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U.S. Bureau of Reclamation Denver Colorado
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Development of Water Marketing Strategies for the Northeast Colorado Water Cooperative

December 31, 2022



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List of Abbreviations

AF	Acre-foot or acre-feet
ATM	Alternative water transfer method
cfs	Cubic feet per second
CWCB	Colorado Water Conservation Board
CWSA	Collaborative water sharing agreement
GRC	Grant Review Committee
LSPWCD	Lower South Platte Water Conservancy District
NECWC	Northeast Colorado Water Cooperative
PVWP	Platte Valley Water Partnership
PWSD	Parker Water and Sanitation District
Reclamation	U.S. Bureau of Reclamation
SEO	State Engineer's Office
SPBIP	South Platte Basin Implementation Plan
SPROWG	South Platte Regional Opportunities Water Group
SWSP	Substitute water supply plan
URF	Unit response function
WSRF	Water Supply Reserve Fund

Executive Summary

Introduction to the NECWC

The Northeast Colorado Water Cooperative (NECWC) was created in 2014 by water users along the South Platte River in northeastern Colorado. It currently has 22 member organizations. The NECWC was intended to be a water management organization that would help District 1 and 64 water users fill periodic and long term supply shortages through infrastructure development and water marketing.

The NECWC developed a vision for short- and long-term services it intended to provide to its members:

- **Short-term services:** The NECWC would coordinate the lease, exchange, and retiming of unused recharge credits from members with periodic available supply to members with periodic shortages.
- **Long-term services:** The NECWC would explore working with partners to incorporate existing and new infrastructure in developing new unappropriated supplies, along with potentially integrating Alternative Transfers Methods and other available supplies.

The objective of the NECWC is to preserve and enhance water supply and economic security for its members and for the lower South Platte River basin

Technical and Legal Analyses Guided the Initial Direction of the NECWC

Using Colorado Water Conservation Board grants and matching funds from members, the NECWC studied technical and legal aspects of short- and long-term services it intended to provide, and it reached the following conclusions:

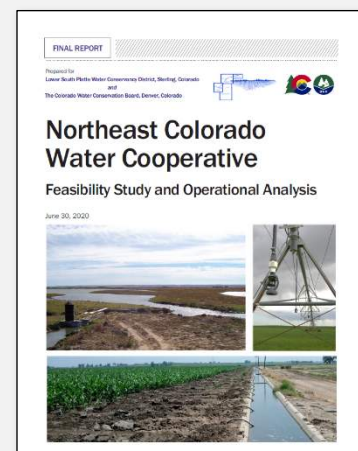
- Member-to-member transactions of unused recharge credits can be conducted, but ensuring that future projected credits could be exchanged to locations of demand is difficult.
- Augmentation plans could use long-term recharge credits and flexible short-term supplies.
- Infrastructure is needed to better manage water supplies available to District 1 and 64 water users.
- Partnerships are needed to help implement and finance multi-purpose infrastructure.

Key takeaways from NECWC analyses:

- Infrastructure is needed to better manage supplies
- Partners are needed to help implement and finance multi-purpose infrastructure

Detailed reports documenting the organizational and operational analyses that were foundational to the formation and implementation of the NECWC can be obtained from the Lower South Platte Water Conservancy District via their website at:

http://www.lspwcd.org/index_files/Page313.htm



Outreach Has Been Critical to Getting Feedback and Forming Partnerships

A multi-pronged outreach and communications plan was used to investigate and develop partnerships that could help the NECWC provide its contemplated services while meeting the needs of others.

The outreach and communications plan considered approaches for communicating with three different groups:

- **NECWC members:** Current members of the NECWC need to be aware of and provide feedback on evolving partnership discussions.
- **Local water users that are not members:** Several augmentation plans and other water users in Districts 1 and 64 have expressed interest in the NECWC, and new infrastructure or partnerships could be beneficial to these users.
- **Regional partners:** Multi-benefit partnerships with water providers and users that operate outside of District 1 and 64 could provide benefits to both local and non-local water users. Regional partners could help fund relatively large infrastructure projects to manage new water supplies.

The outreach activities resulted in a significant regional partnership in the Platte Valley Water Partnership (PVWP) – an infrastructure project that will provide tangible benefits to NECWC members and District 1 and 64 water users as well as for Parker Water and Sanitation District’s (PWSD) municipal water users. In addition, the NECWC has been participating in the development of another regional partnership named the South Platte Regional Opportunities Water Group (SPROWG). The SPROWG concept represents an innovative multi-benefit project to provide supply for future municipal demands while preserving and enhancing irrigation in the South Platte River basin.

Several key observations and conclusions were identified during the overall outreach and communications process:

- Maintaining consistent and honest communication with NECWC members was critical for maintaining trust and providing sound feedback on the path forward.
- Regional partnerships are successful when all of the parties involved need water and derive benefits from the partnership.
- Regional partnerships need motivated proponents. The need for water and a specific timeline for the need is an important motivator that can drive a sense of urgency to create a successful partnership.
- Successful regional partnerships can occur when communication is clear and critical underlying principles are understood and maintained by all partners.

Outreach conclusions:

- Consistent communication builds trust and fosters sound feedback from stakeholders
- All participants should benefit from partnerships
- Successful partnerships need motivated proponents and a sense of urgency
- Important operating principles should be understood

Partnerships were Informed by Technical and Legal Analyses

Technical and legal analyses were conducted to support the scoping of and planning for facilities that could foster water marketing.

Technical analyses focused on

- Infrastructure that could support regional partnerships
- Agricultural infrastructure that could benefit irrigators in a regional partnership

Legal analyses focused on

- Issues that should be investigated when considering water planning and marketing efforts with respect to different sources of water supply

The technical and legal analyses suggested the following:

- **Infrastructure is critical for regional water marketing strategies and partnerships.** Supplies from senior agricultural water rights in a regional water marketing program are only available during the irrigation season and would be derived from a wide variety of geographic locations. Supplies for a regional marketing program would need to be exchanged upstream, because farms potentially involved in a program are generally downstream of their municipal partners. Storage is critical for delivering agricultural supplies when exchanges need to be conducted, especially during droughts when exchange capacity is limited.
- **Agricultural water users would benefit from multiple, flexible strategies to deliver supplies.** Several key conclusions include:
 - **Recharge is key to sustainable pumping:** Long-term recharge credits can provide a reliable source of supply to augment stream flow depletions from irrigation well pumping.
 - **Varied recharge time between sites can help maximize benefits:** A variety of recharge sites with long and relatively short return times provides both on-demand augmentation credit and sustained credit during droughts
 - **Flexible delivery options can maximize benefits:** Deliveries directly to the river and to recharge ponds can be strategically combined to create a dependable, base supply of recharge credits as well as direct supplies when needed by irrigators.
 - **Distributed site locations can ease river bottlenecks:** At various times in the year, certain diversion structures can create bottlenecks that limit exchanges. Recharge sites distributed in different reaches can provide recharge credits at critical locations.
- **Legal analysis and related planning are important aspects of both the marketing and use of available water sources.** Although a potentially transferred water source can be physically available at times, legal and physical restraints may pose challenges to the actual use of the water by an end user at the time and/or location that the water is needed. Such restraints could include limitations in the decrees for the water sources involved or other physical limitations concerning movement of water either up or downstream.

Stakeholders Identified Considerations for Administrative and Management Tools

Several considerations arose during discussions with the NECWC board and members, local water users, and regional partners that need to be considered and incorporated into administrative and management tools that facilitate and foster water marketing. The considerations focused on partnering agreements for use of existing infrastructure, the development of new infrastructure, and water accounting methodologies.

<p>Foundational considerations</p>	<ul style="list-style-type: none"> – Infrastructure is needed before Alternative Transfer Methods (ATMs) can be considered as a significant source of water supply. – Identifying the types of water that can and cannot be managed with project infrastructure is critical. – The agreements for how infrastructure is used will influence a water marketing framework. – Rules of engagement are important when considering third-party participation. – Decision making processes need to be defined.
<p>Considerations for Using Existing Infrastructure</p>	<ul style="list-style-type: none"> – Existing uses of infrastructure and the degree to which existing operations can or cannot be altered. – Costs for improvements to existing infrastructure to accommodate new uses and how those costs are paid. – Costs for operations associated with new uses and how those costs are paid.
<p>Considerations for Building New Infrastructure</p>	<ul style="list-style-type: none"> – How to pay for design, permitting, construction, operation, and maintenance of new infrastructure. – Ownership of new infrastructure. – Coordinated operations of new infrastructure.
<p>Water Accounting Considerations</p>	<ul style="list-style-type: none"> – Accurate water accounting is a critical need for tracking water transactions in a water market, complying with water right decree terms and conditions, and providing transparency. – Water accounting tools will need to consider a variety of infrastructure, water transactions, and methods of delivery. – Water accounting tools can be useful for operations and planning and would likely need to obtain and share data on a real-time basis.

Several Funding Strategies for Infrastructure are Available

Municipal and agricultural water providers/managers have a variety of alternatives available to them to fund infrastructure projects. It is likely that they would use a combination of alternatives to fund the permitting, design, construction, operation, and maintenance of a large infrastructure project. It is also likely that the funding strategies may vary depending on the different stages of project development.

Financial challenges were a primary reason that the NECWC has sought regional partnerships with large water providers that have the financial capacity to fund projects.

- **Municipal funding alternatives** include user fees, system development fees, reserve funds, mill levies, and bonding
- **Agricultural funding alternatives** available to water conservancy districts include reserve funds, mill levies, bonding, user fees, allotments, and water transfers to municipal partners
- **State and federal grants and loans** are outside sources of funds that could be used for water marketing and infrastructure development.

The NECWC has Pursued Partnerships

Analyses of the NECWC pointed to the need for infrastructure and financial partners to fully realize the benefits that could be derived from additional resources to manage water supplies. Upon reaching the conclusion that both infrastructure and financial partners are needed, the NECWC began and has continued to pursue partnerships with entities that could help them develop water supply projects that benefit all participants.

The Platte Valley Water Partnership

The PVWP concept was originally pursued by PWSD and the NECWC as a multi-benefit project that could provide municipal supplies to PWSD while providing irrigation and municipal supplies to District 1 and 64 water users. As partnership discussions evolved, the NECWC board and members concluded that the Lower South Platte Water Conservancy District (LSPWCD) should engage in the PVWP on behalf of District 1 and 64 water users (which includes the NECWC membership). The LSPWCD and PWSD are equal partners in the PVWP. An application for water rights associated with a water supply project is currently being pursued by PWSD and LSPWCD. This project will provide tangible benefits to water users in Districts 1 and 64, and is an important result of the NECWC's work.

The LSPWCD will continue working in partnership with PWSD on the PVWP, which will provide benefits to NECWC members and District 1 and 64 water users as a whole.

South Platte Regional Opportunities Water Group

In 2015, a group of Front Range water managers began exploring strategies for advancing the conceptual in-basin multipurpose water supply project. To further develop these concepts, the Colorado Water Conservation Board (CWCB) provided a grant to fund additional research to build on the work of Front Range water managers and others. The goal of the SPROWG concept is to provide a long-term average of at least 50,000 acre-feet of water annually (less in average and wet years, more in dry years) to meet part of the municipal and industrial water supply gap and also supply additional water for agricultural users in the South Platte River Basin.

The NECWC will continue to participate in the development of the SPROWG concept and evaluate regional partnerships that could result.

A Water Marketing Strategy was Developed by the NECWC

The NECWC's water marketing strategy rests on a variety of critical concepts that needed to be established before it can be feasible and transactions can take place. These concepts form the foundation of the water marketing strategy implementation plan, rules and requirements, agreements, and monitoring plan. The foundational concepts are described below for each of the water marketing strategy elements.

The water marketing strategy for the NECWC consists of several critical concepts that are foundational to developing and implementing a water market. Outreach with local and regional partners will be important for continued development of a water market and infrastructure needed to facilitate transactions.

<p>Implementation Plan</p> <p><i>(Steps needed to implement a water marketing strategy)</i></p>	<ol style="list-style-type: none"> 1. Establish relationships and partnerships 2. Establish conceptual rules and requirements for water marketing 3. Focus on water transactions that benefit all parties 4. Establish agreements 5. Create a governing body 6. Develop infrastructure to enable water marketing 7. Establish communications protocols and plans 8. Monitor transactions and deliveries
<p>Rules and Regulations</p> <p><i>(Measures that uphold the values of participants and foster market activity)</i></p>	<ul style="list-style-type: none"> – Infrastructure cannot foster permanent buy-and-dry – Water marketing activities cannot injure existing water rights – Water marketing activities cannot impact return flows – Local impacts of water marketing should be dispersed – Rules for distributing supplies should be developed – Third party participation should be considered – Rules for affordable and adjustable water pricing are needed
<p>Needed Agreements</p> <p><i>(Agreements needed to create and operate a water market)</i></p>	<ul style="list-style-type: none"> – Charter or Memorandum of Agreement – Project Development and Operating Agreement – Use of Existing Infrastructure – Development and Use of New Infrastructure – Delivery Agreements

The NECWC will Continue to Play an Important Role in the Future

Through the NECWC's work, water marketing challenges and solutions were identified. The solutions focused on the development of infrastructure and partnerships that could foster water marketing activities and provide water security to irrigators and municipal water users in Districts 1 and 64. While the partnerships were the result of the NECWC's work, the NECWC may play an important but indirect role in their implementation.

The NECWC board and members have identified a new path forward for the organization in light of the accomplishments over the last several years:

1. **NECWC members integrate into LSPWCD operations:** Members of the NECWC that are located within LSPWCD boundaries can benefit from the PVWP project and those NECWC members outside the LSPWCD boundaries can be included to receive benefits. Many of the water supply benefits contemplated by the NECWC can be provided to members through the PVWP.
2. **The NECWC board and membership will act as an advisor to LSPWCD:** The NECWC members and other lower South Platte River stakeholders recognize the collective knowledge and experience of the NECWC membership. The NECWC will advise the LSPWCD and the members in the future about the development and operation of the PVWP for the benefit of local agricultural water users.
3. **NECWC will actively participate in regional projects.** The NECWC will continue to seek other regional partnerships that could benefit its members. The SPROWG concept is a good example of a partnership that is still in early development but will be investigated and pursued by the NECWC.

Section 1

Introduction

The Northeast Colorado Water Cooperative (NECWC) is an organization that was created by water users along the South Platte River in northeastern Colorado. The overall objective of the NECWC is to preserve and enhance water supply and economic security for its members and for the lower South Platte basin as a whole. It was formed to create a framework for maximizing the beneficial use and reliability of agricultural water supplies and for fostering partnerships among local and regional water providers and users. The primary goals of the NECWC could be achieved by providing various services to its members, which include:

- Facilitating the temporary, short-term lease and exchange of available water owned by the members to other members with short-term demands.
- Providing a means for leasing the transferrable portion of senior water rights as an alternative to traditional “buy and dry” water transactions (known as alternative transfer methods [ATM] or collaborative water sharing agreements [CWSA]).
- Using existing infrastructure or building new infrastructure to help improve water use efficiency by its members.
- Developing new appropriations of storage or recharge for a variety of beneficial uses.
- Providing a central organization through which partnerships with local and regional water users can be established.

Maximizing the beneficial use of available water supplies is an important goal for water users in northeast Colorado. As discussed in Section 2.2, water supplies that have been the focus of the NECWC analyses include unused recharge credits, unappropriated water supplies, and senior water rights leased via ATMs.

Infrastructure is required to manage each of the water sources considered and make it available when needed. Also, each of the supplies potentially requires water court proceedings or other state approval to authorize use.

1.1 Geographic Focus Area

The focus area for the NECWC has been in the lower South Platte River basin between Greeley, Colorado and the Colorado-Nebraska state line. In addition, outreach with upstream water users to explore regional partnerships has been ongoing and will continue into the future. A map of these two general focus areas is shown in the figure below.

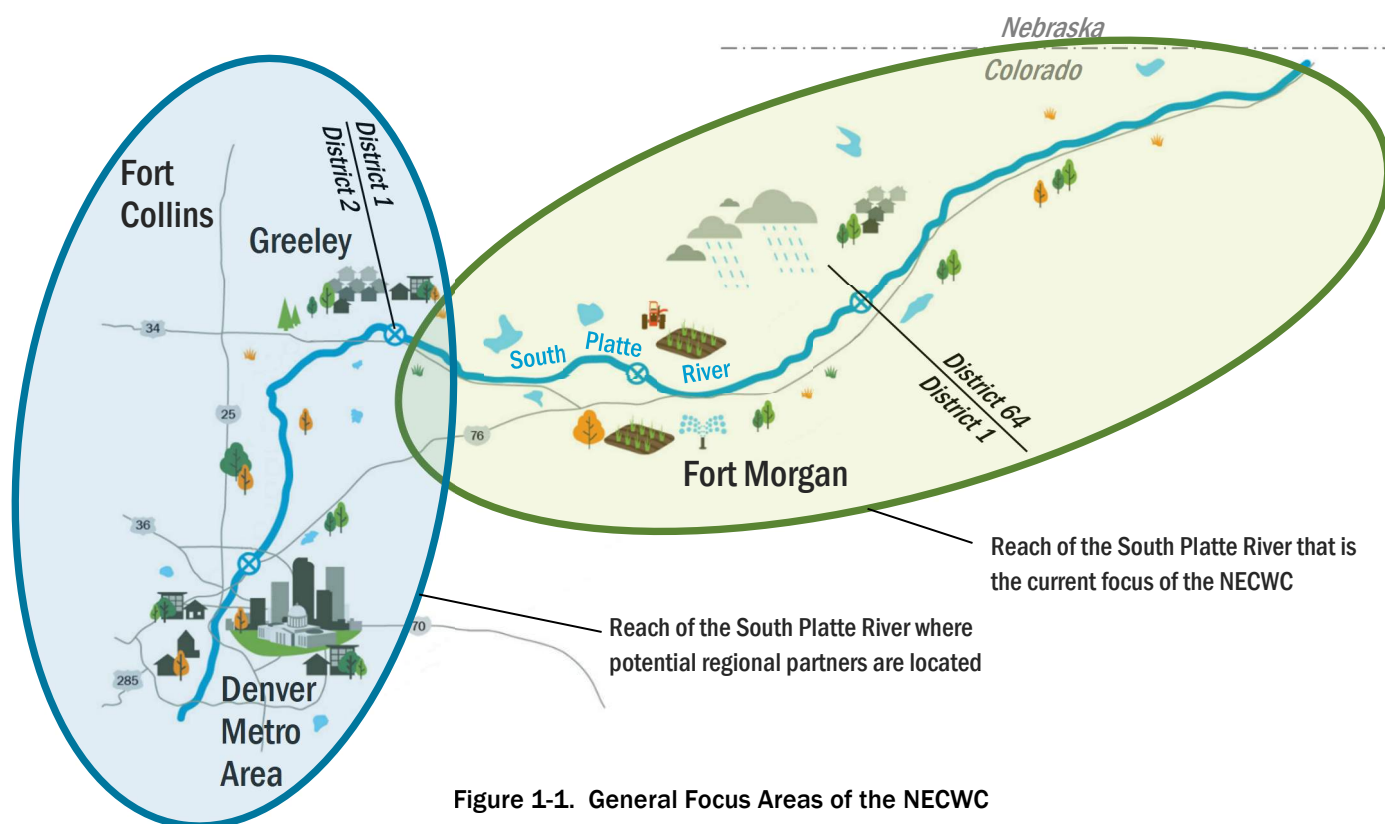


Figure 1-1. General Focus Areas of the NECWC

1.2 History of the NECWC

1.2.1 Early Discussions and Analyses

Mike Groves, an agricultural producer in the Fort Morgan area, identified a need to enhance the use and management of water supplies for the benefit of water users in the lower South Platte basin. In 2008, he brought together a small group of water users and consultants to begin discussing his creative vision and the possibility of developing a water management organization in the area of Water Districts 1 and 64¹ in the lower South Platte River. The water users were interested in creating a means for making unused recharge credits from one augmentation plan available to other augmentation plans that had a temporary or periodic need for additional replacement water. The water users met numerous times to discuss the availability of unused recharge credits and the research needed to explore the feasibility of the organization and to plan a path forward. Over time, these water users became known as the “Steering Committee.”

Preliminary analyses of unused recharge credits and the ability to exchange credits to locations of demand were conducted, and the potential to meet demands with unused recharge credits was deemed favorable. Subsequently, the Steering Committee decided that additional research and outreach to potential stakeholders and participants was warranted. The reader is referred to a report entitled “[Completion Report: Development of Practical Alternative Agricultural Water Transfer](#)

¹ Water Districts were developed by Colorado’s Division of Water Resources to aid in the administration of water rights. Each district has a Water Commissioner that oversees water rights administration (some Water Commissioners oversee multiple water districts).

[Methods for Preservation of Colorado Irrigated Agriculture](#)” (Colorado Corn Growers Association, et al., 2011) for more information on the technical and feasibility analyses of the NECWC (or “the potential Lower South Platte Water Cooperative” as referenced in the report).

