

Executive Summary

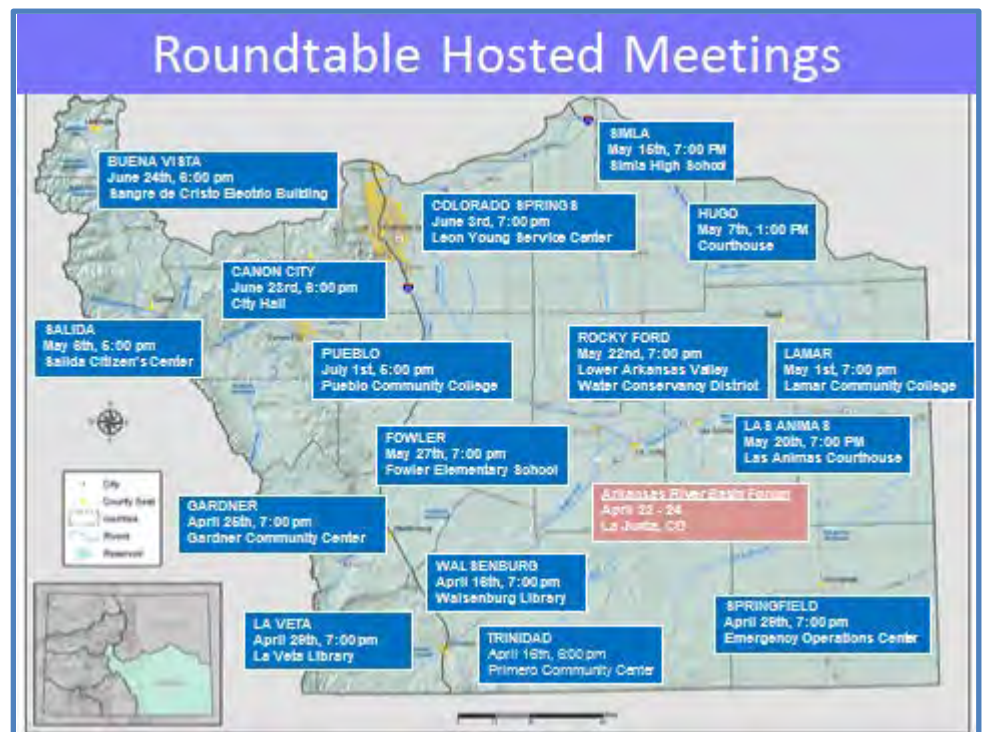
Introduction

In the *Water for the 21st Century Act*, the Arkansas Roundtable was tasked with “proposing projects and methods to meet the consumptive and nonconsumptive needs of the basin.” In response, by 2012, the Executive Committee had begun a shift toward implementation, based on these conclusions:

- The seven years together studying the consumptive and nonconsumptive needs of the Arkansas Basin seemed sufficient. It was now time to put that experience into context and take action to address the multiplicity of needs;
- Recent extremes of hydrology were causing havoc in water administration; 2011 and 2012 were nearly the wettest and then driest years on record.
- The Roundtable needed to attract a broader recreational and environmental advocacy. Portions of the Basin had little or no representation.
- Agriculture is the bedrock of water usage in the Arkansas Basin, but its importance had not been well articulated.

Governor Hickenlooper’s 2013 Executive Order re-energized the Arkansas Basin Roundtable. A revitalized Roundtable embraced the charge to draft a Basin Implementation Plan, with a deadline of July 31, 2014. The Roundtable recognized the need to reach out to the citizens of the Arkansas Basin and organized a series of public meetings.

Given the recent challenges of watershed health, especially the devastating impact of fires and floods on all types of water resources, the Roundtable also organized a Watershed Health Working Group. An invitation was extended to federal and state agencies, non-profit entities with depth of experience in watershed health, and all basin roundtables. This initiative was coordinated with Colorado Water Conservation Board staff.

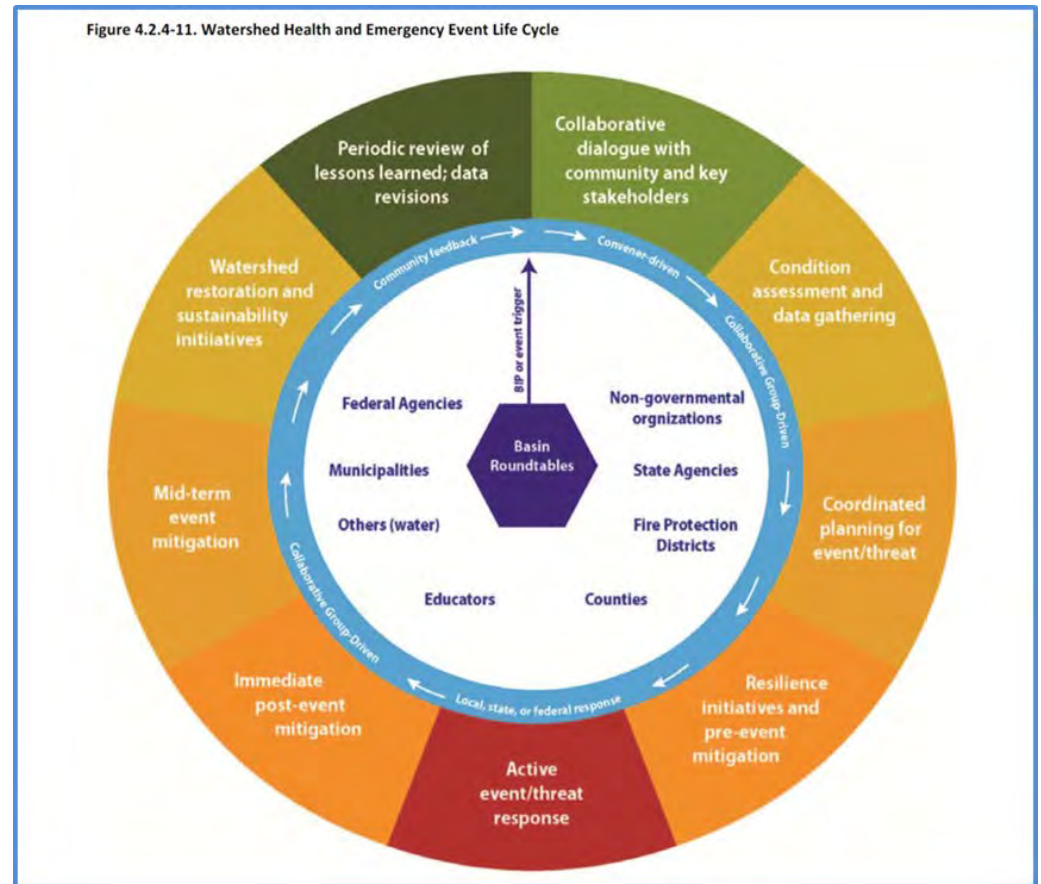


Following is a brief summary of what became clear through this process, along with emerging new perspectives. There are areas where further investigation is warranted and a description of the

Since the Arkansas basin is an importing and exporting basin, the Roundtable is a stakeholder in the future of Colorado's Compact Entitlement.³

The impact of watershed health extends beyond the basin boundaries and intersects with the interests of other Basin Roundtables.

The Watershed Health Working Group included many government agencies, along with non-governmental advocacy groups, in the facilitated dialogue. The tools and processes generated are now available to share with other basin roundtables.⁴ A highlight is the Emergency Event Life Cycle, which evolved from a sketch to a consensus model for community response to watershed values.



Summary and Challenges

The Arkansas Basin Roundtable prides itself on both the quality of its dialogue and its willingness to embrace the difficult issues facing Colorado's allocation of its most precious resource: water. Reconciling one hundred and fifty years of water resource development and administration with our 21st Century values is an enormous task. The Roundtables are charged in the *Water for the 21st Century Act* with "proposing projects and methods to meet the needs of the basin." This first draft of the Arkansas Basin Implementation Plan moves in that direction, with recognition that all needs may not be met to every citizens' satisfaction. Further investigation is needed in many areas, particularly with regard to sustaining agriculture as the cornerstone of environmental and recreational uses. The irreplaceable element for the future of the Arkansas River Basin is the continuation of the dialogue, predicated on the willingness by the Arkansas Basin Roundtable to solicit and then understand the voices of its residents.

³ The Colorado River Compact allocates depletions to the Colorado River between seven (7) States. The Intebasin Compact Committee, created by the *Water for the 21st Century Act*, has completed a set of principles embodied in a Conceptual Agreement regarding future development of Colorado's share of the Compact. See Section 4.8.

⁴ Special thanks to the Watershed Group of Colorado Springs Utilities, who generously supported this program with manpower and GIS mapping. See Section 4.2.

augmentation water, those same facilities may provide recreation. When wetlands are constructed to benefit the environment, improving water quality and habitat, they also consume water through evaporation. While locally beneficial, such increased evaporation will impact senior, agricultural water rights down stream

Greater clarity is also needed in the discussion about municipal conservation, or efficiency . Communities are different, have different needs and see conservation differently. “One size does not fit all.” Enthusiast and advocates on the subject, many from outside the community, hold strong opinions. Is there a uniform way to measure improvements in municipal conservation? Education is essential to a productive conversation.

Where we are going next

The Public Outreach initiative generated over 100 Input Forms. The identification of needs and potential solutions will be read, processed and measured against the Arkansas Basin’s goals and measureable outcomes. Additional information may be needed. The expectation is that the entity or individual generating the suggestion may be invited to present to the Roundtable for further illumination of the potential of a project or method. Since the Outreach meetings were organized by Roundtable Members, the Input Forms are sorted by sub-regions and watersheds.

Understanding regional needs and possible regional or local solutions highlights the need to disaggregate the municipal water supply gap. The 2010 edition of the Statewide Water Supply Initiative estimated the municipal supply gap in the Arkansas Basin for the Year 2050 as a range of 36,000-110,000 acre-feet. Imbedded in that range, which was established based on the probability of successful completion of the then Identified Plans and Projects (IPP’s), was the assumption that water available for municipal use in 2008 would remain available in 2050. Since much of the municipal supply gap is for regions reliant on non-renewable groundwater, a more immediate understanding of local and regional supply gaps is warranted.

Regional solutions are emerging. A collaborative initiative began in 2009 to define the elements of rotating fallowing of agriculture. The Roundtable moved forward on three tracks simultaneously: technical studies, public policy investigations and pilot project to test these strategies. A noble effort, however, the efficacy of the outcome remains uncertain. In the meantime, regional solutions in the upper basin are emerging, the lower basin is gaining greater understanding of its challenges and the Pikes Peak region is investigating cooperative infrastructure configurations.

Continued Dialogue

All of these initiatives will be measured and understood within the context of the basin’s hydrologic constraints and opportunities. In particular, as competing uses and potential reallocation of resources are proposed, the concepts will be evaluated within the context of water rights administration.

Roundtable's focus in the near-term. There remains a commitment to continue the dialogue, both within the Arkansas Basin and within Colorado.

What became clear

What became clear was the interdependence of all water usage types, with agriculture especially important as the foundation of many other derived benefits. Augmentation and/or replacement of groundwater sources is critical in certain sub-regions. The pressure to permanently dry-up senior agricultural water rights is derived from the need to provide a reliable source for such replacements. The Arkansas Basin has gaps in all topic areas, with a need to more fully understand the dynamic between recreation, the environment, agriculture and the municipal sources of supply.

