6.5 MUNICIPAL, INDUSTRIAL, AND AGRICULTURAL INFRASTRUCTURE PROJECTS AND METHODS

GOAL

Colorado's Water Plan encourages the use of grassroots efforts to identify and implement projects and methods to meet community and agricultural water needs throughout Colorado, and to achieve the following statewide long-term goals:

- **Use water efficiently to reduce overall future water needs.**
- **Establish a process to identify the projects and processes to meet the water supply gap for communities while balancing the needs of agriculture, the environment, and recreation across the state.**
- **Obtain the State's encouragement and assistance in the development of balanced and appropriate storage that can meet multiple benefits, including instream flow and augmentation needs.**
- **Meet community water needs during periods of drought.**
- **Develop and implement policies and strategies that support meaningful agricultural viability statewide.**

Colorado will require the implementation of many identified projects, storage, other infrastructure, and methods to meet future municipal, industrial, and agricultural needs. This section discusses the different types of projects that communities must implement to meet Colorado's growing needs, how the basin roundtables identified these projects and methods, and what is required to support those communities. This section also includes a discussion of the IBCC's adopted No-and-Low-Regrets Action Plan as it relates to the implementation of projects and methods, and a summary of ongoing initiatives relating to the viability of agriculture statewide. Colorado's water values name agricultural viability as a priority, and Colorado's Water Plan includes specific policies and strategies to advance this concept. It also addresses the role of storage in meeting Colorado's future supply needs.

Overview

The draft BIP process produced a compendium of projects and methods to meet Colorado's future water needs. These projects and methods are the foundation of this section. In developing their respective lists of projects and methods, the basin roundtables relied upon previously developed IPPs, conducted interviews with water providers, and solicited public input to update existing IPPs and identify additional projects and methods. For the purposes of Colorado's Water Plan, the term projects and methods refers to IPPs and additional efforts the BIPs featured to close the M&I gaps and reduce agricultural shortages.

The basin roundtables vetted these proposed projects and methods in order to develop a draft list for their respective BIPs. Some roundtables vetted the preliminary list through the entire roundtable, while others reviewed projects and methods using subcommittees. In the end, each roundtable reviewed or adopted the draft BIPs. In addition, many roundtables tiered or prioritized their projects and methods to assist with future implementation.

The goal of developing lists of projects and methods is to meet Colorado's future water needs. In addition, this work will help calculate the remaining M&I water supply and demand gaps, determine residual agricultural shortages, estimate the costs of implementing the proposed projects and methods, identify the potential for intrabasin and interbasin

collaboration on proposed projects and methods, and identify the interrelationships and the potential for collaboration between consumptive and nonconsumptive projects and methods.

The basin roundtables proposed a great number of projects and methods beyond those identified in SWSI 2010. Although they primarily designated some of the proposed projects and methods as single-purpose, many are multipurpose. The multipurpose projects could benefit agricultural M&I interests. Alternatively, these projects could benefit the environment or expand recreational opportunities while meeting municipal or agricultural needs. Those projects and methods that intentionally target consumptive and nonconsumptive benefits are categorized as *multipurpose*.

The basin roundtables' projects and methods aim to close the M&I gaps or reduce agricultural shortages—or both. They may require financial expenditures, and while many roundtables included implementation cost estimates, some did not. Proposing a project or method and developing cost estimates and financing mechanisms are two components of implementation. Roundtables have many well-developed proposed projects and methods that are currently in the permitting stages; however, some projects and methods are conceptual in nature, with uncertain or no stated cost estimates. The validity of cost estimates varies greatly across proposed projects and methods and across BIPs. With that caveat, individual project and method implementation costs range from $50,000 to $211 million.

It should also be noted that some proposed projects or methods are multi-year efforts and consist of a wide array of implementation strategies and approaches. Cost estimates to implement the proposed projects and methods range from $500,000 to $486 million per BIP, with a statewide preliminary total of approximately $2 billion. Many roundtables have not yet determined costs for their projects, and most have not done so on a consistent basis. Therefore, this number represents a minimum financial need.

Roundtables must also take into consideration their estimated yield for the identified projects and methods. Estimated yield affects the calculated M&I gaps and agricultural shortages, and is subject to some variability and further refinement by basin roundtables, as well as variability in project permitting and financing. That said, the estimated yield of the proposed projects and methods by BIP ranges from 6,030 acre-feet per year of new supply to 321,316 acre-feet per year. Similarly, the range of yield reflects the level of participation of project sponsors and project beneficiaries. Some projects and methods have multiple sponsors, ranging in size from small, localized water providers, to regional water providers such as conservancy and conservation districts or cities. Furthermore, while a single entity may sponsor some projects, there may be many associated beneficiaries; in other cases, a single entity may sponsor a proposed project or method, with only one beneficiary. The roundtables propose many combinations of project sponsors and project beneficiaries, reflecting the collaborative nature of the BIP process and the anticipated results. This section conducts a more in-depth examination of each BIP, and discusses the IBCC's No-and-Low-Regrets Action Plan and actions.

New and Emerging Water Supply Projects and Methods

As the State of Colorado and the basin roundtables move toward implementing BIPs and Colorado's Water Plan, they will need innovative and creative solutions to meet future demands, given the availability of funding and the nature of limited water resources. There is no perfect solution, but a range of emerging trends add to the suite of options that the State and the basins can implement.

Aquifer Recharge

Aquifer recharge, also referred to as artificial recharge, is the process of infiltrating water to an aquifer through ponds, basins, canals, or wells.[324] Artificial recharge to the alluvial aquifer is most commonly used in Colorado for augmentation of stream depletions because of well pumping. Most of these alluvial recharge projects for augmentation occur in the South Platte Basin, outside of the designated groundwater basins.[325] Permanent artificial recharge projects outside of the designated basins must ultimately receive a decree through water court, and must operate within the confines of Colorado's prior appropriation system. Additionally, a protocol for alluvial recharge within the South Platte Basin is available.[326]

ASR

Aquifer storage and recharge (ASR) uses aquifer recharge or injection to achieve water storage in the aquifer during times of low demand and high water supply, and it later recovers the water by pumping when demand exceeds surface supply.[327] In an alluvial aquifer, recharge for ASR occurs when water is allowed to seep into underlying aquifer. For confined aquifers, ASR uses wells to inject the water at pressures greater than what exists in the aquifer. Several water providers have used Colorado's Denver Basin Bedrock aquifers for the storage of water over the past several decades. The Denver Basin aquifers are confined bedrock aquifers, and they are not considered tributary to the stream system. The water in these aquifers is appropriated under a separate legal framework based on overlying land ownership. Additionally, specific rules govern ASR projects utilizing these Denver Basin aquifers. Although the majority of ASR projects use the Denver Basin aquifers, two ongoing ASR projects in Colorado involve the use of alluvial aquifers. These are Aurora's Prairie Waters project in the South Platte basin, and Cherokee Metropolitan District's aquifer replacement plan in the Upper Black Squirrel Basin.

Collaborative Management Solutions

These sort of projects and methods frequently cross basin boundaries, and comprise multiple parties working together to achieve often-disparate goals. Section 9.2 highlights several solutions in which entities representing many uses come together for creative water management. Examples include the CRCA, the Arkansas River Voluntary Flow Agreement, and the WISE Partnership. In these solutions, creative collaboration and the involvement of many stakeholders throughout the entire agreement process meet a host of different needs.

ATMs

For much of Colorado's water history, the agricultural water user has been faced with two options: continue operations as normal, or sell water rights to an interested party—often a municipality seeking to firm-up supply. Seeking potential alternatives to agricultural transfer, interested parties seek to provide a third option that falls within the boundaries of Colorado's prior appropriation system.

Though the CWCB and other stakeholders are still reviewing the viability of certain types of alternative transfers, ATMs should offer an avenue by which Colorado seeks to meet future needs, in contrast to the permanent "buy-and-dry" of agricultural lands. Section 6.4 discusses ATMs in more detail.

6.5.1 BIP Identified Municipal, Industrial, and Agricultural Infrastructure Projects and Methods

The types of projects and methods basins could potentially implement are as varied as the needs in each basin, as well as statewide needs. While projects and methods generally fall into two generic categories (structural and non-structural), this overview of the BIPs warrants a more specific categorization. These summaries will present tallies of projects by type and use, even though many projects may have multiple benefits.

SWSI 2010 identified several categories of IPPs, which have been consolidated into the following:

- Agricultural water transfers (including ATMs)
- Reuse of existing fully consumable supplies
- Growth into existing supplies
- In-basin projects
- New transbasin projects.[328]

The majority of projects the roundtables identified fall into the category of "In-Basin Projects." For the purposes of this summary, in-basin projects could align with the following descriptions:

- Collaborative Management
- Storage Improvements & Expansion
- New Storage
- Ditch & Diversion Improvements
- Monitoring, Assessment, and Planning Efforts
- Municipal Infrastructure
- Energy
- ASR
- Water Rights and Supply
- Multipurpose

This section examines each BIP's "primary message," which summarizes the prioritized projects and describes how the projects or methods align with basin goals and measurable outcomes. This section also describes the process each basin used to garner public input, which demonstrates how basins generated project lists. Finally, this section describes highlights of the projects and methods, and identifies the acre-feet of development and costs, when available.

In the basin summaries, material in the BIPs identifies project costs and associated, identified acre-feet. Each basin conducted outreach and assimilated and evaluated projects in a manner that is unique to the respective basin. As the basin roundtables further refine the BIPs and projects and methods move to implementation, they will better define project information, costs, and associated acre-feet.