During 2010, Steering Committee members met with numerous ditch and reservoir companies, irrigation districts, augmentation groups, and conservancy districts to discuss whether there was sufficient interest in developing a new water organization. Responses to the potential water organization were positive. To research and address issues raised during meetings with water users, the Steering Committee prepared a work plan to outline a course of action. The primary goals of the Steering Committee were to:

- Develop an organizational structure for the new organization
- Develop a detailed draft operational plan
- Request necessary funding to accomplish this work

The Lower South Platte Water Conservancy District (LSPWCD) has been the primary applicant for grant projects aimed at developing a proposed organizational structure and operational plan for the organization. In addition, several entities have expressed interest in, and have provided financial assistance to, the formation of the organization, including individual agricultural producers, augmentation plans, ditch companies, municipalities, and water conservancy districts (see specific list of collaborators presented in Table 1-1).

1.2.2 Formation of the NECWC

Research and outreach on the member organization was pursued as a result of the initial feasibility efforts and water user interest. As described in Section 1.3, a Water Supply Reserve Fund (WSRF) grant from the Colorado Water Conservation Board (CWCB) was used to conduct the outreach and research.

A Grant Review Committee (GRC) consisting of ten members (five from District 1 and five from District 64) was formed to oversee and contribute to the research for the new organization. The GRC took the place of the Steering Committee described above. The GRC met regularly during the course of the research projects to discuss results, collaborate on important organizational concepts and needs, develop communication strategies with stakeholders, and guide the overall process of forming the organization and developing operational strategies.

Based on the WSRF grant work, the GRC concluded that a cooperative would be the organizational structure that best fit the needs of the stakeholders. Through the WSRF grant work, organizational documents such as articles of incorporation, bylaws, and a business plan were developed. The cooperative was officially incorporated as the Northeast Colorado Water Cooperative on January 1, 2014. A summary of the organizational outreach and analysis findings is included in Section 2.

The business plan was a key organizational document. Written in late 2013, it describes a vision for the short- and long-term services that the NECWC intended to evaluate and provide to its members:

- **Short-term services:** The NECWC would provide several services in the short term to coordinate the lease, exchange, and retiming of unused recharge credits from members who at times have available credits to members who at times have a need for credits.

The 2013 business plan is a key organizational document that has guided the operational analyses and partnership building efforts of the NECWC.

- **Long-term services:** In the long term, the NECWC would explore and implement services to further maximize water uses in Districts 1 and 64 and potentially other parts of the South Platte basin.
 - **Unappropriated supplies:** The NECWC planned to research the historical timing and amount of unappropriated waters in Water Districts 1 and 64 and to utilize existing and new infrastructure to strategically divert and beneficially use such water to meet existing agricultural, municipal, industrial, and non-consumptive shortages for both members and non-members.
 - **ATMs:** The NECWC planned to research and potentially coordinate various means to conduct ATMs and facilitate the lease, exchange, and re-diversion of the transferrable portion of historical consumptive use water from both senior direct flow and reservoir water rights, while maintaining ownership of the agricultural water rights.
 - **Infrastructure:** The NECWC planned to investigate the need for utilizing existing infrastructure and building additional infrastructure to help improve water use efficiency by its members both for short- and long-term operations.

The vision described in the 2013 business plan guided the NECWC's operational analyses and efforts at developing local and regional partnerships.

Upon formation of the NECWC, a Board of Directors was established to oversee the organization on behalf of the members and to conduct additional research and outreach. Nine of the original members of the GRC were named as the initial Board of Directors during the first year of the cooperative. In May of 2015 the number of directors on the board was reduced to five persons. The LSPWCD is the current General Manager of the NECWC.

1.3 Financial Support

The NECWC has relied on financial support provided by the CWCB, contributions of NECWC members and interested stakeholders, and the U.S. Bureau of Reclamation. This section describes the funding used to create and implement the NECWC and to develop operational strategies.

1.3.1 CWCB Grants

The NECWC was investigated, created, and implemented using funding from WSRF and Alternative Agricultural Water Transfer Methods grants (or "ATM grant") from the CWCB. The objectives of each of the grants and their role in creating and implementing the NECWC are described below. The work associated with the grants is summarized in Section 2.

- **Lower South Platte Water Cooperative Organizational Analysis (WSRF grant):** The work under this grant primarily focused on the organizational analysis that informed the creation of the NECWC. The project also focused on operational considerations that contributed to the subsequent analyses in later grant projects.
- **Lower South Platte Water Cooperative, Operational Development of Alternative Agriculture Water Transfer Methods (ATM grant):** The work under this grant primarily focused on assembling foundational data sets that could be used for operational planning, developing operational strategies, and creating an accounting system. It also evaluated potential water rights issues, assessed economic aspects of ATMs, and investigated organizational issues. The grant work was completed in June 2020. The specific project objectives were to:

- Develop an operational plan that identifies water supplies (including direct flow and/or storage water transferred through alternative means, unused recharge credits, new junior water rights, etc.), demands, and the means and infrastructure needed to provide water when and where it is needed.
- Identify existing and potential infrastructure that could help increase the ability of the organization to match supplies with demands.
- Obtain feedback from stakeholders on the operational plan.
- Identify specific data, water measurement, and accounting needs and work with potential members on developing data transfer methods.
- Gain a general understanding of options for funding the new organization.
- **Northeast Colorado Water Cooperative Implementation (ATM grant):** The work under this grant focused on implementing the NECWC and investigating operational issues and strategies associated with the NECWC members. The work under this grant also was completed in June 2020 and consisted of three general phases as described below:
 - Engineering: The objective of the engineering phase was to evaluate the supplies, demands, and delivery strategies for the specific initial participants in the new organization.
 - Accounting: The objective of the accounting phase was to refine and implement an accounting system to track the movement of water among members of the new organization. Work on the accounting system involved acquisition and input of necessary data and information from participating augmentation plans, ditch companies, water providers, etc. and testing of the accounting system. The project team consulted with the Division Engineer to ensure that the accounting protocols were appropriate. Grant funds were also obtained to cover actual water accounting costs for the first year of operation.
 - Project Report: A project completion report was written and submitted to the CWCB.

Funds from both of the CWCB's ATM grants provided matching contributions for the NECWC's WaterSMART grant. The work under those grants was therefore incorporated into the overall WaterSMART grant effort. The completion report for the combined work associated with the ATM grants is included in Appendix A of this report.

1.3.2 Member Funding and Stakeholder Support

A wide variety of organizations in the lower South Platte basin and elsewhere provided matching cash, in-kind services, and consulting services during the WSRF and ATM grant work. Table 1-1 lists the collaborating organizations. The collaborating organizations were instrumental in contributing to the vision for the NECWC and the evolution of the organization.

The degree of stakeholder support for investigating and developing a water organization like the NECWC has been significant and is highly appreciated

Table 1-1. Collaborators that have Provided Cash and In-Kind or Consulting Services to the NECWC

*22 Ranch Limited Partnership	*Geisick Brothers Farms Augmentation	*North Sterling Irrigation District
*Baessler Farms	Groves Farms	*Northern Colorado Water Conservancy District
*Bijou Irrigation Company	Harmony Ditch Company	*Pioneer Irrigation Company
*Bijou Irrigation District	*H-R-R Farms Augmentation	*Prewitt Reservoir Operating Committee
Brown and Caldwell	*Jackson Lake Reservoir and Irrigation Company	*Putnam Ditch Company
CCII, LLC	*Jensen & Teague Augmentation	*Riverside Irrigation District
*Central Colorado Water Conservancy District	*Julesburg Irrigation District	*Riverside Reservoir and Land Company
*City of Sterling	*Logan Well Users	South Platte Ditch Company
*Colorado Corn Growers Association	*Lower Logan Well Users, Inc.	*Springdale Ditch Company
Colorado Division of Water Resources	*Lower Platte and Beaver Canal Company	*Sublette, Inc.
Colorado Open Lands	*Lower South Platte Water Conservancy District	*Upper Platte and Beaver Canal Company
Colorado State University	*Lowline Ditch Company	Vranesh and Raisch, LLP
*Deuel and Snyder Ditch Company	*Morgan County Farm Bureau	*Washington County
Dunn & Phillips LLC	*Morgan County Quality Water District	*Weimer Farms
*Ft. Morgan Reservoir and Irrigation Company	*Mowery Farms	*Weldon Valley Ditch Company

*Indicates collaborators that provided matching cash for ATM grants

1.3.3 WaterSMART Grant

The WaterSMART grant provided by the U.S. Bureau of Reclamation (Reclamation) is the final source of financial assistance that the NECWC has used to date, and it builds on the previous NECWC studies and analyses. The scope of work for the WaterSMART grant brought together all of the previous work and helped the NECWC identify a path forward that provides water security and value to water users in the lower South Platte River as well as regional partners. This report documents the results of the WaterSMART grant work and consolidates and leverages the work of previous grants.

The WaterSMART grant contract (Agreement Number R17AP00314) was issued in February 2019. The approach for the project was described in a Work Plan, which was issued April 8, 2019. The Work Plan is included in Appendix B. The objectives of the WaterSMART project, as summarized in the Work Plan, are presented below:

1. **Preliminary Work Funded Through Matching Funds:** This task is work that was funded by CWCB ATM grants and forms the foundation for the larger scope of work that was funded by the WaterSMART grant.

2. **Develop an Outreach and Partnership Building Plan:** The NECWC will engage local and regional stakeholders to encourage participation in the NECWC.
3. **Conduct Scoping and Planning Activities Related to Local and Regional Partnerships:** Numerous technical and legal research and planning efforts will be needed to support incorporation of new partners and integration with existing NECWC membership.
4. **Enhance Administrative and Management Tools:** Existing contract templates, corporate bylaws, and water accounting tools will be reviewed and enhanced, and new tools will be developed to accommodate additional stakeholders and to make the tools scalable.
5. **Develop Financial and Funding Strategies:** Research will be conducted on the financial structure of water transactions that encourage market activity, and strategies will be developed for enhancing the long-term financial sustainability of the NECWC.
6. **Develop a Water Marketing Strategy:** Consistent with the requirements of this WaterSMART grant funding opportunity, a water marketing strategy will be developed that incorporates the results of outreach and research and integrates the water marketing and implementation strategies developed during the course of the work.

When the Work Plan for the grant was developed, the NECWC contemplated that the services they intended to provide for members would come through the NECWC organization itself. However, as will be described in this report, a regional water supply project named the Platte Valley Water Partnership (PVWP) began to develop. The NECWC saw the PVWP as an opportunity to achieve many of the water supply goals that the NECWC sought to provide. The NECWC membership requested that the LSPWCD pursue the PVWP on their behalf and on behalf of water users in the lower South Platte basin. The NECWC discussed the shift in focus with Reclamation. The NECWC and Reclamation agreed that the tasks described in the Work Plan were still valid and necessary, but the focus could shift to reflect the emergence of the PVWP and the benefits it can to NECWC members (and others). As a result, the Work Plan and grant scope of work were not altered.

Section 2

Summary of Prior Work

The NECWC has conducted several studies and analyses that have been foundational to its objectives and have guided its evolution. As described in Section 1, the work was funded by grants from the CWCB and contributions from NECWC members and other stakeholders, and each grant project had specific organizational and operational study objectives. This section summarizes the approaches and conclusions of prior grant work.

Detailed reports documenting the approaches and conclusions of prior work described in Section 2 can be obtained from the LSPWCD via their website at http://www.lspwcd.org/index_files/Page313.htm

2.1 Organizational Analysis

The organizational analysis was initiated prior to the creation of the NECWC. It informed the type of organizational framework and the characteristics of the organization that were adopted when the NECWC was formed.

The objectives of the organizational analysis were to analyze and determine the best organizational structure for the NECWC and finalize the findings to the point of potential initiation of a water cooperative organization. Another objective of the analysis was to research and evaluate water law issues related to a water cooperative.

Research into appropriate organizational frameworks began with a fairly broad consideration of alternatives and factors that might be considered in evaluating different alternatives. The GRC firmly believed that the selection of an organizational structure should be guided and approved by the stakeholders who would eventually participate in the organization. As a result stakeholder meetings were held early in the evaluation process and GRC meetings were announced and open to stakeholder participation.

Following an initial screening process of organizational alternatives, the GRC consulted



with a corporation attorney who had worked with the Super Ditch². The attorney suggested that, given the flexibility needs of the organization, a for-profit organization might not be the best model. However, a cooperative formed pursuant to the then newly-passed Colorado Uniform Limited Cooperative Association Act could potentially work.

The GRC met several times and held a larger public meeting to gather broad water user input. Based on input from other organizations and stakeholders, several key goals were identified that needed to be met in forming an organizational structure:

- Membership criteria should be balanced, fair, and accessible for local water users.
- The organization should operate in a transparent manner so that water users can see how decisions are made.
- The board of directors criteria should be representative of members yet functional and effective.

After researching various organizations, talking with experts and members of other organizations, and obtaining input from stakeholders, the GRC determined that a cooperative seemed to be the organizational structure that best fit the criteria that had been developed.

2.1.1 Formation of the Organization

The GRC worked with a cooperative attorney to develop organizational documents and to consider issues such as qualifications for membership, defining “patronage” of the cooperative, conditions for leaving the NECWC, costs for membership, qualifications for the board of directors, size of the board of directors, types of membership, etc. The cooperative was officially incorporated on January 1, 2014.

Many of the foundational features of the NECWC are defined in its Articles of Incorporation and its Bylaws. These documents and features of the NECWC are described below.

- **Articles of Incorporation.** A cooperative may be a stock or membership cooperative, and the Articles of Incorporation provide the rights of the members. Those rights may include the right to vote, the right to be a member of the board of directors, and the right to distributions. NECWC’s Articles of Incorporation provide for two classes of membership stock, one with voting rights (Class A) and one without voting rights (Class B).
- **Bylaws.** A cooperative’s Bylaws are used by the cooperative’s board of directors and management team as the operational structure for the cooperative. Several components of the bylaws are described below.
 - **Membership qualifications.** All members, whether voting or non-voting, must patronize the cooperative and abide by the Articles of Incorporation, Bylaws, etc. The two main distinguishing characteristics for Class A voting members are that they own a decreed or pending application for an augmentation plan that includes water rights or a water recharge facility authorized by decree from a Colorado water court (not including persons who are individual shareholders, members or users of an entity with such a right, plan or facility) and that they have a principal office or residence located in either Water District 1 or 64.
 - **Board of Directors.** The next most important section of cooperative Bylaws includes the provisions for the board of directors. Nine of the original members of the GRC were named

² The Super Ditch is an organization of agricultural water users in Colorado’s Arkansas River basin that have sought to pool their water resources, make it available for lease to cities, and thus prevent municipal purchases of senior agricultural water rights and “drying up” historically irrigated lands.

as the initial board of directors during the first year of the cooperative. In May of 2015 the number of directors on the board was reduced to five persons.

- **Management.** The LSPWCD was hired, per a written services agreement, to operate the cooperative for the foreseeable future.
- **Membership Benefits.** The purpose of any cooperative business is to benefit the members of the cooperative, whether through services, purchasing power, for marketing and administrative services or, in the case of NECWC, for the efficient use of water owned by the members.

2.1.2 Water Law and Water Rights Considerations

The project team researched water law and water rights issues related to the goals of the organization to determine the best approach for achieving those goals and to evaluate items that might impact the organization or its members.

A primary goal of the organization is to provide a framework for more efficiently using unused recharge credits from decreed recharge water rights and augmentation plans. Numerous augmentation plan decrees were reviewed to identify common provisions (described below) related to end uses of unused recharge credits that might be applicable to NECWC's cooperative operations.

- Many decrees adjudicating recharge water rights allow for the lease of unused recharge credits to other water users for either short-term or long-term periods, subject to certain approval requirements. Generally, the person or entity leasing excess unused recharge credits must have an approved substitute water supply plan (SWSP) or plan for augmentation.
- Many decrees adjudicating plans for augmentation allow the plan owner to add more replacement sources to the augmentation plan, subject to notice and comment requirements concerning the water source to be added.

Several considerations were identified with respect to future activities related to water court as a result of research into water law and water rights issues and the provisions of the reviewed recharge water right and augmentation plan decrees.

- An area-wide augmentation plan could be developed to allow flexible use of unused recharge credits.
- Decreed exchanges could be used to move these credits to upstream facilities for better water management.
- New places of storage and recharge may be added to facilitate use of the unused recharge credits.
- Changes of water rights could be evaluated as a possible means to include other water sources and water users into the NECWC operations.

2.2 Operational Analyses

Several operational analyses have been conducted by the NECWC and have focused on quantification of supplies that could potentially be the subject of member transactions, demands that could potentially be fulfilled by the NECWC, and water management strategies that could be used to meet demands.

During the analyses, the NECWC explored its alternatives for operating under various assumptions related to supplies, demands, and infrastructure. The relative success and benefits of operations under various assumptions were weighed against considerations such as water law issues, the need for infrastructure, and the need for partnerships with local and regional water users/providers.

The operational analyses required an understanding of potential supplies available to members, potential demands that could be met, and the ability to move water from location of supply to location of demand, both physically and within the legal framework of the members' existing augmentation plans and/or any new plans that might be developed. The operational analyses were conducted using a phased approach:

Phase 1: The first phase examined the operational benefits of member-to-member transactions of unused recharge credits.

Phase 2: The second phase built on the first phase and evaluated the operational benefits of incorporating infrastructure and additional sources of supply such as ATMs and unappropriated stream flows.

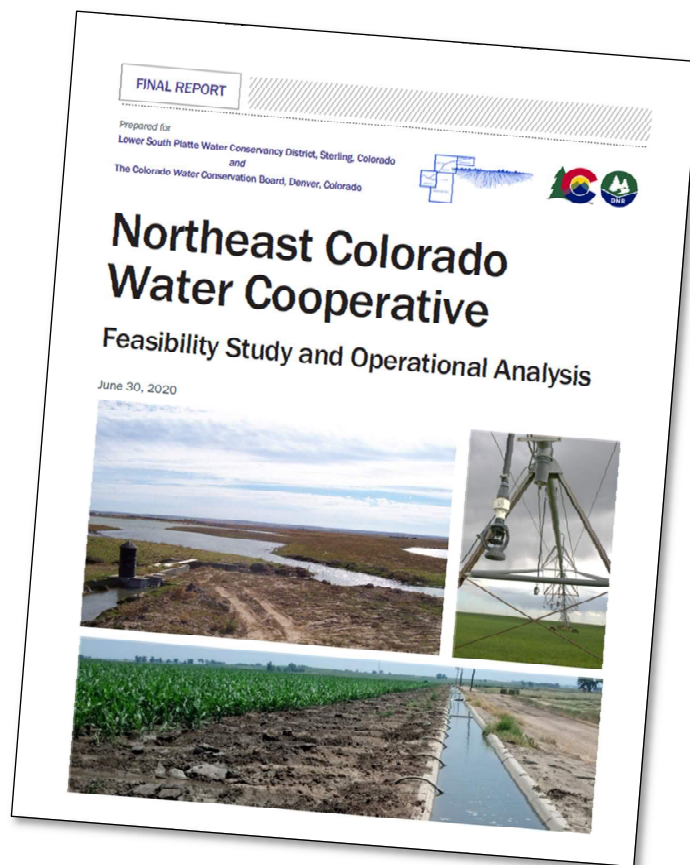
The assessment of supplies, demands, and exchange potential are described below, followed by a description of the subsequent operational analyses that were conducted.

2.2.1 Supplies and Demands

Supplies

Water supplies that have been the focus of the NECWC analyses include unused recharge credits, unappropriated water supplies, and senior water rights leased via ATMs (described in further detail below):

- **Unused Recharge Credits:** Unused recharge credits originate in augmentation plans. Augmentation plans enable water users that use wells to divert alluvial groundwater out-of-priority by providing a



The operational analyses described in this subsection were funded by ATM grants from the CWCB (as mentioned in Section 1.3.1) and provided matching contributions for the NECWC's WaterSMART grant.

means to offset stream flow depletions caused by out-of-priority diversions of alluvial groundwater. Augmentation plans are decreed by Colorado's water court.

Many augmentation plans rely on alluvial aquifer recharge and resulting stream accretions ("recharge credits") as a source of water supply to replace out-of-priority depletions to the river caused by well pumping. Based on the multiple and varied locations of wells and recharge sites, and differences in the timing of lagged depletions and recharge accretions, augmentation plans at times may have more recharge credits available than are needed to replace their depletions. These "unused recharge credits" are not needed by the augmentation plans and in many cases may be available for lease. Unused recharge credits were quantified in Districts 1 and 64 and ranged from 30,000 acre-feet (AF) in some years to 80,000 AF in other years depending on the number of augmentation plans considered and the hydrologic conditions. Unused recharge credits generally occur in the spring and early summer and can vary significantly on a seasonal basis, with periods when unused recharge credits may not exist and some periods when higher amounts are available.

- **Unappropriated Supplies:** Unappropriated supplies are stream flows that occur when existing demands are satisfied, and excess supply is available for a new use. The amount of available unappropriated supply was quantified for recent years, and it varied significantly by year, season, and river location. In dry years, very little unappropriated supply was available, and in wet years, several hundred thousand acre-feet of supply were available in various locations in the basin.
- **Alternative water transfer methods:** Subject to legal process and approval, alternative water transfer methods (or ATMs) allow water users to periodically lease the transferrable portion of senior water rights as an alternative to traditional "buy and dry" water transactions. The amount of supply potentially derived from ATMs depends on several factors, such as consideration of whether ATMs provide firm or interruptible supplies.

