PRICE RIVER BASIN PILOT WATER BANK: SUMMARY ASSESSMENT

December 30, 2022

Prepared for:

Utah Division of Water Resources

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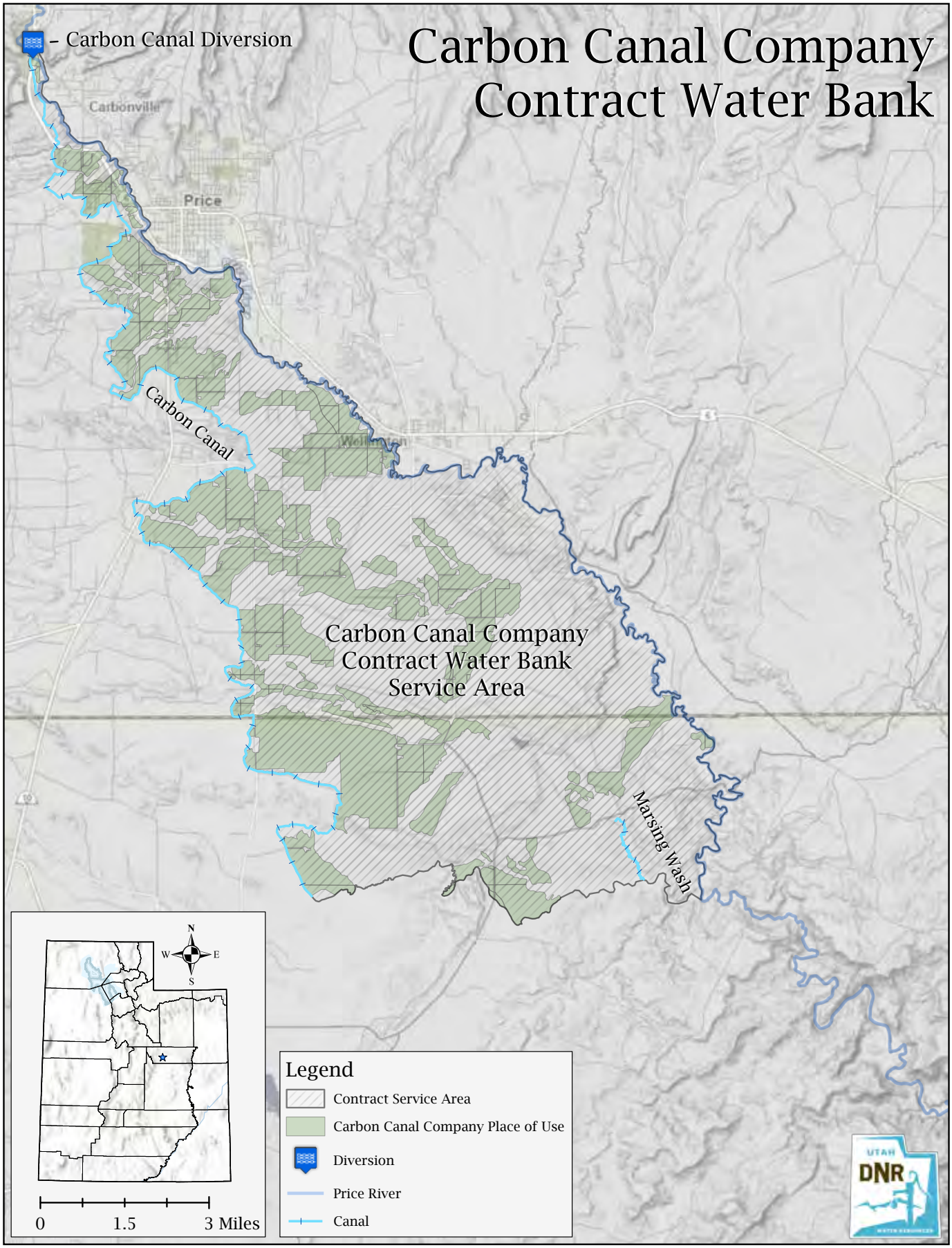
HDR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Price Water Bank Summary

