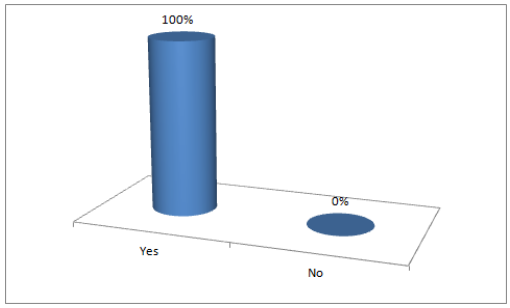
Greetings,

We are pleased to present to you the Draft South Platte Basin Implementation Plan.

This Draft Plan is a product of countless hours by the members of South Platte Basin and Metro Roundtables, its committees, and consulting teams. These efforts started in 2005 with the creation of the Roundtables pursuant to the *Colorado Water for the 21st Century Act*, and were re-energized by the Governor's May 2013 Executive Order to create Colorado's Water Plan. The individuals that participated in crafting this plan collectively represent diverse water interests including: environmental, water conservation, recreation, agriculture, industry, water suppliers, watershed groups, cities, counties, and water conservancy districts. Significant public input was received in person at one of the many public meetings, online through the Basin Implementation Plan website, and from emails to the Colorado Water Conservation Board.

The diversity of the South Platte Basin is what makes it home for the majority of Colorado's population, the State's strongest economic basin, its top agricultural producing basin, and a gateway to valued recreational opportunities and a cherished environment. This diversity is also what makes a holistic "basin" plan a tremendous challenge, and is why we are encouraging you to review the Draft Plan and once again provide your input.



All members of the South Platte Basin and Metro Roundtables unanimously voted "to submit this plan to the Colorado Water Conservation Board on July 31, 2014 for inclusion in the draft Colorado's Water Plan and for further public, stakeholder and Roundtable comment after July 31, 2014."

The South Platte Basin Implementation Plan is drafted using sound facts and grounded expertise. The members of the South Platte Basin and Metro Roundtables are confident that this Draft Plan presents solutions that are pragmatic, balanced, and consistent with Colorado law and property rights. However, it cannot be stressed enough that there is still much work that needs to be done to provide for the water needs of the South Platte Basin and the State as a whole. Although this Draft Plan provides solutions for meeting the South Platte Basin's future water supply needs, it is important to note that the Basin will purposefully continue to maintain a leadership role in efficient use and management of water.

Thank you for your interest in water and taking the time to review the details of this Draft Plan. The Roundtables will continue to work on the Draft Plan through April 2015, when a Final Basin Implementation Plan will be submitted to the Colorado Water Conservation Board.

We look forward to hearing your feedback and encourage you to attend the soon-to-be-scheduled public meetings, including the monthly Roundtable meetings. You will be able to find information on the public meetings, as well as provide feedback online, at www.southplattebasin.com or www.coloradowaterplan.com

Sincerely,

Sean T. Cronin
Chair, South Platte Basin Roundtable

Mark Koleber
Chair, Metro Roundtable

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Draft
South Platte Basin Implementation Plan

Metro Basin Roundtable

South Platte Basin Roundtable

July 31,
2014

HDR

West Sage
water consultants

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July 31, 2014

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Dear Mr. Hecox, Mr. Kernohan, Mr. Koleber, Mr. Cronin, Mr. Streeter, and Members of the South Platte and Metro Roundtables:

On behalf of HDR Engineering and West Sage Water Consultants, we are pleased to provide you with the attached Draft South Platte Basin Implementation Plan (SP-BIP). The Draft SP-BIP was prepared under two separate contracts with project sponsors acting for the State of Colorado. HDR's work related to consumptive water uses was performed under contract to the South Metro Water Supply Authority and the West Sage Team's work on environmental and recreational water needs was performed under contract to Duck's Unlimited. The Draft SP-BIP was reviewed and approved by the Metro and South Platte Basin Roundtables at their joint meeting on July 14, 2014 for submission to the State of Colorado as part of the development of Colorado's Water Plan.

The Draft SP-BIP is the South Platte Basin's first step in a two-year effort towards creation of the Colorado's Water Plan. Following the submission of the Draft SP-BIP to the State, a second and final version of the report will be developed for submission in April 2015. This version will incorporate additional public input, supplementary technical assessments and Roundtable direction. In December 2015, the Final Colorado's Water Plan will be issued by the Colorado Water Conservation Board.

HDR and West Sage thank you for the opportunity to develop this draft plan and acknowledge that it would not have been possible without the generous commitment of time from each of you and also the continuous support of the South Platte's Rio Chato Committee, the Metro's Executive Committee, the Environmental and Recreational Subcommittee, and the entire South Platte and Metro Basin Roundtables. We also greatly appreciate the support of the State's team, especially John Stulp, Rebecca Mitchell, Jacob Bornstein, and Craig Godbout.

We look forward to your feedback on the DRAFT SP-BIP. Thank you for selecting HDR and West Sage for this timely and important project. We look forward to continuing our support you on the SP-BIP going forward.

