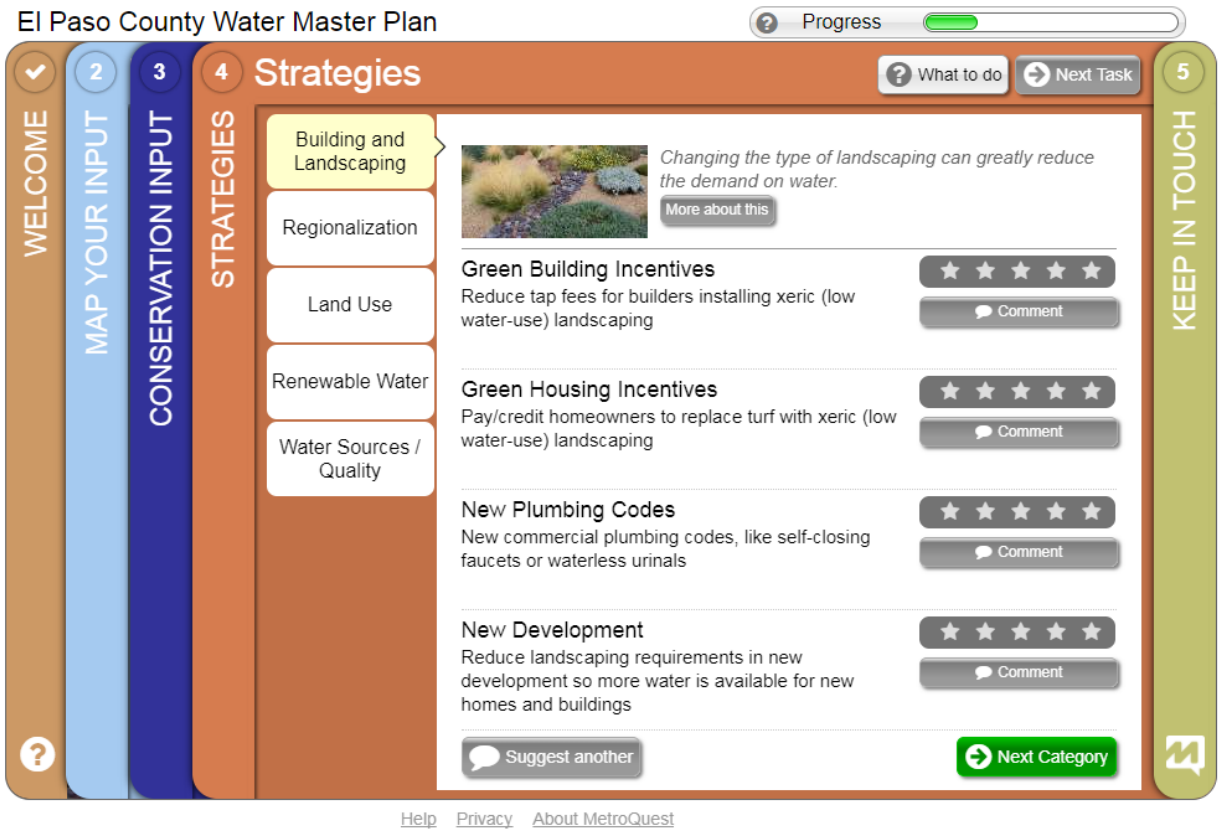


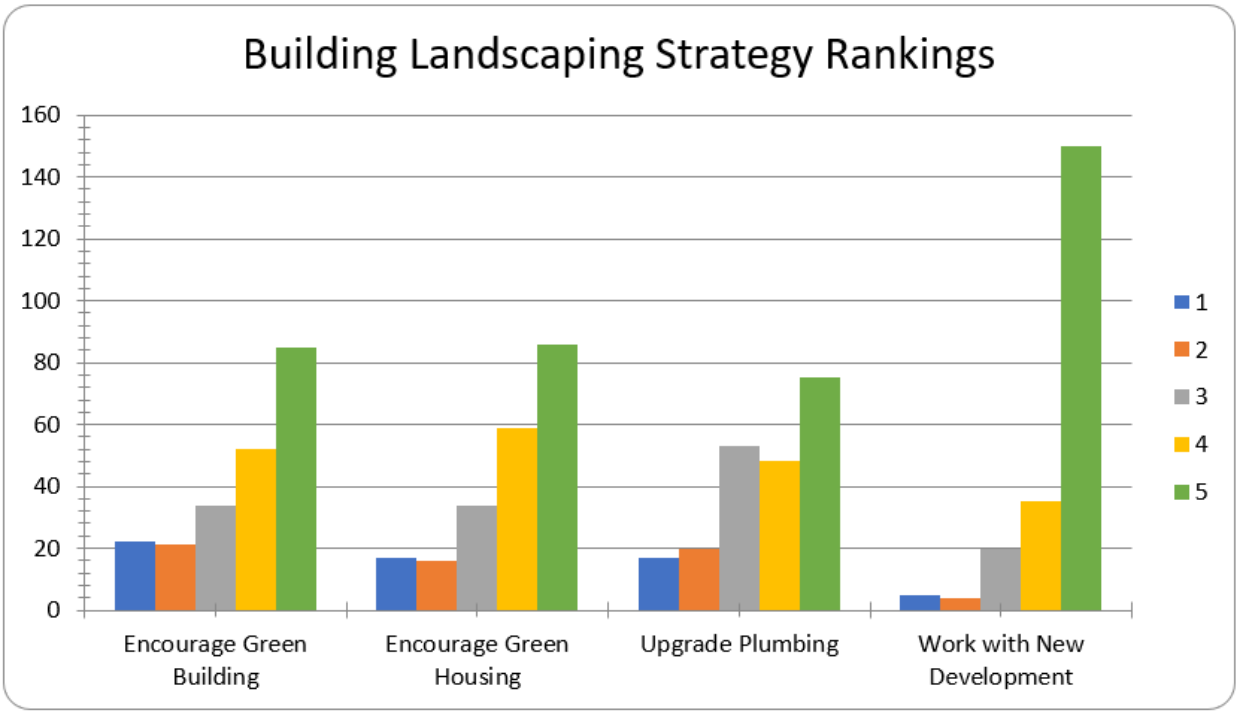
Figure 2-6: MetroQuest Screenshot

The charts in each subsection below summarize how the community responded. The charts are broken up by category. The left-hand axis of the chart shows how many respondents selected each strategy, while the right-hand axis shows how they ranked that strategy (1 being the lowest, 5 being the highest). For example, in the Building and Landscaping chart about 150 respondents selected "Work with New Development" as their highest-ranking strategy, while less than 20 selected it as their lowest.

BUILDING AND LANDSCAPING

It is most cost-effective to incorporate water efficiency measures with new construction, rather than retrofit existing buildings. In this section of the survey, the County is evaluating the level of public awareness and support for incorporating such measures. Changing the type of landscaping used in developments can greatly reduce the demand on water for green or new building/construction, as well as crediting homeowners who replace grass turf with xeric landscaping. New advancements in water efficient fixtures can also help reduce water demand. Respondents were asked to rank the following strategies:

- Green building incentives such as reducing tap fees for builders installing xeric landscaping
- Green housing incentives such as paying or crediting homeowners to replace turf with xeric landscaping
- New plumbing codes for fixtures such as self-closing faucets or waterless urinals
- New development standards such as reducing the landscaping requirements for new development



1 = Do not agree, 3 = No opinion, 5 = Strongly agree

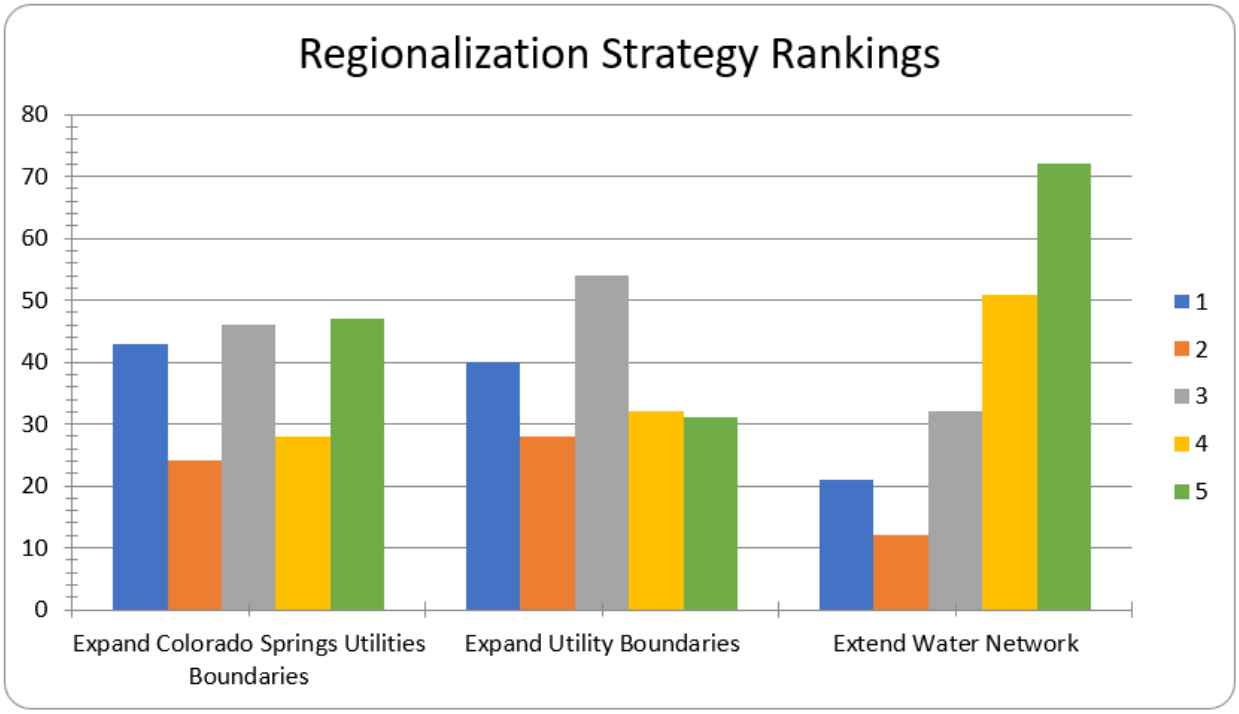
Figure 2-7: Building Landscaping Strategy Rankings

A large majority of respondents reacted positively to each of the strategies. Working with new development/developers overwhelmingly seen as a strategy vital for water conservation. Residents commented that education is a key component of this, and suggested xeric landscaping practices should be encouraged.

REGIONALIZATION

Sharing infrastructure and resources can help improve service by adding emergency connections for improved reliability, and offering a "savings of scale" on shared construction costs. In this question, respondents were asked to rank:

- Expanding Colorado Springs Utilities' service boundaries
- Expanding utility boundaries to encourage other water utilities to serve water users outside their service areas *(Note: Colorado Springs Utilities did not endorse the question about expanding Colorado Springs Utilities boundaries and any annexations or regional water services decisions are entirely up to the City of Colorado Springs and Colorado Springs Utilities.)*
- Extending the water network to encourage utilities to connect and cooperate on water supply and service

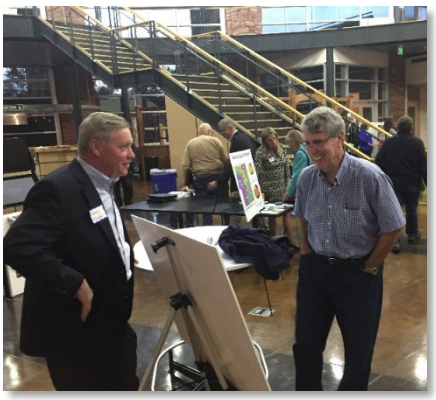


1 = Do not agree, 3 = No opinion, 5 = Strongly agree

Figure 2-8: Regionalization Strategy Rankings

Extended water network was identified as a high priority strategy for regionalization based on feedback. Representative comments state that water utility providers need to work together to create a more regionalized system.

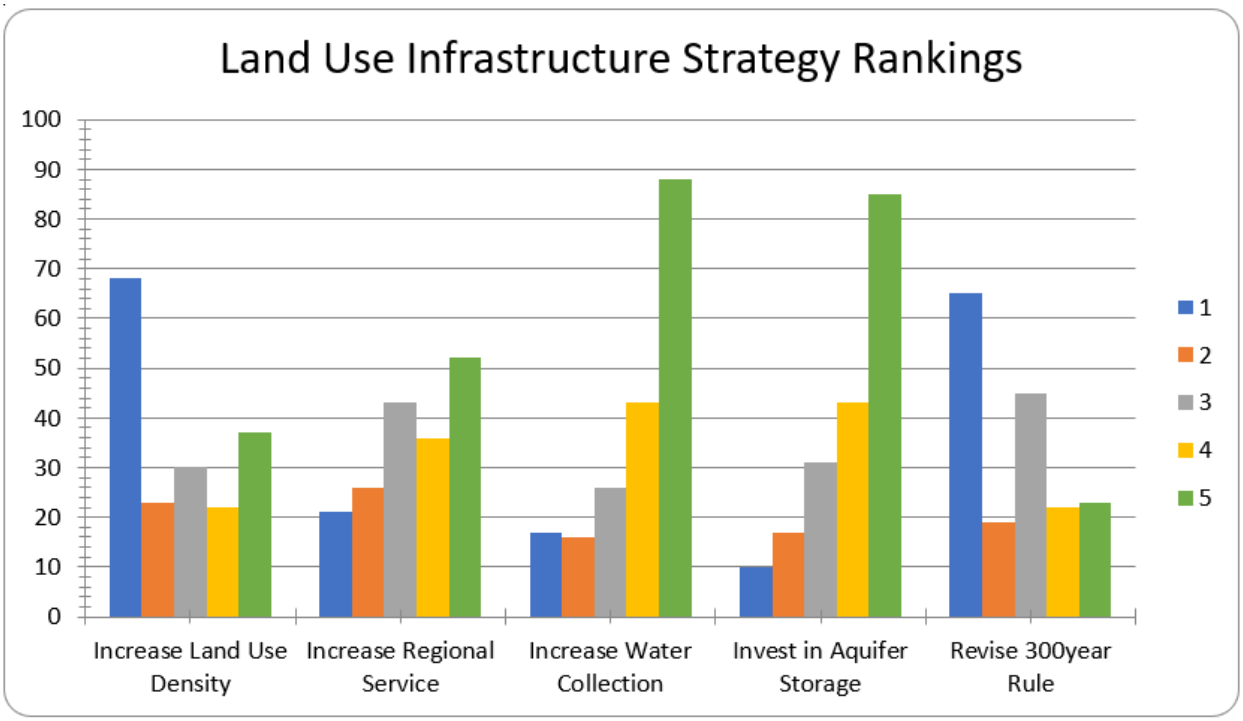
LAND USE INFRASTRUCTURE



Greater development densities can be more water efficient on a per unit basis, and water infrastructure serving such areas can be more cost-effective to build, operate, and maintain vs. low-density development, particularly with regional partnerships. Larger parcels of land generally require more water due to larger lawns and planting areas, as well as creating greater residential and commercial landscaping maintenance needs. Encouraging water providers to share regional waterlines, and save costs through upsizing waterlines vs. constructing several small ones. Adding reservoir storage and aquifer storage areas allows better management of renewable water supplies. Also, modifying the 300-year rule, could promote development of more renewable water supplies.

In this question, respondents were asked to rank the following as priorities for addressing water conservation:

- Increase land use density
- Increase regional services
- Increase water collection
- Invest in aquifer storage
- Revise the 300-year rule



1 = Do not agree, 3 = No opinion, 5 = Strongly agree

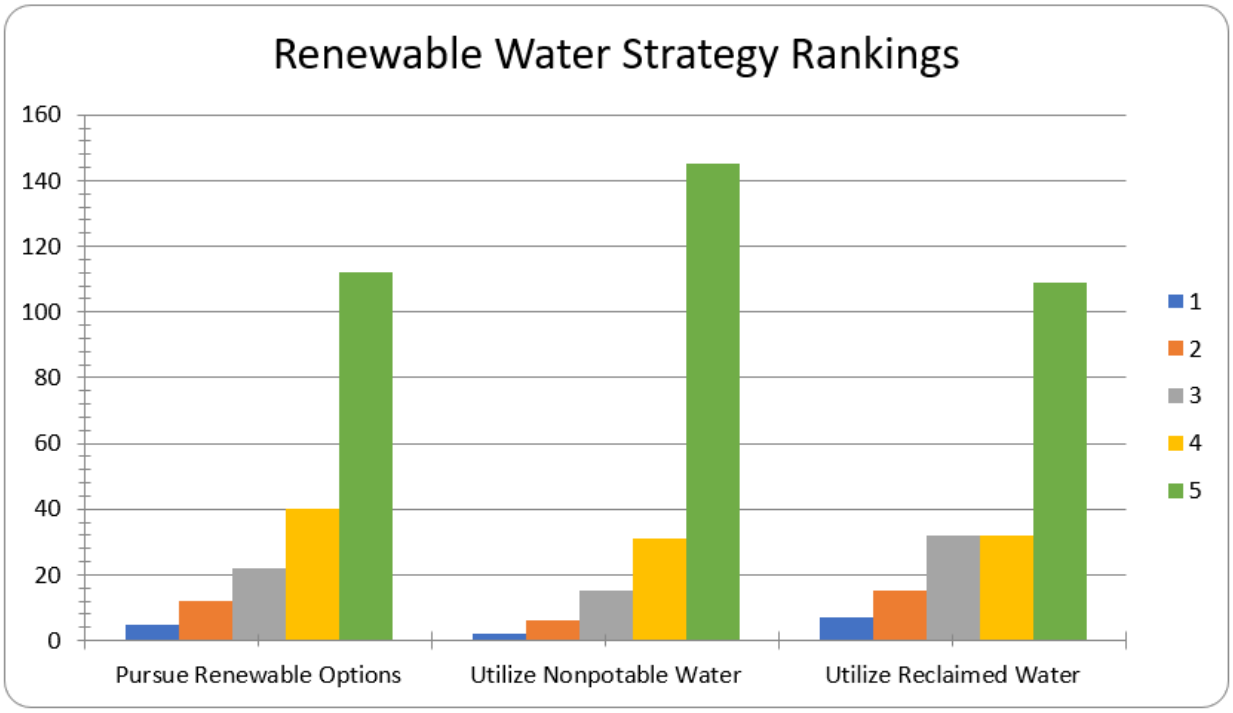
Figure 2-9: Land Use Infrastructure Strategy Rankings

The results for this section varied, with similar numbers of community members selecting increased water collection and investment in aquifer storage as the most important strategies. A good portion of the written comments reflected a hesitancy to support increased land use density, rendering it as the most objectionable strategy. Comments indicated that "more densely populated areas would just use more water," and "increased land use density typically implies apartments and high rises. These don't fit into the rural lifestyle of El Paso County and typically bring more traffic and crime." It is worth noting that there also appeared to be hesitancy in exploring the strategy of revising the County's 300-year rule.

RENEWABLE WATER

Using renewable options, non-potable water, and reclaimed water strategies allows for the conservation of water resources. In this question, respondents were asked to rank the following:

- Pursue renewable options
- Utilize non-potable water
- Utilize reclaimed water



1 = Do not agree, 3 = No opinion, 5 = Strongly agree

Figure 2-10: Renewable Water Strategy Rankings

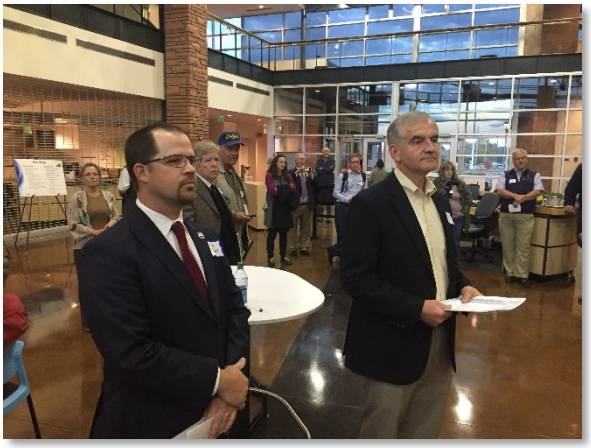
While all three strategies in this category were identified as very important, most of the written comments focused on the need for increased use of non-potable water.

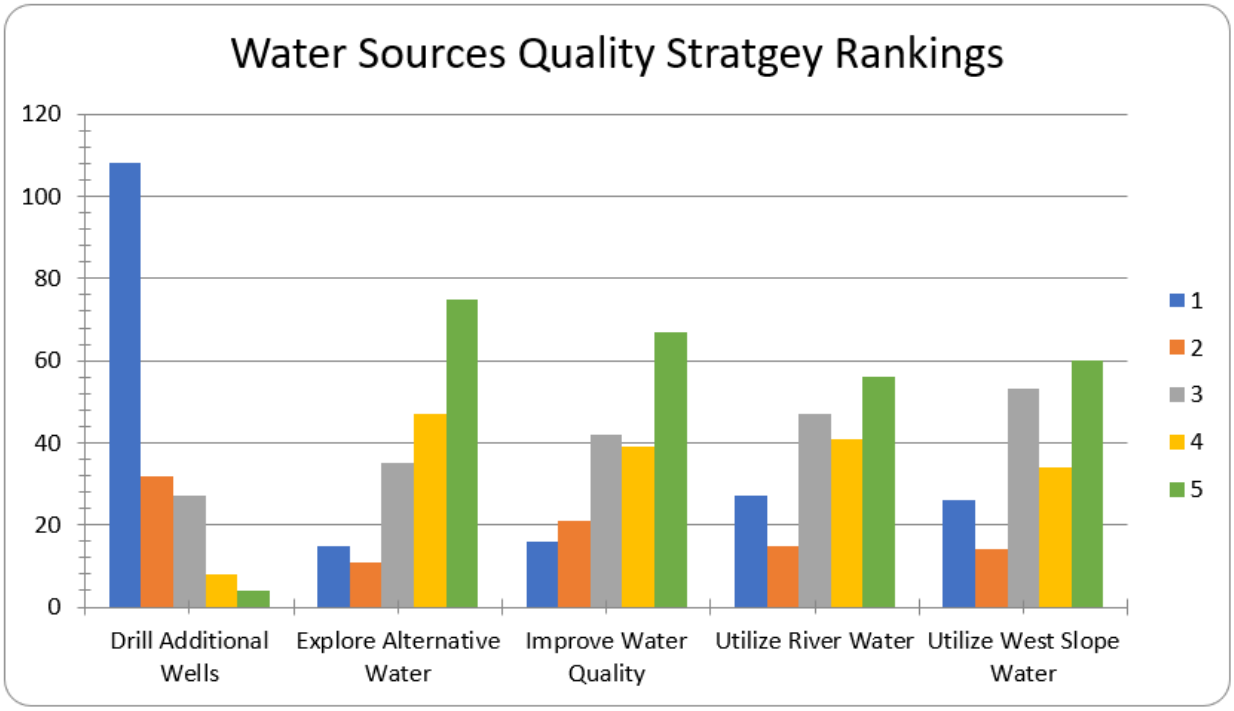
WATER RESOURCES QUALITY

Sustainability and water quality must be considered in planning for future water supply sources. This survey section gauges the public understanding of these issues, and general water supply preferences. Drilling additional wells in the Denver Basin to meet short-term demands is cost-effective, but not sustainable for meeting long-term water demands. A water provider's supply portfolio should generally include renewable supplies to be used during normal and high precipitation years. Water quality in some locations will require greater levels of treatment to meet drinking water standards. Additional surface water may need to be imported to El Paso County in the future for greater sustainability.

In this question, respondents were asked to rank the following:

- Drilling additional wells in the Denver Basin to meet future water demands
- Identify alternative water sources to the non-renewable Denver Basin
- Improve water quality
- Utilize river water
- Utilize West Slope water



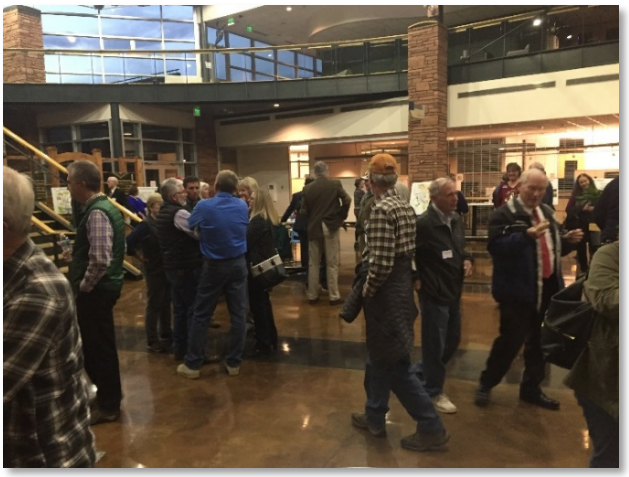


1 = Do not agree, 3 = No opinion, 5 = Strongly agree

Figure 2-11: Water Sources Quality Strategy Rankings

Feedback for this section was generally mixed; however, drilling additional wells stood out as an unacceptable solution to the community. Written comments included, "this should be a last resort, not a solution," "short-sighted," and "No. The aquifers are already shrinking. Stop drilling wells."

2.3 - PUBLIC MEETING



The County held a public open house meeting on October 25, 2018, to follow up on the web-based questionnaire used to reach several hundred people for input on their concerns and ideas about the overall water supply in the County, and to gather additional information from citizens and to answer questions about the WMP planning process.

2.4 - ANALYSIS

The overall feedback that we received from the MetroQuest website, the general public in attendance at the open house, and from the Steering Committee was very valuable. There was very positive feedback on developing renewable water in the County, and negative feedback regarding drilling more wells. The County also received positive feedback on extending water infrastructure, and on providing more water storage. The County received negative feedback on modifications to the County's 300-year

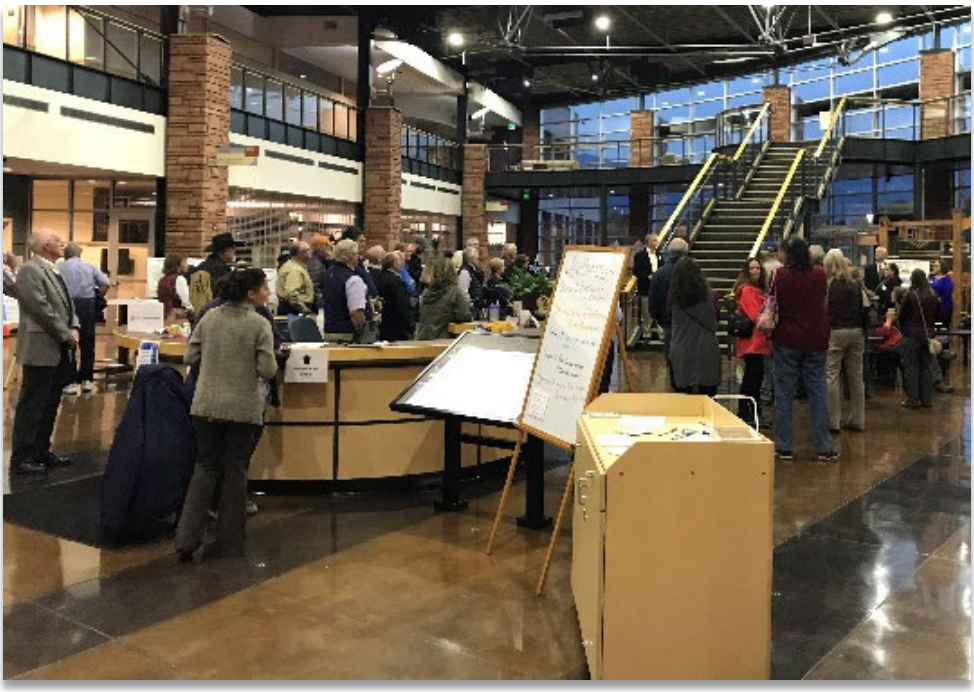
groundwater rule. Further discussion regarding the 300-year rule and renewable water is presented in Section 6 of this WMP.

The following includes typical, overall responses provided in the "Public Comments" section of the MetroQuest website.

- The public is highly aware that water supply is an important topic;
- Development should be slowed and/or stopped to curb the problem;
- Any new development should pay for solutions, not existing residents and owners; and
- It should also be noted that much of the public feedback typically associated density with more people, as opposed to accommodating a similar growth rate but in a more concentrated area. Many of the comments indicated that there was a lack of understanding as to how increased density could reduce water use.

RECOMMENDATIONS

- Consider the impact of new development on water quality and quantity in the approval process.
- Pursue educational campaigns to involve the community and provide a broader basis of understanding regarding water supplies and conservation strategies.
- Explore options for the use of non-potable water and further research into the use of reclaimed water and renewable options.
- Encourage water providers to pursue coordination efforts to align regional water conservation, quality, and infrastructure goals.



3 – Water Service Providers

3 - WATER SERVICE PROVIDERS

There are several different types of water providers within El Paso County. The differences between these water providers is discussed in this section, along with an outline of how each provider services different parts of the County. Although each entity type has governing regulations that are different, all water providers must follow and adhere to federal drinking water standards to provide their customers with water free from harmful chemicals and substances.

GOALS AND POLICIES

Goal 3.1 – Promote cooperation between water providers to save costs on infrastructure.

Policy 3.1.1 – Adequate planning and cooperation between water providers can effectively reduce the overall number of water main lines running through the County.

Goal 3.2 – Promote cooperation between water providers to save costs on treatment.

Policy 3.2.1 – Where possible, operating a treatment plant that provides potable water to different water districts will save on maintenance and operational costs.

Goal 3.3 – Promote cooperation between water providers to save costs on reuse.

Policy 3.3.1 – The ability to reuse wastewater flows will increase water supply and will help diversify a water provider's supply portfolio.

Goal 3.4 – Promote cooperation between water providers to save costs on storage.

Policy3.4.1 – The ability to store water in the off-peak demand periods (winter months) and use the stored water during high demand months (summer months) can be a great management asset to water providers.

Goal 3.5 – Encourage water providers to adapt to drought conditions.

Policy 3.5.1 – In an arid region with limited water supplies, these extreme weather conditions must be taken into account by water providers in order to deliver a reliable and safe water supply.

Goal 3.6 – Develop and maintain partnerships with water providers.

Policy 3.6.1 – The County should engage with water providers to share issues of mutual concern on a periodic basis and work collaboratively to address long-term water supply concerns.

Policy 3.6.2 – Water providers should work with neighboring entities to provide and plan for growth between their respective boundaries.

Goal 3.7 – Encourage the interconnection of infrastructure owned by water providers and projects that will have access to more than one water source, both to foster conjunctive use and to better accommodate water supply emergencies.

3.1 - COUNTY REGIONS

For purposes of this WMP, the County has been divided into eight geographical regions to better evaluate current and future supply vs. demand characteristics. The basis used in delineating these planning regions included the use of similar types of water sources by the entities located within each region and the presence of, or future potential for, regional opportunities (i.e., shared supplies or infrastructure). The eight planning regions are shown in Figure 3-1.

El Paso County

While most of the regions are singular areas, Region 4 is subdivided into three subareas. The three parts of Region 4 are distinguished by their separate designated groundwater basins that fall within the boundaries of the County: with Region 4a encompassing a portion of the Kiowa Basin, Region 4b containing the southernmost part of the Upper Big Sandy Basin, and Region 4c including a portion of the Upper Black Squirrel Creek Basin (UBSCB). Section 4 within this WMP provides more information regarding designated basins.

The use of water within designated groundwater basins, and the replacement of stream depletions resulting from the pumping of wells in a designated groundwater basin, is administered by the State of Colorado Division of Water Resources. The use of designated groundwater is further managed by groundwater management districts specific to each basin.

Grouping water providers by region helps the public, County staff, developers, Planning Commission members, and the Board of County Commissioners (BOCC) to better understand communities of water supply and demand and to better evaluate the issues specific to each region. It also identifies those groups of water providers that could potentially work together to better ensure adequate water supplies to meet future demands, see Figure 3-2.

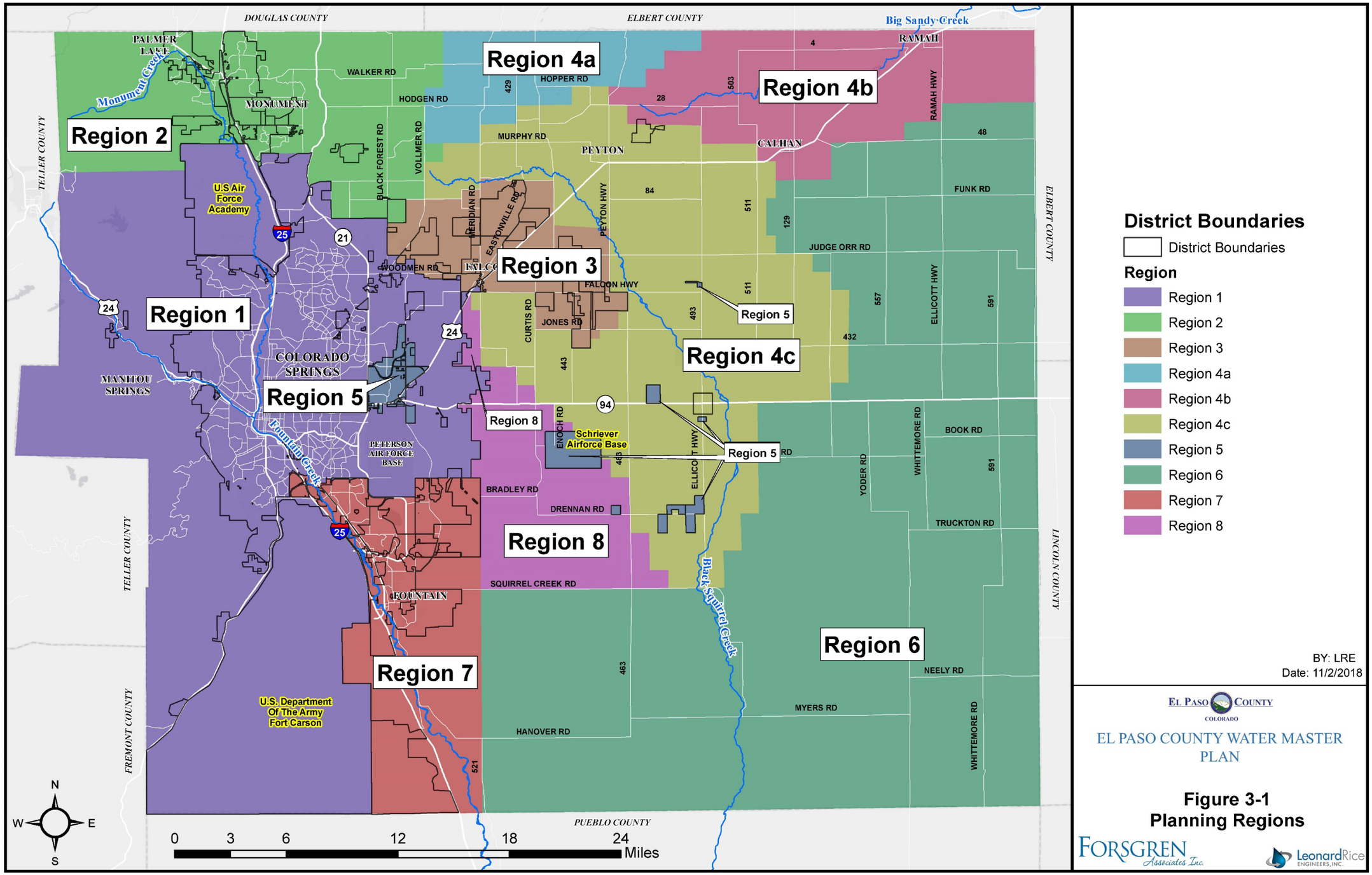
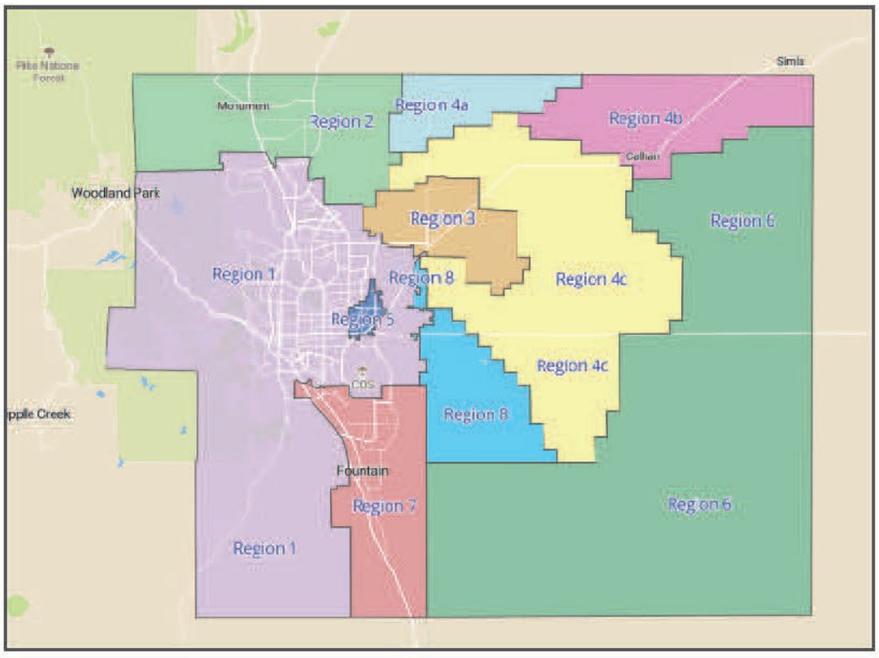

District Boundaries
District Boundaries
Region
Region 1
Region 2
Region 3
Region 4a
Region 4b
Region 4c
Region 5
Region 6
Region 7
Region 8
BY: LRE
Date: 11/2/2018
EL PASO COUNTY COLORADO
EL PASO COUNTY WATER MASTER PLAN
Figure 3-1
Planning Regions
FORSGREN Associates Inc.
LeonardRice ENGINEERS, INC.
DOUGLAS COUNTY
ELBERT COUNTY
TELLER COUNTY
FREMONT COUNTY
PUEBLO COUNTY
LINCOLN COUNTY
Region 1
Region 2
Region 3
Region 4a
Region 4b
Region 4c
Region 5
Region 6
Region 7
Region 8
PALMER LAKE
MONUMENT
COLORADO SPRINGS
MANITOU SPRINGS
PETERSON AIR FORCE BASE
FOUNTAIN
U.S Air Force Academy
Schriever Airforce Base
U.S. Department Of The Army Fort Carson
Monument Creek
Fountain Creek
Big Sandy Creek
Black Squirrel Creek
RAMAH
CALHAN
PEYTON
FALCON
WALKER RD
HODGEN RD
HOPPER RD
MURPHY RD
BLACK FOREST RD
VOLLMER RD
MERIDIAN RD
EASTONVILLE RD
PEYTON HWY
FUNK RD
JUDGE ORR RD
WOODMEN RD
FALCON HWY
CURTIS RD
JONES RD
ELLICOTT HWY
BOOK RD
ENOCH RD
BRADLEY RD
DRENNAN RD
YODER RD
WHITTEMORE RD
TRUCKTON RD
SQUIRREL CREEK RD
NEELY RD
MYERS RD
HANOVER RD
0 3 6 12 18 24 Miles
N
S
E
W

Figure 3.2 El Paso County Providers by Region



Region 1

Colorado Springs Utilities
- *Cascade MD No 1
- *Cheyenne Mtn Air Force Station
- *U.S. Air Force Academy
- *U.S. Dept Of The Army Fort Carson

Manitou Springs
Garden Valley
Cheyenne Mt. Estates
Rock Creek Mesa
Red Rock Valley WD
Turkey Canon Ranch WD
Overlook Mutual WC
Keeton Ranch Water
Rock Creek MD

Region 4a

No water providers in this region

Region 2

Woodmoor WSD
Donala WSD
Triview MD
Town Of Monument
Town Of Palmer Lake
Forest View Acres WD
Academy WSD
Walden WSD
Park Forest WD
Forest Lakes Md
Palmer Lake Mobile Home Ranch
Grandview MHP
Pioneer Lookout WD
Elephant Rock MHP
Peak Shadow
Pinon Pines MD

Region 3

Woodmen Hills MD
Meridian Service MD
Paint Brush Hills
Falcon Highlands MD
Sage WUA
Falcon Heights POA
Bobcat Meadows MD
4 Way Ranch MD1
Camelot
High Plains Ranch MD
Sterling Ranch MD 1-3
School District 49
Woodmen Hills

Region 4b

Town Of Calhan
Town Of Ramah

Region 4c

Prairie Estates
Peyton Pines
Silver Bonnett MHP
Ellicott Town Center MD
Rock Springs Ranch MD 1-3
Ellicott Elem Sr High School

Region 5

Cherokee Md
- *Schriever Air Force Base
- *Sunset Metro District
- *Ellicott Springs
- *East Glen Village
- *Curtis Heights

Region 6

Grand View MHP
Arrowhead MHP

Region 7

City Of Fountain
Security Wsd
Widefield Wsd
- *Rolling Hills Ranch MD

Stratmoor Hills WSD
Colorado Centre MD
Wigwam Mutual WC
Security MHP

Region 8

No water providers in this region

Legend

WD - Water District
WSD - Water & Sanitation District
MD - Municipal District
WC - Water Company
WUA - Water User's Association
POA - Property Owner's Association
MHP - Mobile Home Park

* Water provided by entity listed above

3.2 - MUNICIPALITIES

A municipality is a city, town, village, or government unit formed by a municipal charter from the State of Colorado. Municipalities normally have corporate statutes and the ability to self-govern. Municipalities have the ability to tax individuals and corporations through income tax, property tax, and corporate income tax. Many municipalities were created to address public services at a local level, often controlling streets, water supply, sanitation services, waste disposal, stormwater services, police and fire protection, and public transportation. El Paso County has eight municipalities that provide water to their residents: The City of Colorado Springs, City of Fountain, City of Manitou Springs, Town of Monument, Town of Palmer Lake, Town of Calhan, Town of Ramah, and the Town of Green Mountain Falls.

3.3 - SPECIAL DISTRICTS AND PRIVATE CORPORATIONS/WATER PROVIDERS

Special districts are separate from municipalities and act as self-governing special-purpose units under Colorado law. Special districts can be formed to provide a number of public services, and they often provide public water and sewer services. In some instances, a special district will provide only water or only sewer services. In other cases, a special district will provide only water or only sewer services. In other cases, special districts are responsible for maintaining and providing various public services like: construction and maintenance of parks, roads, water supply, and sewer services. Special districts providing multiple services are sometimes referred to as "metropolitan districts." In El Paso County, there are a number of special districts that are responsible for managing and providing various public services. Most districts are formed and operated pursuant to the Special District Act in Title 32, article 1 of the Colorado Revised Statutes.

Special districts and all other public water providers must follow all of the safe drinking water standards as found in the Colorado Department of Public Health and Environment (CDPHE), like other water providers. Corporations are normally privately owned by a group of individuals or entities.

4 – Water Supplies

4 - WATER SUPPLIES

Water rights can be obtained from different types of water supplies and sources. It is important to understand which of those rights are used where, and the regulations governing such use. This section will describe several different water supplies that are common in the County. The different types of water are: native renewable water, imported renewable water, designated basin groundwater, and Denver Basin groundwater.

GOALS AND POLICIES

Goal 4.1 – Develop an understanding of the differences in water supply sources, and any water quality issues within the County.

Policy 4.1.1 – Protect and enhance the quality of drinking water in the County.

Policy 4.1.2 – Encourage more systematic monitoring and reporting of water quality in individual wells.

Policy 4.1.3 – Support enhanced monitoring of sources of surface and tributary ground water in the County.

Policy 4.1.4 – The County should encourage that drinking water that meets Safe Drinking Water Act standards, as implemented by the State Department of Public Health and Environment, is a necessity for existing and future residents of the County.

Policy 4.1.5 – The County should work collaboratively with water providers, stormwater management agencies, federal agencies, and State agencies to ensure drinking water sources are protected from contamination and meet or exceed established standards.

Goal 4.2 – Support the efficient use of water supplies.

Policy 4.2.1 – Encourage the development of methods which allow more effective monitoring of the adjudicated water rights in the County.

Policy 4.2.2 – In order to reduce the dependency on non-renewable water supplies and accommodate new development, allow for the potential to import new and preferably renewable water supplies from outside the various planning areas, potentially including the Arkansas River.

GOALS AND POLICIES

Policy 4.2.3 – The County should support studies to determine options for how water providers can secure and deliver a more permanent, long-term water supply.

Goal 4.3 – Extend the economic life of the Denver Basin aquifers.

Policy 4.3.1 – Denver Basin Groundwater should be preserved as much as practical through water conservation and efficiency, extending the economic useful life.

Policy 4.3.2 – Encourage the systematic monitoring and careful administration of the bedrock aquifers to avoid over-allocation of groundwater.

Policy 4.3.3 – Incentivize the use of deeper Arapahoe and Laramie Fox Hills aquifers by central water providers, leaving the shallower aquifers for the more dispersed domestic well users.

Policy 4.3.4 – Encourage other monitoring programs and studies which could result in an increased understanding of the quality, quantity, and rate of depletion of available water supplies in the area, including but not limited to private wells.

Policy 4.3.5 – Encourage plans to recharge the Upper Black Squirrel Aquifer if such plans are based on sound science and can be demonstrated to not adversely impact water quality or water rights, with a preference for those plans which will maintain or enhance the available water supply at a regional scale.

Policy 4.3.6 – Encourage well monitoring through-out the County, with an emphasis on the Denver Basin aquifer fringe areas.

Goal 4.4 – Protect and enhance the quality, quantity and dependability of water supplies.

Policy 4.4.1 – The County should encourage and support State legislation that preserves and protects all drinking water sources in the County.

Goal 4.5 – Plan for water resources in a thoughtful way that recognizes the non-renewable nature of water resources in the area, accommodates existing and historical uses, and allows for sustainable, planned growth.

Policy 4.5.1 – Encourage continued collection and analysis of data for the purpose of better determining the extent and availability of groundwater in areas which do not overlie either the Denver Basin or a studied alluvial aquifer.

GOALS AND POLICIES

Goal 4.6 – Collaboration between the County, municipalities, water and wastewater service providers and regional and State agencies should be accomplished through Memoranda of Understanding or similar arrangements.

Policy 4.6.1 – Establishing MOUs should be explored to address shared source water protection, mutual concerns impacting water quality, and commitments to refer development applications to the public water provider for review and comment.

4.1 - NATIVE RENEWABLE WATER

Renewable water can be defined as the annual flow of surface rivers and recharge of aquifers generated from precipitation. Surface water supplies are significantly less in eastern Colorado than areas west of the Continental Divide as shown in the "snake" diagram in Figure 4-1, (with flow volumes in each major river proportional to line thickness).

El Paso County relies heavily on snowpack in the Arkansas River Basin for renewable water supplies. A small segment of northern El Paso County is part of the South Platte River Basin. Native renewable water that flows through El Paso County is mostly controlled with the use of a few reservoirs, dams and diversion structures to ensure supplies for the residents of the County and other downstream users. Most of the diversion structures on Fountain Creek and Monument Creek were built to divert water for irrigation purposes; however, some of those irrigation water rights are now being bought and converted to municipal rights by water providers to help meet growing demands.

Snowpack in the Sawatch and Mosquito Mountain ranges is collected in the Arkansas River, which flows from the headwaters near Leadville through Pueblo Reservoir, out of Colorado, into Kansas, and eventually to the Mississippi River. Major native streams that provide surface water to El Paso County include Fountain Creek, Monument Creek, and Beaver Creek. The main tributary of Fountain Creek is Monument Creek, with headwaters west of the Town of Palmer Lake, and then into Colorado Springs. Some individual water providers have water rights for several ditches within their service area, allowing for relatively small withdrawals and storage. Much of El Paso County's renewable water must be returned to surface streams for use by downstream water users.

Alluvial aquifers located along rivers within the County are continually replenished by stream flows. In general, alluvial aquifers are shallow geological formations comprised of unconsolidated material such as silt, clay, sand, and gravel. Alluvial aquifers are located along lakes and streams, or in floodplain areas, and they are recharged through annual precipitation. Water infiltrates from the river bed into the aquifers where wells are commonly located. In some areas, the aquifers are augmented by treated wastewater flows that are discharged into local streams. Areas along Fountain Creek and its tributaries have significant alluvial aquifers in direct connection with the Arkansas River Basin system. Because this groundwater is influenced by the surface stream, it is regulated by the prior appropriation system so as to not harm downstream senior water rights, similar to surface water rights.

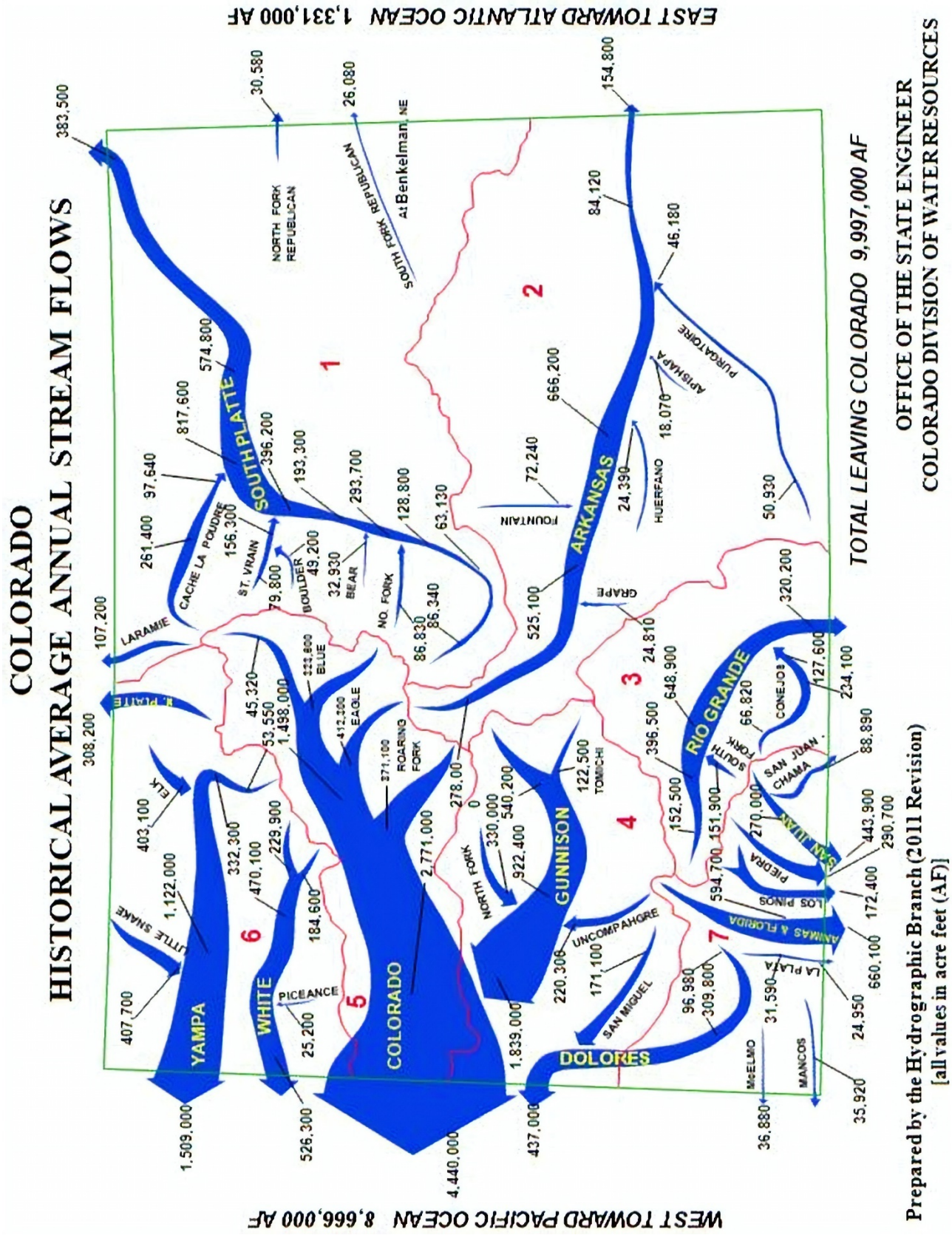


Figure 4-1: Snake Diagram- Historical Avg Annual Stream Flow

Figures 4-2 and 4-3 depict the different percentiles of each type of water being used in the County with Colorado Springs Utilities' renewable water supplies included and not included, respectively. The difference between the pie charts highlights the heavy dependence on nonrenewable groundwater in the unincorporated areas of the County. It is a goal of this WMP to promote a greater share of renewable water to sustainably meet water demands for future land uses.

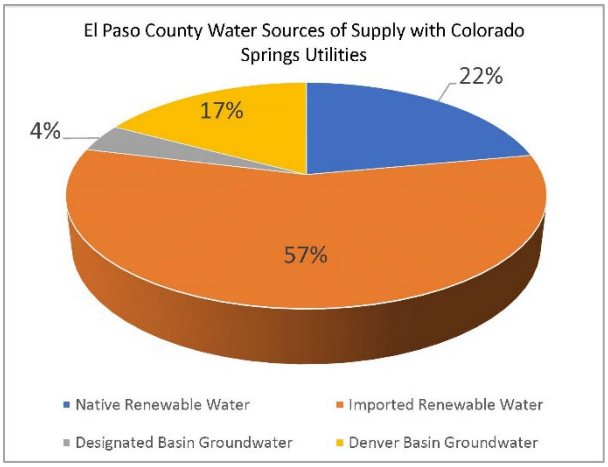


Figure 4-2

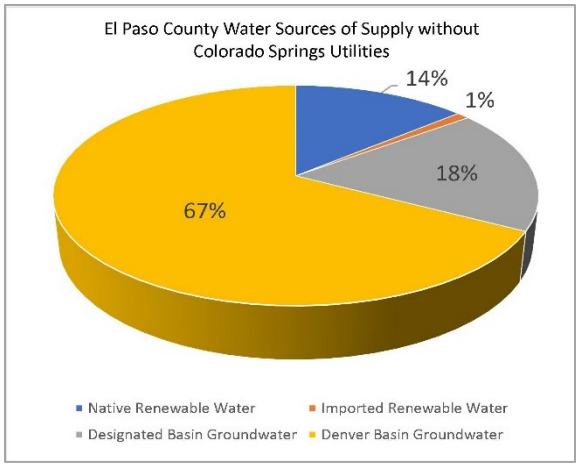


Figure 4-3

4.2 - IMPORTED RENEWABLE WATER

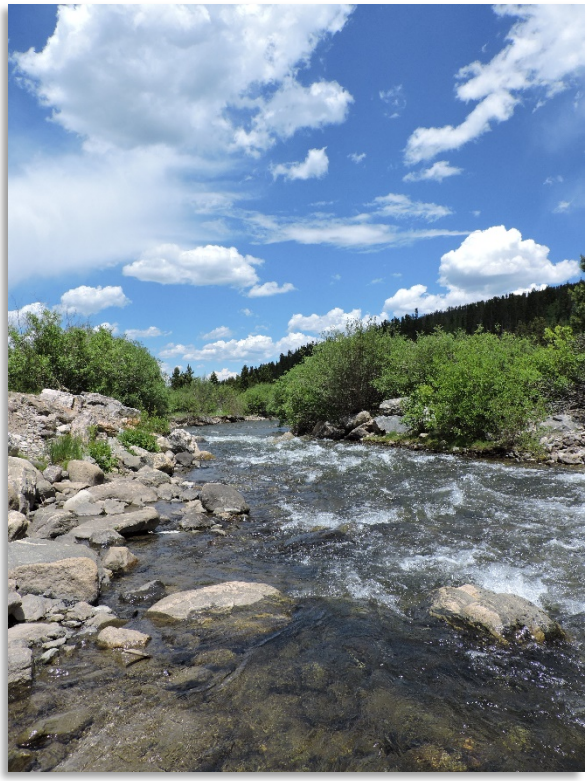
Renewable water supplies in El Paso County fluctuate depending on rainfall and snowpack in the Arkansas River Basin, as well as water that is imported to El Paso County from western Colorado rivers. County water providers, notably Colorado Springs Utilities, have taken innovative steps to assure water deliveries to supply their growing customer bases. But many water providers serving unincorporated areas of the County have little or no renewable water supplies. The County plans to promote more diversified water holding through modifying its land use process as described in this WMP.

WATER IMPORTED INTO THE COUNTY

Native and imported renewable water supplies from the Upper Arkansas River are stored in Pueblo Reservoir, located in Pueblo County. The Fountain Valley Authority Pipeline was completed in 1985, and allows water to be moved from Pueblo Reservoir to Colorado Springs. Following increased demands, and in anticipation of future population growth, Colorado Springs Utilities completed the Southern Delivery System in 2016 with the ultimate capacity to delivery 78 million gallons a day (MGD) of water to Colorado Springs, Fountain, Security, and Pueblo West. Other reservoirs are used to collect water supplies before being transported into the County using the South Slope Water, North Slope Water, and Northfield Systems around Pikes Peak as well.

WATER IMPORTED FROM WEST OF THE CONTINENTAL DIVIDE

One of the largest diversions of water into the Arkansas River is from the Fryingpan River, the headwaters of which are located on the west side of the Continental Divide. The Fryingpan-Arkansas transbasin diversion project diverts approximately 58,000-acre feet of water annually from the Fryingpan River Basin into the Arkansas River Basin. Other west slope water supply



Blue River

diversions to El Paso County include Colorado Springs Utilities, Blue River and Homestake systems.

4.3 - DESIGNATED BASIN GROUNDWATER

Sources of renewable water in El Paso County are groundwater aquifers located within designated groundwater basins (DGB). There are eight DGBs in eastern Colorado established by the Colorado Ground Water Commission (GWC). These DGBs are considered to have little to no connection with streams and rely completely on natural infiltration for replenishment. DGBs that supply groundwater to El Paso County residents include the Upper Black Squirrel Creek DGB, Kiowa Bijou DGB, and the Upper Big Sandy Creek DGB. Figure 4-4 shows the boundaries of the designated basins within the County.

Designated basins are geographical areas of the State established by the GWC in accordance with Colorado Revised Statute (CRS) Section 37-90-106. Designated basins represent "groundwater areas not adjacent to a continuously flowing natural stream, where groundwater has been the principal water supply for at least fifteen years preceding the designation of the groundwater basin." (*Water Education Colorado, Citizen's Guide to Colorado Water Law. 2004,* www.watereducationcolorado.org).

4.4 - DENVER BASIN GROUNDWATER

In most cases in the County, property rights include water rights to either groundwater or surface water. By law, every new well in the State that pumps groundwater to the surface must have a decreed water right, an augmentation plan, and a well permit. The Colorado Water Court system determines water allocation and ownership. A person may obtain a water decree for their water rights on an individual basis by filing an application in Water Court. In order to obtain a water decree, one normally has to hire a water resource engineer and a water attorney to apply for a decree. Additional water law topics can be found within the *Citizen's Guide to Water Law*.