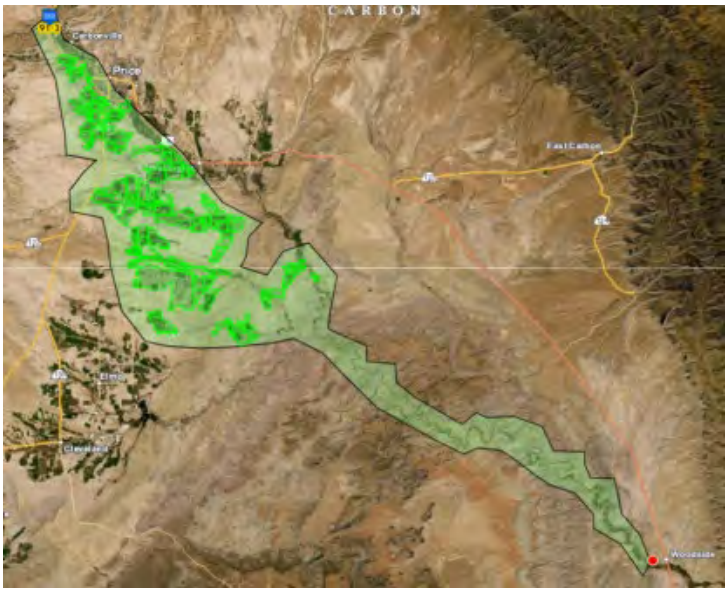
The Utah Water Banking Act promotes better management of the state's water resources through water leasing arrangements that are locally controlled, temporary, and voluntary. To kickstart and demonstrate water banking in the state, the Utah Division of Water Resources worked with local water users in the Price River Basin to form the state's first approved contract water bank, with the objective of assessing whether water banks are useful tools.

Participants

- Lessees: Carbon Canal Company shareholders
- Lessors: The Nature Conservancy, Trout Unlimited, and the Utah Department of Wildlife Resources
- Applicant: Price Watershed Conservation District

Concept

- Improve streamflows in the lower Price River to support recovery of threatened and endangered fish species
- Provide irrigators an alternative source of revenue while protecting their water rights from abandonment



Operations

- Participating shareholders voluntarily fallow their fields on a year-to-year basis in return for payment
- Leased shareholder water conveyed to the tail of the Carbon Canal for delivery to the Price River
- Consumptive use portion of fallowed CCC shares shepherded downstream to enhance instream flows
- Lease price set through bid/ask process
- Robust monitoring and accounting

Status

- Contract among parties signed in December 2021
- Board of Water Resources approved water bank application in January 2022
- State Engineer approved water rights change application in December 2022
- Will be implemented in late 2023 and will operate during the 2024 growing season
- Authorized through 2030

Key Lessons Learned:

- Local conditions should dictate the form, function, and participation in water banks.
- Outreach and education are critical but can require significant resources. Stakeholder engagement should start early and be done often.
- Resources from state agencies are available and grant funding may be available to support setting up a water bank.
- The effectiveness and return on investment for the Price Water Bank should be monitored and compared to other water transaction mechanisms.

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PURPOSE AND ORGANIZATION

The Utah Water Banking Act ("Act"), passed in 2020, promotes better management of the state's water resources through water leasing arrangements that are locally controlled, temporary, and voluntary. To kickstart water banking in the state, the Utah State Legislature approved a pilot program to create a Utah Water Banking Strategy led by the Utah Division of Water Resources ("UDWRe"). UDWRe has worked with local interested water users to identify, form, and demonstrate water banking projects across the state, with the objective of assessing whether water banks organized under the Act are useful tools to meet local water management needs. UDWRe created a team of stakeholders and consultants ("Project Team") to assist strategy and pilot development.

The Project Team pursued pilot water banks in three markets: the Price River Basin, Snyderville Basin (also referred to as East Canyon Creek), and the Cache Valley. Each of these banks required varying levels of coordination, local engagement, and state and federal authorizations. The Price River Basin pilot water bank ("Price Water Bank" and sometimes termed the Carbon Canal water bank) is the subject of this report and is fully founded and will become operational in 2023 or 2024.