Arkansas Basin

Primary message: The basin roundtable identified additional storage as a primary goal of the implementation plan. Roundtable members believe preservation of existing storage is critical to continuing to meet the basin's supply needs for all uses, along with development of new storage. New storage can include reoperation of existing structures in need of repair, along with underground storage (ASR). Additional methods the basin roundtable identified include ASR projects and alternatives to ATMs. Moving forward, the roundtable plans to focus efforts on a disaggregation of the basin gaps to identify more localized needs at the county level. The roundtable will also take a closer look at identified projects and methods to prioritize available funding and resources. In project implementation, the roundtable identified compact compliance issues as a key challenge. The replacement of nonrenewable groundwater and sustainability of designated basins also represents a critical gap.[329]

ARKANSAS BASIN AT A GLANCE

120 projects identified on the IPP List that meet municipal, industrial, or agricultural needs

$344,700,000 in costs identified for **4** projects

166,500 acre-feet of development identified for **17** projects

Process: The roundtable reviewed the SWSI 2010 IPP list, and held 17 public outreach meetings at which stakeholders submitted more than 100 input forms.[330] These forms proposed projects, methods, and potential policy implementation. The roundtable will review and rank these input forms, and will invite some proponents to attend roundtable meetings and present the identified project, method, or suggestion. As part of the roundtable's organization of basin needs, projects, and methods, the group created a comprehensive database. The roundtable categorized projects that met a basin need as follows within the database:

- All Input List: all identified needs from all sources.
- Preliminary Needs List: filtered to remove complete or obsolete needs.
- Master Needs List: The provider of each need on the Preliminary Needs List was asked to identify a Solution and a Plan of Action to implement a solution for the identified need. All needs with a defined Solution and Plan of Action carried forward onto the Master Needs List. Projects on the Master Needs List were located by latitude and longitude for later mapping.
- IPP List: Needs on the Master Needs List were compared to the criteria for an IPP per the SWSI 2016 draft glossary. Needs on the Master Needs List that met the SWSI 2016 IPP criteria are included in the IPP List.

While projects and methods included in the "All Input List" may include obsolete or completed projects, the IPP list is designed to meet SWSI criteria for an IPP.

Projects and methods summary: The roundtable identified a total of 120 projects and methods on the IPP List that meet municipal, industrial, or agricultural needs.[331] Of these projects, 17 identify acre-feet, totaling 166,500 acre-feet of development.

Colorado Basin

Primary message: The Colorado Basin Roundtable is focused on completing a basin-wide stream management plan. The plan will contain more in-depth analysis and understanding of the amounts of water necessary to maintain environmental and recreational attributes. The roundtable expressed concern about uncertainty regarding current water supplies' capacity to meet in-basin consumptive use, as well as environmental and recreational needs, for future projects and methods. The basin emphasized the need for more in-depth studies and work about the effects of climate change on water supplies, and the variability of wet and dry years. The roundtable stated: "The most prudent planning approach… is to assume that there is no more water to develop for export from the Colorado Basin."[332] The extensive public outreach the basin undertook resulted in a comprehensive list of potential identified projects and methods. This list comprises a suite of options the basin can pursue to meet its future needs.

COLORADO BASIN AT A GLANCE

31 projects identified as Top Projects that meet municipal, industrial, or agricultural needs

$500,000 - $152,500,000 in costs identified for **13** projects

24,082 acre-feet of development identified for **3 top** projects

Process: The roundtable members divided into Project Leadership Teams (PLTs), which focused on particular subject matter areas within the BIP. The consumptive PLT worked to identify projects within the basin that would meet future water supply needs. The PLT interviewed water providers, either in-person or through a standardized questionnaire, throughout the basin. These information-gathering efforts focused on existing and forecasted supply, as well as on projects and methods to meet demands. The PLT also analyzed existing studies and reports for planned projects. The basin held town hall meetings, and roundtable members and consultants traveled to many meetings, including county commission and city council meetings, to gather information. Roundtable members took a closer look at the list of projects and methods,

and then identified representative projects in each basin sub-region that met basin themes and sub-region goals. These projects were designated as "Top Projects" and represent important needs at both the basin-wide and sub-region levels.

Projects and methods summary: The roundtable identified a total of five basin-wide Top Projects and methods,[333] and 26 Top Projects by sub-region. It identified all 26 sub-region projects as multipurpose. Beyond the identified Top Projects, the BIP Exhibits lists additional projects and methods the public-input and targeted technical-outreach process generated.

Basin Top Projects were evaluated by basin goals:

- 21 Top Projects were identified that meet the basin goal of "Sustain Agriculture."
- 23 Top Projects were identified that meet the basin goal of "Secure Safe Drinking Water."[334]

Future basin efforts will focus on implementation of identified projects and methods. Modeling efforts are underway to further understand potential constraints and opportunities within the river system.

Gunnison Basin

Primary message: The primary goal of the Gunnison Basin is to "Protect existing uses in the Gunnison Basin."[335] With that overarching goal in mind, the basin is pursuing other goals that promote the continued importance of agriculture, the protection of environmental and recreational uses, and the maintenance of infrastructure within the basin. A primary focus is on agricultural shortages, and methods to address this need. The basin identifies and prioritizes projects and methods accordingly.

GUNNISON BASIN AT A GLANCE

49 projects identified on the Tier 1 list that meet municipal, industrial, or agricultural needs

$478,107,269 in costs identified for **33** projects

139,406 acre-feet of development identified for **21** projects

The roundtable quantified M&I needs, which it currently expects the basin to meet using currently existing supplies and implementing currently planned projects and methods. The roundtable modeled projects and potential constraints to evaluate the potential effects of project or method implementation on supply and water rights. This modeling effort provided a cursory feasibility analysis for projects at a basin-wide scale, taking into account water availability, irrigation decrees, agricultural effects on streamflows, and instream flows. The roundtable evaluated and divided into tiers the projects and methods the basin identified.

Process: Working with water management agencies and stakeholders to identify projects and methods intended to meet future basin needs, the roundtable members and consultants conducted a series of targeted technical outreach meetings throughout the basin. They created a list of current projects intended to represent the state of water planning at the time of BIP publication. The outreach process identified projects that the roundtable compared to the basin goals, and evaluated according to their timeline for completion. With these comparisons and evaluations in mind, the BIP committee approved three "tiers" of identified projects and methods:

- **Tier 1:** implementation likely feasible by 2025; project does excellent job of meeting Basin Goals.
- **Tier 2:** implementation likely not feasible by 2025; 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 2025; project in preliminary stages of planning and/or may meet Basin Goals to lesser degree.[336]

Modeling analyses also informed the tiering process, leading to the identification of projects and methods with multipurpose uses, and the selection of agricultural projects that most effectively address shortages. As stated, the project list is intended to be a "snapshot" of current planning efforts. Future updates and additions to the BIP may affect current prioritization or offer updated information about projects and methods.[337] Future studies may also affect prioritization as the roundtable updates and refines supplies, demands, or processes.

The roundtable created "Project Summary Sheets" in which it analyzed the Tier 1 projects and methods. These sheets provide a more in-depth look at the projects and methods, featuring information such as project yield, sponsor, and details about ways in which the project meets basin goals. A table briefly outlines projects the roundtable classified as Tiers 2 or 3. The table also features inventory projects, which will further examine regional projects and methods.

Projects and methods summary: The roundtable identified a total of 49 Tier 1 projects and methods meeting municipal, industrial, or agricultural needs.[338] Tier 1 projects were rated by their ability to meet basin goals:

- All 49 Tier 1 projects meet the overarching basin goal of "Protect existing water uses in the Gunnison Basin."
- 40 projects and methods seek to specifically "Improve agricultural water supplies to reduce shortages."
- 9 projects meet the basin goal of "Identify and address municipal and industrial water shortages."[339]

A great number of the Gunnison roundtable's identified projects have an agricultural benefit, as one would expect in this largely agricultural area.

North Platte Basin

Primary message: The basin goals the North Platte Basin Roundtable established are intended to maintain historical water uses within the basin, as well as provide a look forward at the future of development. Chief concerns in this particular basin are the equitable apportionment decree and the depletion allowance of the Three State Agreement.[340] Agricultural needs related to shortages, as well as infrastructural storage and water delivery concerns, are paramount. The roundtable created a list of "potential basin solutions," to include both structural projects and methods for water management.

NORTH PLATTE BASIN AT A GLANCE

52 total projects identified that meet municipal, industrial, or agricultural needs.

14 projects analyzed in summary sheets

12,197 acres of new irrigation for **9** projects

11,993 acre-feet of development identified for **5 projects**

Process: Similar to the Gunnison Basin roundtable, identification of projects, and a comparison of those projects to the basin goals, drove the North Platte process. The roundtable conducted targeted technical outreach to water managers and other stakeholders. The basin performed modeling analyses to identify challenges to implementation and to examine the effects of specific projects. As the roundtable reviewed projects, it highlighted potential multiple use projects, and called out potential water availability constraints. With the focus on agricultural needs, the roundtable conducted a shortage analysis to identify projects and methods that most effectively addressed shortages.

The roundtable prioritized the list of solutions by conformity with the basin goals, as well as in accordance with the timeline for potential implementation. It selected some projects that will receive additional analysis in the form of a project summary sheet, for these reasons:

- The project, and associated analysis herein, is representative of other projects on the list, such as the case with the Proposed Willow Creek Reservoir and the Hanson and Wattenberg Ditch Acreage;
- Implementation of the project is currently being pursued, such as the case with the Protocols and MacFarlane Reservoir; or
- Implementation of the project is potentially more feasible than projects on the following list because of limited constraints or challenges or more support from the Basin Roundtable, as with the Canal Maintenance and Improvements project.[341]

The project summary sheets provide a more extensive analysis of project or method information, including such details as "project constraints, implementation strategies and how well the project meets the Basin Goals."[342]

Projects and methods summary: The roundtable identified a total of 52 projects and methods that meet municipal, industrial, or agricultural needs.[343] The 14 projects that received additional analysis were compared with the basin goals:

- 13 projects met the basin goal to "Maintain and maximize the consumptive use of water permitted in the Equitable Apportionment Decree and the baseline depletion allowance of the Three State Agreement."
- 7 projects specifically addressed the basin goal to "Continue to restore, maintain, and modernize critical water infrastructure to preserve current uses and increase efficiencies."
- 3 projects met the basin goal to "Increase economic development and diversification through strategic water use and development."[344]

The majority of the projects and methods identified serve an agricultural benefit. The most numerous of projects are agricultural improvements, and many of the new storage projects will require further study to enable the roundtable to refine acre-feet projections.