An individual or entity must file an application for approval of a well permit with the State Engineer's Office where the State engineering staff determine the theoretical amount of water available to be pumped per year based on a pumping rate that will last for an estimated 100-years and analyzes the potential for injury to other existing water rights under strict statutory guidelines.

Groundwater wells can be categorized as either exempt or non-exempt. Exempt wells are those wells that are not administered under the prior appropriation system and in most cases exempt well permits limit the pumping rate to no more than 15 gallons per minute. Non-exempt wells are governed by the priority system, generally have pumping rates and annual withdrawals

in excess of exempt wells, and operate in compliance with a Water Court decreed and approved augmentation plan. This topic is further addressed in the Section 5.7.

The Denver Basin aquifers are the primary water supply sources in El Paso County. These aquifers are considered to be nonrenewable because they recharge over long periods of time (centuries) and are regulated by State laws regarding their withdrawal pumping rates and type of use. The four primary aquifers in the Denver Basin system are the Dawson, Denver, Arapahoe, and Laramie/Fox Hills. Each of these aquifers underlies a portion of El Paso County and individual lot owners, and non-Colorado Springs Utilities water providers heavily rely upon them to supply potable water to their customers. The Denver Basin aquifers provide a great source of water supply because they are protected from surface contamination and are drought-proof; however, the groundwater levels are declining while the costs to pump water from the basins continue to increase. See Figure 4-5 regarding the overall geographical areas of the Denver Basin aquifers. See Figure 4-6 for a close-up view of El Paso County.

Table 4-1 shows the average depth from the surface to reach each aquifer, the average thickness of the aquifer, and the average saturated thickness of the material. The saturated thickness is the thickness of the aquifer in which all pore space is filled with water.

Denver Basin Aquifers			
	Average Depth (Ft)	Average Thickness (Ft)	Average Saturated Thickness (Ft)
Dawson	0-120	0-400	0-400
Denver	0-1300	800-1000	100-350
Arapahoe	0-2200	400-700	0-400
Laramie-Fox Hills	0-3000	350	0-200

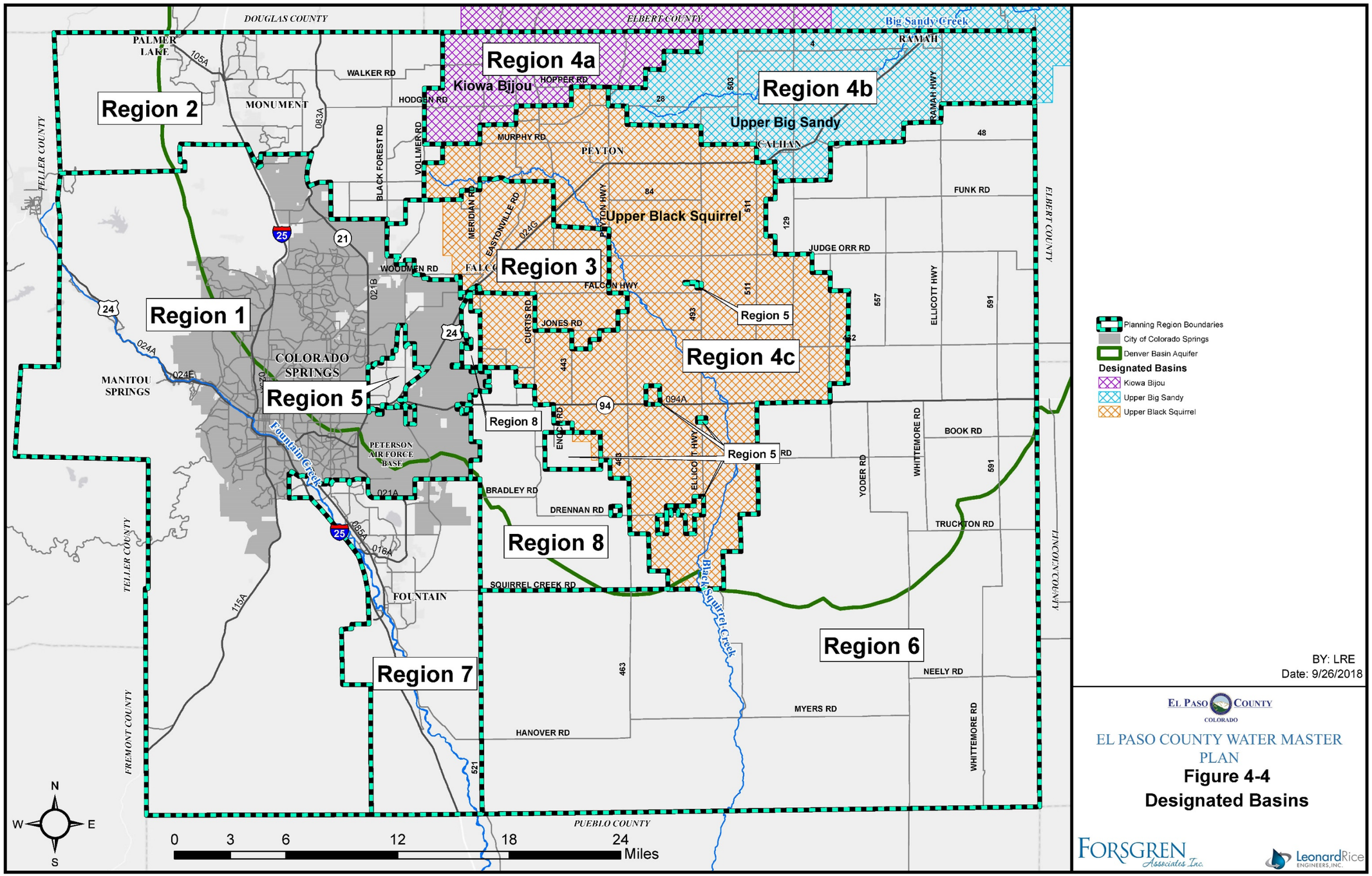
Table 4.1: Denver Basin Aquifers

For a schematic cross-section of a typical bedrock aquifer, see Figure 4-7. This schematic illustrates typical confined aquifer levels, water tables, and different well depths within the Denver Basin aquifers system. Each aquifer in the Denver Basin is surrounded on the top and bottom of its saturated depth by a confining layer of impervious material that generally restricts water from moving from one aquifer to another.

Figure 4-8, *Cascading Reduction in Well Yield* from Water Education Colorado illustrates the need for more wells as aquifer production levels decline over a 100-year life span. In this theoretical example, maintaining a pumping rate of 30-acre feet per year will require an ever-increasing number of wells over time. The costs continue to spiral and at some point, it will no longer be economically feasible to pump water from this site.

Water providers typically draw surface water from a reservoir, lake or river; pump groundwater from bedrock or alluvial wells; or supply a combination of surface water and groundwater that can vary seasonally.

Arkansas River near Salida, CO

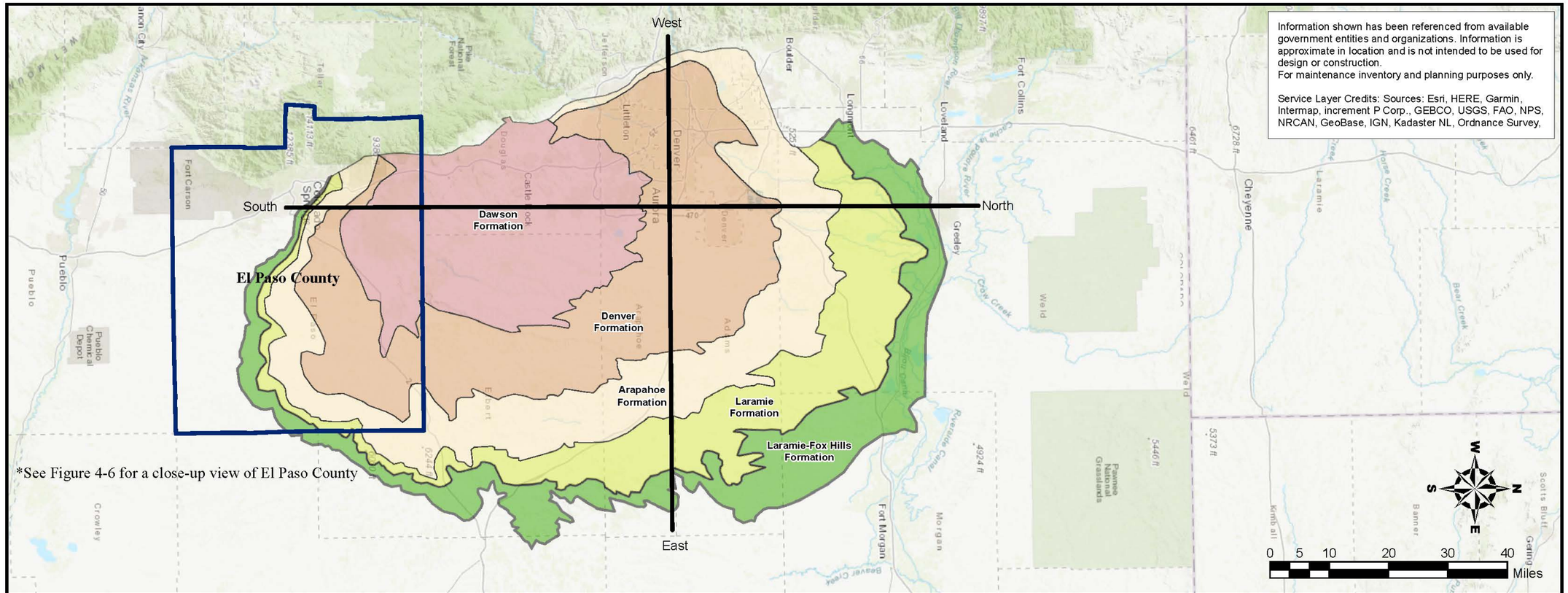


EL PASO COUNTY COLORADO

EL PASO COUNTY WATER MASTER PLAN

Figure 4-4
Designated Basins

FORSGREN Associates Inc.
LeonardRice ENGINEERS, INC.



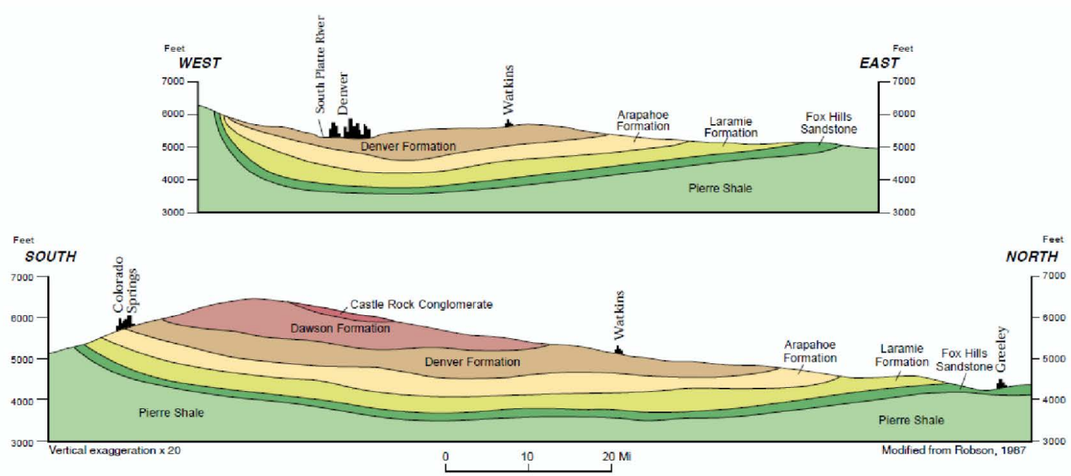


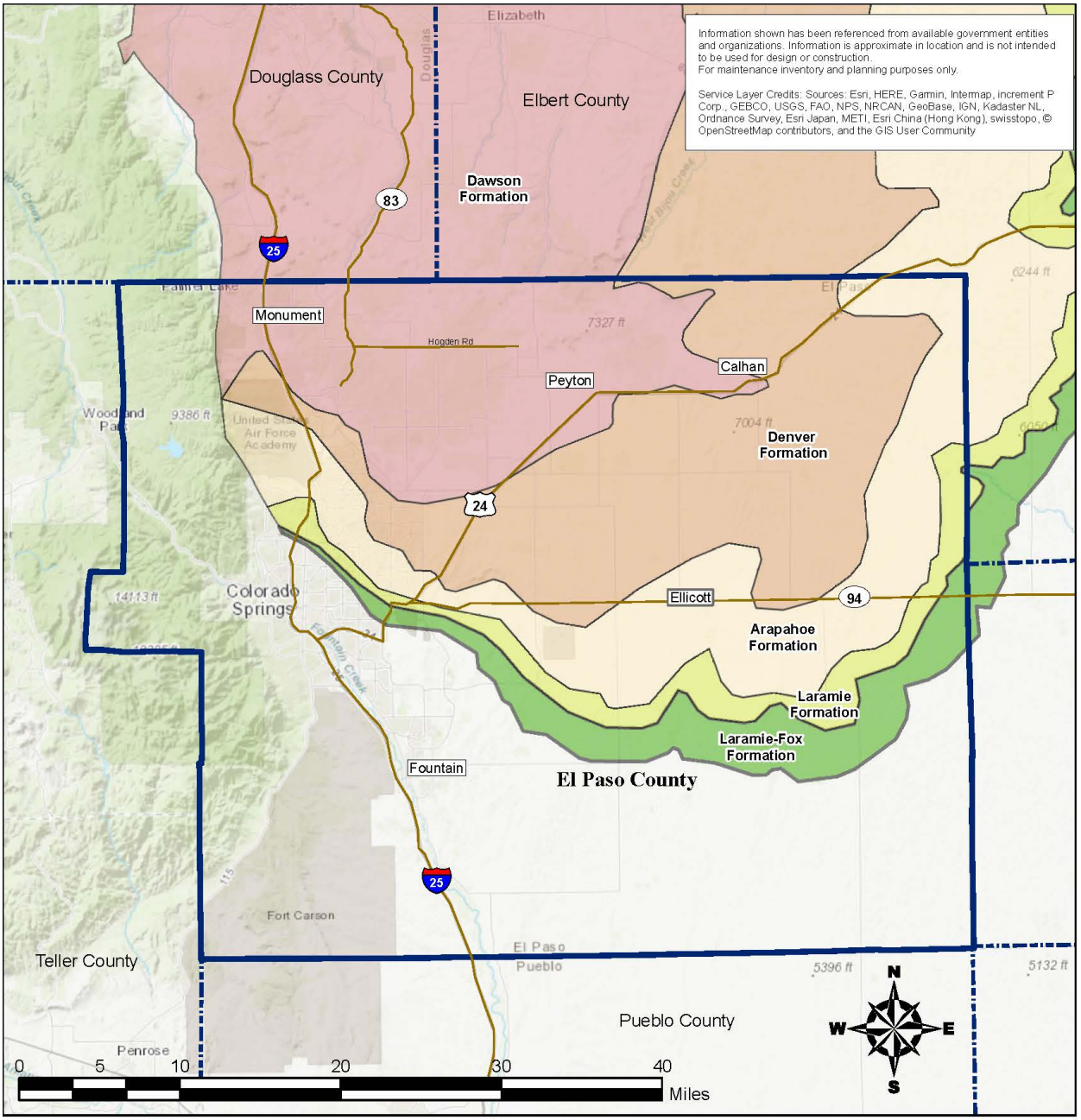
Image courtesy of Colorado Geological Survey

LEGEND
- El Paso County
- Dawson Formation
- Denver Formation
- Arapahoe Formation
- Laramie Formation
- Laramie-Fox Hills Formation

EL PASO COUNTY
WATER MASTER PLAN
FIGURE 4-5
DENVER BASIN AQUIFER
PLAN & SECTION

FORSGREN Associates Inc.

Map by: N. Patterson
Forsgren Associates Inc.
Date: 10/30/2018
Document Name: Map 3-1_Denver_Basin_Aquifer



LEGEND

- El Paso County
- Dawson Formation
- Denver Formation
- Arapahoe Formation
- Laramie Formation
- Laramie-Fox Hills Formation

Image courtesy of Colorado Geological Survey

EL PASO COUNTY
WATER MASTER PLAN
FIGURE 4-6
DENVER BASIN AQUIFER WITHIN EL PASO COUNTY

FORSGREN Associates Inc.

Map by: E. WOODWARD
Forsgren Associates Inc.
Date: 10/30/2018
Document Name: El Paso County-Denver Basin Aquifer

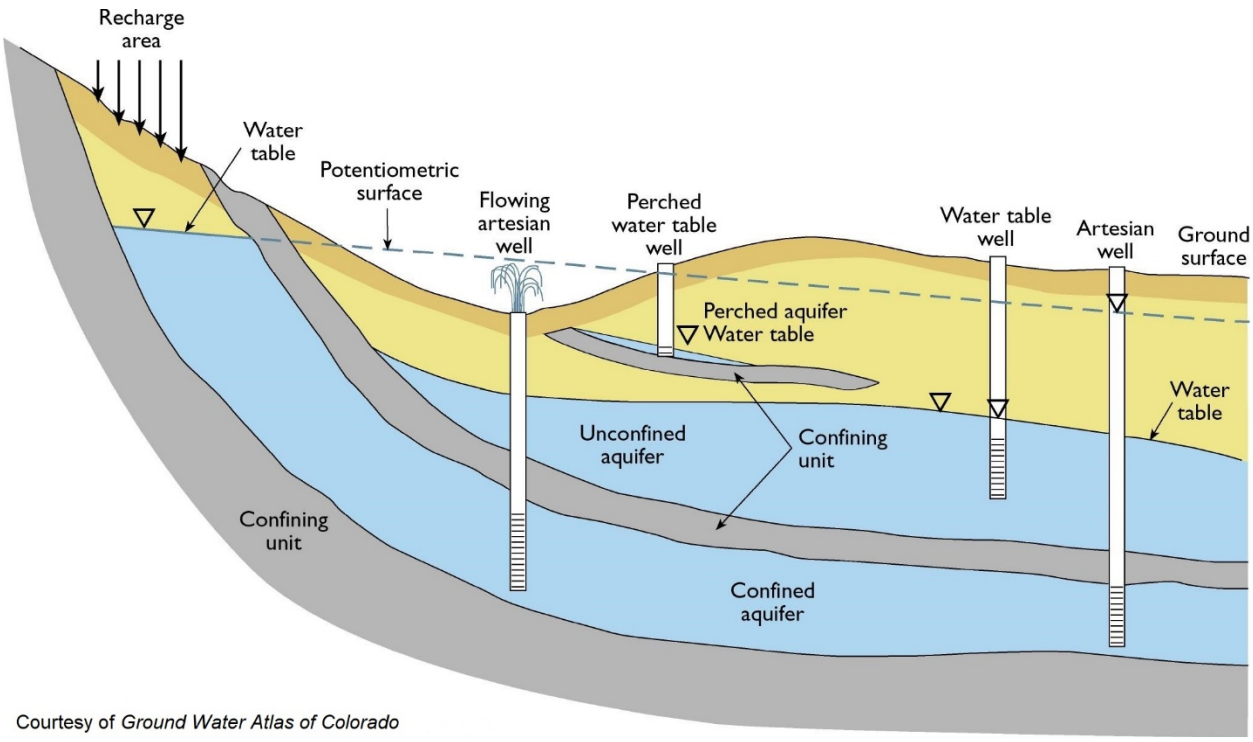


Figure 4-7: Aquifer Cross Section

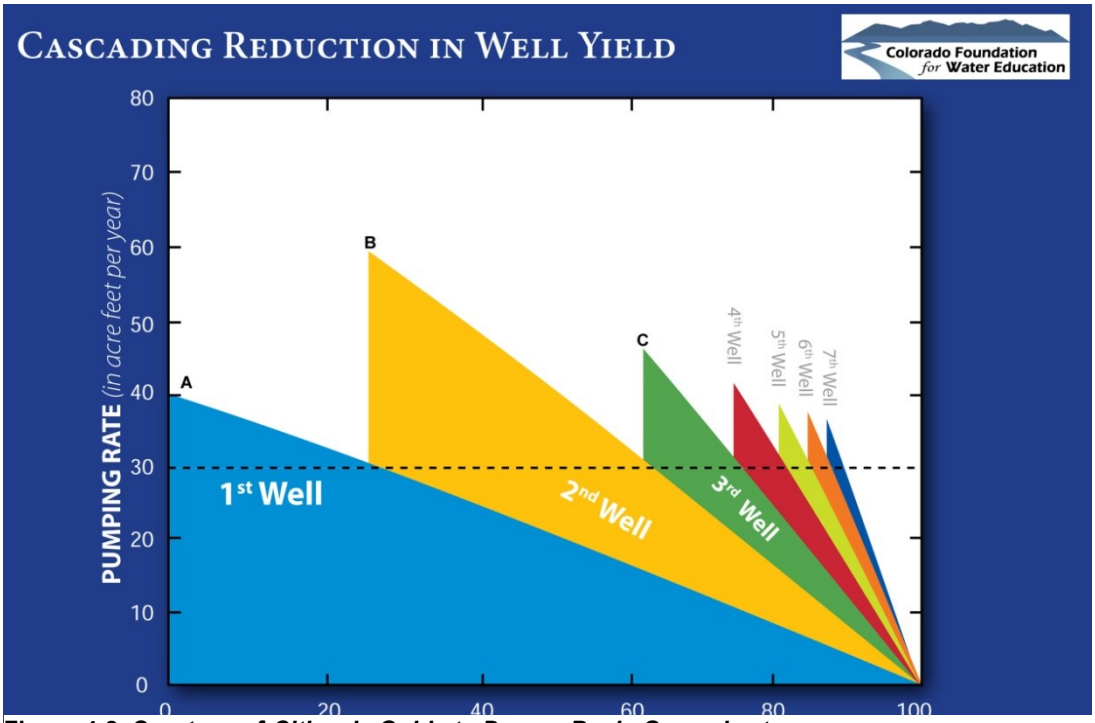


Figure 4-8- Courtesy of *Citizen's Guide to Denver Basin Groundwater*

4.5 - Water Quality

Groundwater

Most water providers in El Paso County provide their customers with Denver Basin groundwater from bedrock aquifers; however, Monument area water providers have some alluvial wells along Monument Creek, and Fountain area water providers have alluvial wells along Fountain Creek and in the Widefield Aquifer (described in Section 6). Also, Cherokee Metropolitan District obtains most of its supply from alluvial wells in the Upper Black Squirrel Creek (UBSC) Basin, a designated basin.

Figure 4-9: Well Head and Minor Treatment Facility

Typically, a well is drilled and groundwater is pumped to a well house, where the water can be filtered. The water is then typically disinfected, usually with chlorine or a variant, before entering the potable water distribution system for consumption. See Figure 4-9 for a photo of a typical well head and minor treatment facility.

Groundwater quality issues occurring in El Paso County include:

- Water from Denver Basin aquifers must often be treated for removal of iron, manganese, or both. These constituents are on the EPA's list of secondary drinking water standards, meaning that they are aesthetic water qualities and not health-related standards. Water from the Laramie-Fox Hills aquifer specifically will often have concerns with the aesthetic qualities of taste and odor.
- With regard to the EPA's safe drinking water standards, the primary standards related to health concerns, some Denver Basin wells can develop elevated levels of radionuclides such as radium. It occurs due to mild radioactivity in the soils surrounding some wells and is very site-specific. This concern can often be addressed by blending with water from other wells or sources prior to distribution but, in some cases, ion exchange or another form of treatment may be required.
- In recent years, water providers pumping alluvial groundwater from the Widefield Aquifer have either had to use alternate sources or provide added treatment. Emerging contaminants known as perfluorinated compounds (PFCs), have been detected in water from the aquifer. In 2016, the EPA reduced the health advisory level for PFCs from 350 parts per trillion (ppt) to 70 ppt. This raised immediate concerns as PFCs are linked to low birth weight, a number of cancers, and increased risk of heart disease. Water providers that will continue using water from the aquifer are adding ion exchange or carbon contactors to meet the new advisory levels and the State is evaluating whether to establish a PFC standard.
- Nitrate often exceeds the primary drinking water standards in agricultural areas, such as across the designated basins, due to extended use of fertilizers. It may also be addressed

by blending with other sources, but may require additional treatment where blending with lower nitrate sources is not possible.

- As part of its indirect potable reuse strategy, Cherokee Metropolitan District (CMD) recharges reclaimed water at the southern end of the Upper Black Squirrel Creek Basin (UBSC) aquifer (described in Section 6). Their UBSC well water is fairly high in total dissolved solids (TDS), listed as a secondary drinking water standard. TDS becomes more concentrated through normal municipal use, so CMD now plans to add reverse osmosis treatment of their reclaimed water before it is used for aquifer recharge.
- Alluvial groundwater quality is regularly sampled and tested to determine if it is influenced by surface water. When it is found to have such an influence, the state health department reclassifies the water source and it must then be treated similarly to surface water. El Paso County has been a primary supporter in a multiphase groundwater study of the Upper Black Squirrel Creek aquifer through ongoing water quality studies, to particularly address nutrient concentrations. Previous results identified nutrients as the primary constituent of concern, and the objective of the Phase 3 study is to assess potential changes in the groundwater quality of the basin since 2013. This project will provide information on changes in groundwater nitrate concentrations over time and identify potential nitrate sources.

SURFACE WATER

The basic purification of surface water starts by removing larger sediment particles from the water, then filtering the water to remove any additional smaller particles through a screening process, followed by disinfecting - typically adding chlorine to the water to kill any bacteria and micro-organisms. The treated water is then introduced into the water distribution system (see Figure 4-10 for a graphical representation of a typical treatment process). There can be site-specific variations to this typical treatment scheme to address particular contaminants in the water.

In general, as surface water supplies must be delivered from longer distances at higher costs, water sources that were previously considered too costly to treat may become more cost-effective. Additionally, more advanced treatments may be needed as a better understanding is obtained of potential health effects of a broad group of trace contaminants that are now measurable (commonly referred to as “contaminants of emerging concern”).

RECOMMENDATIONS

There is a general need to use more renewable water in El Paso County, and to optimize its use. Ideally, renewable water would be used in times of wet and average precipitation, reserving nonrenewable groundwater supplies during drought conditions when renewable water flows are low. This master plan recommends the County help promote effective efforts by water providers and developers to deliver additional renewable water supplies into the County.

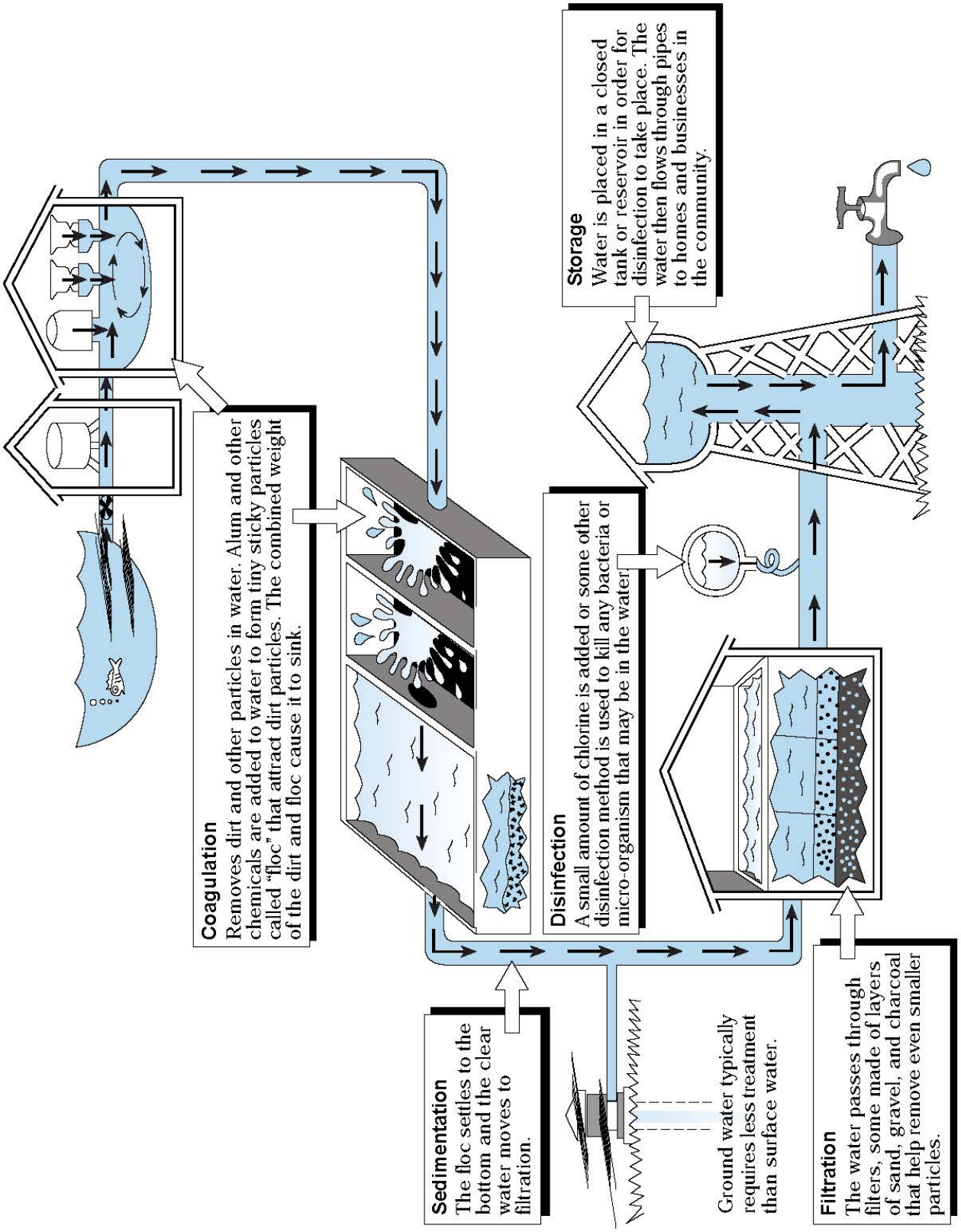


Figure 4-10: Typical Treatment Process

5 – Projected Water Supply Needs

5 - PROJECTED WATER SUPPLY NEEDS

Water providers throughout El Paso County will be charged with securing enough water long-term to provide for the County's growing population. This section shows current overall water supply and water demand numbers by County region, and identifies where growth is likely to occur within each regional area. This section also shows how current water supplies compare to water demands in the years 2040 and 2060. Six goals were identified related to projecting the water supply needs for El Paso County citizens.

GOALS AND POLICIES

Goal 5.1 – Identify the potential water supply gap at projected full development build-out (2060).

Policy 5.1.1 – Consistent with the State Water Plan, the County will work with water providers to address and implement methods to close the gap between water demand and water supply projected by the year 2060.

Goal 5.2 – Identify regional opportunities and barriers to addressing the water supply gap at full development build-out (2060).

Policy 5.2.1 – The County will assist water providers, to the greatest extent practicable, in any future efforts to prepare demand forecasts by sharing information about population growth and new industries or developments in the County that will increase the demand for water.

Policy 5.2.2 – Recognize the water supply challenges and limitations inherent in each of the regional planning areas, with particular emphasis placed on Regional Planning Area 3 (Falcon), as a result of current reliance on non-renewable Denver Basin wells and the renewable, but limited and over-appropriated, Upper Black Squirrel alluvium.

Policy 5.2.3 – Periodically update the County land use master plan to better identify and plan for areas of future growth, in a manner that is consistent with this WMP, as may be amended from time to time.

Policy 5.2.4 – Consider potential growth near existing or proposed water supply projects that would allow shared infrastructure costs

GOALS AND POLICIES

Goal 5.3 – Reduce overall water consumption per end user in the County.

Policy 5.3.1 – Evaluate cluster development projects to determine if water savings could occur.

Policy 5.3.2 – Promote water conscious developments through improved land-use policies.

Goal 5.4 – Promote the long-term use of renewable water.

Goal 5.5 – Identify any water supply issues early on in the land development process.

Policy 5.5.1 – Discourage individual wells for new subdivisions with 2.5 acre or larger average lot sizes, especially in the near-surface aquifers, when there is a reasonable opportunity to connect to an existing central system, alternatively, or construct a new central waters supply system when the economies of scale to do so can be achieved.

Goal 5.6 – Protect property rights.

To achieve these Goals, the project team collected and analyzed water supply and demand information from water providers throughout El Paso County. The team then compiled the information to provide a framework for future water needs and opportunities. El Paso County was divided into eight regions (as described in Section 3) to facilitate identifying regional opportunities and barriers in meeting projected demands at build-out. The project team used three planning horizons to evaluate water supply needs in this section: current, the year 2040, and projected build-out. For purposes of this WMP, build-out is assumed to occur in the year 2060.

This WMP compares the 2040 and build-out (2060) demands to the water supplies that are currently available and connected to municipal water supply systems in El Paso County. Many of the County's water providers identified the water supplies that they are in the process of developing, or intend to develop, in response to a web-based water provider survey (described below). Those future supplies cannot be counted on to meet future needs at this point, because their yield and reliability has not been realized yet.

The project team used a web-based survey to collect water supply and demand information from County water service providers. The Water Provider Survey was distributed to 79 entities in all: 69 water providers, 5 ditch companies, and 5 augmentation associations. Thirty-three entities responded, including 30 water providers and 3 ditch companies. The response rate, based on the number of entities that received the survey, was approximately 43%; however, those responding to the survey serve approximately 93% of El Paso County's population.

Where information from the water service providers was incomplete, the data was supplemented by a variety of other sources. Those sources included: water resource reports submitted to the County supporting land development projects; previously reported information (e.g., PPRWA reports or the Water Report developed by the former El Paso County Water Authority); water supply and demand records from the Colorado Division of Water Resources (DWR); and supplemental information provided by County staff. For areas of the County located outside of a water provider service area, the project team estimated water supply and demand information based on an analysis of the number and types of wells in the area.

5.1 - WATER DEMANDS

To quantify water demands throughout El Paso County, the project team considered the total demands satisfied by water service providers, and the estimated demands for exempt and non-exempt wells (defined in Section 4) located outside of any centralized water service area. For purposes of this WMP, "water demands" are the sum of all demands including potable treated water, non-potable treated water and non-potable reuse (e.g., reclaimed water). It is appropriate to consider each of these types of water when quantifying the water demands for the County because each use must be satisfied from a limited portfolio of available water supplies.

Where water providers did not show demand information, the project team assumed a water demand of 0.33 AF/year per active service connection. The team assumed a water demand of 0.25 AF/year per active service connection for mobile home parks. Both assumptions are based on prior water planning experience.

For exempt and non-exempt wells located outside of a centralized water service area, the project team estimated water demand based on the following assumptions, based on prior experience:

- Each well is used to supply the water demands for one single family dwelling.
- There are three individuals per single family dwelling.
- Daily water usage is 190 gallons per capita per day (gpcd). This rate is consistent with estimated water usage for single-family, low density housing on lots ranging in size from ¼ to ½ acre.

Based on these assumptions, the water demand per well was estimated to be 0.64 AF/year.

5.1.1 - Current Water Demands

An acre-foot of water is enough to serve two to four single-family units for one year. The total current (2018) water demand in El Paso County under average climate conditions is approximately 116,050 AF per year. This includes demands associated with municipal water providers, and for users of exempt and non-exempt wells located outside of water service areas. Table 5-1 presents the current, 2040 (Future), and 2060 (Build-Out) water demands by planning region. Region 1, the Colorado Springs area, makes up 72% of total

current water demand in the County, but that falls to 67% for projected 2060 demands indicating that more growth is anticipated in the other regions proportionally.

Distribution of the current demand by planning region (Figure 5.1) shows that the demand for water in El Paso County is greatest along the Interstate 25 (I-25) corridor. Region 1, being the Colorado Springs area, represents the largest demand. The second largest demand center is Region 7, located south of Colorado Springs generally along the I-25 corridor. The third largest demand center is Region 2, located north of Colorado Springs and generally along the I-25 corridor.

Planning Region	Current Demand (AF per year)	2040 Demand (AF per year)	2060 Build-Out Demand (AF per year)
Region 1	83,622	111,086	138,453
Region 2	7,532	11,713	13,254
Region 3	4,494	6,403	8,307
Region 4a	725	958	1,170
Region 4b	507	628	764
Region 4c	2,970	3,967	4,826
Region 5	4,396	6,468	9,608
Region 6	1,360	1,782	2,167
Region 7	10,141	15,846	26,969
Region 8	299	396	484
Total	**116,050**	**159,250**	**206,000**

Table 5-1: Current, 2040, and Build-Out Water Demand by El Paso County Planning Region

5.1.2 - 2040 Water Demands

The 2040 water demand in El Paso County is estimated to be approximately 159,250 AF per year. The 2040 water demands are summarized by planning region in Table 5-1 and shown in Figure 5.2. Similar to the current water demand pattern, the largest projected water demands in 2040 are located along the I-25 corridor.

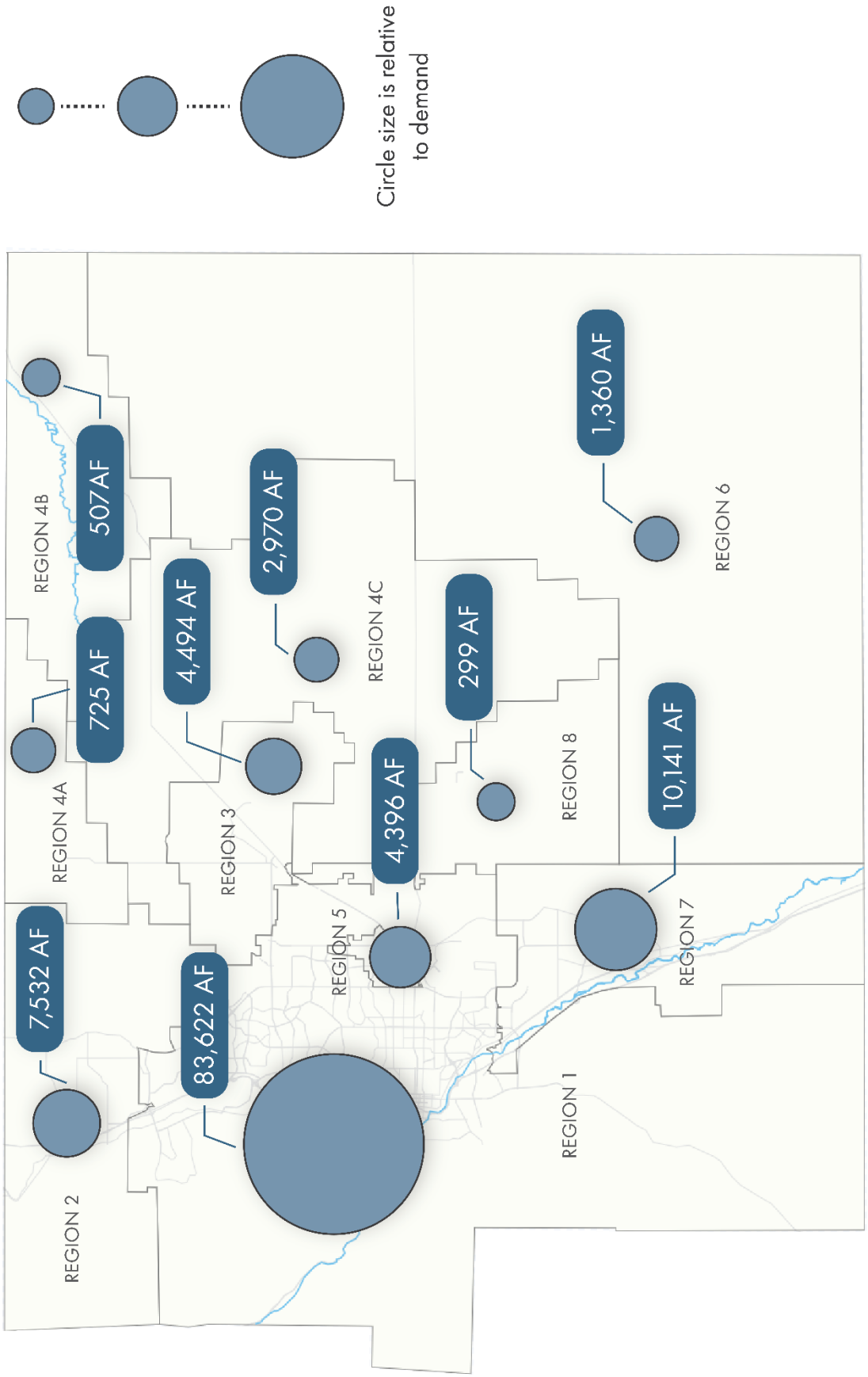
For portions of the County that rely on exempt and non-exempt wells to satisfy water demands, the 2040 demand is estimated based on the preliminary 5-year population forecast by County published by the Colorado Department of Local Affairs (DOLA). According to DOLA projections, the population in El Paso County is expected to grow 32 percent to approximately 971,440 in 2040.

5.1.3 - Build-out / 2060 Water Demands

The projected water demand in El Paso County at build-out (year 2060) is estimated to be 206,000 AF per year. Build-out water demands are summarized by planning region in Table 5-1 and shown in Figure 5.3. The demand pattern at build-out is consistent with the current and 2040 demand pattern, centered along the I-25 corridor.

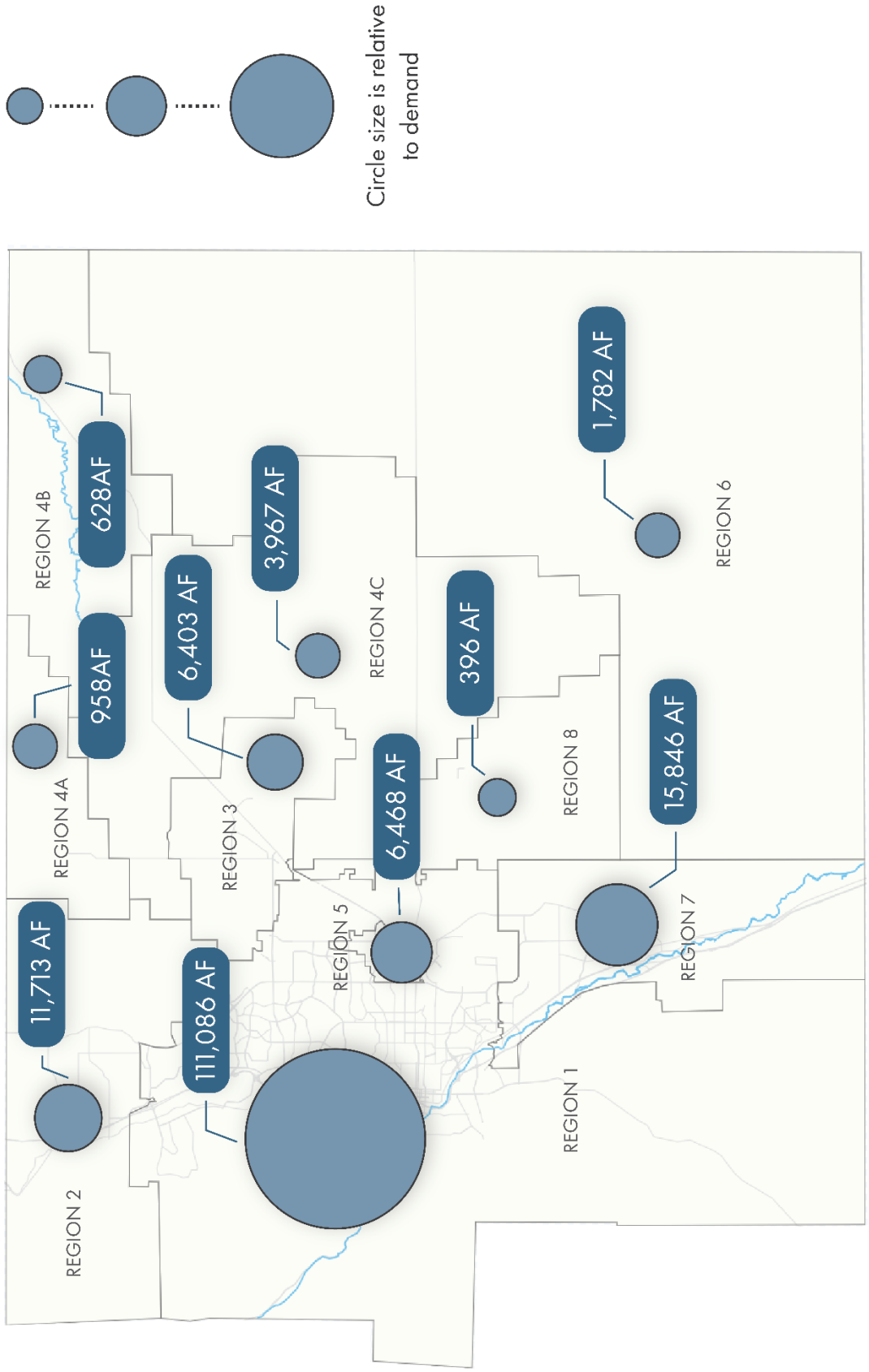
For portions of the County that rely upon exempt and non-exempt wells to satisfy water demands, the build-out (2060) demand was estimated based on the preliminary 5-year population forecast by County published by DOLA. According to DOLA projections, the population in El Paso County is expected to grow approximately 22 percent from 2040 to 2060, when it is expected to approach 1.2 million.

Figure 5.1 - El Paso County Current Demand by Planning Region



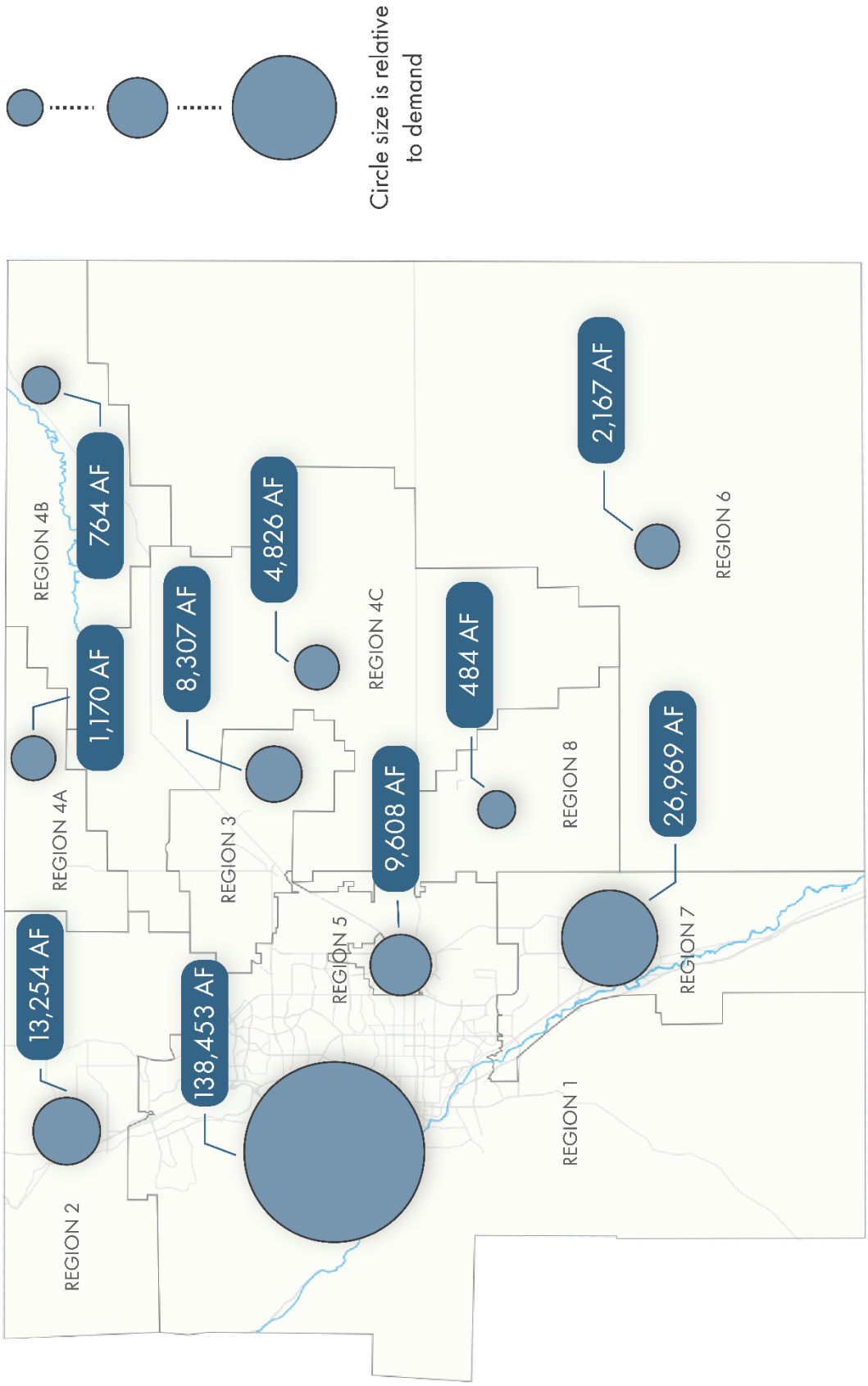
Total Demand: 116,050 AF

Figure 5.2 - El Paso County Future (2040) Demand by Planning Region



Total Demand: 159,250 AF

Figure 5.3 - El Paso County Build-out (2060) Demand by Planning Region



Total Demand: 206,000 AF

5.2 - PROJECTED GROWTH AREAS

Currently, land development in the County is following several trends. Higher density residential development is occurring where water is available from a water provider. Where centralized water service is not provided by a municipality, special district or other entity, the trend is to develop 2.5- to 5-acre lots with individual onsite wells and septic systems. In some cases, developers are creating their own water systems for the purpose of supplying water to higher density developments.

The project team used the 2016 El Paso County Major Transportation Corridors Plan, State Demographer website, and other data to develop the overall 2040 and 2060 growth projections. It is anticipated that growth in the County will continue to follow historic patterns, with larger subdivisions in the northern part of the County and higher density suburban development occurring in and around Falcon and Fountain. Cherokee Metropolitan District lies adjacent to large areas that could potentially develop with higher density residential growth along the Highway 94 corridor. It is anticipated that Schriever Air Force Base will continue to grow over the next several years, which may require increased service.

The Banning Lewis Ranch (BLR) area, covering over 24,000 acres from Woodmen Road south, well past Highway 94 and constituting the majority of the City of Colorado Springs eastern boundary, will continue to see the majority of City's suburban development. Future County development could continue to leapfrog BLR, resulting in significant development in and around Falcon and Fountain, along the Highway 94 corridor; even all the way out to Ellicott.

REGION 1 (Colorado Springs Area)

Region 1 is only projected to have one significant growth area in the unincorporated part of the County by 2040. The development is in the Rock Creek area along Highway 115. The Region 1 growth area can be found on the Region 7 map (Figure 5.6 following the Region 7 summary). It is important to note that this WMP is not intended to identify growth within the City of Colorado Springs.

REGION 2 (Monument Area)

Region 2, located in the northwest corner of El Paso County, is expected to experience significant growth through 2060. The I-25 corridor passes through the center of the Region and offers optimal growth areas in and around the Towns of Palmer Lake and Monument.

Growth is anticipated along both the east and west sides of I-25 by 2040. Additional growth areas are located near Colorado State Highway 83. Low-density developments are expected by 2040 for both the north and south sides of Hodgen Road, along the Highway 83 corridor.

Substantial growth is projected along Highway 83 in northwestern El Paso County. Planned growth areas are expected to be low density and would currently rely on well and septic systems, as no centralized well or sewer systems are available. Region 2 bordering Douglas County also has projected growth by 2060 between Furrow Road and Roller Coaster Road. See Figure 5.4 for Region 2 growth map projections.

REGION 3 (Falcon Area)

Region 3 contains four growth areas west of Falcon projected to be completed by 2040. Other areas of 2040 growth are projected for the north-central part of the region west of Highway 24 extending from Falcon to 4-Way Ranch.

North of Falcon along Highway 24, growth is projected by 2060 on both sides of the highway. Just west of Falcon, another small development is projected by 2060 on the north and south sides of Woodmen Road. On the east side of Highway 24, three separate areas of growth are projected for development by 2060, with the largest of the three spanning from south of Judge Orr Road to east of Peyton Highway into Region 4c. This development will likely consist of 35-acre lots that will require individual wells to use Denver Basin groundwater. The other two growth areas will be located on the north and south sides of Falcon Highway directly east of Falcon. See Figure 5.5 for Region 3 growth map projections.

REGIONS 4a, 4b, 4c (Designated Basin Areas)

Region 4a is located along the northern edge of the County and contains only one area projected for growth by 2060, on the northwest corner of Hodgen and Meridian Roads. Region 4b does not have any projected growth areas by 2060. Region 4c contains one small projected growth area by 2040 located between Highway 94 and Highway 24 along the Region 8 boundary.

Further development will likely be located along the Highway 94 corridor in Region 4c by 2060, due to proximity to Schriever Air Force Base. The largest development in Region 4c is expected to occur by 2060 along the west side of Meridian Road north of Fountain. See Figure 5.5 for Regions 4a, 4b, and 4c growth map projections.

REGION 5 (Cherokee Metropolitan District Service Areas)

Region 5 consists of areas served by Cherokee Metropolitan District and is not expected to experience significant growth by 2060. But the District could consider expanding water and sewer service to growth areas outside of Region 5. No specific growth map was created for Region 5; these areas are shown in other maps.

REGION 6 (Agricultural Areas)

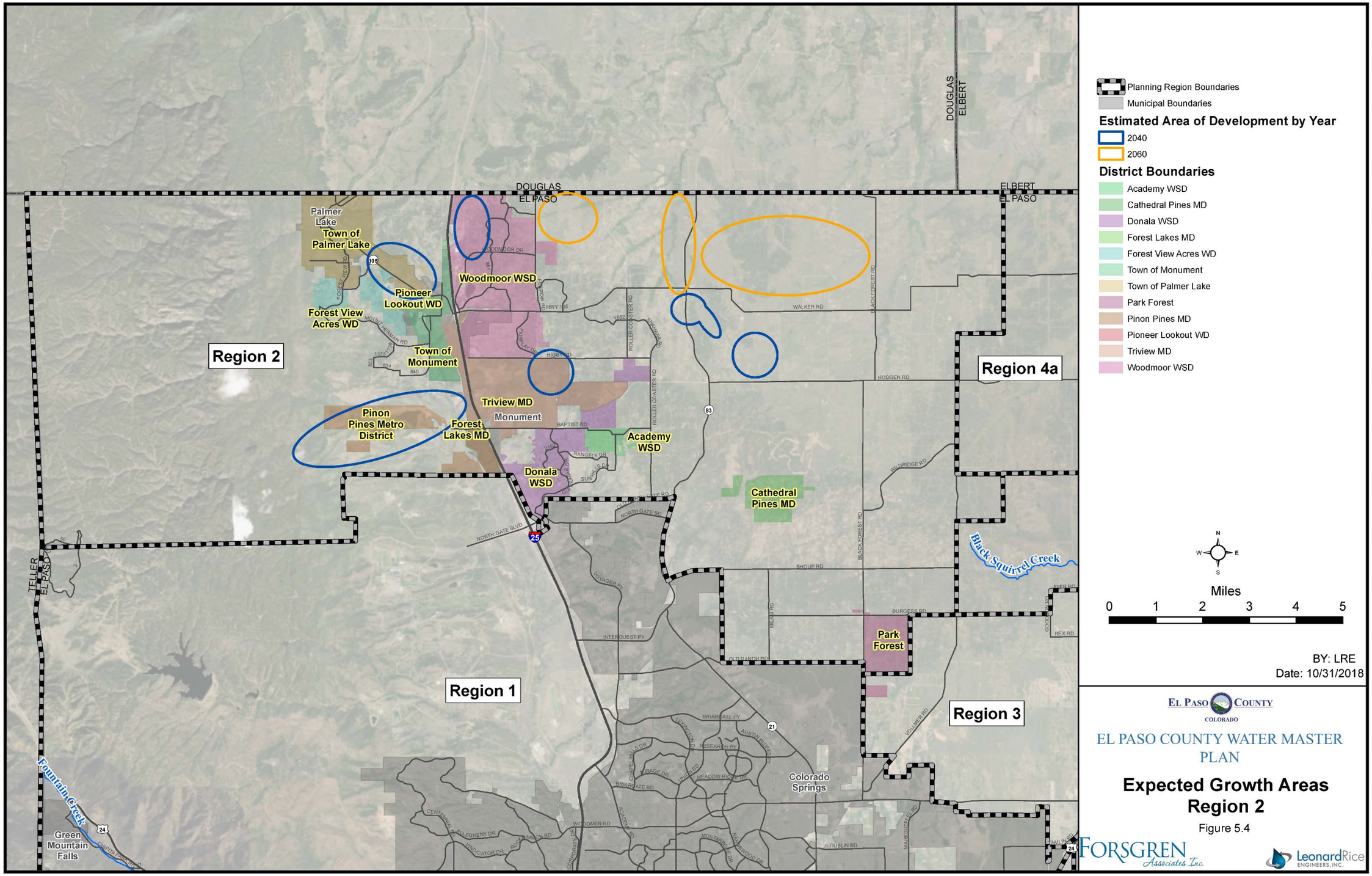
Region 6 contains mostly agricultural areas that are not projected to experience significant growth by 2040 or 2060. The water supply for this area generally comes from independent wells. No growth map was created for this area.