Demands

Water users in Districts 1 and 64 do not currently have access to the supply of water needed to fully meet irrigation requirements. Unmet demands were investigated from a variety of perspectives ranging from interviews with water users to reviews of regional studies of water supplies and demands. Interviews were conducted with NECWC members and potential partners that identified unmet demands of around 40,000 AF/year during dry times. Other studies have identified larger overall agricultural water demands in Districts 1 and 64 that total over 100,000 AF/year.

2.2.2 Exchange Potential

Exchanges are a common and important tool for moving water from a downstream location to an upstream use or diversion location. The NECWC and its members would like to use exchanges as much as possible in their operations to move water efficiently and relatively inexpensively as compared to conveying supplies via pumping stations and pipelines. However, the ability to conduct exchanges can be impeded by water right calls that occur between the exchange "from" and "to" locations. In addition, river reaches with low or no flow will limit "exchange potential" and the ability to conduct exchanges between an exchange "from" and "to" location.

The analyses of exchange potential focused initially on identifying locations that could impede exchanges periodically and reduce their reliability. The analyses indicated the following:

- The ability to conduct exchanges in different parts of the river changes on a seasonal basis and can vary greatly depending on hydrologic conditions.

- Exchanges could be conducted with 100 percent reliability throughout the year or on a seasonal basis in very few locations on the South Platte River.
- While various diversion structures may impede exchange during some parts of the year, exchange potential may be available during other parts of the year.

An analysis of overall exchange potential through diversion structures was conducted to investigate the potential to conduct exchanges if the timing of exchanges could be controlled.

A point flow and call analysis tool was used to evaluate the daily volume of exchange potential through each diversion structure on the South Platte River from the Burlington Ditch headgate to the Colorado-Nebraska state line. If a diversion structure was calling or otherwise drying the river, the exchange potential at that structure was 0 AF. If a diversion structure was not drying the river, the exchange potential was calculated as the physical flow passing the diversion structure minus bypass allowances. Daily exchange potential data were summed annually by water year.

Figure 2-1 shows the results of the exchange potential analysis. To convey the variability of exchange potential, each year of the analysis (2002 to 2015) is shown in the figure, and years with the highest (2015) and lowest (2002) exchange potential are highlighted. Average exchange potential through each diversion structure is also shown.

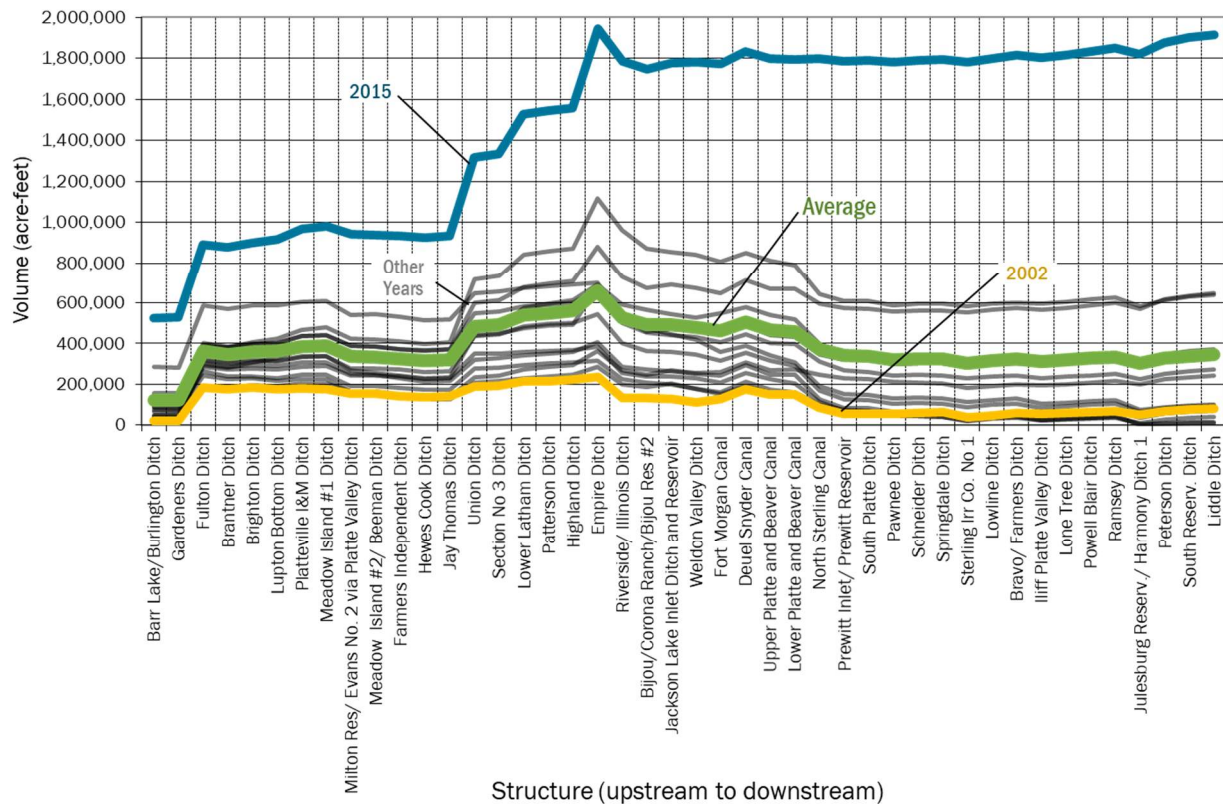


Figure 2-1. Yearly Volume of Exchange Potential Through Various Diversion Structures in the South Platte River, 2002 to 2015

Observations on Figure 2-1 include:

- Exchange potential along the South Platte River generally increases from the Burlington Ditch (just downstream of Denver) to the confluence with the Cache la Poudre River, which is just upstream of the Empire Ditch. Exchange potential in this reach increases significantly just downstream of the Jay Thomas Ditch due to additional inflows from St. Vrain Creek and fewer

water right calls. Exchange potential peaks at the confluence of the Cache la Poudre and South Platte rivers. Downstream of the Cache la Poudre River, exchange potential gradually diminishes somewhat to the state line downstream of the Liddle Ditch

- Exchange potential is highly variable from year to year.
- In general, exchange potential exists at every diversion structure in the river.
- During dry years, such as 2002, exchange potential was present periodically at nearly all of the diversion structures, but it was greatly diminished overall.
- Existing conditional exchanges, if implemented, would likely decrease the amount of available exchange potential, but the degree to which conditional exchanges will be implemented is currently unknown.

2.2.3 Phase 1 Operational Analyses

The NECWC conducted detailed analyses of member-to-member transactions of unused recharge credits in Phase 1. Member-to-member transactions were analyzed (absent infrastructure), because the NECWC anticipated these types of transactions could be more easily pursued in the short term from both operational and legal perspectives. The NECWC does not own infrastructure, and it does not have agreements that allow for joint use of existing infrastructure. Member-to-member transactions could be conducted without the use of infrastructure. In addition, these types of transactions between augmentation plans currently occur throughout the basin, and the administrative approval process for these types of transactions is generally well-established.

Phase 1 operational assessments focused on the exchange potential analyses and the ability to deliver water to meet demands upstream of supply locations, and also discussions with Division 1 Engineer staff regarding the ability to deliver water to meet demands downstream of supply locations. Findings of the analyses are summarized below:

- **A spot market may be feasible:** The ability to deliver water upstream via exchange and downstream generally exists throughout the South Platte River. Opportunistic and short-term leases of unused recharge credits from a downstream member to an upstream member could occur when exchange potential is present. Leases of unused recharge credits from an upstream member to a downstream member could potentially occur more regularly, but bypass/measurement infrastructure would be needed. In addition, spot market use would depend on the relevant members' water court decrees and other legal use requirements.
- **Spot market supplies may be limited in dry conditions:** The availability of water on a spot market basis may be limited during extended dry conditions because 1) owners of recharge credits need to use their credits and therefore fewer unused credits are available; and 2) opportunities to divert to recharge and create new future recharge credits are reduced during extended dry periods. In addition, exchange potential tends to diminish during drier conditions.
- **Inclusion of unused recharge credits in a long-term projection is difficult:** While exchange potential is generally available, it has historically been interrupted periodically or regularly at nearly every diversion point on the South Platte River. As a result, it may be difficult to ensure that future projected unused recharge credits can be exchanged to a location of augmentation demand. Downstream delivery of unused recharge credits would potentially be more reliable.
- **Projectable supplies are more valuable than supplies available on a spot market:** Current-year irrigation well pumping in many South Platte River augmentation plans is often limited by the ability to replace the resulting, lagged stream flow depletions that will occur in future years. However, if an augmentation plan can acquire long-term supplies (including projected unused recharge credits) that can be relied upon in future years, it would be possible to pump more in the current

year. Unless appropriate infrastructure is in place to ensure delivery, unused recharge credits and potential spot market transactions conducted during or after the irrigation season may not be useful to an augmentation plan projection to increase current-year pumping.

- Phase 1 operations may face legal/water court challenges:** Several legal challenges were identified when considering the Phase 1 member-to-member operations. These challenges include the ability to project either: 1) the downstream use of unused recharge credits or the upstream exchange of unused recharge credits, and 2) the notice and timing requirements included in many of the NECWC members’ augmentation plan decrees. Based on these issues, the NECWC board of directors concluded that additional infrastructure and/or the ability to use existing infrastructure would benefit NECWC Phase 1 member operations.

2.2.4 Phase 2 Operational Analyses

Phase 2 operational analyses explored a wider range of supplies and potential benefits of infrastructure (either new or existing) to store or retime supplies and make them available to meet future demands. Phase 2 operational concepts included storing available supplies at a downstream location and exchanging those supplies to upstream storage when potential is available. Supplies located upstream could then be released and delivered to meet downstream demands. In addition to unused recharge credits, unappropriated stream flows and ATMs were evaluated as a source of supply that could potentially meet currently unmet demands in Districts 1 and 64.

The Phase 2 analyses considered a hypothetical operational concept that included recharge facilities and 60,000 acre-feet of storage that could be used to meet currently unmet demands in Districts 1 and 64 that occur during dry periods³.

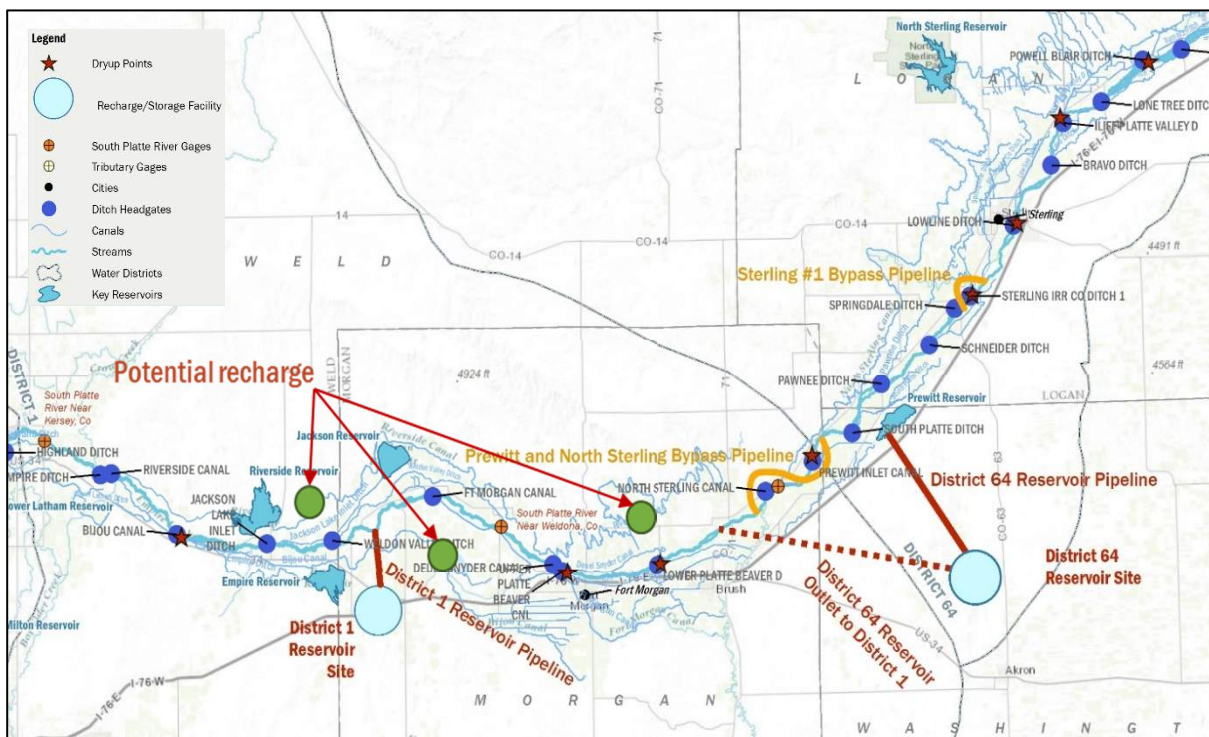


Figure 2-2. Assumed Infrastructure in Phase 2 Operational Analyses

³ See the report entitled “Northeast Colorado Water Cooperative, Feasibility Study and Operational Analysis” for more details on the analysis inputs and results.

The operational concept was simulated using the point flow and call analysis tool for two scenarios. The first scenario did not consider recharge facilities and was only focused on the potential benefits of the District 1 and 64 reservoirs. The second scenario incorporated recharge facilities assuming both 100 cubic feet per second (cfs) and 150 cfs diversion capacities.

Figure 2-3 shows the results of the second scenario, and the data represent results with 150 cfs of capacity to deliver water to recharge.

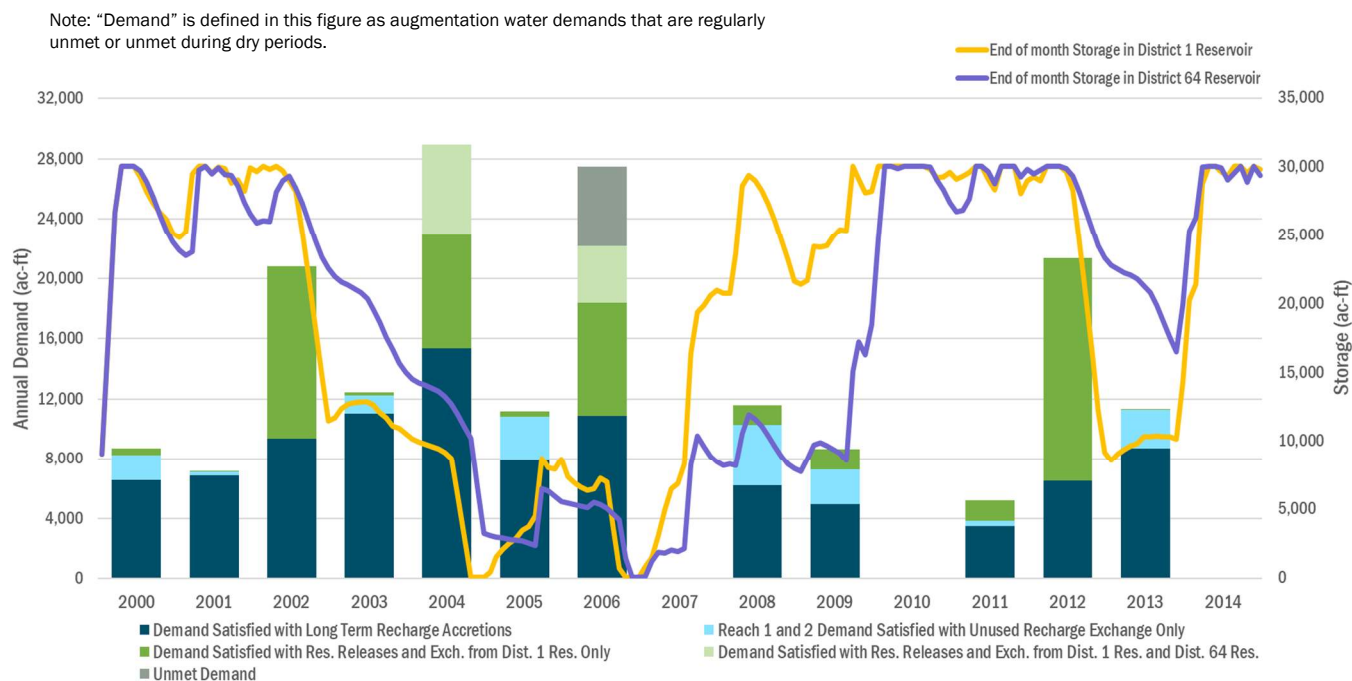


Figure 2-3. Simulation of Phase 2 Operational Concept With Recharge Deliveries

The following are observations on the operational concept simulation shown in Figure 2-3:

- Credits from new recharge facilities with long-term lag times were a significant source of supply throughout the simulation.
- Stored supplies in reservoirs were important for meeting demands during drought periods when other supplies were not available and demands were higher.
- The drought of the early 2000s created conditions in which demands were greater than supplies, but the availability of credits from new recharge facilities helped meet demands. Also use of recharge credits allowed more water to remain in storage to meet higher demands in 2004 and 2006. Even with all of the available supplies, demand was not fully met in 2006.
- ATMs could be used to meet remaining demands when supplies from other sources are not available during drought years.
- An additional model simulation was conducted to evaluate the amount of storage needed to fully meet all demands in all years included in the study period. A total storage capacity of 85,000 AF split between the two assumed reservoirs in the second scenario was required to meet all of the demands shown in Figure 2-3.

2.2.5 Conclusions from Operational Analyses

The Phase 1 and Phase 2 operational analyses conducted via that ATM grants were very valuable to the NECWC. Through the analyses and subsequent discussions, the NECWC determined that infrastructure is needed to better manage water supplies available to District 1 and 64 water users. While spot markets and member-to-member transactions can play a role in optimizing the use of available supplies during wet and normal times, the periods when supplies are most needed (dry times) are when no supplies are available to be transferred through a spot market. Infrastructure is critical for retiming supplies during wet and average hydrologic conditions so that they are available when demands are highest in dry times. However, agricultural water users will need partners that help can fund and implement new infrastructure projects. ATMs could play a valuable role in meeting demands when available supplies in the river and from infrastructure are inadequate.

Key conclusions:

- Infrastructure is needed to better manage supplies
- Partners are needed help to implement and finance multi-purpose infrastructure

Section 3

Outreach and Communications

The results of the operational planning described in Section 2 identified infrastructure and partnerships as key requirements for better managing supplies in Districts 1 and 64 and providing the full breadth of services contemplated by the NECWC. A multi-pronged outreach and communications plan was used to investigate and develop partnerships that could help the NECWC provide its contemplated services while meeting the needs of others.

The outreach and communications plan considered approaches for communicating with three different groups:

- **NECWC members:** Current members of the NECWC need to be aware of outreach activities and evolving partnership discussions. New directions or partnerships for the NECWC would need to be approved by the members.
- **Local water users that are not members:** Several augmentation plans and other water users in Districts 1 and 64 have expressed interest in the NECWC in the past but have not joined. New infrastructure or partnerships could be beneficial to these users and could result in their joining the efforts of the NECWC and/or participating in a regional project that improves water supply security.
- **Regional partners:** Multi-benefit partnerships with water providers and users that operate outside of District 1 and 64 could provide benefits to both local and non-local water users. Many potential regional partners are municipal water providers that have future water needs and an economic base that could help fund relatively large infrastructure projects necessary to manage significant volumes of water supply.

Section 3 describes the outreach and communications process and results for the groups listed above.

3.1 NECWC Members

The objectives of communications with NECWC members were to share results of ongoing research, analysis, and outreach efforts as well as evolving opportunities for partnerships. Outreach occurred primarily through annual member meetings and email notifications but also through informal discussions with individual members.

The topics and progression of annual member meetings illustrate how the discussions of partnerships evolved and how the NECWC board sought feedback from members along the way. Annual member meeting topics and feedback are described below. Note that annual member meetings have been held since the inception of the NECWC in 2014, but the discussion below focuses on meetings held just prior to and during the WaterSMART grant effort.

2018 Member Meeting

The 2018 member meeting was held in May when the NECWC was being funded by ATM grants from the CWCB and prior to the implementation of the WaterSMART funding contract.

Key messages to the members: The WaterSMART grant scope of work and anticipated outcomes were described to the members. A large part of the meeting was focused on the benefits that members could realize through the organization including involvement in large regional projects, participation in a water market involving unused recharge credits or temporary transfers of senior water rights, and real-time accounting and management of supplies.

Key feedback from members: Continue pursuing the benefits described using the remaining ATM grant funds and forthcoming WaterSMART grant funds.

2019 Member Meeting

The 2019 member meeting was held in May, a few months after the WaterSMART grant contract was in place.

Key messages to the members: The WaterSMART grant scope of work was described in detail along with identification of immediate next steps. A feasibility study focusing on a regional water development concept, named the South Platte Regional Opportunities Water Group (SPROWG), was described and the potential benefits of NECWC participation was discussed (see Chapter 7 for a more detailed description of the SPROWG concept).