Best Regards,

Blaine Dwyer, PE
Vice President
HDR Engineering

Laurel Stadjuhar, PE
Principal
West Sage Water Consultants

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Acknowledgements

This Draft South Platte Basin Implementation Plan (SP-BIP) could not have been developed over the past six months without the involvement and guidance of many individuals, committees and organizations with deep commitments to comprehensive water management in the South Platte and Republican River Basins. HDR Engineering and the West Sage Team are very grateful for the generous support provided to us. First, thank you to the South Platte and Metro Roundtables for entrusting the important work of developing this plan to us. Second, we especially appreciate the direction of the two committees (Metro's Executive Committee and the South Platte's Rio Chato Committee) who were assigned by the Roundtables to do the "heavy lifting" during the development, writing and editing of this Draft SP-BIP. The dedication and support of the people comprising this joint committee brought many important and diverse viewpoints to the Draft SP-BIP. In particular, we thank those individuals who routinely took time each week to coordinate with our teams to shape the approach, technical information, and tone presented in this Draft SP-BIP. We also owe significant thanks to the Environmental and Recreational Subcommittee, supporting West Sage in the development of the environmental and recreational portions of the Draft SP-BIP. The balance and thoughtful advice of the subcommittee members brought important perspectives into the report and helped to provide a well-rounded document. Please see the membership lists for these groups below

The Draft SP-BIP builds on a great deal of previous work prepared by the State of Colorado. We are very appreciative of the support provided to us by John Stulp, special water policy advisor to Colorado Governor John Hickenlooper, to the staff of the Colorado Water Conservation Board, especially Rebecca Mitchell, Jacob Bornstein and Craig Godbout and to the State's consulting team on the Statewide Water Supply Investigation, led by CDM-Smith.

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Marc Waage	Denver Water
John Hendrick	Centennial Water and Sanitation Authority
Joe Stibrich	Aurora Water
Peter Nichols	IBCC Representative

South Platte Roundtable Rio Chato:

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Erin Messner	Aurora Water
Rebecca Mitchell	Colorado Water Conservation Board
Douglas Robotham	The Nature Conservancy
John Stencel	Rocky Mountain Farmers Union
Bob Streeter	Environmental and Recreational Subcommittee Chair
Eric Wilkinson	Northern Water Conservancy District

Environmental and Recreational Subcommittee:

Bob Streeter	**Subcommittee Chair**
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Casey Davenhill	Colorado Watershed Assembly
Pete Conovitz	Colorado Parks and Wildlife
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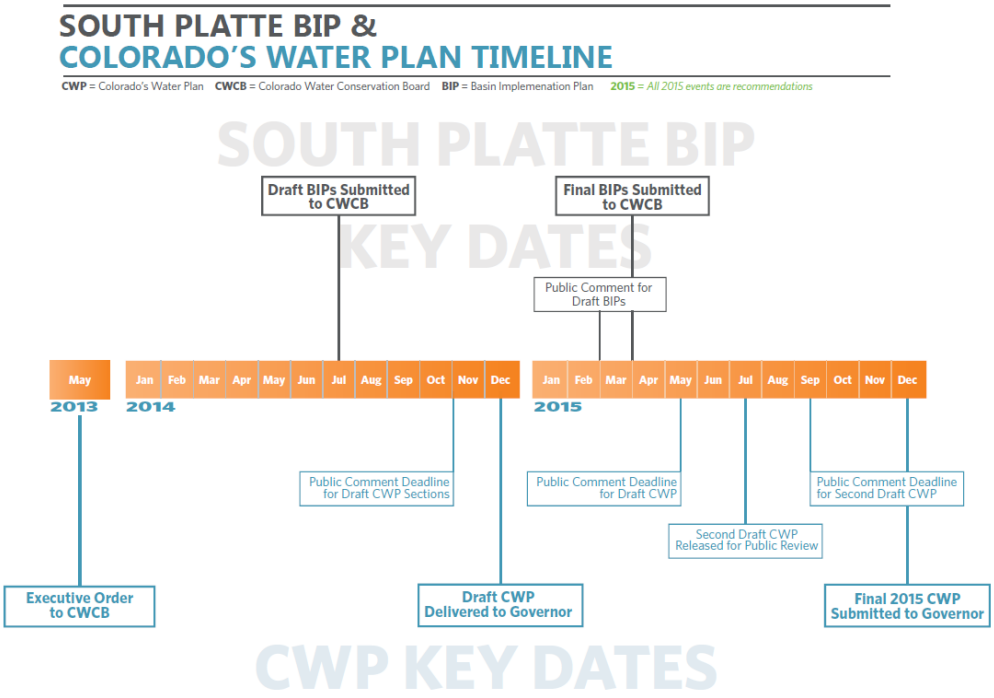
Foreword

At the request of Governor John Hickenlooper, the State of Colorado has begun to develop "Colorado's Water Plan". As part of the plan, "Roundtables" across the state are developing Basin Implementation Plans (BIPs) which will be incorporated in Colorado's Water Plan as appendices. Colorado's Water Plan is intended to set a course for water planning on a statewide level in Colorado, utilizing a grassroots approach that incorporates local knowledge from each river basin. It is the hope of the South Platte and the Metro Basin Roundtables that the South Platte Basin Implementation Plan (SP-BIP) will serve as a first step towards decisive action to address Colorado's water needs now and in the future. The timeline for creation of Colorado's Water Plan, including the deadlines for creating each BIP, and public comment periods is pictured below.

The SP-BIP, as a piece of this larger project, has been developed in a collaborative effort by the South Platte and Metro Basin Roundtables (BRT). As a Joint BRT, they engaged two consulting teams to develop the SP-BIP. HDR Engineering, supported by MWH Americas, Inc., was tasked by the BRTs with developing the portions of the SP-BIP related to consumptive water uses including municipal, industrial, and agricultural uses. The West Sage Water Consultants Team was tasked with developing the information related to environmental and recreational uses. The work of HDR and West Sage has been integrated in this document to form the Draft SP-BIP. Key members of the consulting teams are listed on the following page.