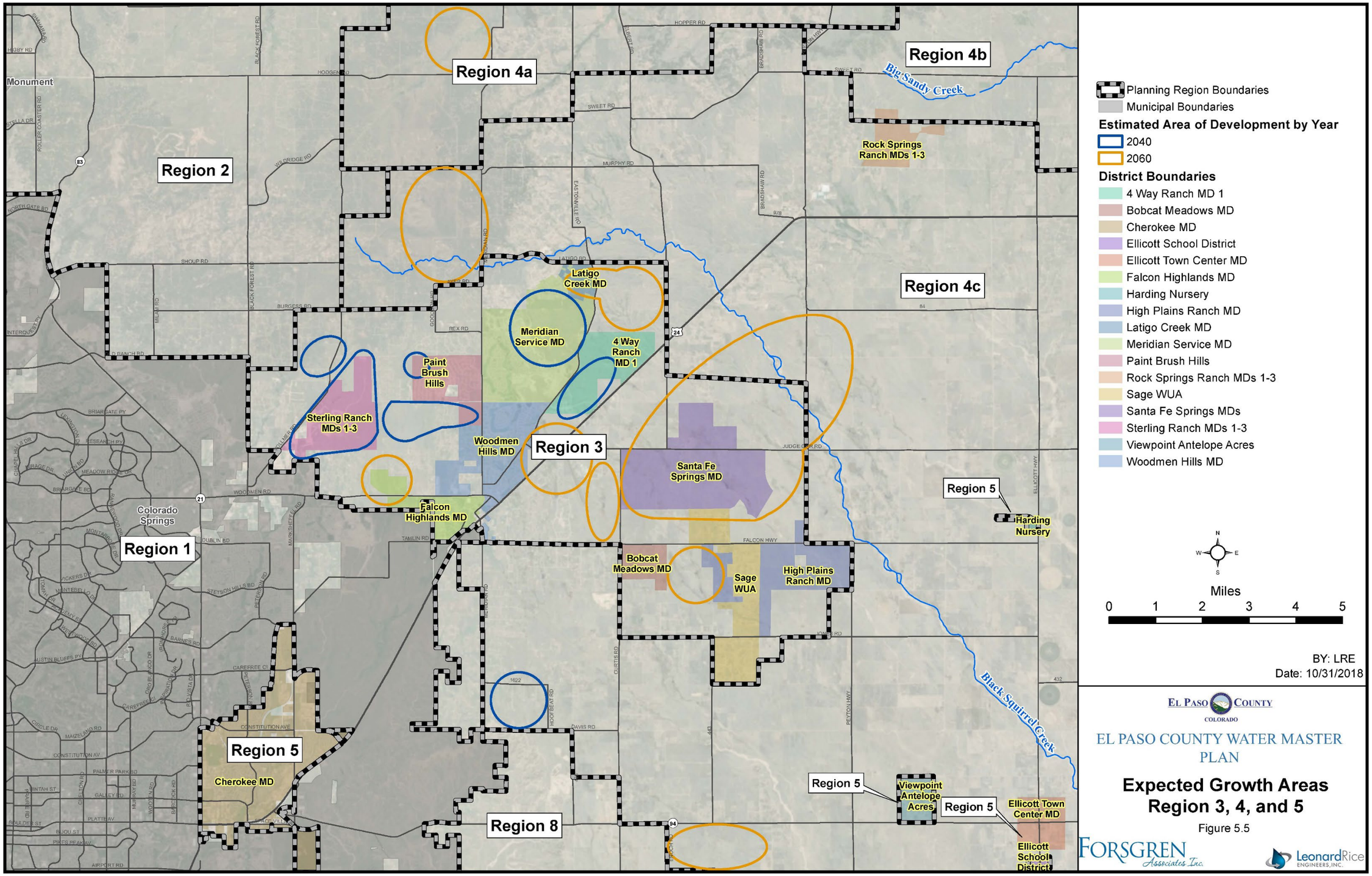
REGION 7 (Fountain Area)

Region 7 could experience the largest demand growth in the County by 2060. Areas projected to develop by 2040 are located south of Fountain on the north and south sides of Link Road. Areas northwest of Fountain along the east and west sides of Marksheffel Road are also expected to grow by then, as well as the area south of Fountain on the west side of I-25. Directly west of Fountain, areas north and south of Squirrel Creek Road are expected to grow by 2060. One large development is expected south of Fountain by 2060, along the west side of I-25. Another is expected in the northeast corner of Region 7, along both sides of Bradley Road. See Figure 5.6 for the Region 7 growth map.

REGION 8 (Along Eastern City Boundary)

Region 8 has three projected areas of development along Highway 94 near Schriever Air Force Base. One development is expected by 2040, just north of the Base and south of Highway 94. Additional developments are projected by 2060 along the Highway 94 corridor, west of the Base. See Figure 5.7 for the Region 8 growth map.


Planning Region Boundaries
Municipal Boundaries
Estimated Area of Development by Year
2040
2060
District Boundaries
Academy WSD
Cathedral Pines MD
Donala WSD
Forest Lakes MD
Forest View Acres WD
Town of Monument
Town of Palmer Lake
Park Forest
Pinon Pines MD
Pioneer Lookout WD
Triview MD
Woodmoor WSD
Region 1
Region 2
Region 3
Region 4a
Palmer Lake
Town of Palmer Lake
Pioneer Lookout WD
Forest View Acres WD
Town of Monument
Woodmoor WSD
Triview MD
Monument
Pinon Pines Metro District
Forest Lakes MD
Academy WSD
Donala WSD
Cathedral Pines MD
Park Forest
Colorado Springs
Green Mountain Falls
Fountain Creek
Black Squirrel Creek
DOUGLAS
ELBERT
EL PASO
TELLER
Miles
0 1 2 3 4 5
BY: LRE
Date: 10/31/2018
EL PASO COUNTY WATER MASTER PLAN
Expected Growth Areas
Region 2
Figure 5.4
FORSGREN Associates Inc.
LeonardRice ENGINEERS, INC.


Region 1
Region 2
Region 3
Region 4a
Region 4b
Region 4c
Region 5
Region 8
Monument
Colorado Springs
Big Sandy Creek
Black Squirrel Creek
Rock Springs Ranch MDs 1-3
Latigo Creek MD
Meridian Service MD
4 Way Ranch MD 1
Paint Brush Hills
Sterling Ranch MDs 1-3
Woodmen Hills MD
Santa Fe Springs MD
Falcon Highlands MD
Bobcat Meadows MD
Sage WUA
High Plains Ranch MD
Harding Nursery
Cherokee MD
Viewpoint Antelope Acres
Ellicott Town Center MD
Ellicott School District
Planning Region Boundaries
Municipal Boundaries
Estimated Area of Development by Year
2040
2060
District Boundaries
4 Way Ranch MD 1
Bobcat Meadows MD
Cherokee MD
Ellicott School District
Ellicott Town Center MD
Falcon Highlands MD
Harding Nursery
High Plains Ranch MD
Latigo Creek MD
Meridian Service MD
Paint Brush Hills
Rock Springs Ranch MDs 1-3
Sage WUA
Santa Fe Springs MDs
Sterling Ranch MDs 1-3
Viewpoint Antelope Acres
Woodmen Hills MD
Miles
0 1 2 3 4 5
BY: LRE
Date: 10/31/2018
EL PASO COUNTY COLORADO
EL PASO COUNTY WATER MASTER PLAN
Expected Growth Areas
Region 3, 4, and 5
Figure 5.5
FORSGREN Associates Inc.
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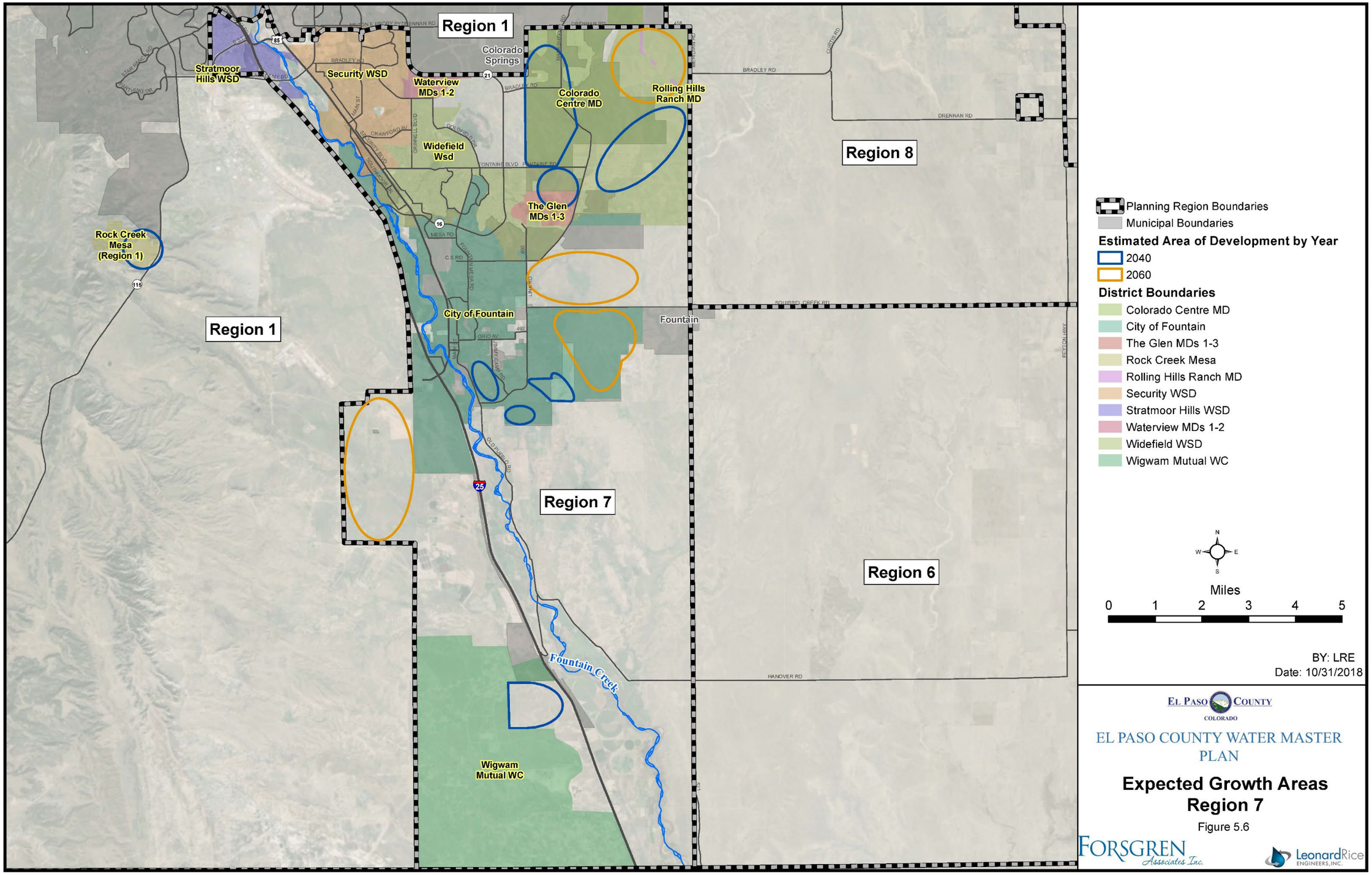
Region 1
Region 1
Region 7
Region 8
Region 6
Colorado Springs
Stratmoor Hills WSD
Security WSD
Waterview MDs 1-2
Colorado Centre MD
Rolling Hills Ranch MD
Widefield Wsd
The Glen MDs 1-3
Rock Creek Mesa (Region 1)
City of Fountain
Fountain
Fountain Creek
Wigwam Mutual WC
Planning Region Boundaries
Municipal Boundaries
Estimated Area of Development by Year
2040
2060
District Boundaries
Colorado Centre MD
City of Fountain
The Glen MDs 1-3
Rock Creek Mesa
Rolling Hills Ranch MD
Security WSD
Stratmoor Hills WSD
Waterview MDs 1-2
Widefield WSD
Wigwam Mutual WC
Miles
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EL PASO COUNTY WATER MASTER PLAN
Expected Growth Areas
Region 7
Figure 5.6
FORSGREN Associates Inc.
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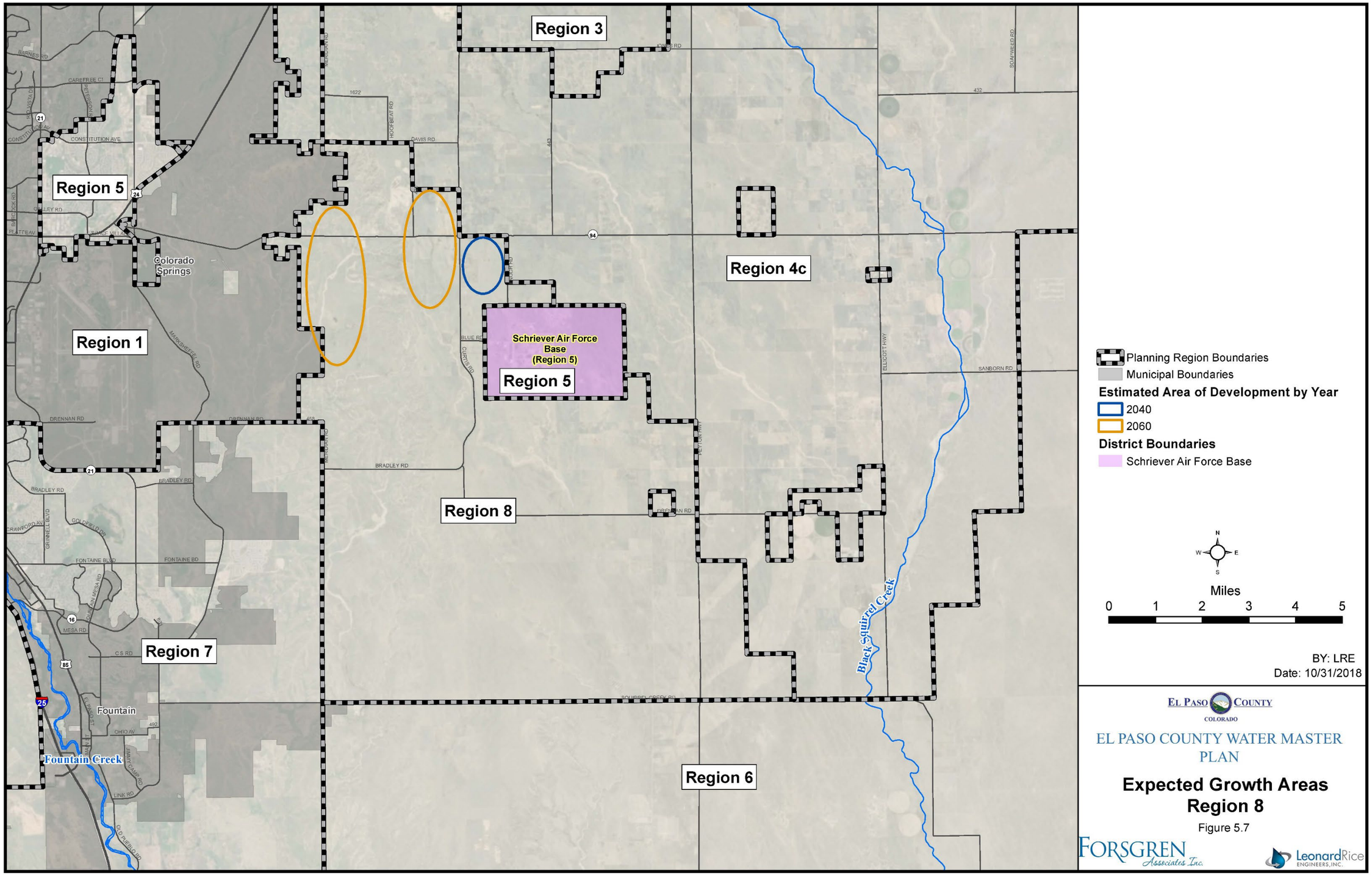
Region 3
Region 5
Region 4c
Region 1
Region 8
Region 7
Region 6
Colorado Springs
Schriever Air Force Base (Region 5)
Fountain
Fountain Creek
Black Squirrel Creek
Planning Region Boundaries
Municipal Boundaries
Estimated Area of Development by Year
2040
2060
District Boundaries
Schriever Air Force Base
N
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Date: 10/31/2018
EL PASO COUNTY COLORADO
EL PASO COUNTY WATER MASTER PLAN
Expected Growth Areas
Region 8
Figure 5.7
FORSGREN Associates Inc.
LeonardRice ENGINEERS, INC.

5.3 - WATER SUPPLIES

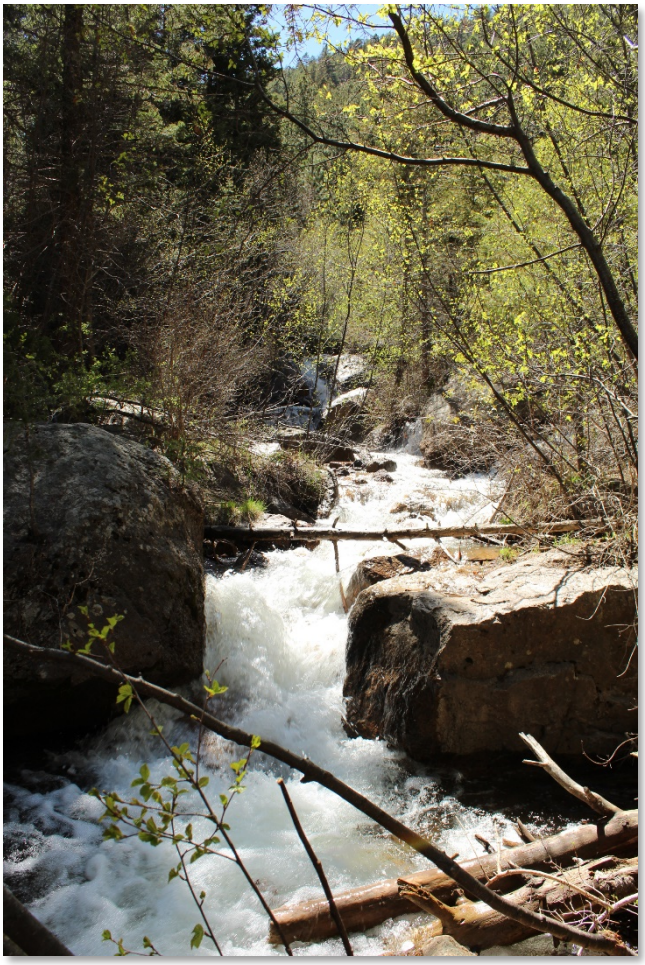
To quantify water supplies throughout El Paso County, the project team relied on information obtained from water service providers and other data, and estimated the supply from exempt and non-exempt wells located outside water service areas, based on the number of wells.

Water supplies used by water providers in El Paso County include surface and groundwater. Surface water sources consist of lakes and rivers, most prominently, Fountain Creek and its tributaries. There are three primary categories of groundwater used in El Paso County: the Denver Basin aquifers, alluvial aquifers, and designated basin groundwater. Designated basin groundwater is also alluvial water, but the basin is closed or semi-closed, meaning that it is not hydraulically connected to a surface stream that drains water out of the basin.

As discussed in Section 4, the nonrenewable nature of Denver Basin water means that it is generally used at a faster rate than it is replenished from surface recharge, and the water is being "mined" over time. Groundwater levels are expected to continue declining, causing pumping costs to increase as well efficiency decreases. Aging wells and decreased well efficiency will require well rehabilitation and replacement, or drilling additional wells in order to achieve historical yields.

As a result, water providers that rely heavily on Denver Basin groundwater can face uncertainty as well production may not be economically sustainable in the long term. Some areas may experience more rapid declines than others, depending on the aquifer. Localized zones of low well productivity and areas along fringes of the aquifers may not be conducive to dense development, or it may be necessary to have water piped from satellite well fields located in more productive areas. The County could consider mapping of these low production zones by aquifer for reference in the land-use planning process.

Denver Basin groundwater should be preserved as much as practicable through water conservation and efficiency, helping extend the economically useful life of the aquifers. Denver Basin water can be preserved further if a portion of future demands is met by water reuse. Reuse requires sanitary sewer systems to collect wastewater for centralized treatment. The water can then either be distributed to irrigation sites (possibly even individual residences, depending on the level of treatment) or returned to blend with a potable water supply (normally, after first passing through an environmental buffer such as a lake, river, or aquifer).



Seven Bridges Trail, El Paso County

A portion of future demands will need to be met with imported renewable supplies. However, financing, constructing, and then operating a water import system requires many years of planning and collaboration by water providers. The County should encourage, and possibly facilitate those water providers in growth areas that will need additional supplies to either stay engaged, or join in regional water planning as soon as practicable.

5.3.1 - Current Supplies

The current (2018) water supply for all of El Paso County is estimated at approximately 146,070 AF per year. For the purpose of estimating the water supply associated with exempt and non-exempt wells, the current water supply is assumed to be sufficient to satisfy the current demand and, therefore, current supply equals current demand.

Table 5-2 presents the current water supplies by planning region. The current water supplies by region are also shown in Figure 5-8. Distribution of the current supply by planning region shows a pattern similar to that observed for the water demands, with available water supplies in El Paso County greatest along the I-25 corridor.

Planning Region	Current Supplies (AF per year)	2040 Supplies (AF per year)	2060 Build-Out Supplies (AF per year)
Region 1	99,001	119,001	139,001
Region 2	13,607	20,516	20,756
Region 3	7,164	7,921	8,284
Region 4a	725	725	725
Region 4b	722	722	722
Region 4c	2,970	3,027	3,027
Region 5	4,849	6,800	10,131
Region 6	1,360	1,360	1,360
Region 7	15,376	25,241	27,840
Region 8	299	299	299
Total	**146,070**	**185,610**	**212,150**

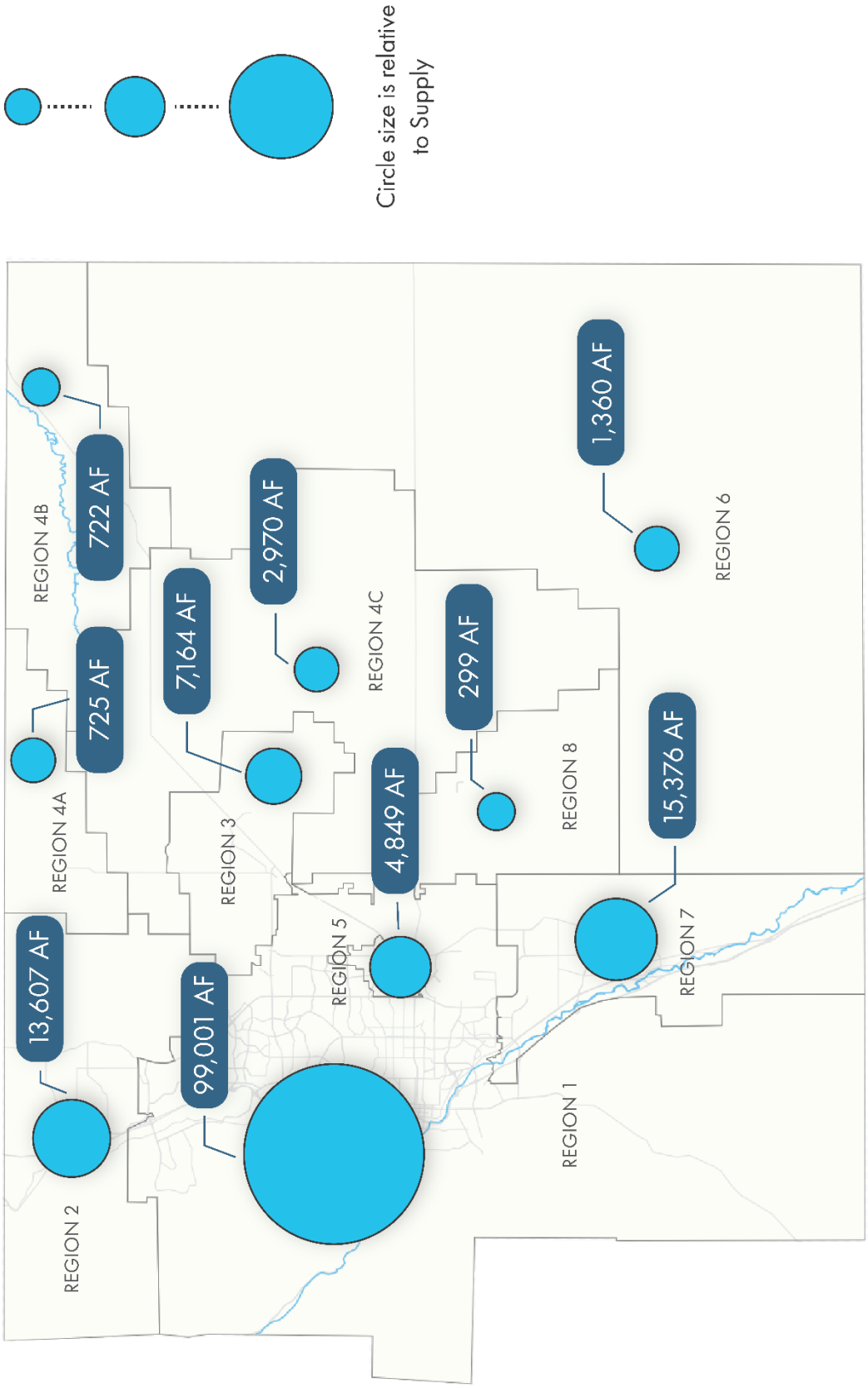
Table 5-2: Current, 2040, and Build-Out Water Supply by El Paso County Planning Region

5.3.2 - Future Supplies

The 2040 and build-out (2060) water supplies, also summarized by region in Table 5-3 and shown in Figures 5.9 and 5.10, reflect information obtained from the web-based water provider survey and other supporting data, as discussed in greater detail earlier in this WMP. The future water supply numbers include those supplies that water providers plan to acquire and/or connect to their systems, but those full amounts are not currently available. There may, or may not be specific Identified Projects and Processes (IPPs) associated with those future supplies.

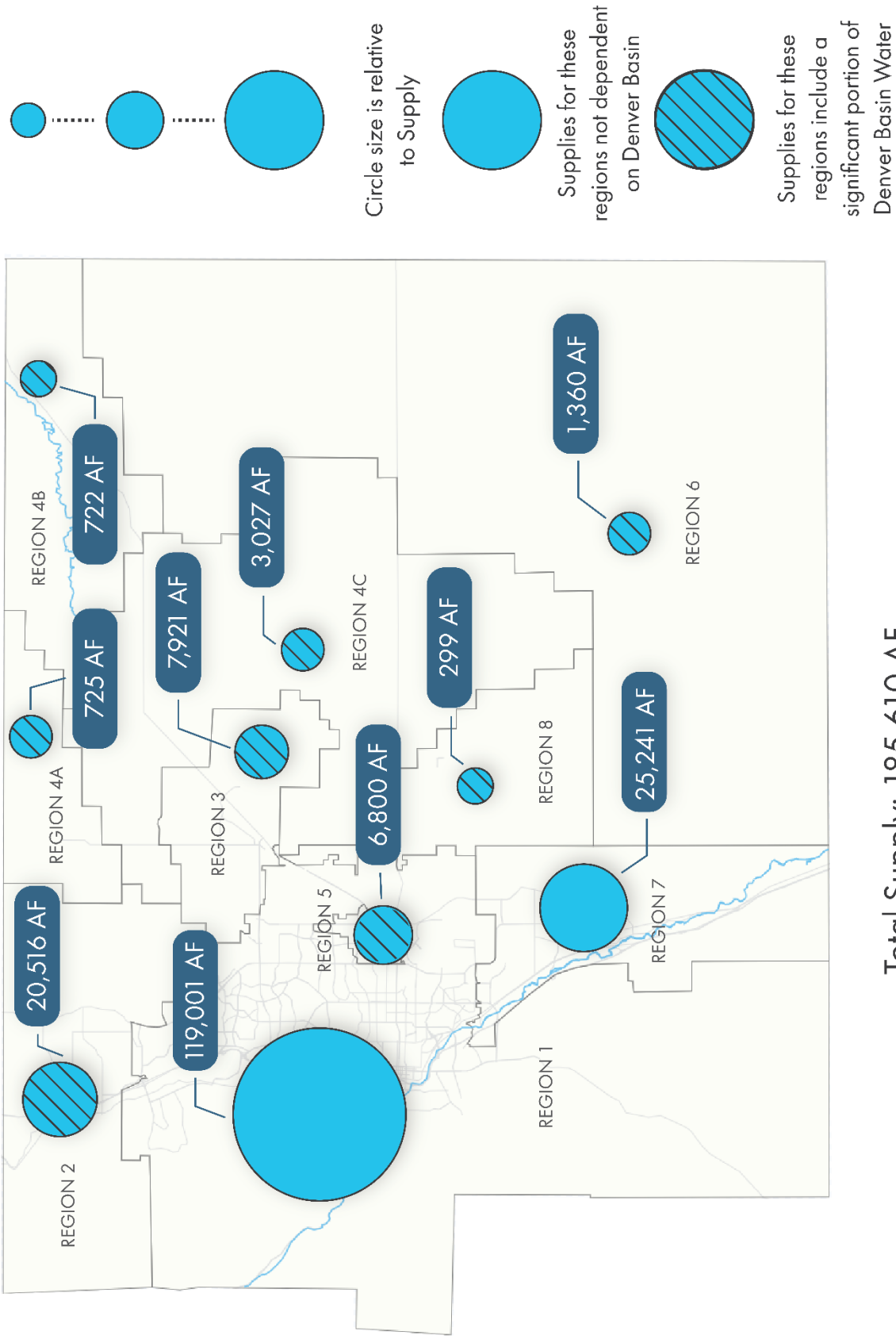
In addition, the water provider survey shows that a number of water providers are relying upon nonrenewable Denver Basin aquifers and designated basins to fulfill these future supplies. Denver Basin water comprises a large share of future supplies for Regions 2, 3, 4a, 4b, 4c, 5, 6, and 8. As previously discussed, heavy use of Denver Basin supplies is not expected to be economically sustainable over the long term. Water supplies in these regions may need to be diversified in the years ahead, depending on local aquifer conditions.

Fugure 5.8 - El Paso County Current Supplies by Planning Region



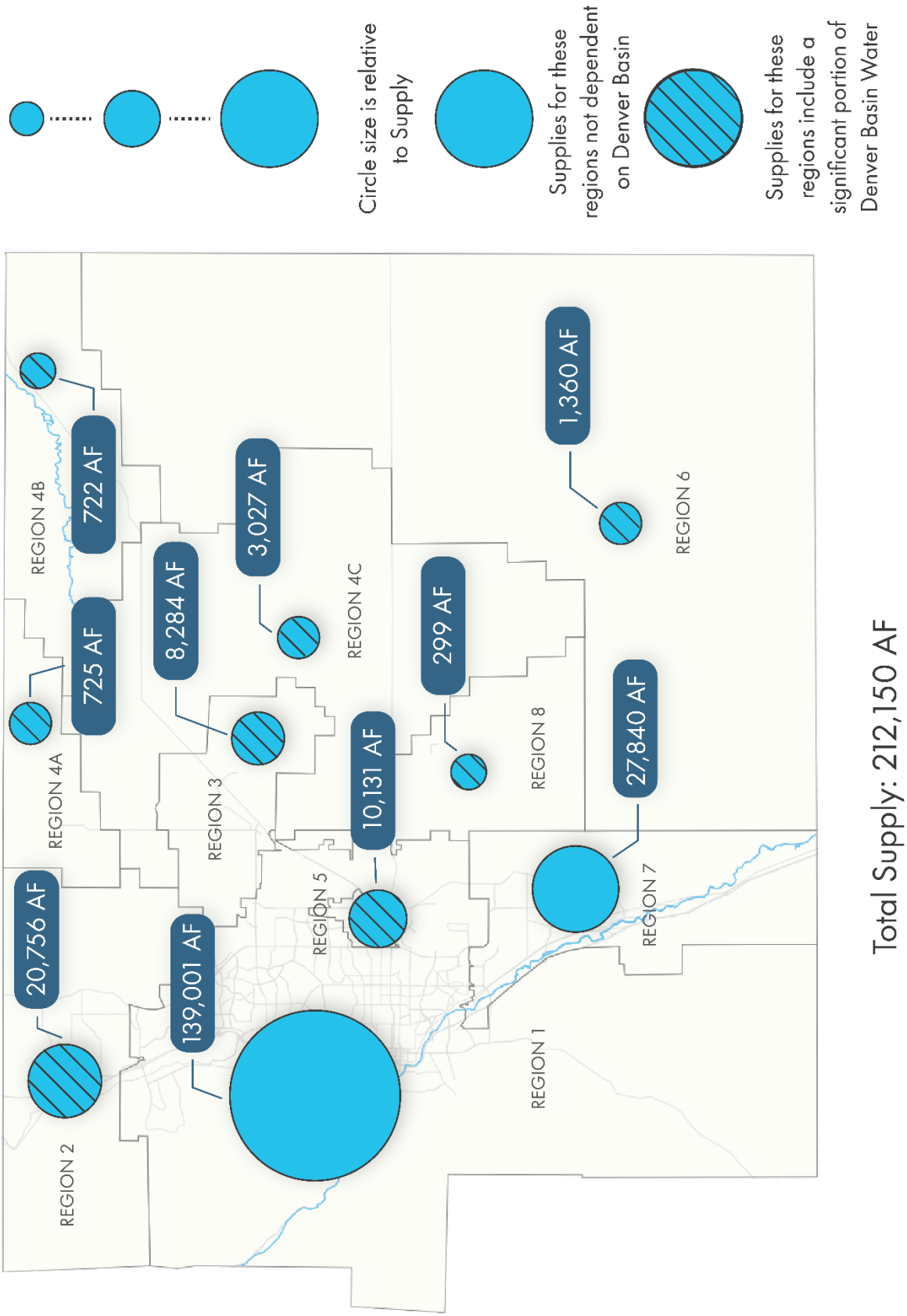
Total Supply: 146,070 AF

Figure 5.9 - El Paso County Future (2040) Supplies by Planning Region



Total Supply: 185,610 AF

Figure 5.10 - El Paso County Build-out (2060) Supplies by Planning Region



Total Supply: 212,150 AF

5.4 - NEEDS ANALYSIS

For purposes of this WMP, future water supply needs are defined as the difference between the projected future demand for water and current available water supply. Current supplies are sufficient to meet current demands under average climate conditions throughout the County. In fact, based on user provided information, there is an apparent surplus of over 30,000 AF of water on an annual basis for the County as a whole. Table 5-3 summarizes the current demands and supplies for El Paso County.

Planning Region	Demand (AF)	Supplies (AF)	Apparent Surplus (AF)	Need (AF)	Need (%)
Region 1	83,622	99,001	15,379	0	0
Region 2	7,532	13,607	6,075	0	0
Region 3	4,494	7,164	2,670	0	0
Region 4a	725	725	0	0	0
Region 4b	507	722	215	0	0
Region 4c	2,970	2,970	0	0	0
Region 5	4,396	4,849	453	0	0
Region 6	1,360	1,360	0	0	0
Region 7	10,141	15,376	5,236	0	0
Region 8	299	299	0	0	0
Total	**116,050**	**146,070**	**30,020**	**0**	**0**

Table 5-3: Current Demand and Current Supplies by El Paso County Planning Region

A needs analysis on a regional basis can be somewhat misleading. The regional analysis aggregates all supplies and all demands for that region. In practice, the supply total in a region may, or may not be available to satisfy the demands of each individual water provider in that region. That analysis is beyond the scope of this WMP.

Further, as previously described, current and future water supplies in Regions 2, 3, 4a, 4b, 4c, 5, 6, and 8 include a large share of nonrenewable Denver Basin groundwater. Depending on local aquifer conditions, it may not be economically sustainable to continue heavy reliance on those supplies over the long term. Any reduction in use of those water supplies would only serve to increase the water supply needs for El Paso County. The needs analysis presented herein does not account for reduction in current supplies for factors such as declining water levels in the Denver Basin aquifers, reduced well production, or climate change. With respect to water demands however, the needs analysis also does not account for water-saving measures that may be implemented to reduce water consumption.

As presented in Table 5-4 and shown in Figure 5.11, the water demand in El Paso County is projected to grow to 159,250 AF per year by 2040. At the current level of water supply (146,070 AF per year) there is a projected need of 13,180 AF per year. Based on the reported and estimated future supply of water, there is projected to be sufficient water supply to serve at least 72% of the projected water demand in 2040. However, the supplies for Regions 2, 3, 4a, 4b, 4c, 5, 6, and 8 make up another 20% of the projected 2040 demand, and include a significant share of Denver Basin groundwater. In general, pumping that groundwater may not be economically sustainable over time, depending on local aquifer conditions. That would serve to increase the water supply needs beyond the 8% that is shown. Water efficiency and reuse measures can help extend the use of Denver Basin however.

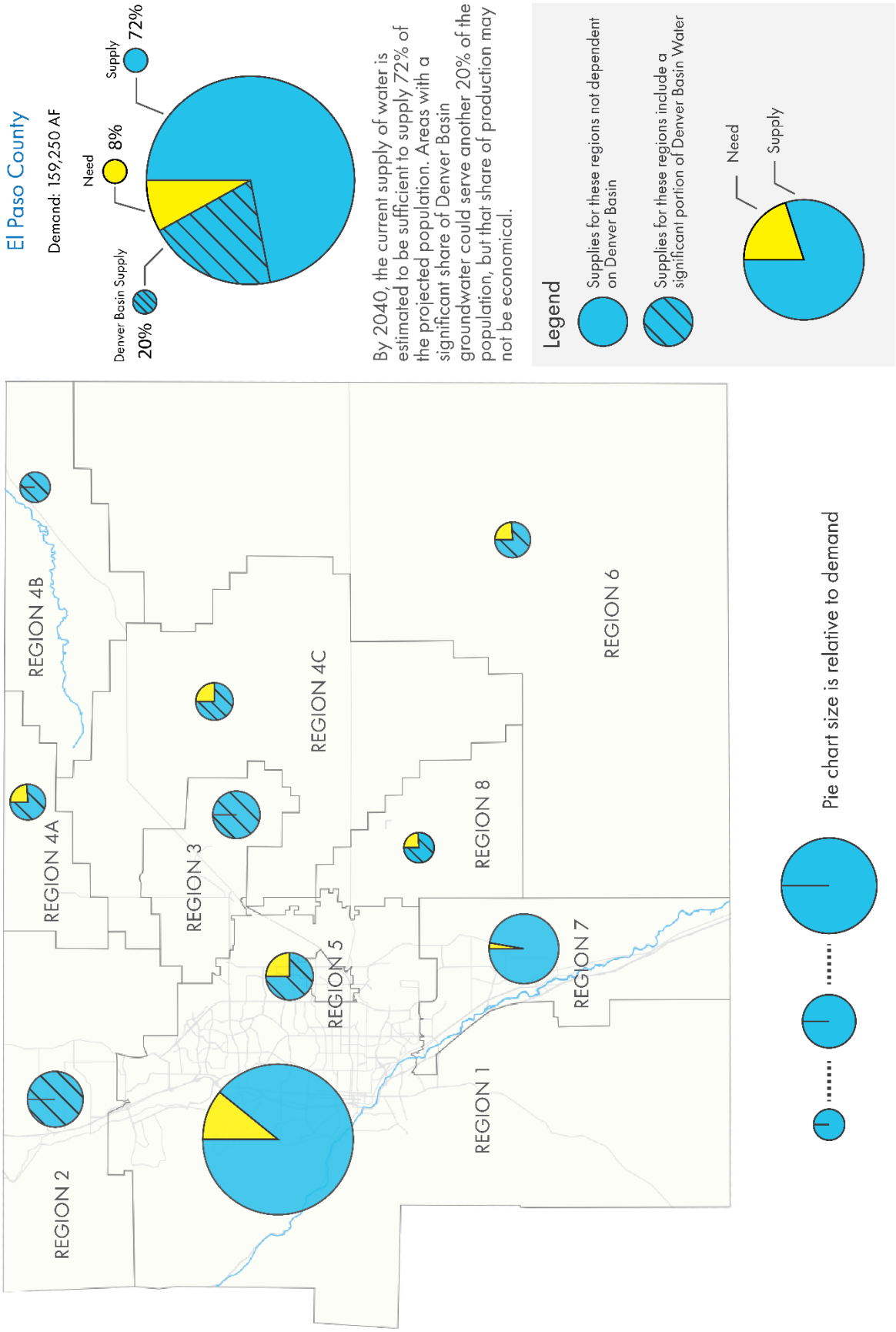
Planning Region	2040 Demand (AF)	Current Supplies (AF)	Apparent Surplus (AF)	Need (AF)	Need (%)
Region 1	111,086	99,001	0	12,085	11%
Region 2*	11,713	13,607	1,894	0	0%
Region 3*	6,403	7,164	761	0	0%
Region 4a*	958	725	0	233	24%
Region 4b*	628	722	94	0	0%
Region 4c*	3,967	2,970	0	997	25%
Region 5*	6,468	4,849	0	1,619	25%
Region 6*	1,782	1,360	0	422	24%
Region 7	15,846	15,376	0	470	3%
Region 8*	396	299	0	97	24%
Total	**159,250**	**146,070**	**0**	**13,180**	**8%**

Table 5-4: Future (2040) Demand and Current Supplies by El Paso County Planning Region

**Water production from Denver Basin wells in this region may not be economically sustainable in the long term, depending on local aquifer conditions.*

Note: The Total row represents the total for the County as a whole, and not the sum of all the regions. When looking at the County as a whole, in 2040 the demand is 159,250, but the total supplies are only 146,070. So, while three regions show a surplus, that surplus is more than the total need for the County, so there is no surplus for the County as a whole.

Figure 5.11 - El Paso County Needs Analysis By Region (Future 2040)



As presented in Table 5-5 and shown in Figure 5.12, the water demand in El Paso County is projected to grow to 206,000 AF per year at build-out (2060). At the current level of water supply (146,070 AF per year), there is a projected need of 59,930 AF per year by 2060. Based on the reported and estimated future supply of water, there is projected to be sufficient water supply to reliably serve at least 56% of the projected water demand in 2060. However, the supplies for Regions 2, 3, 4a, 4b, 4c, 5, 6, and 8 make up another 15% of the projected 2060 demand, and include a significant share of Denver Basin groundwater. Pumping Denver Basin groundwater may not be economically sustainable over time and by 2060, it would likely be less economical than for 2040 demands, depending on local aquifer conditions. That would serve to increase the water supply needs beyond the 29% that is shown.

Planning Region	2060 Demand (AF)	Current Supplies (AF)	Apparent Surplus (AF)	Need (AF)	Need (%)
Region 1	138,453	99,001	0	39,452	28%
Region 2*	13,254	13,607	353	0	0%
Region 3*	8,307	7,164	0	1,143	14%
Region 4a*	1,170	725	0	445	38%
Region 4b*	764	722	0	42	5%
Region 4c*	4,826	2,970	0	1,856	38%
Region 5*	9,608	4,849	0	4,759	50%
Region 6*	2,167	1,360	0	807	37%
Region 7	26,969	15,376	0	11,593	43%
Region 8*	484	299	0	185	38%
Total	**206,000**	**146,070**	**0**	**59,930**	**29%**

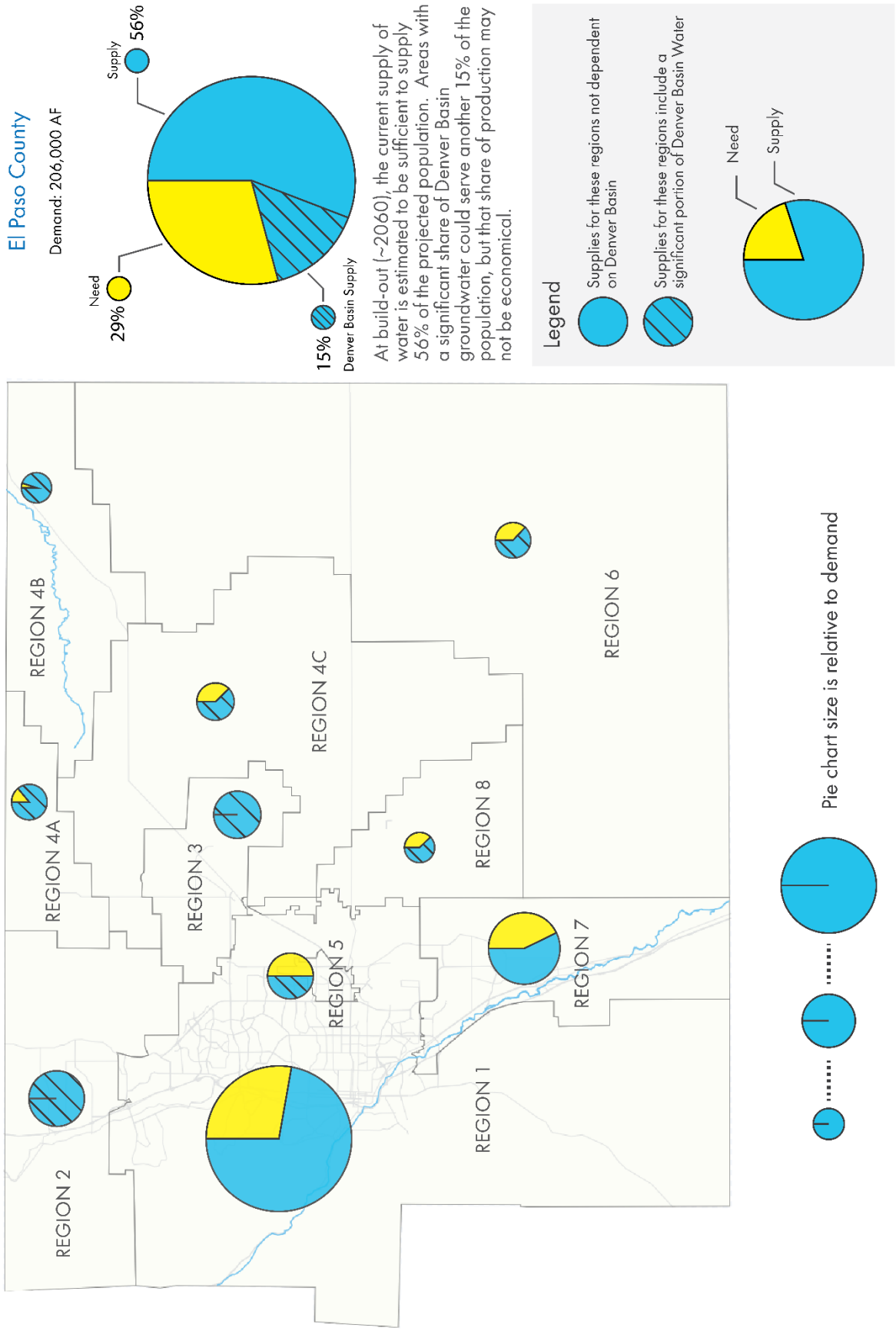
Table 5-5 – Build-out (2060) Demand and Current Supplies by El Paso County Planning Region

**Water production from Denver Basin wells in this region may not be economically sustainable in the long term, depending on local aquifer conditions.*

Note: The Total row represents the total for the County as a whole, and not the sum of all the regions. When looking at the County as a whole, in 2060 the demand is 206,000, but the total supplies are only 146,070. So, while one region shows a surplus, that surplus is more than the total need for the County, so there is no surplus for the County as a whole.

The needs analysis quantifies the additional supplies required for the 2040 and 2060 horizons compared to the supplies ***currently available*** and connected. Based on the water provider survey and supporting data summarized in Table 5-2, water supply totals ***planned*** for 2040 and 2060 exceed the projected demands. It appears that water providers are generally aware of their future needs, and are planning to develop and connect the new supplies they will need. Water providers generally purchase a quantity of water rights and then separately develop the infrastructure capacity to deliver and treat the water, so water supplies will normally be added to their systems in incremental blocks ahead of the needs.

Figure 5.12 - El Paso County Needs Analysis By Region (Build-out 2060)



5.5 - EXEMPT AND NON-EXEMPT WELLS

Exempt wells are those wells that are not administered under the prior appropriation system. According to the Colorado Division of Water Resources (DWR), in most cases exempt well permits limit the pumping rate to no more than 15 gallons per minute, allow for construction of one well on a 35-acre parcel, and the wastewater disposal system for the properties served are to be non-evaporative, such as a standard septic tank and leach field system. Non-exempt wells are governed by the priority system and generally have pumping rates and annual withdrawals in excess of exempt wells. They also operate in compliance with a Water Court decreed and approved augmentation plan. Further, by Colorado law, every well in the state that diverts groundwater must have a well permit.

Estimates for water supply and demand for those portions of the County outside of the water provider service areas were developed based on the number of exempt and non-exempt wells located outside of the water service areas. An estimate of water supply and demand for areas outside the water provider service areas based on the number of wells is appropriate due to the limited supply and availability of any reliable source of surface water in these areas. The water supply and demand associated with these exempt and non-exempt wells has been included in the supply and demand estimates provided in Sections 5.3 and 5.4, respectively.

To estimate the number of exempt and non-exempt wells in El Paso County, the project team generated a list of all well permits in El Paso County utilizing the Colorado Information Marketplace (https://data.colorado.gov/browse?category=Water) and the well database available from DWR (https://www.colorado.gov/cdss). The project team then analyzed the data to remove potential duplicate records. Starting on June 1, 2017, any new well permits identifying multiple applicant names or contact names have been entered into the State well database as individual entries. As a result, duplicate records for the same well permit entered under each of the contact names were removed. Further, when a replacement permit is issued by the State, the original permit number and any replacement permit numbers will both appear on the State well database. Often, the well replacement process can result in two entries for the same well in the State well database. Therefore, the project team reviewed the well database and removed duplicate entries associated with replacement wells.

Using information available from DWR, the project team identified a total of 21,305 permitted exempt and non-exempt wells located within El Paso County. This well count should be considered an estimate of the total number of wells in El Paso County, as it is possible that the DWR well database includes records for wells that are no longer in service. As shown in Table 5-6, a majority of the wells located within El Paso County are drilled into the Denver Basin and outside of designated groundwater basins. Of the wells identified as being located within El Paso County, the DWR well permit database did not include aquifer information for 3,105 wells. These 3,105 wells could include wells that divert water from the alluvial aquifer or additional Denver Basin wells.

Aquifer Based on Well Permit	Exempt Wells	Non-Exempt Wells	Total Well Count
Denver Basin Aquifer Outside of Designated Groundwater Basin	7,822	2,899	10,721
Well Located Outside of Designated Groundwater Basin with Unspecified Aquifer	2,410	695	3,105
Kiowa Bijou Designated Groundwater Basin	986	152	1,138

Table 5-6 – Permitted Exempt and Non-Exempt Wells in El Paso County **(Continued on Next Page.)**

Aquifer Based on Well Permit	Exempt Wells	Non-Exempt Wells	Total Well Count
Upper Big Sandy Designated Groundwater Basin	551	38	589
Upper Black Squirrel Creek Designated Groundwater Basin	5,034	718	5,752
Total Well Count	**16,803**	**4,502**	**21,305**

Table 5-6 - Permitted Exempt and Non-Exempt Wells in El Paso County by Aquifer

Of the 21,305 permitted exempt and non-exempt wells identified in the County, approximately 3,184 wells were identified as being located within an existing water provider service area. For the purpose of this analysis, the water supply and demands associated with wells located within a water provider service area were assumed to be included in the supply and demand projections for that water provider. The total number of wells located in El Paso County and outside of water provider service areas is approximately 18,121 wells. Table 5-7 summarizes the estimated number of exempt and non-exempt wells located in El Paso County, outside of the water service areas.

Planning Region	Well Type	Well Count
Region 1	Exempt	1,315
	Non-Exempt	259
Region 2	Exempt	3,769
	Non-Exempt	2,199
Region 3	Exempt	1,015
	Non-Exempt	411
Region 4a	Exempt	984
	Non-Exempt	152
Region 4b	Exempt	550
	Non-Exempt	38
Region 4c	Exempt	4,150
	Non-Exempt	443
Region 5	Exempt	16
	Non-Exempt	1
Region 6	Exempt	1,972
	Non-Exempt	89
Region 7	Exempt	190
	Non-Exempt	99
Region 8	Exempt	411
	Non-Exempt	58
Total Exempt Wells	14,372	
Total Non-Exempt Wells	3,749	
Total Wells	**18,121**	

Table 5-7 - Estimated Number of Exempt and Non-Exempt Wells Located in El Paso County Outside of Water Service Areas

6 – Closing the Gap

6 - CLOSING THE GAP

El Paso County is located in a part of the State of Colorado that contains relatively high elevations and low to moderate rainfall (less than 30-inches per year). Residents of the County want to make every drop count when it comes to water use. This section will discuss how residents and water providers in the County can be better stewards of their precious water supplies. Preventing wasteful use of a precious resource like water should be the goal of all citizens of El Paso County. Denver Basin groundwater is being mined, but by working together we can help this resource last for generations to come. Per the supply and demand analysis in Section 5 of this plan, water providers in El Paso County will need to acquire and/or connect additional water supplies of over 55,000 AFY by the year 2060.

6.0 - CLOSING THE GAP GOALS AND POLICIES

Goal 6.0 – Require adequate water availability for proposed development.

Policy 6.0.1 – Continue to require documentation of the adequacy of water for proposed development.

Policy 6.0.2 – Encourage development to incorporate water wise development principles

Policy 6.0.3 – Incorporate Water-Saving Actions into Land Use Planning Activities

Policy 6.0.4 – Encourage water providers to incorporate drought conditions into their water supply and demand planning activities.

Policy 6.0.5 – Encourage water and wastewater infrastructure projects to be sited and designed in a manner which promotes compatibility with adjoining uses, a reasonable mitigation of any adverse visibility and other environmental impacts.

Policy 6.0.6 – The County will encourage development that incorporates water wise landscaping principles.

Policy 6.0.7 – The County will consider incorporating water-saving actions and requirements into its development review process.

Policy 6.0.8 – Support implementation of water provider conservation projects.

6.0 - CLOSING THE GAP GOALS AND POLICIES

Policy 6.0.9 –The County will support any efforts by water providers to incorporate drought conditions in their supply and demand forecasts in providing future and existing water supplies

Policy 6.0.10 – The County will encourage the submission of a water supply plan documenting an adequate supply of water to serve a proposed development at the earliest stage of the development process as allowed under state law. The water supply plan should be prepared by the applicant in collaboration with the respective water provider.

Policy 6.0.11 – The County will encourage development patterns and higher density, mixed use developments in appropriate locations that propose to incorporate meaningful water conservation measures.

Policy 6.0.12 – The County will consider amendments to the Land Development Code to incorporate water-saving standards, such as:

- Allowances for xeriscaping or native and drought-tolerant landscaping
- Allowances for water-saving irrigation techniques
- Minimizing the percentage of landscaped area covered with non-native turf
- Increasing the percentage of landscape areas that can be covered with non-living landscape material
- Allowance for design elements that could be included in landscaped area calculations (patios, courtyards, etc.)

Policy 6.0.13 – The County should encourage each land use proposal to expressly declare its water source, quality, quantity, and sustainability in terms of years and number of users.

Policy 6.0.14 – The County should continue to limit urban level development to those areas served by centralized utilities.

6.1 WATER EFFICIENCY

El Paso County falls within a semi-arid part of the State, which requires planning for and protecting water supplies. Colorado has been proactive in drought planning and water supply planning since 1937, with the creation of the Colorado Water Conservation Board (CWCB). The most populous cities located along Colorado's Front Range are often most affected by periods of drought. The last major drought in the State was from 2002 to 2003, revitalizing interest in water conservation and Colorado's water future. The statewide movement for water conservation and efficiency, led to creation of the Water Conservation Act of 2004 (update of the 1991 Act), requiring all sizeable water providers to have a State approved water efficiency plan before obtaining State grants & financing.

"Quite simply, water efficiency is doing more with less – not doing without. Water efficiency efforts include the practices, techniques and technologies that extend water supplies and other resources (e.g. energy) by either saving water or through substituting with alternative supplies such as reuse. This, in turn, frees up water supplies for other uses, such as new development, stored drought reserves, agricultural leases, and environmental uses (e.g. instream flows). Water efficiency is inclusive of water conservation and includes both system demands and customer water demands."

From the Colorado Water Conservation Board website: http://www.cwcb.state.co.us

6.1 - WATER EFFICIENCY GOALS AND POLICIES

Goal 6.1.1 – Identify strategies that can close the build-out (2060) gap.

Policy 6.1.1.1 – Prioritize actions and improvements to address water supply gaps.

Goal 6.1.2 – Promote opportunities to conserve water.

Policy 6.1.2.1 – Follow best management practices to maximize aquifer recharge, including supporting the use of greenway corridors, the maintenance of drainage ways in their natural state, and the avoidance of large amounts of impervious cover for recharge areas.

Policy 6.1.2.2 – Encourage and accommodate water conservation practices for existing and new developments.

Policy 6.1.2.3 – Encourage water providers to implement best management practices for reducing water demand. El Paso County will support best management practices for water management and conservation based upon information presented in the Colorado Water Plan, which can be utilized by the water suppliers.

6.1 - WATER EFFICIENCY GOALS AND POLICIES

Policy 6.1.2.4 – Review and revise, as appropriate, the standards of the various zoning districts to ensure they are consistent with promoting water-wise development.

Policy 6.1.2.5 – The County should consider incorporating water saving measures in all new County facilities and projects. The County should also consider retro-fitting fixtures and landscaping at older facilities with new, water-saving alternatives.

Policy 6.1.2.6 – Encourage utility master plans for new special districts to include water conservation measures.

Policy 6.1.2.7 – Support water resiliency plans prepared by water providers.

Policy 6.1.2.8 – Work with water districts, water and sanitation districts and metropolitan districts and private water suppliers to reduce residential water consumption.

Policy 6.1.2.9 – The County should coordinate with water providers to prepare a water conservation handbook to educate residents and businesses about ways to conserve water in their homes and businesses. The handbook should be accompanied by a public outreach program.

Policy 6.1.2.10 – Encourage water providers to develop and implement incentive packages and standards that reduce water demand and promote water conservation.

Policy 6.1.2.11 – Encourage water suppliers in the County to use reclaimed water for irrigation and other appropriate uses.

Policy 6.1.2.12 – Collaborate with home builders and developers on zoning code amendments that promote decreased water demand coupled with water conservation for residential developments where economical

Policy 6.1.2.13 – Support proposed developments that incorporate water efficiency measures for open spaces and lawns.

6.1 - WATER EFFICIENCY GOALS AND POLICIES

Policy 6.1.2.14 – Evaluate the potential for allowing variances/waivers to the County's 300 year rule as an incentive for developers to commit to best management practices, which may include (1) producing water only from the deeper aquifers for centralized distribution; (2) promoting conservation and efficiency through a water provider-established tiered rate structures, (3) reuse of captured wastewater to offset a portion of demand; and (4) adopting and ensuring enforcement of water efficient landscaping standards.

Goal 6.1.3 – Identify ways to provide landscaping flexibility in design where requiring strict compliance with the County's landscaping standards would be contrary to the goals of this Plan.

Policy 6.1.3.1 – Encourage new developments that incorporate water conservation techniques such as xeric landscaping.

Policy 6.1.3.2 – Provide developers with clear landscape guidance that results in attractive landscaping and reduced water requirements.

Policy 6.1.3.3 – Encourage sustainable landscaping that is tailored to the variations of climate zones across the County.

Policy 6.1.3.4 – Consider amending the Land Development Code to allow for modified landscaping options based on water source, available water supplies, and climate zones across El Paso County.

Policy 6.1.3.5 – Work with representatives of the landscape industry, along with property owners and managers, to promote incorporating water conservation measures for non-residential developments.

Policy 6.1.3.6 – Support lower system development fees (tap fees) for builders that use water efficient landscaping.

Local water providers have shifted their focus to water efficiency, and more consumers have begun limiting their water use. A number of tools for water efficiency are provided on CWCB's website, such as the 2012 *Municipal Water Efficiency Plan Guidance Document.* CWCB's Office of Water Conservation and Drought Planning (OWCDP) also provides both technical and financial assistance to entities throughout the State in backing their water efficiency planning efforts. Results show an increased use of efficient water fixtures and reduction of outdoor water use. In highlighting conservation and efficiency, the State released the *Guidebook of Best Practices for Municipal Water Conservation in Colorado* in 2012 that should be applied throughout El Paso County.