Rio Grande Basin

Primary message: The Rio Grande Basin Roundtable identified 14 different goals, with central tenets being "a resilient agricultural economy, watershed and ecosystem health, sustainable groundwater resources, the encouragement of projects with multiple benefits, and the preservation of recreational activities."[345] Additionally, the roundtable identified preservation of the agricultural economy, which represents 99 percent of the basin's water use, as an overarching goal. Through public outreach and the work of roundtable subcommittees, the roundtable identified projects that met basin goals. It identified as desirable those projects and methods that meet multiple benefits and uses, and that stand a greater chance of receiving funding. In future planning efforts, the roundtable plans to develop project-ranking criteria, and to continue identifying projects and methods that meet basin goals.

RIO GRANDE BASIN AT A GLANCE

61 projects identified that meet municipal, industrial, or agricultural needs

$129,754,895 in costs identified for **29** projects

6,030 acre-feet of development identified for **2** projects

Process: Through the subcommittee and stakeholder outreach process, the roundtable selected 29 projects that would receive a more in-depth analysis through project fact sheets.[346] These fact sheets provided more information about each project, and featured the sponsor, location, estimated project costs, and a comparison of the project outcomes with basin goals. The roundtable also generated a matrix that displayed each project, the needs it met, and the basin goals its implementation would meet. Twenty-five of these projects were site-specific, and had associated cost estimates through the year 2020.[347]

The roundtable identified 21 additional projects and methods for future consideration and discussion. The roundtable did not analyze these projects at the fact-sheet level due to time constraints and available information, but the roundtable believes these projects could be beneficial to meeting basin needs and goals. The basin intends that this plan will remain dynamic, and will add projects and methods as it identifies additional needs, methodologies, and focus areas.

Projects and methods summary: The roundtable identified a total of 61 projects and methods meeting municipal, industrial, or agricultural needs.[348] It evaluated the projects and methods by their ability to meet basin goals. Within the 29 projects the fact sheets evaluated:

- 14 projects meet the goal of "Operate, maintain, rehabilitate, and create necessary infrastructure to meet the Basin's long-term water needs, including storage."
- 14 projects and methods seek to "Manage water use to sustain optimal agricultural economy throughout the Basin's communities."

- 24 projects and methods are identified as multi purpose, meeting the basin goal to "Support the development of projects and methods that have multiple benefits for agricultural, municipal and industrial, and environmental and recreational water needs."

South Platte Basin (Including Metro)

Primary message: The South Platte and Metro Basin Roundtables worked together on a joint BIP and sought water supply solutions that were "pragmatic, balanced, and consistent with Colorado water law and property rights."[349] The BIP emphasized multipurpose projects and specifically identified the following three objectives. "Projects and methods should be configured to meet multipurpose objectives that balance:

a. Consumptive with environmental and recreational needs;

b. Surface and groundwater utilization and storage; and

c. Current versus potential future needs and values."[350]

This BIP specifically referenced the "Four Legs of the Stool," a result of the IBCC's work that identifies four key tactics for meeting future water supply.

SOUTH PLATTE / METRO BASINS AT A GLANCE

63 projects identified that meet municipal, industrial, or agricultural needs

191,980 acre-feet of development identified for **23** projects

The South Platte/Metro Roundtable identified three categories of water development to meet future uses within the basin: 1) Water use efficiency improvements and water sharing strategies, including conservation, reuse, ATMs, and system integration; 2) Supply development involving new storage and conveyance systems and investigating, preserving, and developing Colorado River options; and 3) Watershed health and water quality management.[351] The roundtable examined both larger-scale concepts, such as TMDs, and smaller-scale projects and methods, such as storage and reuse projects. Project concepts the joint BIP identified are primarily geared toward meeting municipal, industrial, and agricultural needs. The BIP further divided these concepts into project categories such as reuse, agricultural transfers, ASR, and TMDs.

Process: Like some other basins, the South Platte/Metro joint effort began with the IPP list the SWSI 2010 process identified. The basin roundtable interviewed potential project sponsors (water conservancy districts, municipalities, and counties) via project summary sheets to gather basin project information, such as sponsor and estimated cost. The Metro Roundtable's executive committee and the South Platte's Rio Chato committee reviewed the project summary sheets gathered through the outreach process. Both roundtables then reviewed the projects and methods in full to consider them for inclusion in the BIP. Additionally, the roundtables considered three conceptual projects that were intended to demonstrate a collaborative approach to meeting basin needs moving forward.

Projects and methods summary: The basin roundtables identified a total of 63 projects and methods meeting municipal, industrial, or agricultural needs:[352]

- 13 projects identified as Reuse IPPs
- 8 Agricultural Transfer IPPs
- 17 In-Basin IPPs
- 5 Transbasin IPPs

Southwest Basin

Primary message: The Southwest Basin takes the approach that all needs should be viewed equally, be they agricultural, municipal, industrial, environmental, or recreational. The roundtable adopted 21 goals and 31 measurable outcomes in its BIP, with a focus on water supply needs.[353] Since SWSI 2010, the roundtable has identified the completion of 55 projects within the basin. Through the basin's outreach process, which it conducted in support of the BIP, the basin added more than 80 new projects to the list, totaling 164 IPPs. Of these identified projects and methods, "agricultural IPPs make up about 19 percent of the total IPPs on the list to date. Municipal and industrial IPPs make up about 29 percent of the

total IPPs on the list to date."[354] The BIP serves as a living document that provides guidance for basin water supply planning, while continuing to refine projects, methods, and goals as needs evolve.

SOUTHWEST BASIN AT A GLANCE

117 projects identified that meet municipal, industrial, or agricultural needs

$60,000,000 in costs identified for **1** project

30,354 acre-feet of development identified for **8** projects

Process: The basin identified themes, goals, and measurable outcomes that are geared toward identifying and meeting water supply gaps. Themes B and C directly address the matter: "B) Maintain Agriculture Water Needs, C) Meet M&I Water Needs."[355] With these overarching themes in mind, the roundtable conducted outreach across the basin. In that outreach, it contacted water managers and other stakeholders to identify potential new projects and methods that had developed since SWSI 2010. Roundtable members and consultants also conducted public workshops members to inform the public about the BIP and Colorado's Water Plan process, and to elicit information about potential projects or methods. The listing of projects in the BIP began with the SWSI 2010 identified projects, and then roundtable members and consultants contacted potential project proponents to gather information in the form of a questionnaire. The roundtable vetted the project questionnaires, and adopted projects or methods by including them in the BIP.

Projects and methods summary: The roundtable identified a total of 117 projects and methods meeting municipal, industrial, or agricultural needs.[356] The BIP highlights some specific IPPs that meet basin goals and measurable outcomes, and that demonstrate the types of projects and methods the basin has planned:

- 8 multi-purpose, cooperative, and regional projects and processes such as renewable energy partnerships, water conservation and management plans, and optimization studies
- 5 potential IPPs related to hydropower
- 7 agricultural infrastructure improvements

The Southwest Basin Roundtable will continue to evaluate projects and methods. Additional refinement of project information will provide more detail about cost estimates and new acre-feet.

Yampa/White/Green Basin

Primary message: In the Yampa/White/Green BIP, the roundtable focused on two main concepts with regard to implementation of projects and methods for municipal, industrial, and agricultural uses. First, the roundtable sought to provide sufficient supply of "local water resources for existing uses and future development."[357] It also identified the need for implementation of projects and methods that are "appropriately located, sized, and operated…to protect important water uses and the environment."[358] The roundtable discussed the importance of the Colorado River Compact, and the need to keep compact concerns in mind when planning for the implementation of projects and methods. With these overarching themes in mind, the roundtable adopted eight primary basin goals, with chief concerns around meeting existing and anticipated future uses within the basin.

YAMPA/WHITE/GREEN BASIN AT A GLANCE

27 projects identified that meet municipal, industrial, or agricultural needs

$4,950,000 in costs identified for **3** projects

317,316 acre-feet of development identified for **12** projects

In consultation with basin water managers and other stakeholders, the roundtable developed a list of projects and processes. The roundtable intends the list to remain dynamic; it will update it as basin needs, the understanding of river operations, and potential project proponents are updated and refined. The projects and processes the roundtable identified stem from information basin studies provided. These include SWSI 2020 and the 2014 Project and Method Study, which the roundtable funded. The roundtable identified 21 projects as having met basin goals, and as being appropriate for implementation. The majority of the projects identified are new storage projects; implementation has met municipal, industrial, and agricultural needs.

TABLE 6.5.1-1 NO-AND-LOW-REGRETS ACTION PLAN SUMMARY TO HAVE A HIGH SUCCESS RATE FOR IDENTIFIED PROJECTS AND PROCESSES

COMPLETED, EXISTING, AND ONGOING ACTIONS	POTENTIAL FUTURE ACTIONS
• Make policy recommendations in support of IPP implementation through the 2010 "Letter to the Governors" • Establish the "Collaborative Approach to Water Supply Permit Evaluation" group to improve communication among state and federal agencies about permitting issues • Support key IPPs (e.g., the Chatfield Reallocation Project, WISE, CRCA. • Coordinate the DNR's responses to IPPs through the DNR Executive Director's Office • Provide technical and financial support to project proponents through WSRA grants	1. Support Local Implementation of IPPs a. Provide technical and financial support, including facilitation, to BIPs b. Support the conversion of single-purpose IPPs into multipurpose IPPs when a project proponent requests it c. Streamline state-permitting processes for IPPs that meet values of the CWP d. Continue state coordination with the federal permitting entities e. Encourage cooperative projects through BIPs f. Support local permitting authorities to identify, as requested, multipurpose components up front in project planning to incorporate county and local concerns 2. Update Tracking and Data Collection via the Basin Needs Decision Support System a. Support basin roundtables in providing updated IPP data as part of their BIPs b. Track and analyze effects of IPPs on the projected water supply gap 3. Optimize Funding Sources for IPPs a. Assess funding needs b. Target existing funding sources towards IPPs c. Identify new funding sources for IPPs 4. Generate Political Support for IPPs a. Facilitate and encourage regular, active communication about IPPs between the CWCB, the IBCC, and the basin roundtables b. Upon a project proponent's request, convene a facilitated dialogue among stakeholders, project proponents, and state agency representatives if there is disagreement about a proposed project or process c. Conduct outreach and education about IPPs and the state water-planning process d. Develop an approach for determining whether a project meets the values of the CWP and has broad stakeholder support e. Upon a project proponent's request, encourage legislative resolutions in support of IPPs that meet the values of the CWP f. Publicly advocate for IPPs that meet the values of the CWP and have stakeholder support

Process: Throughout the basin, the roundtable undertook a public outreach process to engage stakeholders and gather input about the BIP and Colorado's Water Plan. The roundtable updated projects and processes identified through SWSI 2010, and the 2014 P&M Study identified the most up-to-date project information.[359] With the basin goals in mind, the roundtable gathered information from project proponents and stakeholders. It distributed surveys throughout the basin at public information meetings or via individual BIP committee member contact. These surveys were intended to identify projects the SWSI and the P&M Study did not include.