Public input from all categories of water interests in Colorado is critical to formulate a balanced SP-BIP and a successful CWP. To engage the public in the development of the SP-BIP, the Metro and South Platte BRTs are using multi-faceted communications and outreach tools. This approach seeks to reach diverse stakeholders. ***To participate in the SP-BIP development, please use one or more of the following public engagement tools:***

1. Attend a Basin Roundtable meetings (www.coloradowaterplan.com)
2. Attend at SP-BIP Open House Events (TBD, 2014-2015)
3. Visit the South Platte BIP Website (www.southplattebasin.com)
4. Request a presentation by BRT member



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Executive Summary

1 Executive Summary

1.1 Colorado's Water Resources

Over the last decade Colorado has faced substantial and increasingly complex water-related challenges. The sources of these challenges are as diverse as the state itself. They range from competing economic needs including agriculture, oil and gas, tourism, recreational, industrial, and municipal use, to differing regional outlooks about water allocation based on the State's geography and demographics. It was this coalescing of challenges facing Colorado that demanded stronger action. Taken together these and other issues presented a call for executive-level action to align competing interests and outlooks under a unified vision for the future of Colorado water planning.

Because Colorado has a long and proactive water planning history, the state has a very well-established water planning regime. The complex challenges facing Colorado in recent years, however, meant that State-level action to align water planning across the many basins was deemed appropriate. On May 14, 2013 Colorado's Governor, John Hickenlooper, responded to this situation by issuing an Executive Order directing the Colorado Water Conservation Board to commence work on Colorado's Water Plan (CWP). As specified in the Executive Order, the CWP must integrate the following:

- A productive economy that supports vibrant and sustainable cities, viable and productive agriculture, and a robust skiing, recreation, and tourism industry;
- Efficient and effective water infrastructure promoting smart land use; and
- A strong environment that includes healthy watersheds, rivers and streams, and wildlife.

The Colorado Water plan seeks to take up the many water challenges faced by the state including:

- Addressing the projected water supply gap that experts believe may reach 500,000 acre feet per year by 2050
- Addressing the largest regional supply gap in the South Platte Basin – the most populous and agriculturally productive Basin in the state
- Addressing how drought conditions can and may worsen this projected supply gap
- Reducing the state's trend toward "buy and dry" transfers of water rights from agriculture to municipal use as demand increases
- Incorporating environmental and recreational values so important to the economy and quality of life in each of the state's river basins
- Addressing the long standing interbasin and intrabasin challenges through cooperative dialogue and cooperative action, including the basin roundtables and IBCC
- Recognizing that water quantity and quality issues in the state are integrally linked
- Addressing interstate water obligations for the nine compacts and two equitable apportionment decrees applicable to Colorado

In developing the Plan, the Governor directed the Colorado Water Conservation Board to utilize the existing system of Basin Roundtables, established by the *Colorado Water for the 21st Century Act* in 2005. The Basin Roundtables were created to encourage locally-driven, collaborative solutions to the increasingly complex and controversial water questions facing the State.

Additionally, the Governor directed that the Colorado Water Plan should work to align state water projects, studies, funding opportunities, and other efforts. It should improve the State's role in facilitating and permitting water projects, utilize the knowledge and resource of relevant State agencies, as well as assemble and include working groups and ad-hoc panels developed to address specific issues that come to light in the process of making the plan.

The first draft of Colorado's Water Plan will be developed and submitted to the Governor in December 2014, and the work of the Basin Roundtables will form the foundation of the plan.

1.2 Basin Roundtables

As mentioned above, nine Basin Roundtables were established in 2005 to help manage and develop the State's water resources. This occurred in part as a response to the increasingly controversial and contentious water issues facing the state and in part to help proactively manage the changing water demands associated with the State's unprecedented population growth and the growing need for multiple uses for water in Colorado.

The nine basin roundtables, as shown in Figure 1-1, predominantly represent the major river basins of the State with one important exception: the South Platte Basin, which includes two roundtables, the Metro Roundtable and the South Platte Basin Roundtable. The South Platte River Basin covers a large portion of Northern Colorado which includes several major agricultural regions of the Front Range as well as the metropolis of Denver and its surrounding area. As a result, the South Platte Basin and Metro Roundtables decided to develop a single Basin Implementation Plan for the South Platte Basin.