The hydrology of the Arkansas River basin, with imports from the Colorado basin and exports to the South Platte basin, when coupled with the Arkansas River Compact, is complex. The imports, with reservoir storage, underpin a robust recreational economy, support a healthy fishery and deliver water to cities and farms through a Voluntary Flow Management Agreement¹. The interdependence of all four major areas of water usage (agriculture, environment, recreation and municipal) made it imperative that the Arkansas Basin Implementation Plan include the optional sections of Water Management & Administration and Hydrologic Modeling².

The mandates of the 1996 ruling in the lawsuit *Kansas v. Colorado* are primary drivers in water administration throughout the basin. Groundwater pumping, whether for greater agricultural efficiency or for community potable supply systems, requires replacement of depletions. The demand for "augmentation" is increasing while the main source of augmentation supply (fully-consumable municipal effluent) is pledged to meet municipal growth. Previous estimates of the municipal supply gap missed this double count of water: its current use for agricultural and its future use for municipal growth.

There is no "extra" water in the Arkansas basin. The current surplus of municipal return flow comes from mature municipalities, those founded in the 19th Century, which have sufficient municipal water resources for the foreseeable future. Population growth over the last 50 years has depended on groundwater, either non-renewable, hard-rock aquifers or alluvial aquifers. The alluvial aquifers known as Designated Basins are experiencing depletions that threaten the economic vitality of their respective communities. The hard-rock aquifers are non-renewing and approaching their useful life. In many rural areas, wells extended into the local alluvium are depleting groundwater rightly owed to senior water rights downstream, another need for augmentation.

Further investigation

The *Water for the 21st Century Act* divides the needs of the basin into two categories, consumptive and nonconsumptive. These terms have caused confusion, highlighting the need to better understand agriculture's current and future role. Previously, environmental and recreational uses of water were deemed nonconsumptive. Yet, as storage vessels are developed to increase the availability of

¹ Section 4.4

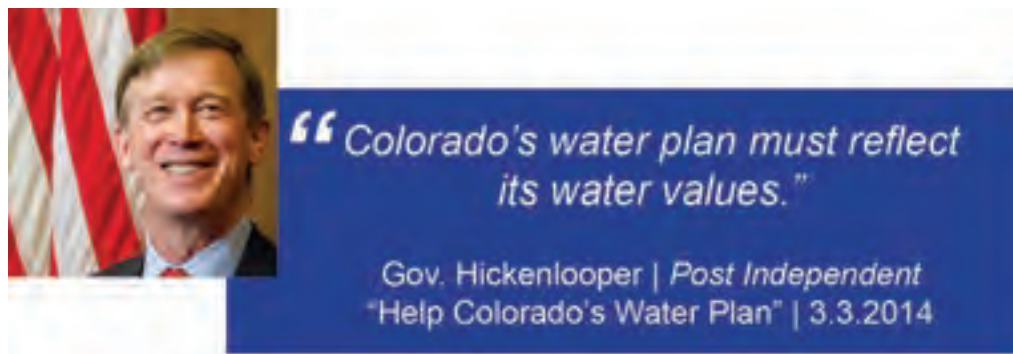
² Sections 3.2 & 3.3

The Colorado Basin Roundtable (CBRT) submits this Basin Implementation Plan (BIP) as its contribution to Colorado's Water Plan. In an executive order, Governor John Hickenlooper in May 2013 called for the state to create a water plan that proposes water-supply solutions for Colorado's growing population, which could double to about 10 million people by 2050, according to the State Demographer. It will be the culmination of more than nine years of work by nine basin Roundtable across the state, including the Colorado Basin Roundtable.

Colorado's General Assembly formed the Roundtable under the 2005 Colorado Water for the 21st Century Act, an effort to broaden discussions among the citizenry to find balanced water-supply solutions that also protect agriculture, the environment and river systems. The Colorado Basin Roundtable's primary interest area is the mainstem of the Colorado River and includes six counties from the headwaters to the Utah state line: Grand, Summit, Pitkin, Eagle, Garfield and Mesa.

The Colorado Basin Roundtable bases its BIP on nine years of taking testimony, holding internal discussions, creating a Vision Statement and the issuing of a White Paper. This body of work underpinned a facilitated effort to inform our constituents and garner public comment for the formation of this BIP. The final work was financed by a state Water Supply Reserve Account grant from the Colorado Water Conservation Board. The grant allowed the CBRT to contract with the consulting engineering firm SGM Inc. of Glenwood Springs.

A primary objective of the BIP is to look inside the six counties for projects and processes that will define the mainstem Basin's water supply future and environmental needs. This BIP does that and it is a first-time aggregation of the many and varied ideas, projects, conditional water rights and environmental concerns that exist across the Basin. It does not favor one project over another. However, it does find that the Basin's 63 water providers have identified projects to meet their future needs. It also identifies the necessity of restoring and protecting the flows and water quality of the Colorado River. This document also addresses the fact that other basins will be looking to the Colorado River system to help solve their water supply Gaps, to move additional Western Colorado water across the Continental Divide to the Front Range.



Overview

This document's strongest finding is that another major transmountain diversion (TMD) of water from the Colorado mainstem to Eastern Colorado should be prevented as damaging to our recreational economy, environment and agriculture. The same concern extends to all of Western Colorado. The state has a ceiling for how much water it can deplete while still meeting its delivery obligations under the Colorado River Compact of 1922. If it fails to understand that ceiling, curtailment looms for post-1922 water rights, both for Western Colorado and Front Range users of transmountain water. While that prospect is not immediately at hand as this document is being prepared, the state of Colorado and six other Colorado River states are discussing a potential operational crisis stemming from low reservoir levels at Lakes Powell and Mead. Powell could fall below levels where it could generate electrical power. At Mead, low water levels threaten the ability to supply water to Las Vegas. Potential mitigation actions include voluntary demand management (conservation and agricultural fallowing). This crisis foreshadows circumstances and actions that could occur under a Compact curtailment. It does not make sense to discuss a big TMD for Colorado while regional concerns point to the potential of cutting use. In all cases and at all times, it is essential that existing uses be protected.

This concern is highlighted by the lessons of overuse and Compact actions that exist today in the Arkansas, Rio Grande and Republican basins. The message: over-development of the river means un-development of agriculture. The CBRT does not want to see Western Colorado agriculture disappear because of poor – or purposeful – water planning. Our recreational and agricultural sectors are linked. The recreational economy “floats” on senior agricultural water rights moving from the headwaters to the Grand Valley.

In Colorado, 15 major TMDs already exist to move water from Western Colorado to the Front Range and Eastern Colorado. In the Colorado Basin Roundtable interest area, 450,000 to 600,000 acre-feet (AF) of water annually leaves the Colorado River system to support municipalities and farming east of the Divide. This Basin is the state's major donor basin. Another 120,000 to 140,000 acre-feet of water could still be developed under existing agreements, prospective agreements and fully developing water rights associated with existing infrastructure.

It is imperative that Colorado's Water Plan goes directly to work on the best means of using the water already at hand through conservation, reuse and best practices for moving water from agriculture to municipalities. Over-development poses an unacceptable risk to existing water users and the environment. It threatens the local economy and the emblematic reasons why so many people travel from the Front Range to Western Colorado every weekend to their favorite vacations spots and second homes.

The seven-state Basin has already reached a point where its demand exceeds supply. The seven states in the Basin and the U.S. Bureau of Reclamation (BOR) collaborated in the Colorado River Basin Water Supply and Demand Study that was released in December 2012. The study concluded that water use in the Basin has exceeded supply, and the Gap will widen in the coming decades. If trends continue, a Compact curtailment between now and the year 2050 is likely unless corrective actions are taken.



The Colorado Basin Implementation Plan – Influenced by a Grassroots Process

The Colorado Basin Roundtable initiated an extensive Public Education and Outreach program in December of 2013 that included more than 6 Town Halls, 20 Roundtable and project leadership team discussions, 30 one-on-one interviews with water providers, 45 public outreach presentations to City and Town Councils and several college forums. From Grand County to Mesa County the public emphasized the importance of not overusing the Colorado River beyond its sustainable carrying capacity and stressed the need to restore and protect the essential flows and water quality of the Colorado River. These outreach efforts connected with more than 900 citizens across the seven regions of the Colorado River Basin, offering them the *unique opportunity to voice their concerns and offer solutions on how to meet future water demands within Colorado River Basin well beyond 2050*.

Public Education and Outreach efforts provided the basis for the Colorado Basin Implementation Plan. The six themes that arose from the outreach portray the voices of the Colorado River Basin stakeholders, the agricultural community, municipalities, water providers, watershed groups, conservancy and conservation districts, government officials, students, and the public. The six themes are:

1. Protect and Restore Healthy Streams, Rivers, Lakes and Riparian Areas
2. Sustain Agriculture
3. Secure Safe Drinking Water
4. Develop Local Water Conscious Land Use Strategies
5. Assure Dependable Basin Administration
6. Encourage a High Level of Basinwide Conservation

Water projects have been identified by Basin stakeholders to proactively address these themes to support future consumptive and nonconsumptive (environmental and recreational) water projects. However, the overarching solution to meeting all six themes is to *not develop additional transmountain diversions from the Colorado River Basin* for other basins.

Six Themes of the Colorado Basin Implementation Plan

The following six themes represent the primary messages gathered from the public outreach efforts. Each theme is supported by solutions, projects and methods specifically targeting how the consumptive, environmental and recreation and agricultural needs should be achieved.

Theme 1 - Protect and Restore Healthy Streams, Rivers, Lakes and Riparian Areas

The economy, environment, agricultural production and drinking water treatment operations in the Colorado River Basin depend on healthy streams, rivers, lakes and riparian areas. Another large TMD would diminish streamflows while impacting water temperature, coldwater fish health and overall water quality – the latter a factor for municipal diverters such as Rifle and Clifton. Greater concentrations of salts threaten irrigated agriculture in the Grand Valley. Many headwater streams currently suffer from

historical TMD diversions, a factor recognized in part through the environmental projects envisioned by the Colorado River Cooperative Agreement (CRCA) between Denver Water and 42 West Slope entities. Water needs for healthy riparian areas are even greater (Sanderson et. al., 2012). Current West Slope and Front Range water diverters are also invested in the success of the Upper Colorado Endangered Fish Recovery Program for four threatened species in the 15-Mile Reach in the Grand Valley. Another large diversion upstream of this section threatens that program's success.

The CBRT is calling for the development of a Stream Management Plan (SMP) in an effort to quantify and document these impacts using the Watershed Flow Evaluation Tool (WFET). The purpose of the SMP will be to 1) establish the environmental and recreational (nonconsumptive) flow needs; 2) assist with the identification of areas where the historical alteration of stream flow is most likely to have modified ecological resources from conditions that may have existed prior to the time that water was first diverted for irrigation, domestic use and other purposes; and 3) develop consistent and reliable standards for data collection and analysis. Additional TMDs will lead to further degradation and diminishment of West Slope stream and river ecosystems, which will not allow the Basin stakeholders to meet their goals.