Key feedback from members: Implement the work described in the WaterSMART grant scope of work and report on progress. Participate in the SPROWG feasibility study and explore potential benefits to members and District 1 and 64 water users that could result from the concept.

2020 Member Meeting

The 2020 member meeting was held in May. The meeting was held via webinar because of restrictions on in-person meetings due to the COVID pandemic.

Key messages to the members: The draft results of the ATM grant work (see Section 2) were summarized for the members. The results of the SPROWG feasibility study were also presented. The potential benefits of infrastructure were described in terms of meeting additional augmentation and irrigation demands that are currently unmet. The benefits of potential regional partnerships to members and District 1 and 64 water users as a whole were discussed.

Key feedback from the members: Members recognized the necessity and benefits of both infrastructure and regional partnerships. The members directed the NECWC board, manager, and consultants to continue pursuing these partnerships. Members recognized that regional projects or partnerships could benefit all District 1 and 64 water users, but they should consider the needs of NECWC members and not “leave them behind.”

2021 Member Meeting

The 2021 member meeting was held in early June. Loosened meeting restrictions allowed for an in-person meeting, but a virtual option was offered due to lingering COVID pandemic issues.

Key messages to the members: Updates were provided on NECWC’s ongoing involvement in discussions and technical analyses associated with potential regional partnerships.

The meeting also included a discussion on the future of the NECWC in light of potential partnerships and their organizational structure. Many of the member benefits originally contemplated by the NECWC could be fulfilled by potential regional partnerships that do not

specifically include the NECWC organization, but could include members. The members discussed what role the NECWC can or should play in the future under those conditions. Alternative roles for the NECWC and the pros and cons of each were discussed.

Key feedback from the members: The members directed NECWC to continue its advisory role for the members, with a focus on monitoring regional activities, potential partnerships, and infrastructure development opportunities.

2022 Member Meeting

The 2022 member meeting was held in early June. The meeting was held in person, but a virtual option was offered for members that could not attend in person due to scheduling conflicts or lingering COVID pandemic issues.

Key messages to the members: Updates on the development of the regional partnerships were provided with a focus on how a partnership could benefit both NECWC members and all of District 1 and 64 water users. Specifically, benefits associated with direct releases of irrigation supplies and deliveries to recharge facilities for augmentation purposes were described.

In addition, the recommended path forward for the NECWC was discussed. In summary, the members and NECWC board have determined that a regional project that does not include the NECWC organization could still provide tangible water supply benefits to NECWC members similar to those that have been sought throughout NECWC implementation process. Nevertheless, the NECWC is a valued advisor to water management organizations in the lower South Platte River. The NECWC should remain incorporated and capable of pursuing water supply and management opportunities should they arise. The NECWC could be flexible and take a less active role depending on the issues and opportunities at hand, but could still be an advisor on selected projects.

Key feedback from the members: The members agreed with the recommended path forward. They felt that water is getting very expensive and that partnerships are necessary to provide additional irrigation supplies to enhance their agriculturally-based economy. The members agreed that the original concept for the NECWC could be fulfilled through partnerships, and they saw benefit in maintaining the NECWC as an organization to pursue future partnerships but also as an advisory group and conduit to involvement and collaboration with agricultural water users.

3.2 District 1 and 64 Water Users

As the NECWC and LSPWCD have investigated regional partnerships, numerous irrigators in Districts 1 and 64 have been engaged to discuss the benefits these partnerships could provide and irrigator feedback. The meetings were held with irrigators who are members of the NECWC and those who are not currently members.

The feedback LSPWCD received from District 1 and 64 water users is described below:

- Irrigators provided wide support for limiting the supplies that could be diverted into a regional water project to those that are not derived from the purchase of senior irrigation water rights that result in the permanent cessation of irrigation (or “dry-up”) of irrigated lands.
- Irrigators showed significant interest in a regional water project and provided positive feedback that a significant portion of the water involved in a project should stay in Districts 1 and 64 for local water users.

- District 1 and 64 water users expressed a desire for future water development to focus on unappropriated supplies. They would like senior irrigation water rights to continue being used locally and only be temporarily transferred to other uses in drought years under interruptible supply agreements. Interruptible supply agreements must be voluntary and irrigators should be fairly compensated for the use of their water by others.
- The costs of water supplies provided by a regional water project was an important question to water users. While the potential future costs of these supplies is currently unclear, the water supplies will need to be affordable for agriculture.

3.3 Potential Regional Partners

The NECWC and LSPWCD have participated in numerous meetings and discussions with potential regional partners. The discussions with potential regional partners are summarized below in three general categories – Parker Water and Sanitation District (PWSD), South Platte Regional Opportunities Water Group, and other potential regional partners.

3.3.1 Parker Water and Sanitation District

Discussions with PWSD have focused on the actual development of a specific regional, multi-benefit water supply project called the Platte Valley Water Partnership (PVWP). See Section 7 of this report for a description of the PVWP project. The NECWC and LSPWCD have worked with PWSD extensively since late 2018 to develop the project details. As PWSD sought to move forward with the new project, the NECWC requested LSPWCD work directly with PWSD as the lead partner. LSPWCD has remained the representative partner and primary point of contact with respect to the NECWC and local water users' interests. The LSPWCD has worked extensively with PWSD to adjudicate the water rights for the project; evaluate financial strategies for construction, operation, and maintenance; and establish agreements for the use of existing infrastructure that will be integral to the PVWP's operation.

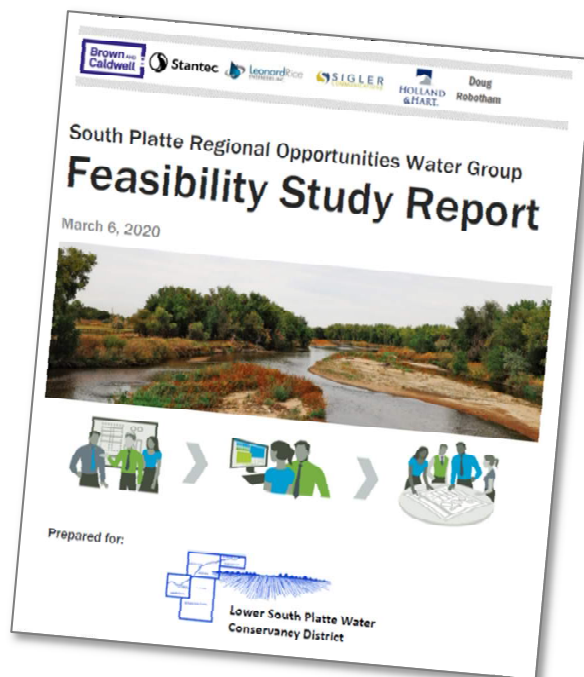
The LSPWCD and its constituents are an equal partner and beneficiary of the PVWP, and those benefits will serve District 1 and 64 local communities while achieving many of the NECWC goals. The collaboration with PWSD has been very successful at developing a long-term regional partnership that will result in infrastructure which will provide benefits to both irrigators and municipal water users. The regional partnership with PWSD is the most developed partnership contemplated by the NECWC.

3.3.2 South Platte Regional Opportunities Water Group

The NECWC participated in numerous meetings with several potential regional partners who are investigating and advancing the SPROWG concept (see Chapter 7 for more detail on the concept).

The feasibility of the SPROWG concept was evaluated from March 2019 to March 2020. Since the conclusion of the feasibility study, a core group of SPROWG proponents (including the NECWC through the general manager and engineering consultant) have continued to meet to evaluate next steps, evaluate key questions, and identify issues that will need to be investigated as the concept is advanced. Questions and issues explored by the SPROWG proponents and NECWC included the following:

- SPROWG yield and need for infrastructure to enable ATMs:** Technical analyses were conducted to evaluate water availability for the SPROWG concept and how water from interruptible water supply agreements with agricultural water users in Districts 1 and 64 could be managed using storage facilities for the benefit of agriculture and SPROWG participants. The technical analysis was supported using WaterSMART grant funds and is described in Section 4 of this report.
- Long term vision for SPROWG development:** The SPROWG proponents explored a long term vision for how the SPROWG concept could be fully developed. The long term vision included potentially upsizing originally-contemplated infrastructure to accommodate additional partners, coordinated operations with other regional projects, outreach to other potential SPROWG participants to better understand specific water needs, and phased development of new SPROWG storage and conveyance infrastructure that could operate to meet municipal and agricultural water needs.
- The ownership of SPROWG facilities:** An important question was explored on the ownership of SPROWG facilities. Would future infrastructure be owned and operated by a new entity or organization made up of participant representatives, or would participants individually own but cooperatively operate infrastructure to meet their own needs but also the needs of other water users in the region in a way that is consistent with SPROWG goals? While this question has not been resolved, it will continue to be investigated in the future.
- Advancing the SPROWG concept:** The SPROWG proponents agreed that a project manager is needed to lead outreach activities and further feasibility studies. The SPROWG proponents discussed the needed characteristics and duties of a project manager and is moving forward with procuring those services.



The SPROWG Feasibility Study Report is available at <https://www.southplattebasin.com/documents/sprowg>

The NECWC will continue to participate in SPROWG concept development. Importantly, SPROWG could provide additional opportunities to develop multi-purpose infrastructure that benefit both agricultural and municipal water users, and it could provide an additional market for dry-year leases of senior agricultural water supplies that help meet municipal needs while providing income for irrigators.

3.3.3 Other Regional Partners

The LSPWCD has explored the potential for regional partnerships with other water providers along the Front Range and with other water users that own water rights in Districts 1 and 64. Many of the discussions have focused on the shared use of potential water management infrastructure. Several overarching considerations have been discussed, but central to these has been the requirement that the water supplies involved in a potential partnership cannot be derived from a purchase of senior water rights and permanent “dry up” of irrigated land. To date no concrete concepts for other regional partnerships have moved forward.

The NECWC and LSPWCD anticipate that, as the PVWP continues its development and as the SPROWG concept is further explored, additional regional partnerships may be identified and pursued.

3.4 Conclusions

The outreach and communications associated with the WaterSMART grant have resulted in a significant regional partnership in the PVWP, which includes a real infrastructure project that will provide tangible benefits to NECWC members and District 1 and 64 water users as well as PWSD’s municipal water users. In addition, SPROWG represents an innovative multi-benefit concept that if implemented, could provide for future municipal demands while preserving and enhancing irrigation in the South Platte River basin. These two regional efforts are significant and benefited greatly from the WaterSMART grant funds. In addition, while the PVWP is further advanced than the SPROWG concept, the WaterSMART communication activities fostered collaboration between the two regional efforts. For example, the Guiding Principles adopted by the SPROWG proponents are reflected in the planned development and operations of the PVWP (see Section 7 for more details on the SPROWG Guiding Principles).

Several key observations and conclusions were identified during the overall outreach and communications process:

- Maintaining consistent and honest communication with NECWC members was critical for maintaining trust and providing sound feedback on the path forward.
- Regional partnerships are successful when all of the parties involved need water and derive benefits from the partnership.
- Regional partnerships need motivated proponents. The need for water and a specific timeline for the need is an important motivator that can drive a sense of urgency to create a successful partnership.
- Successful regional partnerships can occur when communication is clear and critical underlying principles are understood and maintained by all partners.

Section 4

Scoping and Planning Activities

Technical and legal analyses were conducted to support the scoping of and planning for facilities that could foster water marketing. Technical analyses focused on 1) the feasibility of and need for infrastructure that could support regional partnerships with municipal water providers; and 2) agricultural infrastructure that could be constructed specifically to benefit irrigators participating in a regional partnership. Legal analyses focused on identification of questions and issues that should be investigated when considering water planning and marketing efforts with respect to different sources of water supply.

4.1 Technical Analyses

Technical analyses conducted by the NECWC and supported by WaterSMART grant funds are described in this section. The description includes methodologies, assumptions, and results.

4.1.1 Evaluations of Infrastructure for Regional Partnerships

Potential future multi-benefit partnerships and infrastructure associated with the SPROWG concept have been evaluated for the last several years. The NECWC has participated in the evaluations both as a stakeholder/advisor but also in analyzing the capacity of infrastructure needed to provide benefits to both irrigators and municipal members in a regional partnership.

A feasibility study on the SPROWG concept was completed in March 2020 and was cited in Section 3 of this report, and an overall description of the SPROWG concept is included in Chapter 7. The feasibility study evaluated different alternatives for the SPROWG concept that explored varying capacities and locations of infrastructure and associated benefit for municipal and agricultural participants.

A need emerged for additional SPROWG modeling and analysis. Proponents of the concept, including the NECWC, sought to evaluate supplies available to meet SPROWG needs as well as the capacity of infrastructure required to meet SPROWG demands. An important part of the evaluation focused on infrastructure needed to manage senior agricultural water rights that could be leased to SPROWG participants through a regional water marketing framework in dry years to help bolster the firm yield of the SPROWG concept.

Methodology

The analysis of infrastructure for regional partnerships was conducted using a point flow tool. The point flow tool was initially developed to support evaluations of exchange capacity in 2011 (Colorado Corn Growers Association, et al., 2011). The original and current versions of the tool use a daily point flow analysis and daily call information to determine when and where exchanges could have historically been conducted and the amount of unappropriated supply historically available at each diversion point along the South Platte River from Denver to the Colorado-Nebraska state line.

The point flow tool is spreadsheet-based and is straightforward to use, update, and adapt for a variety of analyses. Since its creation, the tool has been modified and used to quantify historical

unappropriated supplies and exchange capacity for several efforts in the South Platte River basin to evaluate available supplies and infrastructure for managing supplies.

The point flow tool uses historical data and includes daily call chronology and daily flow data for river gaging stations, surface water diversions, and measured tributary inflows along the South Platte River mainstem. The tool has estimated flows and calls for 1947 through 1996 and actual data from 1996 through 2015. While no guarantee of the future, the length of the hydrologic study period provides a wide range of flow and administrative conditions by which to model potential SPROWG concept operations.

The SPROWG concept feasibility study includes a more complete description of the point flow tool (see Section 3 for a link to download the study).

Model Concepts and Assumptions

The point flow tool was adapted to consider the operations of the SPROWG concept during the feasibility study. Four alternative SPROWG concepts were evaluated, each with different delivery goals and resulting sizes and amounts of infrastructure. For the evaluations conducted associated with the WaterSMART work, the SPROWG configuration shown in Figure 4-1 was used as the starting point. The configuration shown in Figure 4-1 is one of the four alternatives evaluated in the SPROWG feasibility study. Only one alternative was to be evaluated, and the configuration in Figure 4-1 generally reflects what SPROWG proponents anticipated could be pursued in the nearer term. Note that the agricultural and municipal “demands” shown in Figure 4-1 are described in the context of delivery goals for the SPROWG concept. Projected unmet demands in the South Platte River basin are more than what the SPROWG concept can provide.

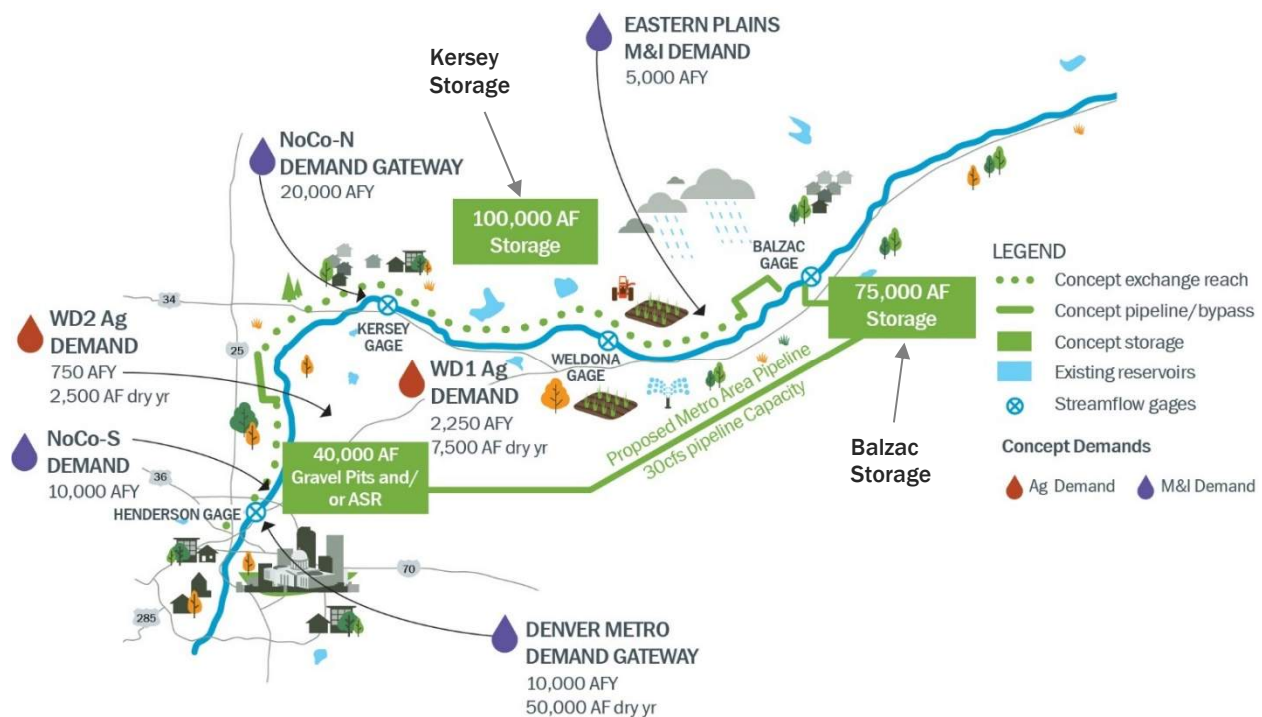


Figure 4-1. Initial SPROWG Configuration Considered for the WaterSMART Analysis

The SPROWG configuration shown in Figure 4-1 was analyzed to explore the sensitivity of project yield to various reservoir sizes for storing unappropriated river flows and water derived from ATMs (which has implications to water marketing strategies). For the modeling analysis, up to 30,000 acre-feet per year of supply was assumed to be available to the SPROWG concept from ATMs in Districts 1 in the driest 30 percent of years in the analysis period. The WaterSMART analysis assumed that those supplies would originate from irrigators in District 1 given the difficulties of exchanging ATM supplies from downstream locations in District 64.

Analysis Results

The point flow tool estimated the degree to which annual demand goals could be met using alternative reservoir sizing and indicated that shortages could occur during severe droughts without sufficient storage. The shortages projected to occur during severe droughts were examined further to evaluate the root cause. During severe droughts, junior water rights are typically out of priority, and unappropriated supplies are scarce. Since the SPROWG concept would divert native South Platte River flows under a junior water right, very little water would be stored during severe droughts and water previously stored would be drawn down to meet demands. Senior water rights leased through a regional water marketing program could be used to meet demand when stored supplies are low. However, storage is needed to help manage and exchange supplies leased from senior agricultural water right owners to upstream municipal water users in a regional ATM program. Figure 4-2 illustrates the degree to which leased senior water rights in an ATM program could be utilized by the SPROWG concept with and without storage at Balzac to help manage those supplies.

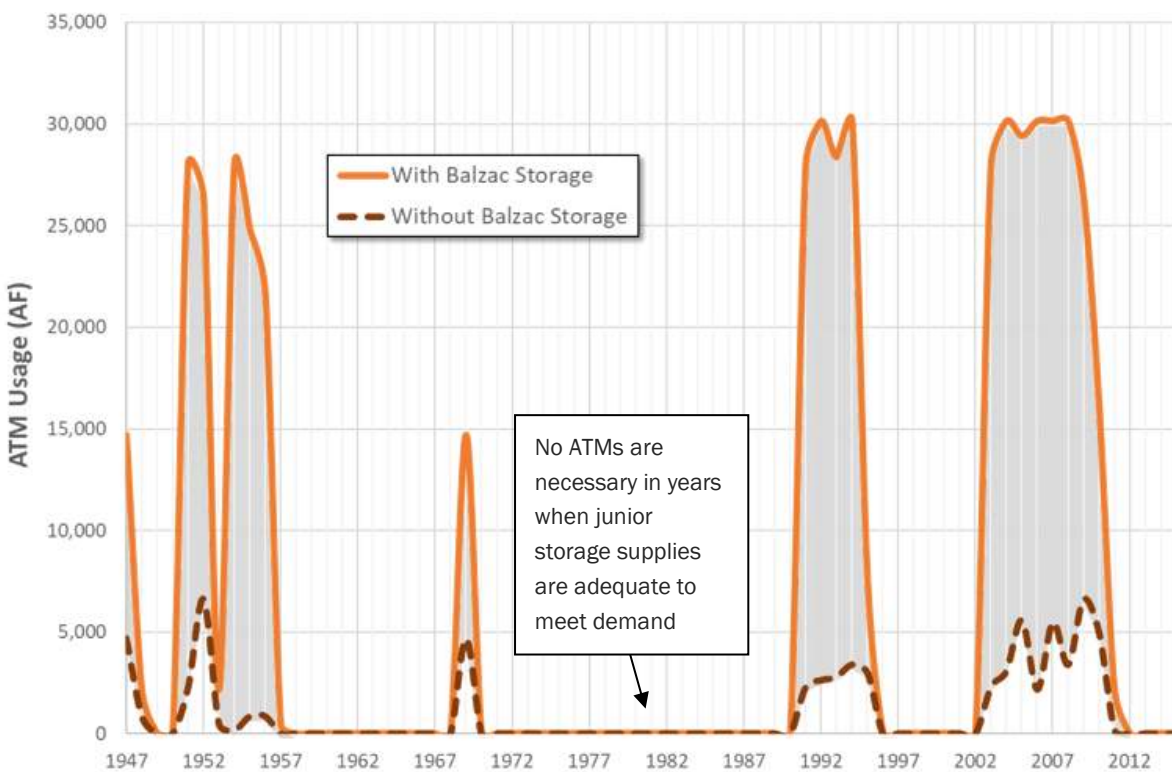


Figure 4-2. Simulated Use of Senior Agricultural Water Rights in the SPROWG Concept With and Without Storage at Balzac

As shown in Figure 4-2, storage is critical for utilizing water from a regional ATM program. Water from senior agricultural water rights could be stored at Balzac until sufficient flow in the South Platte River would allow the supplies stored at Balzac to be exchanged upstream to meet municipal demands or to be stored at Kersey.