Methods by which water providers can be more efficient include:

- Implementing tiered block rates whereby customers must pay a higher rate for higher blocks of usage
- Promoting low flow faucets for residential homes within their service areas
- Promoting low flow faucets for commercial and industrial buildings within their service areas
- Promoting more effective irrigation/sprinkler systems for residential and commercial properties within their service areas

- Having an efficiency plan and funding to implement it
- Reusing water that is returned to their wastewater treatment plants (reuse to be discussed further in-depth in Section 6.2)
- Using non-potable water for irrigation of open spaces and landscaped areas
- Promoting public education to their customers
- Implementing and funding leak repair programs
- Encouraging higher residential densities

BEST PRACTICES

"Best practices" are developed to assist water providers in creating effective water efficiency programs backed by prior experience. In Colorado, the CWCB helps to fund water conservation planning and measurement implementation through the Water Efficiency Grant program. Best practices range from water management practices to improved efficiency steps and regulatory frameworks that have been proven to work across the United States. In the *Guidebook of Best Practices for Municipal Water Conservation in Colorado,* best practices are divided into four target categories:

1. Water System and Utility Best Practices
2. Outdoor Landscape and Irrigation Best Practices

3. Indoor Residential (single-family and multi-family) Best Practices
4. Indoor Non-Residential (commercial, industrial, and institutional) Best Practices

A water efficiency plan should be based on the Guidebook provided by the State, and should lay out the following tasks:

- Describe which conservation measures are going to be implemented
- Prioritize each conservation measure
- Write a detailed description of each conservation measure for public understanding
- Estimate the yearly water savings/outcome of the measure
- Estimate probable implementation costs
- Estimate probable cost savings for completing conservation measures
- Include an implementation cost description for public understanding
- Include a yearly cost description for maintaining the conservation measures

Best Management Practices (BMPs) are recommended voluntary practices undertaken to reduce water consumption and protect water resources and the natural environment. There are BMPs for residential, business, agricultural, commercial and industrial applications.

Implementation of any BMPs by water providers should be based on the implementing body's analysis of the costs and benefits for their service area. The following lists are from the CWCB website.

Residential and Business Applications include:

- Retrofitting with low-volume plumbing fixtures and devices
- Managing landscape irrigation
- Implementing conservation water rate structures
- Providing educational programs
- Using leak detection practices
- Implementing Xeriscape principles

Commercial and Industrial Applications include:

- Conducting water use audits
- Reading water meters regularly
- Inspecting and repairing boiler systems
- Recycling water in cooling towers for water reuse
- Replacing or retrofitting systems

EFFECTIVENESS

The first best practice highlighted in CWCB's Guidebook is the use of a water rate structure. A block rate structure is based upon higher charges for higher water usage and has been proven to be effective in lowering water usage for residential homes. Water providers can use a tiered system, which provides incentives for customers to use less, and those who use more pay a premium for excess water use and supply additional revenue to the utility. Tiered systems are common practice across Colorado, particularly along the Front Range, including El Paso County.

Another best practice highlighted in the CWCB Guidebook is the use of tap or connection fees, requiring an upfront payment to cover both water resources and facilities costs. The connection fees also allow utilities to ensure that new buildings will be constructed with water efficiency in mind, as tap fees can be lower when water efficient appliances are used. El Paso County is expecting significant population growth through 2060, along with commercial and industrial growth. The City of Westminster, Colorado's system to establish connection fees accounting for efficiency of business and irrigation use is cited as a good example. Water providers within El Paso County can follow this example with their own fee calculations.

Other practices that have been effective across the State are discussed in CWCB's *Best Practices Guidebook*. For example, the City of Longmont continually tracks its water loss so they can manage, and minimize, those system losses. Prevention of water waste in the City of Durango focuses on non-beneficial uses including landscape water, and eliminating sprinkler and sprays onto adjacent properties. Many projects across the State are highlighted and should be considered by El Paso County water providers.

EXISTING EL PASO COUNTY LANDSCAPING STANDARDS

Existing El Paso County landscaping standards and guidance are provided in Chapter 6 of the El Paso County Land Development Code (LDC) dated October, 2018 and the *Landscape and Water Conservation Manual* (Manual) dated November 8, 2006. A review of each document was completed to identify additional water conscious landscaping standards that would proactively balance increasing water demands with projected water availability. During the review the project team considered flexibility with respect to potential landscape standards based upon development location, water supplier limitations, and the needs of the current and future residents of El Paso County.

The purpose of Chapter 6 of the LDC is "to provide uniform standards for the development and maintenance of the landscaping of private property and public rights-of-way to achieve a balance between the individual right to develop and the general benefit and welfare of the community." The *Manual* is intended to supplement the LDC and "includes policies, explanations, examples and illustrations of methods that can be used to help an owner comply with the requirements of the LDC…the Manual will help ensure landscaping will have an increased survival rate; require

minimal maintenance; provide the greatest benefit for the dollars spent; work with and compliment the natural environment; and encourage water conservation."

A brief summary of the LDC and Manual landscape standards is provided below. For more information please refer to those documents. Other municipality and county landscaping benchmark reviews and findings can be found in the appendix of this WMP.

Flexibility

- In some cases, flexibility is provided for landscaping that does not meet requirements. Modifications may be approved by the Director on a case-by-case basis.
- Environmental Information and Resources Provided
- The Manual identifies that El Paso County is located in a semi-arid, high plains and foothills environment. Recommended landscaping materials, a Colorado noxious weed list, and xeriscape websites are provided.

Water Conservation Goals

- The Manual identifies that drought resistant and drought-tolerant plants, plus other water, soil, and conservation techniques, provide an opportunity for decreased development and maintenance costs while achieving the intent of the County's landscape requirements.

Applicability

- The LDC identifies that landscaping guidance applies to all land uses except for single-family, duplex buildings, and other uses not located within a planned unit development (PUD).

Plan Submittal Requirements and Qualifications

- Specific requirements on various topics (e.g., irrigation systems, soil preparation, fences, walls, hedges, roadways, parking lots, buffers, internal landscaping, minimum plant sizes, percentage of live material ground cover, mulch, zoning district boundary trees, refuse areas, loading docks, vehicular areas, areas between curbs and lots, utility easements, outside storage areas) are provided. All required landscaping shall be completed and inspected and approved prior to the issuance of Certificate of Occupancy by the Building Department or establishment of use, except when collateral is to acceptable guarantee the completion of the landscaping and is provided. Professional qualifications are not required for the preparation of landscape plans.

RECOMMENDED ENHANCEMENTS TO EL PASO COUNTY LANDSCAPING STANDARDS

The project team compared El Paso County landscaping standards to those of other entities, and considered input from the County staff and Steering Committee for recommending enhancements to the El Paso County landscaping standards. Recommendations are provided below for organization, goals and objectives; flexibility; environmental information and resources provided; water conservation goals; applicability; and plan submittal requirements and qualifications.

Organization, Goals, and Objectives

- In order to provide developers with clear landscape guidance, combine code and landscaping guidance into one expanded document.

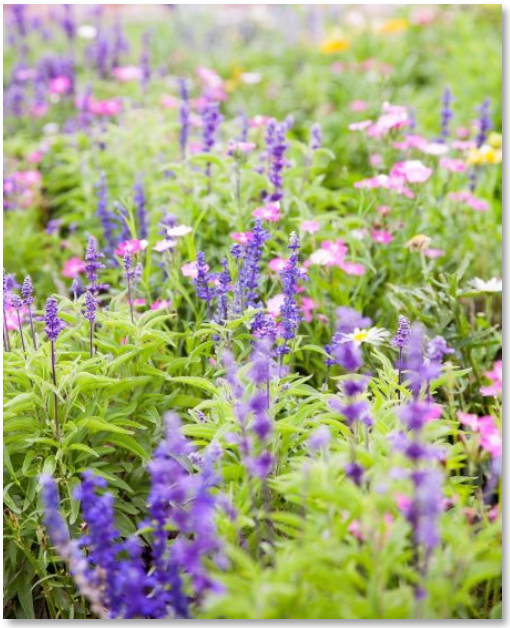
- Consider revising the Manual to a format similar to the Colorado Springs example, with codes presented followed by landscape guidance.

Flexibility

- Have a section on alternative relief and compliance.
- Identify what types of site conditions may preclude strict compliance with landscape requirements (e.g., specific site or space limitations, power lines, pipelines).
- Expand flexibility language to clearly address situations where administrative relief is appropriate (e.g., portions of El Paso County with inadequate water supply for landscaping or where meaningful conservation measures have been implemented on a larger scale).
- Identify procedures for obtaining administrative relief and require in-lieu compensation, as appropriate.

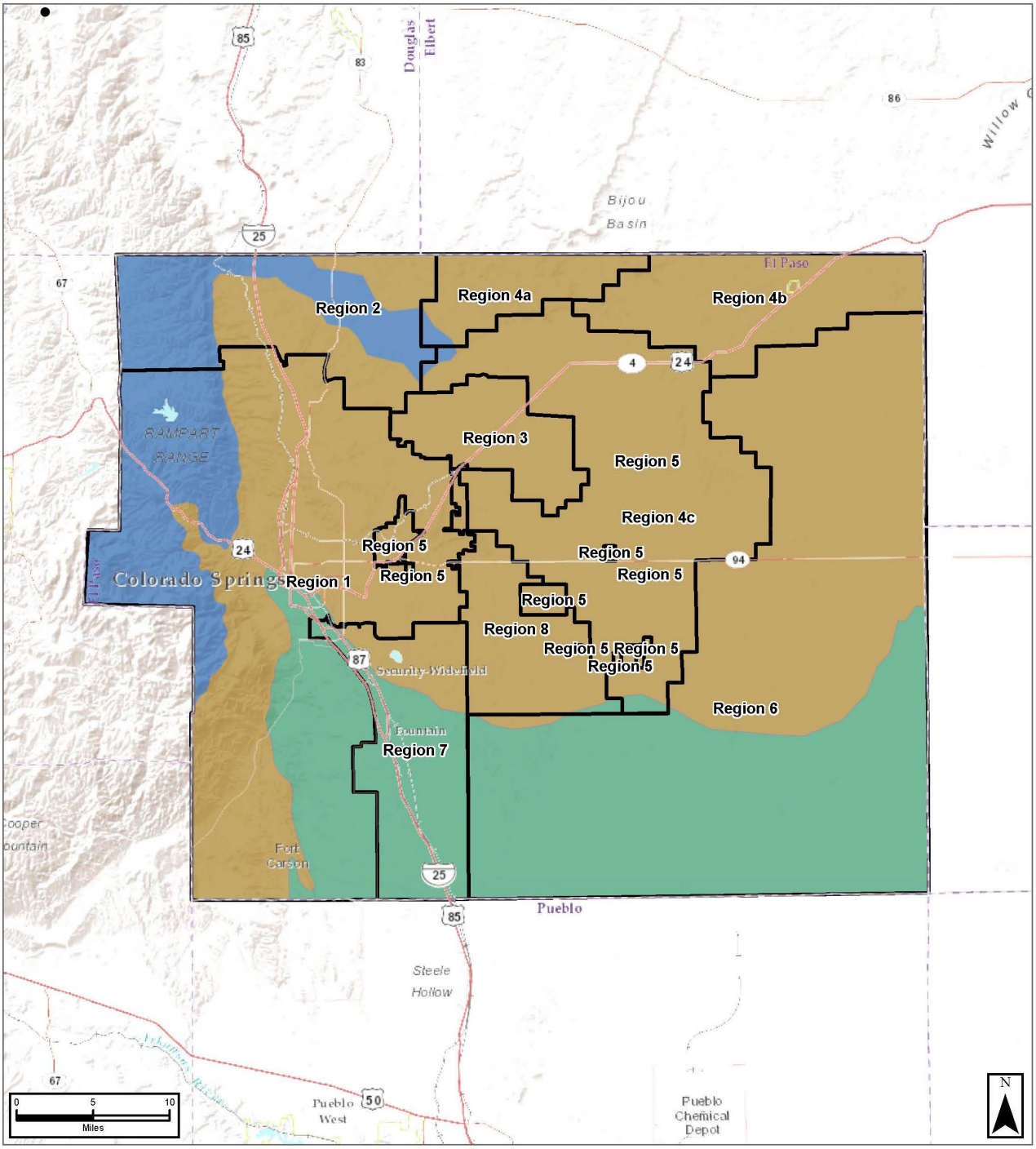
Environmental Information and Resources Provided

- Additional information on natural environments within El Paso County could be provided. Three example maps are included in this section that depict different levels of existing natural environment information available for El Paso County. The first example is from the Natural Resources Conservation Service (Figure 6-1) which reflects Major Land Resource Areas. A second example is from the Environmental Protection Agency and reflects various ecoregions within El Paso County, (Figure 6-2). The third example shows LANDFIRE existing vegetation community types (Figure 6-3). These examples provide a good starting point in developing natural environment information useful for developers and landscape architects during landscape plan preparation.
- Corresponding plant lists could be developed that would be appropriate for specific conditions of each natural environment.
- Expand artificial turf language to clearly address what type of materials can be used, and where it can be used. Consideration should be given to using a dry landscape option checklist similar to Mesa County.
- Expand xeriscape principal information.



Water Efficiency Goals

- The expanded document would have a section on water efficiency goals based on CWCB guidance documents and BMPS.
- Water reuse and efficiency would be addressed within the water conservation goals section.
- Identify incentives for water efficiency (e.g., lower system development fees [tap fees] for builders that install water efficient landscapes, and allow higher density development for those that optimize their water supplies though reuse and conservation).



Planning Region Boundaries

Major Land Resource Areas

- Central High Plains, Southern Part
- Southern Rocky Mountain Foothills
- Southern Rocky Mountains
- Upper Arkansas Valley Rolling Plains

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Figure 6-1

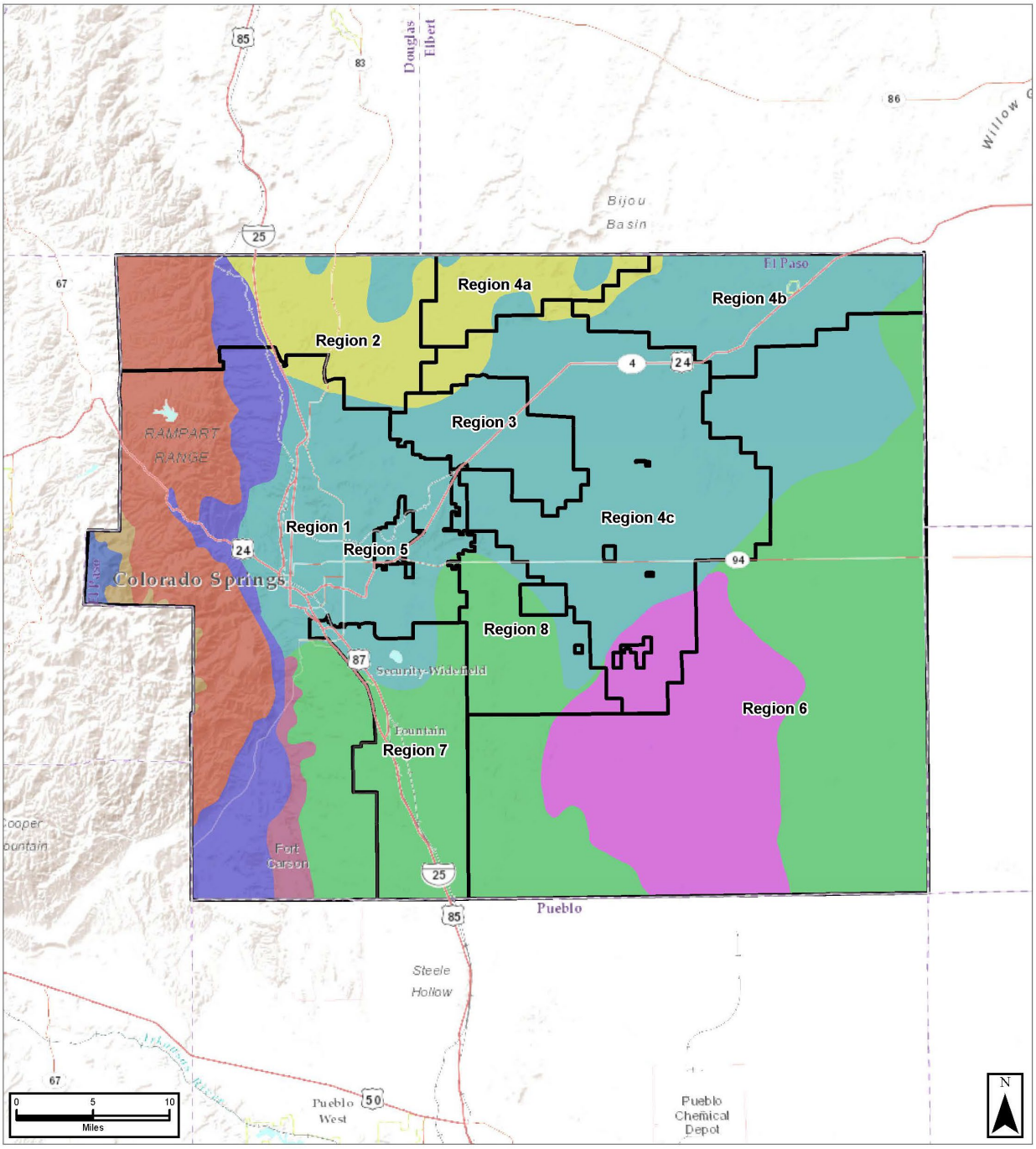
EL PASO COUNTY

NRCS MAJOR LAND RESOURCE AREA

LeonardRice ENGINEERS, INC.

1543FGA01
8/2/2018

Sources: NRCS MLRA 2006 database version 4.2, Esri Basemap
Path: U:\1543FGA01_ElPasoCounty\00_GIS\MXD\Environmental\MLRA_Classes.mxd



Planning Region Boundaries

EPA Ecoregions

- Alpine Zone
- Crystalline Mid-Elevation Forests
- Crystalline Subalpine Forests
- Foothill Grasslands
- Foothill Shrublands
- Piedmont Plains and Tablelands
- Pine-Oak Woodlands
- Pinyon-Juniper Woodlands and Savannas
- Sandsheets

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Figure 6-2
EL PASO COUNTY

EPA ECOREGIONS MAP

LeonardRice ENGINEERS, INC.

1543FGA01
8/2/2018

Sources: EPA Level IV Ecoregions, Esri Basemap
Path: U:\1543FGA01_ElPasoCounty\00_GIS\MXD\Environmental\EPA_Ecoregions.mxd

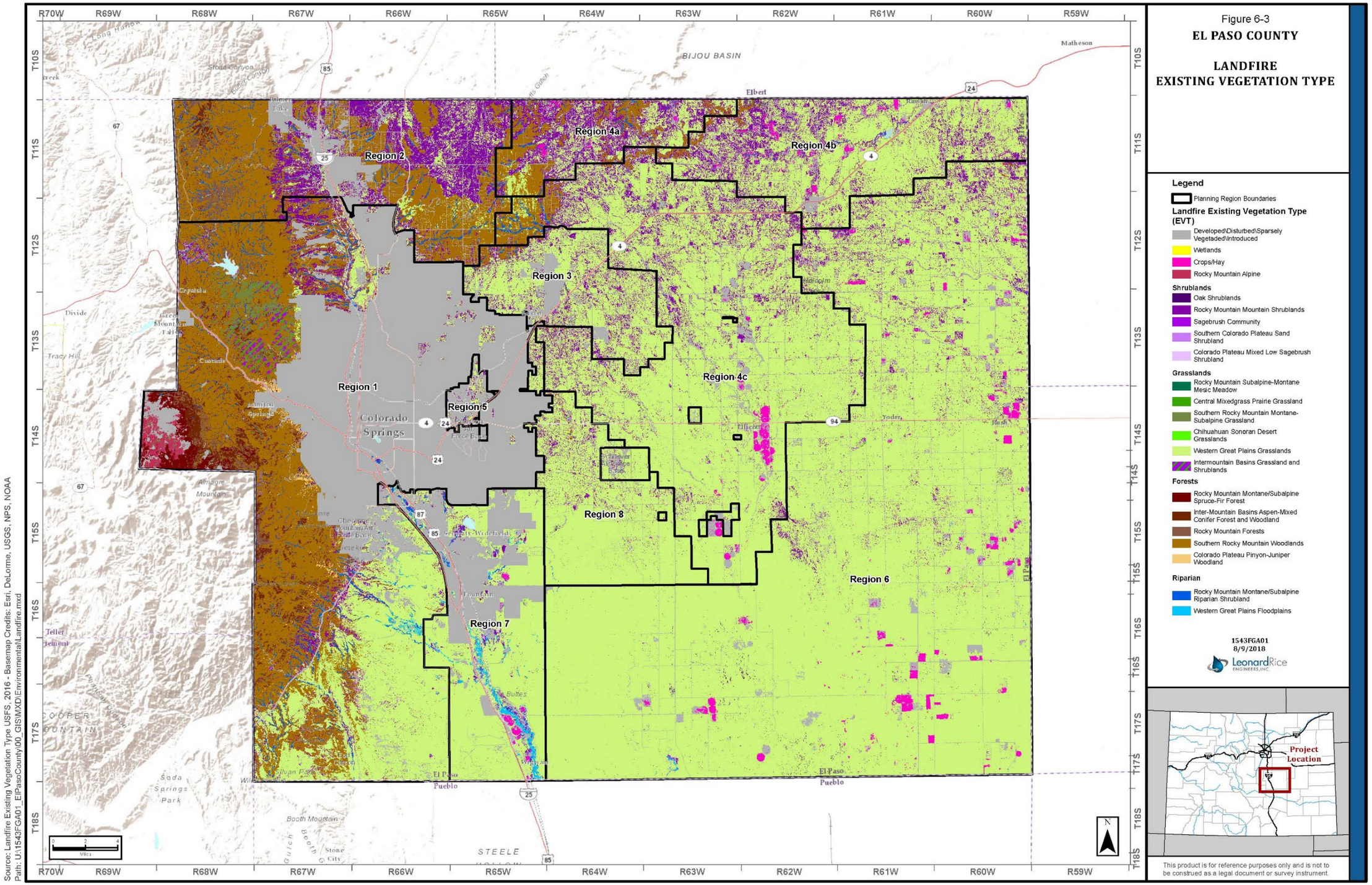
Figure 6-3
EL PASO COUNTY
LANDFIRE
EXISTING VEGETATION TYPE
Legend
Planning Region Boundaries
Landfire Existing Vegetation Type (EVT)
Developed\Disturbed\Sparsely Vegetaded\Introduced
Wetlands
Crops/Hay
Rocky Mountain Alpine
Shrublands
Oak Shrublands
Rocky Mountain Mountain Shrublands
Sagebrush Community
Southern Colorado Plateau Sand Shrubland
Colorado Plateau Mixed Low Sagebrush Shrubland
Grasslands
Rocky Mountain Subalpine-Montane Mesic Meadow
Central Mixedgrass Prairie Grassland
Southern Rocky Mountain Montane-Subalpine Grassland
Chihuahuan Sonoran Desert Grasslands
Western Great Plains Grasslands
Intermountain Basins Grassland and Shrublands
Forests
Rocky Mountain Montane/Subalpine Spruce-Fir Forest
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland
Rocky Mountain Forests
Southern Rocky Mountain Woodlands
Colorado Plateau Pinyon-Juniper Woodland
Riparian
Rocky Mountain Montane/Subalpine Riparian Shrubland
Western Great Plains Floodplains
1543FGA01
8/9/2018
LeonardRice ENGINEERS, INC.
Project Location
This product is for reference purposes only and is not to be construed as a legal document or survey instrument.
Region 1
Region 2
Region 3
Region 4a
Region 4b
Region 4c
Region 5
Region 6
Region 7
Region 8
BIJOU BASIN
Colorado Springs
Elbert
Matheson
Yoder
Ellicott
Fountain
Pueblo
El Paso
Teller
Fremont
Crystola
Divide
Tracy Hill
Cascade
Green Mountain Falls
Almagre Mountain
Cheyenne Mountain Air Force Base
Security-Widefield
Soda Springs Park
Booth Mountain
Stone City
STEELE
COOPER MOUNTAIN
R70W
R69W
R68W
R67W
R66W
R65W
R64W
R63W
R62W
R61W
R60W
R59W
T10S
T11S
T12S
T13S
T14S
T15S
T16S
T17S
T18S
Source: Landfire Existing Vegetation Type USFS, 2016 - Basemap Credits: Esri, DeLorme, USGS, NPS, NOAA
Path: U:\1543FGA01_ElPasoCounty\00_GIS\MXD\Environmental\Landfire.mxd

Applicability

- Consider promoting landscaping standards for residential as well as commercial development.
- The expanded document could have a section that addresses applicability. This section could be combined with alternative relief and compliance.

Plan Submittal Requirements and Qualifications

- Consider requiring professional qualifications for landscape plan development.
- The expanded document could have a section that clearly addresses plan submittal requirements and compliance processes.

6.2 - WATER REUSE

Reuse can be an important component of water supply planning, and as such it is important to note that some water providers have already implemented, or are planning to implement, reuse strategies. Reuse water can provide a great boost to a water provider's supply portfolio.

6.2 - WATER REUSE GOALS AND POLICIES

Goal 6.2.1 – Increase regional water reuse and conservation to better optimize available water supplies.

Policy 6.2.1.1 – Support efforts by water providers to effectively and environmentally implement potable and non-potable water re-use including augmentation.

Policy 6.2.1.2 – Encourage re-use of treated wastewater for irrigation and other acceptable uses when economically feasible.

Policy 6.2.1.3 – Consider opportunities to demonstrate the benefits of using non-potable sources of water and to dispel negative attitudes.

Policy 6.2.1.4 – Encourage land uses which accommodate the reuse of water including capture of non-consumptively used water within the basin and use of reclaimed water for irrigation, within legal parameters and providing that water quality is maintained.

Policy 6.2.1.5 – Support plans for the siting of additional treatment plants or modification of existing facilities to allow for more effective use of non-potable water and to promote plans for responsible aquifer recharge.

Policy 6.2.1.6 – Consider higher residential densities for new developments, in appropriate locations, where such developments will be served by water providers that are optimizing their supplies through established reuse and conservation measures.

Policy 6.2.1.7 – Options for the use of non-potable water and further research into the use of reclaimed water and renewable options should be explored

6.2 - WATER REUSE GOALS AND POLICIES

Goal 6.2.2 – Fully reuse all water that can be economically reused.

Policy 6.2.2.1 – The County should not object to efforts by water providers to increase their ability to sell or share reuse water supplies as long as non-renewable resources are not affected.

TYPES OF WATER REUSE

Water reuse in Colorado allows users to maximize the use of their limited water supplies. Reuse is commonly treated wastewater that is recycled to be used more than once before entering back into the water cycle. One way to reuse water is to treat it to potable water standards and store it underground during wet seasons, and then extract it during dry seasons. This is called Aquifer Storage and Recovery (ASR), and it can be accomplished with little to no evaporative or transmission losses (see Figure 6-4).

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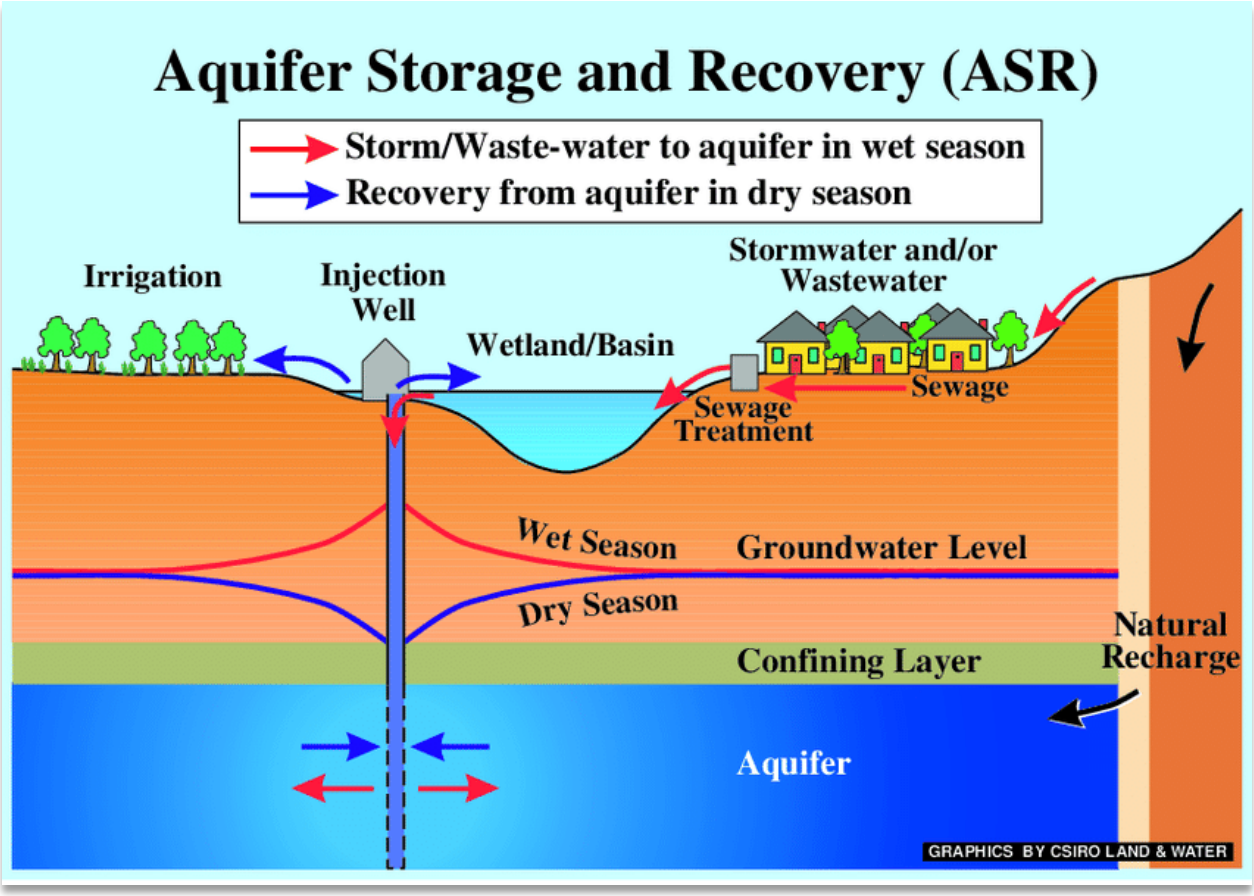


Figure 6-4: Aquifer Storage and Recovery (ASR)

Non-tributary water (typically Denver Basin Groundwater) allows reuse because there are no downstream claims, allowing for almost double the use of water returned to the system. The two main types of water reuse are potable and non-potable reuse (See Figure 6-5). Non-potable reuse is the use of reclaimed water for purposes other than drinking, and is commonly used for irrigation and in industrial sectors.

Potable reuse is recycled water that is treated and purified to meet or exceed federal and state drinking water standards. Potable reuse has two separate categories - indirect and direct reuse. Indirect potable reuse is treated water that is blended through an environmental buffer such as a river, reservoir, or groundwater basin. Direct potable reuse is treated wastewater that is connected directly into a water distribution system. There are no direct potable reuse projects in place or imminent in the State of Colorado.

Water reuse used to satisfy augmentation requirements is another way water is able to be recycled in Colorado. Surface water augmentation is the process of extracting a certain amount of water upstream of a wastewater treatment plant outlet with planned return of the same exact amount of water from wastewater effluent, thus balancing what is taken out of the river with what is put back into the river. Therefore, the downstream senior water rights users still have the same amount of water available and the treated water has been introduced into an environmental buffer for later use. A great source of information regarding reuse can be found online at: www.watereusecolorado.org

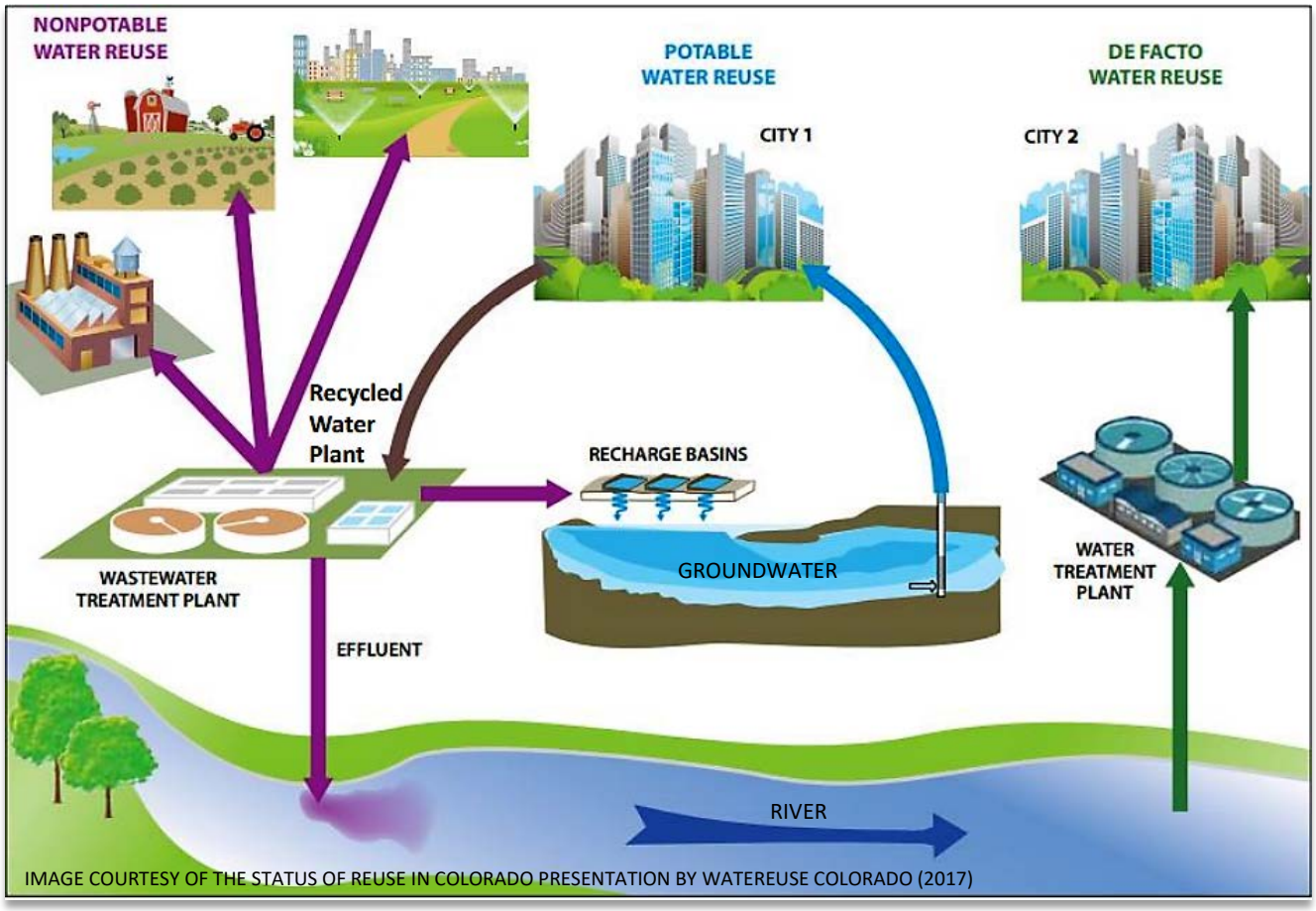


Figure 6-5: Water Reuse Types

CURRENT REUSE

Augmentation use of treated wastewater return flows is a longstanding practice throughout the State, including in El Paso County. But the County's water providers have been working to implement other water reuse programs over the past few years.

CMD Water Reclamation Facility

One example is that of indirect potable reuse by Cherokee Metropolitan District (CMD). CMD currently uses their groundwater aquifers as environmental buffers for their indirect potable reuse system. CMD owns and operates a Water Reclamation Facility (WRF) which treats wastewater, and the reclaimed water is then used to recharge the Upper Black Squirrel Creek Basin's alluvial aquifer. The recharged water is then pumped from wells downgradient of the recharge site, before being chlorinated and returned to the drinking water distribution system.

Colorado Springs Utilities has a long-standing system for direct use of treated wastewater. Non-potable water is currently used for irrigating parks, cemeteries, and golf courses. Colorado Springs Utilities' system incorporates both direct and indirect supplies, including reclaimed wastewater, raw surface water, and groundwater for non-potable uses.

Another example of reuse is the use of non-potable water in cooling towers at the Drake Power Plant in Colorado Springs. Treated wastewater is also discharged into Fountain Creek upstream of the Widefield aquifer. This indirect potable reuse uses Fountain Creek and that aquifer as a buffer. Water is then pumped from the Widefield aquifer and treated before use in the area's drinking water distribution systems.

PLANNED REUSE

In 2016, the Town of Monument and Woodmoor Water & Sanitation District released a joint water reuse plan. The main goals of the planned reuse system are highlighted below:

- Provide the ability to reclaim water, use nonrenewable water supplies more efficiently in the short term and use nonrenewable supplies in the long term.
- Extend the service life of existing wells that utilize the Denver Basin aquifers.
- Avoid or postpone construction of new wells into the Denver Basin aquifers.
- Address potential water quality issues of groundwater in this area, including high iron and manganese, by filtering those elements out of the water.

The plan includes the use of Monument Lake and Monument Creek as environmental buffers for indirect potable reuse. Water would then be pumped from Monument Creek to a new treatment plant and then pumped into the drinking water distribution system.

Another area water provider is considering using direct potable reuse (DPR) advanced treatment. Direct potable reuse has not been implemented in Colorado, but regulations governing its use are being drafted by the state health department.

6.3 - REGIONAL WATER SUPPLY PLANS

Several water providers within the County have banded together to form larger partnerships to develop plans to bring additional water into the County and their individual service areas. These include entities involved in the Fountain Valley Authority, Southern Delivery System, Pikes Peak Regional Water Authority Water Infrastructure Plans and the Widefield Aquifer.

6.3 - REGIONAL WATER SUPPLY PLANS GOALS AND POLICIES

Goal 6.3.1 – Secure and deliver additional long-term water supplies.

Policy 6.3.1.1 – Support the development of environmentally sensitive and safely designed surface water impoundments if these serve to enhance local water supply or service capability.

Policy 6.3.1.2 – Work with water providers to identify regional opportunities and barriers.

Policy 6.3.1.3 – Encourage water providers to pursue additional water storage opportunities, including surface storage as well as storage in both bedrock and alluvial aquifers.

Goal 6.3.2 – Identify applications for renewable water partnerships.

Policy 6.3.2.1 – Support mutually beneficial arrangements among water providers and consumers to reduce cost and protect the County's groundwater and environment.

Policy 6.3.2.2 – Encourage formal agreements among water districts to mitigate potential water supply shortages among individual suppliers.

Policy 6.3.2.3 – Periodically review this Water Master Plan by convening a publicly accountable group, such as the El Paso County Water Master Plan Steering Committee, or arranging a collaborative review with the Pikes Peak Regional Water Authority.

Policy 6.3.2.4 – Encourage the consolidation of regional water and sanitation systems over the proliferation of smaller, individual systems

Policy 6.3.2.5 – Consider public-private partnerships to upsize utility infrastructure to meet potential growth demand.

6.3 - REGIONAL WATER SUPPLY PLANS GOALS AND POLICIES

Policy 6.3.2.6 – Support collaborative coordination with water providers during the design and construction of water infrastructure and public roadways.

Policy 6.3.2.7 – Water providers should pursue coordination efforts to align regional water conservation, quality, and infrastructure goals

FOUNTAIN VALLEY AUTHORITY

The Fountain Valley Authority (FVA) system is operated by Colorado Springs Utilities, receiving their water supply from the Fryingpan-Arkansas Project. Water supplies are brought to the east side of the Continental Divide through a series of tunnels and pipes before being collected in Pueblo Reservoir. Water is then piped through the Fountain Valley Authority Pipeline to one of the FVA water treatment plants. The FVA pipeline was finished in 1986 and consists of 38 miles of trunk line and 10 miles of laterals. The system is fully subscribed and provides 20,100 AF per year of water used for municipal, domestic, and industrial uses. Members include Colorado Springs Utilities, Stratmoor Hills, Widefield, Security, and the City of Fountain.

SOUTHERN DELIVERY SYSTEM

The Southern Delivery System (SDS) allows for water to be moved from Pueblo Reservoir to Colorado Springs Utilities service area and their three partner entities: Pueblo West Metropolitan District, City of Fountain, and Security Water District. The pipeline conveys water supplies stored in Pueblo Reservoir El Paso County's most populous areas. Phase I, completed in 2016, allows the transportation of 50 million gallons per day (MGD). The project will ultimately be expanded to a final capacity of 78 million gallons per day (MGD).

The SDS project carries water approximately 50 miles and is improved with pump stations. The system delivers water to a state-of-the-art treatment plant located near Highway 24 and Marksheffel Roadway, with the capacity to treat 50 MGD using ozone and biological filtration. The SDS is operated by Colorado Springs Utilities and has been sized to meet future demands. SDS is currently permitted to provide delivery services for Colorado Springs, Pueblo West, Fountain, and Security. The Project also provides system delivery redundancy for project participants (See Figure 6-6).

PPRWA WATER INFRASTRUCURE PLANS

The Pikes Peak Regional Water Authority (PPRWA) in El Paso County is made up of a number of water providers that are reliant upon non-renewable Denver Basin groundwater. Seven water providers joined together to complete a PPRWA Regional Infrastructure Study (completed by Forsgren in 2015). Their plan is to develop a system that promotes more efficient use of water,

and gains access to renewable water supplies from the Arkansas River. The seven water providers are:

- Town of Palmer Lake
- Town of Monument
- Woodmoor Water and Sanitation District
- Donala Water and Sanitation District
- Triview Metropolitan District
- Cherokee Metropolitan District
- City of Fountain

PPRWA's plans call for reservoir storage, water transmission pipelines, pump stations, and treatment plants in three project areas extending across a 70-mile corridor. The system would allow water to be delivered from the Arkansas River to meet needs as far north as Monument and Palmer Lake. Water would be exchanged from Stonewall Springs, along the Arkansas River, to Fountain-area gravel pit storage. That water could then be pumped north to a reservoir site in the Monument area (See Figures 6-7 and 6-8).

From a reservoir site in the Monument area, water providers could draw water, treat it to drinking water standards, and distribute it to their customers. The City of Fountain and Cherokee Metropolitan District could also get water from the system and treat and deliver it to their customers.

Overall, the PPRWA members hope to create a regional system to secure water supplies and build delivery systems for future residents. With Monument and Fountain Creek being the only significant renewable water source for these water providers, and those sources being over-appropriated, the need for additional water in the area is a high priority for members of the PPRWA.

WIDEFIELD AQUIFER

The Widefield Aquifer is located in the alluvium of Fountain Creek, south of Colorado Springs. The aquifer is a highly permeable section of Fountain Creek ranging from 30 to 35 feet in depth. The aquifer has a number of wells accessing supplies that provide water to surrounding areas, including Security Water District, Stratmoor Hills Water District, Widefield Water and Sanitation District, and the City of Fountain. These areas include approximately 65,000 residents who use this aquifer for their drinking water supply. The aquifer is continually recharged from the flows of Fountain Creek and creates a reliable source of renewable water (See Figure 6-9).

As discussed previously in Section 4, perfluorinated compounds (PFCs) were found in the Widefield Aquifer at levels exceeding the 2016 EPA health advisory levels, causing several water providers to shut down their Widefield wells. The water providers affected use of alternative supplies where possible, and they are now adding treatment equipment to meet the EPA advisory levels. The contamination of the Widefield Aquifer underscores the importance for water providers to have more than one supply service.

EMERGENCY CONNECTIONS

One way that water providers can work together is by having an emergency waterline interconnection to another water provider where possible. In case of an emergency - such as a major waterline break, a water tank failure, or a major wildland or grassland fire in or near their service area - a water provider may find themselves without sufficient water supply to address the emergency. With a waterline interconnection, however, a water provider may receive additional short-term water supply flows from a neighboring water provider.

This exact scenario played out recently when a water provider in the Monument area had a major waterline break that couldn't be found for several days. The water provider's reserves fell dangerously low, to the point that water service was interrupted. However, due to the fact that the water provider had an emergency interconnection with another water provider that could provide sufficient potable water, a major disaster was avoided. This cooperation between water providers won an award at the 2017 Special District Association (SDA) meeting. In the Monument area, Donala Water and Sanitation District has interconnections to Colorado Springs Utilities and Triview Metropolitan District. Colorado Springs Utilities also has interconnections to Cherokee Metropolitan District.

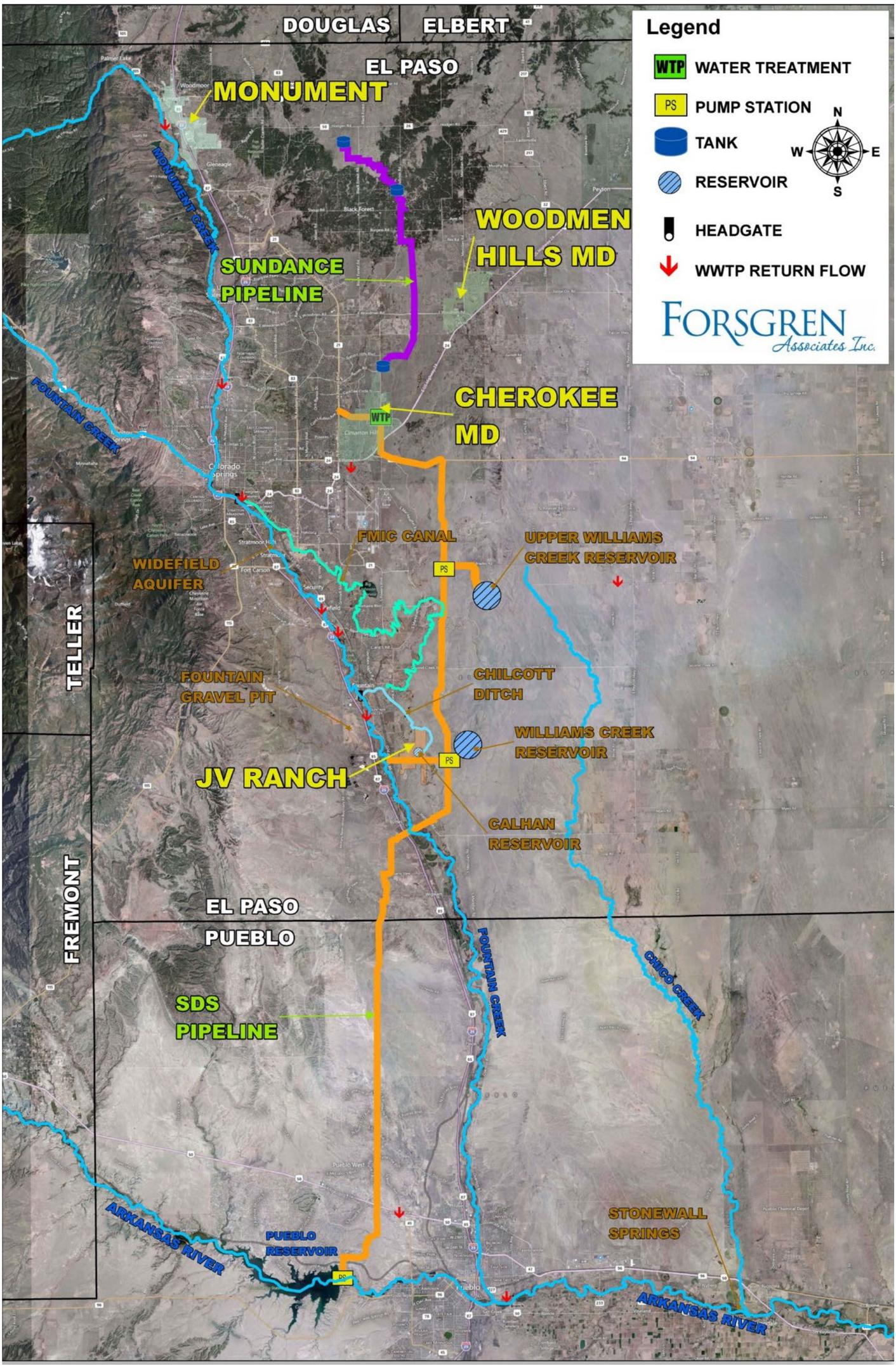
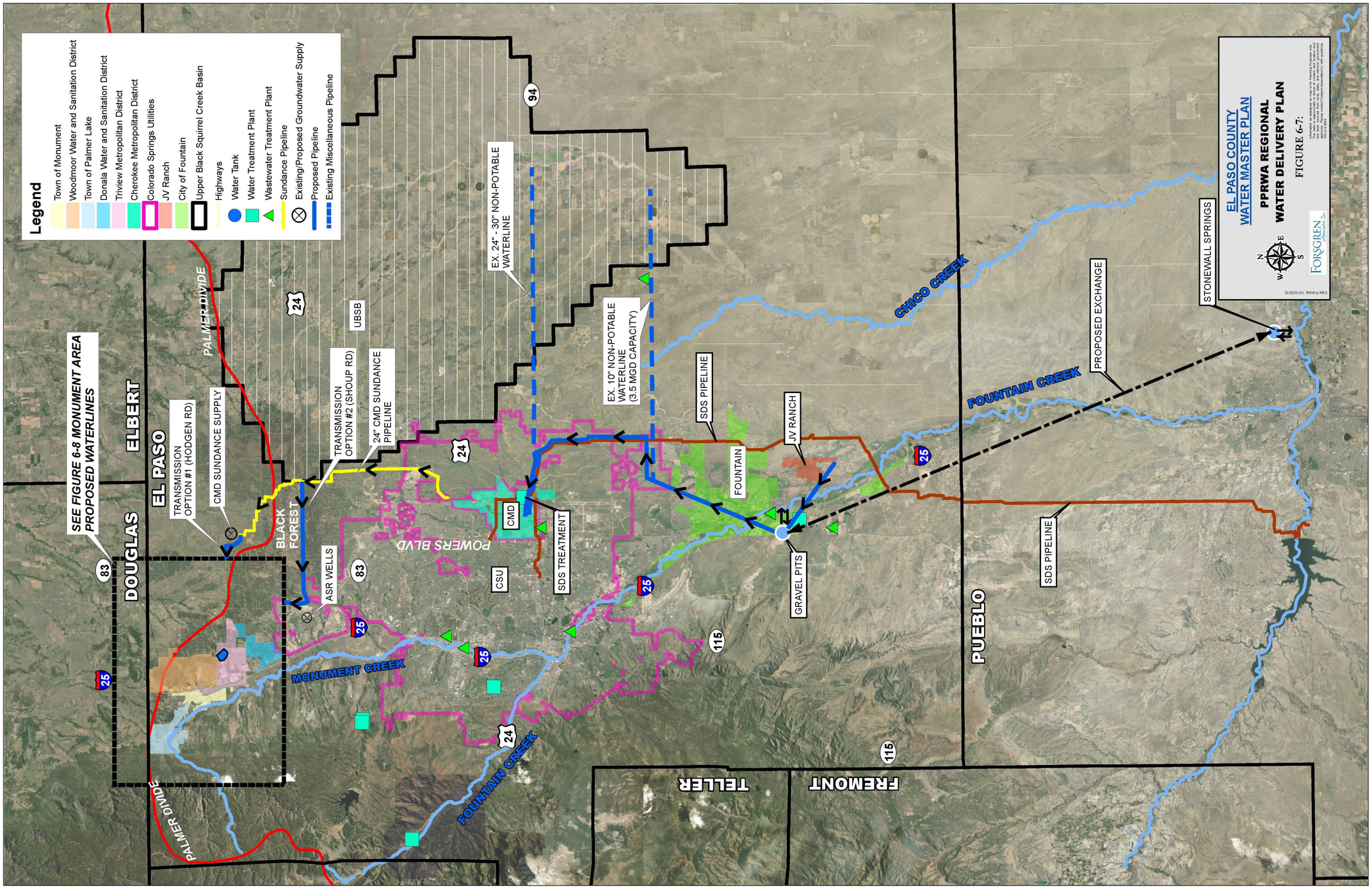
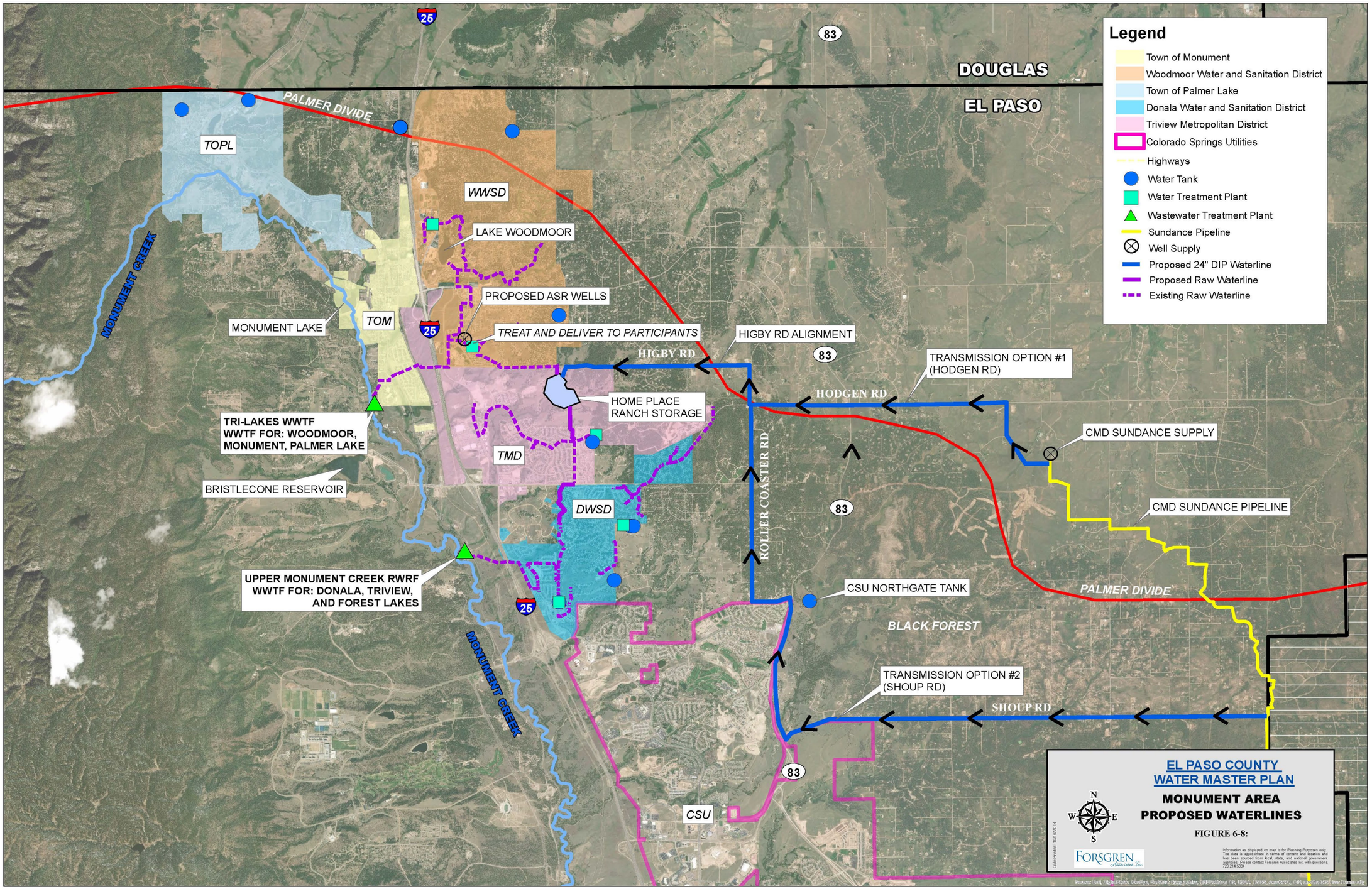


Figure 6-6: Southern Delivery System


Legend
Town of Monument
Woodmoor Water and Sanitation District
Town of Palmer Lake
Donala Water and Sanitation District
Triview Metropolitan District
Cherokee Metropolitan District
Colorado Springs Utilities
JV Ranch
City of Fountain
Upper Black Squirrel Creek Basin
Highways
Water Tank
Water Treatment Plant
Wastewater Treatment Plant
Sundance Pipeline
Existing/Proposed Groundwater Supply
Proposed Pipeline
Existing Miscellaneous Pipeline
SEE FIGURE 6-8 MONUMENT AREA PROPOSED WATERLINES
DOUGLAS
EL PASO
ELBERT
PALMER DIVIDE
TRANSMISSION OPTION #1 (HODGEN RD)
CMD SUNDANCE SUPPLY
TRANSMISSION OPTION #2 (SHOUP RD)
24" CMD SUNDANCE PIPELINE
UBSB
BLACK FOREST
ASR WELLS
EX. 24" - 30" NON-POTABLE WATERLINE
EX. 10" NON-POTABLE WATERLINE (3.5 MGD CAPACITY)
SDS PIPELINE
JV RANCH
FOUNTAIN
CMD
SDS TREATMENT
CSU
POWERS BLVD
GRAVEL PITS
CHICO CREEK
FOUNTAIN CREEK
MONUMENT CREEK
PROPOSED EXCHANGE
STONEWALL SPRINGS
PUEBLO
TELLER
FREMONT
EL PASO COUNTY
WATER MASTER PLAN
PPRWA REGIONAL
WATER DELIVERY PLAN
FIGURE 6-7:
FORSGREN Associates Inc.


Legend
Town of Monument
Woodmoor Water and Sanitation District
Town of Palmer Lake
Donala Water and Sanitation District
Triview Metropolitan District
Colorado Springs Utilities
Highways
Water Tank
Water Treatment Plant
Wastewater Treatment Plant
Sundance Pipeline
Well Supply
Proposed 24" DIP Waterline
Proposed Raw Waterline
Existing Raw Waterline
DOUGLAS
EL PASO
PALMER DIVIDE
TOPL
WWSD
LAKE WOODMOOR
PROPOSED ASR WELLS
TREAT AND DELIVER TO PARTICIPANTS
MONUMENT LAKE
TOM
MONUMENT CREEK
HIGBY RD
HIGBY RD ALIGNMENT
HODGEN RD
TRANSMISSION OPTION #1 (HODGEN RD)
HOME PLACE RANCH STORAGE
TRI-LAKES WWTF
WWTF FOR: WOODMOOR, MONUMENT, PALMER LAKE
TMD
BRISTLECONE RESERVOIR
DWSD
ROLLER COASTER RD
CMD SUNDANCE SUPPLY
CMD SUNDANCE PIPELINE
UPPER MONUMENT CREEK RWRF
WWTF FOR: DONALA, TRIVIEW, AND FOREST LAKES
CSU NORTHGATE TANK
PALMER DIVIDE
BLACK FOREST
TRANSMISSION OPTION #2 (SHOUP RD)
SHOUP RD
CSU
EL PASO COUNTY
WATER MASTER PLAN
MONUMENT AREA
PROPOSED WATERLINES
FIGURE 6-8:
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W
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FORSGREN Associates Inc.