In support of this effort, the CBRT notes that several efforts are in motion that could assist with this theme. Environmental concerns and the ability to address them are cited in the Upper Colorado River Wild and Scenic Stakeholders Alternative Management Plan, the Colorado River Cooperative Agreement and the Windy Gap Firm Project agreement. Each of which is still in the approval process.

Theme 2 - Sustain Agriculture

Agriculture in the Colorado River Basin is part of the region's economic backbone providing food, culture, de facto open space and wildlife habitat. Senior water rights held by Grand Valley irrigators (in addition to water rights held by the Shoshone Hydroelectric Plant in Glenwood Canyon) form base flows upon which Colorado citizens can enjoy recreational experiences, privately or through the recreational industry.

The agricultural economy currently uses about 584,000 acre-feet annually to irrigate 268,000 acres. However, there is an existing annual average shortfall of 100,000 acre-feet (CDM, 2011a). Both the SWSI 2010 and Colorado Basin Needs Assessment state that as irrigated acreage declines, as expected, so will the needs and demands for irrigation. This is unlikely. Projected increases in temperatures will result in higher evaporation, evapotranspiration by plants, and a longer growing season. A decreasing snowpack means a reduction in the West Slope's primary water supply "reservoir." Furthermore, population growth will create a greater demand for food production. All of this will require more consumptive water for agriculture, not less, even if irrigated acreage declines.

The CBRT recognizes the importance of agriculture to the environment, water quality, wildlife, open space, economy and jobs. Our BIP promotes multi-purpose water-supply solutions and projects to benefit agriculture, drinking water supplies, recreation and environmental needs for current and expanded demands. Our BIP supports the overarching goal to protect and sustain existing agricultural practices. Therefore, we have included projects and policies that provide incentives and protections necessary to support agriculture. Water Law should be improved to allow the agricultural community the flexibility to implement efficient irrigation without the loss of water rights.

An additional TMD that supports more blue grass lawns on the Front Range while decreasing Colorado Basin irrigated agricultural lands and associated food supply is poor planning and not sustainable.

Theme 3 - Secure Safe Drinking Water

A critical question that needs to be answered is “how can we secure our drinking water supplies to the year 2050 and beyond?” Water supply infrastructure and long-range planning have historically benefitted from an established institutional structure supported by water attorneys, water engineers, master plans, appointed and elected officials. This proactive local and regional institutional structure has resulted in legal and physical water supplies that meet future drinking water needs. There are, however, future challenges facing water providers including extended droughts, impacts from climate change, degraded forest health, competition from energy needs and unknown Compact curtailment administration.

This BIP recommends in-basin, at-large and regional projects that meet water supply needs up to the year 2050 and beyond. The Colorado Basin Roundtable recommends the establishment of high conservation and efficiency targets which will lessen the need for future drinking water supply infrastructure. Each of the seven regions has specific local projects and policies necessary to meet future drinking water needs. They include recommendations to pursue redundant physical water supplies,

provide regional cooperation, plan for small reservoirs above physical intakes that provide multiple benefits for all water users, implement watershed protections, update master plans that account for future challenges and apply water efficient land use practices. Improvements to the permitting process to support new water supply projects are imperative in securing safe drinking water in the future.

Underlying the theme to secure safe drinking water is the need to maintain streamflows, as we know them. Streamflows diminished by another big transmountain diversion would be costly to water providers who divert directly from the river.



reservoirs provides benefits that accrue to the recreation industry, the environment and municipal water diverters along the way. These operations are crucial to the economies of the Basin. The CBRT recommends that actions be taken to protect the Shoshone Hydroelectric Plant for the benefit of the Colorado Basin and that 100 percent ownership of the Grand Valley irrigation water rights be

retained by West Slope entities. The CBRT supports actions called out in the Colorado River Cooperative Agreement to explore the future ownership of the Shoshone plant. Protection of Grand Valley irrigation rights serves the same interest.

Meeting the Dependable Basin Administration theme also relies upon maintaining Compact depletion limits as set forth in the Colorado River Compact. Nearly 70 percent of the Colorado River's native flow needs to pass the state line. All Colorado River users must be responsible for providing this water as required under the Compact. The CBRT recommends the adoption of a low-risk legal and hydrological assumption for Colorado's obligation under the Colorado River Compact in order to minimize the risk of curtailment on existing users of the Colorado River Basin.

“It's a little bit like being in the middle of a rubber band and being stretched from both ends; we are being stretched by our water supplies to meet Front Range demands and our legal requirement to continue to allow water to go through to our downstream states and to Mexico.”

Eric Kuhn | Colorado River Water Conservation District



Theme 4 - Develop Local Water Conscious Land Use Strategies

The entire State of Colorado must connect land use planning with water supply availability, especially in light of projections that the population may double by 2050. Local governments have the authority and tools to ensure that new growth and development do not outstrip water supply by considering the timing, density, landscaping and location of development. Opportunities exist for closing Colorado's and the Colorado Basin's water supply Gaps between future supply and demand through land use planning and conservation while also restoring and maintaining healthy rivers and preserving agriculture.

The methods for achieving high conservation targets will vary across the Basin and be developed specific to each region. All local governments can improve land use development codes to achieve high conservation targets. Developers can also drive the matter, an example being the water conservation plans proposed by the principals of Sterling Ranch in Douglas County.

Land use planning and water supply planning must extend beyond local jurisdictions and include regional cooperation to recognize the carrying capacity of local water supplies. This BIP encourages regional cooperation among all water users and local governments to ensure that existing and future land use meets conservation targets, protects and restores stream health, preserves and sustains agriculture, and meets Compact obligations.

Theme 5 - Assure Dependable Basin Administration

The Shoshone Hydroelectric Plant and the Grand Valley irrigation rights are the linchpins for administration of the Colorado River mainstem. Both sets of senior water rights pull largely dependable flows down the river from the headwaters. The coordinated administration of these mainstem rights through releases from Green Mountain, Ruedi, Wolford Mountain and Williams Fork

Theme 6 - Encourage a High Level of Basinwide Conservation

Water providers must work with land use decision makers on a local level to craft and implement regulations that will significantly reduce water needs for future growth. A recent analysis authored by John Currier, Chief Engineer of the Colorado River District, (Currier, 2014b) concluded that if the per capita demand within the South Platte basin could be reduced from 178 gallons per capita per day (gpcd) to 129 gpcd the need for a TMD would be non-existent. Significant water savings (new supply) can be achieved through demand management. Water providers must do what they can to lower gpcd rates through infrastructure improvements and water pricing while working with decision makers to implement policies that lower demand through best practices for development. Again, Sterling Ranch in Douglas County is an example of how that might look. A number of water providers on the Front Range have made admirable strides in the area of conservation and efficiency. West Slope communities such as the Town of Winter Park, the City of Aspen, the Town of Snowmass Village, to name a few, are also leading the movement to limit growth based upon their existing water supplies and promoting best management practices that reduce the impervious footprint of new developments. In an effort to lead the state in conservation, the CBRT adopted a high level of conservation goal for future water use and locally controlled planning efforts.

The CBRT's solution to encouraging a high level of conservation includes improvements to Colorado Water Law that support the implementation of water efficiencies, conservation and reuse. This also includes solutions that promote agricultural conservation while maintaining a viable and productive agricultural economy.

The CBRT recommends adoption of high conservation targets for all future and existing land uses. Technical work by the CWCB indicates that a high conservation strategy statewide equates to 460,000 acre-feet of new water supply from active conservation practices. Western Resource Advocates projects a high conservation strategy would be worth 610,000 acre-feet, once passive savings are included. This order of magnitude compares favorably to the state's water supply Gap of 500,000 acre-feet and

Executive Summary (cont)

Colorado Basin Implementation Plan COLLABORATING ON COLORADO'S WATER PLAN

illustrates the power of conservation and how it can put off the day when expensive, impactful transmountain water development is proposed.

The Metro Basin Roundtable published a White Paper that predicted metro area water providers could drive gallons per capita per day (gpcd) to 129. Currently the rate is 155 gpcd. This is a worthy goal that should be held up as an example for other regions of the state. The CBRT supports the Metro Roundtable in these efforts and is willing to assist with efforts to do better, a request made by the White Paper.

No More Water

The old paradigm that increasing demands on the Front Range can always be met with a new supply from the Colorado River system is no longer valid. The current level of water development, population growth and long term hydrology work against this notion. This is not the 1950s or even the 1960s. The overarching solution to meeting our future water challenges is to plan beyond 2050 and avoid future TMDs that could increase the likelihood of a Compact curtailment and triggering many environmental, agricultural and recreational impacts. This policy supports the six themes that emerged from CBRT work and constituent comment. Colorado Water Law does not allow the legal argument of “not one more drop.” From a policy perspective, the CBRT advocates that TMDs should be the last “tool” considered as a water supply solution, once the many and complex questions are addressed over hydrology, Compact curtailment rules, risk to existing water users, impacts to the environment and more - and once everything that can be done to conserve and reuse water has been undertaken. Continued development from the mainstem of the Colorado River toward full Compact entitlement is not sustainable and will harm all of Colorado.

This policy is supported by several documents, including the previously referenced Colorado River Basin Water Supply and Demand Study that concluded Colorado is overusing its Upper Colorado River Basin Compact of 1948 allocation of 51.75 percent of Upper Basin water and is estimated at about 58 percent. It is estimated that there would likely be an average shortfall of 3.2 million acre-feet in the entire seven-state region by 2060 (BOR, 2012).

Lake Powell is the “bank account” that allows Colorado and the Upper Basin to meet the 1922 Colorado River Compact obligations in lean snowmelt years and helps supply the electrical needs of 5.8 million people, including a significant number of people in Colorado. Revenue from hydroelectric generation is applied to several beneficial purposes in Colorado, including, but not limited to salinity control projects and the Endangered Fish Recovery Program. Long term drought that commenced in 1999 and a supply-demand imbalance in the Lower Basin (i.e. more uses than inflow), have caused Lake Powell and Lake Mead to approach critically low levels, below 50 percent of capacity. As a consequence 2014 is the first water year that water deliveries from Lake Powell to Lake Mead are reduced (8.23 million acre feet (MAF) to 7.48 million acre-feet) pursuant to the 2007 Interim Operating Guidelines (BOR, 2007). If long term drought continues and unless something is done in response to these conditions, Lake Powell’s elevation could drop below the level at which the reservoir can generate hydroelectric power (minimum power pool) (McClow, 2014). All Colorado River users need to assess in-basin solutions that use high conservation measures, reuse, land use and best-practice agricultural transfer methods before considering projects that increase diversions from the Colorado River Basin.

Within the state of Colorado the Colorado River Basin is facing challenges related to water supply and water quality to support healthy ecosystems; promoting and sustaining strong agricultural and recreational economies; providing safe and reliable drinking water; and avoiding a looming Compact curtailment. One major factor contributing to these challenges is the 450,000 to 600,000 acre-feet of water currently being diverted to farms and cities of eastern Colorado through transmountain diversions TMDs. The Colorado River Basin is the state’s major “donor” basin of water and is at-risk for losing even more water to the Front Range, as much as 120,000 to 140,000 acre-feet, to support projects identified to meet future demands including:

- ❖ 50,000 to 70,000 acre-feet left for the full use of existing TMDs
- ❖ 50,000 acre-feet in new depletions through Moffat and Windy Gap
- ❖ Potential cooperative projects as contemplated by the Colorado River Cooperative Agreement (CRCA)
- ❖ 20,000 acre-feet contemplated with the Eagle River Memorandum of Understanding (MOU) to benefit Colorado Springs and Aurora

Additional uncertain factors include climate change, agricultural shortages, energy development, dust on snow and the widespread impact of beetle kill on Upper Colorado River watersheds. Undefined environmental and recreational needs and existing identified projects add to the complexity of the Basin’s challenges in planning for future water demands.