This report provides an overview of the purpose, structure, and formation of the Price Water Bank, with focus on the steps the Project Team took to establish the bank and lessons learned during the project. It is intended that by describing the history of this pilot project that the reader may use the Price Water Bank as an example in future efforts to form water banks. The report is organized as follows:

1. Water Banking Act Summary: provides a brief overview of the Act and summarizes the legal and regulatory requirements to establish a water bank

2. Price River Basin Overview: gives an overview of water supply and demand conditions in the Price River Basin

3. Project Concept: addresses the impetus behind the Price Water Bank, the goals for a water market, and the benefits of the water bank market structure

4. Water Bank Structure: describes the form and function of the Price Water Bank, including its organization, operation, and administration

5. Water Bank Formation: reviews steps taken to create the Price Water Bank including the process for contracting, water bank application, and water right Change Application, and highlights key lessons learned in the course of the Price Water Bank development

6. Next Steps and Improvements: describes next steps for operation of the Price Water Bank and provides commentary on key takeaways from the pilot project process.

WATER BANKING ACT SUMMARY

The Utah Water Bank Act amended Utah Code Title 73 Chapter 31 to allow creation of local water banks. Water banks permit water right holders to deposit rights into the bank, which can then be borrowed (i.e., leased) from the bank for use within the water bank service area. The objectives in creating a water bank are to promote the optimal use of water; facilitate temporary, flexible, and low-cost water transactions; and support Utah's agricultural economy. Water banks are designed to facilitate robust and sustainable agricultural production while meeting growing municipal and industrial water demands. Water banks may also be used to improve water quality, simplify water rights administration and distribution, and support a healthy and resilient natural environment.

Two types of water banks are allowed under the Act: contract water banks and statutory water banks. Contract water banks are created by contract between water right owner(s) and water right user(s) providing the terms by which water can be leased and the area of use. Statutory water banks are organized through a local legal entity and granted statutory powers designed to facilitate water leasing. Statutory banks have defined service areas, but unlike contract water banks, are broader and allow additional water rights to be added to the bank after the bank is established. The Price Water Bank was formed as a contract water bank, as detailed below.

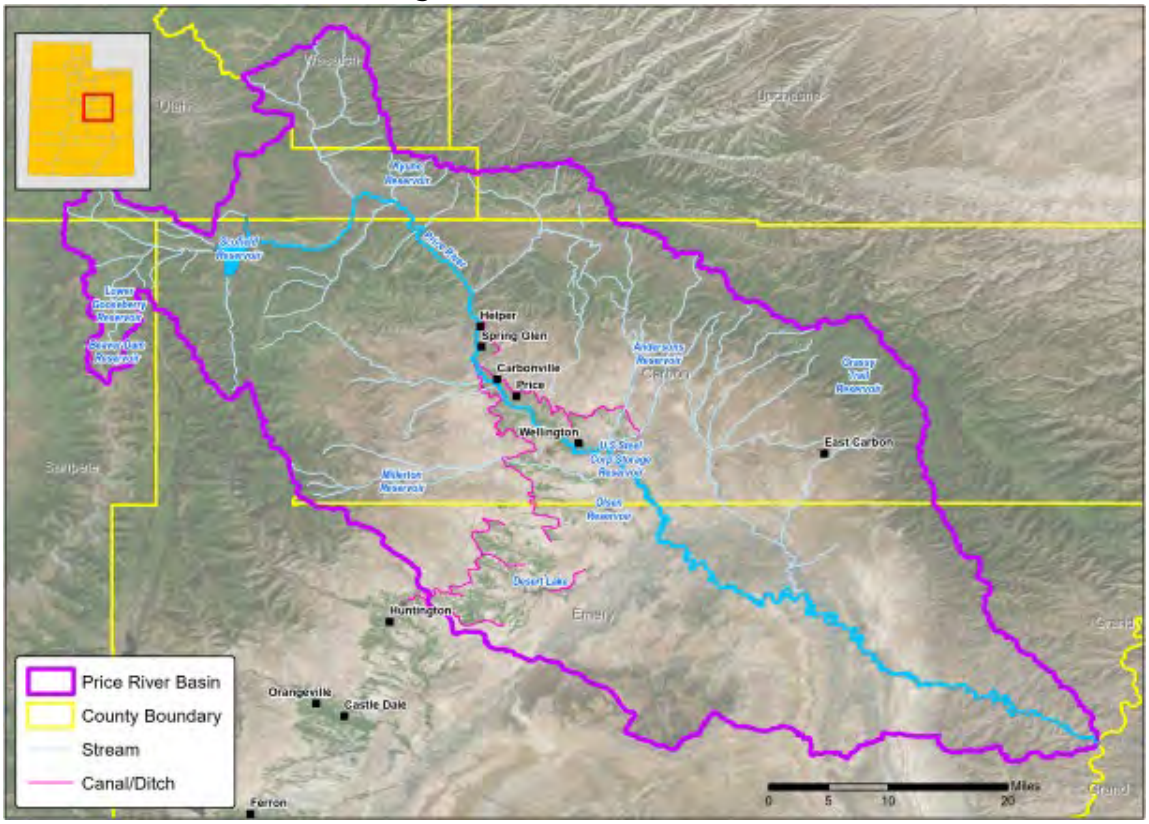
For both types of water banks, the Utah Board of Water Resources (“UBWR”) must approve the creation of the bank and the State Engineer must approve a Change Application authorizing use of banked water rights. The State Engineer cannot approve Change Applications that authorize use of water in a water bank past 2030. Both surface and groundwater may be transferred in water banks. Water rights deposited in water banks are not subject to abandonment from nonuse.