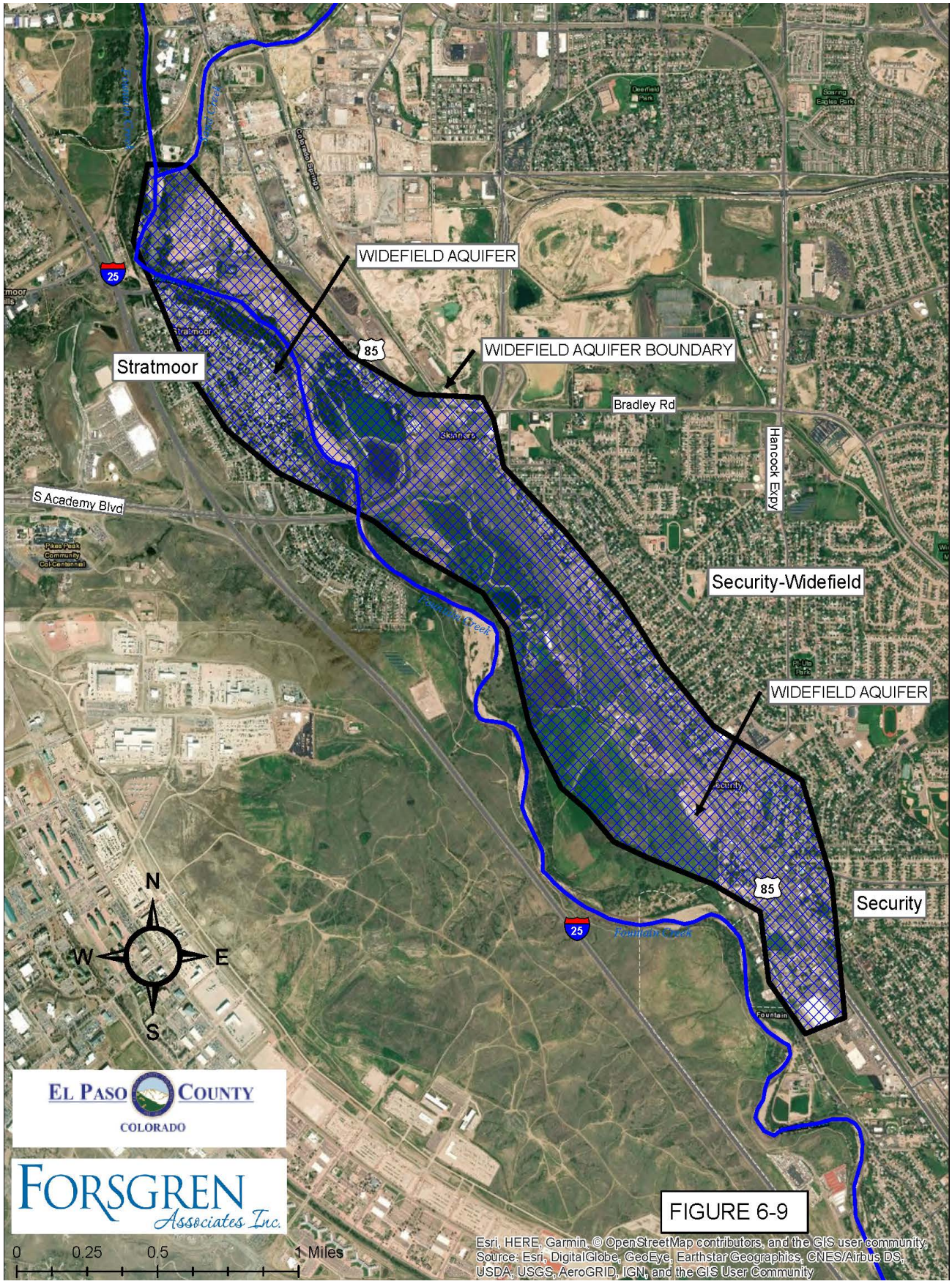
WIDEFIELD AQUIFER
WIDEFIELD AQUIFER BOUNDARY
Stratmoor
Security-Widefield
WIDEFIELD AQUIFER
Security
Bradley Rd
Hancock Expy
S Academy Blvd
Fountain Creek
Skinners
Security
Fountain
25
85
N
W
E
S
EL PASO COUNTY
COLORADO
FORSGREN Associates Inc.
0 0.25 0.5 1 Miles
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FIGURE 6-9

6.4 Renewable Water Development

This section describes use of water rights with respect to the health, safety, and welfare of the residents of El Paso County. In 1986, the BOCC approved a subdivision regulation that all Denver Basin groundwater needed to meet a "300-year rule" for withdrawal rates for all unincorporated property in the County not receiving water from another source. Thus, whatever the State determined the water right quantity to be for a specific piece of property, based on a 100-year life, that water right needs to be divided by three to theoretically last for 300 years. This rule limits the amount of water that can be committed to support new development (see Appendix F).

6.4 - RENEWABLE WATER DEVELOPMENT GOALS AND POLICIES

Goal 6.4.1 – Promote diversified, sustainable water portfolios for new development, reducing their reliance on a single source of supply.

Policy 6.4.1.1 – Promote "conjunctive use" of water, favoring use of renewable surface and alluvial supplies during wet and normal years balanced by using a greater share of nonrenewable Denver Basin supplies in dry years.

Policy 6.4.1.2 – Further evaluate modifications to the 300-Year Rule to incentivize best practices for water efficiency, water reuse, and development of renewable supplies.

Policy 6.4.1.3 – Consider allowing higher densities for developments served by water providers that have meaningful supplies of renewable water in their portfolios.

Policy 6.4.1.4 – Support efforts by water providers to obtain renewable water supplies through collaborative efforts and regionalization.

Policy 6.4.1.5 – Promote long-term planning by water providers for sustainable water supplies serving new development.

Policy 6.4.1.6 – Streamline the 1041 Regulations to favor projects related to delivery or development of renewable water in El Paso County.

In contrast to escalating costs and diminishing returns of adding more Denver Basin wells, a renewable water project generally allows for long-term cost control. Figure 6-10, which is based on an economic analysis by Woodmoor Water and Sanitation District, illustrates this point. Capital costs accumulate over a period of years needed to implement the renewable water project, but costs thereafter are only what is needed to operate and maintain the system. Reliance on nonrenewable water, however, results in ever-increasing costs as more wells are added, and each adds a smaller incremental capacity than the one before.

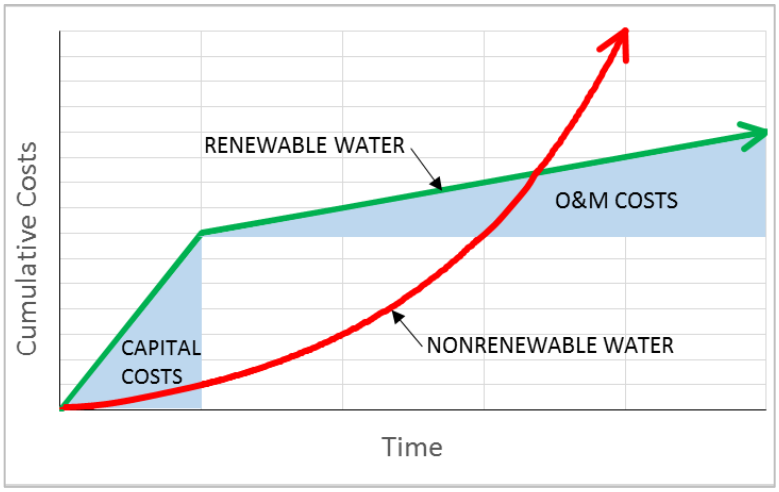

Figure 6-10: Long-term Cost Control

County 300-year Rule

Some of the projected water supply gap can be addressed by re-evaluating and improving upon the County's 300-year rule. In fact, a change to this rule may further encourage the development of renewable water supplies.

Based on a review of growth patterns throughout the County since the 300 Year Rule was approved in 1986, it appears that there have been no significant land use pattern changes. Low density development has continued to occur throughout the County. Development continues to occur where groundwater rights are available, and in areas where centralized water systems did not previously exist. Developers have been forming water districts to provide water based on groundwater rights in areas of the County where the land costs were the lowest. There is evidence that some of those districts cannot sustain any more growth as their water rights become depleted.

Based on review of developments since 1986, it appears that virtually no developer has developed or brought significant new sources of renewable water into the County. The main reason appears to be based on economics. All significant surface water resources within the County already have all of their water rights appropriated. Some water districts have bought remote supplies of renewable water, but with no real economic way of connecting that water to their system, unless they work together with other water providers. The cost of extending a major waterline from a renewable water source to a water service area can be prohibitive, and time consuming.

When a land use application is reviewed by County staff, this document can help both the applicant and the reviewer identify possible water supply issues early in the entitlement process. It is a benefit to both the applicant and the County to identify water issues earlier in the land entitlement process before significant funds are spent on a project through planning, engineering, surveying, acquisitions and other requirements associated with a project.

El Paso County understands that each landowner has property rights and, in many cases, those property rights include water rights. The County's goal is not to infringe on those rights, but to foster a sustainable place for people to live and work.

The County initiated discussions with the Steering Committee on how to incentivize water providers to supply renewable water to their customers, and reduce reliance on Denver Basin groundwater. As a result, the Steering Committee recommended that the County initiate a more thorough and technical review of the 300-year rule. It is understood that an assessment of the water supplies available in the Denver Basin aquifers would be needed as well as an evaluation of options for modifying the 300-year rule to further incentivize provision of renewable water resources.

Another topic that has been discussed to encourage renewable water development is to allow higher densities in areas served by renewable water, thus providing more tap fee revenue to water providers and lowering the overall water use per lot or unit. People use less water in higher density areas than do large single-family lots. This is largely due to the amount of irrigation water used for large lots. Figure 6-11, from Colorado Water Conservation Board (CWCB) Draft Technical Memorandum, "Calculating Per Capita Water Demand Savings and Density Increases to Residential Housing for Portfolio and Trade-off Tool", dated March 3, 2010, shows diminishing Gallons per Capita per Day (GPCD) reductions when increasing the density of dwelling units or lots.

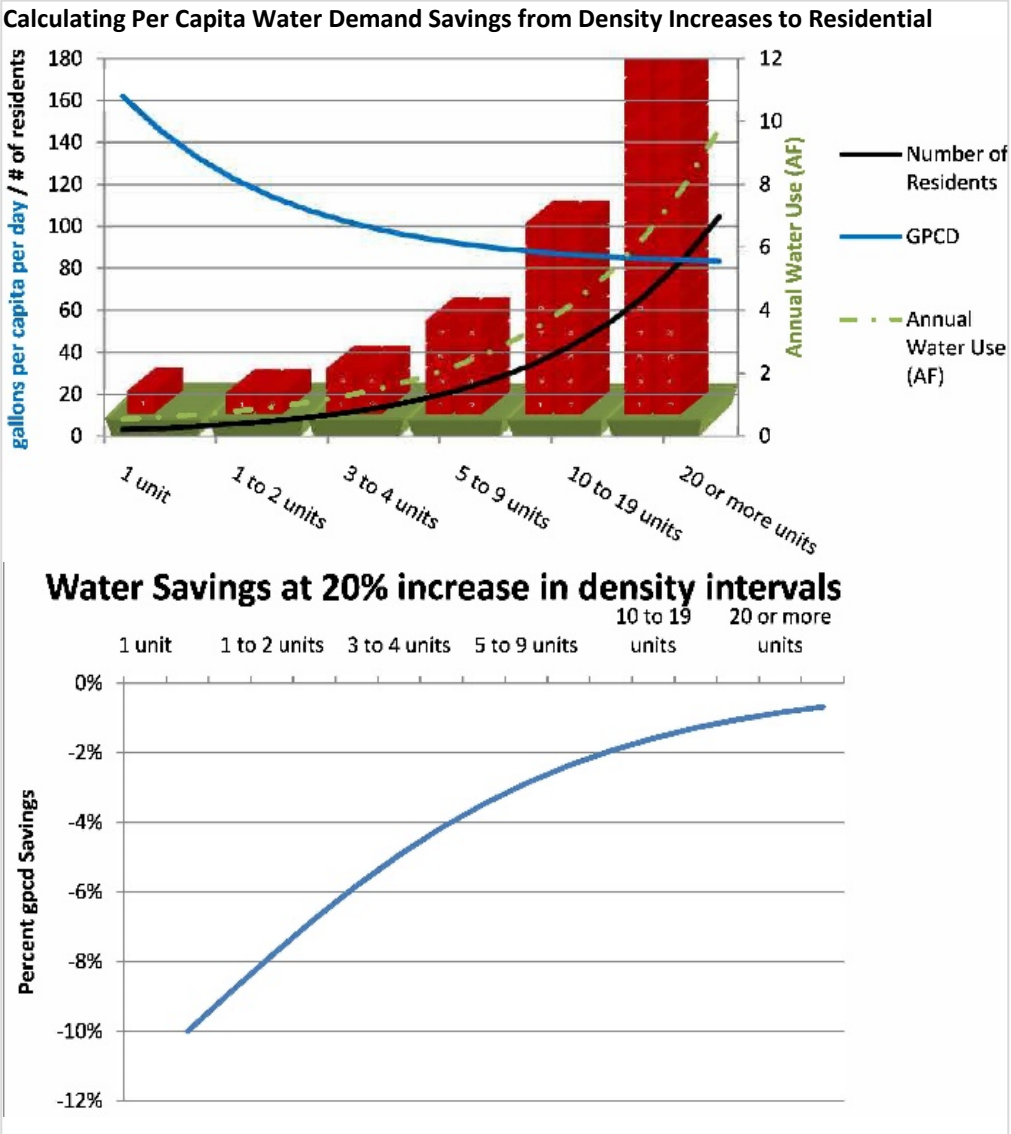

Figure 6-11: Density Technical Memo Details

Promote Diversified Water Portfolios

One of the overall goals of bringing in renewable water sources is to better diversify a water provider's portfolio. Many of the water providers in the County are solely supplied by Denver Basin groundwater. Ideally, a water provider could, at a minimum, supply enough water from a supplemental renewable source to meet their average yearly demands, and reserve their groundwater for drought or emergency conditions.

Water Imports

As El Paso County has limited renewable water resources, bringing in additional water from the Arkansas River system is vital to meeting the growth demands of the future. Colorado Springs Utilities has invested heavily in the required infrastructure to not only bring in Arkansas River water, but to provide transmountain diversion water as well.

Alluvial Storage

Alluvial storage is the method of storing water in a shallow alluvial deposit. Raw water can be stored for long periods of time and retrieved when needed. One great advantage of underground storage is that the water will not evaporate; however, each situation is unique and needs to be studied. Water can be introduced into an alluvial aquifer by way of an injection well or by infiltration basins.

Alluvial aquifer storage in the Upper Black Squirrel Creek Basin (UBSCB) was evaluated and summarized in the Upper Black Squirrel Creek Basin Aquifer Recharge and Storage Evaluation (Colorado Geological Survey, 2008). The findings in this report were used in evaluating and assessing the size of the southern portion of the UBSCB unsaturated portion of the alluvium. The unsaturated thickness varies from 1 foot to a maximum of 174 feet. A typical cross section of the UBSCB is presented in Figure 6-12.

The UBSCB is a valuable asset to El Paso County communities as a water storage option. It is highly recommended that water users in El Paso County continue working together to explore using the aquifer as a water storage option.

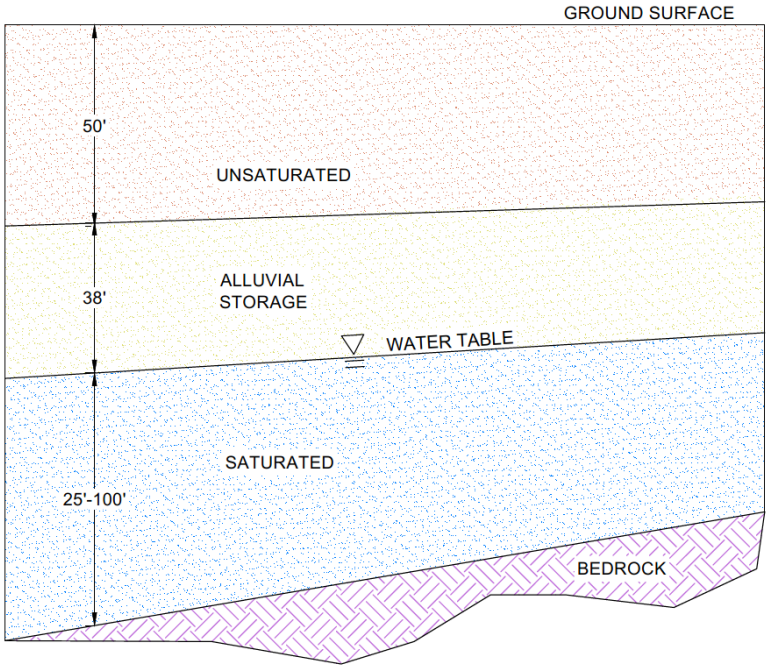

Figure 6-12: Typical Alluvial Storage Cross-Section

7 – Implementation

7 - IMPLEMENTATION

This section identifies how this WMP may be implemented within the County land use entitlement process to help County elected officials, staff, developers, and the public plan for a sustainable future in the context of water use.

7.1 - Entitlement Process

The land use application process is the County's primary mechanism for implementing this WMP. Land use applications require a Letter of Intent (LOI) by which the applicant must identify how their project supports El Paso County's goals, policies, and objectives. With adoption of the WMP, the County would also require the LOI to identify how development projects integrate the WMP's goals, policies, and objectives. This is very similar to current requirements for a project LOI regarding goals and policies of the El Paso County Policy Plan and other applicable elements of the County master plan.

As part of a land use process relying on water from a water provider, the applicant must obtain a Will Serve Letter of Commitment from the water provider that is to serve the development project. The County could standardize requirements of this letter to address questions such as the following:

- Do you have a current Water Master Plan?
- Do you have a current, state-approved water conservation plan?
- Are you participating with a regional entity, such as the Pikes Peak Regional Water Authority or Colorado Springs Utilities, in long-term water supply planning?
- Do you utilize renewable or nonrenewable water, or a combination of both?
- Do you have a system for water reuse?
- Do you have a means of utilizing surface and/or below-ground water storage?
- Do you allow a reduction in tap fees for water-efficient landscaping?

As part of the application for a preliminary plat, the water provider submits a commitment and water supply tabulation to quantify the portion of its supply that is to be allocated to a particular project. That commitment could include an expiration if the project does not proceed to final plat within a certain period.

To promote implementation of the WMP, the County may take the following steps:

- Provide each member of the BOCC and Planning Commission with a copy of the Plan
- Maintain the Plan in electronic format on the County website
- Apply the Plan to zoning and subdivision application review and decisions
- Review the Plan's effectiveness with respect to goals
- Re-evaluate the merits and applicability of the Plan every five years
- Integrate elements of the Plan into GIS
- Consider the need for ongoing public outreach/information

- Consider changes in the El Paso County Land Development Code to include best management practices for water use
- Encourage water providers to rely more on renewable water sources
- Coordinate closely with other governmental entities, particularly special districts serving water in unincorporated parts of the County, regarding water supplies vs. commitments

7.2 - Grants

Funding for projects to develop renewable water supplies in the County and increased water reuse primarily would have to come from municipal and special district financing; however, the Colorado Water Conservation Board (CWCB) has sources of funding through multiple grants and loans specifically for water related projects. Below is a list of some of the grants offered through the CWCB that would have relevance to the water supply alternatives for El Paso County.

Colorado's Water Plan (CWP) Grants

Provides financial assistance to make progress on the CWP's Measurable Objectives or critical actions. Current funding levels are shown, but will vary year to year.

- Supply and Demand Gap Projects ($2 M available)
- Water Storage Projects ($3 M available)
- Conservation, Land Use Planning ($1 M available)
- Engagement and Innovation Activities ($1 M available)
- Agricultural Projects ($1 M available)
- Environmental and Recreational Projects ($1 M available)

Water Efficiency Grants

Provides financial assistance to communities, water providers and eligible agencies for water conservation-related activities and projects.

- Water Conservation Planning Grants
- Water Conservation Implementation Grants
- Drought Mitigation Planning Grants
- Water Resource Conservation Public Education and Outreach Grants

Water Supply Reserve Account

Provides grants and loans to assist Colorado water users in addressing their critical water supply issues and interests. The funds help eligible entities complete water activities, which may include competitive grants for (requests for these funds must be approved by at least one of Colorado's nine Basin Roundtables):

- Technical assistance regarding permitting, feasibility studies, and environmental compliance
- Studies or analysis of structural, nonstructural, consumptive, and non-consumptive water needs, projects, or activities
- Structural and nonstructural water projects or activities

Severance Tax Trust Fund Operational Account Grants

Provides grants for regional water resource planning studies and associated demonstration projects.

The funds from the account can be used for a study or demonstration project that will benefit a wide range of people and organizations, and/or a large geographic area within Colorado. Approved grants must be able to begin the project 6 months after the application date and complete the project within 12 months.

The following pages include a matrix of additional funding and grant opportunities.

GRANT AND LOAN AVAILABILITY SUMMARY FOR WATER PROJECTS

Entity	Grant/Loan Program	Type	Eligible Projects	Eligible Recipients	Maximum Amount/Requirements	Application Deadline
CWCB	***CO Water Plan Grant - Supply and Demand Gap***	Grant	Feasibility; Design and Permitting; Multiple Stakeholder Interest Projects	Public: Muni., districts, enterprises, counties, State Agencies; Ditch Companies, Consulting, non-profit, partnerships	No more than 50% of the unreserved funding. For balances: http://cwcb.state.co.us/LoansGrants/Colorados-Water-Plan-Grants/Pages/main.aspx	August 1 and February 1 Annually (Pending Funding Availability)
CWCB	***CO Water Plan Grant - Water Storage Projects***	Grant	Feasibility; Design and Permitting; Projects that Result in Water Storage	Public: Muni., districts, enterprises, counties, State Agencies; Ditch Companies, Consulting, non-profit, partnerships	No more than 50% of the unreserved funding. For balances: http://cwcb.state.co.us/LoansGrants/Colorados-Water-Plan-Grants/Pages/main.aspx	August 1 and February 1 Annually (Pending Funding Availability)
CWCB	***CO Water Plan Grant - Conservatoin and Land Use***	Grant	Conservation Projects: reuse, water and landuse, meter replacement, system loss, etc.	Public: Muni., districts, enterprises, counties, State Agencies; Ditch Companies, Consulting, non-profit, partnerships	No more than 50% of the unreserved funding. For balances: http://cwcb.state.co.us/LoansGrants/Colorados-Water-Plan-Grants/Pages/main.aspx	August 1 and February 1 Annually (Pending Funding Availability)
CWCB	***CO Water Plan Grant - Engagement and Innovation Activities***	Grant	Communication, outreach, education	Public: Muni., districts, enterprises, counties, State Agencies; Ditch Companies, Consulting, non-profit, partnerships	No more than 50% of the unreserved funding. For balances: http://cwcb.state.co.us/LoansGrants/Colorados-Water-Plan-Grants/Pages/main.aspx	August 1 and February 1 Annually (Pending Funding Availability)
CWCB	***CO Water Plan Grant - Agricultural Projects***	Grant	ATM Development, water banking, agricultural efficienty, etc.	Public: Muni., districts, enterprises, counties, State Agencies; Ditch Companies, Consulting, non-profit, partnerships	No more than 50% of the unreserved funding. For balances: http://cwcb.state.co.us/LoansGrants/Colorados-Water-Plan-Grants/Pages/main.aspx	August 1 and February 1 Annually (Pending Funding Availability)
CWCB	***CO Water Plan Grant - Environmental and Recreation***	Grant	Restoration, recreation, watershed health, flood mitigation, fire prevention	Public: Muni., districts, enterprises, counties, State Agencies; Ditch Companies, Consulting, non-profit, partnerships	No more than 50% of the unreserved funding. For balances: http://cwcb.state.co.us/LoansGrants/Colorados-Water-Plan-Grants/Pages/main.aspx	August 1 and February 1 Annually (Pending Funding Availability)
CWCB	***Water Conservatoin Planning Grant***	Grant	Conservation plans and plan imlementation, drought mitigation, conservation education and outreach	Covered entities, non-covered entities and other state or local governmental entities	No expressed limit, contigent on funding availability (25% matching requirement)	<$50,000 - ongoing; >$50,000 - 1st of month prior to board meeting
CWCB	***Water Supply Reserve Fund Grant***	Grant	Permitting, studies, structural/nonstructural consumptive/nonconsumptive water needs projects or activities	Rountable approved, public, private (incoporated or not), non-profit, covered	No expressed limit, contigent on funding availability. Statewide Account: 25% match; Basin Account 50% match	Throughout the year or first of month prior to board meeting to be considered at that board meeting

GRANT AND LOAN AVAILABILITY SUMMARY FOR WATER PROJECTS

Entity	Grant/Loan Program	Type	Eligible Projects	Eligible Recipients	Maximum Amount/Requirements	Application Deadline
CWCB	***Severance Tax Trust Fund Operational Account Grants***	Grant	Regional planning studies and demonstration projects related to minerals, energy, water and geology	Any public or private entity	No expressed limit, contingent on funding availability. Matching encouraged	January 31 - funds would be received 6 months later
CWCB	***Colorado Watershed Restoration Grants***	Grant	Restoration of stream channels, habitat, riparian areas, erosion, flood, water use	Non-profits, watershed coalitions, State Agencies, local governments, conservation/conservancy districts, Colorado Ute Tribes	No expressed limit, contigent upon funding availability. Must provide in-kind and catch match.	Nov. 3rd (For 2017)
CWCB	***Agricultural Emergency Drought Response Program - Loans and Grants***	Grants and Loans	Lease of aug. water, purchase of water rights for aug., construction of structures	Agricultural organizations located in areas where a disaster emergency has been proclaimed due to drought	No expressed limit, contigent upon funding availability.	Within three months after the end of any fiscal year during which a drought was declared
CWCB	***Alternative Agricultural Water Transfer Methods Grants***	Grant	Interruptible supply agreements, rotational fallowing, water banks, deficit/partial irrigation, alt. cropping types	Any public or private entity that can contract with the state and can establish a need for the project.	No expressed limit, contigent upon funding ($1,000,000 available)	The first of the month prior to a board meeting
CWCB	***Fish Wildlife Resources Fund Grants***	Grant	Acquisition/appropriation of water rights to preserve or improve the natural environment, river restoration	operators of existing water diversion, delivery or storage facility projects and the CWCB.	No expressed limit, contigent upon funding availability.	Throughout the year
CWCB	***Non-Reimbursable Project Investment Grants***	Grant	Projects, programs or studies of statewide importance	Any public or private entity that can contract with the state and can establish a need for the project.	No expressed limit, contigent upon funding availability.	August 1
CWCB	***Phreatophyte Control Program Grants***	Grant	Projects to control and/or eradicate invasive phreatophyte species	State Agencies, local gov., conservation/conservancy/weed management districts, non-profits, watershed coalitions, private individuals, Ute Tribes	No expressed limit, contigent upon funding availability.	November 13
CWCB	***Reservoir Dredging Program Grants***	Grant	Recovery or reservoir storage volumes by dredging and construction	Municipalities, districts, irrigation companies, private owners that own/operate a storage reservoir	No expressed limit, contigent upon funding availability ($1,000,000 annually)	February 1

GRANT AND LOAN AVAILABILITY SUMMARY FOR WATER PROJECTS

Entity	Grant/Loan Program	Type	Eligible Projects	Eligible Recipients	Maximum Amount/Requirements	Application Deadline
CWCB	***Water Project Loan Program***	Loan	Raw water projects (dams, pipelines, ditches, wells, new projects or rehabilitation)	Any organization (small municipalities, agricultural ditch companies, home owner association, special districts)	Contigent upon funding availability; loans typically range from $100,000 to $10,000,000 (over $5,000,000 requires legislative approval)	<$5,000,000 - ongoing; >$5,000,000 August 31 deadline for following year funding
DOLA	***Community Development Block Grant***	Grant	Facilities improvements, economic development, housing	CDBG non-entitlement municipality or county; districts and private systems are eligigble sub recipients	$500,000 (guideline)	Varies - Contact DOLA Field Staff
EDA	***EDA Public Works and Development Facilities Program***	Grant	Water and sewer facilities primarily serving industry and commerce; access roads to industiral sites, and business incubator buildings	Public and non-profit	No-limit (subject to Federal Appropriation)	Ongoing
DOLA	***Energy and Mineral Impact Assistance Grant/Loan Program***	Grants and Loans	Water and sewer	Political subdivisions socially or economically impacted by the development, processing, or energy conversion of minerals and mineral fuels	Tier 1 up to $200,000; Tier II up to $2,000,000; 20-year terms for loans, at least 5% interest.	August 1, 2010; December 1, 2010
USDA	***USDA Rural Development Grants***	Grant	Water, wastewater, stormwater	Municipality, county, special district, non-profit. Focus is on rural communities.	Subject to Federal Appropriation	Ongoing
RCAC	***Rural Community Assistance Corporation (RCAC) Loan Fund***	Loan	Water and Wastewater	non-profit, public agencies, tribal fovernements	$50,000, $250,000, and $1,500,000 depending on project. Rates of 5.75% and 5% for short and intermediate term. Long term set at closing.	Ongoing
CDLG; WQCD	***Water Pollution Control Revolving Fund - Division of Local Governement; Water Quality Control***	Loan	Wastewater treatment and collection, nonpoint source polltuion, stormwater projects	Municipalities, counties, special districts and political subdivisions	No limit for leveraged loans (subject to availability of funds); $2,000,000 for direct loans	January 15th and June 15th for leveraged loans; direct loans ongoing

GRANT AND LOAN AVAILABILITY SUMMARY FOR WATER PROJECTS

Entity	Grant/Loan Program	Type	Eligible Projects	Eligible Recipients	Maximum Amount/Requirements	Application Deadline
CDLG; WQCD; CWRPDA	*Drinking Water Revolving Fund (DWRF)*	Loan	Water and wastewater	Municipalities, counties, special districts and political subdivisions; Disadvantaged Community Program: All of the above, w/ populations of 5,000 or less	No limit for leveraged loans (subject to availability of funds); $2,000,000 for direct loans	January 15th and June 15th for leveraged loans; direct loans ongoing
DOLA	*Private Activity Bonds*	Loan	Water, sewer, solid and hazardoud waste projects	Local Governments	Bond Counsel determines eligible cost	Around January 18 Annually, August 30th if allocation still avaialable

DOLA - Department of Local Affairs - https://www.colorado.gov/dola

CWCB - Colorado Water Conservation Board - http://cwcb.state.co.us/Pages/CWCBHome.aspx

WQCD - Water Quality and Control Division - https://www.colorado.gov/pacific/cdphe/wqcd

CWRPDA - Colorado Water Resources and Power Develeopment Authority - http://www.cwrpda.com/

EDA - Economic Development Administration - https://www.eda.gov/

USDA - United States Department of Agriculture - https://www.usda.gov/

- The above websites will contain further details and information
- More information is available on some of these programs in the attached document from DOLA Titled "Available Financial Assistance"

CWCB Contacts:

Supply and Demand Gap Projects: Gregory.Johnson@state.co.us
Water Storage Projects: Anna.Mauss@state.co.us
Conservation, Land Use Planning: Kevin.Reidy@state.co.us
Engagement & Innovation Activities: Mara.MacKillop@state.co.us
Agricultural Projects: Brent.Newman@state.co.us
Environmental & Recreation Projects: Linda.Bassi@state.co.us

7.3 - Summary of All Goals and Policies

The Goals and Policies provided throughout this WMP provide the roadmap to implementing this Plan, and are summarized below..

Section 1 - Introduction

Goal 1.1 – Ensure an adequate water supply in terms of quantity, dependability and quality for existing and future development.

Policy 1.1.1 – Adequate water is a critical factor in facilitating future growth and it is incumbent upon the County to coordinate land use planning with water demand, efficiency and conservation.

Goal 1.2 – Integrate water and land use planning.

Goal 1.3 – Promote awareness of environmental issues associated with water use.

Section 2 - Public Engagement

Goal 2.1 – Reach a broad geographic and socioeconomic range of community members and gather feedback from stakeholders on location specific input, strategy preferences, and open-ended feedback.

Policy 2.1.2 – Share educational and project specific materials

Policy 2.1.2 – Educational campaigns should be pursued to involve the community and provide a broader basis of understanding regarding water supplies and conservation strategies

Policy 2.1.3 – Communicate and gather input on complex, and at times, contentious water and land use considerations.

Section 3 - Water Service Providers

Goal 3.1 – Promote cooperation between water providers to save costs on infrastructure.

Policy 3.1.1 – Adequate planning and cooperation between water providers can effectively reduce the overall number of water main lines running through the County.

Goal 3.2 – Promote cooperation between water providers to save costs on treatment.

Policy 3.2.1 – Where possible, operating a treatment plant that provides potable water to different water districts will save on maintenance and operational costs.

Goal 3.3 – Promote cooperation between water providers to save costs on reuse.

Policy 3.3.1 – The ability to reuse wastewater flows will increase water supply and will help diversify a water provider's supply portfolio.

Goal 3.4 – Promote cooperation between water providers to save costs on storage.

Policy3.4.1 – The ability to store water in the off-peak demand periods (winter months) and use the stored water during high demand months (summer months) can be a great management asset to water providers.

Goal 3.5 – Encourage water providers to adapt to drought conditions.

Policy 3.5.1 – In an arid region with limited water supplies, these extreme weather conditions must be taken into account by water providers in order to deliver a reliable and safe water supply.

Goal 3.6 – Develop and maintain partnerships with water providers.

Policy 3.6.1 – The County should engage with water providers to share issues of mutual concern on a periodic basis and work collaboratively to address long-term water supply concerns.

Policy 3.6.2 – Water providers should work with neighboring entities to provide and plan for growth between their respective boundaries.

Goal 3.7 – Encourage the interconnection of infrastructure owned by water providers and projects that will have access to more than one water source, both to foster conjunctive use and to better accommodate water supply emergencies.

Section 4 - Water Supplies

Goal 4.1 – Develop an understanding of the differences in water supply sources, and any water quality issues within the County.

Policy 4.1.1 – Protect and enhance the quality of drinking water in the County.

Policy 4.1.2 – Encourage more systematic monitoring and reporting of water quality in individual wells.

Policy 4.1.3 – Support enhanced monitoring of sources of surface and tributary ground water in the County.

Policy 4.1.4 – The county should encourage that drinking water that meets Safe Drinking Water Act standards, as implemented by the State Department of Public Health and Environment, is a necessity for existing and future residents of the County.

Policy 4.1.5 – The County should work collaboratively with water providers, stormwater management agencies, federal agencies, and State agencies to ensure drinking water sources are protected from contamination and meet or exceed established standards.

Goal 4.2 – Support the efficient use of water supplies.

Policy 4.2.1 – Encourage the development of methods which allow more effective monitoring of the adjudicated water rights in the County.

Policy 4.2.2 – In order to reduce the dependency on non-renewable water supplies and accommodate new development, allow for the potential to import new and preferably renewable water supplies from outside the various planning areas, potentially including the Arkansas River.

Policy 4.2.3 – The County should support studies to determine options for how water providers can secure and deliver a more permanent, long-term water supply.

Goal 4.3 – Extend the economic life of the Denver Basin aquifers.

Policy 4.3.1 – Denver Basin Groundwater should be preserved as much as practical through water conservation and efficiency, extending the economic useful life.

Policy 4.3.2 – Encourage the systematic monitoring and careful administration of the bedrock aquifers to avoid over-allocation of groundwater.

Policy 4.3.3 – Incentivize the use of deeper Arapahoe and Laramie Fox Hills aquifers by central water providers, leaving the shallower aquifers for the more dispersed domestic well users.

Policy 4.3.4 – Encourage other monitoring programs and studies which could result in an increased understanding of the quality, quantity, and rate of depletion of available water supplies in the area, including but not limited to private wells.

Policy 4.3.5 – Encourage plans to recharge the Upper Black Squirrel Aquifer if such plans are based on sound science and can be demonstrated to not adversely impact water quality or water rights, with a preference for those plans which will maintain or enhance the available water supply at a regional scale.

Policy 4.3.6 – Encourage well monitoring through-out the County, with an emphasis on the Denver Basin aquifer fringe areas.

Goal 4.4 – Protect and enhance the quality, quantity and dependability of water supplies.

Policy 4.4.1 – The County should encourage and support State legislation that preserves and protects all drinking water sources in the County.

Goal 4.5 – Plan for water resources in a thoughtful way that recognizes the non-renewable nature of water resources in the area, accommodates existing and historical uses, and allows for sustainable, planned growth.

Policy 4.5.1 – Encourage continued collection and analysis of data for the purpose of better determining the extent and availability of groundwater in areas which do not overlie either the Denver Basin or a studied alluvial aquifer.

Goal 4.6 – Collaboration between the County, municipalities, water and wastewater service providers and regional and State agencies should be accomplished through Memoranda of Understanding or similar arrangements.

Policy 4.6.1 – Establishing MOUs should be explored to address shared source water protection, mutual concerns impacting water quality, and commitments to refer development applications to the public water provider for review and comment.

Section 5 - Projected Water Supply Needs

Goal 5.1 – Identify the potential water supply gap at projected full development build-out (2060).

Policy 5.1.1 – Consistent with the State Water Plan, the County will work with water providers to address and implement methods to close the gap between water demand and water supply projected by the year 2060.

Goal 5.2 – Identify regional opportunities and barriers to addressing the water supply gap at full development build-out (2060).

Policy 5.2.1 – The County will assist water providers, to the greatest extent practicable, in any future efforts to prepare demand forecasts by sharing information about population growth and new industries or developments in the County that will increase the demand for water.

Policy 5.2.2 – Recognize the water supply challenges and limitations inherent in each of the regional planning areas, with particular emphasis placed on Regional Planning Area 3 (Falcon), as a result of current reliance on non-renewable Denver Basin wells and the renewable, but limited and over-appropriated, Upper Black Squirrel alluvium.

Policy 5.2.3 – Periodically update the County land use master plan to better identify and plan for areas of future growth, in a manner that is consistent with this Water Master Plan, as may be amended from time to time.

Policy 5.2.4 – Consider potential growth near existing or proposed water supply projects that would allow shared infrastructure costs

Goal 5.3 – Reduce overall water consumption per end user in the County.

Policy 5.3.1 – Evaluate cluster development projects to determine if water savings could occur.

Policy 5.3.2 – Promote water conscious developments through improved land-use policies.

Goal 5.4 – Promote the long-term use of renewable water.

Goal 5.5 – Identify any water supply issues early on in the land development process.

Policy 5.5.1 – Discourage individual wells for new subdivisions with 2.5 acre or larger average lot sizes, especially in the near-surface aquifers, when there is a reasonable opportunity to connect to an existing central system, alternatively, or construct a new central waters supply system when the economies of scale to do so can be achieved.

Goal 5.6 – Protect property rights.

Section 6 - Closing the Gap

Goal 6.0 – Require adequate water availability for proposed development.

Policy 6.0.1 – Continue to require documentation of the adequacy of water for proposed development.

Policy 6.0.2 – Encourage development to incorporate water wise development principles

Policy 6.0.3 – Incorporate Water-Saving Actions into Land Use Planning Activities

Policy 6.0.4 – Encourage water providers to incorporate drought conditions into their water supply and demand planning activities.

Policy 6.0.5 – Encourage water and wastewater infrastructure projects to be sited and designed in a manner which promotes compatibility with adjoining uses, a reasonable mitigation of any adverse visibility and other environmental impacts.

Policy 6.0.6 – The County will encourage development that incorporates water wise landscaping principles.

Policy 6.0.7 – The County will consider incorporating water-saving actions and requirements into its development review process.

Policy 6.0.8 – Support implementation of water provider conservation projects.

Policy 6.0.9 –The County will support any efforts by water providers to incorporate drought conditions in their supply and demand forecasts in providing future and existing water supplies

Policy 6.0.10 – The County will encourage the submission of a water supply plan documenting an adequate supply of water to serve a proposed development at the earliest stage of the development process as allowed under state law. The water supply plan should be prepared by the applicant in collaboration with the respective water provider.

Policy 6.0.11 – The County will encourage development patterns and higher density, mixed use developments in appropriate locations that propose to incorporate meaningful water conservation measures.

Policy 6.0.12 – The County will consider amendments to the Land Development Code to incorporate water-saving standards, such as:

- Allowances for xeriscaping or native and drought-tolerant landscaping
- Allowances for water-saving irrigation techniques
- Minimizing the percentage of landscaped area covered with non-native turf
- Increasing the percentage of landscape areas that can be covered with non-living landscape material
- Allowance for design elements that could be included in landscaped area calculations (patios, courtyards, etc.)

Policy 6.0.13 – The County should encourage each land use proposal to expressly declare its water source, quality, quantity, and sustainability in terms of years and number of users.

Policy 6.0.14 – The County should continue to limit urban level development to those areas served by centralized utilities.

Section 6.1 - Water Efficiency

Goal 6.1.1 – Identify strategies that can close the build-out (2060) gap.

Policy 6.1.1.1 – Prioritize actions and improvements to address water supply gaps.

Goal 6.1.2 – Promote opportunities to conserve water.

Policy 6.1.2.1 – Follow best management practices to maximize aquifer recharge, including supporting the use of greenway corridors, the maintenance of drainage ways in their natural state, and the avoidance of large amounts of impervious cover for recharge areas.

Policy 6.1.2.2 – Encourage and accommodate water conservation practices for existing and new developments.

Policy 6.1.2.3 – Encourage water providers to implement best management practices for reducing water demand. El Paso County will support best management practices for water management and conservation based upon information presented in the Colorado Water Plan, which can be utilized by the water suppliers.

Policy 6.1.2.4 – Review and revise, as appropriate, the standards of the various zoning districts to ensure they are consistent with promoting water-wise development.

Policy 6.1.2.5 – The County should consider incorporating water saving measures in all new County facilities and projects. The County should also consider retro-fitting fixtures and landscaping at older facilities with new, water-saving alternatives.

Policy 6.1.2.6 – Encourage utility master plans for new special districts to include water conservation measures.

Policy 6.1.2.7 – Support water resiliency plans prepared by water providers.

Policy 6.1.2.8 – Work with water districts, water and sanitation districts and metropolitan districts and private water suppliers to reduce residential water consumption.

Policy 6.1.2.9 – The County should coordinate with water providers to prepare a water conservation handbook to educate residents and businesses about ways to conserve water in their homes and businesses. The handbook should be accompanied by a public outreach program.

Policy 6.1.2.10 – Encourage water providers to develop and implement incentive packages and standards that reduce water demand and promote water conservation.

Policy 6.1.2.11 – Encourage water suppliers in the County to use reclaimed water for irrigation and other appropriate uses.

Policy 6.1.2.12 – Collaborate with home builders and developers on zoning code amendments that promote decreased water demand coupled with water conservation for residential developments where economical

Policy 6.1.2.13 – Support proposed developments that incorporate water efficiency measures for open spaces and lawns.

Policy 6.1.2.14 – Evaluate the potential for allowing variances/waivers to the County's 300 year rule as an incentive for developers to commit to best management practices, which may include (1) producing water only from the deeper aquifers for centralized distribution; (2) promoting conservation and efficiency through a water provider-established tiered rate structures, (3) reuse of captured wastewater to offset a portion of demand; and (4) adopting and ensuring enforcement of water efficient landscaping standards.

Goal 6.1.3 – Identify ways to provide landscaping flexibility in design where requiring strict compliance with the County's landscaping standards would be contrary to the goals of this Plan.

Policy 6.1.3.1 – Encourage new developments that incorporate water conservation techniques such as xeric landscaping.

Policy 6.1.3.2 – Provide developers with clear landscape guidance that results in attractive landscaping and reduced water requirements.

Policy 6.1.3.3 – Encourage sustainable landscaping that is tailored to the variations of climate zones across the County.

Policy 6.1.3.4 – Consider amending the Land Development Code to allow for modified landscaping options based on water source, available water supplies, and climate zones across El Paso County.

Policy 6.1.3.5 – Work with representatives of the landscape industry, along with property owners and managers, to promote incorporating water conservation measures for non-residential developments.

Policy 6.1.3.6 – Support lower system development fees (tap fees) for builders that use water efficient landscaping.

Section 6.2 - Water Reuse

Goal 6.2.1 – Increase regional water reuse and conservation to better optimize available water supplies.

Policy 6.2.1.1 – Support efforts by water providers to effectively and environmentally implement potable and non-potable water re-use including augmentation.

Policy 6.2.1.2 – Encourage re-use of treated wastewater for irrigation and other acceptable uses when economically feasible.

Policy 6.2.1.3 – Consider opportunities to demonstrate the benefits of using non-potable sources of water and to dispel negative attitudes.

Policy 6.2.1.4 – Encourage land uses which accommodate the reuse of water including capture of non-consumptively used water within the basin and use of reclaimed water for irrigation, within legal parameters and providing that water quality is maintained.

Policy 6.2.1.5 – Support plans for the siting of additional treatment plants or modification of existing facilities to allow for more effective use of non-potable water and to promote plans for responsible aquifer recharge.

Policy 6.2.1.6 – Consider higher residential densities for new developments, in appropriate locations, where such developments will be served by water providers that are optimizing their supplies through established reuse and conservation measures.

Policy 6.2.1.7 – Options for the use of non-potable water and further research into the use of reclaimed water and renewable options should be explored

Goal 6.2.2 – Fully reuse all water that can be economically reused.

Policy 6.2.2.1 – The County should not object to efforts by water providers to increase their ability to sell or share reuse water supplies as long as non-renewable resources are not affected.

Section 6.3 - Regional Water Supply Plans

Goal 6.3.1 – Secure and deliver additional long-term water supplies.

Policy 6.3.1.1 – Support the development of environmentally sensitive and safely designed surface water impoundments if these serve to enhance local water supply or service capability.

Policy 6.3.1.2 – Work with water providers to identify regional opportunities and barriers.

Policy 6.3.1.3 – Encourage water providers to pursue additional water storage opportunities, including surface storage as well as storage in both bedrock and alluvial aquifers.

Goal 6.3.2 – Identify applications for renewable water partnerships.

Policy 6.3.2.1 – Support mutually beneficial arrangements among water providers and consumers to reduce cost and protect the County's groundwater and environment.

Policy 6.3.2.2 – Encourage formal agreements among water districts to mitigate potential water supply shortages among individual suppliers.

Policy 6.3.2.3 – Periodically review this Water Master Plan by convening a publicly accountable group, such as the El Paso County Water Master Plan Steering Committee, or arranging a collaborative review with the Pikes Peak Regional Water Authority.

Policy 6.3.2.4 – Encourage the consolidation of regional water and sanitation systems over the proliferation of smaller, individual systems

Policy 6.3.2.5 – Consider public-private partnerships to upsize utility infrastructure to meet potential growth demand.

Policy 6.3.2.6 – Support collaborative coordination with water providers during the design and construction of water infrastructure and public roadways.

Policy 6.3.2.7 – Water providers should pursue coordination efforts to align regional water conservation, quality, and infrastructure goals

Section 6.4 - Renewable Water Development

Goal 6.4.1 – Promote diversified, sustainable water portfolios for new development, reducing their reliance on a single source of supply.

Policy 6.4.1.1 – Promote "conjunctive use" of water, favoring use of renewable surface and alluvial supplies during wet and normal years balanced by using a greater share of nonrenewable Denver Basin supplies in dry years.

Policy 6.4.1.2 – Further evaluate modifications to the 300-Year Rule to incentivize best practices for water efficiency, water reuse, and development of renewable supplies.

Policy 6.4.1.3 – Consider allowing higher densities for developments served by water providers that have meaningful supplies of renewable water in their portfolios.

Policy 6.4.1.4 – Support efforts by water providers to obtain renewable water supplies through collaborative efforts and regionalization.

Policy 6.4.1.5 – Promote long-term planning by water providers for sustainable water supplies serving new development.

Policy 6.4.1.6 – Streamline the 1041 Regulations to favor projects related to delivery or development of renewable water in El Paso County.

8 – Appendices

EL PASO COUNTY WATER MASTER PLAN

APPENDICES OUTLINE

A. COUNTY LAND DEVELOPMENT CODE WATER SUPPLY STANDARDS

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G. WATER PROVIDERS SURVEY

H. GLOSSARY

APPENDIX A
COUNTY LAND DEVELOPMENT CODE WATER SUPPLY STANDARDS

8.4.7.Water Supply Standards

(A) General

(1) Purpose

The purpose of this Section is to promote the health, safety, and welfare of the residents of El Paso County and is adopted pursuant to various State statutory authorities granted to counties, including, but not limited to, C.R.S. §§30-28-101, et seq., C.R.S. §§30-28-201, et seq., C.R.S. §§29-20-101, et seq., C.R.S. §§24-65.1-101, et seq., C.R.S. §§24-67-101, et seq., respectively.

This Section is not intended to enhance, diminish, displace, modify or supersede any applicable State Statutes or regulations regarding the initiation, adjudication, administration or use of water rights.

(2) Applicability

The requirements of this Section shall apply to any development application which results in the creation of new lots, except as otherwise provided, with the following clarifications:

- The effective date of this Section is originally November 20, 1986, and this Section shall fully apply to any subdivision which does not have preliminary plan approval prior to that date;

- Any proposed subdivision with a preliminary plan approval by the BoCC prior to November 20, 1986, but still in the process of obtaining plat approval, shall be subject to the previously existing water supply regulations in this Code and any controlling State statutory requirements regarding subdivision water supplies. Notwithstanding the foregoing, a subdivision proposing a change in its source of water which would result in a substantial decrease in the quality, quantity or dependability of the water supply or a substantial increase in the annual water demand shall be subject to this Section. In no case shall a change from a renewable to non-renewable source provide less than a 300-year water supply; and
- The requirements of this Section shall apply if there has been a substantial change in the water supply of the subdivision. The BoCC, with recommendations from the County Hydrogeologist or the OCA, shall determine if a substantial change in the water supply or water demand is proposed. Factors to be considered in the determination of a substantial change in the water supply or water demand include the percent increase or decrease in water demand or water availability and the absolute quantity increase or decrease in the water demand or water availability.

(3) Exceptions

The requirements set forth in this Section shall not apply to:

- Subdivisions which will not use water;
- Agricultural uses not associated with residential, commercial, or industrial activities requiring subdivision approval;
- A proposed subdivision which, by reason of the nature, type and extent of the proposed development, will not require a water supply as prescribed herein. Subdivisions meeting this requirement are not designed or developed for permanent occupation or habitation. The determination shall be made by the BoCC, following recommendations by the OCA, PCD Director, or County Hydrogeologist, on a case-by-case basis, and shall be based on a specific request and supporting evidence presented by the applicant along with recommendations of the Planning Commission. If exempted by the BoCC, any subsequent change in the subdivision as approved may require compliance with this Section;
- A vacation or vacation and replat of an existing subdivision or lots within an existing subdivision or any plat change, any of which will not result in significantly greater total water use than previously anticipated for the subdivision. All determinations as to the significance of the change in water use shall be made by the BoCC, with recommendations by the County Hydrogeologist or OCA; and

- The Planning Commission may recommend and the BoCC may, on a case-by-case basis, waive any or all of the requirements of this Section pursuant to a waiver application; however the finding of sufficiency for the quality, quantity, and dependability for water supplies shall not be waived; and

(4) Terminology

Unless specifically provided by this Code, water terminology within this Section shall have the same meaning, definition and application as set forth in C.R.S. §§37-90-101, et seq. and §§37-92-101, et seq.,

(B) Water Resource Report

(1) General

(a) Purpose

The purpose of the water resources report is to provide the data necessary for the Planning Commission and the BoCC to determine whether the proposed water supply is sufficient in terms of quality, quantity and dependability for the proposed subdivision.

(b) Water Resources Report Required

A water resources report as required by this Section shall be submitted with sketch plan, preliminary plan, final plat, and any subdivision applications which will create a new lot. A copy of the report will be kept on file in the El Paso County PCD.

(c) Prepared by Qualified Professional

The water resources report shall be prepared by a qualified hydrogeologist, hydrologist, licensed civil engineer, qualified groundwater geologist, or other qualified professional with appropriate experience.

(d) Document Adequate Water Supply

The Water Resources Report shall include adequate documentation that the proposed water supply is sufficient in terms of quantity, dependability, and quality for the proposed subdivision.

(e) Enforcement

In addition to any other remedies provided by law or this Code, the BoCC shall have the right to enforce compliance with the provisions of this Section, including any agreement provided pursuant to this Section, by means of withholding building permits within the subject subdivision or withholding plat approvals for additional development phases within the subject subdivision pending full compliance or other resolution.

(2) Description Report Contents and When Required

(a) Sketch Plan Report

The initial water resource report submitted with the sketch plan may be of a general nature, may be based on published and unpublished data and reports, and need not include site-specific hydrogeologic data. The purpose of the report included with the sketch plan is to identify probable compliance of the proposed subdivision with the water supply standards and to identify the need for additional water supplies which will be required for the subdivision.

(b) Preliminary Plan Report

The water resource report submitted with the preliminary plan shall include all of the data needed to determine whether the water supply is sufficient in terms of quality, quantity and dependability for the proposed subdivision. The report shall be based on engineering calculations and site-specific data and shall include a detailed discussion of the water demand, supply, quality, dependability, and supply facilities for the proposed project. The report shall identify those aspects of the water supply plan which are insufficient in terms of quantity, quality or dependability and shall identify the actions to remedy the deficiencies.

(c) Final Plat and Replat Report

The water resource report submitted with the final plat shall include all of the data needed to determine whether the proposed water supply is sufficient in terms of quality, quantity and dependability for the type of subdivision proposed. The report shall be based on engineering calculations and site-specific data and shall include a detailed discussion of the water demand, supply, quality, dependability, and supply facilities for the proposed subdivision.

A water resources report is not required if the BoCC made a finding that the proposed water supply plan of the preliminary plan was sufficient in terms of quantity, quality and dependability. However, an amended water resources report is required if there is a substantial change in either the water supply or the estimated water demand.

(d) Residential Subdivisions of 4 Lots or Fewer

A complete water resources report is not always required for minor subdivisions. State statute requires the State Engineer to review all proposed water supplies. The State Engineer requires at a minimum a narrative discussion and a Water Supply Information Summary Form.

(3) Water Resource Report

The water resource report shall document the requirements of this Section and shall include the following data, documentation, and analysis at a level of detail necessary to make the determinations of sufficiency:

(a) Summary of the Proposed Subdivision

The water resource report shall include a summary of the proposed subdivision with the following information:

- A location map including roads, Township and Range, a copy of all maps required with sketch and preliminary plan and final plat submittals, and legal description; and
- A description of subdivision including acreage of each proposed land use, number of dwelling units, etc. For phased projects the description shall clearly describe the acreages, land uses and number of units of each phase. The location of each proposed land use shall be shown on appropriate maps.

(b) Information Regarding Sufficient Quantity of Water

(i) Calculation of Water Demand

The water resource report shall include water demand calculations in separate calculations for the type, number and annual water requirements of existing, proposed and potential maximum uses of the subject property and a general timetable when the demands are expected. Acceptable methods of determining water demand are described in this Section.

(ii) Calculation of Quantity of Water Available

The water resource report shall identify and describe each source of water including: (1) a map showing the location of any off-site water to be used and the location of major water transmission lines, reservoirs, etc; (2) calculations of the quantity of water available from each source (on-site and off-site sources shall be determined separately); and (3) a description of groundwater sources.

(iii) Groundwater Source Information

The water resource report shall list each aquifer to be used. Each aquifer shall be identified as tributary, non-tributary, not non-tributary or from a designated basin, and as either renewable or non-renewable aquifers. The report shall discuss the need for and the status of any augmentation plans required to use the proposed supply. The report shall also describe the annual and the

300-year quantity of water available from each proposed aquifer.

(iv) Production Wells Information

The water resource report shall discuss location, construction and production details of existing and proposed production wells. The following shall be included: (1) estimated number, size and short- and long-term yields of wells necessary to serve the proposed subdivision; (2) estimated life expectancy of wells; (3) estimated short and long-term well development schedule indicating probable timing of bringing additional wells on line; (4) A map showing locations of wells to be used during the first 5 years of the subdivision and probable locations of wells in the following years; (5) Well drilling logs and well completion reports; and (6) Pumping test data and analysis, including data and analysis of constant rate and step drawdown tests.

(v) Surface Water Sources

The report shall list each surface water supply to be used. The report shall discuss the need for and the status of any augmentation plans required to use the proposed supply. In addition, the report shall describe the annual and the 300-year quantity of water available from each proposed surface water supply, and calculate the number of years of water supply. For phased projects, the calculation shall delineate the years of water available for each phase.

(c) Information Regarding Sufficient Dependability of Water Supply

The water resource report shall include the following information to allow a determination of sufficient dependability of the water supply to be established:

(i) Proof of Ownership

Proof of ownership or right of acquisition of use of existing or proposed water rights sufficient in quality, quantity and dependability to serve the proposed use including well permits, court decrees, well applications, export permits, etc.

(ii) Financial Plan

Financial plan and capital improvements plan of water provider.

(iii) Description of Water Supply

Description of the water supply, location shown on maps, and, when appropriate, engineering designs of existing and proposed water supply facilities, including wells, storage facilities, major transmission lines, etc.

(iv) Calculations Demonstrating Quantity

Calculations and documentation demonstrating that the aquifers are capable of supplying the required quantity of water and analysis showing the wells are capable of producing the required water supplies, if groundwater is to be used.

(v) Evidence of Water System Source

If a public or private water system is to be used, evidence that the source can and will supply water to the proposed subdivision stating the amount of water available for use within the subdivision and the feasibility of extending service to the area. This evidence shall include the following information: (1) A letter indicating a commitment to serve (except in the case of a sketch plan); (2) Name and address of the municipality, quasi-municipality, or water company which will supply the water; (3) Current capacities of the existing system; (4) Total amount of current and committed use; and (5) Amount and timing of water to be supplied to the subdivision.

This requirement does not apply to subdivisions to be supplied by individual wells.

(vi) Evidence of Short-Term Supply for Fire

Evidence that short-term water supply needs of the subdivision can be met to satisfy fire demand and reduction of supplies as a result of flooding, and damaged or otherwise incapacitated systems. Short-term dependability can be satisfied by such features as reservoirs, cisterns, standby wells and standby connections with other water supply or distribution systems.

(d) Information Regarding Sufficient Quality

The following shall be supplied: (1) Chemical analyses of proposed water from each proposed source; (2) Evidence of compliance with County and State water quality standards; and (3) Discussion of potential for water quality degradation from on-site and off-site sources.