Projects and methods summary: The BIP identified a total of 27 projects and methods meeting municipal, industrial, or agricultural needs.[360] Some representative projects and methods presented in the BIP are as follows:

- 9 projects identifying potential new storage sites
- 2 irrigation improvement projects
- 2 reservoir improvements or expansion

Ongoing studies in the basin will inform additional acre-feet yield, and project proponents can develop project costs during the permitting and financing stages.

IBCC No-and-Low-Regrets Identified Projects and Processes Actions

In 2014, the IBCC developed the No-and-Low-Regrets Action Plan to have a high success rate for identified projects and processes, and to implement and assess storage and other infrastructure. These strategies outline the minimum level of effort required regarding these topics on a statewide basis.

Table 6.5.1-1 explores potential future actions the IBCC agreed could generate a high success rate for identified projects and processes. Statewide, the No-and-Low-Regrets Action Plan indicates that on average, basins stakeholders need to implement 80 percent of the yield—equivalent to 350,000 acre-feet— identified in these projects. The BIP and Colorado's Water Plan processes are already addressing many of the IBCC's requests.

6.5.2 AGRICULTURAL VIABILITY

Governor Hickenlooper's executive order directed the CWCB to incorporate "a productive economy that supports vibrant and sustainable cities, viable and productive agriculture, and a robust skiing, recreation, and tourism industry" as key values Colorado's Water Plan is intended to reflect.[361] In every BIP, the roundtables identified the importance of agriculture as an economic driver and an overall community benefit to the basin landscapes. In discussing agricultural viability, the path forward is complicated; to some extent, hydrology, commodity prices, and federal programming dictate the landscape to farmers and ranchers.

Colorado's Water Plan sets an objective that agricultural economic productivity will keep pace with growing state, national, and global needs, even if some acres go out of production. Though irrigated acreage has declined by 338,000 acres statewide, agricultural productivity has increased.

The following table shows an estimate of irrigated lands that have been taken out of production in Colorado over the past several decades. Although the CWCB made an attempt to present agricultural statistics from the USDA, the unreliable nature of the data and the mix of available data through the years made estimates loose at best. Instead, the CWCB used CDSS GIS data gathered during the various DSS projects statewide. Estimates were derived by determining which parcels from past datasets were no longer catalogued in the CWCB's "master" parcel files of irrigable lands for each division. The exception to this was Division 3, where the 1998 dataset (which had greatest total lands) was compared to 2012 (which had the lowest total lands). It should be noted that the CWCB has not determined permanent loss of agricultural lands due to urbanization or permanent dry-up; such a determination would require a more laborious process.

Also included is a chart (Figure 6.5.2-1, page 6-139) of total irrigated lands for the state, as reported by the USDA Census of Agriculture.

In order to meet the objective to maintain agricultural economic productivity, innovation and technological improvements will be integral to future agricultural water management. As the CWCB advances future funding initiatives and technical support, support for viable agriculture will remain a key consideration. Section 9.2 more thoroughly explores the role of future funding for agriculture. Potential long-term funding sources for agricultural viability could support the following endeavors:

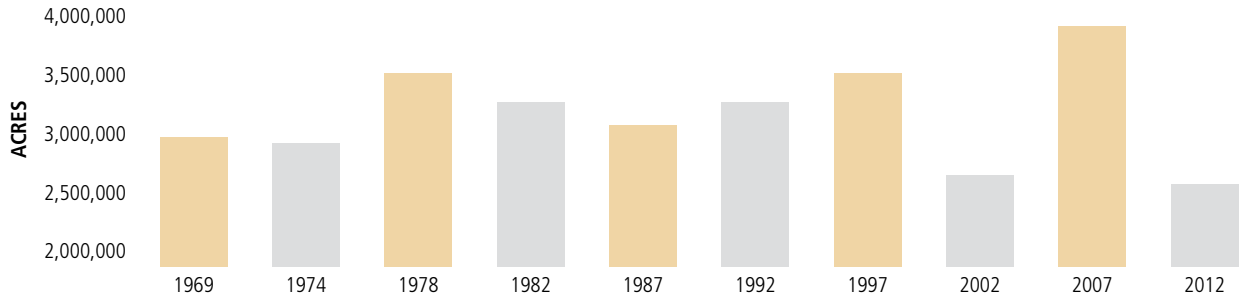
- Exploring conservation easements for irrigation water.
- Developing incentives to keep water in irrigated agriculture, in addition to developing alternative methods for urban transfer.
- Upgrading irrigation and diversion systems.
- Purchasing water rights specifically to create an "agricultural water bank" for water sharing.
- Providing adequate staff resources to manage and coordinate an Agricultural Water Program.

TABLE 6.5.2-1 IRRIGATED LANDS TAKEN OUT OF PRODUCTION

	Div 1	Div 2**	Div 3*	Div 4	Div 5	Div 6	Div 7
No longer Irrigated	136,760	115,630	13,882	13,573	38,476	7,359	13,140
Total irrigated lands in Div	998,214	~	585,457	311,659	235,240	116,380	205,645
% of total	13.7%		2.4%	4.4%	16.4%	6.3%	6.4%

**Permanent dry-up acres from Div 2 staff
*See note above

FIGURE 6.5.2-1 STATEWIDE IRRIGATED ACRES



The basin roundtables proposed solutions, stakeholders submitted comments to the CWCB, and the IBCC convened a subcommittee with the express purpose of exploring policies and concepts—with a goal to maintain viable agriculture in light of future water supply-and-demand challenges. The roundtables summarized these initiatives with the acknowledgement that agricultural viability is an ongoing matter that will require greater study, collaboration, and action items moving forward.

Basin Implementation Plans and Agricultural Viability

Arkansas Basin

In its BIP, the Arkansas Basin Roundtable proposes an economic measure of agricultural benefit. Members of the roundtable worked with a team from Colorado State University to establish a baseline for agricultural production at $1.5 billion annually.[362] Given the constraints of water management within the Arkansas Basin, including the Arkansas River Compact, the roundtable seeks to maintain or increase this baseline by identifying and implementing sources of augmentation water, supporting the development of leasing/fallowing programming within the basin, and further exploring the nexus between agricultural and environmental and recreational uses.[363]

> "The preservation of irrigated agriculture in the Arkansas Basin shall be given a high priority in the state water plan. It is too important to tourism, the preservation of food production, recreation, the environment and the health and well-being of our citizens as well as the economy of the State of Colorado to be ignored."
>
> — *Arkansas BIP*

Colorado Basin

In assessing the future of agriculture in the Colorado Basin, the roundtable first articulated concerns regarding development of a new TMD from the Colorado main-stem, citing existing diversions and the effect that further development could have on the agricultural economy.[364] The roundtable prioritized agriculture in one of six basin themes, and established the following guiding principles for the Colorado BIP: "Sustain, Protect, and Promote Agriculture." The BIP cites the importance of return flows to other economic drivers in the basin, such as recreation and tourism, and points to the 100,000 acre-feet in shortages the SWSI 2010 estimated.[365] The roundtable identified four goals to support this basin theme:

- Reduce agricultural water shortages
- Minimize potential for transfer of agricultural water rights to municipal uses (within private property rights)
- Develop incentives to support agricultural production
- Increase education among the agricultural community about Colorado River Basin water issues

The BIP articulates in greater detail measureable outcomes, short-term needs, long-term needs, and projects and methods in support of each goal.[366]

Gunnison Basin

Under the umbrella goal of "Protect existing water uses in the Gunnison Basin," the Gunnison roundtable also identified three basin goals centered on agricultural viability:

- Discourage the conversion of productive agricultural land to all other uses within the context of private property rights.
- Improve agricultural water rights to reduce shortages.
- Describe and encourage the beneficial relationship between agricultural and environmental recreational water uses.

> "Traditional agricultural water uses not only provide direct economic benefits but also help to drive the recreational economy by preserving the beautiful landscape enjoyed by the Basin's inhabitants and visitors."
>
> — *Gunnison BIP*

In the inventory of projects and methods, the Gunnison Roundtable identified projects that specifically seek to advance these three basin goals.[367] The roundtable discussed each goal in detail, proposed a process to achieve each goal, and defined a measurable outcome that often included a quantifiable target. For example, in discussions about the first bulleted basin goal, the roundtable hopes to achieve the following measurable outcome: "Preserve the current baseline of about 183,000 protected acres in the Gunnison Basin and expand the participation in conservation easements by 5 percent by 2030 through programs like the Gunnison Ranchland Conservation Legacy."[368] The roundtable also includes implementation goals, which may include a number of projects it will develop in accordance with a certain benchmark, or the completion of a study to assess infrastructural needs. The BIP further explores specific processes and measurable outcomes.

North Platte Basin

The North Platte Basin Roundtable identified in its BIP agricultural shortages and issues related to infrastructure as priority needs, along with concerns regarding long-term implications of the equitable apportionment decree.[369] Similar to the Gunnison BIP, one basin goal in the North Platte seeks to "describe and quantify the nonconsumptive benefits of agricultural use."[370] Moving forward, the roundtable hopes to complete further study of this relationship by quantifying the benefits and their overall effect on water management within the basin. Measurably, the roundtable seeks to complete at least two multipurpose projects in the basin meeting multiple needs.[371] The BIP identifies four specific projects by directly addressing this multipurpose-projects goal.