PRICE RIVER OVERVIEW

Water Supply

The Price River Basin is a significant drainage basin of the Wasatch Plateau and Book Cliffs in east-central Utah. The Basin covers approximately 1,900 square miles, varying from mountainous landscape to desert canyons. The Price River flows from Scofield Reservoir near the headwaters down to a confluence with the Green River, as shown in Figure 1. Monthly flows of the Price River are typical for a snowmelt driven river system in the Western U.S., with a spring runoff peak and monsoon rainstorms in late summer. Annual streamflow volumes in the Price River show a long-term average of 79,000 acre-feet per year ("AFY"); however, more recent data since 2001 shows a reduced flow volume of 52,000 AFY[1].

Figure 1: Price River Basin



The only significant reservoir in the Price River Basin is Scofield Reservoir, which has a storage capacity of 73,600 AF and an active capacity of 65,800 AF determined by the outlet elevation. Scofield Reservoir storage is allocated to shareholders in the Price River Water Users Association ("PRWUA"). A total of 29,508 shares are held by local irrigation companies, and Carbon Canal Company is the largest shareholder

[1] Streamflow statistics for Price River are based on measurement data for USGS stream gage at Woodside, UT.

with 65% of shares, followed by Wellington Canal Company (15%), and Spring Glen Canal Company (5%)[2]. Other shareholders include the Price River Water Improvement District ("PRWID"), a municipal water provider in the Price River Valley, and PacifiCorp, a power generation company.

Water Demand

The Price River Basin is administered as Basin 91 by the Utah Division of Water Rights ("UDWRi"). Surface water sources in Basin 91 are considered to be fully-appropriated and "*new water diversions and consumptive uses on surface sources must be accomplished by Change Applications filed on valid existing water rights owned or acquired by the applicant*". Non-consumptive uses are considered on an individual basis by UDWRi. There are approximately 4,800 water rights in the Price River Basin.[3]

Irrigation Water Use

The dominant water use in the Price River Basin is irrigated agriculture, representing over 90% of the total 65,000 AFY of water demand in the basin.[4] Agricultural demand is not expected to see substantial growth in future years. In fact, irrigated acres in Carbon County decreased nearly 38% in the 10-year period ending in 2017[5]. Nevertheless, there are regular annual water supply shortages for agriculture because native water supplies are typically not sufficient to provide full irrigation. An active annual rental market exists for storage supplies in Scofield Reservoir.

The largest agricultural water provider in the Price River Basin is the Carbon Canal Company ("CCC"). The CCC serves approximately 11,000 acres of crops and pastures and has approximately 10,500 shares of stock across 230 shareholders. The company holds 11 direct flow water rights in addition to storage water from Scofield Reservoir via PRWUA. Recent CCC diversions have averaged 23,000 AFY. A map of the CCC service area is shown below in Figure 2.