Key Conclusion:

Infrastructure is critical for a regional water marketing strategy. Supplies from senior agricultural water rights in a regional water marketing program are only available during the irrigation season and would be derived from a wide variety of geographic locations. Supplies for a regional marketing program would need to be exchanged upstream, because farms potentially involved in a program are generally downstream of their municipal partners. Storage is critical for delivering agricultural supplies when exchanges need to be conducted, especially during droughts when exchange capacity is limited.

4.1.2 Evaluations of Recharge Facilities

Recharge facilities could be very useful for providing long term recharge credits to augmentation plans in District 1. Investigations were conducted to evaluate potential areas along the South Platte River where recharge facilities could be sited to provide long term recharge credits with varying return timing characteristics over a distributed area. The investigation also contemplated direct deliveries to the river that would benefit water users in Districts 1 and 64. The evaluation considered 28 potential recharge sites, multiple delivery schedule scenarios, two aquifer characteristic datasets, and the impacts of recharge on individual river reaches as well as collectively across the entire project area.

Methodology

A spreadsheet-based model was developed for the analysis. The recharge facility model, or recharge optimization model, can route deliveries to recharge facilities or groups of recharge facilities on a monthly basis. The tool can run up to 40 years of deliveries and tracked accretions. The model inputs include aquifer characteristics and the corresponding unit response functions (URFs) for the 28 recharge sites as well as an annual delivery schedule to the recharge facilities. The output is the cumulative accretions from the recharge facilities.

Recharge Facility Site Selection: The 28 sites selected for the optimization model represent potential recharge sites within the region and service areas of NECWC members. The sites were pre-screened for favorable return flow timing characteristics using a decision support tool developed in 2014 by Brown and Caldwell that could identify potentially favorable sites for constructed recharge wetlands or ponds based on a multi-criteria analysis and weighting scheme. All data were organized on a 40-acre quarter section grid and included groundwater return flow timing in the criteria. Using the grid, potential sites were identified where at least 50% of the recharge accretions returned to the river in 5 years or more. Sites with this relatively “long” return time for recharge accretions could provide steady, reliable credit at the river under a variety of hydrologic conditions. Sites were divided into three reaches based on the location of their return point along the river in relation to the location of major ditch headgates. Reach 1 was upstream of the Upper Platte and Beaver Ditch headgate. Reach 2 was between the Upper Platte and Beaver and Lower Platte and Beaver headgates. Reach 3 was downstream of the Lower Platte and Beaver headgate. All recharge evaluated in the optimization tool accrued above the North Sterling headgate.

Once the sites were identified, the individual aquifer characteristics were identified and URFs were generated using the Glover method. Figure 4-3 shows a sample URF curve for a recharge site in the tool. URFs represent the percentage of the recharge delivery that accretes to the river in a given month. There are multiple sources for aquifer data for the Glover analysis, but the final analysis was completed using the dataset developed for the South Platte Decision Support System. This is the most commonly used data set for Glover analyses, and it uses aquifer transmissivity data based on output from a calibrated groundwater model.

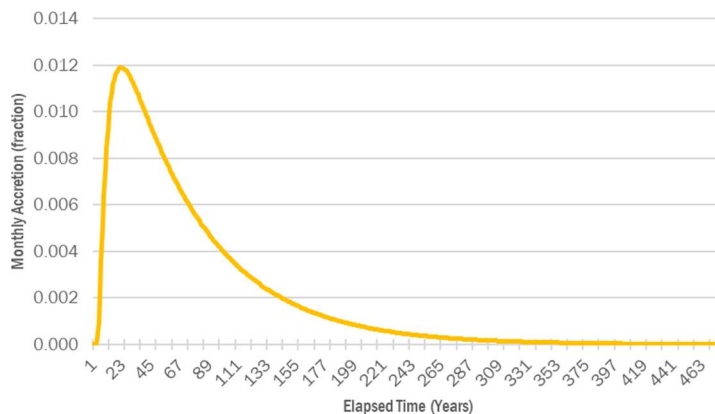


Figure 4-3 Sample URF Curve

Deliveries to Recharge: The LSPWCD provided 20 years of data describing potential deliveries to recharge from initial hydrologic modeling of the PVWP project. The optimization tool runs for 40 years, and the data were extended in a variety of ways to create separate “scenarios” that covered a range of possible future hydrologic conditions. The scenarios included a “cycled hydrology” set that repeated the 20-year input data in chronological order (e.g., year 21 repeated year one values, year 22 repeated year 2 values, etc.). The next three scenarios all used the cycled hydrology pattern but scaling factors were applied to certain years to resemble drier or wetter hydrology. Accordingly, the second scenario represented an extended dry period where the wet and average years were scaled to mimic the dry years in the initial 20-year period. The third scenario represented an extended average inflow series. The wet years were scaled down to match the average values and the average and dry values were repeated without scaling. The last scenario modeled an extended wet period where dry years were replaced with the average of the wet years from the initial output. The tool allows the user to select which hydrologic scenario they wish to analyze and the results will automatically populate based on the selection.

The tool divides annual deliveries to recharge facilities among the reaches. The user can specify the percentage of the delivery that is allocated to recharge facilities in each reach. Within the reaches, the allocation of deliveries can be divided among the individual sites. Again, the user can assign a percentage of delivery within the reach to each site. The primary analysis divided the deliveries evenly between the ponds in each reach. After the sites have their annual delivery allocations, the deliveries were assumed to occur in April, May, and June of each year, spread evenly to each month. This delivery schedule coincides with the period of highest availability of water in the river.

The direct deliveries to the river are assumed to occur in Reach 1 in the tool. The direct deliveries were distributed on a monthly basis between June and September.

Tool Results

The accretions for each site were calculated by multiplying the URF by the delivery for each month and summing the cumulative accretions over the 40-year analysis period. Those accretions were summed by reach and the overall project area. Each reach included sites with varying return flow timing characteristics, so the combined accretions form a smoother and more even curve than the individual site curves. The two charts below show a sample of output from the tool for Reach 1 as a total for the reach and as individual sites using the cycled (non-scaled) hydrology scenario. The tool

was set up to send approximately 43% of the available deliveries to Reach 1. Sites within each reach received equal deliveries.

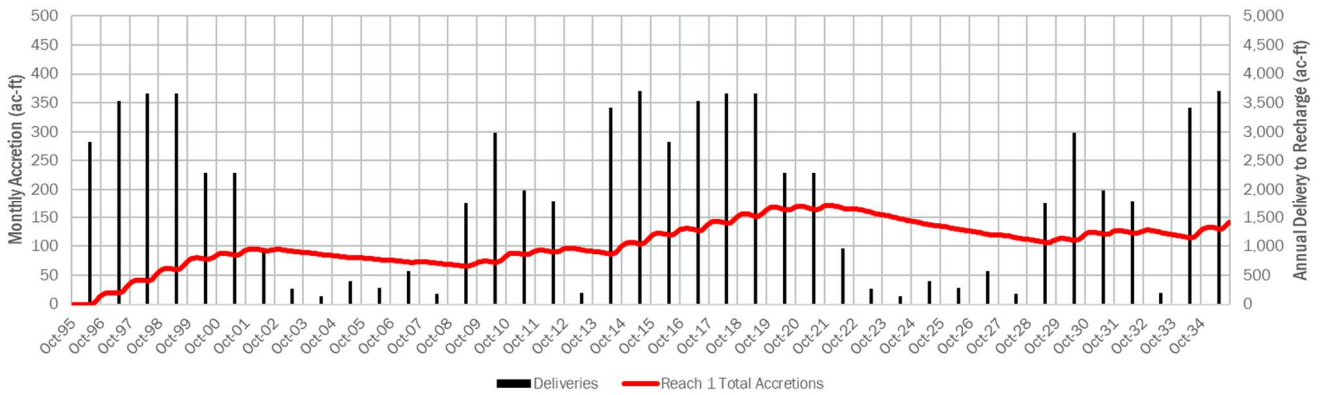


Figure 4-4 Reach 1 Total Accretions – Cycled Hydrology Scenario

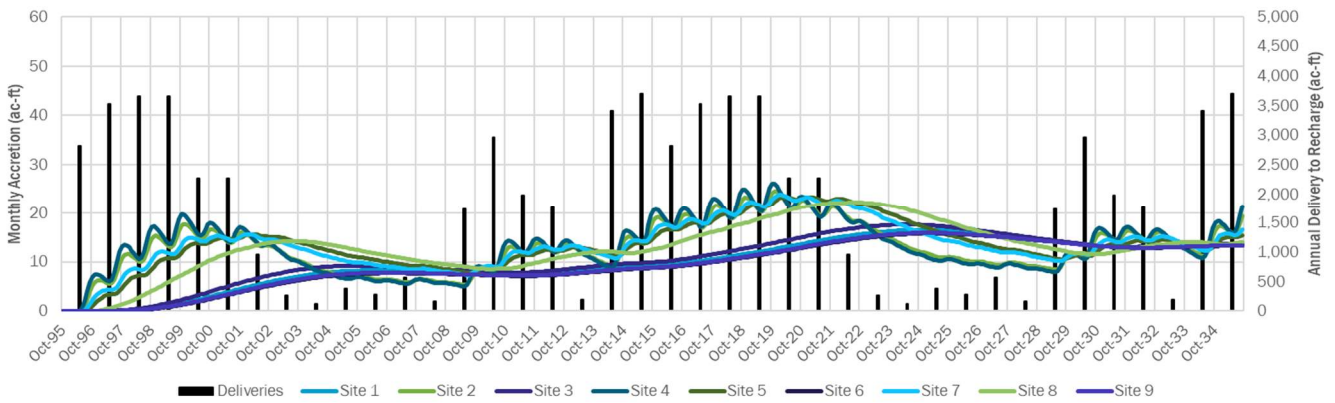


Figure 4-5 Reach 1 Individual Pond Accretions – Cycled Hydrology Scenario

The sites with the more rapid return timing show the annual oscillatory pattern as a large slug of recharge reaches the river in the first few months following the deliveries and then the accretion rate recedes until the next delivery. The sites with longer return times show a more even and attenuated accretion pattern. The recharge at these sites can take years to return to the river. The reach total reflects some of the quick responses but in general shows a more sustained accretion pattern. Results in Reaches 2 and 3 are similar to Reach 1. Reach 3 mostly contains sites that have longer return times, so the total curve is smoother than that of Figure 4-4, but reflects the same general pattern.

The value of the distributed recharge sites and the longer return times is best illustrated during dry periods when sustained “baseload” recharge credit is still available, even after multiple years of limited deliveries. Additionally, direct deliveries can immediately and efficiently add supply to meet peak demand on an as needed basis. Figure 4-6 below shows the total accretion curve for all reaches combined with the direct deliveries included.

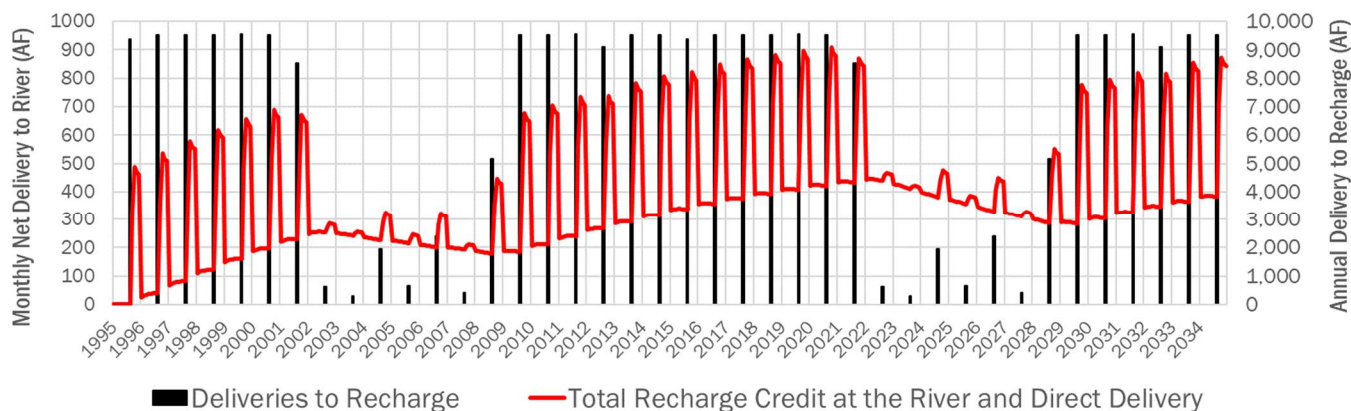


Figure 4-6. Example of Water Supply Benefits in District 1 from Recharge and Direct Deliveries

Key Conclusions

Several key conclusions were derived from this analysis:

- **Recharge is key to sustainable pumping:** The delayed and attenuated nature of the recharge credits provides a predictable and reliable augmentation source for pumping depletions.
- **Varied recharge time between sites can help maximize benefits:** The long return times at some of the sites evaluated in the recharge optimization tool can provide extended water supply during droughts and other low yield years. However, having a mix of long and relatively short return time sites provides both on-demand augmentation credit and sustained credit.
- **Flexible delivery options can maximize benefits:** Deliveries directly to the river and to recharge ponds can be strategically combined to create a dependable, base supply of recharge credits as well as direct supplies that can be efficiently delivered when needed by irrigators. Figure 4-6 illustrates how supplies stored under a junior water right (yellow bars) with variable availability can be retimed with recharge ponds or delivered directly to the river for the benefit of District 1 and 64 water users.
- **Distributed site locations can ease river bottlenecks:** At various times in the year, certain headgate locations can be diverting all or most of the flow in the river, creating a bottleneck that limits downstream users' ability to operate exchanges and puts further administrative limits on diversions. With potential recharge site distributed in separate reaches, recharge credit can be more readily available at critical locations.

4.2 Legal Analyses and Planning

As reflected in prior sections of this report, there are potential opportunities on the South Platte River, especially in Districts 1 and 64, to make use of water that is available either through temporary or longer-term transfers of excess recharge accretions or other fully consumable water (via leases or other agreements). The work that NECWC has done pursuant to its CWCB and WaterSMART grants makes clear that legal analysis and related planning is an important aspect of both the marketing and use of the available water sources. Although a potentially transferred water source can be physically available at times, legal and physical restraints may pose challenges to the actual use of the water by the end user at the time and/or location that the water is needed. Such

restraints could include limitations in the decrees for the water sources involved or other physical limitations concerning movement of water either up or downstream.

Any planning and marketing effort should include, at minimum, legal analysis of the following:

Unused Recharge Credits

- What water sources, recharge operations, and/or plans for augmentation are involved in a proposed transfer/use project?
- Where are these water sources and operations located on the stream in relation to the proposed transfer/use?
- What do the existing decrees for the water sources, recharge operations, and/or plans for augmentation allow with respect to:
 - Generation of excess recharge accretions and temporary transfer of those accretions and/or the identified water sources.
 - Are there any temporal, volumetric, or other restrictions on transfer or other use of the proposed water sources?
 - Are there any notice requirements for transfer of the available water sources?
 - Addition of water sources into a prospective users' plan for augmentation operations.
 - Can this be done through the decree for the plan for augmentation, or is a new water court application and/or SWSP required?
 - Are there any notice requirements for adding a water source to the proposed users' plan for augmentation, and if so, how does the timing of the notice and related review period impact the availability of the water source involved under a transfer or other use agreement?
- Will the available water source need to be exchanged to an upstream location of use?
 - Are there any legal (or physical) limitations that might impact the proposed transfer and/or use (projection limitations, etc.)?
 - Will the upstream use require consent to use structures, and if so, what legal process is needed?
- If the water source will be used at a downstream location, are there any legal (or physical) limitations that might impact the proposed transfer and/or use?
 - Can the water source be managed in a way that allows for its projection and delivery to the proposed downstream user in amount, timing, and location so as to be practical to the entity using the water?
 - Will the downstream use require consent to use structures (either at the downstream location or through by-pass at existing intervening river headgates), and if so, what legal process is needed?
- What potential legal risks to existing water rights and decrees are involved in the proposed transfer/use transaction?

Unappropriated Supplies

- Have the basic requirements for a new appropriation under Colorado law been met (intent, identified beneficial uses, need/no speculation, can and will)?
- Will the new appropriation require consent to use structures, and if so, what legal process is needed?
- Are there any legal or physical limitations on movement of water to allow for the proposed beneficial uses?

Alternative water transfer methods

- What legal process is required to allow for the ATM use (needed agreements, necessary court process, etc.), and can that process be accomplished?
- What potential legal risks are involved for the water rights that will be the subject of the ATM use?
 - Will any required court process result in additional restrictions on the historical use of the decreed water right (i.e., limitations on amount or timing of the historical use)?
 - Are there other potential risks to the historical operations or the original decree terms from pursuing the ATM use?
- Are there any practical limitations on the ATM use (a need to move water upstream or downstream, use of structure impediments, stream administration impediments, etc.)?
 - Can these limitations be overcome, and if so, what process and communications are needed?

Section 5

Administrative and Management Tools

Administrative and management tools include water transfer agreements and templates, partnering agreements for use of existing infrastructure and/or the development of new infrastructure, and water accounting methodologies. Since its formation, the NECWC has discussed the issues that need to be considered and defined in administrative and management tools and has developed draft tools as needs have arisen.

Section 5 describes issues that have arisen through discussions with the NECWC board and members, local water users, and regional partners that need to be considered and incorporated into administrative and management tools. The NECWC anticipates that these issues would be of interest to other entities that are contemplating or pursuing multi-benefit partnerships.

5.1 Agreements for Infrastructure

Agreements governing the use of existing infrastructure or the development, ownership, and use of new infrastructure have been an important topic for the NECWC and LSPWCD. The NECWC has discussed the types of considerations to be addressed in agreements for the use of existing facilities with owners of existing infrastructure (some of whom serve on the NECWC board). The LSPWCD has assisted in the development of agreements with owners of existing infrastructure along with the creation of agreements for the development of new infrastructure via its pursuit of regional partnerships.

5.1.1 Foundational Considerations

Several considerations were identified that are foundational for the development and operation of water supply and/or marketing activities. These foundational considerations became apparent through the analyses of regional partnerships and the outreach with potential partners that have been conducted by the NECWC and LSPWCD.

- **Infrastructure is needed before ATMs can be considered as a significant source of water supply.** Temporary leases of water supply (mainly, recharge credits) regularly occur among water users in the South Platte River basin in relatively small volumes. However, if a large water market is to be developed that can provide significant amounts of supply, infrastructure is needed to aggregate and manage the supplies. Large amounts of supply derived from temporary leases would come from numerous water users spread out over a wide area. Those supplies would need to be collected at one or a few discrete locations so that they can be treated and conveyed to an end user (if they are a municipal water provider) or delivered to agricultural water users when needed. If the leased supplies are to be exchanged upstream to another user, the supplies often cannot be exchanged when they are available. For example, during dry years when senior irrigation rights could be leased to a municipality, exchange potential may not exist, and the

leased supplies may need to be stored in a downstream location until exchange potential develops and the supply can be exchanged upstream to the municipal end user. In addition, a flexible system of return flow delivery is necessary to maintain historical return flows associated with multiple locations where senior agricultural water rights are leased. Surface reservoirs or a system of recharge facilities with varying times of return would be needed to provide a supply of return flow that is tailored to the aggregate historical patterns associated with numerous farms.

- **Identifying the types of water that can and cannot be managed with project infrastructure is critical.** Irrigators in the lower South Platte River basin have been apprehensive about water development projects that could help foster purchases of senior irrigation water rights and the permanent dry up of irrigated lands in Districts 1 and 64. Development and agreement to principles that mitigate these types of concerns is foundational to the creation of partnerships in the South Platte River basin.
- **The agreements for how infrastructure is used will influence a water marketing framework.** Participants in a partnership each have their own operational objectives that need to be met, and these considerations influence the way a water marketing framework can operate. For example, capacity necessary for using conveyance or storage for water marketing purposes may not always be available depending on the needs of participants. Infrastructure capacity constraints can limit the ability to manage or deliver water in a market. Conversely, shared infrastructure could create opportunities for transactions among participants and may increase water marketing opportunities. Understanding these types of limitations and opportunities is foundational to the creation of a water market.
- **Rules of engagement are important when considering third-party participation.** Oftentimes, when a water project or partnership is initiated, it raises interest with other parties that could benefit from joining the partnership. Creating a set of principles or rules for engagement with third parties is important for communicating the limitations and opportunities associated with a partnership and the use of infrastructure and is also critical for maintaining the trust and support of existing parties in the partnership.
- **Decision making processes need to be defined.** In any partnership, decisions will need to be made about issues that are foreseen and problems that arise that were not anticipated. Defined decision making processes are important for maintaining trust and guiding participant processes for making decisions for the partnership.