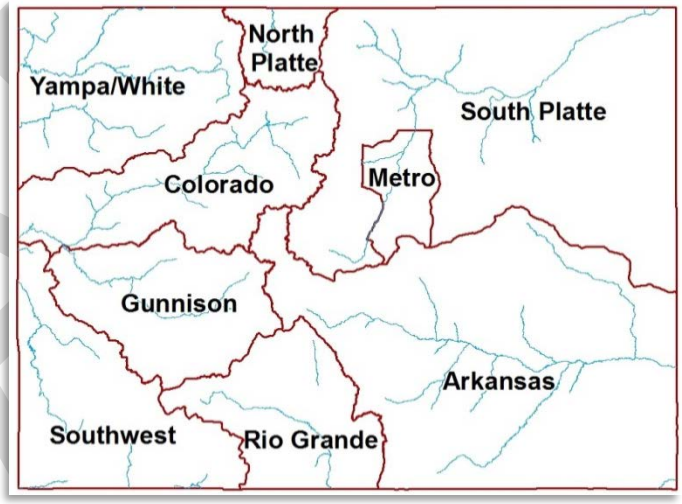

Figure ES-1. Colorado River Basins

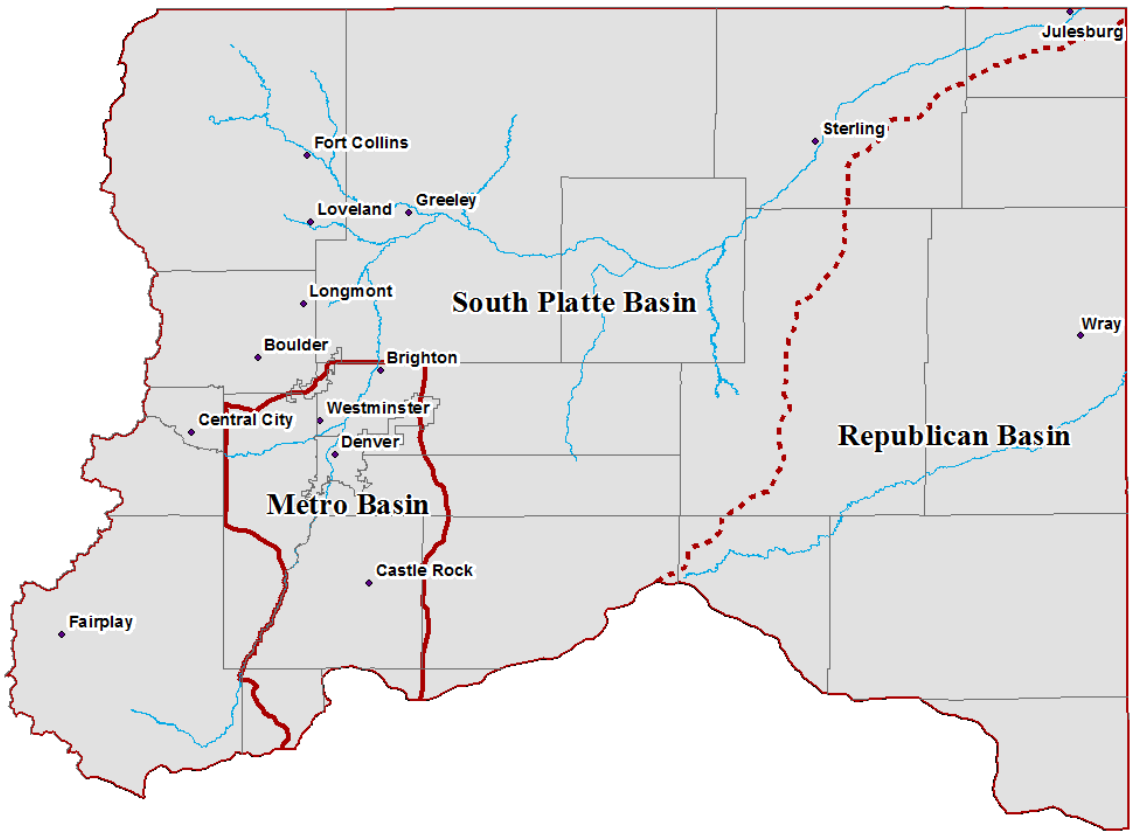

Figure ES-2. The South Platte Basin

The factors affecting water in the South Platte including the diversity of demographics and water uses for the urban portion of the Basin, versus the very different needs of agricultural users in other portions of the basin were deemed significant enough that the Basin was divided into two separate Basin Roundtables, one representing the Metro region of the South Platte and the other representing the remainder of the Basin including the portion of the Republican River Basin in far Eastern Colorado.

2 South Platte Basin Water Supply Challenges

The South Platte Basin supports a wide range of water needs including municipal, industrial, agricultural as well as important water-dependent ecological and recreational attributes. Coloradoans and tourists regularly enjoy the South Platte's recreational opportunities provided by the many environmental features of the basin. Based on State Demographers Office population projections, the South Platte and Metro Basins are projected to grow from approximately 3.5 million people in the year 2008 to about 6 million people by the year 2050. Population growth will significantly increase the future municipal and industrial water needs.

There are many water supply challenges and opportunities specific to the South Platte Basin which set the stage for analysis of water demand and implementation of satisfactory solutions. Familiarity with the

South Platte's water issues by water managers, regulatory agencies, elected officials, the business community, and the general public both will bolster Colorado's ability to maintain and improve sustainable water supplies. This will help promote economic growth, public safety, and environmental diversity both within the South Platte Basin and across the state. A good Colorado solution depends on a good South Platte solution.

Several water supply challenges specific to the South Platte Basin shape the ways that solutions for water availability in the basin are identified, analyzed and implemented. Below, these challenges are described in greater detail.

Limited Native Supply in the South Platte

The Basin, in a typical year, has little unappropriated water from either the South Platte or Republican Rivers available for new uses. This means that any new population or new economic activity requires a transfer of water away from another use, or the importation of new Colorado River water supplies. In recent years, these transfers have predominantly been from agriculture to municipal use – a system known as "buy and dry" where agricultural water rights are willingly sold to municipalities to supplement their supplies, resulting in the dry up of agricultural lands. Extensive continuation of this process is not in the best interest of the Basin nor is it in the best interest of the State.