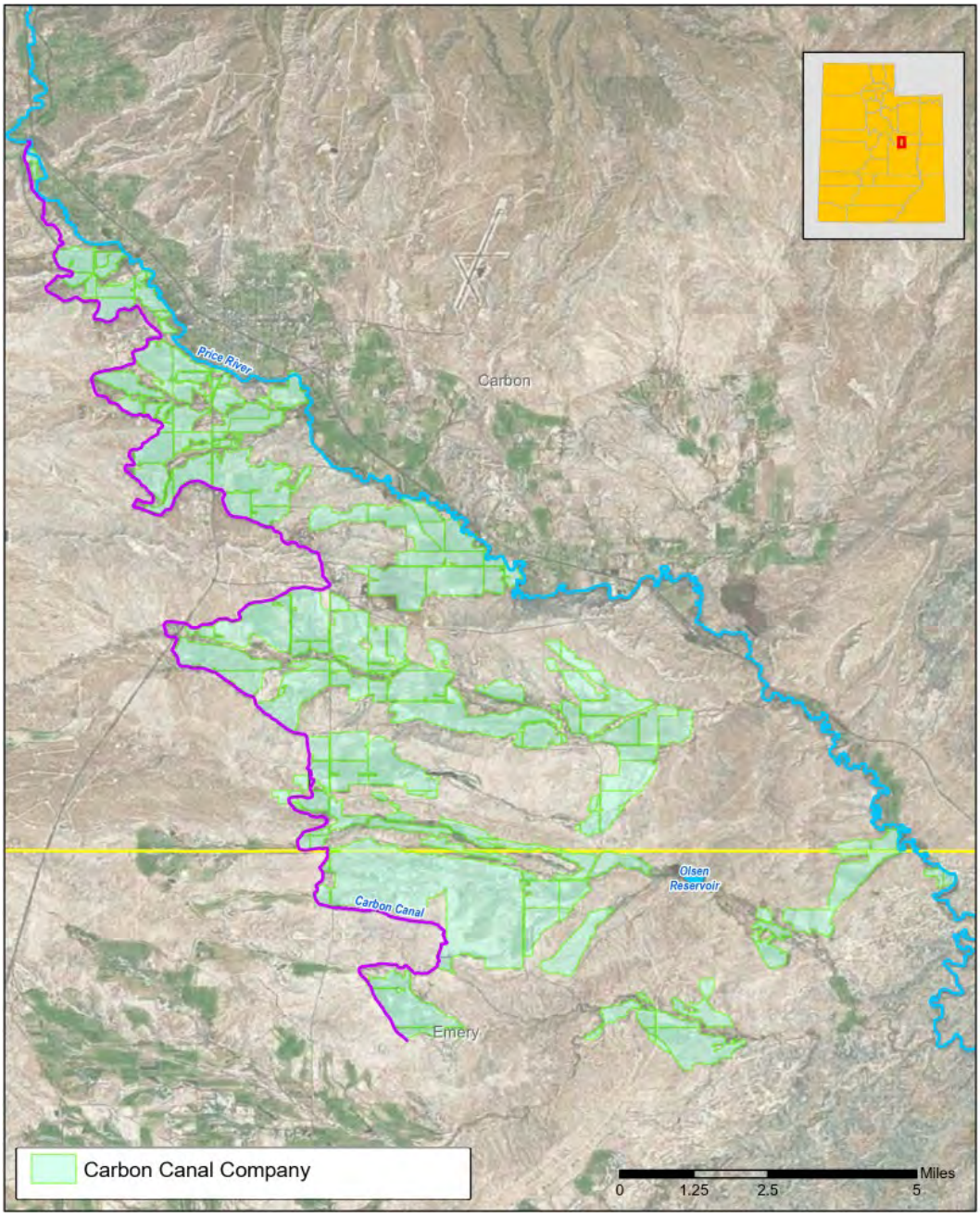
[2] Sun Advocate. 8/5/2004. County's water supplies at Scofield Reservoir dwindling.

[3] Utah Division of Water Rights. Area 91.

[4] The Price River Basin was estimated as 100% of Carbon County and 10% of Emery County total water uses from USGS data.

[5] Irrigated acres based on USDA Census of Agriculture statistics for 2007 and 2017.