5.1.2 Considerations for the Use of Existing Infrastructure

Partnerships and agreements are needed with infrastructure owners when considering the use of existing infrastructure to manage supplies in a water market. These agreements need to consider a variety of factors. Oftentimes, partnership development can require significant discussion and time to build trust and mutually beneficial operational strategies. Factors for consideration on the use of existing infrastructure include:

- **Existing uses of infrastructure and the degree to which existing operations can or cannot be altered.** Existing infrastructure is typically constructed and operated to meet a specific need. In some instances, the need could continue to be met if operations are altered. However, most often, the operations will need to be largely maintained as has occurred historically and will take precedence over the operations of a new partner. Understanding how existing infrastructure operates, options for changing operations, the available capacity for a new partner, and whether the available capacity is adequate for new uses is critical. In some instances, the capacity of existing infrastructure can be expanded to accommodate a new use. Modeling and technical analysis is

often needed to evaluate existing and proposed operations and to support negotiations for agreements on the use of existing infrastructure.

- **Costs for improvements to existing infrastructure to accommodate new uses and how those costs are paid.** If existing infrastructure is improved or modified to accommodate a new use, the costs for modifications and the payment process for the modifications need to be understood by all parties and described in an agreement. In some instances, depending on the financial capacity of the parties and improvements to be made, capital costs could potentially be borne upfront by one or more parties with other parties paying their share in the form of water or other contributions.
- **Costs for operations associated with new uses and how those costs are paid.** Like the costs of infrastructure improvements, costs of operating existing infrastructure need to be negotiated and described in an agreement. Compensation for operations would likely be based to some degree on proportional use of infrastructure, but is subject to negotiation.

5.1.3 Considerations for New Infrastructure

Like the use of existing infrastructure, constructing new facilities to manage supplies requires an agreement and the development of trust and a partnership. Factors for consideration when contemplating the construction of new infrastructure include:

- **How to pay for design, permitting, construction, operation, and maintenance of new infrastructure.** Costs through the life-cycle of new infrastructure are an important consideration, and the larger the infrastructure project, the more daunting the costs will likely be. Methods of compensation for the different stages of new infrastructure development and operation may vary. For example, the parties may pay design and permitting costs with cash based proportionally on ownership or anticipated use of infrastructure. However, they may agree that a party with more financial capacity would pay the bulk of construction costs, and the party having less financial capacity could make contributions to the other party in lieu of cash. Negotiations for the costs to build and operate infrastructure can take extensive effort and significant time for large infrastructure projects.
- **Ownership of new infrastructure.** Terms describing the ownership of new infrastructure should be included in a partnership agreement. Ownership structure should balance the parties' interest in the infrastructure and the relative importance of the project. For example, if the parties will be reliant on the project and it will provide significant benefit for all, then the ownership structure will likely need to provide equal power to each of the parties to make decisions regarding the operation and future of the project. If one party has less interest or dependence on the project, then ownership of the project could potentially favor others with more dependence. The ownership structure is a factor that should be carefully considered by all parties in the partnership.
- **Coordinated operations of new infrastructure.** Future operations of the infrastructure need to be considered carefully, and operational parameters should be described in an agreement. Protocols for coordination and decision making on operations should be established and agreed upon. Potential future changes in conditions based on water supply limitations, changing demands, or the inclusions of third parties should be evaluated to understand the degree to which operations could change. Aspects of operations that need to remain consistent or could be altered to accommodate future changes should be discussed and understood.

5.2 Existing NECWC Administrative Tools

The NECWC previously developed administrative tools to enable and manage a limited set of water transactions that could potentially occur in the absence of infrastructure. The WaterSMART grant scope of work included tasks for evaluating and modifying existing administrative tools based on findings of analyses and results of outreach. The NECWC's existing administrative tools are a template for requesting temporary transfers of unused recharge credits and a real-time water accounting system to record the water transactions and report the transactions to the State Engineer's Office (SEO). Another important function of the real-time accounting system is to provide data and information for managing water transactions and operating a water market.

5.2.1 Template Water Transfer Requests

When the NECWC was formed, it created transfer request forms that were distributed to members and were intended to be used to manage and document requests for delivery of water and requests for consideration of available supplies that could be leased to other NECWC members. The water transfer request templates ask for information describing augmentation plans (name, water court case number), monthly volumes of water needed from the NECWC for up to a 14-month time period, and monthly volumes of water available for lease through the NECWC over a 14-month time period.

During the implementation of the WaterSMART grant work, no need to change the existing forms was identified. A copy of the form is included in Appendix C.

5.2.2 Water Accounting Tool

Accurate water accounting is a critical need for tracking water transactions in a water market, complying with water right decree terms and conditions, and providing transparency. During the formation of the NECWC, the board and consultants discussed the type of data necessary to track and account for water transactions that could potentially be facilitated by the cooperative. Given the ever-changing nature of hydrology, river operations, water demands, and administration, the tool would need to be dynamic and include real-time data and information. The NECWC and consultants thought that, in addition to performing water accounting, an accounting tool could also provide operational insights and aid in decision-making.

A water accounting tool (or "Accounting Tool") was created to meet the accounting and operational planning objectives that were contemplated in Phase 1 of the NECWC's development, which focused on spot-market transactions of unused recharge credits. The Accounting Tool was built in Microsoft Excel and uses a wide variety of macros to acquire web-based, real-time diversion and call data, perform calculations, and display data.

The Accounting Tool is currently configured to track and manage member-to-member transactions of unused recharge credits or deliveries from storage or recharge facilitates. Available unused recharge credits and call data are key inputs to the Accounting Tool. Information describing the location and amount of water NECWC members or others would like to make available for lease would be provided by potential lessors, and information regarding potential water needs would be provided by potential lessees. Call information can be imported into the Accounting Tool on a real-time basis and allows the tool to identify the ditch diversion structures that may be impeding exchange.

The NECWC's water accounting tool is described with more detail in "Northeast Colorado Water Cooperative Feasibility Study and Operational Analysis", which is included in Appendix A

The tool uses call data to evaluate how far upstream that water supplies could be exchanged. It also evaluates how far down the river the supplies could be delivered based on the capacity to bypass flows past diversion structures that dry the river. The Accounting Tool accounts for transit losses when considering downstream deliveries. While the current Accounting Tool has a focus on transactions involving unused recharge credits, it can manage and track deliveries from ATMs and storage or recharge facilities in similar ways.

The Accounting Tool identifies calls and dry up points on a real time basis giving the user the ability to make efficient and sound water management decisions

The Accounting Tool has been updated several times since its creation, and the NECWC anticipates that it will be updated in the future to reflect new types of transactions and the specific needs of members and other partners. During the work funded by ATM grants (and described in the report attached in Appendix A), the NECWC considered the specific types of modifications the tool could need to broaden the scope of transactions to include reservoir releases and deliveries to recharge facilities. During the WaterSMART project, the NECWC evaluated the specific accounting processes that the Accounting Tool would need to reflect pursuant to the outreach conducted with potential regional partners and the infrastructure and facilities that are being contemplated.

Regional, multi-benefit water development projects that are being contemplated involve storage reservoirs (new and existing), pumps and pipelines for water conveyance, alluvial aquifer recharge ponds, and water exchanges and trades. The accounting for water in these potential projects will need to reflect the movement and ownership of water and will be complex.

Specific modifications have not been made to the Accounting Tool, because potential regional water partnership and project concepts being investigated by the NECWC and LSPWCD are in the early stages of development. However, several detailed schematics were developed to reflect the range of facilities and transactions that the Accounting Tool will need to reflect and will be useful to guide future modifications to the Accounting Tool at the appropriate time.

The schematics presented below reflect four accounting scenarios that include diversions from and deliveries to the South Platte River, use of existing reservoirs, use of new reservoirs, and deliveries to recharge facilities.

Use of an Existing Reservoir

Figure 5-1 depicts a range of diversions, deliveries, and transactions that could be considered using an existing storage reservoir. The schematic contemplates that the existing reservoir operations would remain relatively unaltered by new operations (except for water trades/exchanges that are described below) and that reservoir space utilized by the new uses is available capacity in the reservoir that the owners are not using. The schematic also contemplates that the space in the existing reservoir can only be used temporarily and is not available for long-term storage, because the owners periodically need the full capacity of the reservoir. As a result, the available storage for new uses in the existing reservoir could be considered a “forebay” that temporarily stores water before it is conveyed to recharge, delivered to the river, or conveyed to a long-term storage facility.

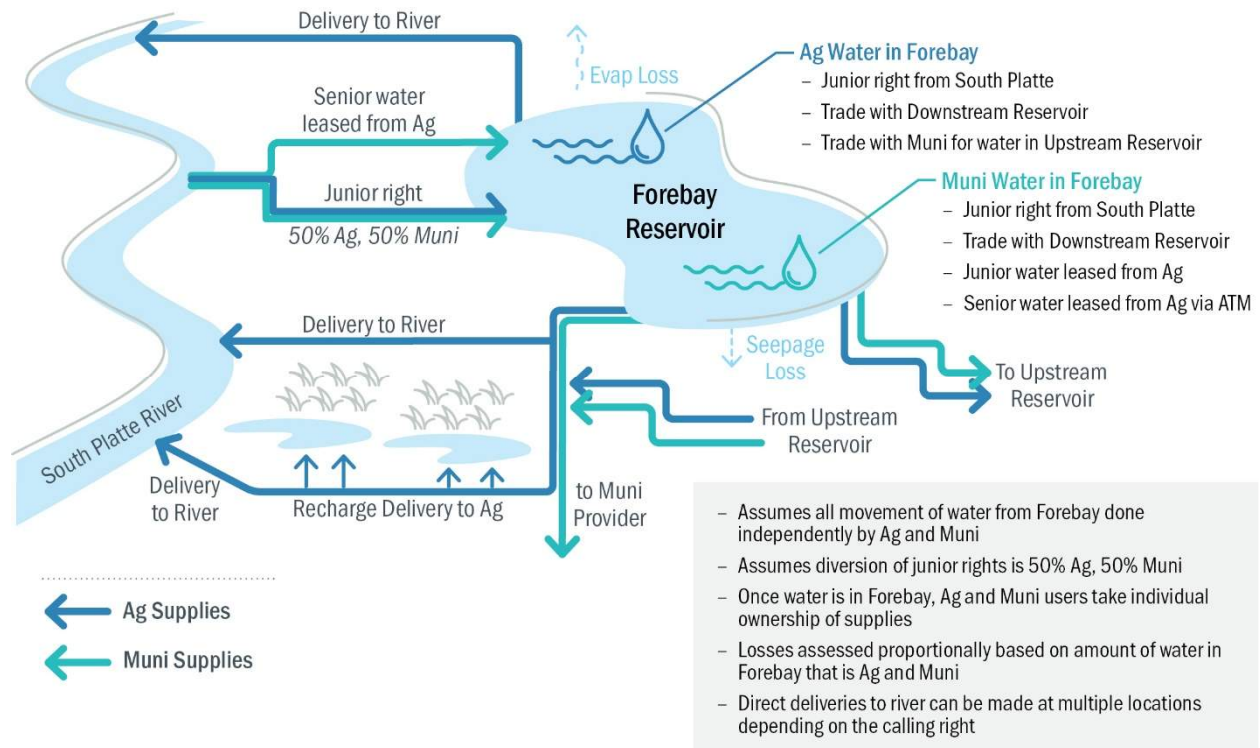


Figure 5-1. Accounting Schematic for Use of Existing Reservoir

Processes that need to be reflected in the Accounting Tool for the facilities shown in Figure 5-1 are described below:

- Diversions:
 - Daily diversions of native unappropriated flows from the South Platte River along with the ownership of the diverted water will need to be tracked by the Accounting Tool. Figure 5-1 assumes that the diversions from the river occur under a junior water right (because this is a new use) and are owned 50 percent by an agricultural water user and 50 percent by a municipal water user.
 - Senior water rights leased from irrigators through an ATM program could be delivered via the South Platte River from upstream locations or downstream locations (via exchange) and could be diverted into the storage facility.
- Deliveries
 - Water could be delivered to agricultural water users via direct releases from storage.
 - Water could be delivered to agricultural water users via a pipeline to recharge facilities at various strategic locations adjacent to the South Platte River that result in long-term recharge credits which can be incorporated into augmentation plans and boost irrigation well pumping.
 - Municipal supplies could be released from storage and conveyed via pipeline to meet municipal demands.

- Water in storage:
 - Agricultural and municipal supplies in storage will need to be tracked separately in the Accounting Tool. It is likely that the agricultural and municipal participants will maintain their own accounting of their supplies. If that occurs, the accounting tools operated by each entity must be synchronized and reflect the same data where there is overlap.
 - Agricultural water supplies in storage may reflect water stored via their junior water right and supplies that accrue to the agricultural storage account via water trades.
 - Municipal water supplies in storage may reflect water stored via their junior water right, supplies that accrue to the municipal storage account via water trades, and supplies that are acquired via ATMs.
- Losses
 - Daily evaporative and seepage losses that occur when water is being temporarily stored in the forebay must be tracked and allocated to the agricultural and municipal supplies in storage. The losses would likely be apportioned based on the relative amounts of water being stored in the respective agricultural and municipal storage pools.
- Conveyance to long term storage
 - Because the water in the forebay can only be stored temporarily, Figure 5-1 assumes that a new reservoir located upstream will be available for long term storage of supplies. The agricultural and municipal participants are anticipated to make independent decisions on when and how much water to move to long term storage, so separate tracking of releases to long term storage will be required.

New Reservoir for Long-Term Water Storage

Figure 5-2 illustrates processes that would need to be reflected in the accounting for a new reservoir that could be operated in conjunction with the forebay reservoir and that could store water for longer periods of time.

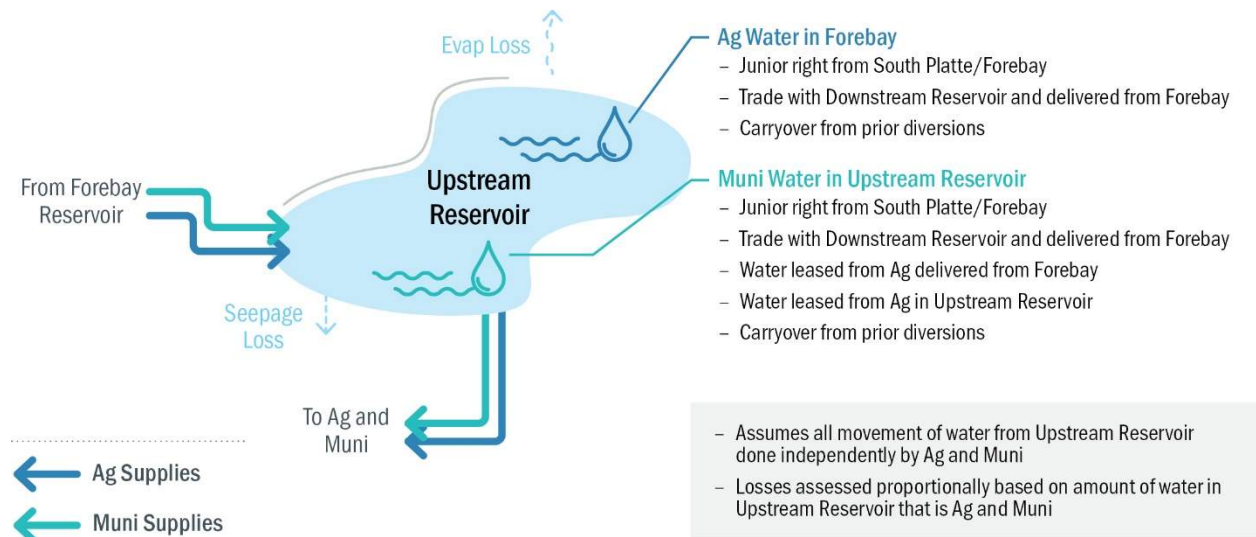


Figure 5-2. Accounting Schematic for Use of New Reservoir for Long-Term Water Storage

Processes that need to be reflected in the Accounting Tool for the facilities shown in Figure 5-2 are described below:

- Deliveries
 - Water could be conveyed from the forebay reservoir by agricultural and municipal participants based on their individual operating decisions and would need to be tracked separately.
- Water in storage:
 - Agricultural and municipal supplies in storage will need to be tracked separately in the Accounting Tool. If the agricultural and municipal participants maintain their own accounting, their respective accounting tools will need to be synchronized where data overlap.
 - Agricultural water supplies in storage may reflect water that was stored first in the forebay either via their junior water right or through accruals to the forebay's agricultural storage account via trades and then subsequently delivered to the upstream storage facility. Carryover from past diversions to storage will also need to be tracked.
 - Municipal water supplies in storage may reflect water that was stored first in the forebay via their junior water right and trades and then subsequently delivered to the upstream storage facility. Also, water leases from the agricultural partner accruing to the municipal partner's storage account in the upstream reservoir will need to be tracked as well as carryover from past deliveries.
- Losses
 - Daily evaporative and seepage losses that occur when water is being temporarily stored in the forebay must be tracked and allocated to the agricultural and municipal supplies in storage. The losses would likely be apportioned based on the relative amounts of water being stored in the respective agricultural and municipal storage pools.
- Releases
 - Releases to both agricultural and municipal participants will need to be tracked separately.

Downstream Reservoir

Figure 5-3 illustrates processes that would need to be reflected in the accounting for a new reservoir, possibly downstream of the forebay reservoir, that could be operated in conjunction with the forebay reservoir and could store supplies from the junior water right owned by the agricultural and municipal partners but could also facilitate trades of supplies with the forebay reservoir for the benefit of other agricultural users.

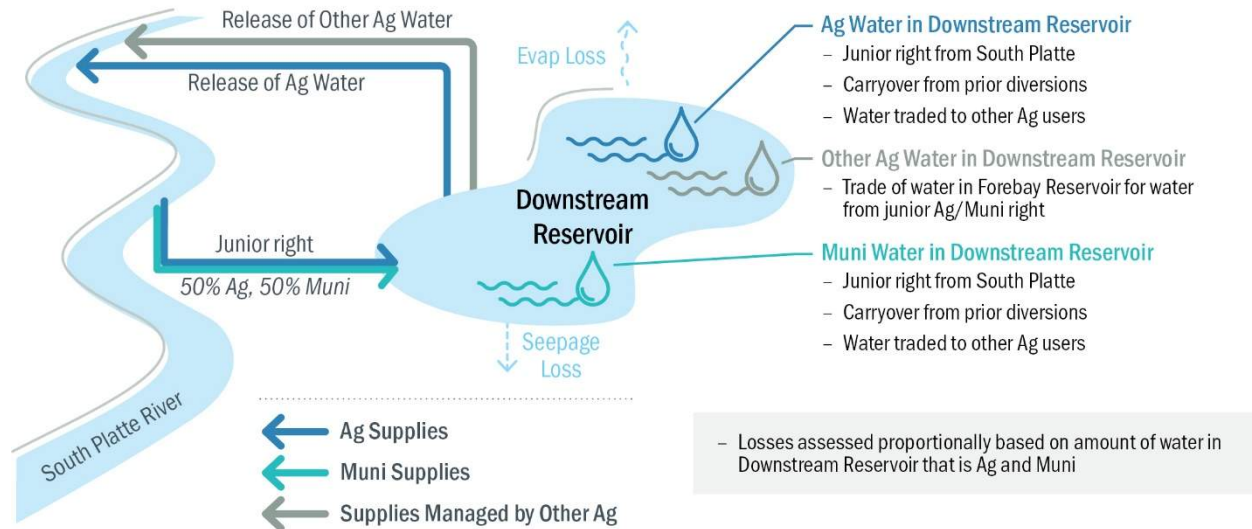


Figure 5-3. Accounting Schematic for Use of New Reservoir for Short-Term Storage and Trades

Processes that need to be reflected in the Accounting Tool for the facilities shown in Figure 5-3 are described below:

- Diversions:
 - Daily diversions of native unappropriated flows from the South Platte River along with the ownership of the diverted water will need to be tracked by the Accounting Tool. Diversions from the river would be under the junior water right and are owned 50 percent by an agricultural water user and 50 percent by a municipal water user.
- Water in storage:
 - Agricultural and municipal supplies in storage will need to be tracked separately in the Accounting Tool. If the agricultural and municipal participants maintain their own accounting, their respective accounting tools will need to be synchronized where data overlap. Carryover from past diversions to storage will also need to be tracked.
 - Figure 5-3 contemplates that a focused and mutually-beneficial water marketing framework could be developed with the owners of the existing forebay reservoir (assumed to be located upstream). Supplies diverted under the junior right and stored in the downstream reservoir could be traded with the owners of the existing forebay reservoir for supplies in that facility. The trade would position irrigation supplies for the owners of the forebay reservoir farther downstream and closer to their place of use, allowing for more precise releases to meet needs and reducing transit losses. The agricultural and municipal partners would then obtain supplies in the forebay reservoir via the trade, and the traded water could be conveyed for longer term storage in the upstream reservoir, released directly to the river or to recharge facilities for agricultural water users, or conveyed back to a city to meet municipal needs.
- Deliveries
 - Water could be released from the downstream reservoir to meet the needs of the agricultural partner.