(e) Public and Private Commercial Water Providers

(i) Information from Commercial Water Providers

It is the responsibility of the applicant to provide information regarding the availability of water supplies from any source, including public and private commercial water providers. Should the subdivision fall within a water provider's service district, a general water resources report supplied by the provider may be used to evaluate available water resources provided the content meets or exceeds the requirement of the Water Resource Report.

(ii) Water Providers Report

In those cases where the water provider submits a general Water Resources Report, the water resource report shall be updated annually, by February of each year. Update information shall include:

- Volume of water sold in the previous year;
- New water acquisitions, commitments, augmentation plans, etc.;
- Water trades or other losses of water supplies;
- Anticipated water acquisitions for the upcoming year;
- Legal documentation accompanying new water acquisitions and augmentation plans;
- Major capital improvements accomplished during the past year and anticipated major capital improvements for the upcoming year; and
- Other information which would be useful in evaluating the availability of water supplies.

(f) Review of Water Resource Report

Water Resource Reports will be referred to the State Engineer and any applicable designated groundwater management district or water service provider, and reviewed by the County Hydrogeologist, OCA, EPCDHE, and PCD. When a proposed subdivision is located within a designated groundwater management district, El Paso County may receive comments and review recommendations from the district; however, the recommendations are not binding on the County.

(i) Sketch Plan Report

After receipt of the report, County staff and review agencies will submit a statement of their conclusions, finding and recommendations to the PCD.

Given the general and preliminary nature of water information available at the sketch plan stage, the OCA

will not provide recommendations or comments on the sufficiency of the water supply for sketch plan.

(ii) Preliminary Plan Report

The County Hydrogeologist will, in consultation with the OCA and the PCD, prepare a recommendation that the water supply be found sufficient or insufficient in terms of quantity and dependability. The EPCDHE will prepare a recommendation that the water supply is sufficient or insufficient in terms of quality. If the County Hydrogeologist, OCA or EPCDHE recommend that the proposed water supply be found insufficient they shall identify the deficiencies in the water supply plan to be corrected prior to submittal of the final plat.

(iii) Final Plat

The County Hydrogeologist will, in consultation with the OCA and the PCD, prepare a recommendation that the water supply be found sufficient or insufficient in terms of quantity and dependability. The EPCDHE will prepare a recommendation that the water supply is sufficient or insufficient in terms of quality. If the County Hydrogeologist, OCA or EPCDHE recommend that the proposed water supply be found insufficient they shall identify the deficiencies in the water supply plan.

(4) Basis of Determination of Sufficiency

(a) General Provisions

The Planning Commission shall, as part of its deliberations, make a recommendation regarding the sufficiency of the proposed water supply. The BoCC shall determine the sufficiency of the proposed water supply in terms of quantity, dependability, and quality based on the information presented and the recommendation of the Planning Commission.

In determining the sufficiency of a proposed water supply, the BoCC shall, at a minimum, consider the Water Resources Report, data and recommendations from the State Engineer's Office, OCA, the County staff, and the County Hydrogeologist; the recommendations of the Planning Commission; and public comment. In all cases the burden of proof in demonstrating sufficiency rests with the applicant, and it shall be the applicant's sole responsibility to document in the Water Resources Report that the proposed water supply is sufficient in terms of quantity, dependability, and quality.

(b) Conditional Finding of Sufficiency

Conditional findings of sufficiency can be made by the Planning Commission and the BoCC specifying conditions that shall be

met prior to recording the final plat. Some examples of conditions include, but are not limited to: written proof that a well has been abandoned or re-permitted, written proof that an applicant has voluntarily reduced the amount of withdrawal, completion of CDPHE Technical, Managerial and Financial (TMF) analysis and issuance of PWSID number for a new central water system, and formal annexation of the lot into a central water system's service area. Once these requirements are met, the conditional finding of sufficiency becomes a finding of sufficiency.

(c) Exception to 300-Year Water Supply

An exception to the 300-year water supply can be granted to those lot(s) not included in the Water and Sanitation or Metropolitan District's service area but the applicant desires to subdivide their land, annex into the District, and utilize the District's service for the new lot(s), which lot(s) may be granted an exception of the 300-year water supply requirement due to the fact that the District has effectively appropriated all the groundwater under the proposed subdivision by virtue of the cylinders of appropriation around its pre-1973 well(s). However, if exempt well(s) will continue to be used by an existing lot (and will not use the District's water service), the applicant must reduce the amount of withdrawal from their exempt well(s) to meet the County's 300-year supply life requirement.

(d) Documents Needed for Review by the OCA

The following documents shall be reviewed by the OCA:

- Water Supply Information Summary Form
- Letter of Commitment from Water District
- Copies of all well permits
- Copies of all Water Court Decrees
- Copies of all Colorado Groundwater Commission Determinations of Water Rights
- State Engineer's Office Opinion

(e) Phases of Plan Approval

(i) Sketch Plan:

Approval of a sketch plan by the Planning Commission and BoCC does not require a finding that the proposed water supply is sufficient in terms of quality, quantity and dependability.

(ii) Preliminary Plan

- Action of the Planning Commission: The Planning Commission shall make a recommendation that the proposed water supply is or is not sufficient in terms of quantity, dependability, and quality. Separate recommendations may be made. A preliminary plan

may be approved even if a recommendation of insufficiency is made. The Planning Commission shall identify the deficiencies in its recommendations to the BoCC.

- Action of the BoCC: The BoCC shall make a finding that the proposed water supply is or is not sufficient in terms of quantity, dependability, and quality. Separate findings may be made. A preliminary plan may be approved even if a finding of insufficiency is made. The BoCC shall identify the deficiencies with respect to the water supply plan.

(iii) Final Plat

- No final plat shall be approved by the Planning Commission or the BoCC without a finding that the proposed water supply is sufficient in terms of quality, quantity and dependability for the proposed subdivision.
- For subdivisions with 4 lots or more whose water supply consists of wells, and particularly where there are water augmentation or replacement obligations, the applicant shall establish a HOA or other entity approved by the OCA that shall be responsible to carry out the obligations under the water court decree, Colorado Groundwater Determination, and any related augmentation or replacement plans. For subdivisions with 3 lots or less, while creation of an HOA is preferred, responsibility for the obligations may be placed on the individual lot owners in the covenants or in a Joint Use Well-Sharing and Easement Agreement. Unless the water court or Colorado Groundwater Commission authorizes differently, no more than 6 lots shall share a well in a joint-use well sharing arrangement. Plat notes concerning the responsibility for the obligations and for conveyances of water rights shall be included on the face of the final plat. Prior to recording the final plat for any such subdivision, the applicant shall provide to PCD and the OCA for review and approval documents including, but not limited to, water court decrees and plans for augmentation signed by the Water Judge; determinations of water rights and replacement plans signed by the Colorado Groundwater Commission; deeds to cure defects in title to water rights; form deeds conveying water rights to individual lot owners; deeds conveying water rights for augmentation or replacement to the HOA (or to lot owners for

subdivisions with 3 lots or less); Joint Use Well Sharing and Easement Agreements (where applicable); restrictive covenants; and documents creating the HOA including articles of incorporation, certificate of incorporation by the Secretary of State, and bylaws.

(5) Finding of Sufficient Dependability

The proposed water supply shall meet the following criteria to be found sufficient in terms of dependability:

- The supply is of sufficient quantity to meet the needs of the proposed subdivision for 300 years;
- The proposed water supply system and water supply is capable of meeting the average annual and peak daily demand of the proposed subdivision; and
- The applicant has provided adequate evidence of ownership or the right of acquisition or use of existing or proposed water rights sufficient in quantity, dependability, and quality to serve the proposed uses within the subdivision; and (1) the legal capability to accomplish any changes in the uses or points of diversion of the rights with quantities and dependability necessary to serve the proposed subdivision without material injury to vested water rights; or (2) adequate evidence that the public or private water provider can and will supply the proposed subdivision with water of adequate quality, quantity and dependability.

(6) Adequate Proof of Ownership or Right of Acquisition

No final plat will be approved without adequate proof of ownership or the right of acquisition or use of existing and proposed water rights. Following are the minimum requirements of each type of water supply as proof of ownership or the right of acquisition of or use of existing and proposed water rights of surface or groundwater:

(a) Surface Water

For surface water and underground water defined in C.R.S. §37-92-103 (11), the following shall be considered adequate proof of ownership or right of acquisition:

- Copies of appropriate well permits or court decrees for water rights, changes of water rights, and augmentation plans or State Engineer approved temporary exchange plans; or
- If the decree or historic use and priority does not provide for a probable uninterrupted supply, the applicant shall submit a legally binding alternative supply plan, such as reserve groundwater.

(b) Groundwater Outside the Designated Groundwater Basins

For groundwater outside the designated groundwater basins and subject to C.R.S. §37-90-137(4) (S.B.-5 and S.B.-213), the following shall be considered adequate proof of ownership or right of acquisition:

- Copies of well permits, court decrees for the intended type of use and quantity, or determinations made by the State Engineer under rules and regulations adopted pursuant to C.R.S. §37-90-137(9) in response to water court request pursuant to C.R.S. §37-92-302(2), and in the referral and review process of C.R.S. §30-28-136(1) (h)(I);
- With respect to groundwater classified as not non-tributary, a court decree approving a plan of augmentation is required.

(c) Designated Groundwater

(i) Alluvial Groundwater

For alluvial groundwater, permits or determinations issued by the Colorado Groundwater Commission for the intended type of use or court decrees shall be considered adequate proof of ownership or right of acquisition. If appropriate, export permits are required.

(ii) Bedrock Groundwater

For bedrock groundwater, permits or determinations issued by the Colorado Groundwater Commission for the intended type of use, or court decrees and estimates of the quantity of groundwater in Denver Basin formations shall be considered adequate proof of ownership or right of acquisition. Either a permit or a court decree is required for water which will be used during the first 20 years of the proposed project. Denver Basin formation estimates are only permissible for those deeper aquifers which will not be needed during the first 20 years of the project life. If appropriate, export permits are required.

- Perfected Groundwater Rights (1973): For groundwater rights perfected prior to enactment of Senate Bill 213 (July 6, 1973) and not defined in §37-92-103 (11), C.R.S., a court decree or well permits for the intended types of use shall be considered adequate proof of ownership or right of acquisition.

(d) Other Information Required

In addition to the above requirements, the applicant shall provide any other pertinent information and documentation which further

expands, restricts or modifies (or which could potentially expand, restrict, or modify) the existence, ownership and right to use the subject water rights for the proposed subdivision.

(e) Written Evidence Required

The applicant shall provide written evidence satisfactory to the BoCC that documented water rights have been committed to and will be retained for subdivision use to the fullest extent necessary to satisfy the water demand of the proposed subdivision as required by this Section. The written evidence may include one or a combination of the following:

- An adequate letter of commitment from an established water provider agreeing to provide water service to the proposed subdivision, and stating the amount of water available for use within the proposed subdivision and the feasibility of extending service to that area;
- A legally binding agreement between the BoCC and the applicant or water provider setting forth and prescribing the terms, conditions, limitations and restrictions as to the commitment and retention of documented water rights necessary to satisfy the present and anticipated future water demand of the proposed subdivision or the respective filing thereof in accordance with this Section; or
- A plat note conveying or identifying the documented water rights committed to the proposed subdivision, and restricting the further conveyance, sale, transfer, or change in use of the committed water rights.

In determining the appropriate means to accomplish the foregoing, the BoCC shall consider, among other factors, the legal classification of the water involved, the type of water system proposed, and the water provider's history of experience and reliability of providing service.

(f) Written Documentation Recorded Prior to Plat Approval

The written documentation required by the BoCC pursuant to this Section 8.4.7, shall be finalized, fully executed and recorded prior to or concurrent with the recording of the final plat for the subject property, except that the letter of commitment shall not be recorded. HOA documents shall be recorded, to the extent that the HOA is in existence at the time of plat recording.

(g) Adequate Proof from Water Provider

(i) General

Adequate proof is required of the capability of the water provider to serve the proposed subdivision and pre-

existing subdivisions, if any, with adequate quantity, dependability, and quality at average annual and at peak daily demand. The 300-year water supply requirement does not apply to pre-existing (prior to November 20, 1986) subdivisions.

(ii) Financial and Capital Improvement Plan

The financial plan and capital improvements plan shall include a program for future wells if future groundwater development is planned and shall show that necessary financial resources have been satisfactorily committed to extend water service to the proposed subdivision and to adequately maintain and operate the water supply system. Projects in which each residence will be served by an individual well are not required to have a financial or capital improvement plan.

(iii) Water Bearing Capacity of Aquifers

Proof shall be provided that the water bearing properties of aquifers (i.e., hydraulic conductivity, transmissivity, storativity, storage coefficient, etc.) are adequate to yield the quantity of water which is proposed to be extracted from the aquifer.

(iv) Physical Facilities and Technical Capabilities Adequate

Proof shall be provided that physical facilities, or the necessary financial and technical resources and legal commitments and authority to construct a system, for raw water acquisition, collection, storage and treatment, and for treated storage and distribution and maintenance or water pressure are sufficient to serve the needs of the proposed subdivision.

(v) Water Demands for Fire

Proof shall be provided that water demands needed to satisfy fire demand, replacement of supplies reduced due to flooding, damaged or otherwise incapacitated systems can be met. This short term dependability is satisfied by such features as reservoirs, cisterns, standby wells and standby connections with other water supply or distribution systems.

(vi) Compliance with Drinking Water Regulations

When a new community water system subject to the Colorado Primary Drinking Water Regulations is proposed in conjunction with a subdivision, a conditional finding of sufficiency may be issued by the Planning Commission and BoCC in the approval of a preliminary plan or final plat subject to the following:

- CDPHE TMF capacity, analysis and approval thereof, as evidenced by issuance of a Public Water System Identification (PWSID) number;
- Adequate construction surety for the proposed water system which includes all waterworks identified in the CDPHE TMF analysis;
- Restrictions on the sale of lots and the issuance of building permits until the water system is constructed and certified are included on the final plat; and
- An entity acceptable to the water court, or Colorado Groundwater Commission or the CDPHE shall be formed or engaged to assure operation of the community water system.

(7) Finding of Sufficient Quantity

(a) Sources of Water

Water shall be supplied from legally and physically available water sources and may be supplied from on-site sources, off-site sources, or both.

(b) Required Water Supply

The water supply shall be of sufficient quantity to meet the average annual demand of the proposed subdivision for a period of 300 years. Sketch plans are not required to include documented evidence that the proposed water supply will meet the needs of the proposed subdivision for a period of 300 years.

(c) Determination of Water Demand

(i) Sketch Plan

The total 300-year water demand shall be estimated for the entire subdivision. Each phase of a subdivision shall be estimated independently. It is recognized that this estimate will be based on the general concept of the proposed subdivision and not final engineering plans. Acreages of community landscaping, lawn sizes, specific types of commercial and industrial uses, etc., may be based on estimates.

(ii) Preliminary Plan and Final Plat

Estimates shall be based on actual acreages and densities, engineering plans and designs, land surveys and restrictive covenants, as applicable.

(d) Presumptive Use Values

In the absence of data on water use to the contrary or other minimum values established as acceptable by the State Engineer, the following presumptive values will be used to calculate the annual water demand:

- Residential inside use 0.26 acre feet per year for single family residences and 0.20 acre feet per year for each occupancy unit in multiple family residences other than single family. A duplex contains 2 occupancy units, a triplex contains 3 occupancy units, etc;
- Residential and commercial landscaping use 0.0566 acre feet per 1,000 square feet of landscaping;
- Commercial and industrial inside use 0.1 gallon per day for each square foot of developed space; and
- Miscellaneous irrigation (landscaping, golf courses, etc.) use 2.46 acre feet per acre per year.

(e) Calculation of Unusual Water Demands

Unusual water demands for residential projects, such as large swimming pools, lakes, large fountains, irrigation of golf courses, greenbelts and pasture land, shall be determined and calculated separately.

(f) Water Use for Uses Not Itemized

For uses not itemized above the applicant shall conduct a site specific study.

(g) Water Demand of Comparable Projects

The applicant may also submit an estimate of annual water demand based on the water use of comparable projects, water reuse, groundwater recharge, water conservation, or other innovative methods. Complete documentation shall accompany these estimates, and it shall be the applicant's sole responsibility to demonstrate the validity of water demand estimates made from alternative calculations. If alternative calculations are included, calculations using the above presumptive values shall also be included. The BoCC will make the final determination of water demand.

(h) Adjustments to Water Demand Calculations

At the preliminary plan and final plat stage of a subdivision, the calculations of the water demand may be adjusted for the time required for subdivision buildout. The adjustment shall be in increments of whole years and the adjustment period shall not exceed 20 years from the date of final plat approval.

(8) Determination of Available Water

(a) Sketch Plan

Existing and potential water supplies shall be estimated for the entire subdivision. Proposed quantities of available water are considered general estimates and need not be based on court decrees, well permits or final engineering plans. The quantity of

water available from each proposed on-site and off-site source and each aquifer shall be determined and described separately. For phased projects the supply for each phase shall be estimated independently. The quantities of available water shall be expressed in acre feet per year and total acre feet for the proposed subdivision to evidence a 300-year supply. Because substantial differences may exist between the estimates included with the sketch plan submittal and actual water supplies available for preliminary plan and final plat submittals, acceptance of the estimates accompanying the sketch plan will not guarantee the number of dwelling units permissible in later stages of the subdivision approval process.

(b) Preliminary Plan and Final Plat

The quantity of water available from each proposed on-site and off-site source and each aquifer shall be determined and described separately. Calculations shall be based on court decrees, well permits, approved augmentation plans and determinations by the State Engineer. The quantities of available water shall be expressed in acre feet per year and total acre feet for the proposed subdivision to evidence a 300-year supply.

(9) Water Calculation by Category of Water Type

(a) Surface and Undergroundwater as Defined by Statute

Available surface and undergroundwater as defined in C.R.S. §37-92-103(11) are calculated as follows.

(i) Renewable Water Sources

Certain water as defined in C.R.S. §37-92-103(11) which is provided from surface water and underground sources is considered to be annually renewable and is therefore considered to have a minimum life of 300 years.

(ii) Well Permits and Court Decrees

The quantities of water available shall be derived from appropriate well permits, court decrees for water rights, changes of water rights, augmentation plans, and State Engineer approved temporary water exchange plans which will be legally and physically available for the proposed subdivision. In the event the court decreed quantity or well sited quantity of water has historically been unavailable at times because of a junior priority or for other reasons, the water supply may only be counted if an alternative supply, of equal quantity, is available when the surface supply is not. For example, if the priority of a surface water supply is such that water is only available seasonally, then an equal supply of reliable alternative water shall be available when the surface supply is not available.

(iii) Calculation of Quantity

The quantity of water available shall be calculated by multiplying the annual appropriation, in acre feet, times 300 years. If a supplemental water supply is required, reduce the number of years by the percentage of time the supply is not available. For example, if a supply of surface water is not available for 6 months out of the year, then the quantity of surface water available shall be reduced by 50%. The supplemental source shall be documented independently.

(b) Groundwater Outside Designated Basins

Available groundwater outside designated groundwater basins and subject to C.R.S. §37-90-137(4) (S.B. 5 (July 1, 1985) and S.B. 213 (July 6, 1973) groundwater) is calculated as follows:

(i) Quantity of Nontributary and Not-Nontributary Groundwater

The quantity of nontributary and not nontributary groundwater available is that quantity prescribed by court decrees, wells, or quantity determinations made by the State Engineer under rules and regulations adopted pursuant to C.R.S. §37-90-137(9), in response to water court request pursuant to C.R.S. §37-92-302(2) and in the referral and review process of C.R.S. §30-28-136(1)(h)(I). With respect to groundwater classified as not nontributary, the applicant shall furnish a court decree approving a plan of augmentation.

(ii) Calculation of Quantity

The quantity is calculated by multiplying the annual appropriation by 100 years. The quantity shall be adjusted for the quantity of groundwater used in prior years. Calculations of the quantity of groundwater available shall be based on the following priority: first, court decrees; second, well permits; and third, State Engineer's recommendations.

(c) Available Designated Groundwater

(i) Not Exceed Quantity Allocated by Commission or Court

The quantity of groundwater may not exceed the quantity of groundwater allocated by permits or determinations approved by the Colorado Groundwater Commission, or the quantity exhibited by court decrees plus the quantity of groundwater which occurs beneath the project site in Denver Basin formations for which the Colorado Groundwater Commission has not approved well permits.

(ii) Priority of Wells a Factor

If a court or the Colorado Groundwater Commission has decreed a priority appropriation list of wells in the basin, the priority and significance of the priority of the proposed wells to any condition of basin over-appropriation shall be a factor in determining sufficiency.

(iii) Quantity of Alluvial Groundwater

The quantity of renewable alluvial groundwater is calculated by multiplying the annual well appropriation or court decree, in acre feet, by 300 years. The appropriation shall be adjusted, if necessary, to account for a junior priority appropriation.

(iv) Quantity of Bedrock Groundwater

The quantity of nonrenewable bedrock groundwater is calculated by multiplying the annual appropriation, as specified in the Colorado Groundwater Commission determination or court decrees and well permits, in acre feet, by 100 years. The appropriation shall be adjusted, if necessary, to account for groundwater previously appropriated or extracted. Denver Basin groundwater underlying the project site for which Colorado Groundwater Commission determinations or court decrees or well permits have not been issued may be counted as part of the water supply. The estimates of Denver Basin groundwaters are only permissible for those deep aquifers which will not be needed during the first 20 years of the project.

(d) Available Perfected Groundwater

Available groundwater from groundwater rights perfected prior to enactment of Senate Bill 213 (July 6, 1973) is calculated as follows:

(i) Calculating Quantity of Groundwater

If renewable (i.e. alluvial) multiply the annual appropriation by 300 years; if nonrenewable (i.e. Denver Basin aquifers) multiply the annual appropriation by 100 years. If appropriate make adjustments for the 3/7 rule on the Arkansas River or other extraction limitations.

(ii) Calculating Quantity of Pre-1973 Court Decree and Groundwater

The quantity of groundwater from pre-1973 court decrees and well permits shall be calculated independently, and when appropriate the cylinder of appropriation of the well shall be subtracted from the area of other groundwater calculations.

(10) Finding of Sufficient Quality

In conjunction with applicable State and federal water quality standards and requirements, the proposed water supplies shall meet the following requirements:

(a) Chemical Analysis Required

A chemical analysis shall be performed on a representative water sample from every bedrock groundwater source which will be utilized by the subdivision during the first 5 years and from every non-bedrock source to be used by the subdivision. Large subdivisions may require multiple samples from the same source (not the same well) to ensure representative water quality analyses.

(b) Contaminant Levels to Meet Drinking Water Requirements

Maximum permissible contaminant levels shall meet the requirements of the Colorado Primary Drinking Water Regulations, as clarified by the EPCDHE.

(c) Analysis of Major Ions

Analyses of the major ions calcium, magnesium, potassium, sodium, bicarbonate/carbonate, chloride and sulfate may be required by the EPCDHE.

(d) Collection Techniques

Samples shall be collected by qualified personnel using standard collection and preservation methods and shall be analyzed within the limits of standard holding times. A chain of custody shall be maintained and documented from sampling to a laboratory analysis. Samples shall be analyzed by a Colorado certified testing laboratory.

(e) Sampling Location

Samples from bedrock aquifers shall be collected within ½ mile of the project site or off-site source. If the bedrock source will not be used during the first 5 years of the project and if wells are not available for sampling, the requirement for bedrock aquifer water quality analysis may be deferred as a condition of approval by the BoCC. Samples from shallow alluvial aquifers shall be collected within 500 feet of the project site or off-site source and shall be collected from the closest up-gradient well. All samples shall be representative of the source.

(f) Water Quality Not Meeting Standards

If the quality of the source water does not meet the standards specified in the Colorado Primary Drinking Water Regulations, as clarified by the EPCDHE, the applicant shall demonstrate that treatment facilities will be constructed and maintained which will bring the water within the standards.

(g) Presumption of Water Quality

In the absence of evidence to the contrary, a presumption is made that residential subdivisions of 4 or fewer lots will meet the water quality standards. In the absence of evidence to the contrary, it is presumed that water supplied from an existing Community Water Supply, which operates in conformance with the Colorado Primary Drinking Water Regulations and the CDPHE requirements, as clarified by the EPCDHE, is determined to meet the water quality standards as required by the section.

(h) Future Water Quality to Meet Standards

Under foreseeable and likely future conditions, the quality of the proposed water supply shall meet or exceed the water quality standards established herein. Both on-site and off-site source conditions shall be considered.

(i) Compliance Not to Diminish Other State and Federal Standards

Compliance with this Section is not intended to modify, displace, supersede or diminish compliance with other State and federal water quality requirements.

(C) General Requirements (Clarifications)

(1) Renewable Groundwater Life 300 Years

Water provided from renewable groundwater sources is considered to be annually renewable and, therefore, is considered to have a minimum life of 300 years.

(2) Recharge Not Used to Modify Bedrock Calculations

Groundwater recharge may not be used to modify the calculations of the quantity of extractable groundwater in bedrock aquifers unless it is included in court decrees, well permits, approved augmentation plans or determinations by the Colorado Groundwater Commission and the State Engineer.

(3) Alternative Supplies May be Considered Renewable

Alternative water supplies such as treated effluent may be considered renewable or nonrenewable and shall be evaluated on a case-by-case basis.

(4) Private Arrangements and Agreements

Any private or public arrangements, agreements or contracts that modify, limit, or condition the use of any water rights or water supplies may result in a reduction of the water calculated to be available for subdivision use.

(5) Nonrenewable Water from Off-Site

When nonrenewable water is provided to a development from an off-site location, the calculation of water for purposes of this Section is at the

point of delivery to the development or customer, rather than at the point of pumping of the well.

(D) Post-Approval Compliance

(1) Prior to Authorization of Building Permits

Prior to authorization by the PCD for the issuance of building permits, the following shall be accomplished. This provision does not apply to subdivisions supplied by individual wells.

- All required step drawdown tests shall be performed on production wells.
- For new community water supply systems a certification shall be issued by a qualified professional (knowledgeable with the water system) certifying that the water system is operational for the intended use. CDPHE TMF capacity analysis and approval thereof, as evidenced by issuance of a public water system Identification (PWSID) number shall be provided.
- For existing and established community water supply systems the certification may come from the water supplier's engineer or may be satisfied by the district or supplier's acceptance of the facilities.

(2) Proof of Well Permit Prior to Approval of Building Permits

Subdivisions subject to this Section shall provide proof of a well permit prior to the PCD's authorization for the issuance of building permits for residential usage for properties located within the designated groundwater basins and for individual lots within a subdivision dependent on an individual on lot well system.

(3) Water Provider No Longer Able to Supply

In the event that the applicant or his water provider is no longer able to supply the subdivision with the quality, quantity, or dependability of water identified in this Section and in the final plat and associated documents approved for the subdivision, the issuance of building permits for the subdivision may be limited by the BoCC until the problem is resolved to the satisfaction of the BoCC.

(4) Production Well Testing

The following shall apply:

(a) Step Drawdown Test Performed

A step drawdown test shall be performed on each production well which will be needed to meet the daily and peak water needs of the proposed subdivision and which meet the following criteria: (1) The well or anticipated production rate is for 40 gpm or more, or (2) The well is a community well and will ultimately serve more than 50 acres or 100 dwelling units or an equivalent commercial or industrial project which is subject to the provisions of this Section.

Step drawdown testing is encouraged for all wells. Step drawdown tests shall be an appropriate number of steps of adequate duration to allow evaluation of the production potential of the well. Step drawdown testing is not required for approval of sketch plans. It is recommended that the test results be included with the preliminary plan and final plat submittals.

(b) Test Results to Determine Capacity

Test results will be used to determine whether the production wells have adequate capacity to supply the needs of the subdivision. If test results indicate additional production wells are necessary, the additional wells shall be installed and tested prior to authorization by the PCD for issuance of building permits for the subdivision. Prior to issuance of building permits, the County Hydrogeologist shall review the test results and shall certify that the test results indicate that the production wells have, at the time of certification, adequate production capability to supply the needs of the subdivision.

(c) Sufficient Production Wells Required Before Approval of Building Permits

The PCD shall not authorize the issuance of a building permit for an approved subdivision until sufficient production wells needed to supply the subject phase of the subdivision are installed,, tested, and conveyance is established..

(5) Water Level Monitoring

The following monitoring and reporting is required until all plats for a proposed subdivision have been approved and all building permits for the subdivision have been issued:

- Monthly pumping volumes from each community production well shall be reported to the PCD semiannually;
- Water level and piezometric level monitoring is required for all projects using community or commercial wells. The purpose of this monitoring is to develop historical data of long-term water level changes. Measurements will usually be taken monthly. Monitoring shall be done in accordance with a monitoring plan approved by the County Hydrogeologist. It is anticipated that most monitoring programs will use existing wells. Deep bedrock wells may not be required for monitoring purposes only; and
- All required water level monitoring devices shall be maintained in good working order and the wells shall be available to County staff at reasonable times for water level measurements. The water supplier will be responsible for maintaining the water level monitoring devices.

(E) Substantial Change In Water Supply

(1) Substantial Change Requires Compliance

A substantial change in the water supply for a subdivision shall require compliance with this Section. A substantial change to the water supply includes, but is not limited to, the following:

- A change in the source of water which would result in a substantial decrease in the quality, quantity or dependability of the water supply;
- A change in the subdivision which would result in an increase in the annual water demand exceeding 10%;
- A change from a central water system to individual wells;
- A change from individual wells to a central water system;
- A change that causes modifications to an approved and recorded subdivision plat, covenants as they relate to water supply, a decree, or an augmentation plan;
- A change that results in the water being supplied from a different aquifer from that which was proposed in the review and approval of the subdivision; or
- A change from a renewable source of water to a non-renewable source which would provide less than a 300 year water supply.

(2) Administrative Determination of Whether Change is Substantial

The administrative determination whether the change in water supply is considered substantial shall be made by the PCD Director, in consultation with OCA and County staff. Factors to consider in this determination include, but are not limited to:

- The percent increase or decrease in water demand or water availability; or
- The absolute quantity increase or decrease in the water demand or water availability.

(3) Substantial Change Requires New Final Plat Submittal

In the event that the change is determined to be substantial, the application for a substantial change in water supply may be a customized submittal as determined by OCA and County Staff, and processed as a platting action which may require submittal of new plat documents, and which is subject to approval by the Board of County Commissioners.

(4) Administrative Approval of Change Granted

In the event that the change is determined to be not substantial, administrative approval of the change may be granted along with any other modifications to implement the administrative approval.

APPENDIX B
LANDSCAPING INFORMATION FROM OTHER CITIES AND COUNTIES

EL PASO COUNTY WATER MASTER PLAN

OTHER COMMUNITIES' LANDSCAPE STANDARDS

Other Municipality and County Landscaping Standards Review

Other counties' (e.g., Adams, Larimer, Mesa) and municipalities' (e.g., Colorado Springs, Aurora, Boulder) landscaping codes and standards were reviewed for the same criteria as El Paso County. A brief summary of landscaping standard benchmark findings is provided below. For more detailed information, refer to the actual documents (see attached references).

ORGANIZATION, GOALS, AND OBJECTIVES

Colorado Springs. Colorado Springs has an integrated Landscape Code & Policy Manual that provides landscaping guidance. Goals include addressing development pressures, loss of indigenous landscapes, and the challenges of balancing rapidly disappearing natural settings with development. The Landscape Code & Policy Manual identifies that landscape development consistent with climatic and soil conditions of the region will be the most successful and sustainable. Use of xeric principals is suggested including planning and design, soil analysis/conservation, appropriate plant selection, practical turf areas, efficient irrigation, organic mulch use, and proper maintenance. Objectives include water conservation, aesthetics, environmental quality, horticultural sustainability, human values, land values and investment, nuisance species control, improved design, administration and enforcement.

Aurora. In Aurora, landscaping requirements are addressed in a Landscape Reference Manual. The Landscape Reference Manual refers to the City of Aurora Development Regulations. The goal is that the landscape plan is a legal document that is binding. The objectives of the Landscape Reference Manual is to guide developers through the landscape plan requirements.

Boulder. In Boulder, landscaping is addressed in ordinances and standards. Goals of the ordinances and standards include providing minimum requirements for landscaping and maintenance; promoting sustainable landscapes; enhancing air quality; reducing and improving stormwater runoff; reducing the spread of noxious weeds; increasing the capacity for groundwater recharge; minimizing water use by promoting xeriscaping; enhancing the appearance of residential and non-residential areas; reducing visual impacts of large expanses of pavement and rock; improving compatibility between uses; enhancing street scapes; providing shade; attenuating noise; filtering air; buffering wind; and reducing glare.

Adams County. Adams County addresses landscape requirements in their Development Standards and Regulations. Goals include enhancing and promoting a unique image;

protecting public health, safety and welfare (e.g., increasing parking lot safety; minimizing noise, air, water and visual pollution; screening/buffering incompatible land uses; reducing reflected glare and heat absorbed; breaking up large expanses of parking lots; preserving property value; providing wind screening); conserving water resources (e.g., promoting xeriscaping and drought-tolerant native plantings; and the utilization of stormwater detention as an irrigation source); and ensuring landscaping is an integral part of the site design and development process.

Larimer County. Larimer County addresses landscape requirements in their Land Use Code. Goals and objectives include protecting the aesthetic, economic, recreational and environmental resources of Larimer County with landscape standards that enhance the quality and appearance of new development in public or private areas; mitigating negative visual impacts between existing and proposed uses; promoting efficient use of water in landscaping through application of xeric design techniques to establish procedures for landscape design, installation and maintenance; improving the environment by providing shade to reduce the heat island effect generated by large paved areas or structures; preserving existing, non-invasive, trees and shrubs; using native, adaptive, and drought tolerant plants; purifying the air; protecting wildlife habitat; creating wildfire safe designs; and controlling erosion, stormwater, noxious weeds, and invasive/destructive plants.

Mesa County. Mesa County addresses landscape requirements in their Land Development Code. Goals include preserving and improving public health, safety, and general welfare; promoting consistency and compatible development within Mesa County. Specific goals are not provided with respect to landscaping. Landscaping objectives are required based on adopted area, neighborhood plan, or general minimum requirements.

FLEXIBILITY

Mention of flexibility in complying with landscape requirements is provided in most of the landscape codes, standards, manuals, and ordinances of the municipalities and counties reviewed. At the request of El Paso County staff, available text on flexibility is taken directly from these codes, standards, manuals, and ordinances.

Colorado Springs. Alternative Relief (Chapter 7, Article 4, Section 306, Policy 306). The purpose of this section is to provide for flexibility in the application of landscaping regulations when a standard is inapplicable or inappropriate to a specific use or design proposal or when a minor problem arises with the strict application of development standards. Some degree of administrative relief may be anticipated in those districts noted in the Landscape Policy Manual. Should findings justify the granting of administrative relief, the findings and relief shall be consistent with the Administrative Relief of this Zoning Code and with the policies and procedures of the Landscape Policy Manual.

1. The written request for Administrative Relief in conjunction with a development plan, or building permit site plan shall be submitted to the City Planner reviewing the plan.

2. City planning shall not render a decision on Administrative Relief. City Planning shall limit their review to compliance with the Zoning Requirements.
3. The designated planner should render a decision within three days after receipt of the request and complete information.
4. City Planning recognizes that the specific landscape requirements in the Zoning Code and Landscape Manual cannot and do not anticipate all possible landscape situations.
5. Compliance with the requirements should not be forced into a site design. For both visual effect and ease of maintenance, relatively few and larger landscapes spaces integrated with the other elements of the site design are generally encouraged. Relatively numerous and smaller landscapes spaces not integrated with the other element of the site design are generally discourage.
6. The granting of Administrative Relief should not always mean that a requirement is reduced without compensation. For example, the granting of a reduced setback depth should be compensated by the planning of additional shrubs or other plants.
7. A decision regarding Administrative Relief may be appealed to the Hearing Officer in conformance with the requirements of 7.5.907 of the Zoning Code.
8. Some degree of administrative relief may be anticipated in the following districts:
   a. Central Business Districts
   b. Hillside Area Overlay District
   c. Historic Preservation Overlay District

<u>Alternative Compliance (Chapter 7, Article 4, Section 307, Policy 307).</u> Regulations, standards, and polices contained in the Landscape Code and Policy Manual are to facilitate development that is consistent with the City's landscape objectives. The requirements are intended to foster creative design but not to invoke an inordinate hardship where compliance as outlined in the Landscape Code and Policy Manual.

1. Alternative compliance is a procedure that enables a development to occur where the intent of the Code is met through and alternative design. It's not a waiver of regulation rather it permits a site-specific plan that results in a better design while meeting the intent of the landscape code.
2. A pre-submittal conference is required to determine the preliminary response from the City Planning. Should the development/site plan include a request for approval of Alternative Compliance, sufficient explanation and justification, both written and or graphic shall accompany the submittal.
3. An application for Alternative Compliance, as a comprehensive form of Administrative Relief may be submitted provided the proposal meets one or more of the following criteria:
   a. The site conditions, including but not limited to topography, soils, natural water features, significant vegetation, wildlife habitat, or issues of environmental quality may be better addressed and the intent of the Code better realized through the alternative proposal.
   b. The landscape areas of the project site are unusually shaped so as to result in space limitations that are deleterious to the health or growth of plants, safety

and/or visibility, or for which alternative construction and installation techniques must be used.

c. The neighborhood context, historical setting or vegetative quality of the site will be better served by an alternative design.

d. The alternative compliance proposal meets the Objectives of Zoning Code 7.4.302 in a manner equal to or better than compliance with the regulations contained in the Code and Policy Manual.

4. Alternative Compliance shall apply to the specific project for which Administrative Relief is requested and does not establish a precedent for assured approval of other requests.

Aurora. Sec. 146-1412. Administrative Modifications to Planting Requirements. Any requirement to install a particular type, size, or amount of landscape materials may be modified by the Director of Planning if:

1. The area where the landscaping is required to be installed contains high voltage power lines, large pipelines, or other similar utility structures; or
2. The Director of Planning makes a written finding during the development approval process that landscaped areas left in their natural and undisturbed state would be a greater amenity to the development than a formally landscaped area. Irrigation is not required for undisturbed natural areas; however, temporary irrigation is required to establish disturbed and restored natural areas. (Ord. No. 2004-58, § l(Exh. A), 9-13-2004; Adm. Corr. of 6-8-2006)

Boulder. (c) Modifications to the Landscape Standards. The City Manager is authorized to modify the standards set forth in this section and Sections 9-9-13, "Streetscape Design Standards," and 9-9-14, "Parking Lot Landscaping Standards," B.R.C. 1981, upon finding that:

(1) The strict application of these standards is not possible due to existing physical conditions;

(2) The modification is consistent with the purpose of the section; and

(3) The modification is the minimum modification that would afford relief and would be the least modification of the applicable provisions of this chapter.

The manager shall require that a person requesting a modification supply the information necessary to substantiate the reasons for the requested modification. The details of any action granting modifications will be recorded and entered in the files of the planning department.

Adams County Change in Use. When there is a change in use, as determined within the Change in Use Section of Chapter 4*, all of the applicable landscape requirements that can reasonably be complied with shall be complied with. Mere financial hardship caused by the cost of meeting the landscaping requirement does not constitute grounds for

finding compliance is not reasonably possible. *Adopted by the BoCC on December 13, 2010.

Administrative Relief. Administrative relief is provided to add flexibility in the application of the landscaping regulations in this Section 4-16 when a standard is inapplicable or inappropriate to a specific use or design proposal. However, the granting of administrative relief should not always mean a requirement is reduced without compensation. For example, the granting of a reduced bufferyard depth should be compensated by the planting of additional trees, shrubs, or other plants. A written request for administrative relief shall be submitted to the Director of Community and Economic Development either before or in conjunction with the building permit review process.

The Director of Community and Economic Development must make all of the following findings in order to grant administrative relief:

1. The strict application of the regulations in question is unreasonable given the development proposal or the measures proposed by the applicant or the property has extraordinary or exceptional physical conditions or unique circumstances which do not generally exist in nearby properties in the same general area and such conditions will not allow a reasonable use of the property in its current zone in absence of relief;

2. The intent of the landscaping section and the specific regulations in question is preserved, and

3. The granting of the administrative relief will not result in an adverse impact upon surrounding properties.

The Director of Community and Economic Development shall render a decision on the request within ten (10) working days of receipt of the request and all required information. An appeal of the decision of the Director of Community and Economic Development may be made to the Board of Adjustment within ten (10) days after the decision.

The Board of Adjustment shall grant the appeal, modify the administrative decision, or deny the appeal based on consideration of the staff report, the evidence from the public hearing, and compliance with the criteria for approval.

Policies:

1. The County recognizes the specific landscape requirements in this Section cannot and do not anticipate all possible landscape situations. In addition, the County recognizes there may be landscape proposals that conform to the purpose, intent and objectives of the landscape standards, but were not anticipated in the specific regulations. Therefore, the County may grant administrative relief in the event of these situations and proposals.
2. The County recognizes a proposed development of a relatively small commercial or industrial lot, which was created prior to the current landscape requirements, or the

expansion or remodeling or an existing commercial site may present unusual difficulties in complying with the current requirements. Therefore, the County may grant administrative relief in the event of these situations and proposals.

3. The County shall attempt to balance the reasonable use of such a lot with the provisions of required landscaping. This balance will be affected by the site's characteristics, as well as the proposed development plan.
4. The County recognizes in order to allow reasonable development, there should be an upper limit to the amount of the site, which is required to be landscaped. As a general guideline for relatively small commercial or industrial lots (such as one (1) acre or less), the requirements should not exceed twenty-five (25) percent of the site.

Larimer County. 8.5.2. – Applicability Appeals and waivers. Applicants for development review may request that the planning director waive the section 8.5, standards in part or in whole, for applications in the planning department's administrative review process. Decisions of the planning director may be appealed in writing to the board of county commissioners per section 22 (appeals) of this Code.

Mesa County. §3.3 Land Development Code Amendments. 3.3.2 Application Filing. Applications to amend the text of this Land Development Code shall be submitted to the Planning Director. 3.3.3 Public Hearing Notice. Notice of Planning Commission's and Board of County Commissioners' public hearings shall be published in accordance with Section 3.1.8. 3.3.4 Planning Director's Review and Report. The Planning Director shall review each proposed Land Development Code amendment to determine whether it complies with the purpose of the Land Development Code set forth in Section 1.5, Purpose, and whether the amendment would conflict with other sections in the Land Development Code, and, if deemed necessary, distribute the application to other reviewers. Based on the results of those reviews, the Planning Director shall provide a report to the Planning Commission. 3.3.5 Planning Commission's Review and Recommendation. The Planning Commission shall hold a public hearing on the proposed text amendment, and, at the close of the public hearing, make a recommendation to the Board of County Commissioners. 3.3.6 Board of County Commissioners' Review and Decision. After receiving the recommendation of the Planning Commission, the Board of County Commissioners shall hold a public hearing, and, at the close of the public hearing, act to approve, approve with modifications, or deny the proposed text amendment.

ENVIRONMENTAL INFORMATIONAND RESOURCES PROVIDED

Environmental information and resources are provided in the landscape codes, standards, manuals, and ordinances of the municipalities and counties reviewed. At the request of El Paso County staff, available text on artificial turf is taken directly from these codes, standards, manuals, and ordinances.

Colorado Springs. Setting information (e.g., locale, elevation range, vegetation communities) is provided. Definitions, regional plant communities, selected plants for Colorado Springs, planting details, Signature Landscapes Design Manual that provides detailed design resources.

Artificial turf. Artificial turf is not mentioned.

Aurora. Recommended xeriscape plant list, policy on the preservation of existing trees, single-family detached landscaping information, artificial turf requirements, calculation and table information.

Artificial turf. Sec. 146-1410. Definitions (F) Artificial Turf. A man-made substitute for organic turf, lawn, or sod which effectively simulates the appearance of a well-maintained lawn and meets all of the quality, material and installation standards listed in Section 146-1428 of this article.

Sec. 146-1427 Turf Regulations (A) Artificial Turf. Turf as defined and described in Section 146-1410(F) and Section 146-1428 may be used to meet the natural turf requirements of this article when installed in accordance with all city requirements and regulations. The use and installation of artificial turf is also subject to the following limitations:

1. In single family detached, two-family, and single-family attached duplex homes. Artificial turf may replace natural turf in front, side, and rear yards, but must meet minimum and maximum percentage requirements found in Table 14.3A.
2. In all other uses. Artificial turf shall be considered a non-living material and its use as such shall be limited as specified in Section 146-1431Living Material Requirements. More specifically, the quantity of artificial turf that may be installed shall be determined in combination with all other natural non-living materials so that the combination of these materials may not exceed 50% of said site's landscape area as measured within property lines.
3. Prohibited use. The use of indoor or outdoor plastic or nylon carpeting or other materials or combinations of materials as a replacement for artificial turf or natural turf shall be prohibited.

Sec. 146-1428 Artificial Turf Standards The use of artificial turf shall be governed by the following standards:

A. Materials. Artificial turf shall be of a type known as a cut pile infill and shall be manufactured from polypropylene, polyethylene, or a blend of polypropylene and polyethleyene fibers stitched onto a polypropylene or polyurethane meshed or hole punched backing. Hole-punched backings shall have holes spaced in a uniform grid pattern with spacing not to exceeding four inches by six inches on center.
B. Installation. Artificial turf shall be installed over a compacted and porous road base material and shall be anchored at all edges and seams. Seams shall be glued and not sewn. An infill medium consisting of ground rubber, ground coal slag, clean washed sand and ground rubber, or other approved mixture shall be brushed into the fibers to insure

that the fibers remain in an upright position and to provide ballast that will help hold the turf in place and provide a cushioning effect.

C. Slope Restrictions. The installation of artificial turf on slopes greater that 6.6% shall require the approval of the city engineer and shall meet requirements of the Public Works Department.

D. General Appearance. Artificial turf shall be installed and maintained to effectively simulate the appearance of a well-maintained lawn. The Planning Department shall maintain and make available for public inspection a sample of various artificial turf products that meet this standard of appearance.

Sec. 146-1431. Living Material Requirements. Non-living landscapes materials means non-landscaped organic and inorganic materials such as rock, cobbles, wood chips and shredded bark, artificial turf, natural and man-made pavers, crusher fines, and crushed granite.

Sec. 146-1450. Additional Requirements for Residential Development. No artificial trees, shrubs, turf or plants or other materials not derived from natural vegetation or artificial turf meeting requirements found in this code shall be used to fulfill the requirements as set forth in this section; however, such items may be used for decorative purposes supplemental to the natural vegetation.

Sec. 146-1478 Urban Street Landscaping (F) Urban Landscaping Specification the Standards are as follows: Groundcover. The use of groundcovers shall be subject to requirements found herein. Permitted non-living groundcovers include: Artificial turf in conformance with requirements found in this article

Boulder. Resources provided include: Ordinance Numbers 5930 (1997); 7079 (2000); 7088 (2000); 7279 (2003); 7331 (2004); 7713 (2011); 7921 (2013); 8018 (2014) ; 8166 (2017); 9-9-13 Streetscape Design Standards; 9-9-14 Parking Lot Landscaping Standards; 9-9-15 Fences and Walls; 9-9-16 Lighting, Outdoor; 9-9-17 Solar Access; 9-9-18 Trash Storage and Recycling Areas.

Artificial turf. Water Conservation: Landscaping shall be designed to conserve water through application of all Xeriscape™ landscaping principles. Xeriscape™ landscaping principles do not include artificial turf or plants, mulched or gravel beds, or areas without landscape plant material, bare ground, weed-covered or infested surfaces, paving of areas not required for pedestrian access, plazas, or parking lots, or any landscaping that does not comply with the standards of this section.

Adams County. All landscape materials shall be healthy and compatible with the local climate and the site soil characteristics, drainage, and water supply. Xeriscape fundamental principles are provided. Recommended plant materials that are more drought tolerant are identified.

Artificial turf**.** 4-16-04 – Prohibited Landscaping. No artificial trees, plants, or turf shall be used as a landscape material.

Larimer County. Larimer County provides a Landscaping Guide that provides information on basic landscaping concepts.

Artificial turf. Artificial turf is not mentioned.

Mesa County. Plant selection shall emphasize drought-tolerant plant species and shall limit the use of high water-use plant species. Plant and soil information is provided in the Mesa County Landscape Handbook. The use of turf grass is discouraged. Where turf is used as a groundcover, warm-season grasses and native seed mixes should be considered. A variety of design standards are provided for various locations.

Artificial turf. CHART F: DRY LANDSCAPES. For Developments that are proven to be completely dry with no water for irrigation and/or properties served by a water district with domestic water only.

1. Dry Landscape Options (Minimum 25 points, Maximum N/A)
REQUIRED: Groundcover of gravel, decomposed granite, or other mulch.

Boulders (minimum size 24" x 30"): 1 point each with maximum of 10 points	1
Dry creek bed or other significant landscape feature	5
Western collectibles-small (ex: wagon wheel, antlers): 1 point each with maximum 5 points	1
Large western antiques (ex: mining cart, wagon) 5 pts each with maximum 10 points	5
Shade structure or other structure (ex: small bridge, pavilion)	10
Fine art/sculpture (NOT including small garden ornaments)	5
3-6' Masonry wall with decorative features (may only be counted on one chart)	5
Shrubs: #2 container size, at density to attain 5% bed coverage after 3 years	5
Evergreen Tree, 1 point each with maximum of 10 points	1
Use of low-water-consumption grasses for at least 5% of bed coverage	5
Use of permeable, realistic, ARTIFICIAL TURF on at least 5% of bed coverage	5
Preservation of existing significant vegetated areas and/or natural rockscapes	5
Reclamation of native species	5

WATER CONSERVATION GOALS

Water conservation goals are provided in all of the landscape codes, standards, manuals, and ordinances of the municipalities and counties reviewed. A summary of each municipalities' or counties' information is presented below.

Colorado Springs. Water conservation is mentioned throughout the guidance document. Some of the major water conservation goals include: use of xeriscape principles, use of site-specific plant material matched to soil type and microclimate, conservation of indigenous plant communities, promotion of landscapes that require minimal supplemental irrigation, prohibition of restrictive covenants requiring turf grass due to water demand.

Aurora. Section 146-1431 has been rewritten to assist those who intend to remove areas of blue grass or who will convert their traditional high water landscapes to water conserving sustainable

landscapes. Xeriscape information is provided for front yards. A Xeriscape Rebate Program is available.

Boulder. A list of water conservation goals are provided. Landscaping shall be designed to conserve water through application of all xeriscape landscaping principles.

Adams County. Conserving water resources is suggested by promoting xeriscaping and using drought-tolerant native plantings. Adams County promotes the utilization of stormwater detention as an irrigation source. In eastern Adams County, single-family residential land uses are not required to install landscaping and no landscaping is required for commercial and industrial land uses, which are serviced exclusively by wells and which are restricted by the Colorado Division of Water Resources to inside use only.

Larimer County. Larimer County promotes the efficient use of water in landscaping through the application of xeric design techniques. Xeric design techniques are mentioned with respect to landscape design, installation and maintenance.

Mesa County. Mesa County identified that xeriscape principles should be applied to landscaping plans. Plant selection shall emphasize drought-tolerant plant species and shall limit the use of high water-use plant species. All required landscapes, with the exception of dry landscapes where no water is available, shall include a designed irrigation system with a timer. Additional guidelines are provided in the Mesa County Landscape Handbook.

APPLICABILITY

This section identifies entities that are subjected to each municipalities' and counties' landscape codes, standards, manuals, and ordinances.

Colorado Springs. Applies to public and private property, and public rights-of-way. Does not apply to single or two-family residential lots.

Aurora. Applicability is not entirely clear, implies all types of development.

Boulder. Applies to lots and parcels, street frontages, streetscapes, paved areas, and parking lots.

Adams County. Applies to all new development which has not applied for a building permit before the effective date of this Section; or existing development which requires a change in use permit.

Larimer County. Applies to subdivisions, planned land divisions, planned developments, conservation developments, special reviews, minor special reviews, special exceptions, site plan and public reviews, rezoning applications and, any use where the board of county commissioners determines that additional landscaping is appropriate. Does not apply to single- or two-family residential lots except for single- or two-family lots that are part of development plan where street trees or other landscaping is required on a per-lot basis.

Mesa County. Applies to development projects (not including single family residential or 2-family residential) located in the Urban Zoning District, Rural Communities, and non-residential

development among state highways and arterial roads. Conditional Use Permits may be subject to landscaping requirements as deemed appropriate by the Planning Director.

PLAN SUBMITTAL REQUIREMENTS AND QUALIFICATIONS

This section identifies each municipalities' and counties' landscape plan submittal requirements and qualifications needed to submit landscape plans.

Colorado Springs. Plan submittals include: a landscape plan, landscape grading plan, irrigation plan, and inspection affidavit. Plans need to demonstrate compliance with Signature Landscapes Framework, expression of plant communities, retention of significant vegetation and topography, and ecological basis. In addition, landscape plans need to comply with the Landscape Code and Policy Manual, policies, procedures, standards, Selected Plant List and application forms. Site Categories required to be landscaped include landscape setbacks for double frontage lot streetscapes, motor vehicle lots, internal landscaping, landscape buffers/screens, and street trees in parkways. Professional Qualifications are needed to prepare required plans.

Aurora. Aurora requires a preliminary landscape plan which is submitted concurrently with the site plan during development review. Submittal of final landscape plans is not required. The landscape plan is submitted concurrent with the development application and is reviewed for compliance with the landscape code during development review. All new development and changes to existing development proposing the seeding or re-seeding of non-irrigated areas with native grasses, dryland grasses, or restorative grasses where the native or naturalized landscape is intended to remain as the permanent condition on lands that will not be conveyed to the city shall submit a revegetation plan and comply with all requirements. The revegetation plan must meet the requirements of City Code related to erosion and sediment control as found in Sections 138-440 and 138-442. The landscape plan is a commitment to quality and is a long-term maintenance agreement therefore, the plans must be complete and legible and will not be accepted if they are unclean or information is illegible or missing. Professional qualification requirements not noted.

Boulder. Detailed landscape plan requirements are provided. Professional qualification requirements not noted.

Adams County. Detailed landscape plan requirements are provided. A landscaping plan is required as a condition of building permit approval. Professional qualification requirements not noted.

Larimer County. The planning director, or a designated representative, may determine that a landscape narrative can substitute for a landscape plan. The landscape narrative must be approved by the county prior to installation of any landscape materials. Detailed landscape plan requirements are also provided. Landscaping must be maintained. Automated irrigation systems are required where public water is available. A certified irrigation designer shall design the system. All final landscape plans must be prepared by or under the direction of a licensed landscape architect registered in the State of Colorado.

Mesa County. Detailed landscape plan requirements are provided. Landscape plans must be prepared by landscape architect licensed in the State of Colorado. Mention is made about projects being subjected to stormwater regulations.

APPENDIX C
DEPARTMENT OF LOCAL AFFAIRS (DOLA) AVAILABLE FINANCIAL ASSISTANCE

AVAILABLE FINANCIAL ASSISTANCE

WATER AND WASTEWATER ASSISTANCE

Department of Local Affairs
1313 Sherman Street, Room 521
Denver, Colorado 80203
303-866-2156
www.dola.colorado.gov

AVAILABLE FINANCIAL ASSISTANCE

Colorado Department of Local Affairs
1313 Sherman Street, Room 521
Denver, Colorado 80203
(303) 866-2156
www.dola.colorado.gov

INTRODUCTION

There are a number of potential sources of funds available to local governments and other community organizations to make needed improvements to water and wastewater systems. This publication details the commonly used sources of funding from the federal and state governments for these needs. For more specific questions related to these funding sources, please contact the program managers listed at the end of the descriptions of each program, or the Department of Local Affairs Field Representatives listed at the end of the handout.

COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)

CDBG is a state administered, federally-funded program. Grants are provided to "non-entitlement" municipalities and counties for public facilities, economic development, and housing projects which principally benefit low and moderate income (LMI) persons. Districts and private entities (such as nonprofit water companies or homeowners associations) are eligible if sponsored by a municipality or county.

Eligible activities include, but are not limited to, public facilities improvements, property acquisition and rehabilitation, relocation expenses and business financing. All activities must meet at least one of three national objectives: benefit to low and moderate income persons, prevention or elimination of slum and blight, or address an urgent need.

Ineligible activities include buildings for the general conduct of government, general government expenses, income payments, operating/maintenance, and repairs.

CONTACT: Department of Local Affairs Field Representatives (see last page).

ECONOMIC DEVELOPMENT ADMINISTRATION (EDA) PUBLIC WORKS AND DEVELOPMENT FACILITIES PROGRAM

Federal grants are provided to help distressed communities attract new industry, encourage business expansion, diversify their economies, and generate long-term, private sector jobs. Among the types of projects funded are water and sewer facilities primarily serving industry and commerce; access roads to industrial sites or parks; and business incubator buildings. Proposed projects

must be located within an EDA eligible area. Eligibility is based on low per capita income (PCI) or high unemployment. Eligibility can also be based on various measures of special economic need. Projects must be consistent with an approved Comprehensive Economic Development Strategy (CEDS). An applicant may be a state, political subdivision of a state, Indian tribe, special-purpose unit of government, or public or private nonprofit organization. CONTACT: Trisha Korbas, EDA (303) 844-4902 or tkorbas@eda.doc.gov.

ENERGY & MINERAL IMPACT ASSISTANCE GRANT/LOAN PROGRAM

The largest distribution of funds by the State Energy and Mineral Impact Assistance Program occurs in the form of discretionary grants for basic infrastructure and community development projects. Loans are available, with a fixed interest rate of 5%, for domestic treated water and sewer projects only. By statute, funds can only be distributed to political subdivisions socially or economically impacted by the development, processing, or energy conversion of minerals and mineral fuels. CONTACT: Department of Local Affairs Field Representatives (see last page).

USDA RURAL DEVELOPMENT (RD)

Rural Development awards grants and loans to rural communities (not more than 10,000 population) for construction and replacement of water, wastewater, storm sewer and solid waste facilities. Communities can receive a loan and grant combination, with percentages based median incomes, health hazard elimination and annual debt service charges. The agency can assist public, non-profit entities such as homeowner associations and Indian Tribes with financing, provided no other credit is available, at reasonable rates and terms. Funds may be used for construction, engineering, interest payments during construction, essential equipment, site acquisition, legal fees, water rights, etc. CONTACT: Robin Pulkkinen, State Loan Specialist, 720-544-2929, robin.pulkkinen@co.usda.gov

COLORADO RURAL WATER ASSOCIATION (CRWA)

Colorado Rural Water Association's Revolving Loan Program, RLP, established under a grant from USDA Rural Utilities Services, USDA/RUS, may provide financing to eligible utilities for pre-development costs associated with your proposed water and wastewater projects and may also be used with existing water/wastewater systems and the short term costs incurred for replacement equipment, small scale extension of services or other small capital projects that are not a part of your regular operations and maintenance. Systems applying must be public entities. This includes municipalities, counties, special purpose districts, Native American Tribes and corporations not operated for profit, including cooperatives, with up to 10,000 population and rural areas with no population limits. Loan amounts may not exceed $100,000 or 75% of the total project cost whichever is less. Applicants will be given credit for documented project cost prior to receiving the RLF loan. Loans will be made at the lower of the poverty or market interest rate as published by RUS, with a minimum of 3%

at the time of closing. CRWA Circuit Riders will come to your community and will help complete the required paper work. CONTACT: CRWA at (719) 545-6748.