The roundtable also described shortages in the basin and the causes of these shortages, which fall into three categories: physical, legal, and irrigation-practice related.[372] Other basin goals seek to resolve identified issues with water availability under the decree, and address issues related to aging or non-functional infrastructure. Detailed project information is available for projects that address agricultural needs for multipurpose benefits.

Rio Grande Basin

The Rio Grande BIP begins by recognizing the importance of agriculture to the basin economy. Agriculture accounts for approximately 99 percent of the basin's water use.[373] The challenges inherent in compliance with the Rio Grande Compact and the basin's Well Rules and Regulations make viability of agricultural production a major concern for basin stakeholders. Twelve of the 14 basin goals include an agricultural consideration, ranging from compliance with legal mechanisms to optimal management of agricultural and environmental water uses.[374]

The BIP discusses the role of innovations in agriculture, and examines the future roles of strategic crop development and irrigation improvements as potential water management strategies.[375] Additionally, the BIP includes a summary of current approaches within the basin to improve soil health as a component of improved water management as it relates to agricultural production.[376] The roundtable took a closer look at 29 projects and methods identified to meet future

needs within the basin. Of those 29 projects, 24 meet identified agricultural needs.[377] Beyond the projects and methods the project sheets explored in further detail, the BIP identifies 18 additional projects and methods with an agricultural nexus. These range from specific improvements, to agricultural infrastructure, to an "Alternative Cropping Education and Promotion Program."[378]

South Platte Basin (Including Metro)

> "The importance of agricultural production in the South Platte and Republican River Basins should not be overlooked. It is a major factor in the State's economy and includes processing of food and livestock from the entire state."
>
> — *South Platte BIP*

In proposing strategies to meet the projected water supply gap in the South Platte and Metro Basins, the roundtables set guidelines recognizing the importance of agriculture to the basin economy, and encouraging multipurpose projects with a minimal effect on agricultural uses.[379] In planning for the future of water within the basin, the roundtable set a basin goal to "Minimize traditional agricultural "buy and dry" and maximize use of ATMs to extent practical and reliable."[380] Specific recommendations for achieving this goal include further support of water-sharing methods and improvements to the water court process, with an acknowledgement of the importance of vested rights to water-rights holders.

The BIP discusses the benefits and challenges associated with the implementation of ATM projects, and identifies some lessons learned from previous and ongoing ATM projects within the basin. The roundtables also provided some strategies at the local level to minimize agricultural dry-up, such as switching to cool-weather crops, deficit irrigation, and dry-year leasing. The BIP emphasizes continuation of state pilot programs for water sharing, as well as collaborative solutions such as the coupling of agricultural easements with municipal lease options.[381]

Southwest Basin

Similar to other western slope basins, the Southwest Basin expresses concerns about the Colorado River Compact, and the influence future development of Colorado River supplies may have on basin agriculture, given downstream obligations. To that end, the roundtable proposed that proponents of a new TMD, or water providers that are utilizing agricultural dry-up to meet demands, should meet a 70:30 ratio of inside-to-outside use of municipal water by 2030.[382] In assembling the BIP, the roundtable identified 21 goals, three of which specifically address the theme of "Meet Agricultural Needs."[383] In addition to the proposed municipal-use ratio, the roundtable recommended implementation of ATM and efficiency projects, strategies to discourage permanent dry-up, and the implementation of at least 10 agricultural water efficiency projects identified as IPPs by 2050.[384]

The Southwest BIP also presents the challenges inherent in achieving these measurable outcomes, such as potential opposition to a statewide conservation ratio, and the difficulties in ATM implementation under water-rights administration within the basin.[385] In compiling the Southwest BIP, the roundtable conducted extensive outreach to update the IPP list. Of the total IPPs listed, agricultural projects and methods total about 19 percent, while 17 percent are multipurpose and may have an agricultural component.[386]

Yampa/White/Green Basin

The Yampa/White/Green Basin Roundtable identified eight goals, two of which specifically mention agricultural uses of water:

- 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.[387]

In looking to the future of the basin, the roundtable undertook a modeling exercise that demonstrated agricultural shortages under a baseline scenario, and substantial shortages under a dry-future scenario.[388] The roundtable projected the addition of up to 14,805 irrigated acres within the basin. As a result of the exercise, roundtable members determined their priority to be the identification of timing and location

of shortages. In the context of private property rights, the BIP proposes potential cooperative programs to reduce shortages, while encouraging multipurpose projects with a benefit to agricultural uses.[389] With this closer study of shortages, and the encouragement of policies and programming to benefit agriculture, the roundtable has identified some quantifiable outcomes:

- Preserve the current baseline of approximately 119,000 irrigated acres and expand by 12 percent by 2030.
- Reduce agricultural shortages basin-wide by 10 percent by the year 2030.[390]

Additionally, the roundtable identified several processes related to improving agricultural infrastructure. These processes involve collaboration and more in-depth analysis of potential for improvements, taking into account the effects on other water uses.

BIPs and Agriculture Summary

The roundtables are exemplary in their detailed accounting of projects and methods, with the goal of achieving agricultural viability. In their BIPs, they establish and inventory these projects and methods at the grassroots level, incorporating policy suggestions from the stakeholders who are actively involved at the local basin level. Local stakeholders, water managers, and water users know what sorts of practices are actionable, and what will work in their area. Moving beyond an acknowledgement of the importance of agriculture to the economy and communities, the roundtables make a series of bold steps toward actionable and measurable strategies that seek to maintain the viability of agriculture across the basins. The IBCC Agricultural Viability Actions and Strategies section summarizes work occurring at the IBCC level, and highlights policies and strategies that have statewide applicability. The roundtables strive to measurably and meaningfully encourage the viability of agriculture around the state through a series of action items, and they also take a broader approach by seeking actions that may provide a benefit.

Effects of Agricultural Dry-Up

As basin roundtables and stakeholders statewide seek to identify projects and methods that promote agricultural viability, a greater understanding of the relationship between irrigated agriculture and the surrounding communities and ecosystems should be encouraged. Governor Hickenlooper's executive order and the work of the IBCC and CWCB support creative alternatives to traditional "buy-and-dry," while respecting the private property rights involved.

Return flows must be maintained in the case of an agricultural water rights transfer. However, reduction in use of an agricultural irrigation water right may still result in impacts on wetlands associated with agricultural dry-up, the loss of open space and wildlife habitat, and to local businesses and economies that depend on agricultural industry within a community.

These sorts of impacts merit further exploration, but not in a way that affects private property rights, increases uncertainty, or unduly burdens water users seeking to enter into a transaction. As with other action items in Colorado's Water Plan, the purpose of this effort should not be to increase red tape or create regulatory hoops, but foster a greater understanding of the role of viable agriculture in local communities, given the water supply challenges identified in other chapters and sections of this plan.

Moving forward, the CWCB should provide technical work and financial support of grassroots efforts to clarify the effects of transfers and to understand the relationship between irrigated agriculture and the surrounding communities and ecosystems. Entities in the Arkansas and Yampa/White/Green have applied for WSRA funds in this vein, and the IBCC Agricultural Viability subcommittee has suggested a potential "Framework for evaluations of agricultural transfers," described below. Such efforts should strive to include potential proponents of a water use change, as well as community members who would potentially be affected. These efforts would ideally lead to a greater understanding between members of the community regarding the effects of transfers.

IBCC Agricultural Viability Actions and Strategies

To inform the ongoing statewide discussion about agricultural viability, the IBCC assembled a subcommittee in 2015. The intent of the subcommittee was to propose specific concepts and strategies to attain the IBCC's support and achieve potential short-term implementation. The committee presented to the IBCC draft concepts for discussion, and the IBCC approved

the pursuit of further work and implementation of those action items. Moving forward, the CWCB's members and staff will work with stakeholders and other interested parties to implement these action items, while recognizing the challenges and opportunities each presents. The following summary briefly describes each of the IBCC concepts.

Agricultural viability long-term goal: The IBCC asked the subcommittee to craft a long-term goal that would be closely tied to continued, long-term viability for agricultural uses, and to reflect the broad need to educate Coloradans about the importance of agriculture. Ideally, the goal should be measurable.

Program to facilitate agricultural opportunities: The state needs to provide additional education and assistance to farmers and ranchers to help realize more transactions that allow for ATMs, and to enable new Colorado farmers to successfully enter the agricultural industry. This assistance may include financial and other support for land links, land trusts, and conservation easements that protect working farmland and make irrigated land affordable for the next generation of farmers and ranchers. The program should include education on and assistance with the following:

- Deals, contracts, and other options for sharing agricultural water.
- Strategies to remain market competitive.
- Ways to achieve long-term certainty for both water lessors and lessees.
- ATMs that allow the farmer to continue owning the land.
- Opportunities to overcome entry barriers for young growers (in collaboration with such entities as Land Link, Farm Bureau's Young Farmer Group, and Colorado State University Extension).
- Perpetual agricultural agreements, such as conservation easements (such as those demonstrated by entities like the Lower Arkansas Valley Water Conservancy District).
- Other similar contractual agreements that allow for more long-term flexibility (an example is the purchase of water rights in the Arkansas Basin by Aurora Water).
- Funding opportunities for agricultural producers.

Proponents need to create the program's scope of work, goals, geographic range, and responsibilities, as well as measurements for success. Because many aspects of the program relate to agreements between municipalities and agricultural producers, program sponsors should involve both sectors in the development of the program and solicit their continued input.

Enforcement of minimum standard for water-rights applications: The court should be diligent in enforcing the minimum water-rights application requirements, which are already in existence, and should standardize these requirements statewide. Better guidance should be provided and advertised for applicants who do not have legal counsel or engineering consultants.

Incentives to reduce urbanization and fragmentation of agricultural lands: Colorado's Water Plan should indicate that current land-use incentives it describes would also help to keep agricultural lands in production. The CWCB should review these incentives to determine whether more incentives will be needed to further encourage local governments and land owners to reduce fragmentation and urbanization of agricultural lands. The CWCB's intent is that the incentives will provide additional options, but not infringe upon private property rights.