- Traded water could be released to meet the needs of agricultural water users that own the forebay reservoir.
- Losses
 - Daily evaporative and seepage losses that occur when water is being stored in the downstream reservoir must be tracked and allocated to the agricultural and municipal supplies in storage and also to the water in storage that was traded to the owners of the forebay reservoir. The losses would likely be apportioned based on the relative amounts of water being stored in the respective storage pools.

Agricultural Recharge Facilities

Figure 5-4 illustrates potential accounting processes needed to capture deliveries to agricultural users that operate recharge facilities in augmentation plans. Water for the recharge facilities could be released from either the forebay reservoir described in Figure 5-1 or the upstream reservoir described in Figure 5-2.

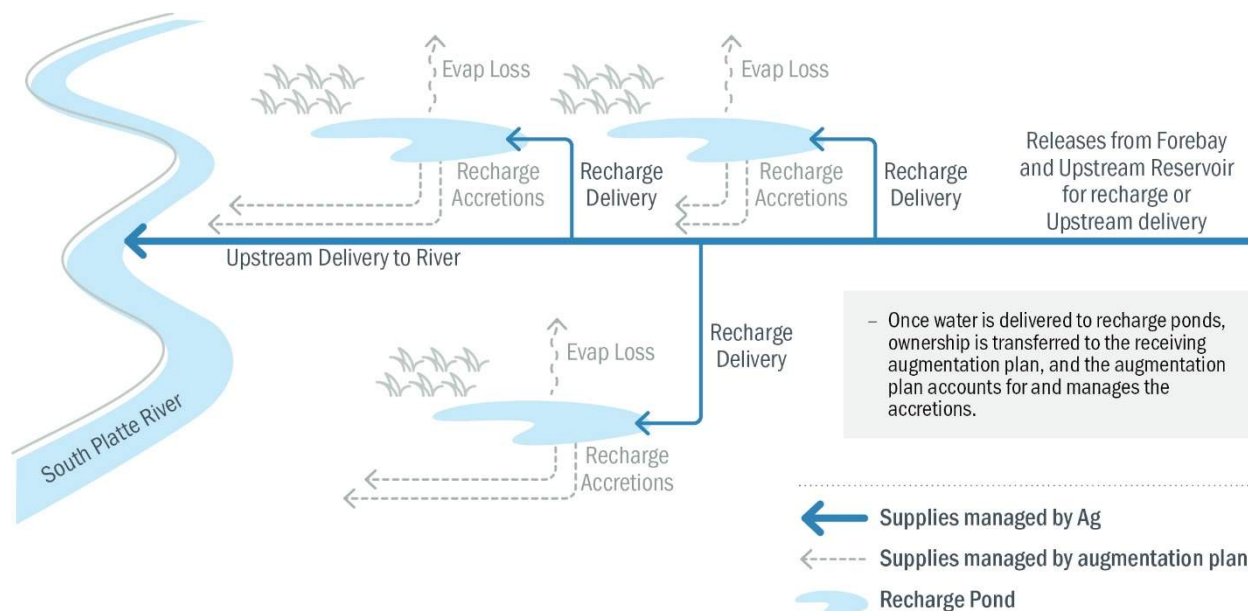


Figure 5-4. Accounting Schematic for Delivery of Agricultural Supplies to Recharge and the River

Processes that need to be reflected in the Accounting Tool for the facilities shown in Figure 5-4 are described below:

- Deliveries to recharge facilities
 - Water supplies could be delivered to recharge facilities owned and operated by augmentation plans and should be tracked by the Accounting Tool to the delivery point of individual recharge facilities. Once delivered, the operators of the recharge facilities would own and track the recharge supplies within the accounting for their individual augmentation plan. The owner's accounting should reflect evaporative losses of the supplies and the timing and amount of recharge accretions that reach the river to offset their pumping depletions.

- Direct deliveries to the river:
 - Figure 5-4 contemplates that the delivery pipeline that provides water for recharge facilities could also make direct deliveries of supplies to the South Platte River upstream of augmentation plans. While supplies for long-term recharge are needed by augmentation plans, short term supplies are also needed periodically to meet augmentation needs. The direct delivery pipeline could provide releases from storage that can be conducted on short notice to meet immediate needs of augmentation plans. The direct deliveries should be tracked to the river and reflected in the Accounting Tool. Once supplies are delivered, ownership would transfer to the receiving augmentation plan. Conveyance losses between the delivery point and location of need would be borne and tracked by the receiving augmentation plan.

Other Needed Accounting Tool Enhancements

In addition to the water accounting concepts and components described above, other accounting tool enhancements needed to fully track water supplies associated with regional partnerships and infrastructure include:

- **Linkages between water accounting systems:** Separate water accounting tools may be developed based on operations (e.g., storage, conveyance of supplies, recharge deliveries) or based on the specific needs of different partners. If separate accounting tools are developed, they will need to be linked to ensure that consistent data sets are being used. For example, if partners who jointly own a reservoir need to develop their own accounting for the water they are managing in a reservoir, their accounting must use the same data reflecting total storage, total evaporation, etc. The water accounting systems will likely need to share data on a real-time basis to ensure consistency.
- **A different software platform may be needed:** The current NECWC water accounting system is spreadsheet-based. However, a database platform may need to be considered to accommodate additional functionality and complexity of additional operations such as recharge or reservoir accounting. A database platform may perform calculations more efficiently than a spreadsheet and be more suitable for archiving historical data.
- **Phased development:** Accounting tool enhancements may need to be developed in a phased approach. Initial discussions among the NECWC board and consultants suggested the following phases:
 - Reservoir accounting could first be developed that reflects delivery of water to and from reservoirs and the storage accounts for reservoir users.
 - Accounting associated with the delivery of water to recharge facilities would be the next phase of accounting enhancements. Note that once water is delivered to recharge facilities, the NECWC anticipates that the end user of the recharge will account for lagged stream flow accretions resulting from recharge deliveries as well as evaporative losses from recharge facilities.
 - The third phase of accounting enhancement could focus on supplies delivered to the river and their conveyance to the location of need (either downstream or upstream via exchange).

Section 6

Financial and Funding Strategies

The NECWC has considered several physical water use options to provide benefits to its members, but funding for these options has been a consistent challenge. As described in Section 2, infrastructure is needed to manage water supplies in ways that provide significant benefit to members, but partnerships are needed to help overcome the financial challenges faced by agricultural water users in constructing infrastructure.

Financial challenges also led the NECWC to consider the role of LSPWCD in pursuing regional, multi-benefit partnerships. The NECWC is a relatively new organization with a limited number of members and does not have many options for raising initial funds to pursue an infrastructure project.

Municipal and agricultural water providers/managers have a variety of alternatives available to them to fund infrastructure projects. It is likely that they would use a combination of alternatives to fund the permitting, design, construction, operation, and maintenance of a large infrastructure project. It is also likely that the funding strategies may vary depending on the different stages of project development.

Financial challenges were a primary reason that the NECWC has sought regional partnerships with large water providers that have the financial capacity to fund projects.

6.1 Municipal Funding Alternatives

Municipalities have a variety of available methods for raising funds and are generally better positioned than agricultural water users to raise or borrow significant capital. Funding alternatives available to municipalities and/or municipal water providers are listed below:

- **User fees:** Water user fees come from the sale of water to residential and commercial customers. User fees can be raised at a reasonable rate to keep up with funding needs.⁴
- **System development fees:** New water customers are charged a system development fee. As growth continues and new customers come on line, system development fees are accrued.
- **Reserve funds:** Excess operating and capital funds can be transferred to a reserve fund that can be used for future project investments.
- **Mill levies:** Districts assess real property and apply mill levies to raise revenue for operating expenses and to pay debt service.
- **Borrowing:** Bonds can be issued to fund infrastructure projects. Mill levies can be used to repay the debt.

⁴ As the population grows, user fees often grow as well. However, water conservation and reductions in use can lower per capita demand and impact the amount of revenue raised through user fees. In fact, many municipalities have recently not seen increasing demand even as their population has grown.

6.2 Agricultural Funding Alternatives

Agricultural water users also have alternatives for raising funds, though the amount of funding that can be generated is generally less than that of municipalities. Water conservancy districts are a type of organization that may be best positioned to raise revenue on behalf of their constituents, who many times are agricultural users.

- **Reserve funds:** Excess operating and capital funds can be transferred to a reserve fund that can be used for future project investments.
- **Mill levies:** Water conservancy districts assess real property and apply mill levies to raise revenue for operating expenses and to pay debt service.
- **Borrowing:** Bonds can be issued to fund infrastructure projects. Mill levies can be used to repay the debt.
- **User fees:** Fees could be charged for the water that is delivered by the new infrastructure. Fees could vary by user. Fees for new supplemental water could be commensurate with a portion of the additional farm profit the new water generates. Fees could be charged on the amount of water that is delivered to recharge facilities or delivered directly to the river. Fees for a new industry or agribusiness could be based on the value of a reliable source of supply.
- **Allotments:** A water conservancy district could issue allotment contracts to project end users or participants and collect annual fees.
- **Temporary transfers to municipal partners:** The agricultural partner could temporarily transfer a portion of its newly developed supply to the municipal partner as a means to assist with paying for their share of an infrastructure project. The agricultural partner would need to carefully plan how much of its supply to transfer to the municipal partner and how much to reserve for delivery to agricultural water users. This funding strategy is consistent with the types of activities associated with ATMs, as part of the agricultural water supply is periodically provided to another type of water user on a compensated basis. In this case, the compensation for the municipal use of the agricultural supplies is based on the municipality's role in funding the construction of the infrastructure project.

6.3 Other Sources of Funding

Both municipal and agricultural water users have access to state and federal sources of funding assistance that could be used to fund infrastructure that could facilitate a market for water.

6.3.1 State Sources of Funding

The State of Colorado, through the CWCB, offers a wide variety of grants and loans to fund projects:

- The Colorado Water Plan Grants program supports water projects that advance the goals and vision of the Colorado Water Plan. Proposition DD, a measure passed in 2019 that uses revenues from sports gambling to fund water projects, may provide as much as \$27 million annually for the Colorado Water Plan Grants program.
- The Water Supply Reserve Fund Grants Program administered by the CWCB provides grants to address water supply issues and interests in each of the state's eight major river basins.
- The CWCB administers a Water Project Loan Program that provides low-interest loans for the design and construction of agricultural, municipal, and hydro projects in Colorado. Projects must align with the goals of the Colorado Water Plan to be eligible for this program.

- Specific appropriations from Colorado’s General Assembly can sometimes be obtained, especially for larger projects.

6.3.2 Federal Sources of Funding

Federal agencies offer several funding programs that can benefit water projects:

- The Natural Resources Conservation Service’s Regional Conservation Partnership Program (under the U.S. Department of Agriculture) offers about \$300 million annually to projects that address watershed and regional natural resource concerns.
- The Natural Resources Conservation Service’s Watershed and Flood Prevention Operations Program (under the U.S. Department of Agriculture) provides cooperation between the Federal government and states and their political subdivisions to prevent erosion, floodwater and sediment damage, promote conservation development, use and disposal of water, and to further the conservation and proper use of land in authorized watersheds.
- The Bureau of Reclamation’s WaterSMART Water and Efficiency Grants (under the U.S. Department of the Interior) provides cost-share funding to irrigation and water districts, and other entities with water delivery authority.
- The U.S. Department of the Interior’s Land and Water Conservation Fund supports the protection of federal public lands and waters and voluntary conservation on private land.
- Funding could be sought via a direct appropriation through Congress.

Section 7

Identification of Regional Partnerships

The NECWC has conducted implementation-focused outreach with local and regional partners that has been guided by the results of technical and legal analyses and by the NECWC board and membership. The evolution of the NECWC and its operational planning started with evaluating the resources available to the members in the form of unused recharge credits and the benefits that could be derived from transactions involving those credits. Subsequent analyses pointed to the need for infrastructure and financial partners to fully realize the benefits that could be derived from additional resources to manage water supplies. Upon reaching the conclusion that both infrastructure and financial partners are needed, the NECWC began and has continued to pursue partnerships with entities that could help them develop water supply projects that benefit all participants.

7.1 Overview of the PVWP Project

The pursuit of partnerships resulted in a relationship and ongoing project with Parker Water and Sanitation District, a member of the NECWC. The project is known as the Platte Valley Water Partnership (or PVWP as defined earlier in this document).

The PVWP concept was originally pursued by PWSD and the NECWC as a multi-benefit project that could provide municipal supplies to PWSD while providing irrigation and municipal supplies to District 1 and 64 water users. As partnership discussions evolved, the NECWC board and members concluded that the LSPWCD should engage in the PVWP on behalf of District 1 and 64 water users (which includes the NECWC membership). More detail on the discussions with NECWC members related to the establishment of the PVWP is provided in Section 3. The LSPWCD and PWSD are equal partners in the PVWP. An application for water rights associated with the PVWP water supply project is currently being pursued by PWSD and LSPWCD.

The PVWP brings agricultural and municipal water users together to capture unappropriated supplies in times when that water would otherwise leave the state, and put it to beneficial use in Colorado. The project will create water storage and infrastructure to convey supplies to meet both municipal and agricultural needs. While PWSD will convey their share of the water back to the Front Range to serve their district, LSPWCD will put its water to use for agricultural and municipal purposes within its boundaries in Northeast Colorado. The PVWP focuses on the use of native South Platte River flows diverted under junior water rights, and not allowing supplies derived from permanent buy-and-dry of agricultural supplies to be diverted, stored, or conveyed using project infrastructure.

The LSPWCD will continue working in partnership with PWSD on the PVWP, which will provide benefits to NECWC members and District 1 and 64 water users as a whole.

An illustration of the PVWP as it is currently envisioned is shown in Figure 7-1. The project details are currently being developed, and as a result, the description of the PVWP is relatively conceptual.



Note: Illustration courtesy of Sigler Communications, Inc.

Figure 7-1. Conceptual Illustration of the Platte Valley Water Partnership project

The project is anticipated to be constructed in two phases:

Phase One: Consists of adding infrastructure to divert available water from the South Platte and deliver it to PWSD. The infrastructure would also be used to deliver water to constituents within the LSPWCD. Components include:

- New Small Storage Reservoir: 4,000 to 6,500 AF of storage
- Prewitt Reservoir Improvements: Improve diversion structure and inlet canal
- Delivery system to LSPWCD users
- Delivery system to PWSD
 - 125 miles of pipe
 - 4 pump stations to transport up to 12 million gallons per day
 - Desalinization facility for treating up to 9 million gallons per day

Phase Two: Includes building the shared Large Storage Reservoir to store available water from the South Platte, and then pump at lower rates to PWSD or local LSPWCD users. Components include:

- New Large Storage Reservoir: 72,000 AF of storage
- Delivery system to and from the Large Storage Reservoir
 - Up to 250 cfs pump station
 - 12.5 miles of pipeline

Construction is anticipated to begin in the late 2030s with water delivery in 2040. Construction for various components will occur concurrently.

7.2 Overview of the SPROWG Concept

Background

Diverse interests across the South Platte River basin have for years been considering water supply projects and strategies that benefit municipal, industrial, agricultural, recreational, and environmental interests. The South Platte Basin Roundtable and Metro Basin Roundtable published the South Platte Basin Implementation Plan (SPBIP), originally in 2015 with an update in 2022, which identified water demands and evaluated various strategies to meet the identified water supply gap. Included in the original 2015 SPBIP, a “Conceptual Future In-Basin Multipurpose Project” was identified as one strategy in which South Platte supplies can be used with the greatest potential benefit (see 2015 SPBIP, Section 4.6.2). This conceptual project relies on developing several types of South Platte water supplies to meet multiple benefits.

In 2015, a group of South Platte water managers began exploring strategies for advancing the conceptual in-basin multipurpose water supply project described in the original SPBIP. Their work resulted in a framework for developing collaborative water projects in the South Platte basin that was the precursor to the SPROWG concept. In a parallel effort, the South Platte Storage Study, authorized by the Colorado General Assembly (HB 16-1256), evaluated the South Platte River between Kersey and the Colorado-Nebraska state line for potential water storage that could meet the considerable water gap identified in Colorado’s Water Plan. It found that on average, the South Platte River carries almost 300,000 acre-feet of water per year out of Colorado in excess of the amount needed to satisfy the South Platte River Compact with Nebraska (though the amounts vary widely).

SPROWG Feasibility Study

To further develop these concepts, the CWCB provided a grant to fund additional research (the SPROWG Study) to build on the aforementioned work of South Platte water managers and the South Platte Storage Study. The study approach included gathering input from a broad and diverse group of stakeholders to ensure that all interests were heard and considered. A major part of the effort focused on outreach to municipal, industrial, agricultural, recreation and environmental interest groups. A final report was completed in March 2020.

The SPROWG Study investigated a holistic approach to meet diverse water needs in the South Platte River Basin. Water supply concepts included multiple, operationally linked storage facilities (above and/or below ground) capable of holding more than 200,000 acre-feet of water in total at various locations between Denver and the state line. In addition, infrastructure was considered to treat and transport the water to users within the South Platte River basin. Potential organizational structures for developing and managing a regional water project were compared and contrasted.

SPROWG Concept Description

The goal of the SPROWG concept is to provide a long-term average of at least 50,000 acre-feet of water annually (less in average and wet years, more in dry years) to meet part of the municipal and industrial water supply gap and also supply additional water for agricultural users in the South Platte River Basin. A significant portion of the supply is targeted for smaller rapidly growing communities along the I-25 and Highway 85 corridor between Denver and Greeley, larger communities in the metro Denver and northern Colorado, and smaller communities east of Greeley. While four

alternative infrastructure configurations were evaluated in the SPROWG Study, the generalized version of the SPROWG concept is illustrated in Figure 7-2.

Alternative concepts evaluated in the SPROWG Study included different storage volumes to meet a range of target demands. Water would be moved to demand areas using exchanges or a new pipeline from a potential reservoir just downstream of Fort Morgan to potential storage facilities at the northern end of the Denver Metropolitan area. Alternatives involving delivery of treated water to municipal participants assumed reverse osmosis treatment technology and brine disposal. Nonpoint source control measures were considered as companion strategies to improve source water quality.

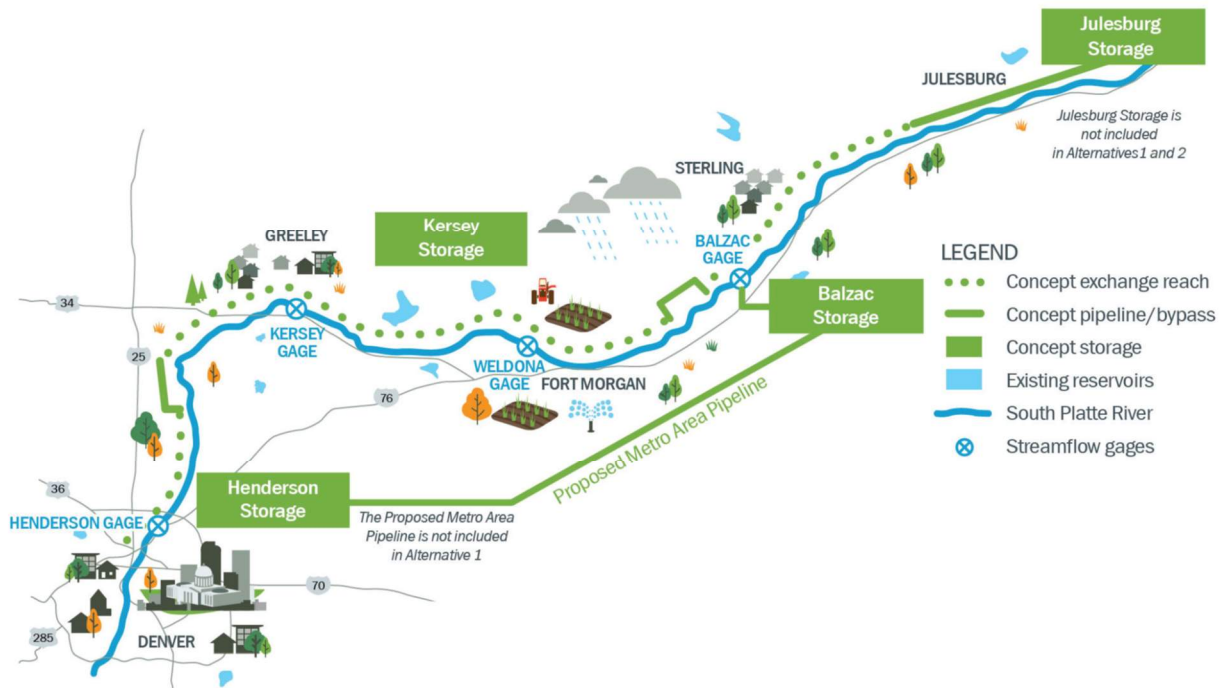













Figure 7-2. Conceptual Illustration of the SPROWG Concept

SPROWG Guiding Principles

A set of principles developed and agreed to by stakeholders describes the characteristics of the SPROWG concept. The Guiding Principles are foundational to the SPROWG concept and ensure that proponents and participants have a common understanding of what the concept is intended to achieve and how it intends to do it. Table 7-1 provides a summary of the Guiding Principles.