Conservation, Reuse, and Successive Use

To answer some of this need, efficiencies in water use have been improved substantially along the South Platte, including successive use of water. On average, South Platte Basin water is used 7 times successively before it leaves the state at the Nebraska border. While this amount of successive use by downstream users is commendable, it either constrains the ability of water agencies to exchange water or to convey it back upstream or reduces the amount of water that has been previously available to downstream water users. Every drop in the South Platte River is used and reused many times over in meeting multiple needs.

A key premise in Colorado water law is the concept of "beneficial use." Further, under Colorado water law, the specific water uses must be identified to receive a decree. The water right decree also indicates whether that water right is limited to a single use and, in many cases, specifies the degree it can be reused. Frequently such rights constrain or prevent water from being reused. While some opportunities for additional reuse still exist in the South Platte, there is limited ability to expand reuse to cover our growing water demand.

Water providers in the South Platte Basin continue to seek expansion of their existing conservation programs for several reasons. Though these agencies have already implemented significant water conservation measures that are known nationally for their rigor, they plan to pursue even more aggressive conservation levels in the future. Some factors that limit the amount of conservation which can be implemented include the type of industry seeking water savings. Several industries within the Basin including livestock operations, food processing, beverage production, oil and gas extraction, as well as mineral development have significant water requirements which cannot be reduced indefinitely. And finally, the wide range of cultures, community settings, and backgrounds within the Basin affect lot sizing

and landscaping and consequently result in a widely varying per capita water usage that cannot be approached with a one-size-fits-all conservation approach.

Groundwater and Aquifer Storage and Recovery

Two types of groundwater are recognized in Colorado water administration: 1) tributary (or alluvial aquifers hydrologically connected to rivers and streams) and 2) non-tributary (not hydrologically connected to rivers and streams). While groundwater and aquifer storage present some opportunities in the Basin, continuation of current rates of withdrawals and/or potential expansion of the use of the important regional asset of the non-tributary Denver Basin Aquifer are constrained by declining water levels and well productivity in large areas of the Aquifer. New technologies for Aquifer Storage and Recovery (ASR) offer the opportunity that the Denver Basin Aquifer could be used for future water storage; however this technology requires additional research on managing stored water and being able to reliably recover the water as needed.

Alluvial aquifers (aquifers hydrologically connected to rivers and streams) along the South Platte have been used historically by water users. However, in 2006, the State required that numerous wells be shut down in the central South Platte Basin whose owners had not yet developed augmentation plans to make up for out-of-priority water use and delayed effects of the groundwater pumping. This has significantly constrained the use of alluvial groundwater in the central South Platte Basin and has generated considerably controversy and state legislation to more fully consider potential solutions and management options.

Interstate Water Commitments

South Platte River management is constrained by both interstate compacts and other programmatic and regulatory issues. The South Platte River Compact divides the waters of the South Platte River between Colorado and Nebraska, giving Colorado the right to fully use the water between Oct. 15 and April 1. During the irrigation season, Colorado must deliver 120 cubic feet per second to Nebraska at Julesburg or it must curtail junior diversions. The State Engineer is authorized to administer the compact. In addition, compliance with federal programs for threatened and endangered species recovery also results in interstate water management commitments that are outlined on the following page.

The Republican River Compact between Colorado, Nebraska and Kansas places severe challenges on Colorado's residents living and working in this basin. The Republican River Basin is physically distinct from the South Platte Basin and the Rocky Mountain snowmelt feeding the South Platte River does not benefit the Republican River Basin. The Ogallala Aquifer that spans eight Great Plains states supplies the Basin's agricultural economy (Yuma, Kit Carson, Phillips, and Washington counties are ranked in the top ten agricultural producing counties in the State according to the 2012 USDA agricultural census). Irrigation with Ogallala Aquifer water contributes to superior crop yields but a declining groundwater table raises concerns about how much longer or to what degree the Basin will be able to benefit from this water source.

Environmental Permitting Processes and Threatened and Endangered Species Recovery

There are challenges in developing additional water supplies for the South Platte Basin related to important species protection plans, namely the Platte River Recovery Implementation Plan (PRRIP). This three-state program serves to protect the habitat of four endangered species that utilize the Platte River and riparian areas. The current program places specific constraints on approval of new water depletions and prevents certain types of new water storage facilities in the lower reaches of the South Platte River in Colorado.

In addition to the PPRIP, other regulatory and permitting issues constrain water planning in the South Platte to a large degree. A key constraint on the South Platte Basin is the ability to permit new reliable sources of future supply. Due to the unpredictable timeframes and requirements associated with federal (Clean Water Act, Endangered Species Act), state and local permitting requirements for major projects, some water supply projects have been 10 years or longer without clear resolution. These associated delays and the resulting extension of the permitting timeline for a water project result in significantly higher financial burdens to Colorado's residents. Given the immense need for water in the Basin, it is critical that permitting processes for major water projects in the state improve both in terms of turnaround times and the predictability of the process while still providing the needed environmental protections and mitigations.

Environmental and Recreational Uses

Preserving and enhancing the environmental and recreational aspects of the South Platte River is important to Colorado's economy and quality of life. Water is necessary to maintain aquatic, riparian and wetlands habitats that are essential for ecological diversity. In addition, flows in streams are essential to many recreational economies, including fishing, waterfowl hunting and boating, and for general aesthetics near waterways, including greenways, trails and wildlife viewing. The important environmental and recreational values in the South Platte Basin must be considered when planning for Colorado's water future. Many of these attributes currently suffer due to current water diversions and infrastructure operations.