Addressing barriers to keeping agricultural land and water ownership when water sharing: Members of the IBCC will work with BRTs to apply for a multi-basin WSRA grant in order to compile ATM data, identify areas that will encourage irrigators to enter agreements, analyze barriers (beyond law review), and bring in municipalities' perspectives to understand both buyers' and sellers' viewpoints. CWCB will develop next steps once it has compiled and reviewed this data.

Framework for evaluations of agricultural transfers: More transparency with regard to agricultural transfer transactions is needed to help agriculture producers and the general public understand the effects of agricultural transfers to agriculture, the local community, and the environment. An evaluation of agricultural transfers could help, but several concerns and details that would need to be determined. An evaluation of agricultural transfers could encroach on private property rights, stall operations, and create a permitting hurdle, thereby functioning like an environmental impact statement (EIS). The end goal of such an evaluation would not be to create another hurdle in the permitting or water court process, but

to provide transparency for the cumulative effects of such a transfer. Other remaining details to determine include the party responsible for conducting the evaluation, the evaluation's end goal, the evaluation's effect on agricultural viability, and timing of such an evaluation in the water-rights transaction process. The CWCB will host a stakeholder group comprising landowner and water provider participants to develop a framework for an evaluation of agricultural transfers to determine whether such a framework is appropriate from a technical, legal, and policy perspective.

Agricultural-to-agriculture, -environment, or -industry sharing pilot: In 2015 Governor Hickenlooper signed Senate Bill 198 into law, allowing pilot projects to share water among agricultural entities and industrial or nonconsumptive uses. To implement this program, the CWCB should encourage a pilot project to test the concept, and should educate ditch companies about this opportunity. Some ditch companies may need to change their bylaws to allow for water sharing.

Updates and improvements to Colorado's aging infrastructure: For many agriculture producers, building new storage and other infrastructure, and updating aging infrastructure, is too expensive and difficult due to the myriad regulations, permits, and costs. Storage both benefits and supports all uses and all sectors. Therefore, the CWCB encourages additional work to improve the permitting, system, water administration review, court system, and law, as well as work to increase funding for aging infrastructure and identified agricultural projects.

Regulations that increase costs for growers, and how to modify them: The agricultural community needs relief from increased government regulations across sectors. Stakeholders must address these mounting regulations as one of agriculture's top priority issues for the future, especially when encouraging young agriculturalists to continue farming.

Additional recommendations: The IBCC discussed the need for two additional points that focus on funding agricultural infrastructure and agricultural IPPs. The latter recommendation will support agricultural and municipal IPPs that reduce reliance on agricultural dry-up.

ROBERT T. SAKATA

SOUTH PLATTE RIVER BASIN

Robert is a vegetable farmer in Brighton and served on the Water Quality Control Commission, Metro Roundtable, and several other boards where he's demonstrated leadership statewide in the agriculture and water community. Robert is pictured on his farm.

One of my favorite quotes is from Albert Einstein who said, "We cannot solve our problems with the same thinking we used when we created them." And yet change is never easy. But I will need to change the way that I farm if I'm going to stay in business. Everybody is going to have to change the way we think about water in the world we live in. The Colorado Water Plan can be a first step. It outlines the parameters of how water administration works, it states the need, and it develops a basic action plan…but to carry out the outlined actions will require the state to provide the leadership to facilitate and minimize...

CONTINUED AT END OF CHAPTER

PROFILE

6.5.3 STORAGE

The implementation of projects and methods with a storage component will play a crucial role in meeting Colorado's water supply needs. Basin roundtables have identified storage as an important element of the BIPs, and have highlighted the necessity for storage through basin goals and measurable outcomes, or identified specific projects and methods with a storage component, as discussed in the BIP summaries above. Additionally, the IBCC has called attention to the future role of storage through the No-and-Low Regrets Action Plan, as summarized in Table 6.5.3-1 (page 6-152).

These types of projects and methods are identified in every BIP, which point out the many benefits that can be realized from new or reoperated storage projects. In establishing goals and measurable outcomes for the BIPs, basin roundtables universally expressed a preference for multipurpose storage projects moving forward. These projects can potentially meet multiple needs and serve multiple beneficiaries. This more inclusive model of collaboration in project planning may lead to more diverse funding models for project financing, and reduce hurdles to project implementation by working with a diverse set of users.

While new storage projects will certainly play a role in meeting the state's water needs, the enlargement and rehabilitation of existing dams and reservoirs will provide more options for the path forward, as Chapter 4 discussed. Additionally, options for storage in alluvial and bedrock aquifers provide another solution to supply challenges.

Colorado's Water Plan sets a measurable objective of attaining 400,000 acre-feet of water storage in order to manage and share conserved water and the yield of IPPs by 2050. This objective equates to an 80 percent success rate for these planned projects.

Extreme weather events and conditions such as those in 2013 and 2015 have precipitated discussion statewide and at the basin roundtable level regarding the benefits of storage for an array of purposes. Storage vessels can meet a variety of needs beyond water conservation, including but not limited to:

- **Flood Control:** In spring 2015, a "Miracle May" of late season snow and rain fell statewide, bringing Colorado's various regions out of drought classifications. Chatfield Reservoir south of Denver was one of many storage projects used statewide to control flows, which avoided property damage and unsafe river conditions.
- **Compact Compliance:** In recent years, discussions among Upper Basin states have focused on drought contingency planning, as discussed in Chapter 2. Upper Basin reservoirs have been key to the discussion of reoperation, with the intent of keeping levels in Lake Powell above minimum power pool. Reservoirs that could conceptually be used in a drought contingency planning reoperation strategy include Flaming Gorge, Navajo, and the Aspinall Unit. Reservoirs are also critical to meeting compliance with compact obligations; and example is the role of John Martin Reservoir with respect to the Arkansas River Compact.

- **Drought Mitigation:** The Soil Conservation Service (now the NRCS) and the Colorado DWR originally developed the Surface Water Supply Index. The purpose of the index is to describe drought severity in regions where water availability is driven by winter snow accumulation and subsequent melt. The index is comprised of four elements: snowpack, streamflow, precipitation, and reservoir storage. As a part of state and local planning and mitigation for drought, the inclusion of reservoir storage in this tool demonstrates the importance of this resource for water managers and resource officials around the state.[391] As climate change affects supplies, storage vessels also afford more flexibility to water managers planning for associated effects.
- **Crop Protection**: The Division 2 office of the DWR administers the Winter Water Storage Program, and the Southeastern Colorado Water Conservancy District coordinates it. This program allows agricultural users on the Arkansas River to store flows, which had historically been diverted onto their lands during the winter, in Pueblo Reservoir. With this reservoir in place, the stored water can be released during the irrigation season, allowing for better water usage by the farming and ranching communities in the Lower Arkansas Valley.[392]
- **Minimizing Buy and Dry:** The Southern Water Supply Project operated by Northern Colorado Water Conservancy District (NCWCD) provides water from Carter Lake to several northeastern Colorado communities. Rapidly growing communities such as Broomfield, Louisville, and Superior are project beneficiaries. These communities needed a year-round water supply, and the ability to contract with NCWCD for this water provided a solution, without needing to purchase agricultural water rights and converting these to municipal use.[393]
- **Ecosystem Health:** In August 2015, the CWCB entered into an agreement with the Ute Water Conservancy District to supplement flows in the Colorado River with water stored in Ruedi Reservoir. This agreement allows the CWCB to lease between 6,000 and 12,000 acre-feet of water for instream flow use on the "15-Mile Reach" of the river, which provides critical spawning habitat for endangered fish species.[394]
- **Environmental and Recreational Enhancements:** In 2012, 2013, and 2015, the Colorado Water Trust entered into an agreement with multiple partners to boost summer flows in the Yampa River upstream of Steamboat Springs by releasing water from Stagecoach Reservoir. This purchase of water from the Upper Yampa Water Conservancy District augments stream health and provides recreational opportunities in this area.[395]

BIPs and the Role of Storage

Every BIP addresses the role of storage within the roundtable's planning horizon. Addressing storage is accomplished in two different ways statewide: through the establishment of goals or measurable outcomes that relate to the future of storage within the basin, or through the identification of proposed projects and methods with a storage component. Some basin roundtables established a policy-based goal by stating the importance of storage to future needs within the basin and listing roundtable action items as a means to further such a goal. Other roundtables set a numerical measurable outcome by establishing a benchmark of new storage (in acre-feet) to be achieved by a certain time. Roundtables that chose to list proposed projects and methods within the basin boundaries included specific information, such as project proponents, estimated project yield, or timeline for project completion. Below is a summary of each BIP, specifically outlining how each roundtable addressed the matter of storage.

Arkansas Basin

The Arkansas Basin Roundtable identified three broad themes to guide the Arkansas BIP. The first theme directly addresses storage:

- *Increased water storage and preservation of existing water storage capacity is critical to all solutions.*[396]

This theme is echoed in a series of "Storage Goals," which the basin roundtable developed based on input basin stakeholders provided during the BIP public outreach process. These storage goals include a numerical acre-feet goal to be accomplished by 2020, and three goals that are action items the basin roundtable and basin stakeholders to implement. These three action items reflect the general sentiment statewide, emphasizing the importance of multipurpose projects and the exploration of a variety of storage options:

1. *Increase surface storage available within the basin by 70,000 acre-feet (AF) by the year 2020;*
2. *Develop alluvial and designated storage in gap areas within the basin;*
3. *Support multiple uses at existing and new storage facilities; and*
4. *Identify storage facilities that can be renovated, restored, or enhanced for additional storage.*[397]

The roundtable also identified a set of specific actions needed to accomplish these goals. It explored potential rehabilitation of nonfederal reservoirs, and listed action items such as implementation of IPPs and funding plans.

Colorado Basin

The Colorado Basin Roundtable discussed storage chiefly in two different sections of the BIP: storage as identified through the public input process, and the role of storage in meeting identified basinwide themes. The roundtable undertook an ambitious public outreach and input process for the BIP, and that led to the development of six major basin themes. While conservation was the most frequently advocated solution for meeting future water supply gaps, respondents also discussed increased water storage.