In summary, the CBRT does not promote the use of TMDs to meet future water demands without first considering reuse, conservation and first developing in-basin water supply projects.

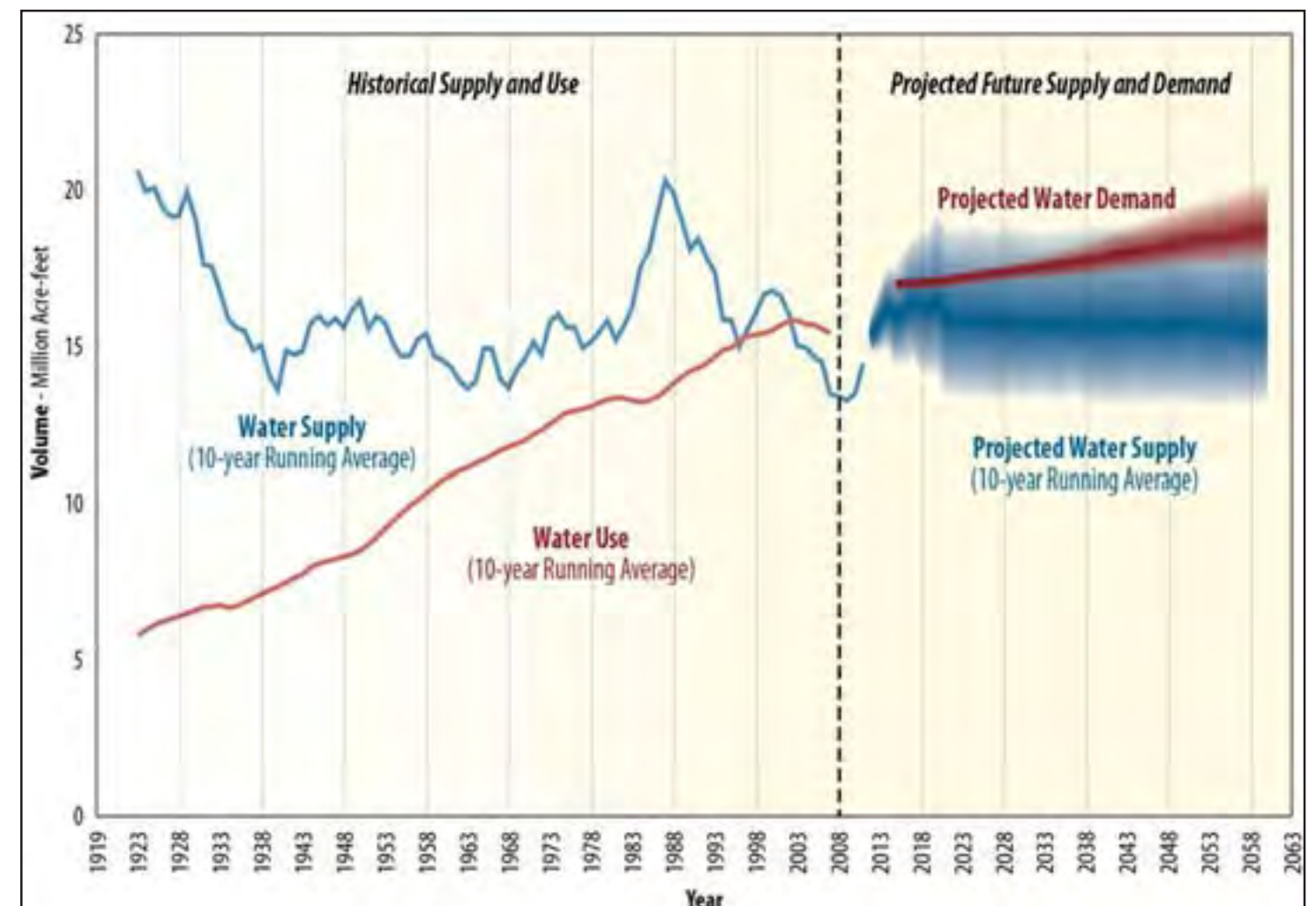


Figure 1. Historical and Future Projected Colorado River Basin Use and Demand. (BOR, 2012)

Executive Summary



Objectives

This report is designed to follow the framework of the Basin Implementation Plan Guidance (December 10, 2013) provided by the Colorado Water Conservation Board. Application of the guidance to local issues in the Gunnison Basin and preparation of the report was overseen by the Gunnison Basin Roundtable and its Basin Implementation Plan Subcommittee. To improve consistency, coherence, and relevance to local issues some sections of the plan were restructured as appropriate. According to the Guidance:

“The purpose of the Basin Implementation Plans is for each basin [roundtable] to identify projects and methods to meet basin-specific municipal, industrial, agricultural, environmental, and recreational needs. The Basin Implementation Plans will inform and help drive Colorado’s Water Plan.”

The Gunnison Basin Roundtable is pleased to submit this Basin Implementation Plan for inclusion into the Colorado Water Plan process. The projects identified in this report meet a variety of important needs in the Basin. Every effort was made to recognize the most appropriate goals, projects, and strategies to address the Basin’s priorities. Despite the best efforts to comprehensively address water needs in the Basin, given the accelerated deadline and resource constraints, this report inevitably falls short of adequately identifying all projects and issues in the Basin. It is also important to note, due to the inherent tradeoffs surrounding water use in Colorado all priorities and projects documented in this report are not equally and unanimously supported by all members of the roundtable.

Background

The Gunnison Basin Implementation Plan (GBIP) was created by the Gunnison Basin Roundtable (GBRT) for submittal to the Colorado Water Conservation Board (CWCBC). It is designed to support regional water planning through the roundtable process established by the Colorado Water for the 21st Century Act. The GBIP builds on previous roundtable work to propose and fund projects for meeting water needs. The GBIP also provides critical grassroots input to the forthcoming Colorado Water Plan (CWP).

To encourage locally-driven and balanced solutions to water supply challenges, the plan identifies water projects through targeted analyses of water issues in the Basin. The GBIP includes analyses of water shortages, water availability under variable hydrologic conditions, and various site-specific water supply issues. The ultimate purpose of the plan is to better identify water priorities in the Basin and highlight proposed projects that will excel at meeting these priorities in the near future.

The GBIP process continues the important public education, participation, and outreach work that the GBRT has been engaged with for almost ten years. The creation of the GBIP included targeted technical outreach to refine information on water needs and projects. It also included public outreach with local stakeholders to gather input on key elements of the report. The GBRT's ongoing outreach and education efforts will be critical throughout the development of the CWP.

The structure of this document generally follows CWCB BIP guidelines with some modifications to better address local issues, streamline the report, and focus on proposed projects.

- **Introduction:** summarizes the current planning process, related outreach, major Basin issues, and available information.
- **Section 1:** defines Basin Goals, Statewide Principles, and corresponding measurable outcomes.
- **Section 2:** summarizes water supply needs in the Basin.
- **Section 3:** describes options to analyze projects and case studies.
- **Section 4:** identifies proposed projects, related constraints, and strategies for implementation.
- **Section 5:** summarizes conclusions and recommendations.

Section 1: Basin Goals

The GBRT identified nine Basin Goals to establish priorities for water development and to maintain and protect the current balance of water use in the Gunnison Basin; each goal is paired with Measurable Outcomes and a process for their achievement to provide a concrete measurement of success (Table 1).

Table 1. Basin Goals

Primary Goal:

1. Protect existing water uses in the Gunnison Basin.

Complementary Goals (order does not indicate priority):

2. Discourage the conversion of productive agricultural land to all other uses within the context of private property rights.
3. Improve agricultural water supplies to reduce shortages.
4. Identify and address municipal and industrial water shortages.
5. Quantify and protect environmental and recreational water uses.
6. Maintain or, where necessary, improve water quality throughout the Gunnison Basin.
7. Describe and encourage the beneficial relationship between agricultural and environmental recreational water uses.
8. Restore, maintain, and modernize critical water infrastructure, including hydropower.
9. Create and maintain active, relevant and comprehensive public education, outreach and stewardship processes involving water resources in the six sectors of the Gunnison Basin.

The GBRT also identified seven Statewide Principles (Table 2) to complement Basin Goals and to reflect the GBRT's vision for major water policy issues in Colorado. Basin Goals and Statewide Principles are collectively intended to inform and help drive the Colorado Water Plan as stated in the CWCB's Basin Implementation Plan Guidance Document.

Table 2. Statewide Principles

1.	Future supply of Colorado River water is highly variable and uncertain; therefore any proponent of a new supply project from the Colorado River System must accept the risk of a shortage of supply however the shortage occurs, strictly adhere to the prior appropriation doctrine, and protect existing water uses and communities from adverse impacts resulting from the new supply project.
2.	It must be explicitly recognized that a new supply development from any location in the Colorado River System affects the entire West Slope, as well as the Front Range diverters.
3.	Any new supply project from the Colorado River System must have specifically identified sponsors and beneficiaries, and meet certain minimum criteria.
4.	Local solutions must be utilized to meet Colorado's future water needs without a major state water project or related placeholder water right.
5.	Water conservation, demand management, and land use planning that incorporates water supply factors should be equitably employed statewide.
6.	Scenario planning should be used as the principal tool for water planning.
7.	Statewide discussion, outreach, and education concerning the Gunnison Basin Roundtable's vision for water development in Colorado should be continued.

Section 2: Basin Needs

The GBRT identified water needs by summarizing corresponding information from existing relevant sources and updates secured through targeted technical outreach with agricultural, municipal, industrial, environmental, and recreational entities.

Agricultural shortages are estimated to be approximately 116,000 AFY by 2050 (Table 3), prompting four primary water management needs, including improving water supply reliability; minimizing loss of agriculture to other uses; rehabilitating key water supply infrastructure, and developing public education programs (Table 4).

Table 3. Agricultural Needs (quantitative)

Analysis	Irrigated Acres	Crop Irrigation Requirement (CIR) (AFY)	Irrigation CU (AFY)	Shortage (AFY)	Non-Irrigation Demand (AFY)
Current	272,000	633,000	505,000	128,000	54,000
2050	244,000 ¹	573,000	457,000	116,000	48,000

Table 4. Agricultural Needs (qualitative)

❖	Improve agricultural water supplies to reduce shortages.
❖	Consider alternatives to growth patterns and identify creative solutions to minimize loss of agricultural land to other uses.
❖	Inventory existing dams, headgates, and canals; assess their current conditions; and prioritize rehabilitation and repairs.
❖	Develop an education program to help new irrigators understand how historical practices evolved through experience, and help maximize water available to irrigators throughout each tributary.

Municipal and Industrial (M&I) needs are estimated to be up to approximately 44,000 AFY—a 24,000 AFY increase from current levels—by 2050 (Table 5). These increased needs are generally expected to be managed with sufficient existing supplies and/or planned projects.