Maintaining or enhancing environmental and recreational attributes can be a constraint on potential future water development, however many opportunities exist to maintain these opportunities while concurrently developing water supply projects. Multi-purpose projects or agreements for cooperative operation of existing projects to help benefit these important attributes should be considered when projects are planned to help meet water needs. Additional projects to address these needs should be considered including environmentally friendly diversion structures, restoration of habitat and stream channels, and environmental pools in reservoirs with release timing to benefit the environment.

Water Quality Issues

A major challenge in the South Platte Basin relates to adequacy of the water quality for domestic and municipal water uses. These water users and water supply agencies recognized as early as the late 1800s that higher quality water was found in the mountain tributaries of the South Platte River where they exit the foothills. Since then delivery systems bringing high quality, reliable water from the South Platte River tributaries have been a staple of South Platte Basin water planning. Today, however, these higher

quality water sources are fully developed and municipal water suppliers are attempting to meet new supply demands with lower quality water sources often located within the lower portions of the Basin. Major technological innovations are needed for delivery, treatment, and disposal of the waste streams from currently available complex water treatment systems, which results in significant cost to customers, impacts to the environment, and uncertain regulatory permitting processes. Relying exclusively on South Platte River supplies in the face of decreasing water quality will be a major challenge in the South Platte Basin.

Summary of Challenges

Because of the diverse population and economic drivers in the basin, as well as a host of specific challenges on the water available for developing new supply, the South Platte Basin faces an enormous challenge in meeting its future water needs. As the Basin faces the greatest projected regional supply gap, it will need to continue to develop creative, multifaceted approaches to meet a growing demand. The challenges facing the South Platte are representative in many ways of the greater challenges facing Colorado as it looks to plan its water supply to 2050. ***Though the challenges loom, they are not insurmountable.*** The South Platte Basin Implementation Plan offers an integrated planning approach that will maximize the use of existing water supplies, develop new opportunities, and leverage technology and policy advancements that help to meet the Basin's diverse water supply needs.

3 Solutions for the South Platte

Making Choices

Finding solutions for the range of issues constraining water planning in the South Platte Basin is as much about determining how to balance the competing demands of Colorado and the South Platte Basin as it is about seeking technological and political solutions. To produce a viable and sustainable model to meet the projected water supply gap requires tradeoff within the Basin and the State concerning how we want to balance the utilization of our natural resources to support diverse economic, cultural, and environmental interests across the state.

Today's current de facto answer to our growing water demands has been the use of agricultural transfers. These transfers offer a mechanism to provide much-needed water to municipal suppliers and the environment through instream flows; however this water comes at the expense of the agricultural sector, which has a long and rich history in Colorado. The dry up of agricultural land in order to support growing municipal demands means that farmers and ranchers who have cultivated land, helped support small communities across the state, and contributed to Colorado's rich cultural heritage are making choices to leave agriculture – and, in the process, affecting surrounding rural economies and our State's historical identity. A key element of the South Platte solution is establishing systems where farmers can decide for themselves how to manage their water rights while concurrently offering potential new

transactional methods to help lessen the associated impacts on others is a key element of the South Platte solution.

The current solutions for increasing water demands can also have tradeoffs for environmental and recreational values throughout the Basin. The South Platte's environmental and recreational attributes are important for the economy and resident's way of life, and these attributes should be proactively considered when planning for the Basin's future water needs. Colorado's residents appreciate Colorado's natural resources and want to maintain scenic and ecological values throughout the State, including in the South Platte Basin.

Strategic Overview

Although the roundtables support the free market and rights of water owners to sell their property, the roundtables have explored options to counter the "buy and dry" trend. The three major guidelines the Basin Roundtable has utilized in determining solutions to meeting the projected water supply shortfall are below:

1. Minimize adverse impacts to agricultural economies;
2. Develop new multipurpose projects that either offset transfers from agricultural uses or provide additional water to reduce current agricultural shortages;
3. Proactively identify and implement methods to protect and enhance environmental and recreational water uses.

In Colorado water planning, a commonly understood, integrative approach to planning is known as the "Four Legs of the Stool." This approach recognizes that successful water planning in Colorado will need to utilize four specific tools; Conservation and Reuse, Identified Projects and Processes (IPPs), Agricultural Transfers, and new Colorado River supplies along with a supporting storage component. The South Platte Basin Implementation Plan employs this approach in its strategy to meet the water supply needs of the South Platte and Metro Basins.

The South Platte Basin's goal is to prepare for future water needs in a way that maximizes the state-wide beneficial use of our water resources while minimizing the impacts of additional water use on environmental and recreational resources. An integrated and managed approach to meeting the supply gap will include implementing a large percentage of the Basin's IPPs, a term used to describe the existing strategies and water projects which have been planned but not yet fully implemented. Additionally, the plan calls for enhancing water use efficiencies (conservation and reuse), integrating multi-purpose projects comprised of storage, conveyance via pipelines and other methods, and the integration of existing water infrastructure systems where possible. The plan intends to incorporate environmental and recreational protections and enhancements, utilize some degree of agricultural transfers using alternative methods to traditional "buy-and-dry," and simultaneously develop new unappropriated Colorado River supplies for the benefit and protection of all of Colorado, both now and in the future.