The roundtable also identified basin goals that correspond to the six basinwide themes. It mentioned storage as part of several action items in support of basin themes. For example:

- ***Basin Goal:*** *Develop a basinwide funding system to meet basin environmental and recreational needs.*
  - ***Long Term Needs:*** *Evaluate future storage projects in-basin and the potential impacts to nonconsumptive values.*[398]
- ***Basin Goal:*** *Reduce agricultural water shortages.*
  - ***Measurable Outcomes:*** *Identify multipurpose storage projects and methods that address the annual 100,000 acre-feet agricultural shortage.*
  - ***Short Term Needs:*** *Expand the storage capacity in existing reservoirs.*[399]
- ***Basin Goal:*** *Secure growing water demand by developing in-basin supplies and expanding raw water storage supply.*[400]
- ***Basin Goal:*** *Expand regional cooperation efforts to improve efficiency, provide water supply flexibility, and enhance environmental and recreational amenities.*
  - ***Long Term Needs:*** *Expand scope of smaller water providers to proceed on needed water storage projects as multi-beneficial projects.*[401]

Lake San Cristobal near Lake City is the second largest natural lake in Colorado.

The goals and actions the basin roundtable identified are consistent with statewide themes: addressing multiple beneficiaries through implementation of multipurpose projects and exploring multiple types of storage projects including new storage and rehabilitation of existing projects. The roundtable also discussed the role of storage across the different regions of the basin; it identified storage as a solution to regional concerns, and identified specific proposed projects as a solution to water supply concerns by region.

Gunnison Basin

The Gunnison Basin Roundtable identified a set of basin goals and a set of statewide principles. In discussion of these goals and principles, the roundtable identified storage in established processes as a way to achieve basin goals, and as a measurable outcome for implementation. As a result of conversations with water providers and proponents within the basin, the roundtable also compiled an extensive list of proposed projects, methods, and basin needs. Many of these specifically identified projects and methods include a storage component.

The primary goal the roundtable identified is to "Protect existing water uses in the Gunnison Basin."[402] Complementary basin goals seek to improve water supplies to reduce municipal, industrial, and agricultural shortages. In proposed processes to achieve these goals, the roundtable identified a common action item:

- *Recommend potential solutions in collaboration with local water users. Recommendations could include an initial analysis of hydrology (water variability), cost, financing, and permitting. Such projects could include new storage, water right exchanges, efficiency measures, operational optimization, etc.*[403]

The roundtable also identifies the benefits of projects and methods that meet multiple objectives. Basin measurable outcomes also directly address implementation of multi-purpose storage projects, geared to exploration of the beneficial relationship between agricultural and environmental and recreational water uses:

- *Complete at least five new multi-purpose water projects, including two storage projects, in the Gunnison Basin by 2025 that demonstrate the beneficial relationship between agricultural, environmental, and recreational uses.*
- *Explore and develop recommendations on alternative sources of funding from recreational users within the Basin to support development of those multi-purpose water projects.*[404]

Similar to the Colorado Basin Roundtable, the Gunnison Roundtable identified situations in which storage is a part of the solution to regional water supply challenges, and highlighted the role of storage in addressing environmental and recreational needs.

North Platte Basin

The North Platte Basin Roundtable also focused on the role of storage in meeting identified basin goals, most noticeably through measurable outcomes. The BIP focuses on maximizing the beneficial water use in the North Platte Basin within the limitations of the Equitable Apportionment Decree and the Three State Agreement.[405] The roundtable proposed an action item to meet this goal, with a storage component:

- *Recommend potential solutions in collaboration with local water users. Recommendations should include an initial analysis of hydrology (water availability), cost, financing, and permitting. Solutions will include storage and supplemental supplies (e.g. augmentation plans) to mitigate late season shortages.*[406]

The roundtable identified three measureable outcomes associated with this basin goal, which include development of projects and methods, as well as a numerical acre-feet goal for storage:

- *Develop three projects from the list of recommended solutions by 2020.*
- *Incrementally bring up to 17,000 additional acres under irrigation by 2050.*
- *Develop 37,000 AF of additional storage (doubling of current storage) by 2050.*[407]

Projects the basin roundtable identified include an array of solutions including "both structural solutions such as reservoirs and irrigation ditches, and nonstructural solutions such as protocols for the Colorado Division of Water Resources (storage, irrigated acreage, irrigation season)."[408] The list of proposed projects, methods, and actions the roundtable provided include a compilation of project summaries, some of which include a storage component.

Rio Grande Basin

The Rio Grande Compact affects the implementation of storage within the basin, limiting storage potential in post-Compact reservoirs. The Rio Grande Basin Roundtable identified a series of basin goals, some of which directly involve the development of storage, and also highlight the importance to the roundtable of multipurpose projects and methods:

- *Operate, maintain, rehabilitate, and create necessary infrastructure to meet the Basin's long-term water needs, including storage.*
- *Support the development of projects and methods that have multiple benefits for agricultural, municipal and industrial, and environmental and recreational water needs.*[409]

The Rio Grande BIP discussed a multi-pronged approach to storage concerns, including the rehabilitation of existing reservoirs, augmentation of water sources, and acquisition of storage or recharge necessary to replace well pumping depletions.[410] Aquifer sustainability is a primary concern within this basin, and the roundtable described declining levels of aquifer storage as a major need to be addressed with projects and methods within the BIP. The basin roundtable identified 29 primary projects and methods which are examined in further detail in Project Fact Sheets. Of those 29 projects, 14 address the first basin goal relating to storage, and 24 address the basin goal relating to the implementation of multipurpose projects.[411]

South Platte Basin (Including Metro)

The South Platte and Metro Roundtables collaborated on this BIP, which emphasizes the importance and benefits of multipurpose projects, and advocates for balanced approaches to the implementation of storage projects. In the list of elements needed to address South Platte water supply challenges, the roundtables emphasize the role storage must play in meeting current and future needs through this specific action:

- *Promote multi-purpose storage projects that enhance other South Platte basin solutions.*

The roundtables established a list of "South Platte Solutions" which seek to provide the water needed for current and future uses. The solutions are categorized into three groups, one of which addresses storage:

- *Supply development involving new storage and conveyance systems and investigating, preserving, and developing Colorado River options.*

With regard to this solution, the roundtables developed two goals that directly address the implementation and development of storage. These goals are supported by associated measurable outcomes, noted below.

- ***IPP Implementation***
  - ***Goal:*** *Bring a high percentage of entries in the updated IPP list on-line as a key strategy consistent with the "no/low regrets" scenario planning approach.*
  - ***Measurable Outcome:*** *Maximize implementation of the updated IPP list.*
  - ***Environmental and Recreational Measurable Outcome:*** *Encourage multi-purpose projects that also provide environmental and recreational considerations.*
  - ***Environmental and Recreational Measurable Outcome:*** Foster opportunities to improve environment and recreation conditions of affected watersheds in association with IPPs.
- ***South Platte Storage and Other Infrastructure***
  - ***Goal:*** *To the extent possible, develop multipurpose storage, conveyance, system interconnections and other infrastructure projects to take advantage of limited remaining South Platte supplies and enhance water use efficiencies and supply reliability.*
  - ***Measurable Outcome:*** *Explore opportunities to maximize yield from additional South Platte Basin strategic and multipurpose storage and other infrastructure including collaborative interconnections between water supply systems and including both above ground and groundwater (e.g. ASR and alluvial recharge) storage.*
  - ***Environmental and Recreational Measurable Outcome:*** *Encourage multipurpose projects that provide environmental and recreational considerations.*
  - ***Environmental and Recreational Measurable Outcome:*** *Take into consideration environmental and recreational attributes when considering Storage and Other Infrastructure projects and methods.*

These themes, goals, and measurable outcomes reflect the ongoing statewide discussion regarding storage. The roundtable emphasized multipurpose projects and the implementation of varied storage options, including implementation of new projects, maximization of yield from existing projects, and the incorporation of ASR and alluvial storage strategies.

Southwest Basin

In its BIP, the Southwest Basin Roundtable established seven primary themes, and 21 total goals to address those themes. The roundtable also identified 31 measurable outcomes, many of which relate to the implementation of IPPs that may have a storage component. The Southwest Roundtable also expressed support for multipurpose projects "when possible and when they can be accomplished in a manner that is protective of the values present."[412]

The first theme identified by the roundtable is "Balance all Needs and Reduce Conflict" is, with the following goals and measurable outcomes related to the implementation of IPPs:

- ***Goal:*** *Pursue a high success rate for identified specific and unique IPPs to meet identified gaps and to address all water needs and values.*
- ***Goal:*** *Support specific and unique new IPPs important to maintaining the quality of life in this region, and to address multiple purposes including municipal, industrial, environmental, recreational, agricultural, risk management, and compact compliance needs.*
- ***Goal:*** *Implement multi-purpose IPPs (including the creative management of existing facilities and the development of new storage as needed).*

These goals address identified gaps by seeking IPP implementation, with a focus on projects that serve multiple purposes and multiple uses. Measurable outcomes for the basin also focus on a quantified goal for implementation:

- ***Measurable Outcome:*** *Complete 27 multipurpose IPPs to meet identified gaps.*
- ***Measurable Outcome:*** *Complete 40 IPPs aimed at meeting municipal water needs.*

Through public and stakeholder outreach, the Southwest Basin Roundtable also compiled a list of projects and methods, many of which feature a storage component. The BIP details some of these projects, and provides project information and the water supply needs they will address.