Table 5. M&I/SSI Needs

Demand Type	2008	2035	2050 Low	2050 Med	2050 High
M&I	20,000	33,000	36,000	39,000	43,000
SSI	260	650	650	650	650
Total	20,260	33,650	36,650	39,650	43,650

*All values in AFY. Source: SWSI 2010

Environmental and Recreational needs include the identification and inventorying of projects throughout the Basin and in 29 target stream reaches identified by the GBRT, as well as addressing water quality and watershed/forest health issues (Table 6).

Table 6. Environmental and Recreational Needs

Identify and inventory specific projects to address environmental and recreational needs in the following target reaches:

1. Blue Mesa, Morrow Point, Crystal Reservoirs (Aspinall Unit of the Colorado River Storage Project) and Gunnison River in Curecanti National Recreation Area
2. Gunnison River - Almont to Blue Mesa Reservoir
3. Gunnison River in Black Canyon of the Gunnison National Park
4. Gunnison River in Gunnison Gorge National Conservation Area downstream to Confluence with North Fork of the Gunnison River
5. Gunnison River - Confluence with North Fork Gunnison River to Hartland Diversion
6. Gunnison River - Hartland Diversion to Confluence Colorado River
7. North Fork of the Gunnison River - Paonia Dam to Confluence with the Gunnison River
8. Stream Segments on Headwaters Wilderness Areas
9. Coal Creek, Slate River and Tributaries
10. East River - Gothic to Almont
11. Henson Creek and Tributaries
12. Uncompahgre River and Tributaries - Headwaters to Ouray
13. Uncompahgre River - Ouray to South Canal Outfall and West Canal Flume
14. Grand Mesa Reservoirs on National Forest
15. Tributaries to Taylor Park Reservoir
16. Taylor Park Reservoir
17. Taylor River - Taylor Park Reservoir to Almont
18. Lake San Cristobal
19. Lake Fork of the Gunnison River - Lake San Cristobal to Blue Mesa Reservoir
20. Ridgway Reservoir
21. Upper East River and Tributaries - Headwaters to Gothic
22. Tomichi Creek (Sargents to confluence with Gunnison River)
23. Curecanti Creek (headwaters to confluence with Morrow Point Reservoir)
24. Smith Fork Creek
25. Ohio Creek (headwaters to confluence with Gunnison)

26. Cottonwood Creek (included in the Dominguez-Escalante Resource Management Plan)
27. Cow Creek (lower reach—last 5 miles)
28. East and West Dallas Creeks
29. Cimarron River and Blue Creek

Water quality and watershed health needs in the Gunnison Basin:

- CDPHE is implementing further Monitoring and Evaluation (M&E) of specific water quality parameters for 22 water body segments identified by CDPHE in the Gunnison Basin.
- CDPHE is developing Total Maximum Daily Load (TMDL) strategies for specified pollutants within water body segments identified in the Gunnison Basin, including point source projects and other scheduled improvements to help water quality issues.
- CSFS and USFS are addressing forest health projects related to forest management; forest insects, diseases, and disorders; and wildfire mitigation and education.

Section 3: Basin Evaluations

The GBRT used the Gunnison River basin Water Resources Allocation Model, case studies, and mapping overlays to evaluate projects and project constraints. Modeling tools allowed evaluation of impacts to the availability of water to individual users and projects based on variable hydrology, water rights, and operations (e.g., proposed diversions, reservoirs, and management strategies). The modeling tools helped to evaluate five case studies to investigate basin-wide issues and opportunities with specific projects (i.e., water availability analysis, Upper Basin irrigation decrees, agricultural impacts on streamflows, and instream flow analysis). Mapping overlays of project data and Basin needs were used to provide a consistent methodology to review potential projects, highlight options for multi-use projects, and identify projects that may compete for available water.

Section 4: Basin Projects

Projects are the primary focus of the GBIP and the mechanism for addressing Basin Goals. Section 4 summarizes projects highlighted for implementation. Developed in close coordination with the GBIP Subcommittee, the GBRT, and project proponents, the list of proposed projects is considered a current snapshot of potential Basin solutions that should be periodically refined with input from project sponsors. To strategically focus implementation efforts, projects are divided into 3 tiers:

- **Tier 1:** implementation likely feasible by 2020; project does excellent job of meeting Basin Goals.
- **Tier 2:** implementation likely not feasible by 2020; project would excel at meeting Basin Goals. Project may also have important conditional water rights and/or completed planning efforts.
- **Tier 3:** implementation likely not feasible by 2020; project in preliminary stages of planning and/or may meet Basin Goals to lesser degree.

Tier 1 projects are summarized in Table 7 showing which Basin Goals are met by the projects.

Table 7. Proposed Basin Projects

Ref. No.	Project	Basin Goals Met								
		1	2	3	4	5	6	7	8	9
1	Inventory of Irrigation Infrastructure Improvement Needs - District 28	✓		✓		✓		✓	✓	
2	Cole Reservoirs #4 and #5	✓		✓					✓	
3	Crawford Reservoir System Optimization Study and Prioritized Conveyance Improvements	✓		✓					✓	
4	Doughty #1 - Chipmunk Reservoir	✓	✓	✓					✓	
5	Fire Mountain Canal Delivery Efficiency Project	✓		✓					✓	
6	Marcott Reservoir	✓	✓	✓					✓	
7	North Delta Canal	✓		✓					✓	
8	Orchard Ranch Ditch	✓	✓	✓					✓	
9	Overland Reservoir Enlargement (Part 2)	✓		✓					✓	
10	Paonia Reservoir Sediment Removal and Outlet Modification Project	✓		✓					✓	
11	Young's Creek Reservoirs (#1 & #2) Rehabilitation	✓		✓					✓	
12	Granby Reservoirs (#5 and #11) Rehabilitation	✓		✓					✓	
13	Inventory of Irrigation Infrastructure Improvement Needs - District 40, Grand Mesa (Surface Creek)	✓		✓		✓		✓	✓	
14	Inventory of Irrigation Infrastructure Improvement Needs - District 40, Upper North Fork	✓		✓		✓		✓	✓	
15	Rehabilitation/Enlargement-28 Reservoirs LCWUA	✓		✓					✓	
16	Somerset Diversion Improvement	✓		✓	✓	✓				
17	Environmental/Recreational Project Identification and Inventory - North Fork Region	✓				✓		✓		
18	Uncompahgre Valley Water Users System Optimization Projects (Canal Lining and Re-regulation of Reservoirs)	✓		✓					✓	
19	Project 7 - 10 kAF Raw Storage (Part 2)	✓			✓					
20	Redlands Pump Modernization and Hydropower Optimization Project	✓		✓		✓		✓	✓	
21	Dillsworth Ditch	✓	✓	✓					✓	
22	Meridian Lake Reservoir and Washington Gulch Storage Project	✓	✓	✓						
23	Water Conservation Planning Process for the Upper Gunnison Basin	✓			✓					
24	Cunningham Lake Reservoir Rehabilitation	✓	✓	✓				✓		
25	Gunnison Ohio Creek Canal Enlargement	✓		✓					✓	
26	Inventory of Irrigation Infrastructure Improvement Needs - District 59	✓		✓		✓		✓	✓	
27	Inventory of Irrigation Infrastructure Improvement Needs - District 62	✓		✓		✓		✓	✓	
28	Environmental/Recreational Project Identification and Inventory - Lake Fork Region	✓				✓		✓		
29	City of Ouray Water Efficiency and Conservation Plan	✓			✓				✓	
30	Inventory of Irrigation Infrastructure Improvement Needs - District 68	✓		✓		✓		✓	✓	
31	Environmental/Recreational Project Identification and Inventory - Upper Uncompahgre Region	✓				✓		✓		
32	Environmental/Recreational Project Identification and Inventory - Upper Gunnison Region	✓				✓		✓		
33	NoChicoBrush	✓	✓	✓					✓	
34	Gunnison Basin Selenium Management Plan and Gunnison Basin Selenium Task Force	✓		✓			✓		✓	
35	Colorado River Storage Project - MOA Projects	✓		✓			✓		✓	
36	Development of Upper Uncompahgre Water Supplies	✓		✓	✓				✓	
37	Improvements to Red Mountain Ditch	✓		✓	✓				✓	
38	Gunnison Basin Roundtable 2015 Education Action Plan Activities	✓	✓					✓		✓

Table 8 provides brief narrative descriptions discussing general relationships between identified Basin Goals and proposed Tier 1 Basin Projects. Most Basin Goals are fulfilled by numerous Basin Projects.

Table 8. Relationships between Basin Goals and Proposed Basin Projects

Goal 1: Protect existing water uses in the Gunnison Basin – Thirty eight sponsored projects are expected to help fulfill this goal, many with the intent to maintain current irrigated acreage. The projects include community outreach and conservation planning to enable communities to reduce municipal and industrial water consumption; and strategic basin system improvements for improved crop yields, reduced operational inputs, improved water quality, and system reliability.

Goal 2: Discourage the conversion of productive agricultural land to all other uses within the context of private property rights – Eight projects are expected to help fulfill this goal with the intent to preserve current irrigated acreage. The projects include four miles of conveyance piping to overcome existing ditch leakage issues; enlargement of an existing reservoir; rehabilitation of an existing dam; improvements of existing delivery systems; improvement of Sage Grouse habitat; providing new augmentation water; and strategic basin system improvements for improved crop yields, reduced operational inputs, improved water quality, and system reliability.

Goal 3: Improve agricultural water supplies to reduce shortages – Thirty sponsored projects are expected to help fulfill this goal with the intent to reduce projected agricultural shortages. The projects include restoration, maintenance, or modernization of significant agricultural water supply infrastructure; enlargements of existing canals and reservoirs; improvement of existing canal delivery efficiency; removal of reservoir sediment; modification of reservoir outlet works; rehabilitation of an existing dam; development of water supplies for augmentation M&I, irrigation, hydropower, and instream flow enhancement; and strategic basin system improvements for improved crop yields, reduced operational inputs, improved water quality, and system reliability.

Goal 4: Identify and address municipal and industrial water shortages – Six sponsored projects are expected to help fulfill this goal with the intent to reliably meet projected municipal demands and continue effective water conservation programs. The projects include enlargement of an existing reservoir; upgrades to an outlet structure of an existing reservoir; siting of two new reservoirs; community outreach and conservation planning to enable communities to reduce municipal and industrial water consumption; and development of water supplies for augmentation, irrigation, hydropower, and instream flow enhancement.

Goal 5: Quantify and protect environmental and recreational water uses – Twelve sponsored projects are expected to help fulfill this goal with the intent to improve environmental and recreational focus areas in existing stream channels and to improve native trout populations. The projects include the investigation of feasibility for nonconsumptive focus segments in four specific regions of the Gunnison Basin.

Goal 6: Maintain or, where necessary, improve water quality throughout the Gunnison Basin – Two sponsored projects are expected to help fulfill this goal with the intent to maintain outstanding water quality in headwaters streams and improve site-specific water quality related to mining, selenium, and salinity issues. The projects include investigation of feasibility for nonconsumptive focus segments in four specific regions of the Gunnison Basin; and development of water supplies for augmentation, irrigation, hydropower, and instream flow enhancement.