Ideally, projects within this strategy would be multi-purpose and address associated recreational and environmental benefits. New Colorado River supply would be developed in a manner that does not exacerbate compact obligations. Front Range storage would come from enlarging existing reservoirs; building off-river storage; and using underground storage to maintain aquifer levels, reduce evaporative

losses and minimize riparian impacts. New Colorado River supplies and Front Range storage would form the base of the municipal and industrial supply while providing environmental and recreational benefits. Front Range agricultural transfers coordinated with use of the Denver Basin Aquifer would be used primarily for droughts and drought recovery. Alternative transfer methods including land and water conservation easements could be used to help maintain agricultural production and the local economic benefits of agriculture. Continued leadership in conservation and reuse will ensure that all of these resources are used efficiently, allowing the Basin to maximize the benefits and minimize costs of development.

The South Platte Basin's vision is to develop solutions that balance the use of new Colorado River supplies with South Platte agricultural transfers, conservation, reuse and environmental and recreational programs in a coordinated manner to reduce the size and effects of the Colorado River supply projects and equitably share project benefits between the east and west slopes. The South Platte Basin proposes the construction of projects that develop tandem, diverse sources of supply – from new Colorado River supplies and agricultural transfers – instead of building projects based on a single source, from either new Colorado River supplies or agricultural transfers.

4 Implementation

The graphic above represents the process used to write the South Platte Basin Implementation Plan. Arrows represent each stage of the development of the Plan sequentially. Specific lists or themes are identified that were established during each phase of the plan's development. These themes and lists helped to drive the evolution of the report, and to establish the strategies and portfolios recommended in Sections 5 and 6.

Implementation of the multipurpose solutions described in the South Platte Basin Plan will be where ideas meet reality. To meet the supply gap and achieve the goals and outcomes identified by both the Governor of Colorado and the Basin Roundtables, the South Platte Basin Implementation Plan has recognized ten areas of focus, whose successful completion will be integral to meeting the regional supply gap and ensuring that Colorado's future water needs are met. Current projections anticipate that in 2050 water demands will exceed water supplies for municipal and industrial uses as well as for irrigated agriculture. This water supply gap under a medium demand scenario, with current conditions, anticipates that by 2050 there will be a municipal and industrial water supply gap of 428,000 acre-feet and irrigated agriculture water supply gap of 422,000 acre-feet.

1) Maximize implementation of IPPs

Successfully implemented IPPs, both in-basin and transbasin, will be critical to meeting the projected supply gap. The extent of which IPPs are successful will relate directly to the magnitude of the M&I gap.

Successful IPPs will lead to a smaller M&I gap while unsuccessful IPPs will increase the gap even further. A summary of anticipated yields from each category of regional IPPs at a 60 percent success rate is given in Table ES-1 below.

Table ES-1. IPP Yield by South Platte Subbasin

Region	Agricultural Transfer	Reuse (AFY)	Growth into Existing Supplies (AFY)	Regional In-Basin Project (AFY)	Firming In-Basin Water Rights (AFY)	Firming Transbasin Rights (AFY)	New Transbasin Rights (AFY)	Total IPPs at 60% Yield
Denver Metro	3,000	12,600	20,000	10,000	900	4700	10,800	62,000
South Metro	3,000	20,700	8,100	13,800	0	500	6,000	55,200
Northern	10,200	6,200	16,600	28,100	8,200	12,000	0	81,300
Upper Mountain	0	0	2,200	25	2,200	0	0	4,400
Lower Platte	0	0	4,500	2,900	4,500	0	0	11,900
High Plains	0	0	2,100	0	0	0	0	2,100

2) Maintain leadership in conservation and reuse and implement additional measures to reduce water consumption rates (see Section 4.3)

Already, the Basin has reduced their water use by approximately 20 percent since 2000 and currently achieves one of the lowest per capita water uses in the state. Even so, both Roundtables anticipate implementation of additional conservation programs tailored to diverse types of water supply systems and conditions existing in the South Platte River Basin. The interplay between conservation programs and municipal and industrial water reuse will continue to be examined.

Currently there are a limited number of sources that can legally be reused in Colorado, but water providers are attempting to reuse every drop to which they are entitled. Water that isn't reused locally is reused within the basin through successive use. Reuse will continue to push the economic, technical, and legal limits in order to maximize South Platte supplies.

3) Maximize use and effectiveness of native South Platte supplies

To more effectively utilize native South Platte supplies, the Roundtables suggests the development of multipurpose water storage and conveyance infrastructure, as well as new methods to more effectively utilize tributary and non-tributary groundwater. Another critical aspect of utilizing existing supplies will be the exploration of integration of existing South Platte Water Supply Systems.

4) Minimize traditional agricultural buy-and-dry and maximize use of Alternative Transfer Methods (ATMs) to extent practical and reliable

Many water providers count planned agricultural transfers towards their Identified Projects and Processes. These transfers are in the planning stages and will proceed, barring hold ups in water right transactions,

permitting of conveyance infrastructure or other unexpected circumstances. Ensuring that such projects proceed to the extent possible is an important piece of meeting the South Platte supply gap.