Table 7-1. Abbreviated Guiding Principles for the SPROWG Concept	
Principles describing what SPROWG <i>is</i>	Principles describing what SPROWG <i>is not</i>
<ul style="list-style-type: none">  SPROWG will advance the goals of the South Platte/Metro Basin Implementation Plan (BIP) and Colorado’s Water Plan, and will be consistent with Colorado water law, interstate compacts/agreements.  SPROWG intends to provide at least 50,000 acre-feet of yield to meet part of the projected municipal and industrial water supply project gap in the South Platte basin. A significant portion of this yield is targeted for smaller but rapidly growing communities between Denver and Greeley and larger communities in the Denver Metro area and northern Colorado. The project will also explore providing supplies to smaller communities east of Greeley.  SPROWG will utilize different sources of water available in the South Platte basin and manage them conjunctively to achieve an overall reliable yield beyond what an individual source could produce.  SPROWG will identify and incorporate strategies to address environmental and recreational needs.  SPROWG intends to enhance the ability to conduct alternative water transfers, thus reducing the need for traditional buy-and-dry transfers  SPROWG is intended to help water supply organizations and water users maximize the use of in-basin supplies.  SPROWG intends to improve integration of water quality and quantity planning and management activities.  SPROWG intends to meet a portion of the agricultural gap. 	<ul style="list-style-type: none">  SPROWG is not intended to be a substitute for existing or planned projects.  SPROWG is not intended to store supplies from an existing or new transmountain diversion project (though it will provide a means to utilize unused reusable return flows from transmountain diversions).  SPROWG is not intended to be used to deliver water developed from the permanent dry up of irrigated lands in the South Platte basin.

Several proponents of the SPROWG concept, including the NECWC and several large municipal and agricultural water providers, have continued to meet since the conclusion of the feasibility study and explore strategies to promote the SPROWG concept to water users, conduct further technical studies, and advance organizational and financing options. The proponents will be working with a project manager and facilitator that will assist in conducting outreach to potential participants, exploring how the SPROWG concept could be tailored to meet participant needs, and obtaining grant funding to provide resources for additional outreach and technical, organizational, and legal evaluations.

The NECWC will continue to participate in the development of the SPROWG concept and evaluate regional partnerships that could result.

The NECWC will continue to engage with additional potential partners in the future

Section 8

Water Marketing Strategy

The water marketing strategy for the NECWC has been in development for several years. In some ways, the vision for the water marketing strategy has been relatively consistent from the inception of the NECWC. The NECWC foresaw near- and long-term benefits that could be provided to its members, but the NECWC board and consultants knew that much analysis, time, and collaboration would be needed to achieve their vision. In other ways, the water marketing strategy has seen significant evolution that has resulted from detailed technical evaluations, legal considerations, outreach, and partnership building.

The NECWC's water marketing strategy rests on a variety of critical concepts that needed to be established before it can be feasible and transactions can take place. These concepts form the foundation of the water marketing strategy implementation plan, rules and requirements, agreements, and monitoring plan. The foundational concepts are described below for each of the water marketing strategy elements.

The water marketing strategy for the NECWC consists of several critical concepts that are foundational to developing and implementing a water market. Outreach with local and regional partners will be important for continued development of a water market and infrastructure needed to facilitate transactions.

8.1 Implementation Plan

The implementation plan for the NECWC is described through the series of steps below. Some of these steps have been completed and others will be completed in the future. While these steps are specific to the NECWC, it is likely that many or all of them could be generally applied by other parties interested in developing a water marketing strategy.

- 1. Establish relationships and partnerships.** For a water marketing strategy to be successful, partnerships among entities with common interests and/or who have a mutual need for water must be established. The PVWP came about because of relationships developed several years ago between PWSD and the NECWC (of which PWSD is a member). The NECWC and PWSD worked together to evaluate potential alternative concepts that could meet both agricultural and municipal needs. Through these early interactions, trust and working relationships developed that were essential to creating and pursuing the PVWP.
- 2. Establish conceptual rules and requirements for water marketing.** Parties to a water marketing strategy may approach it with different motivations and values. Rules and requirements for water marketing should be developed or at least conceptualized early on to ensure that each party's values are being protected and their needs are being fulfilled in the water marketing strategy.
- 3. Focus on water transactions that benefit all parties.** A water marketing strategy that meets the needs of all parties is crucial. The PVWP provides several examples of this. Water from the PVWP will help provide for current and future unmet water needs in LSPWCD and the NECWC, will provide for the future needs of PWSD, and will also provide economic benefits and some additional supply for irrigators that own existing infrastructure that will be used in the PVWP.

4. **Establish agreements.** Agreements for how water marketing transactions will take place and what they will cost; how necessary enabling components like infrastructure or measurement facilities will be permitted, constructed, and paid for; and how decisions will be made are important to the future success of a water marketing strategy. Agreements should contemplate future changes like the addition of partners or potential new types of water transactions. Agreements that establish the ability to conduct a set of mutually-beneficial water transactions and have transparent decision making processes are foundational for the ability to enhance the suite of potential transactions in the future to include different types of ATMs or different partners.
5. **Create a governing body.** Individuals entrusted with making decisions related to a water marketing project may be specified in agreements, but it is likely that a governing body with a representative board will be needed to make operational, financial, and planning related decisions on behalf of the participants.
6. **Develop infrastructure to enable water marketing.** Infrastructure, especially in the South Platte River basin but also in the western U.S., can be critical to enabling water marketing. Potential water marketing activities can be severely limited without the ability to aggregate and manage supplies and then convey supplies to a location of use.
7. **Establish communications protocols and plans.** Communication between a governing body and stakeholders associated with a water marketing project is important for obtaining continuous feedback and building trust.
8. **Monitor transactions and deliveries.** Transparent accounting for water and financial considerations needs to be implemented to maintain compliance with agreements or legal obligations, ensure transactions are fairly compensated, track deliveries, and maintain trust in the partnership.

The NECWC has worked with and encouraged LSPWCD to implement the above process with respect to the PVWP. Currently, the parties to the PVWP are working on agreements and are pursuing water rights for the project. Infrastructure necessary to manage supplies as well as enable water diversions and transactions has been conceptualized and will be designed in detail in the near future. The time and work necessary to get to the point of establishing agreements has been considerable. However, implementation of the PVWP is essential to all parties involved, and its success has been, and will continue to be, due to the foundational implementation steps taken early on.

8.2 Rules and Regulations

Rules and regulations for a water marketing strategy that uphold the values of the participants and foster market activity should be developed early, at least in conceptual form. Through the outreach and feedback conducted for this project, and also through the development of partnerships such as the PVWP, the following principles have been established to guide the rules and regulations of a water marketing strategy:

- **Infrastructure cannot foster permanent buy-and-dry.** Infrastructure for managing and delivering water supplies involved in a water market cannot be used to also manage and deliver supplies that result from the purchase of senior agricultural water rights and the permanent cessation of irrigation on agricultural lands. Irrigators have expressed apprehension about infrastructure projects that can divert supplies from agricultural regions and convey the water to a municipality. They fear that the infrastructure could foster buy-and-dry purchases that will have negative consequences for the region's agricultural economy and way of life. Rules that prohibit the

management of supplies from buy-and-dry activities give local stakeholders confidence that the infrastructure will provide long-term, local benefits rather than negative economic impacts.

- **Water marketing activities cannot injure existing water rights.** Water marketing activities cannot cause material injury to existing water rights and must be conducted within the framework of Colorado’s water law. In addition, water marketing activities need to be administrable by Colorado’s State Engineer’s Office. Administrability is generally characterized by the ability to:
 - Measure water that is supplied from a farm to a water market
 - Divert water only when in priority
 - Verify that expansion of use will not occur
 - Shepherd the water to the end user or to storage
 - Ensure that historical return flows are being maintained in time, location, and amount
- **Water marketing activities cannot impact return flows.** Return flows, or the portion of irrigation water that returns to the stream after agricultural uses, are a critical component of water supplies in the South Platte River basin and across Colorado as well as the Western U.S. Maintaining the timing, amount, and location of historical return flows when water supplies are temporarily transferred to other uses will be a requirement for water marketing activities in Colorado and potentially in other states. Ensuring that return flows are provided in the appropriate amounts, timing, and location can be a complicated process requiring detailed water accounting and flexible delivery strategies when water is transferred from a variety of farms over a large geographic area. Rules for ensuring return flows are maintained would likely be incorporated into a Colorado water court decree, but additional operational rules may be required to ensure deliveries are being made where and when needed.
- **Local impacts of water marketing should be dispersed.** While water marketing is a way to maintain agricultural production and local economies while providing water to other uses, there are still some reductions in agricultural output that can have local impacts. Rules for water marketing should encourage that lands enrolled in a program are dispersed both geographically and temporally. Geographic dispersion of lands could help reduce secondary economic impacts to agriculturally focused businesses in individual towns. Temporal limitations, such as requiring individual fields are irrigated at least 6 out of 10 years, ensures long-term agricultural production is maintained.
- **Rules for distributing supplies should be developed.** If supplies available to a water market do not meet overall demand, rules should be developed and incorporated into agreements with end users that describe how water will be allocated among end users.
- **Third party participation should be considered.** As described earlier in this report, rules for how to incorporate additional parties in a water marketing system should be developed. When a water partnership or water marketing program is initiated, it raises interest with other parties that could benefit from joining the partnership. Creating a set of principles or rules for engagement with third parties is important for communicating the limitations and opportunities associated with a partnership and the use of infrastructure and is also critical for maintain the trust and support of parties in the existing partnership.
- **Rules for affordable and adjustable water pricing are needed.** Water pricing should be considered from multiple perspectives whether water prices are set by an authority or board or are driven by market forces. Transparency in water pricing rules and decision-making are important to maintain trust among market participants. Considerations for water pricing include:

- **Cost recovery.** If infrastructure needs to be developed to enable water marketing activities, the end user’s price for water will likely need to cover some or all the costs of infrastructure construction and maintenance.
- **End user affordability.** Water costs for end users will need to be affordable to agricultural producers or municipal partners or they will not participate in the water market.
- **Market conditions.** Agricultural water “suppliers” often will be hesitant to participate in a water market if the price paid for their water does not reflect market conditions. Market conditions may vary depending on location, but they often consider commodity prices, farming input costs, and prices paid for similar water transactions. In addition, prices paid for water should include adjustment factors so that they reflect future changes in market conditions.

8.3 Specific Agreements Needed

Development and establishment of a water market will require a variety of agreements. Below is a description of agreements identified by the NECWC that are either being developed or will need to be developed in the future to enable water marketing activities with local and regional partners.

- **Charter or Memorandum of Agreement.** Informal or non-binding agreements like a charter or a memorandum of understanding (MOA) are useful at the beginning of a potential project or partnership to ensure that parties understand and conceptually agree to the objectives or general nature of the partnership they are pursuing, processes for making early decisions, tasks that will be conducted to research a potential project or partnership, and financial obligations that may be incurred. These agreements could include “off ramps” that allow one or more of the parties to end their participation under certain conditions.
- **Project Development and Operating Agreement.** Parties that participate in a water development and/or marketing partnership should develop an agreement that describes the scope of the project (such as the intent of the project, necessary infrastructure, geographic boundaries of water market activities if necessary, and constraints on water supplies or end uses), ownership of water and infrastructure, terms on how cooperation will occur among the parties to develop the project, financing considerations, operation and maintenance responsibilities, decision-making for operations, and handling unforeseen issues. Responsibilities for obtaining water rights should also be considered in an agreement. The resulting water court decree will likely include terms that need to be considered or incorporated into operating or delivery agreements. In addition, consideration should be given to what, if any, restrictions the parties should adopt on potential future water marketing or acquisition activities that occur outside of the partnership.
- **Use of Existing Infrastructure.** Section 5 described several considerations for using existing infrastructure and the types of administrative tools or agreements that would be necessary. The primary factors for consideration listed in Section 5 are as follows (see Section 5 for more detail):
 - Existing uses of infrastructure and the degree to which existing operations can or cannot be altered.
 - Costs for improvements to existing infrastructure to accommodate new uses and how those costs are paid.
 - Costs for operations associated with new uses and how those costs are paid.
- **Development and Use of New Infrastructure.** Section 5 also described several considerations for the development and use of new infrastructure and the types of administrative tools or agreements

that would be necessary. Note that some of the considerations are also incorporated into the Project Development and Operating Agreement description above but are repeated in the context of considerations specific to new infrastructure. The primary factors for consideration listed in Section 5 are as follows (see Section 5 for more detail):

- How to pay for design, permitting, construction, operation, and maintenance of new infrastructure.
- Ownership of new infrastructure.
- Coordinated operations of new infrastructure.
- **Delivery Agreements.** Agreements with end users of supplies from a water market of the type contemplated by the NECWC will need to include considerations such as price and pricing adjustments, delivery amounts and factors that could impact the amounts, location(s) of delivery, responsibilities and costs for measurement of deliveries, costs of water accounting services (if applicable), and definition of when ownership of water transfers to the end user.

8.4 Monitoring Plan for Marketing Activities

Monitoring of water marketing activities will be required from both financial and water accounting perspectives.

Financial monitoring and accounting will be required to ensure long-term stability and viability of the partnership or water market, to ensure that partners are fulfilling their monetary obligations, to track revenues from water sales, and to develop a historical database of water pricing that could inform future transactions.

Water accounting will be required for water market/project operations, planning, and regulatory compliance. Detailed water accounting is commonly required in Colorado to meet the terms and conditions of water rights decrees. In addition, detailed and real-time water accounting can help managers of a water market or project make daily operational decisions and plan operations in the short, medium, and long terms. The water accounting necessary for water marketing and the operation of infrastructure to enable water marketing was described in Section 5.

Section 9

Conclusions and the Path Forward

The process and stakeholder outreach associated with the early development and implementation of the NECWC, as well as its more recent evolution, generated a wide variety of findings and conclusions. Findings and conclusions were often derived as the NECWC identified challenges, conducted analyses, and identified solutions to the challenges based on results of analyses and member feedback. Many of these findings and conclusions are identified in previous sections of this report, and they're summarized in the format of challenges and solutions below:

Challenge: NECWC members need water during dry times when marketable supplies are scarce.

The initial research into potential operations of the NECWC showed that the real benefit to members was rooted in developing strategies to store or retime water when it is abundant and provide it to end users during dry times. When “extra” water is available in the South Platte River basin during wetter periods, most users tend to have sufficient supply, and the need for additional supply is diminished. On the other hand, during dry times when needs for additional water supply develop, very few water users have supply available to transfer via water leases.

Solution: Infrastructure is necessary to store and manage water when it is abundant and supply it when needed.

Challenge: Future availability of unused recharge credits is difficult to forecast.

Temporary unused recharge credits for augmentation plans are typically not a supply that can be reliably predicted or counted on by end users without additional infrastructure to manage this source. While unused recharge credits regularly occur, they are a byproduct of augmentation plan operations and efforts to ensure that the amount of supply in augmentation plans always meets or exceeds pumping depletions.

Solution: Infrastructure is needed to derive the most value from unused recharge credits. Additional water management infrastructure can improve the long-term reliability of unused recharge credits by providing a means to store and convey the water when and where it is needed by end users.

Challenge: Managing significant amounts of supply from numerous farms in a water market will be complicated.

Irrigation ditch companies and irrigated farms that might participate in a water marketing strategy are dispersed over a lengthy geographic area along the South Platte River, and larger municipal providers with whom partnerships could be established, are located upstream of the basin's primary agricultural region. Managing and supplying relatively small amounts of water from numerous farms to an end user will present challenges in terms of conveyance and timing. Also, maintaining the timing, amount, and location of historical return flows (in compliance with Colorado water law) from numerous farms will be a complicated challenge.

Solution: Infrastructure for water management is necessary to enable significant water marketing activities in the lower South Platte River basin. Infrastructure is necessary to aggregate and convey unappropriated supplies that are marketed between agricultural and municipal partners and also agricultural supplies provided through an ATM-based water market. Infrastructure can be used to store water when exchange to upstream uses is not possible and release water when exchange capacity develops. Historical return flows from farms participating in a water marketing program can be maintained by releasing supplies from strategically located infrastructure (potentially in several locations in the basin).

Challenge: Significant infrastructure projects are expensive.

Agricultural water users typically do not have the financial resources to develop large infrastructure projects needed to store and convey supplies that provide a significant amount of regional water security.

Solution: Partnerships between agricultural and municipal water users are necessary to provide sufficient capital to develop multi-benefit projects that can enable significant water marketing opportunities.

Challenge: Water marketing programs using ATMs have not proliferated in Colorado.

Water marketing through ATM-based programs has been somewhat slow to proliferate in Colorado. Water leaders in Colorado have encouraged the scaling-up of these types of programs. While there is interest among Colorado water users in these programs, many times the costs and unique challenges of ATMs can cause users to focus on more conventional ways to acquire water supplies.

Solution: Participants in a partnership need a sense of urgency. With ever-growing water demands and competition for limited supplies, the urgency for creative water supply solutions is growing. The PVWP is a good example of a partnership fostered by the NECWC that pairs a municipal water provider (PWSD) with a pressing need for water supplies and an agricultural water management organization (LSPWCD) that is focused on providing needed benefits to its agricultural constituency. Partnerships can develop when mutually-beneficial water transactions can be identified.

Challenge: Agriculture often lacks a forum to pursue water partnerships

While agriculture-focused organizations exist in Colorado, the voices of irrigators are often not unified or consolidated, which can lead to diminished leverage in water-focused negotiations and in communications.

Solution: The NECWC is an organization that has members throughout Districts 1 and 64. The NECWC's board is representative of the members and, with member feedback, can monitor water-related activities in the basin and participate directly or indirectly in current and future partnership activities. Maintaining the NECWC organization into the future and encouraging involvement by local stakeholders will enhance the unified voice, knowledge transfer, and leverage that will benefit the members and local communities.

The Path Forward for the NECWC

The NECWC's future has evolved through the course of the WaterSMART grant project. As described earlier in this report, the relatively new NECWC faces significant difficulties in implementing the initial concept of providing significant water supply benefits to members. However, through collaborative efforts, the LSPWCD and PWSD formed a partnership that may provide many of the benefits that the NECWC sought to provide. As a result, a significant focus of the NECWC has been implementing the PVWP for the benefit of water users in Districts 1 and 64.

The NECWC board and members have identified a new path forward for the organization in light of the accomplishments over the last several years:

1. **NECWC members integrate into LSPWCD operations:** Members of the NECWC that are located within LSPWCD boundaries can benefit from the PVWP project, and those NECWC members outside the LSPWCD boundaries can be included to receive benefits. Many of the water supply benefits contemplated by the NECWC can be provided to members through the PVWP.
2. **The NECWC board and membership will act as an advisor to LSPWCD:** The NECWC members and other lower South Platte River stakeholders recognize the collective knowledge and experience of the NECWC membership. The NECWC will advise the LSPWCD and the members in the future about the development and operation of the PVWP for the benefit of local agricultural water users.
3. **NECWC will actively participate in regional projects.** The NECWC will continue to seek other regional partnerships that could benefit its members. The SPROWG concept is a good example of a partnership that is still in early development but will be investigated and pursued by the NECWC.

Section 10

References

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Lower South Platte Water Conservancy District, Vranesh and Raisch, CCII, LLC, and Brown and Caldwell. "Northeast Colorado Water Cooperative Feasibility Study and Operational Analysis", Colorado Water Conservation Board, Alternative Agricultural Water Transfer Methods Grant Program, June 30, 2020.

Lower South Platte Water Conservancy District, Vranesh and Raisch, Phillips Law Offices, and Brown and Caldwell. "WSRA Grant Completion Report: Organizational Analysis for the Northeast Colorado Water Cooperative", Colorado Water Conservation Board, Water Supply Reserve Account Grant Program, June 30, 2015.

Appendix A: Final Report – Northeast Colorado Water Cooperative Feasibility Study and Operational Analysis

Appendix B: Work Plan for Development of Water Marketing Strategies for the Northeast Colorado Water Cooperative

Appendix C: Water Transfer Request Template

Limitations

This document was prepared solely for Northeast Colorado Water Cooperative in accordance with professional standards at the time the services were performed and in accordance with the contract between Lower South Platte Water Conservancy District and Brown and Caldwell dated August 29, 2019. This document is governed by the specific scope of work authorized by the Lower South Platte Water Conservancy District; it is not intended to be relied upon by any other party outside of the Northeast Colorado Water Cooperative and regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by the Northeast Colorado Water Cooperative and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

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