Goal 7: Describe and encourage the beneficial relationship between agricultural and environmental and recreational water uses – Thirteen sponsored projects are expected to help fulfill this goal with the intent to complete new multi-purpose water projects in the Gunnison Basin that meet multiple needs. The projects include four miles of conveyance piping to overcome existing ditch leakage issues;

rehabilitation of an existing dam; improvements of existing delivery systems; improvement of Sage Grouse habitat; and providing new augmentation water.

Goal 8: Restore, maintain, and modernize critical water infrastructure, including hydropower –

Twenty eight sponsored projects are expected to help fulfill this goal with the intent to implement at least one project every year in the Gunnison Basin focusing on the restoration, maintenance, and modernization of existing water infrastructure. The projects include restoration, maintenance, or modernization of significant agricultural water supply infrastructure; enlargements of existing canals and reservoirs; improvement of existing canal delivery efficiency; removal of reservoir sediment; modification of reservoir outlet works; rehabilitation of an existing dam; development of water supplies for augmentation, irrigation, hydropower, and instream flow enhancement; and strategic basin system improvements for improved crop yields, reduced operational inputs, improved water quality, and system reliability; improvements to conveyance, automation, and measurement infrastructure for an existing reservoir; and reconstruction of a tunnel and ditch piping.

Goal 9: Create and maintain active, relevant and comprehensive public education, outreach and

stewardship processes involving water resources in the six sectors of the Gunnison Basin – One sponsored project is expected to help fulfill this goal with the intent to encourage participation in water education and leadership programs. The project includes community outreach and conservation planning to enable communities to reduce municipal and industrial water consumption.

Section 5: Basin Recommendations

Each project proposed for the Gunnison Basin requires a unique and systematic plan for implementation that includes discrete steps to maneuver the project from conception to completion. These implementation strategies typically involve two primary categories of action prior to completion of the project: *securing project acceptance* and *demonstrating project feasibility*. Each step in the project implementation process includes various challenges (constraints), or potential key issues or circumstances that may limit the ability of a project proponent to implement the proposed project. For each constraint, there exists a corresponding strategy to successfully complete the project. Table 9 summarizes strategies to overcome constraints related to securing project acceptance and demonstrating project feasibility to allow implementation of projects proposed for the Gunnison Basin. More detailed recommendations for each of these strategies is included in Section 5.

Table 9. Project Constraints and Implementation Strategies

Category	Constraint	Strategies
Project Acceptance	Conflict	Partnerships Cooperative Strategies
	Perception	Public Education and Outreach Incentive-Based Programs
	Regulations	Cooperative Strategies Regulatory Streamlining
Project Feasibility	Cost	Creative Funding Mechanisms Partnerships and Cooperative Strategies
	Water Availability	Water Availability Analyses Water Administration Strategies
	Constructability	Feasibility Analyses Engineering Design



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

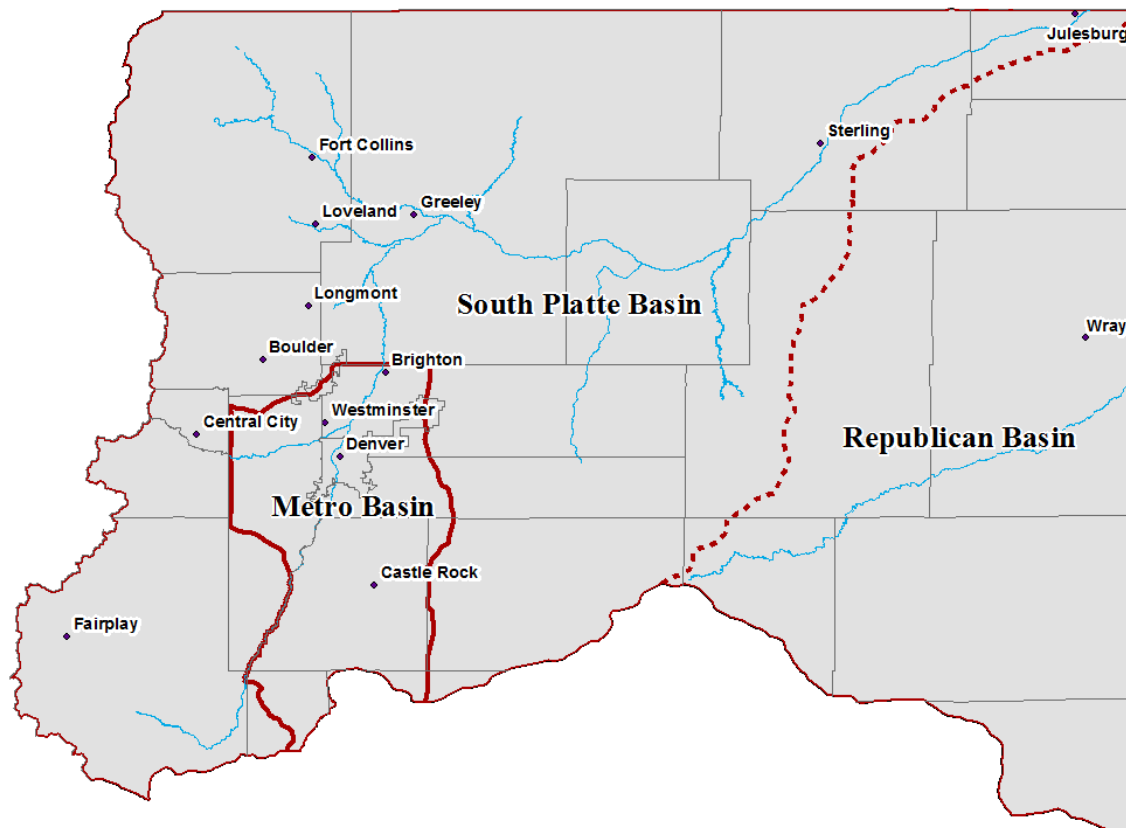


Figure ES-2. The South Platte Basin

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 PRRIP, 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.

Executive Summary

Objectives

This report is designed to follow the framework of the Basin Implementation Plan Guidance (December 10, 2013) provided by the Colorado Water Conservation Board. Application of the guidance to local issues in the North Platte Basin and preparation of the report was overseen by the North Platte Basin Roundtable. To improve consistency, coherence, and relevance to local issues some sections of the plan were restructured as appropriate. According to the Guidance:

“The purpose of the Basin Implementation Plans is for each basin [roundtable] to identify projects and methods to meet basin-specific municipal, industrial, agricultural, environmental, and recreational needs. The Basin Implementation Plans will inform and help drive Colorado’s Water Plan.”

The North Platte Basin Roundtable (NPBRT) is pleased to submit this Basin Implementation Plan for inclusion into the Colorado Water Plan process. The projects identified in this report meet a variety of important needs in the basin. Every effort was made to recognize the most appropriate goals, projects, and strategies to address the priorities of the roundtable. The NPBRT put forth their best efforts to comprehensively address water needs in the basin however, given the accelerated deadline and resource constraints, this report does not adequately identify all projects and issues in the basin. It is also important to note that due to the inherent tradeoffs surrounding water use in Colorado, all priorities and projects documented in this report are not equally and unanimously supported by all members of the roundtable.

Overview

The North Platte Basin Implementation Plan (NPBIP) was created by the North Platte Basin Roundtable (NPBRT) for submittal to the Colorado Water Conservation Board (CWCB). It is designed to support regional water planning through the roundtable process established by the Colorado Water for the 21st Century Act. The NPBIP builds on previous roundtable work to propose and fund projects for meeting water needs. The NPBIP also provides critical grassroots input to the forthcoming Colorado Water Plan (CWP).

To encourage locally-driven and balanced solutions to water supply challenges, the plan identifies water projects through targeted analyses of water issues in the basin. The NPBIP includes analyses of water shortages, water availability under variable hydrologic conditions, opportunities for improving environmental and recreational attributes in the basin, and various site-specific water supply issues. The ultimate purpose of the plan is to better identify water priorities in the basin and highlight planned projects that will excel at meeting these priorities in the near future.

The NPBIP process continues the important public education, participation, and outreach work that the NPBRT has been engaged with for almost ten years. The creation of the NPBIP included targeted

technical outreach to refine information on water needs and projects. It also included public outreach to gather input on key elements of the report and related aspects of operational protocols for the Colorado Division of Water Resources, described in Section 4. The NPBRT's ongoing outreach and education efforts will be critical throughout the development of the CWP.

Report Structure

The structure of this document generally follows CWCB BIP guidelines with some modifications to better address local issues, streamline the report, and focus on planned projects.

- **Introduction:** summarizes the current planning process, related outreach, major basin issues, and available information.
- **Section 1:** defines basin goals and corresponding targets or measurable outcomes.
- **Section 2:** summarizes water supply needs in the basin.
- **Section 3:** describes options to analyze projects and case studies.
- **Section 4:** identifies proposed projects, related constraints, and strategies for implementation.
- **Section 5:** summarizes conclusions and recommendations.

Section 1: Basin Goals

The NPBRT identified eight Basin Goals to establish priorities for water development and maintain important historical water uses in the North Platte Basin. Each goal is paired with Measurable Outcomes and a process for their achievement to provide a more concrete measurement of success.

North Platte Basin Goals

1. Maintain and maximize the consumptive use of water permitted in the Equitable Apportionment Decree and the baseline depletion allowance of the Three State Agreement.
2. Increase economic development and diversification through strategic water use and development.
3. Continue to restore, maintain, and modernize critical water infrastructure to preserve current uses and increase efficiencies.
4. Maintain healthy rivers and wetlands through the strategic implementation of projects that meet prioritized nonconsumptive needs.
5. Describe and quantify the nonconsumptive benefits of agricultural use.
6. Promote water rights protection and management through improved streamflow gaging data.
7. Enhance forest health and management efforts for wildfire protection and beetle kill impacts to watershed health.
8. Support the equitable statewide application of municipal water conservation.

Section 2: Basin Needs

The NPBRT identified water needs by summarizing corresponding information from existing relevant sources and updates secured through targeted technical outreach.

- **Agriculture:** Agricultural shortages are significant even in years with above average annual streamflow, and are more than 60 percent in drought years. Average annual agricultural shortages are currently 89,000 AF and projected to be 110,000 AF by 2050. Interviews with agricultural water users during outreach meetings and NPBRT meetings highlighted issues with aging or non-functional infrastructure, resulting in historically irrigated acreage that has not been irrigated in several years. Feedback also highlighted concerns over the amount of acreage currently irrigated and potential long-term implications of irrigating less than the maximum acreage allowed under the Equitable Apportionment Decree.
- **Municipal and Industrial:** The North Platte Basin has addressed its municipal needs through the Walden Water Supply Improvement Project. The very small amount of ongoing and future industrial needs in the basin are met with available supplies and accounted for by JCWCD through the Three States Agreement.
- **Environmental and Recreational:** Environmental and Recreational needs are summarized and targeted through a weighted focus map based on the NPBRT's prioritization of attributes. This map uses the relative priority and concentration of environmental and recreational attributes to create a heat map that better indicates the concentration and relative importance of attributes per roundtable consensus. This map will be used in conjunction with an understanding of the individual environmental and recreational attributes to help target projects to address identified attributes in the basin, including both multi-purpose projects as well as specific environmental and recreational projects. The resulting map is detailed in Figure 12.