Additionally, it is recognized that Colorado's water right transfer process is heavily weighted towards dry-up of irrigated lands in order to transfer the historical consumptive use (CU) water. One alternative method to bolster water supply options is the use of alternative agricultural water transfer methods (ATMs). ATMs are meant to "minimize the impact on the local economy, provide other funding sources to the agricultural user, and optimize both the agricultural and nonagricultural benefits of the remaining lands." (SWSI 2010) Some of these alternative transfer methods include rotational fallowing, interruptible supply agreements (ISAs), water banks, purchase and leasebacks, deficit irrigation, and changing crop types. Through the implementation of ATMs, the agricultural producer can view their water rights as a "crop" and cities may view the cornfields as "reservoirs" holding water supplies for times of shortage. Much is still unknown about the feasibility of ATMs, but pilot projects in the basin are looking to find solutions to overcome the associated legal, technical, institutional, and financial issues associated with ATMs.

5) Protect and enhance environmental and recreation attributes

There are various important environmental and recreational attributes within the South Platte Basin that must be proactively considered when addressing water supply needs. Currently, there are some existing impairments to environmental and recreational needs within the Basin, and areas where habitat and streamflows must be enhanced or maintained to support these needs. The efforts being undertaken to meet the supply gap may potentially impact flows in streams, habitat, as well as water quality. Reduced stream flow in focus areas has the potential to create additional areas needing protection in order to sustain or enhance environmental and recreational attributes. Additional storage in the Basin has the potential to impact streamflows and to disturb wildlife habitat. However, opportunities to align environmental and recreational uses with the projects needed to meet the supply gap do exist. If cooperative operational agreements with cooperative operations or considerations can be put into place, there exists the potential to align environmental and recreational interests with the overarching goals of water suppliers. The strategies discussed regarding additional Colorado River supplies are intended to distribute impacts and benefits to environmental and recreational attributes to both the West and East slopes. Watershed management programs should also continue and be expanded to focus on additional high priority areas. Focused attention is needed to address threats associated with extensive tree mortality in the basin, increased fire hazards and water quality degradation associated with major recent floods.

6) Simultaneously advance the consideration and preservation of new Colorado River supply options

The Metro and South Platte Roundtables believe in strong consideration and preservation of the ability to use Colorado's entitlement under the Colorado River Compact as we also pursue other strategies to meet our water demands. Investigating, preserving, and developing Colorado's entitlement to Colorado River supplies is beneficial to the state's economic, social, political and environmental future. This may involve large state-level water projects, or small level projects, each with comprehensive West Slope water supply and environmental and recreational components.

7) Manage the risk of increased demands and reduced supplies due to climate change

The effects of climate change on water resource availability are very difficult to assess and the exact ways it will affect Colorado are unknown. Many South Platte water providers consider it irresponsible not to consider the potential for climate change in making water supply and demand projections.

8) Facilitate effective South Platte communications and outreach programs that complement the State's overall program

A critical component in advancing the South Platte Basin Implementation Plan and Colorado's Water Plan will be a strategic focus on communication and education with stakeholders including water users, political leaders, and leaders of major businesses and industries throughout the State. Improving public understanding about the goals, needs, and plans of the State and the South Platte Basin will help to improve public acceptance of the need for innovative water rate structures, energetic conservation measures, and more integrated land use and water supply planning.

9) Research new technologies and strategies

Water quality is an ongoing issue for the South Platte Basin. A major concern is the ability to manage and treat lower quality water effectively, and then dispose of the waste products (brine) in a cost effective and environmentally sound way. One important component of the South Platte Basin Implementation Plan will be for the State to take a proactive role in investigating technologies capable of treating low quality water sources and disposing of waste products.

10) Advocate for improvements to federal and state permitting processes

Cities throughout the South Platte Basin are struggling with the time and cost to obtain permits for incremental expansions to their water systems despite the environmental mitigation and enhancements offered by the projects. To meet the near and long term supply gaps, improvements to the permitting processes for supply projects are needed while still maintaining full regulatory compliance and environmental protections. This begins with approvals for planned supply projects including IPPs for meeting the nearer term supply gaps as well as other supply projects expected in the medium and long range timeframes. It is recognized that not all of the projects currently engaged in federal permitting or planned in the near future may obtain permit approvals with conditions acceptable to the project sponsors. Regardless of permit success rates, an important component of the South Platte Basin Implementation Plan is development of specific and actionable steps to improve the federal and state permitting processes for major water projects both in terms of efficiency and the predictability of the process while still providing the needed environmental protections and mitigations. ***Broader political and financial support is essential if the state is to use integrated projects to meet the supply gap.***

5 Summary

The South Platte Basin faces a cadre of unique challenges in planning for its municipal, industrial and agricultural water needs. It hosts some of the largest population centers in the state as well as several of the leading economic drivers from business, industrial, recreational and agricultural producers. As such, the South Platte Basin faces the largest projected regional shortfall for municipal, industrial and agricultural water in the future.

The South Platte Basin Implementation Plan offers a strategy to combat this shortfall utilizing diverse, tandem-supply solutions to chart a course that meets the projected water needs of the South Platte Basin as it develops in the future. This plan acknowledges the unique challenges, opportunities and tradeoffs present in the South Platte Basin, then leverages these challenges into ten specific implementation strategies to address them. Because the solutions developed in the Plan are multifaceted, approaching the Basin's water challenges with an arsenal of tools to help improve supply, they may help to achieve the goal of bridging the projected supply gap while evenly distributing the impacts of the State's water development across the State's many regions as well as its diverse economic interests.

When executed with the support of the State, political leaders, business leaders, and the public, the implementation strategies outlined in the Plan has the potential to achieve the ambitious goal of supplying water to the South Platte Basin, and by extension help supply the water needs and sustain the economy of the State of Colorado through 2050.