Yampa/White/Green Basin

The Yampa/White/Green Basin Roundtable begins by addressing the relative underdevelopment of the basin drainages in as comparison to other basins within the state. Storage in the Yampa/White/Green area is limited, and the majority of existing storage serves current municipal and industrial needs.[413]

The roundtable adopted eight goals and associated measurable outcomes to meet current and future YWG Basin needs. Two of those goals directly address the role of storage within the basin:

- *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.*[414]

The roundtable established a series of processes to accomplish these two goals, and outlined measurable outcomes as benchmarks for each goal moving forward. Processes include identification of basin infrastructure that requires improvement or replacement, identification of potential locations for small scale water storage projects, and opportunities for collaborative partnerships for improvements with multiple benefits.[415] Given the existing and proposed storage options within the basin, the roundtable also plans to complete modeling to evaluate storage operations and explore contracting possibilities. Basin measurable outcomes with a potential storage component include:

- *Implement at least one project every year in the YWG Basin focusing on the restoration, maintenance, and modernization of existing water infrastructure.*
- *Administration and infrastructure improvements making decreed amounts of water available to diversion structures with less need for seasonal gravel dams in the river.*[416]

The Yampa/White/Green Roundtable also compiled a summary of current IPPs, several of which have a storage component. IPPs are identified by location, proponent, and primary purpose of project, though consideration is given to potential multiple benefits and to uses of each project or method.[417]

TABLE 6.5.3-1 NO-AND-LOW-REGRETS ACTION PLAN SUMMARY TO IMPLEMENT AND ASSESS STORAGE AND OTHER INFRASTRUCTURE

COMPLETED AND ONGOING ACTIONS	POTENTIAL FUTURE ACTIONS
• Identify needed storage	1. Manage and Develop Strategic Storage and Infrastructure a. Identify storage and other infrastructure opportunities through BIPs b. Manage and improve storage and infrastructure to effectively use conserved water c. Prepare for uncertainty in hydrology and climate change d. Explore and implement ASR e. Explore and implement storage and other infrastructure to support meeting Colorado's compact obligations 2. Identify and Prioritize Multipurpose Storage and Infrastructure Opportunities a. Manage and improve storage, infrastructure, and reservoir operations to benefit environmental and recreational values b. Support basin roundtables in identifying feasible multipurpose projects c. Prioritize implementation of multipurpose projects that meet values of the Colorado Water Plan d. Identify partners for permitting, funding, and constructing multipurpose projects e. Manage and improve storage, infrastructure, and reservoir operations to benefit agriculture f. Manage and improve storage, infrastructure, and reservoir operations to benefit M&I uses g. Manage and improve storage, infrastructure, and reservoir operations to support hydropower production 3. Analyze Infrastructure Needs for Storage of ATM water a. Analyze existing storage and infrastructure for opportunities to increase exchange capacity b. Develop water-quality treatment infrastructure c. Manage and improve agricultural storage and infrastructure, including support of single-purpose projects as needed

IBCC No-and-Low-Regrets Storage Actions and Strategies

The IBCC has defined storage and other infrastructure as a critical cross-cutting topic. Storage can help water users maximize supplies by re-timing water availability. This allows users to capitalize on average and wet years, and may increase the possibility of sharing water resources when possible. Storage and infrastructure are also important for minimizing agricultural losses, maximizing the use of conservation and reuse savings, and allowing for additional new supplies. In addition, storage can play a critical role in supporting the environment, particularly in support of endangered- and threatened-species recovery programs. Moreover, storage is an important element in protecting Colorado's interstate water rights, pursuant to the State's compacts and equitable apportionment decrees.

As Colorado plans for its water future and looks ahead to a projected 2050 supply gap, it will need new storage and infrastructure to share, transfer, store, and convey water for the benefit of all. Additionally, the State should explore new opportunities for existing storage and infrastructure to provide maximum utilization for all purposes and to ensure compact compliance.

STORAGE GOALS AT A GLANCE

The **IBCC No-and-Low-Regrets Action Plan** identifies a goal of **80 percent yield** of IPP implementation.

This equates to **70,000 acre feet** of additional yield per year for the western slope and **280,000 acre-feet** of additional yield per year for the eastern slope.

This goal is based on implementation of IPPs as enumerated in SWSI 2010 and **does not include** additional projects and methods identified by roundtables during the BIP process.

While this section discusses new storage, it is not meant to include storage that would increase transbasin diversions. Therefore, this section does not include concerns related to new-supply development.

6.5.4 MAINTENANCE OF EXISTING PROJECTS AND METHODS

New projects and methods will be critical to Colorado's ability to meet its water supply needs. However, existing infrastructure and currently operational projects and methods require maintenance and upkeep, which are equally important to bringing new methods online. In evaluating funding mechanisms for future projects, many proponents will include operations and maintenance costs within the proposed budget. Many federal projects include maintenance costs in repayment contracts, or associate costs with power revenues. Many municipal projects pass maintenance costs on to the ratepayer. Funding mechanisms through entities such as the CWCB, as Section 9.2 discusses, are available for costs associated with maintenance, repair, and improvements.

Every BIP includes goals to modernize water infrastructure or improve agricultural efficiencies. Through the BIP process, many basins also identified operations, maintenance, and improvements as part of their plan for future needs. For example, 10 of the North Platte Basin's projects identified ditch and diversion improvements as their primary benefit. In these agriculturally focused basins, improvements to conveyance systems will be of high importance when planning for future needs.[418] The Gunnison Basin Roundtable classified 22 projects as storage improvements and expansion—which either maintain existing reservoirs or plan for more storage.[419] Similarly, the Colorado Basin listed many projects associated with storage expansion, as well as plans for improving or updating existing municipal infrastructure.[420] In this manner, the basins are preparing for new projects and methods while maintaining the existing supply systems.

Working on ultraviolet oxidation reactors at the Peter D. Binney Purification Facility. The reactors help remove substances such as pharmaceuticals and personal care products, part of the multibarrier treatment process used before water reaches Aurora residents. Courtesy of Havey Productions.

ACTIONS

Colorado's Water Plan sets a 2050 measurable objective to attain 400,000 acre-feet of innovative storage in order to manage and share conserved water and the yield of IPPs. This objective equates to an 80 percent success rate for these planned projects, as stated in the IBCC's No-and-Low Regrets Portfolio.

While the right to buy or sell private property water rights must not be infringed upon, the State will encourage innovation and creativity by agricultural producers and research institutions to maximize the productivity of every drop of water. Colorado's Water Plan sets an objective that agricultural economic productivity will keep pace with growing state, national, and global needs, even if some acres go out of production.

To support projects and methods that meet future municipal, industrial, and agricultural needs, several next-steps are necessary.

1. **BIP project support:** The CWCB will continue to support and assist the basin roundtables in moving forward the municipal, industrial, and agricultural projects and methods they identified in their BIPs. It will accomplish this through technical, financial, and facilitation support when a project proponent requests it.
2. **Climate change incorporation:** The CWCB will work with the basin roundtables and, upon request, work with project proponents, to incorporate the potential effects of climate change on municipal, industrial, and agricultural projects and methods.
3. **Expansion of projects to be multipurpose:** The CWCB will prioritize funding to the basin roundtables to support an integrated approach to understanding the ways in which environmental and recreational projects and methods may interact with municipal, agricultural, and industrial projects and methods. As part of this task, basin roundtables will work with local stakeholders and project proponents to explore multipurpose projects and convert existing and planned single-purpose projects and methods into those that are multipurpose.
4. **Project tracking:** In partnership with the basin roundtables, the CWCB will continue to track municipal, industrial, and agricultural projects and methods.
5. **Project support:** The CWCB will continue to support and implement State programs that contribute to implementing municipal, industrial, and agricultural projects and methods. These include loan and grant programs, as well as ongoing studies, such as
the SWSI.
6. **Project funding:** As Section 9.2 discusses, the CWCB will work with partners to strengthen funding opportunities for municipal, industrial, and agricultural projects and methods by:
    a. Coordinating current funding
    b. Assessing funding needs
    c. Exploring additional funding opportunities
7. **Storage opportunity assessment:** As part of the next version of SWSI, the CWCB will work with the DWR and local partners to assess storage opportunities to determine where existing storage can and should be expanded, where it is needed to prepare for climate change, where it can help to better improve sharing and use of conserved water, and where it can help meet Colorado's compact obligations. Furthermore, the CWCB will provide financial support to technical and practical innovations in the use of aquifer storage and recharge where it is practicable.
8. **Multipurpose project funding:** The CWCB will prioritize support for multipurpose projects and those that modernize, make more efficient, or lead to the building of new critical infrastructure for agriculture purposes, M&I uses, and hydropower production. Section 9.2 explores these programs.
9. **Permitting:** As Section 9.4 discusses, the CWCB will refine the permitting process to make it more effective and efficient.

10. **Technical and financial support of efforts to understand impacts to agricultural viability:** The CWCB and IBCC will work with stakeholders to provide grassroots-level support for efforts that foster a greater understanding of the effects of reductions in agricultural use on communities.

11. **Facilitation of agricultural opportunities:** The CWCB and the CDA will establish an education and assistance program for farmers and ranchers to help realize more transactions that allow for ATMs, and to enable new Colorado farmers to successfully enter the agricultural industry. This assistance may include financial and other support for land links, land trusts, and conservation easements that protect working farmland and make irrigated land affordable for the next generation of farmers and ranchers. The CWCB will need to create the program's scope of work, goals, geographic range, and responsibilities, in addition to measurements for success. Because many aspects of the program relate to agreements between municipalities and agricultural producers, the CWCB should involve both sectors in the development of the program, and should provide continued input.

12. **Enforcement of minimum standard for water-rights applications:** The court should be diligent in enforcing the minimum water-rights application requirements, which are already in existence, and should standardize these requirements statewide. Better guidance for applicants who do not have legal counsel or engineering consultants should be provided and advertised.

13. **Framework for evaluations of agricultural transfers:** The CWCB will develop a technical and legal framework for an evaluation of agricultural transfers before considering the requirement of such an evaluation. To help produce such a framework, the CWCB will host a stakeholder group, which will include local government, agricultural producers, municipalities, water providers, landowners, and environmental interests.

14. **Update and improve Colorado's aging agricultural infrastructure:** Over the next five years, the CWCB will work with the basin roundtables and agricultural partners to further identify and prioritize aging infrastructure projects, especially where there can be a large effect on or multiple benefits to other sectors. The CWCB will coordinate funding opportunities to address these needs.

15. **Encourage ditch-wide and regional planning:** Over the next two years, the CWCB will work with agricultural partners to explore opportunities to conduct ditch-wide and regional planning, such as the planning that is occurring in the Uncompahgre. These plans will explore system-wide conservation and efficiency opportunities, explore the potential for water sharing, and develop a long-term infrastructure-maintenance and upgrade plan.