Section 3: Basin Evaluations

The NPBRT used the North Platte River Basin Water Resources Allocation Model, case studies, and mapping overlays to evaluate projects and project constraints. Modeling tools allowed for the evaluation of water availability to individual projects based on variable hydrology, water rights, and operations (e.g. proposed diversions, reservoirs, and management strategies). The modeling tools helped to evaluate three case studies to investigate basin-wide issues and opportunities with specific projects (i.e. irrigated acreage analysis, legally available flow, and an analysis of agricultural impacts on streamflows). Mapping overlays of project data and basin needs were used to provide a consistent methodology to review potential projects, highlight options for multi-use projects, and identify projects that may compete for available water. Section 3 of this report provides details on how these evaluations were conducted.

Section 4: Basin Projects

Projects are the primary focus of the NPBIP and the mechanism for addressing Basin Goals established in Section 1 of this report. This section summarizes projects that are highlighted for potential implementation, based on information presented in Section 4 of this report. Developed in close coordination with the NPBRT, the list of proposed projects is considered a current ‘snapshot’ of potential basin solutions that is expected to be continually refined by project sponsors. To strategically focus implementation these projects were determined to be the most effective at meeting basin goals and most likely to be feasible in the near future. Projects and the corresponding Basin Goals that they are designed to address are summarized in the following table.

Relationships between Basin Goals and Proposed Basin Projects

Project	Basin Goal							
	1	2	3	4	5	6	7	8
MacFarlane Reservoir	x		x	x	x			
Evapotranspiration Project	x							
Walden Reservoir	x	x	x					
Basinwide Augmentation Plan	x	x						
Hanson and Wattenberg Ditch Acreage	x		x					
Proposed Streamgage Installation	x					x		
Storage Protocol	x							
Irrigation Season Protocol	x							
Irrigated Acreage Assessment Protocol	x							
Proposed Willow Creek Reservoir	x		x					
Dam Ditch Headgate Improvement	x		x	x				
Canal Maintenance and Improvements	x		x	x	x			
Instream Diversion Structure Identification	x		x	x	x			
Verner State Wildlife Area – North Platte River Restoration		x		x				

Section 5: Recommendations

Each project proposed for the North Platte Basin requires a unique and systematic plan for implementation that includes discrete steps to maneuver the project from conception to completion. These ‘implementation strategies’ typically involve two primary categories of action prior to completion of the project: *securing project acceptance* and *demonstrating project feasibility*. Each step in the project implementation process includes various challenges (constraints), or potential key issues or circumstances that may limit the ability of a project proponent to implement the proposed project. For each constraint, there exists a corresponding strategy to successfully complete the project. The following table summarizes strategies to overcome constraints related to securing project acceptance and demonstrating project feasibility to allow implementation of projects proposed for the North Platte Basin. More detailed recommendations for each of these strategies is included in Section 5.

Project Constraints and Implementation Strategies

Category	Constraint	Strategies
Project Acceptance	Conflict	Partnerships Cooperative Strategies
	Perception	Public Education and Outreach Incentive-Based Programs
	Regulations	Cooperative Strategies Regulatory Streamlining
Project Feasibility	Cost	Creative Funding Mechanisms Partnerships and Cooperative Strategies
	Water Availability	Water Availability Analyses Water Administration Strategies
	Constructability	Feasibility Analyses Engineering Design



Rio Grande Basin Water Plan

Prepared for:

THE RIO GRANDE
BASIN ROUNDTABLE

For submittal to:

THE COLORADO WATER
CONSERVATION BOARD

Draft – July 31, 2014

**Rio Grande Basin
did not provide an
Executive Summary**

Executive Summary

The Southwest Basin Roundtable (Roundtable) is unique for the complexity of hydrography, political entities, water compacts and treaties, and distinct communities that it encompasses. The Roundtable provides a forum for water discussions pertaining to nine distinct sub-basins, including the San Juan River, the Piedra, the Pine, the Animas (including the Florida River), the La Plata, the Mancos, McElmo Creek, the Dolores and the San Miguel, eight of which flow out of Colorado.

Many communities, agricultural producers, and natural systems depend on the water produced by these sub-basins. The Southwest Basin is home to the Southern Ute Indian Tribe and the Ute Mountain Ute Indian Tribe, the only two Indian Reservations in Colorado. Neighboring these tribal lands are 10 counties including Archuleta, La Plata, San Juan, Montezuma, Dolores, San Miguel and portions of Mineral, Hinsdale, Montrose, and Mesa. These tribal areas and counties represent distinct communities and landscapes, with their own specific and unique social, economic and environmental values, challenges and opportunities.

The Southwest Basin is a region of diverse natural systems, agricultural heritage, outstanding beauty, and extensive recreational opportunities. The area supports many water-dependent species of wildlife, including warm and cold water fish species addressed by three different multi-state conservation agreements, and four terrestrial species that are currently listed under the Endangered Species Act. Many towns within the area rely heavily on tourism and the recreational industry as a primary economic driver. Agriculture and the open spaces it maintains contribute to the culture, economy and quality of life of the Southwest Basin. Municipal and industrial activities round out the economic and social values and help support the diverse and vibrant communities of the region.

The Roundtable has developed this Basin Implementation Plan based on the best available information and current conditions at this time. The Roundtable plans to employ and maintain the Plan as a living document to be reviewed and updated periodically as conditions evolve. The Roundtable takes a balanced and cooperative approach to include and address all water supply needs. While acknowledging that they sometimes represent competing demands and conflicting interests, the roundtable treats agricultural, municipal, industrial, environmental and recreational needs equally, and is always open to new projects and processes that can help address the Basin's goals.

Through its consensus-based discussions, the Roundtable has developed agreement around several salient aspects of both Basin-wide and state-wide water supply.

Highlights of these agreements include conditions under which the Basin can consider a new trans-mountain diversion project, goals for statewide municipal water conservation measures, and the Basin's outstanding data needs.

The Roundtable is concerned about any new transmountain diversion (TMD). A new TMD would increase the risk of a Colorado River Compact call, as well as the risk of contingency measures to address serious conditions such as the inability to generate power from Lake Powell or levels of Lake Mead dropping below Las Vegas's intake. An increase in such risks jeopardizes the Southwest Basin's ability to develop water supplies to meet needs in the Southwest Basin and puts additional pressure on the Basin's agriculture to meet downstream water needs for compact compliance and/or obligations. Therefore, the Roundtable agrees on seven factors to be addressed prior to considering a new TMD.

The Roundtable supports the idea that on a statewide basis we all need to be more efficient with our water use and achieve high conservation. Recognizing that municipal demand is one of the driving forces behind agricultural dry-up and that outdoor urban irrigation is one of the highest consumptive uses of municipal water, therefore, the Basin agrees that before it will consider a new TMD, outdoor irrigation by water providers using agricultural buy – up and dry-up and/or pursuing a TMD should meet the higher goal of 70/30 ratio of inside to outside use of municipal water by the year 2030.

In Colorado, the authority to establish water policies of the state, determine the beneficial uses of the water resources, and the administration of water rights pursuant to the Doctrine of Prior Appropriation fall under the jurisdiction of state government. It is recognized that there is a significant amount of land administered by the federal government in Colorado, which creates the potential for conflicts between state and federal laws and policies. Federal policies and actions could affect existing and future water supplies and planning efforts in southwestern Colorado.

Therefore, the Roundtable encourages and supports creative solutions sought through collaborative efforts, renewal of State-Federal MOUs, and the full recognition and use of tribal rights under the Colorado Ute Indian Water Rights Settlement to limit conflicts between state, tribal and federal policies, laws, and land management plans. Maintaining opportunities that allow for management solutions that provide for multiple beneficial uses and are protective of environmental and recreational values are critical for the planning and strategic development of the water resources in the State of Colorado.

With respect to the Southwest Basin's Environmental and Recreational values and water needs, the Roundtable recognizes that there are significant gaps in the data and understanding regarding the flows and other conditions necessary to sustain these values. The Roundtable also recognizes that the tools currently available to help maintain those conditions are limited. The Roundtable has identified two methods that it hopes can help address and bridge this need for additional information and tools. These are:

1. Evaluation of environmental and or recreation gaps is planned to be conducted for improvement of non-consumptive resources and/or in collaborative efforts with development of consumptive IPPs. The evaluations may be conducted by a subgroup of the Roundtable or by individuals, groups, or organizations with input from the Roundtable. The evaluation may utilize methodologies such as the southwest attribute map, flow evaluation tool, R2 Cross, and any other tools that may be available.
2. Where environmental and/or recreational gaps are identified, a collaborative effort will be initiated to develop innovative tools to protect water identified as necessary to address these gaps.

The Roundtable has adopted 21 goals and 30 measureable outcomes to meet identified gaps and water supply needs. Since SWSI 2010, the Roundtable success rate for completing IPPs is 44%. A total of 55 projects were completed since the drafting of the SWSI 2010 list. Through the BIP outreach process 75 new projects were added to the list. The list totals about 130 IPPs for all sub-basins. Of these 130, about 50% of the IPPs are for needs such as agricultural, municipal and industrial while the remaining 50% of the IPPs are for environmental and recreational needs.

To date, the Roundtable has granted \$1,791,361 from the Southwest Basin account and \$5,160,359 from the statewide account.

EXECUTIVE SUMMARY

Background

The Basin Implementation Plan, developed by the Yampa-White-Green Basin Roundtable, addresses key issues about the most important natural resource in the American West - water. These issues are discussed from a policy viewpoint; the complex issues of water law and environmental concerns will be addressed in greater detail as individual projects and processes are implemented to meet the objectives outlined in this document. In this Basin Implementation Plan, the Basin Roundtable addresses the role of the Yampa and White rivers in meeting Colorado's obligations within the Colorado River Basin as a whole; the need to retain an equitable share of local water resources for existing uses and future development; the need to conserve the natural hydrology for environmental and recreational use; the need for appropriately located, sized, and operated projects to protect important water uses and the environment-particularly during drought; and finally coordinate these issues with the Yampa-White-Green Basin Roundtable process.

The Yampa-White-Green Basin Implementation Plan was created by the Yampa-White-Green Basin Roundtable to reflect the Basin's goals in the State's water planning process and to satisfy the requirements that the Colorado Water Conservation Board set forth in the Guidance documents for the Basin Implementation Plans. Basin implementation Plans are designed to bring regional water planning to the next level in each of Colorado's nine basins. The Yampa-White-Green Basin Implementation Plan builds on work of the Basin Roundtable to fulfill the legislative mandate of HB05-1177 to propose projects or methods, both structural and nonstructural, for meeting the Basins' needs and utilizing unappropriated waters where appropriate. In addition, the Basin Implementation Plans serve as critical grassroots input to the forthcoming Colorado Water Plan commissioned on May 14th, 2013 by Governor Hickenlooper's executive order D2013-005.

The Yampa-White-Green River Basin has an excellent opportunity to achieve the vision of the Governor's Executive Order to balance future in-basin consumptive, recreational and environmental needs while continuing its historical role as a major contributor of flows to fulfill Colorado's and the Upper Basin States' obligations under the Colorado River Compact. This Basin Implementation Plan includes a needs assessment on where and how water will be used and desired for both consumptive uses, such as for agriculture, municipal use and industrial uses, as well as for environmental and recreational uses, which are non-consumptive uses of water. The following chapters represent the outcome of considerable dialogue on the complexities of water allocation and the potential it has to solve problems, both economic and environmental. In particular, much consideration is given to the importance of the Yampa, White and Green Rivers and the communities they serve while understanding the needs of others. Much effort was made to prioritize and balance local concerns and needs in the face of a looming gap for Colorado and the entire American West. Years of dedication by the volunteer Yampa-White-Green Basin Roundtable members - who represent every constituency in the community- have been devoted to ensuring our most important resource is properly managed for future generations.