RURAL COMMUNITY ASSISTANCE CORPORATION LOAN FUND (RCAC)

Rural Community Assistance Corporation's (RCAC) Environmental Infrastructure Loan Program helps create, improve or expand the supply of safe drinking water and waste disposal systems/facilities that serve low and moderate-income communities in the West, including Colorado. RCAC's loan programs provide the early funds small communities need to determine feasibility and pay pre-development costs prior to receiving state and/or federal program funding. RCAC may also provide long-term loans when system improvements are needed and there is a lack of priority for obtaining funds through state or federal programs. Eligible applicants are non-profit organizations, public agencies, and tribal governments. Projects must be located in rural areas with populations of 50,000 or less. Community size is limited to 10,000 for long-term USDA guaranteed loans and short-term loans for which USDA is the long-term lender. Short-term loans for up to three years with an interest rate of 5.50% are available for: Feasibility studies such as preliminary engineering and environmental reports for up to $50,000; predevelopment loans for such items as engineering, legal and bond counsel for up to $250,000; and construction loans for up to $2,000,000 are available. An intermediate term loan of up to 20 years with an interest rate of 5.00% is available for environmental infrastructure loans. Long-term loans for up to $5,000,000 are available so long as the project meets the requirements of the USDA Rural Utilities Service Water and Waste Disposal Guaranteed loan program. The interest rate for these loans is set at the time of loan closing. CONTACT: Josh Griff, (720) 951-2163; jgriff@rcac.org

WATER POLLUTION CONTROL REVOLVING FUND (WPCRF)

The WPCRF is a low-interest loan program for funding governments (municipalities, counties, and special districts), whose projects will correct water quality problems or qualify as eligible pollution control programs. Created by the State Legislature in 1988, the WPCRF replaced the Federal Construction Grant Program. Between the program's inception and December 2006, the U.S. Environmental Protection Agency has provided $203.2 million in capitalization grants which must be matched with an additional 20% from the state. These funds, along with a fairly aggressive leveraging program, have allowed the fund to make in excess of $691 million in loans. The fund can cover up to 100% of the eligible project costs with terms of up to 20 years. The Disadvantaged Community Program was established in 2006, offering eligible communities loans from the WPCRF with reduced interest rates, depending on median household income. The fund is jointly administered by the Colorado Division of Local Government (DLG), the Water Quality Control Division (WQCD), and the Colorado Water Resources and Power Development Authority (CWRPDA). CONTACTS: DLG, Barry Cress, (303) 866-2352, barry.cress@state.co.us; WQCD, Michael Beck, (303) 692-3374, michael.m.beck@state.co.us; CWRPDA, Keith McLaughlin, (303) 830-1550 x22 kmclaughlin@cwrpda.com.

DRINKING WATER REVOLVING FUND (DWRF)

The Drinking Water Revolving Fund is a low-interest loan program which was initially created in 1995 and funded by the state and the Water Resources and Power Development Authority. In 1997 it was further capitalized with federal dollars to fund eligible projects defined by the federal Safe Drinking Water Act. Local governments (municipalities, counties, and special districts) are eligible for funding. Between the program's inception and December 2006, the U.S. Environmental Protection Agency has provided in excess $272 million in capitalization grants which must be matched with an additional 20% from the state. These funds have allowed the program to make approximately $221 million in financing available to Colorado drinking water system projects. The Disadvantaged Community Program was established in 2005, offering eligible communities loans from the DWRF with reduced interest rates (depending on median household income), and loan terms up to 30 years. The fund is jointly administered by the Colorado Division of Local Government (DLG), the Water Quality Control Division (WQCD), and the Colorado Water Resources and Power Development Authority (CWRPDA). CONTACTS: DLG, Barry Cress, (303) 866-2352, barry.cress@state.co.us; WQCD, Mike Beck, (303) 692-3374, michael.m.beck@state.co.us CWRPDA, Keith McLaughlin, (303) 830-1550 x22, kmclaughlin@cwrpda.com.

COLORADO WATER RESOURCES AND POWER DEVELOPMENT AUTHORITY WATER REVENUE BONDS PROGRAM

The Colorado Water Resources and Power Development Authority was created by the General Assembly to provide Colorado with a mechanism to finance water and wastewater projects. The Authority can assist governmental entities such as cities, towns and districts by issuing revenue bonds and loaning the proceeds to the governmental entity with substantial savings in costs of issuance and interest rates. Eligible projects include: storage reservoirs, water and wastewater treatment plants, distribution systems, water wells and pumping stations. Construction costs include design, engineering, costs of issuance, financing reserves, interest during construction, site acquisition, planning, environmental documentation, water rights, and mitigation costs. CONTACT: Keith McLaughlin, (303) 830-1550 x22, kmclaughlin@cwrpda.com.

DWRF/WPCRF PRE-LOAN PLANNING AND DESIGN GRANT

Planning and Design Grants are available to assist communities with populations under 5,000 and median household income (MHI) is less than 80.0% of the statewide MHI (The current 80.0% MHI number is $45,165 (currently American Community Survey 2006 - 2010). This number will be used through June 30, 2013 at which time the program will default to the most available data for the next period as stated above. Grants are for those communities considering projects which are identified on the current year's project eligibility list or are being added to the subsequent year's list for either the Drinking Water Revolving Fund (DWRF) or the Water Pollution Control Revolving Fund (WPCRF) program. Each program has at least $150,000 in grants available for each calendar year. Grants, up to $10,000 may be awarded for project planning activities including: preliminary engineering reports, engineering design documents, environmental

assessments, technical, managerial and financial capacity assessments and in some cases legal fees to convert an ineligible entity into an eligible local government (i.e., converting a home owners association to a special district provided the grant is sponsored by their county). A local match will be required for planning and design grants. Local match requirements for traditional infrastructure projects are set at a ratio of 80:20 where the community will contribute 20 percent of the planning and/or design cost. An applicant may not receive more than one planning and design grant for the same project. Grants applications will be accepted between January 1 and January 31 of each year. If there are more grants than applications, additional application deadlines will be solicited. If the entity does not seek funding through the SRF, they may be requested to repay the grant or seek a waiver of the repayment requirement from the Authority Board.) CONTACTS: Mike Beck, Water Quality Control Division, (303) 692-3374, michael.m.beck@state.co.us; CWRPDA; Keith McLaughlin, Colorado Water Resources and Power Development Authority, (303) 830-1550, x22, kmclaughlin@cwrpda.com.

WQCD SMALL SYSTEMS TRAINING & TECHNICAL ASSISTANCE GRANT (SSTTA)

SSTTA grants are available to assist communities with populations under 10,000 and Median Household Income (MHI) less than 80% of Colorado OR current/post project water monthly rates are equal to or greater than the state average (current year, state monthly average for water - $38.44 AND must be on the current DWRF Eligibility List Appendix A or G (private-not-for-profit). Applications will be prioritized based on the prioritization criteria found in the DWRF Intended Use Plan. Request for Application (RFA) will be April 1 – April 30 with award of grant on or before June 1. Grants are not to exceed $25,000 and there is $100,000 allocated to this fund through Federal Capitalization Grant Set-aside. Grants, may be awarded for project planning activities including: preliminary engineering reports, engineering design documents, environmental assessments, technical, managerial and financial capacity assessments and in some cases legal fees to convert an ineligible entity into an eligible local government (i.e., converting a home owners association to a special district provided the grant is sponsored by their county). CONTACT: Louanna Cruz, Water Quality Control Division, (303) 692-3604, louanna.cruz@state.co.us.

CWCB WATER EFFICIENCY GRANT PROGRAM

The Colorado General Assembly under Senate Bill 07-008, expanded a mechanism for the Colorado Water Conservation Board (CWCB) through its Office of Water Conservation and Drought Planning to provide financial assistance to water providers and qualifying agencies in the State of Colorado that are seeking to perform or promote more meaningful water conservation. The specific use of the grant monies are as follows: To develop a water conservation plan; implement the water conservation programs and measures specified in their water conservation plans; for public and private agencies, whose primary purpose is to promote the benefits of water resource

conservation, the money may be used to provide education and outreach aimed at demonstrating the benefits of water efficiency; and to develop drought mitigation plans identified as sufficient by the Office. Applications will be accepted throughout the year with awards made to eligible and qualified organizations that meet the requirements of the grant program. Grant guidelines are provided on the CWCB Website: www.cwcb.state.co.us. CONTACT: Ben Wade, (303) 866-3441 x3238 or ben.wade@state.co.us

CWCB WATER SUPPLY RESERVE ACCOUNT

This program provides resources to implement projects and methods for meeting the state's water consumptive and non-consumptive needs. The program can grant or loan money for a broad range of eligible activities including: construction of infrastructure (storage, pipelines, river improvements, etc.), feasibility studies, studies of human and environmental needs, and technical assistance for permitting or environmental compliance. Both statewide and individual basin accounts are established for projects that promote collaboration and cooperation, facilitate water activity implementation, meet water management goals and objectives, and identified water needs, and address issues of statewide value.
In 2009, the Water Supply Reserve Account Program was reauthorized in perpetuity by SB 09-106. It is authorized to receive up to $10,000,000 per year from the Severance Tax Trust Fund, subject to available funding. Detailed guidelines are available on the Water Conservation Board's website at:
http://cwcb.state.co.us/IWMD/RelatedInformation/ToolsResources/
CONTACT: Greg Johnson, (303) 866-3441 x3249 or gregory.johnson@state.co.us

COLORADO WATER CONSERVATION BOARD (CWCB) WATER PROJECT LOAN PROGRAM

The Water Project Loan Program was established in 1971 to provide low interest loans for raw water resource projects. Eligible borrowers have received over $400 million in loans for planning, engineering and construction from the CWCB. Eligible projects involve the collection, storage and transmission of raw water supplies. Examples include new or the rehabilitation of: reservoirs, ditches/canals, pipelines, groundwater wells, water rights purchases, and flood control facilities. A loan feasibility study is required, which must include preliminary engineering by a professional engineer to help select the best alternative and determine project costs. Thirty year loan interest rates range from 2.5% to 3.25% for municipal borrowers, and 1.75% for agricultural borrowers. There is a 1% loan service charge that can be financed into the loan. Loans are available for up to 90% of the total project cost. Applications for loans less than $10 million are accepted throughout the year, and are approved at the bi-monthly CWCB meetings (allow five months for loan approval and loan contracting). Loan requests in excess of $10 million are due August 1st and are considered once a year at the November CWCB meeting, with funds available the following July (if authorized by State Legislature and with executed loan contract). CONTACTS: Anna Mauss, CWCB, 303-866-3441 x3224, anna.mauss@state.co.us

PRIVATE ACTIVITY BONDS (PAB)

Tax-exempt private activity bond allocations are available to municipalities and counties as well as issuing authorities. These entities can in turn issue bonds or other obligations to private entities with interest exempt from federal income taxation. Privately owned water, sewer, and certain waste disposal facilities are eligible for this funding. Local governments with populations greater than 27,000 receive a direct allocation. Local governments which do not receive a direct allocation may receive an allocation from the statewide balance. The statewide balance can be accessed through application to the Department of Local Affairs. CONTACT: Ann Watts, Colorado Division of Housing, (303) 866-4652, ann.watts@state.co.us

FINANCIAL ASSISTANCE FOR WATER AND WASTEWATER PROJECTS

GRANT PROGRAMS

PROGRAM	ELIGIBLE PROJECTS	TERMS	ELIGIBLE RECIPIENTS	MAXIMUM AMOUNT	SPECIAL REQUIREMENTS	APPLICATION DEADLINE
COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)	Water and wastewater	Grants only	CDBG non-entitlement municipality or county; districts and private systems are eligible sub-recipients	$500,000 (guideline)	- Local cash participation - Low/mod income - Davis-Bacon wages - NEPA[1]	Varies - contact DOLA field staff
U.S. ECONOMIC DEVELOPMENT ADMINISTRATION (EDA)	Water and wastewater	Grants only	Governmental units and non-profit organizations	No limit (subject to federal appropriation)	Must be in economically distressed areas & tied to permanent private sector jobs and investments.	Ongoing
DWRF and WPCRF[2] PLANNING AND/OR DESIGN GRANT	Project must be on either the Drinking Water Revolving Fund (DWRF) or the Water Pollution Control Revolving Fund (WPCRF) Eligibility List	Grants only	Entities with populations <10,000; MHI less than statewide median	$10,000 with 20% local match	- Currently required to borrow project's construction funds from the SRF unless a waiver is received from CWRPDA's Board of Directors	January 1st – January 31st
CWCB WATER CONSERVATION & DROUGHT MITIGATION PLANNING GRANT PROGRAM	Water Conservation Planning; Drought Mitigation Planning	Grants only	Any private or other publicly owned utility that provides at retail two thousand acre-feet of water or more annually. Monies for drought planning are available to state and local governmental entities.	No limit, as long as funding is available	Water cons. plans must meet the requirements of §37-60-126 (6) C.R.S. Grant apps must follow CWCB Guidelines. Grants under $50K can be approved by staff. Grants over $50K need CWCB Board approval.	July 1st – Feb 1st.
CWCB WATER EFFICIENCY GRANT PROGRAM	To aid in achieving goals in Water Conservation Plans. To promote the benefits of water resource conservation for education and outreach aimed at demonstrating the benefits of water efficiency.	Grants only	Covered entities that have a current or future total annual demand of 2,000 acre-feet or more. Public or private agencies whose primary purpose is to promote the benefits of water conservation.	No limit, as long as funding is available	Grant applications must meet applicable criteria outlined in CWCB Guidelines. Grants under $50K can be approved by staff. Grants over $50K need Board approval.	Applications can be submitted at any time during the year but must be received by the 1st of the month prior to a Board meeting.
CWCB WATER SUPPLY RESERVE ACCOUNT	To provide resources to implement projects and methods for meeting the state's water needs.	Grants only	Public entities, and a wide range of private entities, including for-profit corporations.	Subject to appropriation.	- Need applicant description - Background statement - Scope of work - 6 month reports - Final report	Anytime during the fiscal year. Allocations made at CWCB bi-monthly board meetings.

GRANT AND LOAN PROGRAMS

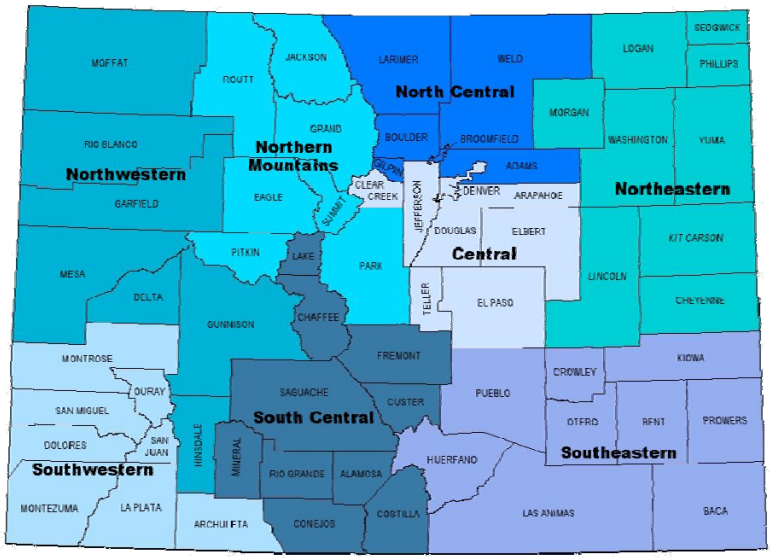
PROGRAM	ELIGIBLE PROJECTS	TERMS	ELIGIBLE RECIPIENTS	MAXIMUM AMOUNT	SPECIAL REQUIREMENTS	APPLICATION DEADLINE
ENERGY & MINERAL IMPACT ASSISTANCE FUND	Water and wastewater	Loan terms up to 20 years, and interest rates of at least 5%	Municipality, County, or Special District	Tier I grants of up to $200,000; Tier II grants, of up to $1,000,000.	- Local cash participation - Energy/mineral industry impacts	December 1st, April 1st, and August 1st
RURAL DEVELOPMENT (U.S. DEPARTMENT OF AGRICULTURE)	Water, wastewater & stormwater projects	- Loans and grants based upon income and health hazards - Three levels of interest rate available, depending upon need - Terms up to 40 years or useful life of project	Municipality, County, Special Districts, or Non-profits	Subject to federal appropriation	- Must be unable to get credit from other sources - NEPA[1]	Ongoing

LOAN PROGRAMS

PROGRAM	ELIGIBLE PROJECTS	TERMS	ELIGIBLE RECIPIENTS	MAXIMUM AMOUNT	SPECIAL REQUIREMENTS	APPLICATION DEADLINE
WATER POLLUTION CONTROL REVOLVING FUND (WPCRF)	Wastewater treatment and collection, nonpoint source pollution, and stormwater projects	- Interest on leveraged loans at 70% of market for 2012 - Direct loans at 2% - 20 year maximum	Municipalities, counties, special districts and political subdivisions	- No limit for leveraged loans (subject to availability of funds) - $2,000,000 for direct loans	- Water Quality Control Commission eligibility list - 208 management plan - Facility plan with environmental assessment	- December 15th and June 15th for leveraged loans - Direct loans the 15th of March, June, September and December
DRINKING WATER REVOLVING FUND (DWRF)	Water treatment, storage and distribution projects emphasizing health hazards and compliance standards	-Interest on leveraged loans at 70% of market for 2012 - Direct loans at 2% - 20 year maximum - Disadvantaged Community Program: Reduced rates & 30 year terms depending on program (see narrative).	-Municipalities, counties, special districts and political subdivisions - Disadvantaged Community Program: municipalities, counties, special district and political subdivisions with population 5,000 or less	- No limit for leveraged loans (subject to availability of funds) - $2,000,000 for direct loans	- Water Quality Control Commission eligibility list - Facility plan with environmental assessment - Eligibility assessment - Technical, managerial and financial capacity review	- December 15th and June 15th for leveraged loans - Direct loans the 15th of March, June, September and December
COLORADO RURAL WATER ASSOCIATION (CRWA)	Water and Wastewater	- The lower of poverty or market interest rate as published by RUS, with a minimum of 3% at closing	Municipalities, counties, special districts, Native American Tribes and corporations not operated for profit, including cooperatives, with up to 10,000 population and rural areas with no population limits.	- $100,000 or 75% of the total project (whichever is less)		Ongoing
RURAL COMMUNITY ASSISTANCE CORPORATION LOAN FUND (RCAC[4])	Water and Wastewater	-Short term: Three years @ 5.75% interest -Intermediate term: Up to 20 years @ 5.00% interest -Long term: Set at closing	Non-profit organizations, local governments and tribal governments.	-See narrative, RCAC	Long-term loans require USDA RD loan guarantee	Ongoing
CWR&PDA[2] WATER REVENUE BONDS PROGRAM	Water and wastewater	Market rates Up to 30 years	Municipalities, counties, special districts and political subdivisions	$100,000,000 ($300,000 minimum)	- Board approval - Raw water storage and diversion projects need CWCB review	Ongoing
COLORADO WATER CONSERVATION BOARD (CWCB) WATER PROJECT LOAN PROGRAM	Raw water projects (dams, pipelines, ditches, wells, new projects or rehabilitation).	Loans for up to 90% of project costs. Repayment periods up to 30 years. Average rates: Agricultural: 2.5% Municipal: 3.25 - 4.25% Commercial: 5.25% 1% Loan Service Charge	Any organization (Small municipalities, agricultural ditch companies, home owner associations, special districts) See CRS 37-60-121	- Limited to fund availability. - Loans typically range from $100,000 to $10,000,000	- Loans under $5,000,000 are regularly approved at regularly scheduled CWCB meetings - Loans over $5,000,000 must be approved by the state legislature	- Ongoing under $5 million - Over $5 million August 31 deadline for following year funding
PRIVATE ACTIVITY BONDS (PAB)	Water, sewer, solid & hazardous waste projects	Variable - depending upon bond market rates	Local governments	Bond counsel determines eligible cost	- Community support - Repayment ability - Local economic benefit	Around January 18 annually, or August 30th if allocation still available

[1] National Environmental Policy Act (NEPA) compliance required
[2] Colorado Water Resources and Power Development Authority

DLG Regional Managers and Regional Assistants



REGIONAL MANAGERS	**SOUTHWESTERN** **Ken Charles** Fort Lewis College 1000 Rim Dr. Durango, CO 81301 970-247-7311 / FAX 970-247-7032 ken.charles@state.co.us	**NORTHERN MOUNTAINS** **Greg Winkler** P.O. Box 687 Lake George, CO 80827-0687 970-668-6160 / FAX 970-668-3216 greg.winkler@state.co.us	**CENTRAL** **Clay Brown** 15220 S. Golden Rd. Golden, CO 80401 303-273-1787 / FAX 303-273-1795 clay.brown@state.co.us	**SOUTH CENTRAL** **Christy Culp** 610 State Ave., Suite 203 P.O. Box 1660 Alamosa, CO 81101 719-589-2251 / FAX 719-589-6299 christy.culp@state.co.us
	NORTHWESTERN **Elyse Ackerman** 222 S. 6th St., Rm. 409 Grand Junction, CO 81501 970-248-7333 / FAX 970-248-7317 elyse.ackerman@state.co.us	**NORTH CENTRAL** **Don Sandoval** 150 E. 29th St., Ste.215 Loveland, CO 80538 970-679-4501 / FAX 970-679-4500 don.sandoval@state.co.us	**NORTHEASTERN** **Greg Etl** P.O. Box 1191 Sterling, CO 80751 970-521-2414 / Fax 970-521-2415 greg.etl@state.co.us	**SOUTHEASTERN** **Lee Merkel** 132 West "B" St., Ste. 260 Pueblo, CO 81003 719-544-6577 / FAX 719-545-1876 lee.merkel@state.co.us
REGIONAL ASSISTANTS	**Leslie Hentze** 222 S. 6th St., Rm. 409 Grand Junction, CO 81501 970/248-7313 / FAX 970/248-7317 leslie.hentze@state.co.us Provides regional assistance for: ☐ Entire Southwestern region; ☐ Portion of Northwestern, including: Mesa, Delta, Gunnison, Hinsdale Counties	**Joe Carter** 222 S. 6th St., Rm. 409 Grand Junction, CO 81501 970/248-7311 / FAX 970/248-7317 joe.carter@state.co.us Provides regional assistance for: ☐ Entire Northern Mountains region; ☐ Portion of Northwestern, including: Moffat, Rio Blanco, Garfield Counties	**Robert Thompson** 150 E 29th St., Suite 215 Loveland, CO 80538 970-679-4503 / FAX 970-679-4500 robert.thompson@state.co.us Provides regional assistance for: ☐ Entire North Central, Central and Northeastern regions	**Bill Gray** 132 West "B" St., Ste. 260 Pueblo, CO 81003 719-924-2087 Cell Only FAX 719-545-1876 bill.gray@state.co.us Provides regional assistance for: ☐ Entire South Central and Southeastern regions

Questions on financing water and sewer projects can also be addressed by contacting Barry Cress in the Denver Office at 303-866-2352, or barry.cress@state.co.us.

APPENDIX D
REFERENCES

REFERENCES

Topper, R. E., & Wilson, J. C. ***Ground Water Atlas of Colorado*** (Ser. 53). Denver, CO: Colorado Geological Survey, Division of Minerals and Geology, Department of Natural Resources, 2003

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Black & Veatch, ***Draft Feasibility Study for Interconnection of the Monument and Palmer Lake Water System***. Town of Monument, Colorado: January 1998

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APPENDIX E
WATER PROVIDERS INFORMATIONAL SPREADSHEETS

The following tables contain contact information for each water provider, per County region, with information regarding the general manager, address, phone numbers, and email. This information is provided for use by the county staff, general public and developers. All information presented in these tables is subject to change.

Region 1:

Provider Name	General Manager	Address	Phone Numbers	Email
Colorado Springs Utilities	RENEE SCHROEDER	701 E LAS VEGAS ST , COLORADO SPRINGS, CO 80903	(BUS) 719-668-4587;	RSCHROEDER@CSU.ORG
*Cascade Metro District No 1	KEVIN WALKER	20 BOULDER CRESCENT ST STE 200 , COLORADO SPRINGS, CO 80903	(BUS) 719-447-1777;	KEVIN@SCHOOLERANDASSOCIATES.COM
*Cheyenne Mtn Air Force Station	TERRY SEAMAN	1 NORAD RD STE 4102 721 CES CEO, COLORADO SPRINGS, CO 80914	(BUS) 719-474-2047;	TERRY.SEAMAN@US.AF.MIL
*U.S. Air Force Academy	KEITH SUE	10 AMDS/SGPB 4102 PINION DR RM 2046 , USAF ACADEMY, CO 80840	(BUS) 719-333-4825;	KEITH.SUE@US.AF.MIL
*U.S. Department Of The Army Fort Carson	HAROLD NOONAN	1626 EVANS ST BLDG 1219 , FORT CARSON, CO 80913-5035	(BUS) 719-526-1730;	HAROLD.V.NOONAN.CIV@MAIL.MIL
Manitou Springs	KIRK GREASBY	606 MANITOU AVE , MANITOU SPRINGS, CO 80829	(BUS) 719-685-5597;	kgreasby@comsgov.com
Garden Valley	BRENDA SMITH	2840 S CIRCLE DR #358 , COLORADO SPRINGS, CO 80906	(BUS) 719-375-4251;	bsmith@orcllc.com; RPBSB12345@MSN.COM;
Cheyenne Mt. Estates	Unknown	Unknown	Unknown	Unknown
Rock Creek Mesa	KATHY OLSON	180 ROCK CREEK MESA , COLORADO SPRINGS, CO 80926	(BUS) 719-576-0746;	rockcreekwater@wildblue.net;
Red Rock Valley Wd	RAVEN RUDDUCK	10415 S HWY 115 , COLORADO SPRINGS, CO 80926	(BUS) 719-359-0020;	CABINFEVER1151@GMAIL.COM
Turkey Canon Ranch Wd	ELLEN ELLSON	9548 WATERBURY DR , FALCON, CO 80831	(BUS) 719-352-5257;	ELLSON.ELLEN@GMAIL.COM
Overlook Mutual Wc	Unknown	Unknown	Unknown	Unknown
Keeton Ranch Water	Unknown	Unknown	Unknown	Unknown
Rock Creek Metro District	Unknown	Unknown	Unknown	Unknown

Region 2:

Provider Name	General Manager	Address	Phone Numbers	Email
Woodmoor Wsd	JESSIE SHAFFER	PO BOX 1407, MONUMENT, CO 80132	(BUS) 719-488-2525;	jessies@woodmoorwater.com
Donala Wsd	MARK PARKER	15850 HOLBEIN DR , COLORADO SPRINGS, CO 80921	(BUS) 719-488-3603;	MARKP@DONALAWATER.COM
Triview Md	JIM MCGRADY	16055 OLD FOREST POINT STE 300 , MONUMENT, CO 80132	(BUS) 719-488-6868;	jmcgrady@triviewmetro.com
Monument Town Of	STEVE R SHEFFIELD	645 BEACON LITE RD , MONUMENT, CO 80132	(BUS) 719-243-3312;	ssheffield@tomgov.org
Palmer Lake Town Of	TARA BERRETH	PO BOX 208, PALMER LAKE, CO 80133	(BUS) 719-481-2953;	TARA@PALMER-LAKE.ORG
Forest View Acres Wd	JOEL MEGGERS	7995 E PRENTICE AVE STE 103E , GREENWOOD VILLAGE, CO 80111	(BUS) 303-381-4960;	jmeggers@crsofcolorado.com
Academy Wsd	ANTHONY PASTORELLO	1755 SPRING VALLEY DR , COLORADO SPRINGS, CO 80921	(BUS) 719-481-0711;	academywsd@qwestoffice.net
Walden Wsd	PETER SUSEMIHL	Unknown	719-579-6500	Unknown
Park Forest Water District	BILL STEDMAN	7340 MCFERRAN RD , COLORADO SPRINGS, CO 80908	(BUS) 719-494-2075;	BILLS@PFWD.ORG
Forest Lakes Md	ANN NICHOLS	2 N CASCADE AVE STE 1280 , COLORADO SPRINGS, CO 80903	(BUS) 719-327-5810;	ANICHOLSDUFFY@AOL.COM
Palmer Lake Mobile Home Ranch	DAVID L JACK	700 HWY 105 , PALMER LAKE, CO 80133	(BUS) 719-481-9134;	DJYOGI@LIVE.COM
Grandview MHP	Unknown	Unknown	Unknown	Unknown
Pioneer Lookout Wd	MARY BOWMAN	PO BOX 851, MONUMENT, CO 80132	(BUS) 719-488-0761;	marybowman463@msn.com;
Elephant Rock MHP	Unknown	Unknown	Unknown	Unknown
Peak Shadow	Unknown	Unknown	Unknown	Unknown
Pinon Pines Metro District	Unknown	2 N CASCADE AVE STE 1280 , COLORADO SPRINGS, CO 80903	(BUS) 719-327-5810;	ANICHOLSDUFFY@AOL.COM

Region 3:

Provider Name	General Manager	Address	Phone Numbers	Email
Woodmen Hills Md	GENE COZZOLINO	8046 EASTONVILLE RD , FALCON, CO 80831	(BUS) 719-495-2500;	GENECOZZOLINO@WHMD.ORG
Meridian Service Md	TOM SCHUBERT	11919 W I 70 FRONTAGE RD STE 116A , WHEAT RIDGE, CO 80033	(BUS) 720-287-0605;	TSCHUBERT@ORCWATER.COM
Paint Brush Hills	STEVE D KNEPPER	9830 LIBERTY GROVE DR , FALCON, CO 80831	(BUS) 719-495-8188;	STEVE@PBHMD.COM
Falcon Highlands Md	CYNTHIA M BEYER	8390 E CRESCENT PKWY STE 500 , GREENWOOD VILLAGE, CO 80111	(BUS) 303-779-5710;	CYNTHIA.BEYER@CLACONNECT.COM
Sage Wua	Unknown	Unknown	Unknown	Unknown
Falcon Heights Poa	ROBERT PRATHER	7055 BUCKBOARD DR , PEYTON, CO 80831	(BUS) 719-238-0941;	BUFNJAM@ELPASOTEL.NET
Bobcat Meadows Md	DAVE GRISER	PO BOX 463, WOODLAND PARK, CO 80866	(MOB) 719-235-6064;	davidgriser@live.com
4 Way Ranch Md 1	RYAN MANGINO	545 E PIKES PEAK AVE STE 300 , COLORADO SPRINGS, CO 80903	(BUS) 719-227-0072;	rmangino@jdshydro.com
Camelot	Unknown	Unknown	Unknown	Unknown
High Plains Ranch Metro District	Amanda Johnson-Gorton	2154 E Commons Ave. Suite 2000, Centennial, CO 80122	303-858-1800	agorton@wbapc.com
Sterling Ranch Metro Districts 1-3	Kevin Walker	20 Boulder Crescent Street Suite 200 Colorado Springs, CO 80903	719-447-1777	Kevin.W@WSDistricts.com

School Districts

School District 49	Unknown	Unknown	Unknown	Unknown

Region 4:

Provider Name	General Manager	Address	Phone Numbers	Email
Calhan Town Of	CINDY TOMPKINS	PO BOX 236, CALHAN, CO 80808	(BUS) 719-347-2586;	TOWNCLERK@CALHAN.CO
Ramah Town Of	CINDY TOMKINS	PO BOX 129, RAMAH, CO 80832	(BUS) 719-541-2163; Clerk: 719-541-3908	Unknown
Prairie Estates	DAVID HENLEY	475 LOG RD NO 37 , CALHAN, CO 80808	(BUS) 719-332-5297;	profesr3304@aol.com
Peyton Pines	DEBBIE DEBAUN	PO BOX 171, PEYTON, CO 80831	(BUS) 719-749-0611;	DEBBIE@BC-SOLUTIONSLLC.COM
Silver Bonnett MHP	Unknown	Unknown	Unknown	Unknown
Ellicott Town Center Metro District	LISA JOHNSON	141 UNION BOULEVARD SUITE 150, LAKEWOOD, 80228	303-987-0835	ljohnson@sdmsi.com
Rock Springs Ranch Metro District 1-3	Unknown	8390 EAST CRESCENT PARKWAY SUITE 500, GREENWOOD VILLAGE, CO 80111	Unknown	Unknown

School Districts

Ellicott Elem Sr High School	DAVE SANGER	395 S ELLICOTT HWY , CALHAN, CO 80808	(BUS) 719-683-2700; (FAX) 719-683-4442;	davesanger@ellicottschools.org

Region 5:

Provider Name	General Manager	Address	Phone Numbers	Email
Cherokee Md	JONATHON SMITH	6250 PALMER PARK BLVD , COLORADO SPRINGS, CO 80915	(BUS) 719-597-5080;	JSMITH@CHEROKEEMETRO.ORG
*Schriever Air Force Base	Unknown	Unknown	Unknown	Unknown
*Sunset Metro District	ALAN POGUE	Unknown	303-292-9100	kcameron@2riverswater.com
*Ellicott Springs	Unknown	Unknown	Unknown	Unknown
*Woodmen Hills	GENE COZZOLINO	8046 EASTONVILLE RD , FALCON, CO 80831	(BUS) 719-495-2500;	GENECOZZOLINO@WHMD.ORG
*East Glen Village	Unknown	Unknown	Unknown	Unknown
*Curtis Heights	Unknown	Unknown	Unknown	Unknown

Region 6:

Provider Name	General Manager	Address	Phone Numbers	Email
Grand View MHP	Unknown	Unknown	Unknown	Unknown
Arrowhead MHP	Unknown	Unknown	Unknown	Unknown

School Districts

Hanover School District	Unknown	Unknown	Unknown	Unknown
Yoder School District	Unknown	Unknown	Unknown	Unknown

Region 7:

Provider Name	General Manager	Address	Phone Numbers	Email
Fountain City Of	JUSTIN MOORE	116 S MAIN ST , FOUNTAIN, CO 80817	(BUS) 719-322-2073;	JUSTIN@FOUNTAINCOLORADO.ORG
Security Wsd	RICHARD DAVIS	231 SECURITY BLVD, COLORADO SPRINGS, CO 80911	(BUS) 719-392-3475;	r.davis@securitywsd.com
Widefield Wsd	BRANDON BERNARD	37 WIDEFIELD BLVD , COLORADO SPRINGS, CO 80911	(BUS) 719-955-0548;	BRANDON@WWSDONLINE.COM
*Rolling Hills Ranch Metro District	Unknown	Unknown	Unknown	Unknown
Stratmoor Hills Wsd	KIRK MEDINA	1811 B ST , COLORADO SPRINGS, CO 80906	(BUS) 719-210-5295;	KIRK@STRATMOORHILLSWATER.ORG
Colorado Centre Md	PEDRO VELAZQUEZ	4700 HORIZONVIEW DR , COLORADO SPRINGS, CO 80925	(BUS) 719-390-7003;	pedroccmd@earthlink.net
Wigwam Mutual Wc	Unknown	Unknown	Unknown	Unknown
Security Mobile Home Park	Unknown	Unknown	Unknown	Unknown

Region 8:

Currently no water providers.

APPENDIX F
A 300-YEAR WATER SUPPLY REQUIREMENT – ONE COUNTY'S APPROACH
APA JOURNAL, BY ALAN L. MAYO 1990

A 300-Year Water Supply Requirement

One County's Approach

Alan L. Mayo

El Paso County, Colorado, has adopted and the courts have upheld a land use regulation that requires a 300-year water supply for new subdivisions. This stringent policy was developed in response to unprecedented growth pressures, limited or difficult-to-acquire surface and ground water supplies, the absence of a credible water authority for the provision of urban water, and state law that permits depletion of ground water within 100 years. The regulations are an attempt to equate the availabilities of nonrenewable and renewable water supplies, and to balance the competing needs for economic development with the desire to avoid an expensive water bailout by future generations.

Mayo is an associate professor of hydrogeology at Brigham Young University, and a consultant in hydrogeology and land use planning. As a consultant for El Paso County he prepared policy drafts of the new county water policy, and was an expert witness during the ensuing litigation. Previously he was a senior environmental planner with San Diego County, California, where he was responsible for development of environmental land use policies and supervised the preparation of the regional growth management strategy EIS.

The process of gaining approval for land development takes place in the political arena. Here, a balance must be sought amongst factors that often are in competition: the demand for economic development, the desire of property owners to develop their land for maximum profit, the preservation of the individual's water rights, and the need to ensure an adequate water supply. While local land use authorities have the responsibility of approving land development projects, it is not within their province to allocate water rights. Yet, clearly the availability of services, including water, is a factor that must be considered. In regions such as the southwestern United States, where water is a scarce commodity, the property rights of land use and water use may come into conflict in the land development process.

In response to the demand for land development and concerns over the long term availability of water supplies, El Paso County, Colorado, has adopted what may be the nation's most stringent water supply requirements for land development (Ferris 1986; Hordon 1977; Mayo 1979; Thomas 1972; Wilson 1983). This article describes the technical, legal, and political issues that led to the adoption of the regulations, explains the county's means of resolving the key issues, gives an overview of the regulations, and describes the legal challenge.

Technical Issues

Urban Growth

El Paso County (Figure 1), like many urban regions in the arid west, has experienced unprecedented growth in recent years. Colorado Springs, the county's major city, has grown from less than 50,000 people after World War II to more than 263,000 people today. The current population of the unincorporated region of the county is about 86,000 (PPACG 1986). However, selection of the county as the site for the Consolidated Space Operations Center and the fact that it costs less to build in the county than in the city has led to proliferation of land speculations that at buildout would greatly increase the population of the unincorporated area.

Since 1983, more than 40 urban-density land development projects, which would house an additional 210,000 people, have been proposed for the unincorporated area (Figure 2). The projects would form a fringe of urban density developments in the unincorporated area surrounding Colorado Springs. At buildout these projects would swell the population of the unincorporated region to over 300,000 people.

Statewide Water Availability

Colorado, like many other western states, still has an abundance of fresh water. But the development of additional municipal water supplies for the rapidly growing urban communities will be difficult because of several factors (Anderson and Wengert 1977; Peak 1977; Petsch 1986). Historically, most fresh water has been drawn from surface water sources (Table 1). These supplies are predominantly controlled by agricultural interests (An-

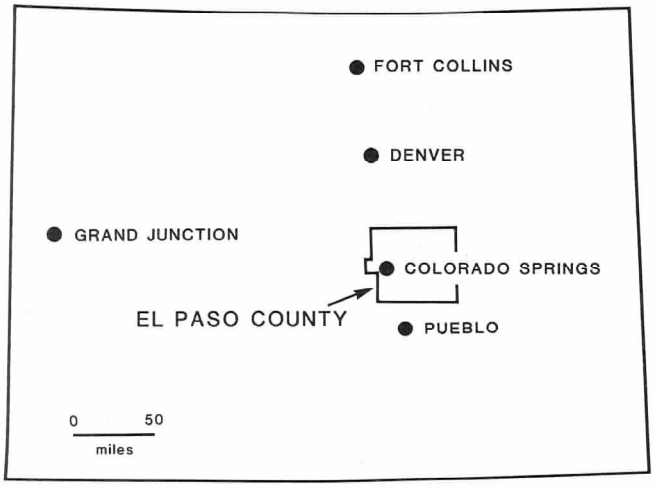

FIGURE 1: Location of El Paso County and the major cities in Colorado. All of the cities except Grand Junction lie along the base of the Rocky Mountains in what is known as the "urban corridor."

derson and Wengert 1977; Peak 1977; U.S. Army Corps. of Engineers 1986). Only 14 percent of Colorado's major surface flows are near the urban corridor (Figure 3) and, except in the Pueblo region, the potential for developing new gravity-fed municipal surface water supplies is limited (Petsch 1986).

Because the state contains part or all of the headwaters of several interstate and international river systems, about 58 percent of the state's surface run-off must be released for out-of-state uses (Petsch 1986). Significantly, the state of Colorado has not elected to be an active participant in the development and financing of major water projects. Instead, the acquisition of water and the construction of reservoirs and aqueducts have been largely left to competing irrigation, municipal, and water conservancy districts (Anderson and Wengert 1977; Ferris 1986; Peak 1977; Thomas 1972; Weatherford and Schupe 1986).

Local Water Providers

The city of Colorado Springs, the major water provider in El Paso County, has reserves and the economic means to meet the water demands of the entire region well into

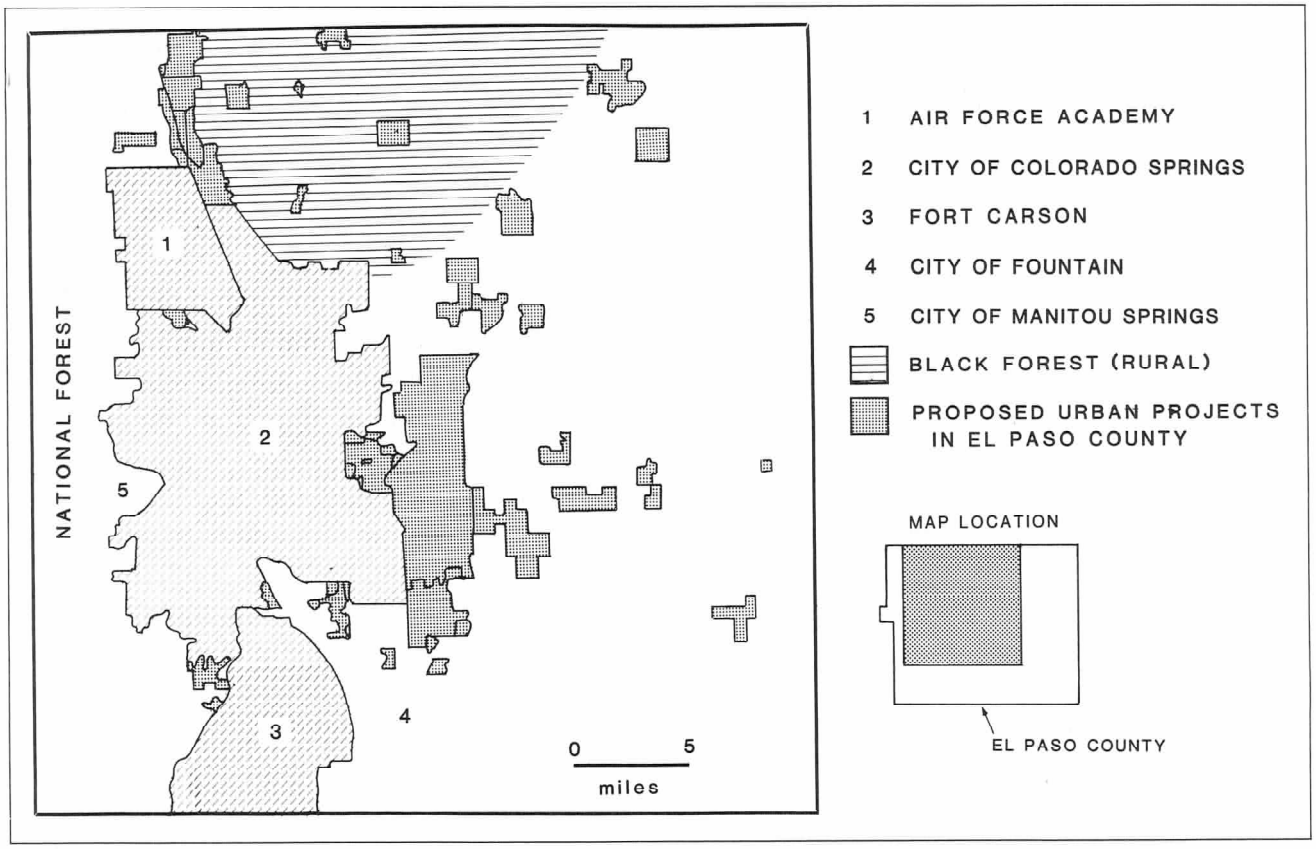

FIGURE 2: Proposed urban developments in the unincorporated portion of El Paso county form an urban fringe to the north and east of Colorado Springs. (Data from various El Paso County land use maps.)

TABLE 1: Summary of annual fresh water use in Colorado[a]

Source	Million acre feet
Total withdrawals (surface and ground water)	17.9
Surface water withdrawals	14.6
Ground water withdrawals	3.3
Use	**Percent**
Public water supply	4.3
Rural water supply	0.5
Livestock	0.7
Industrial	7.1
Irrigation	87.4

a. Modified after Petsch 1986.

the next century. In 1987 the city owned water rights to 90,000 acre feet annually, had the capability of delivering 65,000 acre feet, and delivered about 55,000 acre feet. However, the city has adopted a policy of not providing water outside its boundaries. This policy is designed, among other reasons, to protect and enhance the city's tax base by encouraging annexations.

Outside Colorado Springs, more than 30 independent municipal, quasi-municipal, and private water companies provide water service to the small satellite cities and to the unincorporated portion of the county (Figure 4). The burden of providing water service for the proposed urban growth in the unincorporated region, whose annual demand at buildout would be approximately 1 acre foot per dwelling unit, or 85,000 acre feet of additional water (Phillips 1986), would fall upon these existing and possibly new independent water providers.

Individually, none of the independent water providers has the economic means to acquire or deliver the needed 85,000 acre feet. For several reasons, efforts to create a regional water authority for the purpose of developing and distributing wholesale water have proven unsuccessful. Some water providers serve single land development projects and their interest is largely the sale of real estate, not long term water provision. Water districts serving multiple land development projects often have short term water surpluses, but are reluctant to commit a portion of their supplies to land speculators and less prudent water suppliers. Additionally, as discussed further on, without financial support from either the state or the city of Colorado Springs, the cost of purchasing local or distant water rights and developing the wholesale

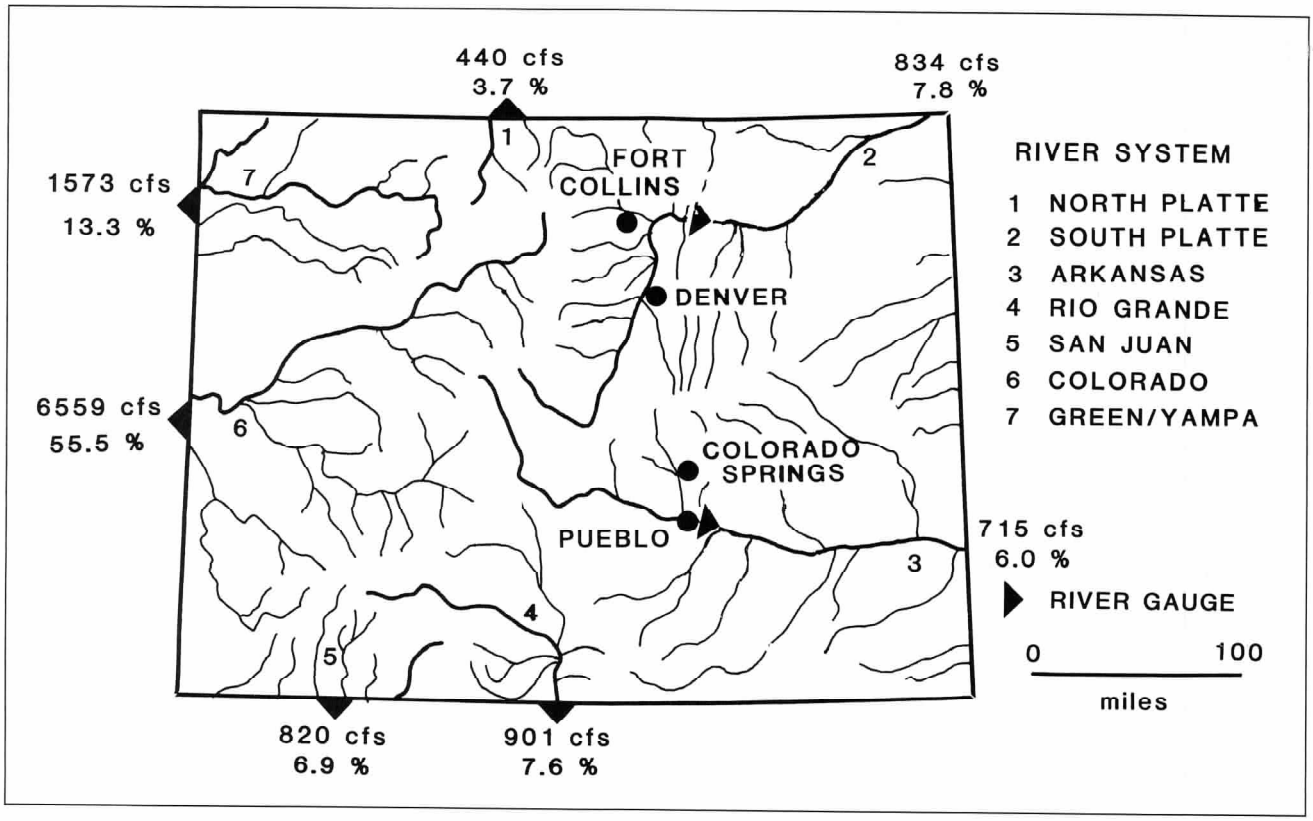

FIGURE 3: Mean annual discharge of Colorado's seven major systems. Flows in the east slope or urban corridor rivers, the South Platte and Arkansas, constitute only 7.8 and 6.0 percent, respectively, of the state's total surface water. (Modified after Petsch 1986.)

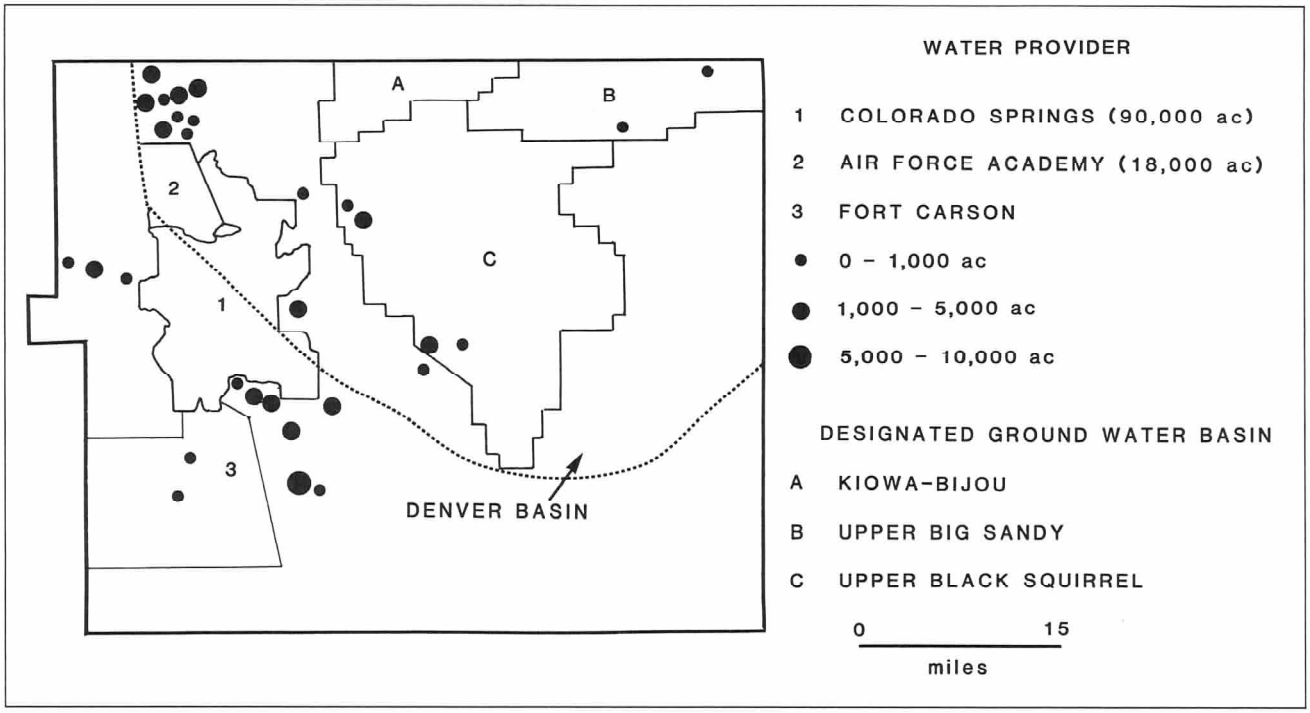

FIGURE 4: Location and size of service area of water providers and designated ground water basins in El Paso County, Colorado. Serving 90,000 acres, the city of Colorado Springs is the dominant player. Although large in size, the military bases of the Air Force Academy and Fort Carson have minimal urban areas. The dotted line represents the limit of the Denver hydrogeologic basin. Land located outside the Denver Basin has minimal ground water resources. (Data from various El Paso County land use and state engineer Denver Basin hydrogeologic maps.)

distribution infrastructure is presently beyond the means of a coalition of local water purveyors.

Potential Sources of Additional Water

Both availability of water and economic considerations are important factors affecting the ability of the independent water providers to meet their share of anticipated additional water demand. There are four potential water sources: local and distant surface water, renewable alluvial ground water, and nonrenewable bedrock ground water. Only bedrock ground water from the Denver Basin and distant surface water are available in sufficient quantities to serve the anticipated high-density growth in El Paso County, and under present conditions only bedrock ground water is economically feasible.

Local surface water rights are largely controlled by the city of Colorado Springs and downstream users not in El Paso County (Livingston et al. 1976). Development of a distant surface water project from the Arkansas River or the major rivers located across the Continental Divide would require the construction of at least 50 miles of pipeline and pumping and storage facilities. Such a major river water project is attractive because it would have greater dependability than the disjointed efforts of dozens of water providers and hundreds of wells in various states of repair, and it would tend to have lower overall operational and maintenance costs than pumping ground water. However, such a water project requires substantial initial capital outlay. Bamberger (1986) estimated the initial capital cost of an Arkansas River project to be between $111 and $200 million, depending on the project size (Table 2).

In the near term the likelihood of constructing an Arkansas River project is not great. Only one of the proposed land developments is of sufficient size and financial strength to pursue such a project, but this development has been courting annexation to the city of Colorado Springs. Other possibilities for financing a major pipeline project include bonding by a regional water authority or private investment. As already mentioned, local water providers and land developers have shown little interest in forming a water authority, and private capitalization does not appear to be on the horizon.

Among renewable water sources there are 20,000 acre feet annually of alluvial ground water (unconfined, in surficial sands and gravels) in the county. This water is not a major source for new high density development in the urbanizing fringe around Colorado Springs because it is largely developed for existing urban projects (Table 3 and Figure 5). Another 3,500 acre feet of alluvial ground water in the northern county's Upper Black Squirrel Creek Basin could be developed; however, this

TABLE 2: Comparison of estimated initial capital cost of ground water and river water projects

	Annual delivery[a] (acre feet)	Water acquisition cost[b] ($/acre foot)	Total water acquisition cost ($ × 10^6)	Total construction cost ($ × 10^6)	Unit construction cost[b] ($/acre foot)	Total capital cost ($ × 10^6)	Unit capital cost[b] ($/acre foot)
Arkansas River							
42-inch pipeline[c]	18,000	2,000	36.0	75.0	41.67	111.0	61.67
54-inch pipeline[c]	20,500	2,000	41.0	99.9	48.73	140.9	68.73
66-inch pipeline[c]	31,625	2,000	63.2	131.6	41.61	200.8	63.35
Denver Basin ground water							
Single well[d]	75	2,500	0.19	0.22	29.3	0.41	54.33[d]
Well field[e]	28,300	2,500	74.3	88.0	31.1	162.3	57.35[e]

a. Minimum project size.
b. Assuming 100-year amortization, interest not included.
c. From Bamberger 1986.
d. Based on a single Denver Basin well. Actual 100-year capital cost will be higher because additional wells will be required.
e. Denver Basin well field. Construction costs are for the first 50 years only, and project includes 122 initial wells and 197 additional wells. Actual 100-year capital cost will be higher because additional wells will be required.
Sources: U.S. Army Corps of Engineers 1986 and Bamberger 1986.

water is not available for use in the urbanizing fringe because the Basin's Management District has adopted a "no export" policy. The southern portion of the county is underlain by up to 5,000 feet of low water-producing Pierre Shale (Bryant et al. 1981; Scott et al. 1981; Scott and Wobus 1973; Trimble and Machete 1979).

There is ample nonrenewable bedrock ground water (in deeper aquifers) for the development of the proposed high density urban projects. An estimated 64 million acre feet of nonrenewable Denver Basin ground water is stored in 4 bedrock aquifers in the northern half of El Paso County (Table 3 and Figure 6). However, extractable

TABLE 3: Summary of ground water resources in El Paso County, Colorado

	Renewable alluvial		Nonrenewable bedrock				
Typical aquifer parameters and well yields	Fountain and Jimmy Camp Creeks	Upper Black Squirrel designated basin	Dawson	Denver	Arapahoe	Laramie-Fox Hills	Total
Transmissivity (ft^2/d)	—	—	0–1,200	0–100	0–300	0–100	
Storativity (10^{-4})	—	—	2–8	2–6	2–4	2–4	
Specific yield (%)	25 est	25 est	15	17	17	20	
Well yield (gpm)	to 1,000	to 1,000	0–225	0–225	0–225	0–225	
Estimated storage (10^6 acre feet)							
Tributary	0.1	0.35	9.04	5.36	6.02	2.94	23.36
Nontributary	0	0	0	2.22	3.71	4.67	10.69
Designated basin	0	0.35	1.67	8.05	10.83	9.01	29.61
Total	0.1	0.35	10.71	15.63	20.56	16.71	63.61
Percent in designated basin	0	100	15.6	51.5	52.7	53.9	46.7
Annual recharge (acre feet)	9,000+	11,000					
Annual appropriation (acre feet)	9,000+	76,435					
Annual withdrawal (acre feet)	9,000+	7,500					

Sources: Livingston et al. 1976 and state engineer's Denver Basin maps.