Basin Facts, Needs and Vision

While the hope is that this Basin Implementation Plan will provide the foundation for future policies, processes and projects that can be followed and implemented to maintain and enhance the waters of the region, it in no way should be interpreted as an end point; rather it serves as a new beginning. A great amount of additional effort and dedication will be required to continue this work. The Basin Roundtable process offers local communities the ability to have a strong voice in how this important resource will be managed now and in the future. This unique democratic relationship does not exist in other states, where different and sometimes locally alienating processes can dominate. Recreational environmental, agricultural, municipal and industrial interests have come to consensus on goals and measurable outcomes that can represent individual and collective needs through the process of this Basin Implementation Plan.

The Yampa-White-Green Basin Roundtable recognizes that almost any water supply, whether or not it is categorized as an Identified Project and Process, will involve complex and nuanced tradeoffs. Each project will present its own specific set of opportunities and constraints, and what is a constraint for one project might be an opportunity for another. Consequently, at this time, the Yampa-White-Green Basin Roundtable believes it is not possible to develop a comprehensive list of opportunities and constraints. Instead, this Basin Implementation Plan sets out planning "considerations" that will serve to guide the future development and evaluation of water supply and resource projects.



The Yampa-White-Green drainages are relatively undeveloped and have limited existing storage compared to other basins in the State of Colorado. The majority of the existing storage is for industrial and municipal use, although there are some agricultural storage supplies particularly in the Upper Yampa Valley. Recreation is an ancillary benefit of many of the existing storage projects. Supplies on smaller tributary streams where no storage exists are typically inadequate in the late season.

Administration has only occurred on the mainstem of the Yampa and White Rivers under special circumstances, such as protecting reservoir releases in dry conditions. This historical lack of administration is not due solely to the relatively lesser development on these basins, but is a result of a culture of a willingness to share shortages voluntarily and the existence of an undeveloped diversion infrastructure.

Constraints on water development and water management to protect habitat for endangered species are in place in the Green and Yampa River Basins, and similar constraints are being contemplated for the White River Basin. Consequently, this Basin Implementation Plan addresses how the Basin's water needs must be developed in ways that provide collaborative solutions to water supply challenges while maintaining a balanced and diverse economic base long into the future.

How the Yampa-White-Green Basin fits into obligations for water supplies both in and out of the state is an extremely important concern. Interstate compacts require that some of the water originating in the Colorado River Basin flows to downstream States; some water is diverted out of the Colorado River Basin for use in the Front Range urban corridor and eastern plains; and some is used locally. Therefore, the Yampa and White Rivers, as part of Colorado River Basin, are caught between the needs of the downstream States, the needs of the east slope of Colorado, and their own needs. Since there are compact demands downstream to the west and out-of-basin needs to the east, the Yampa-White-Green Basin Roundtable must take a position on each.

The Yampa-White-Green Basin Roundtable recognizes that the overdevelopment of limited Colorado River system water is a serious risk that would impact all users of Colorado River Basin water. Thus, before it could be considered by the Yampa-White-Green Basin Roundtable, any proposed trans-mountain diversion out of the Colorado River Basin must undergo a full operational analysis to determine its impact on the entire river system. The analysis must recognize that, within the Colorado River system, the diversion of any "extra" water available during wet years may occur under certain "trigger" conditions of a full (or nearly full) supply in reservoirs designed to carry the Colorado River Basin through a drought. This analysis must be sufficient to determine that the risks of operating project(s) in a junior manner to identified Colorado River Basin needs are understood by all. Such a project should not be funded by the State of Colorado, but by interests, public and/or private, willing to accept such operational and financial risk. Prior to undertaking development of a new trans-mountain diversion, the Front Range must first integrate all other water supply solutions including conservation, reuse, and maximize use of its own native water resources and existing trans-mountain supplies.

With respect to downstream flows, the Yampa-White-Green Basin Roundtable recognizes that the Yampa and White Rivers play a significant role in providing water for compliance with the State of Colorado's downstream obligations, and that this must be recognized in the Colorado Water Plan. The Yampa-White-Green Basin Roundtable also thinks that negotiated equitable apportionment among Colorado River tributary basins must be included in the Interbasin Compact Committee's agreements and in the Colorado Water Plan, as it was in previous interstate agreements, and envisioned by the HB05-1177 process.

The Yampa-White-Green Roundtable seeks through its Basin Implementation Plan to make certain that existing consumptive, environmental and recreational uses are met, even during anticipated drought periods. This includes drought periods that are in the reconstructed paleo-hydrologic record and might be exacerbated by temperature increases. Additionally, the Yampa-White-Green Basin will also have to accommodate new water uses. While population growth will drive additional municipal needs and additional irrigated agricultural areas have been identified in State-funded studies, the energy sector has the potential to have the greatest additional consumptive water demands in the Yampa-White-Green Basin. Further, traditional uses, particularly agriculture and recreation, could be hindered if large extractive industries emerge to utilize the vast untapped fossil resources in the region. Endangered species, riparian plant communities, sport fisheries, rafting, and ecological integrity are important non-consumptive needs, and these uses



are expected to expand. The Yampa-White-Green Basin's average consumptive use demand may reach approximately 361,000 acre-feet¹ per year by the year 2050 under a dry hydrology scenario.

The Yampa-White-Green Basin Roundtable identified eight primary basin goals to address the Yampa-White-Green Basin's needs.

- Protect existing decreed and anticipated future water uses in the Yampa-White-Green Basin.
- Protect and encourage agricultural uses of water in the Yampa-White-Green Basin within the context of private property rights
- Improve agricultural water supplies to increase irrigated land and reduce shortages
- Identify and address Municipal and Industrial water shortages
- Quantify and protect non-consumptive water uses
- Maintain and consider the existing natural range of water quality that is necessary for current and anticipated water uses.
- Restore, maintain, and modernize water storage and distribution infrastructure
- Develop an integrated system of water use, storage, administration and delivery to reduce water shortages and meet environmental and recreational needs

The Yampa-White-Green Basin goals ultimately seek to promote a healthy and diversified economy long into the future. The principal objective underlying all of the goals is the maintenance and protection of historical water use in the basin as well as the protection of water supplies for future in-basin demands. By maintaining historical water use, the people of the Yampa-White-Green Basin will continue to use the basin's natural resources sustainably and will consequently maintain a balanced and diverse economic base.

Accordingly, the Colorado Water Plan must address how a Colorado River compact curtailment or any other administrative action causing curtailment would be applied, and must recognize the negotiated equitable apportionment to the Yampa-White-Green Basin for existing and future development as mentioned above. The Yampa-White-Green Basin will not consider a new trans-mountain diversion until and unless a satisfactory Intrastate Compact and negotiated equitable apportionment of Colorado River supplies is achieved. The Yampa-White-Green Basin Roundtable will continue its willingness to discuss the preservation of flows that deliver needed water to downstream obligations and can also meet environmental and recreational needs of the Yampa-White-Green Basin, but also stresses the importance of assuring non-curtailment of its existing water use and protecting water for future uses in state-wide discussions.

Much of the information in this Basin Implementation Plan about water needs and projects and methods information was developed through a series of Statewide Water Supply Initiative and Basin-wide studies, particularly the 2014 Project and Methods Study. The 2014 Project and Methods Study is the most recent state-funded study that was largely used to inform this Basin Implementation Plan.

Several Identified Projects and Processes were developed with input from the Basin Roundtable and other stakeholders, taking into consideration information from previously completed studies and the considerations laid out in the preceding paragraphs. The Identified Projects and Processes are dynamic lists reflective of the incomplete current planning process. These lists will continue to be updated with new Projects and Processes as the Yampa-White-Green Basin continues to refine its water needs and its overall understanding of the river operations through its Projects and Processes modeling. Examples of the Projects and Processes that have been identified and included in this Basin Implementation Plan are Elkhead Reservoir Enlargement, Lake Avery Enlargement, Morrison Creek Reservoir, Upper Elkhead Creek Stream Restoration, and assessment of flow regime for endangered fish recovery in the White River from Rio Blanco Lake to Colorado state line.

This Basin Implementation Plan is an ongoing process and this document represents a single preliminary analysis. Water supply planning is dynamic, and the Yampa-White-Green Basin Roundtable will continue working towards balanced future needs of the region. Integrating important considerations such as addressing certainty of existing uses, enabling modest future growth and retaining important recreational and environmental values will continue to be guideposts of the Yampa-White-Green Basin Roundtable. These core ideas will be considered throughout the process, as projects and methods are developed and implemented to ensure reliable water supplies for the region now and into the future.

¹ Projects and Methods StateMod Model, 2014



Next Steps

The Yampa-White-Green Basin Roundtable will continue its efforts in developing the Basin Implementation Plan after July 31, 2014. Specifically, additional effort will occur to refine the Colorado Decision Support Systems' modeling to provide more detailed information regarding the operations of the full suite of current Identified Projects and Processes, and to identify opportunities for additional multi-use projects. It is possible that additional shortage areas will be identified after July 2014 through this follow-on modeling and/or during future updates to the Basin Implementation Plan. Discussions will therefore continue on how to best meet these shortages throughout the Yampa-White-Green Basin while referencing the goals and measurable outcomes identified herein. Information developed as a result of the additional modeling will be incorporated into future versions of the Yampa-White-Green Basin Implementation Plan as opportunities arise. An initial summary of next steps for the Yampa-White-Green Basin Roundtable associated with Basin Implementation Plan development and refinement are presented below.

- Refine the Projects and Methods Study Model and reevaluate scenarios to be addressed with future modeling.
- Add new Identified Projects and Processes to the model and re-assess the results.
- Look for opportunities for multi-purpose projects and operations of projects with willing proponents.
- Facilitate public engagement and education to help build consensus on the Identified Projects and Processes.

Basin Position

- Any development of a new trans-mountain diversion must provide the full analysis outlined in the Yampa-White-Green Basin's white paper and this Basin Implementation Plan. This analysis must be sufficient to determine that the risks of operating project(s) in a junior manner to identified Colorado River Basin needs are understood by all. Such a project should not be funded by the State of Colorado, but by interests, public and/or private, willing to accept such operational and financial risk.
- Prior to undertaking development of a new trans-mountain diversion, the Front Range must first integrate all other water supply solutions including conservation, reuse, and maximize use of its own native water resources and existing trans-mountain supplies.
- With respect to the Colorado River Compact, the Yampa-White-Green Basin Roundtable recognizes that the Yampa and White Rivers play a significant role in providing water for compliance with the State of Colorado's downstream agreements, and that this must be recognized in the Colorado Water Plan. The Yampa-White-Green Basin Roundtable also thinks that negotiated equitable apportionment among Colorado River tributary basins must be included in the Interbasin Compact Committee's agreements and in the Colorado Water Plan, as it was in previous interstate agreements, and envisioned by the HB05-1177 process.