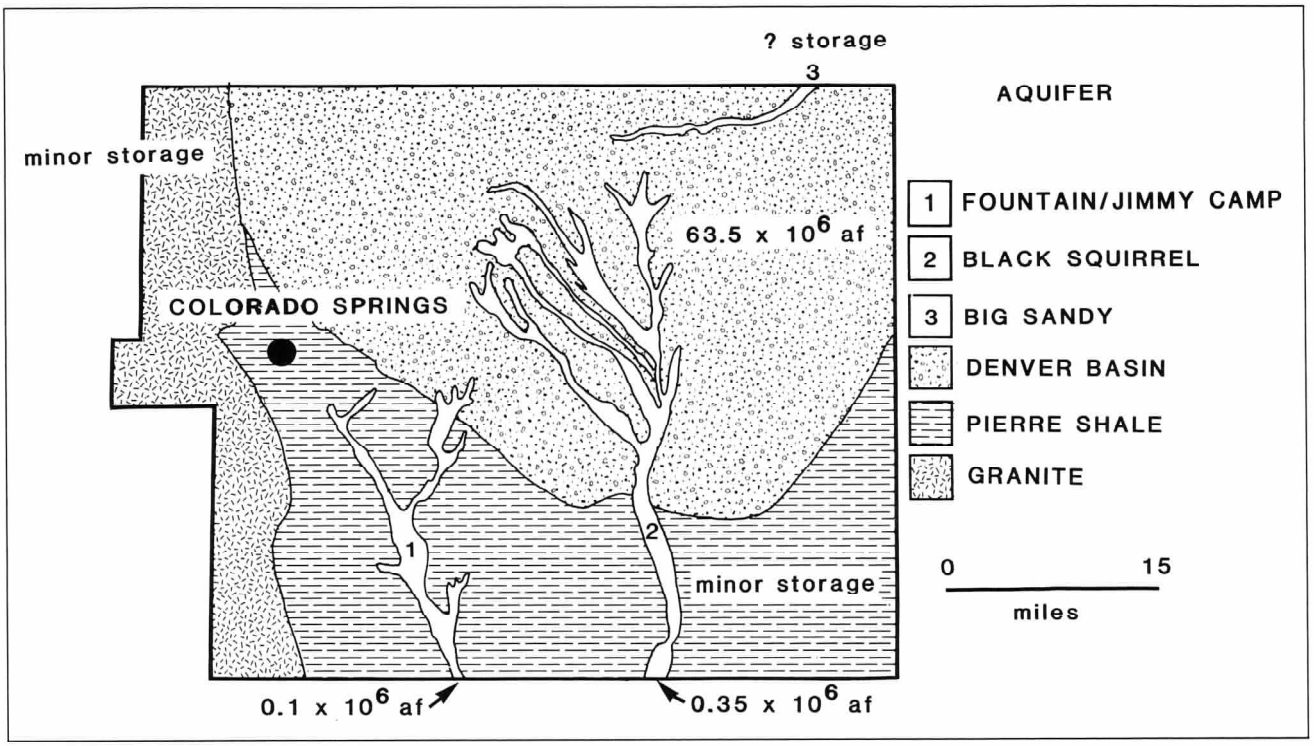

FIGURE 5: Simplified hydrogeologic map of El Paso County, Colorado. Only alluvial and Denver Basin aquifers contain sufficient quantities of ground water to support urban density development. Renewable aquifers include alluvium in Fountain, Upper Black Squirrel, and Big Sandy Creeks. Nonrenewable bedrock ground water is limited to the Denver Basin. Estimated quantities of ground water in storage are shown in acre feet. (Data from various state engineer Denver Basin hydrogeologic maps.)

ground water may only be 32 to 54 million acre feet, because economical recoverable yields are only 50 to 70 percent; potential commercial production is also hindered by the discontinuous nature of the water-bearing horizons and the depth to many aquifers (Robson and Romero 1981a, 1981b; Robson et al. 1981a, 1981b). Also, well-production rates of Denver Basin wells are typically 200 gpm or less (low for commercial wells) because of hydraulic conductivities—0.5 to 2.0 feet/day (Robson 1983). Finally, existing low density housing covers much of the deeper portions of the basin, so those ground water rights would be difficult to acquire and consolidate. Therefore, acquisition and development of this source as a single water project to meet the anticipated annual need of 85,000 additional acre feet would be difficult.

Development of bedrock water supplies is within the financial means of smaller subdividers, however (see Table 2). The initial capital cost of a small bedrock water project that will serve a 150-home subdivision is about $410,000, or $2,733 per house. Such a project would require only a single 75-gpm well. The drawback is that not all proposed projects overlie sufficient quantities of Denver Basin water. Potentially extractable ground water is not evenly distributed throughout the basin (Figure 7). Also, the long term cost of supplying the total proposed urban-density development from such sources may be nearly as great as the cost of a major surface-water importation project because of the eventual need for satellite well fields and a costly well replacement program (see Table 2).

The Legal Framework

Over the past century the state of Colorado has developed a comprehensive but confusing body of water law. For the most part, water law is based on the concept of prior appropriation and is largely designed to protect surface water rights. From the perspective of long range planning in El Paso County, the most significant ground water regulation is the so-called 100-year depletion rule established by Senate Bill 213 (1973) and Senate Bill 5 (1985). These laws require a minimum useful life of 100 years for many Colorado aquifers; they permit mining (i.e., removal of ground water at a rate greater than natural recharge) of nonrenewable ground water at a rate of 1 percent per year.

This 100-year depletion rule is significant because a substantial portion of the proposed water supplies for most of the 40 proposed developments are based on it. Extraction of underlying bedrock ground water, at a rate

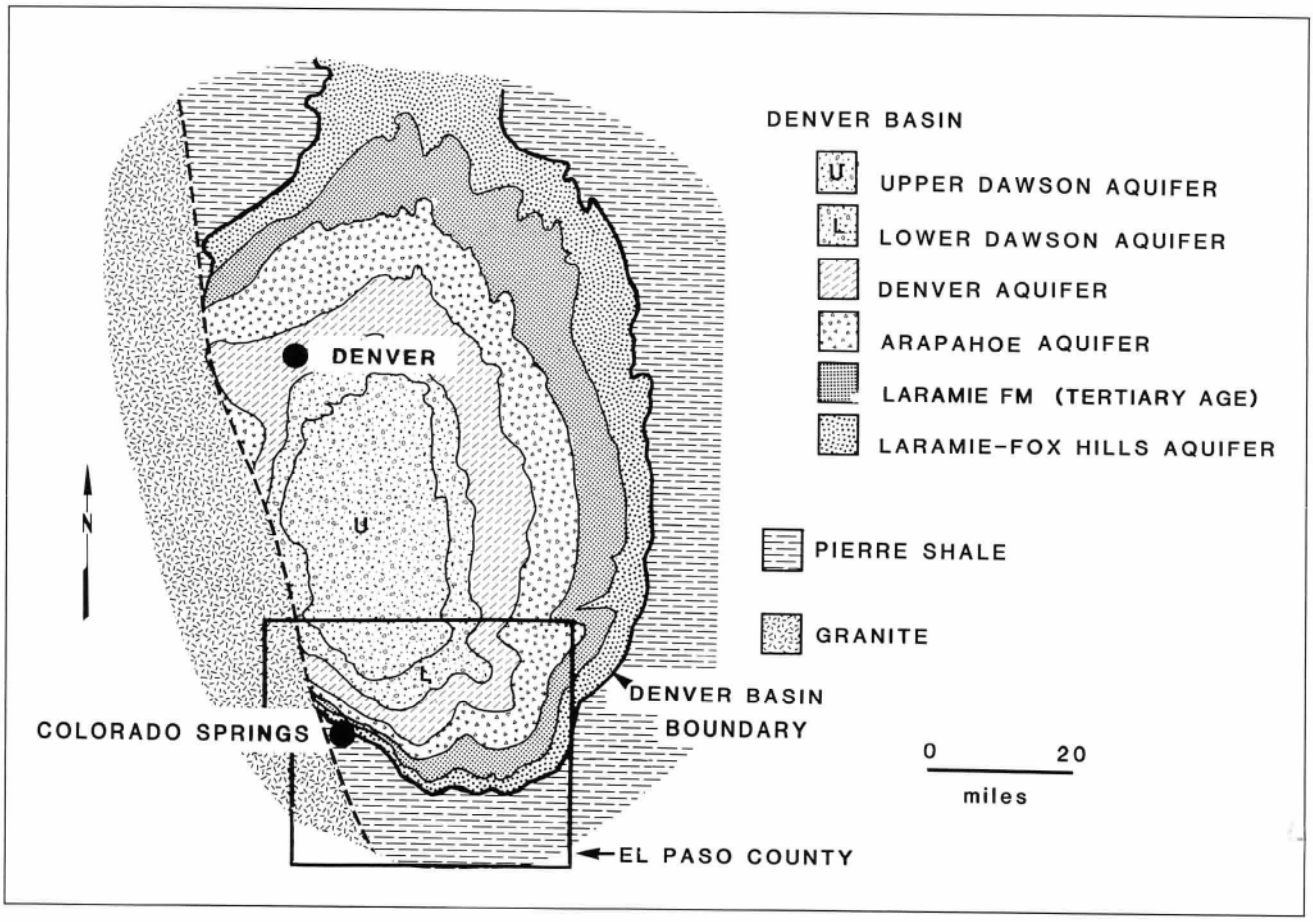

FIGURE 6: Simplified hydrogeologic map of the Denver Basin, Colorado. The Dawson, Denver, and Arapahoe aquifers are part of the Dawson Formation, dating from the Upper Cretaceous-Paleocene age. The Laramie-Fox Hills aquifer is the lower-most Laramie Formation and the uppermost Fox Hills Formation, both of which are from the Upper Cretaceous age. (Modified after various state engineer Denver Basin hydrogeologic maps.)

of 1 percent per year, would initially provide sufficient supplies for most proposed urban density developments. However, the underlying supplies would likely become exhausted in less than 100 years because of the low economical recoverable yield (50 to 70 percent). Timely replenishment of withdrawn supplies from nondeveloped or sparsely developed regions of the Denver Basin is unlikely because of the low aquifer transmissivities and the pumping interference effects of adjacent well fields. Eisel (1987), using the computer code MODFLOW, demonstrated that there would be no subsurface inflow to a hypothetical property surrounded by a fully developed well field.

Although Colorado water law is well defined and often detailed, planning law, particularly regarding public services, is of a more general nature. Colorado statute CRS 30-28-133 requires each county to adopt subdivision regulations. The subdivision regulations must include provisions requiring subdividers to submit "adequate evidence that a water supply that is adequate in terms of quality, quantity, and dependability will be available for the proposed subdivision." However, Colorado statute and implementing regulations do not define "adequate" and do not establish guidelines for counties to define "adequate." Prior to the El Paso County case the relationship between water rights and planning law requiring adequate water services had not been clarified by the courts.

Development of the Water Policy

The Board of County Commissioners recognized that a dependable water supply is critical for the long term viability and economic health of the new urban area. They also recognized that, in the absence of state intervention, the problem of ensuring water supply for land development had to be solved at the local level. Accordingly the board spent three years evaluating alternative water supply programs and policies.

Between 1984 and 1986 the county considered three

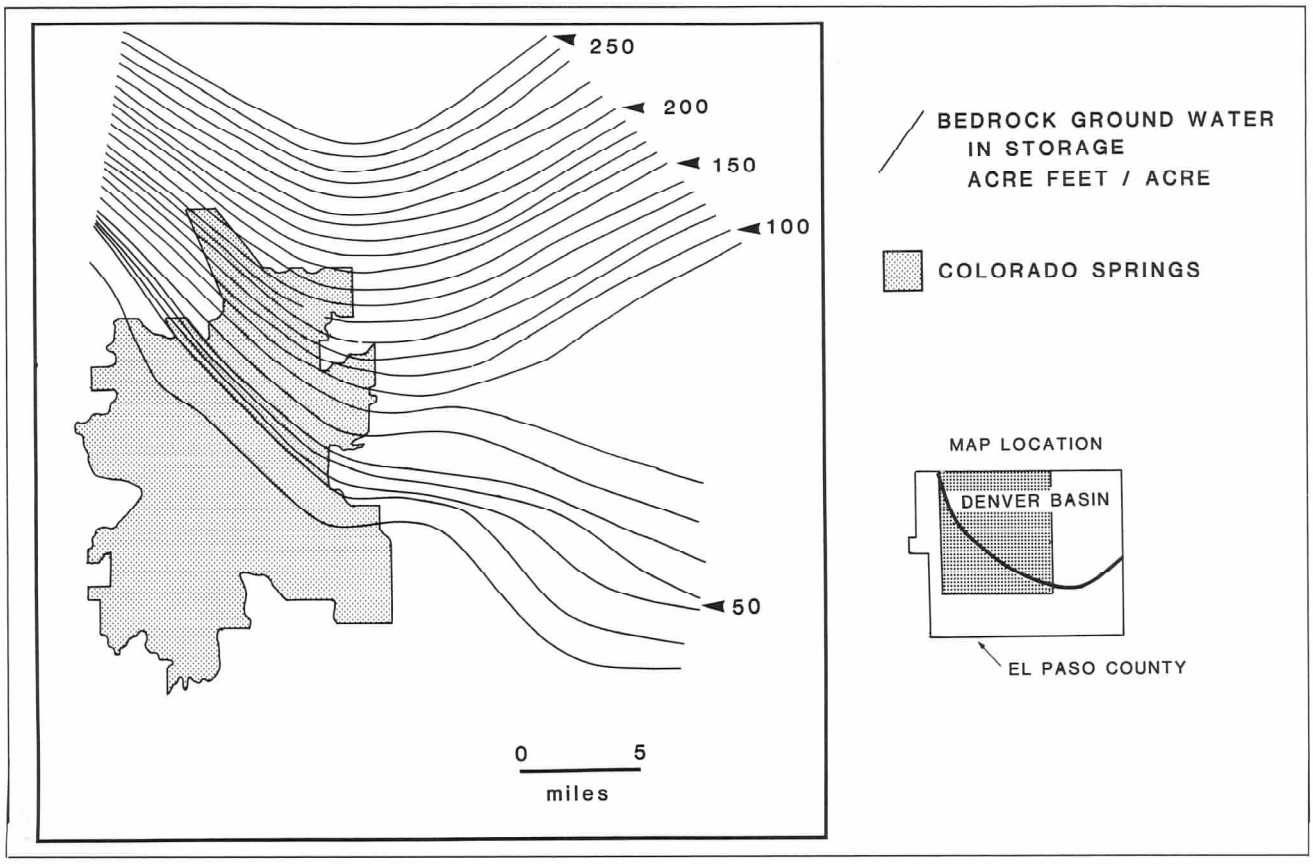

FIGURE 7: Distribution of stored ground water in Denver Basin aquifers in the proposed urban fringe of Colorado Springs. Proposed projects north of the city tend to have ample ground water, whereas those to the south often have less than 50 years' supply.

major water supply options. The first alternative, the County Water and Wastewater Systems (COWWS), was quite visionary (El Paso County 1985). Under the COWWS the county and private industry would develop a loop water and waste water system. Water would be pumped from the Arkansas River and then delivered to the county along 50 miles of pipeline. Waste water would then be treated and discharged back into the Arkansas River. Escalating cost estimates, the absence of private funding, the uncertainty of retail sales, and the lack of technical expertise among the staff caused the project to be dropped.

Next, the board appointed the El Paso County Resource Management Board (RMB). The RMB was composed of citizens, land developers, water suppliers, and county staff and was charged with evaluating water supply alternatives. In 1985, the RMB recommended that the county resolve the water supply issue by adopting subdivision regulations requiring urban density projects to provide either a 200-year supply of bedrock ground water or renewable water.

The county then hired a consultant to review the RMB report and to prepare draft subdivision regulations. These were reviewed by the board, water providers, developers, other government agencies, and the public. The adoption process was lengthy and was designed to solicit public comment. Policy proposals were discussed and refined at a series of public work sessions with the Board of County Commissioners. Formal adoption followed review and comment by the county's Regulatory Review Committee and the Planning Commission.

In November 1986 the board adopted a very controversial set of water supply regulations. The final policy draft was a compromise between voices calling for a 100-year policy and voices calling for a 400-year or longer policy, and was an attempt to strike a balance between the long term reliability of renewable supplies and the much greater availability of nonrenewable supplies.

Objections to the Proposed Policy

The proposed regulations polarized the community. Traditionally influential lobbies, including land developers, the Home Builders Association, water suppliers, and many members of the business community, strongly objected to the proposed policy because of fears that the policy would impede economic development and for general philosophical reasons. Specific objections were based on the following issues:

1. The requested density of many proposed land development projects was based on the supply of underlying nonrenewable ground water and on the 100-year depletion rule. The proposed policy would require, in some instances, the acquisition of additional water supplies, thus increasing the up-front cost and reducing the economic advantage over projects in the city of Colorado Springs. In some cases land had been purchased on a speculative basis and often at inflated prices. Securing additional water supplies could make some projects economically infeasible.
2. Many local water providers are chartered by the state as quasi-governmental agencies and have taxing authority. Some of these agencies objected to what they perceived as county interference in their legally chartered activities.
3. It was also argued that the 100-year ground water depletion rule entitled a land owner to a land use density commensurate with the annual withdrawal rate during the 100 years. In other words, opponents argued that maximum ground water extraction rates established by water law also established land use density. These opponents contended that lesser densities reduced their annual extraction rate and were thus illegal.
4. Growth-based economic interests, such as the Home Builders Association, the Chamber of Commerce, and owners of land in the path of urban growth, generally felt that the extra expense of acquiring additional water supplies would slow growth. Their general view was that development should proceed on available water supplies and that the long term water needs of the region would be most effectively resolved after the tax base had expanded through regional growth.
5. El Paso County, like many regions, is in a transition period, changing from a rural community into a large urban region. Such transitions may be politically difficult when long-held views of perceived individual rights begin to give way to more communal needs.

The City of Colorado Springs, other local municipalities within El Paso County, and the vocal public strongly supported the regulations. The expressed concern of the city was that it not be called upon at a later date to provide a "water bailout" outside the corporate boundaries. The state engineer, who issues well permits, held the position that the regulations did not violate state water law and that the county should determine for itself what constitutes "adequate" in terms of quality, quantity, and dependability.

In adopting the water supply requirements the county had to resolve four issues that are common to many planning agencies:

1. What constitutes an adequate water supply?
2. How should renewable and nonrenewable water sources be equated in terms of long term adequacy?
3. Does a ground water extraction right or other water right issued by the state constitute a land development right?
4. How should short term gain from economic development be balanced against the potential need for a publicly financed bailout if water supplies become inadequate at some future date?

The county commissioners were faced with quite a dilemma. The county acknowledged the validity of the conventional wisdom that an adequate water supply for major western urban areas should be based on renewable sources. However, such supplies were not readily available, and the prospect of either the public or private sector developing sufficient quantities of renewable water was doubtful. The effect of the county requiring renewable supplies for urban density developments would be to force all development into the city of Colorado Springs because the development community could not afford to build an Arkansas River project. Although forcing development into the city might ease the burden of extending public services, in terms of equity and from a purely political perspective, this alternative was unacceptable. Requiring renewable water was viewed as a no-growth policy and was not acceptable to the general public or any of the commissioners.

The commissioners also recognized that the region's vast quantity of nonrenewable bedrock ground water is a valuable resource that could play an important role in urban and economic development. The board was reluctant, however, to allow major urban development on the basis of a water supply that would be depleted within, at best, 100 years. Within 70 years or less, use of such a supply could require, as elsewhere, a very expensive major intervention. In Arizona, for example, where construction of the Central Arizona Project was necessary to bring Arizona's remaining entitlement of Colorado River water to central Arizona, new state ground water management legislation was required to alleviate the current rate of ground water overdraft (Ferris 1986).

A Resolution

The El Paso County commissioners recognized that development of a water supply policy would require a careful balancing of water and planning law. Because of state ground water law, the county could not adopt a policy that restricted the rate at which ground water could be withdrawn or that would require the owner of a ground water right to take more than 100 years to completely de-water an underlying aquifer.

The board resolved the issues of adequacy and the use of renewable-versus-nonrenewable supplies in one stroke. An adequate supply for an urban density project was established as sufficient water to meet project needs for a period of 300 years, regardless of the source of that water. Renewable surface and renewable ground water both meet the 300-year criterion on face value. Sources for a project could be mixed. For example, a project could be started on a 100-year supply of nonrenewable ground

water, provided an alternative source of nonrenewable or renewable water would be available at the end of the 100-year period.

It was the county's position, with concurrence from the state engineer, that under water law the issuance of well permits and water rights entitled the owner of the permit or right to remove and use a specified quantity of water. However, water law does not confer land development rights or establish what is an adequate supply of water for land development. Rather, the county, under planning law, has the obligation to determine independently land use densities and to decide what constitutes an adequate water supply for nonagricultural land use. In a stand of political courage the county commissioners decided that problems associated with today's growth should be solved today rather than pushed off onto future generations.

The regulations include the following elements:

1. Prior to project approval, the board of county commissioners must make a finding that a proposed water supply plan is adequate with respect to quality, quantity, and dependability. The applicant is required to submit a water resources report conforming to specified criteria. The county attorney, county hydrogeologist and county health department must analyze the report and make recommendations as to the adequacy of the proposed water supply.
2. The applicant has the sole responsibility for providing and documenting that an adequate water supply will be developed. When water districts are involved, the district will usually supply the needed information.
3. The board's findings are to be guided by criteria that define adequacy of a proposed water supply with respect to quality, quantity, and dependability.

   Quality:

   a. Water quality screening is required for all water sources that will be utilized during the first five years of project life. Screening must adhere to state standards for inorganic and organic contaminant levels.
   b. A presumption is made that individual wells serving projects of 4 parcels or less meet the water quality standards.
   c. Under foreseeable future conditions the proposed water supply may not exceed water quality standards.

   Quantity:

   a. The land developer must secure a 300-year supply of water for each subdivision. The commissioners recognized that a calculated 300-year supply of nonrenewable bedrock ground water might be available for only 210 years or less because of the problem of economic recovery.
   b. Water may be from a single source or any combination of renewable and nonrenewable sources. Renewable sources meet the 300-year criteria on face value. Quantities of available water supplies are established by the state engineer, the Colorado Ground Water Commission, and the courts. The quantity of available nonrenewable ground water is usually based on a 100-year depletion.
   c. Estimates of annual water demand must be based on the presumptive use values. The values are based on an average indoor use of 80 gallons per occupant per day; an occupant density of 2.91 and 2.32 persons per dwelling unit for single- and multiple-family units, respectively; an outside use of 0.0566 acre feet per 1,000 square feet of irrigation (2.46 acre feet) and 1 acre foot per acre of commercial or industrial land plus irrigation requirements. The applicant may demonstrate other values that are more appropriate.

   Dependability:

   a. Well permits, court decrees, and state-approved augmentation plans and other legal documentation are necessary to demonstrate that the proposed water supplies are available for project use.
   b. The applicant must demonstrate through financial and capital improvement plans that the proposed water supply plan can be constructed.
   c. Water supplies must be irrevocably committed to the proposed subdivision.
   d. The proposed physical facilities must be capable of meeting peak daily, peak annual, and extraordinary water demands.
   e. Aquifers and wells must be capable of delivering projected supplies; production-well testing is required for commercial wells.
   f. For a project based on nonrenewable ground water, where the aquifer may be exhausted within 100 years the water provider must have acquired the rights to and must have shown the economic feasibility of developing a substitute supply when needed.
4. After project approval the county may withhold building permits if water is not available as planned.

Legal Challenge to the New Policy

The newly adopted subdivision regulations were immediately challenged in water court and in district court by a coalition of land developers and water districts. The plaintiffs sued for $100 million in damages and requested that the regulations be set aside. The plaintiffs charged that:

1. The regulations would interfere with established water rights by limiting the withdrawal rate of nontributary ground water to 1/3 of 1 percent per year. They claimed that the regulations created a 300-year depletion rule.
2. The regulations constituted an arbitrary and unreasonable exercise of authority.
3. The county's action constituted an unconstitutional taking of property without compensation.
4. The county's action was ultra vires (i.e., beyond the authority of the county).

Early in the legal proceedings, the water court determined that it did not have jurisdiction because the suit was not a water matter. The district court dismissed the damage claim and ruled in favor of the county on all issues. The court found that state water and planning laws have equal standing, and that ground water law that grants the right to extract ground water at 1 percent per year does not constitute the right to develop urban density land uses based on this water extraction rate.

Noting that adoption of the regulations was a legislative action carrying a presumption of validity, the court found that evidence presented by the state engineer, elected officials, and county consultants established a rational basis for the county's action. The court was therefore hesitant to substitute judicial judgment for political judgment.

The court found that the challenge was a facial one and that no evidence demonstrating that property had been taken was presented. To establish taking, all reasonable uses of property, not just the most profitable ones, have to be prohibited. The court further ruled that the county's action was not ultra vires and that the issue of establishing criteria for determining sufficiency of a water supply is correctly resolved through the political legislative process.

The case was appealed to the Colorado Supreme Court, which refused to hear it. In January 1989, the Colorado Appellate Court ruled in favor of the county.

Implications for Land Use Planning

The El Paso County commissioners have demonstrated that local government can take the lead and break new ground in water supply requirements for land use. The commissioners understood and balanced ground water issues that were complex technically, scientifically, and legally, with politically sensitive land use and economic growth issues. In adopting the 300-year water supply criteria the commissioners filled the planning void created by state government.

El Paso County took a conservative approach when adopting water supply requirements for urban development. An attempt was made to equate the availabilities of nonrenewable bedrock ground water and renewable surface water, and to balance the competing needs for economic development with the desire to avoid an expensive water bailout by future generations. Adoption of the regulations required a careful avoidance of water rights injury. This approach is consistent with the general western water supply standard of developing long term supplies for high density uses.

The court's affirmation of the county's right to establish independent criteria for determining the adequacy of water supplies greatly strengthened the ability of other local Colorado jurisdictions to set public service criteria. The consequences of the court action are already felt in Colorado. For example, Douglas County, located adjacent to El Paso County, has recently adopted a new and stringent water supply requirement for proposed urban density land development projects.

Perhaps more important, the court case established in Colorado, and possibly strengthened elsewhere, the principle that planning law has equal standing with other bodies of law, such as water law, and that local land use planning agencies may establish criteria for what constitutes adequate levels of public services and facilities. This equal standing exists even when planning law is somewhat ambiguous and other laws are explicit and detailed. The court decision also reinforces the idea that local planning agencies can set criteria for the adequacy of public services for land development even though they have no specified authority over service-providing agencies.

The ideas that equal standing exists between water law and planning law and that local planning agencies may establish adequacy criteria for public service levels are useful concepts in planning, regardless of the state ground water laws. The important fact is that all ground water laws merely impart the right to extract and use ground water; they do not impart a specified land use density, even in cases where the water right is based on a specified beneficial use. From the perspective of land use planning it makes little difference if the ground water right is based on English rule (the right of absolute ownership of water under the land), the American rule (the right to use only reasonable amounts of underlying ground water), appropriative rights (the right to appropriate water for beneficial use regardless of land ownership), or correlative rights (land owners can use reasonable amounts of water and the excess is appropriable). Planners must bear in mind that decisions regarding land use types and densities rest with local authorities and that the availability of public services, including water, is one of the factors that must be carefully considered.

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APPENDIX G
WATER PROVIDERS SURVEY

Welcome to the Water Provider Survey

WHY COMPLETE THIS SURVEY?

As a water provider in El Paso County (County) you are uniquely aware that the long-term viability of the County and the Pikes Peak region depends on the use and management of water. The County Planning and Community Development Department recognizes the critical connection between water supply and land development and, in response, is developing a Water Master Plan as an element of the County Master Plan.

The responses to this survey will be used to better understand the details of the gap identified in El Paso County in the future demand for water as compared to the current supply. With this information, the County will develop a Water Master Plan that creates a path forward to assist residents, water providers, and decision makers to craft a course that protects the viability of our region and our water supply.

This survey will ask for information about your current and future water demand and supplies, the extent of your entity boundaries and your Water Service Area, the extent to which you implement water conservation practices, and your participation in regional planning efforts.

Please complete this survey by Friday, December 22, 2017

HOW TO TAKE THIS SURVEY

Prior to your starting the survey, we encourage you to download a document version of the survey (DOWNLOAD HERE (https://gallery.mailchimp.com/8206964d880f37898309a31ad/files/5a22ee64-0ef0-43b9-8617-abb2416ee688/EPC_WaterProviderSurvey.01.pdf)) so you are familiar with the type of questions and level of detailed information being requested. At the end of each page in the survey you will be provided an option to SAVE AND EXIT. If you select the SAVE AND EXIT option, all information you have entered into the survey will be saved so that you can return and complete the survey at a later time.

Technical Support: If you are in need of technical support at any time while working on this survey, please contact Ben Tyler at **ben.tyler@lrewater.com (mailto:ben.tyler@lrewater.com?Subject=El%20Paso%20County%20Water%20Survey%20Question)**.

Survey Support: If you have any questions about the survey, please contact Mary Presecan at **mary.presecan@lrewater.com (mailto:mary.presecan@lrewater.com?Subject=El%20Paso%20County%20Water%20Survey%20Question)**.

BEGIN SURVEY PICK UP WHERE YOU LEFT OFF

Water Provider Information

Provider Name:

demo

Entity Type:

Water District

Primary Contact:

Primary Phone No:

XXX-XXX-XXXX

Primary Email:

example@example.com

Full Address:

SAVE AND EXIT

NEXT SECTION

()

10%

Water Demands (Current)

Current Demands (Current **average** year demand)

Note:
For the purpose of this survey, the acronym and unit SFE (single family equivalent) is used interchangeably with ERU (Equivalent Residential Unit) and EDU (Equivalent Dwelling Unit).

Describe how your entity defines an SFE, EDU, ERU, or other unit? (e.g, 1 SFE is the amount of water used by a average single family residential unit).

What is your actual average annual consumption of 1 SFE (or other planning unit used by your entity)?

AFY

Total Current Number of Active Service Connections

SFEs | # of Connections

Total Current Number of Active Service Connections With Zero Use

SFEs | # of Connections

Potable Treated Water Demand

AFY | SFEs

Non-Potable Demand Met by Raw Water

AFY | SFEs

Non-Potable Reuse (Reclaimed) Water Demand

AFY | SFEs

Of your total current demand (potable and non-potable), what percentage is satisfied by reusable supplies?

%

Current Customers by Category and Associated Water Use

	Number of Customers by Category		Average Annual Water Use by Category (Based on Prior 5 years use)	
Category	**SFE**	**Active Service Connections**	**AFY**	**Avg MGD**
Residential Single Family	0	0	0	0
Residential Multi-Family	0	0	0	0
Utility/Municipal	0	0	0	0
Commercial/Industrial	0	0	0	0
Irrigation Only	0	0	0	0

Wholesale Water (Provided to Others)	0	0	0	0
Wholesale Water (Receiving from Others)	0	0	0	0

SAVE AND EXIT PREVIOUS SECTION NEXT SECTION (http://5.152.179.210/elpaso-wmp-dev/survey/home)

20%

Water Demands (Future, 2040)

Attention

To carry over current demands to future demands, check the box below or enter data for future demands

- [ ] Carry over current demands from previous page to future demands

Future Demands (2040)

Acronym Definitions

For the purpose of this survey, the acronym and unit SFE (single family equivalent) is used interchangeably with ERU (Equivalent Residential Unit) and EDU (Equivalent Dwelling Unit).

Potable Treated Water Demand

AFY SFEs

Non-Potable Demand Me by Raw Water

AFY SFEs

Non-Potable Reuse (Reclaimed) Water Demand

AFY SFE

Of your total future demand (potable and non-potable), what percentage do you anticipate will be satisfied by reusable supplies?

%

Future Customers and Projected Annual Water Use

	Number of Customers by Category		Projected Annual Water Use by Category	
Category	**SFE**	**Anticipated Active Service Connections**	**AFY**	**Avg MGD**
Residential Single Family				
Residential Multi-Family				
Utility/Municipal				
Commercial/Industrial				
Irrigation Only				
Wholesale Water (Provided to Others)				
Wholesale Water (Receiving from Others)				

Water Demands (Build-out, 2060+)

Attention

To carry over future demands to build-out demands, check the box below or enter data for build-out demands

- [ ] Carry over future demands from previous page to Build-out demands

Build-out Demands (2060+)

Acronym Definitions

For the purpose of this survey, the acronym and unit SFE (single family equivalent) is used interchangeably with ERU (Equivalent Residential Unit) and EDU (Equivalent Dwelling Unit).

What is your anticipated year for Build-out?

Potable Treated Water Demand

AFY SFEs

Non-Potable Demand Met by Raw Water

AFY SFEs

Non-Potable Reuse (Reclaimed) Water Demand

AFY SFE

Of your total build-out demand (potable and non-potable), what percentage do you anticipate will be satisfied by reusable supplies?

%

Build-out Customers and Projected Annual Water Use

	Number of Customers by Category		Projected Annual Water Use by Category	
Category	**SFE**	**Anticipated Active Service Connections**	**AFY**	**Avg MGD**
Residential Single Family				
Residential Multi-Family				
Utility/Municipal				
Commercial/Industrial				
Irrigation Only				
Wholesale Water (Provided to Others)				
Wholesale Water (Receiving from Others)				

Water Service Area

Water Service Area Boundaries

For the purpose of this survey "Water Service Area" is defined as the region or area to which your water system provides, or is capable of providing, an adequate and safe supply of water to a substantial portion of the population within that area. The "Water Service Area" may be the same region, or may be different than, your Entity Boundary.

In the map below you will see an outline for your Entity based on GIS shapefiles maintained by El Paso County (note: if the figure below shows "No GIS Data Available", the County does not have GIS information for your Entity boundaries. Is the delineation for your Entity Boundary provided in the map below Are the following boundaries correct? If not please upload a map, drawing, or shapefile.

No GIS Data Available

Are your Entity Boundary and Service Area the same?

No ▾

If your Water Service Area is different than your Entity Boundary or the boundaries are incorrect or unavailable, please upload a map, drawing, or shapefile of your Water Service Area.

Please upload a map, drawing or shapefile

Drag and drop
a file to upload or browse

box

If you do not have any documentation of your service area, may we contact you to discuss further?

Yes ▾

SAVE AND EXIT PREVIOUS SECTION NEXT SECTION ()

Water Supplies (Current)

Water System Connections

Do you currently have any connection with other Water Entities?

Yes

Please provide the following information about your connection(s) with other Water Entities/Water Providers.

Note: If you both provide and receive water through connections with other entities, please include information for both.

Connection Type	Average Annual Delivery from Connection (AFY)	Providing or Receiving?	Entity Connected To	Location Description or Coordinates
Master		Providing		

Add New Connection

Current Water Supplies

What is your current Total Firm Water Supply from all sources (not including reusable supplies)?

AFY

What is your current Total Firm Water Supply from reusable sources?

AFY

Calculated Total Firm Water From All Supplies

0.00 AFY

Note: The first use percentage splits for potable and non-potable for each water source must add up to 100%

Water Source	Water Supply By Source (%)	Volume (AFY)	Demand Splits	First Use (%)
Wholesale Water		0	Potable	
			Non-Potable	
Surface Water		0	Potable	
			Non-Potable	
Alluvial Water		0	Potable	
			Non-Potable	
Denver Basin Water		0	Potable	
			Non-Potable	
Designated Basin Water		0	Potable	
			Non-Potable	
Total (Not including reusable supplies)	0	0.00	Potable	0
			Non-Potable	0

Briefly describe how each water supply is utilized by your entity (e.g. primary base supply, to meet irrigation demands, peaking demands in summer, etc.).

Wholesale

Surface Water

Alluvial Water

Denver Basin Water

Designated Basin Water

Reusable Supplies

Water Supplies (Future, 2040)

Attention

To carry over current supplies to future supplies, check the box below or enter data for future supplies

- [ ] Carry over current supplies from previous page to future supplies

Future (2040) Water Supplies

What is your anticipated Future Total Firm Water Supplies from all sources (not including reusable supplies)?

AFY

What is your anticipated future Total Firm Water Supply from reusable sources?

AFY

Calculated Total Firm Water Supplies From All Sources

0.00 AFY

Note: The first use percentage splits for potable and non-potable for each water source must add up to 100%

Water Source	Water Supply by Source (%)	Volume (AFY)	Demand Splits	First Use (%)
Wholesale Water		0	Potable	
			Non-Potable	
Surface Water		0	Potable	
			Non-Potable	
Alluvial Water		0	Potable	
			Non-Potable	
Denver Basin Water		0	Potable	
			Non-Potable	
Designated Basin Water		0	Potable	
			Non-Potable	
Total (Not including reusable supplies)	0	0.00	Potable	0
			Non-Potable	0

Briefly describe how you anticipate utilizing each water supply in 2040 (e.g. primary base supply, to meet irrigation demands, peaking demands in summer, etc.).

Wholesale

Surface Water

Alluvial Water

Denver Basin Water

Designated Basin Water

Reusable Supplies

SAVE AND EXIT PREVIOUS SECTION NEXT SECTION ()

70%

Water Supplies (Build-out, 2060+)

Attention

To carry over future supplies to Build-out supplies, check the box below or enter data for Build-out supplies

- [ ] Carry over future supplies from previous page to Build-out supplies

Build-out (2060+) Water Supplies

What is your anticipated Build-out Total Firm Water Supplies from all sources (not including reusable supplies)?

AFY

What is your anticipated Build-out Total Firm Water Supply from reusable sources?

AFY

Calculated Total Firm Water Supplies From All Sources

0.00 AFY

Note: The first use percentage splits for potable and non-potable for each water source must add up to 100%

Water Source	Water Supply by Source (%)	Volume (AFY)	Demand Splits	First Use (%)
Wholesale Water		0	Potable	
			Non-Potable	
Surface Water		0	Potable	
			Non-Potable	
Alluvial Water		0	Potable	
			Non-Potable	
Denver Basin Water		0	Potable	
			Non-Potable	
Designated Basin Water		0	Potable	
			Non-Potable	
Total (Not including reusable supplies)	0	0.00	Potable	0
			Non-Potable	0

Briefly describe how you anticipate utilizing each water supply at Build-out (e.g. primary base supply, to meet irrigation demands, peaking demands in summer, etc.).

Wholesale

Surface Water

Alluvial Water

Denver Basin Water

Designated Basin Water

Reusable Supplies

SAVE AND EXIT PREVIOUS SECTION NEXT SECTION ()

80%

Water Conservation & Landscaping Standards

Do you have a documented water conservation plan?

- [ ] Yes - we have a plan and it is current
- [ ] We are in the process of developing one
- [ ] No

If your entity does have a Water Conservation Plan, how would you evaluate your progress toward hitting the goals you identified in the Plan?

NA - Our entity does not have a Water Conservation Plan

Do your rates provide incentives for water conservation (e.g., inclining block rate structure, tiered rate structure, etc.)?

Yes

If yes, what type of incentives?

Does your entity have landscape standards for water use?

- [ ] Yes - we have documented landscape standards specific to our entity
- [ ] We are in the process of developing entity specific landscape standards
- [ ] No - we rely upon standards as outlined in the El Paso County Land Development Code

If your entity has documented landscape standards, were the standards developed based on specific water use goals?

Yes

Are you familiar with the Landscape and Water Conservation Manual that is referenced int he El Paso County and Development Code?

Yes

What recommendations do you have for modifications to the El Paso County Landscape and Water Conservation Manual?

Key Infrastructure

Important References

One goal of the El Paso County Water Master Plan is to support the discussion of opportunities and challenges to cooperative planning and water sharing. To achieve this goal, the Water Master Plan will consider existing and future water infrastructure and identify potential for interconnections between water facilities.

Please attach a current map(s) of key infrastructure and sizing/capacity information. Key water infrastructure may include, and is not limited to, the following:

- **Pipelines** (Raw Water, Distribution Pipelines)
- **Diversions** (Surface Water Diversions)
- **Wells** (Alluvial, Denver Basin, Designated Basin Wells)
- **Storage** (Reservoirs, Gravel Pits, Water Storage Tanks, ASR)
- **Water Treatment** (Water Treatment Facilities and Wastewater Treatment Facilities)

Submit Files

Drag and drop
a file to upload or browse

box

SAVE AND EXIT PREVIOUS SECTION NEXT SECTION ()

Regional Projects, Planning, and Partnerships

Regional Projects, Planning and Partnerships

Please identify any regional projects, planning efforts, or partnerships that you are currently a part of or receive water or other benefits from.

- [ ] PPRWA
- [ ] Fountain Valley Authority
- [ ] Southern Delivery System
- [ ] Other

If other, please specify

SAVE AND EXIT PREVIOUS SECTION NEXT SECTION ()

100%

Conclusions

Important References

Please attach important references such as engineering reports, master plan documents, or studies that may help the County understand your water system:

Submit Files

Drag and drop
a file to upload or browse

box

Please use the space below to provide any comments or questions you have on the survey or the information you provided in response to this survey.

Would you like to sign up for future notifications about the El Paso County Water Master Planning effort?

Yes

Finish and submit

If you have additional questions, or would like to discuss this survey further, please contact Mary Presecan at mary.presecan@lrewater.com (mailto:mary.presecan@lrewater.com?Subject=El%20Paso%20County%20Water%20Survey%20Question) or at 303-455-9589.

APPENDIX H
GLOSSARY

GLOSSARY

A

Acre-foot- The volume of water required to cover one acre to a depth of one foot. Equal to 43,560 cubic feet or 325,851 gallons, or 1,233 cubic meters.

Adjudication—Judicial process to determine the extent and priority of the rights of persons to use water in a river or aquifer system.

Alluvial aquifer—An aquifer formed by material laid down by physical processes in a stream channel or on a floodplain.

Alluvium—Unconsolidated clay, silt, sand, or gravel deposited during recent geologic time by running water in the bed of a stream or on its floodplain.

Appropriation—The right to use water for a beneficial use or the acquisition of such a right gained through the process of diverting water and putting it to a beneficial use.

Appropriative rights— Appropriative water rights, generally found in western states, are created by diversion of water and putting it to beneficial use. Appropriative water rights have a priority based on the date of first usage. In times of shortage, junior appropriators are cut off while senior appropriators receive their full allotment.

Aquifer—A saturated water-bearing formation, or group of formations, which yield water in sufficient quantity to be of consequence as a source of supply.

Aquifer system—Heterogeneous body of interbedded permeable and poorly permeable material that functions regionally as a water-yielding unit. It consists of two or more permeable beds separated at least locally by confining beds that impede vertical ground-water movement, but do not greatly affect the regional hydraulic continuity of the system; includes both saturated and unsaturated parts of permeable materials.

Aquifer yield— Maximum rate of withdrawal that can be sustained by an aquifer. See ***Yield***

Artesian well or artesian spring —A well or spring that taps ground water under pressure beneath an aquiclude so that water rises (though not necessarily to the surface) with- out pumping. If the water rises above the surface, it is known as a flowing artesian well.

Artificial recharge— Deliberate act of adding water to a ground-water aquifer by means of a recharge project. Artificial recharge can be accomplished via injection wells, spreading basins, or in-stream projects.

Augmentation plan—A court-approved plan that allows a water user to divert water out of priority so long as adequate replacement is made to the affected stream system and water right in quantities and at times so as to prevent injury to the water rights of other users.

B

Basin yield— Maximum rate of withdrawal that can be sustained by the complete hydrogeologic system in a basin without causing unacceptable declines in hydraulic head anywhere in the system or causing unacceptable changes to any other component of the hydrologic cycle in the basin. See ***Yield***.

Bed— A layer of rock in the earth. Also the bottom of a body of water such as a river, lake, or sea.

Bedrock— The solid rock that underlies any unconsolidated sediment or soil. Shale and

granites are common types of bedrock in Colorado.

Beneficial use— Use of water, such as domestic, municipal, agricultural, mining, industrial, stock watering, recreation, wildlife, artificial recharge, power generation, or contamination remediation, that provides a benefit. Water rights not put to beneficial use are subject to forfeiture. Historically, very few uses of water have been declared non-beneficial by courts.

C

Capture— water withdrawn artificially from an aquifer derived from a decrease in storage in the aquifer, a reduction in the previous discharge from the aquifer, an increase in the recharge, or a combination of these changes. The decrease in discharge plus the increase in recharge is termed capture. Capture results in reduced surface flows.

Certification— the process whereby a permit to appropriate water is finalized based on the completion of the diversion work and past application of water to the proposed use in accordance with the approved water0right application. A certified water right has a legal, state0issued document that establishes a priority date, type of beneficial use, and the maximum amount of water that can be used annually.

Clean Water Act— The federal law that establishes how the United States will restore and maintain the chemical, physical, and biological integrity of the country's water (oceans, lakes, streams and rivers, ground water, and wetlands). The law provides protection for the country's water for both point and non-point sources of pollution.

Colorado Water Quality Control Act— Legislation to prevent injury to beneficial uses made of state waters, to maximize the beneficial uses of water, and to achieve the maximum practical degree of water quality in Colorado.

Commercial water use— water for motels, hotels, restaurants, office buildings, other commercial facilities, and institutions. The water may be obtained from a public supply or may be self-supplied.

Community water system— A public system that serves a year-round residential population such as a group of homes receiving water from the same source.

Conditional water right— legal preservation of a priority date that provides a water user time to develop a water right while reserving a more senior date. A conditional water right becomes an absolute right water is actually put to beneficial use.

Cone of depression— A cone-shaped depression in the water table around a well or a group of wells. The cone is created by withdrawing ground water more quickly than it can be replaced.

Confined aquifer— An aquifer that is bounded above and below by confining layers. Because of the pressure created in a confined aquifer, the water level in a well drilled into a confined aquifer will rise above the top of the aquifer and, in some instances, above the land's surface.

Conservation— Management of water resources to eliminate waste or maximize efficiency of use.

Conservation storage— storage of water in a reservoir for later release for useful purposes such as municipal and industrial water supply, water quality, or irrigation.

Consumptive use— That portion of water withdrawn from and lost to the immediate surface or ground-water storage environment. Typical withdrawals or uses included evaporation, transpiration, incorporation into products or crops,

consumption by humans or livestock, or other removals.

Contaminant— A substance not naturally occurring in water or occurring in an amount that presents a health risk.

Cubic foot per second (cfs) — Rate of discharge representing a volume of cubic foot (28.317×10^{-3} m^3) passing a given point during one second. This rate is equivalent to approximately 7.48 gallons (0.0283 m^3) per second.

D

Decree —An official document issued by the court defining the priority, amount, use, and location of water right.

Depletion— Use of water in a manner that makes it no longer available to other users in the same system.

Depletion time— Time indicating how long it would take the watershed or the ground0water system to dry out if surface runoff or ground0water replenishment (recharge) were stopped from an instant onward, and if outflow water maintained at the rate it had at that instant. Depletion times of surficial waters usually are on the order of hours to weeks. They may run into month or years if the river basin includes large lakes. Depletion times of aquifers are usually on the order of tens to hundreds, and often thousands of years. As a consequence, rivers react quickly to precipitation and to abstraction of water, whereas ground-water systems react very sluggishly to these events.

Depth to water—The depth of the water table below the Earth's surface.

Designated basin—An area in which the use of ground water is assumed not to impact the major surface river basin to which the designated basin would otherwise be tributary. Much of eastern Colorado is in designated basins.

Discharge— The volume of water passing a particular point in a unit of time. Units of discharge commonly used include cubic feet per second (cfs) or gallons per minute (gpm).

Disinfection by-products— Chemicals, such as total trihalomethanes, formed from naturally occurring humic or fulvic acids and the disinfectant used to treating water.

Diversion— Physical removal of surface water from a channel. Also, the act of bringing water under control by means of a well, pump, or other device for delivery and distribution for a proposed use.

Domestic well use—Water used for drinking and other purposes by a household, such as from a rural well. Domestic use permits normally allow limited irrigation and outside watering uses.

Drainage basin— Hydrologic unit consisting of a part of the surface of the earth covered by a drainage system made up of a surface stream of body of impounded surface water plus all tributaries. The runoff in a drainage basin is distinct from that of adjacent areas. A river basin is similarly defined.

E

Effluent—Any substance, particularly a liquid, that enters the environment from a point source. Generally, refers to waste-water from a sewage-treatment or industrial plant.

Evaporation—Process of liquid water becoming water vapor, including vaporization from water surfaces, land surfaces, and snowfields, but not through leaf surfaces. Compare with transpiration.

Evapotranspiration—A collective term for water that moves

F

Flow—The volume of water moving past a point during a specified time. Also known as discharge.

Freshwater— Water containing only small quantities (generally less than 1,000 milligrams per liter) of dissolved materials.

G

Goal— Brief, clear statement of an outcome to be reached.

Gravel pack— Coarse sand and gravel placed in the annular space between the borehole and the well casing in the vicinity of the well screen. The purpose of the gravel pack is to minimize the entry of fine sediment into the well, stabilize the borehole, and allow the flow of ground water into the well.

Ground water— Underground water that is generally found in the pore space of rocks or sediments and that can be collected with wells, tunnels, or drainage galleries, or that flows naturally to the Earth's surface via seeps or springs.

Ground-water basin— Geologically and hydrologically defined area that contains one or more aquifers that store and transmit water and will yield significant quantities of water to wells.

Ground-water mining— Pumping ground water from a basin at a rate that exceeds safe yield, thereby extracting ground water that had accumulated over a long period of time.

Ground-water storage— 1) Quantity of water in the saturated zone, or 2) water available only from the storage as opposed to capture.

H

Hydraulic head of (static) head— Height that water in an aquifer can raise itself above an arbitrary reference level (or datum), generally measured in feet or meters. When a borehole is drilled into an aquifer, the level at which the water stands in the borehole (measured with reference to a horizontal datum such as sea level) is, for most purposes, the hydraulic head of water in the aquifer at that location. Ground water possesses energy mainly by virtue of its elevation (elevation head) and of its pressure (pressure head). When ground water moves, some energy is dissipated and therefore a head loss occurs.

Hydraulically connected— A condition in which ground water moves easily between aquifers that are in direct contact. An indication of this condition is that the water levels in both aquifers are approximately equal.

Hydrologic budget or balance— Accounting of the inflow to, outflow from, and storage in a hydrologic unit such as a drainage basin, aquifer, soil zone, lake, or reservoir; the relationship between evaporation, precipitation, runoff, and the change in water storage, expressed by the hydrologic equation.

Hydrologic cycle— The complete cycle that water can pass through, beginning as atmospheric water vapor, turning into precipitation and falling to the earth's surface, moving into aquifers or surface water, and then returning to the atmosphere via evapotranspiration.

Hydrology— the study of the characteristics and occurrence of water, and the hydrologic cycle. Hydrology concerns the science of surface water and ground water, whereas

hydrogeology principally focuses on ground water.

Hydrostatic pressure— The pressure exerted by the water at any given point in a body of water or aquifer.

I

Impervious— Resistant to penetration by water or plant root.

Industrial uses— Water used for a wide range of purposes by industries, including cooling water for electrical power generation, manufacturing, food preparation, washing of wastes, etc. The quality needed ranges substantially depending on the use.

Infiltration (soil) — Movement of water from the ground surface into the soil.

Injection well— Well used for injecting water or other fluid into a ground-water aquifer. See ***Artificial recharge.***

Inorganic— Not made of or derived from living matter. Minerals are inorganic.

Instream use— Use of water that does not require withdrawal or diversion from its natural watercourse; for example, the use of water for navigation, recreation, and support of fish and wildlife.

Intermittent flow— Surface water flowing only during periods of seasonal runoff.

Irrigation use— Water applied to the soil surface by center pivots, ditches, or other means or to the soil subsurface by tubes to add to the water available for plant growth.

L

Livestock water use— Water for livestock watering, feed lots, dairy operations, fish farming, and other on-farm needs. Livestock as used here includes cattle, sheep, goats, hogs, and poultry.

M

Monitoring well— Non-pumping well used primarily for taking water-quality samples and measuring ground-water levels. See ***Observation well.***

N

Nonconsumptive use— Use that leaves the water available for other uses. Examples are hydroelectric power generation and recreational uses.

Non-potable— Water not suitable for drinking.

Nontributary ground water— Underground water in an aquifer that neither draws from nor contributes to a natural surface stream in any measurable degree.

Not-nontributary ground water— Ground-water that is hydrologically connected to a surface stream system.

O

Objective— Specific, measurable, realistic, and timebound condition that must be attained in order to accomplish a particular goal. Objectives define the actions must be taken within a year to reach the strategic goals.

Observation well— Non-pumping well used primarily for observing the elevation of the water table or the piezometric pressure; also to obtain water-quality samples.

Organic— Pertaining to or relating to a compound containing carbon. For example, petroleum products contain organic compounds derived from plant and animal remains.

P

Percolation— Laminar-gravity flow through unsaturated and saturated earth material.

Permeability— 1) Ability of a material (generally an earth material) to transmit fluids (water) through its pores when subjected to pressure of a difference in head. Expressed in units of volume of fluid (water) per unit time per cross section area of material for a given hydraulic head; 2) description of the ease with which a fluid may move through a porous medium; abbreviation of intrinsic permeability. It is a property of the porous medium only, in contrast to hydraulic conductivity, which is a property of both the porous medium and the fluid content of the medium.

Point source— Source of pollution that originates from a single point, such as an outflow pipe from a factory.

Policy— Deliberate system of principles to guide decisions and achieve rational outcomes

Pollution— Contamination from human activities that restricts the uses of water.

Porosity— Fraction of bulk volume of a material consisting of pore space. Porosity determines the capacity of a rock formation to absorb and store ground water.

Porous— Geologically, this term describes rock that permits movement of fluids through small, often microscopic openings, much as water moving through a sponge. Porous rocks may contain gas, oil, or water.

Precipitation— Water in some form that falls from the atmosphere. It can be in the form of liquid (rain or drizzle) or solid (snow, hail, sleet).

Prior appropriation— Doctrine for prioritizing water rights based upon dates of appropriation ("first in time, first in right"). Common method for allocating water rights in the western United States.

Priority— Seniority date of a water right or conditional water right to determine their relative standing to other mater rights and conditional water rights and conditional water rights deriving water from a common source. Priority is a function of both the appropriation date and the relevant adjudication date to the right.

Priority date— The date a water right is established.

R

Raw water— Untreated water.

Recharge— The replenishment of ground water in an aquifer. It can be either natural, through the movement of precipitation into an aquifer, or artificial in the pumping of water into an aquifer.

Recharge area— A geographic area where water enters (recharges) an aquifer. Recharge areas usually coincide with topographically elevated regions where aquifer units crop out at the surface. In these areas infiltrated precipitation is the primary source of recharge. The recharge area also may coincide with the area of hydraulic connection where one aquifer receives flow from another adjacent aquifer.

Reclaimed wastewater— Wastewater treatment plant effluent that has been diverted for beneficial use before it reaches a natural waterway or aquifer.

Recycled water— Water that is used more than one time before it passes back into the natural hydrologic system.

Return flow— Part of water that is not consumed and returns to its source or another body of water.

S

Safe drinking Water Act (SDWA) — Federal legislation passed in 1974 that regulates the treatment of water for human consumption and requires testing for and elimination of contaminants that might be present in the water.

Saturated thickness— The vertical thickness of an aquifer that is full of water. The upper surface is the water table. The height of the hydrogeologically defined aquifer unit in which the pore spaces are filled (saturated) with water. For the High Plains aquifer and similar unconfined, unconsolidated aquifers, the saturated thickness is equal to the difference in elevation between the base of the aquifer and the water table. The predevelopment saturated thickness is based on the best available estimate of the elevation of the water table prior to human altercation by ground-water pumping.

Saturated zone— A subsurface zone in which all the interstices are filled with water under pressure greater than atmospheric. The upper surface of the saturation zone is the water table.

Specific storage— Volume of water released from or taken into storage per unit volume of the porous medium per unit change in head. It is the three-dimensional equivalent of storage coefficient or storativity, and is equal to storativity divided by aquifer saturated thickness.

State Engineer— The person charged by state law with the supervision and administration of water and the enforcement of decreed priority and legislative enactments. The State Engineer discharges the obligations of the state of Colorado imposed by compact or judicial orders and coordinates the work of the Division of Water Resources with other departments of state government. The State Engineer has rule-making obligations and supervisory control over measurements, record keeping, and distribution of the public water of the state and all employees under his direction and any other such acts as may be reasonable necessary to enable the performance of his duties.

Strategy— The art of devising or employing plans or stratagems toward a goal

Streamflow— Discharge that occurs in a natural channel. A more general term than runoff, streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Surface water— Water found at the Earth's surface, usually in streams or lakes.

T

Transmissivity— Flow capacity of an aquifer measured in volume per unit time per unit width. Equal to the product of hydraulic conductivity times the saturated thickness of the aquifer.

Treated water— Water that has been filtered and disinfected.

Tributary— A tributary is generally regarded as a surface water drainage system which is interconnected with a river system. Under Colorado law, all surface and ground water, the withdrawals of which would affect the rate or direction of flow of a surface stream within 100 years, is considered to be tributary to a natural stream.

U

Unconfined aquifer— An aquifer that is not bounded above by a confining bed; water levels in wells screened in an unconfined aquifer coincide with the elevation of the water table.

Unsaturated zone— Also known as the vadose zone, this is the area of soil or rock just above the water table.

V

Void— Pore space or other openings in rock. The openings can be very small to cave-size and are filled with water below the water table.

W

Wastewater— Water that carries wastes from homes, businesses, and industries.

Water court— A specific district court that has exclusive jurisdiction to hear and adjudicate water matters. There are seven water courts in Colorado, a judge, who is also district court judge, presides over each court.

Water level— The level of water in a well or aquifer. It can be measured as depth below the ground surface or as an elevation related to a datum, such as sea level.

Water quality— Physical, chemical, and biological characteristics of water and how they relate to it for a particular use.

Water Quality Control Act— Colorado statute enacted in 1981 to protect, maintain, and improve the quality of state waters through prevention, abatement, and control of water pollution. This act created the nine member Water Quality Control Commission that is responsible for developing specific water quality policy.

Water right— Any vested or appropriation right under which a person may lawfully divert and use water. It is a real property right appurtenant to and severable from the land on or in connection with which the water is used. Water rights pass as an appurtenance with a conveyance of the land by deed, lease, mortgage, will, or inheritance.

Watershed— An area from which water drains and contributes to a given point on a stream or river.

Water table— A fluctuating demarcation line between the unsaturated (vadose) zone and the saturated (phreatic) zone that forms an aquifer. It may rise or fall depending on precipitation (rainfall) trends. The water table is semi-parallel to the land surface above but is not always a consistent straight line. Because of impervious beds of shale, etc., local water tables can be perched above the area's average water table.

Water year— Twelve-month period in which the U.S. Geological Survey reports surface water supplies. Water years begin October 1 and end the following September 30, and are designated by the calendar year in which the water year ends.

Well— A vertical excavation into an underground rock formation.

Well permit— the granting of permission by the State Engineer allowing the digging of a hole in search of ground water to apply to a beneficial use. A written permit obtained from the State giving permission to dig a hole to find ground-water.

Well yield— Pumping rate that can be supplied by a well without drawing the water level in the well below the pump intake. See ***Yield.***

Y

Yield— Amount of water that can be supplied from a reservoir, aquifer, basin, or other system during a specified interval of time. This time period may vary from a day to several years depending upon the size of the system involved.

SOURCES

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