Figure 2: Carbon Canal Company Service Area and Irrigated Lands



Municipal Water Use

Available information on municipal water demands in the Price River Basin indicates that future growth will be a relatively small volume and the largest municipalities are pursuing the Garley Dam Project to meet expected needs for the near term. Therefore, future municipal water supply shortages are not expected. Municipal water providers often rent water to irrigators on an annual basis.

Environmental Water Use

There are continued efforts to improve instream flows in the Price River, led by The Nature Conservancy ("TNC")[6] and Trout Unlimited ("TU")[7]. These two non-profit organizations have funded several water conservation and enhancement projects in the Price River Basin in recent years. The goals of the projects are to improve streamflows to support recovery of threatened and endangered fish species in the lower river, and the Colorado River basin as a whole, including the roundtail chub, flannelmouth sucker, Colorado pikeminnow, and bluehead sucker. The groups have also sought water to support wetland creation in the basin. Additional information on efforts to enhance flows in the lower Price River is provided later in this report.

[6] https://www.nature.org/en-us/about-us/where-we-work/united-states/utah/stories-in-utah/price-river-reservoir/

[7] https://waterpartners.tu.org/how-trout-unlimited-partners-with-land-stewards/

PROJECT CONCEPT

Project Motivation

Starting in 2016, TNC in association with the Utah Watershed Restoration Initiative began evaluating rehabilitation of the existing Olsen Reservoir, located on Marsing Wash near the tail end of the CCC, to store and regulate flows into the Price River. The project makes use of excess "push water" in the ditch (carriage water used to convey shareholder water to the end of the ditch). That water is stored in the off-channel Olsen Reservoir and subsequently released down a tributary of the Price River to bolster late season streamflow.

Beginning in 2017, TNC and TU assisted landowners in the Price River basin to participate in the System Conservation Pilot Project ("SCPP"), a program administered by the U.S. Bureau of Reclamation to test the effectiveness of conservation actions to reduce consumptive use in the Colorado River basin. TNC and TU piloted several split season and full season fallowing projects on lands served by the CCC. These fallowing projects were supported by TNC and TU to provide additional streamflow in the Price River. Funding for the SCPP ended in 2018.

With the sunset of the SCPP in 2018, TNC and TU along with the Utah Division of Wildlife Resources ("UDWiR") sought new ways secure water for environmental flows in the lower Price River. Under Utah law, these entities could not simply purchase and convert other water rights, for example irrigation water rights, for instream flow purposes. Meanwhile, shareholders of the CCC expressed interest in creating other water leasing arrangements to replace the SCPP projects and generate income from fallowing programs. With the passage of the Utah Water Banking Act in 2020, the parties began evaluating use of the water banking concept as a means to lease water from users under the CCC for instream flow purposes.

Water Bank Benefits

The Price Water Bank allows TNC, TU, and the UDWiR ("Leasing Entities") to lease water from willing CCC shareholders. Participating shareholders voluntarily fallow their fields on a year-to-year basis in return for payment. The water entitlement attributable to the leased CCC shares will be conveyed to the tail of the Carbon Canal for delivery to the Price River via Olsen Reservoir. Once delivered to the Price River, the water will be shepherded downstream to Woodside. However, only the historic consumptive use ("CU") portion of the fallowed CCC shares will be shepherded. The water bank will operate in addition to TNC's conservation efforts.

A water bank is uniquely adapted for this type of flexible leasing arrangement. The leases will be temporary and flexible – each year, irrigators can elect whether to deposit water to the bank and at what volume and can set their desired lease price (as further discussed below). The water right change process for the individual shareholders is handled through the water bank; individual Change Applications for each lessor are not required. The water bank provides irrigators an alternative

means to generate revenue from their water rights and protect irrigators' water rights from abandonment.

For environmental groups, the banks provide a market-based program to secure water for instream flows. Leasing Entities can annually decide whether to lease water from the bank at the offered price. The water bank also provides a legal mechanism to shepherd water for environmental purposes. In addition to providing instream flow enhancement, an ability to shepherd water could aid conservation efforts in the Upper Colorado River Basin.

WATER BANK STRUCTURE

The Price Water Bank provides a flexible water market for members of the CCC. It is structured as follows.

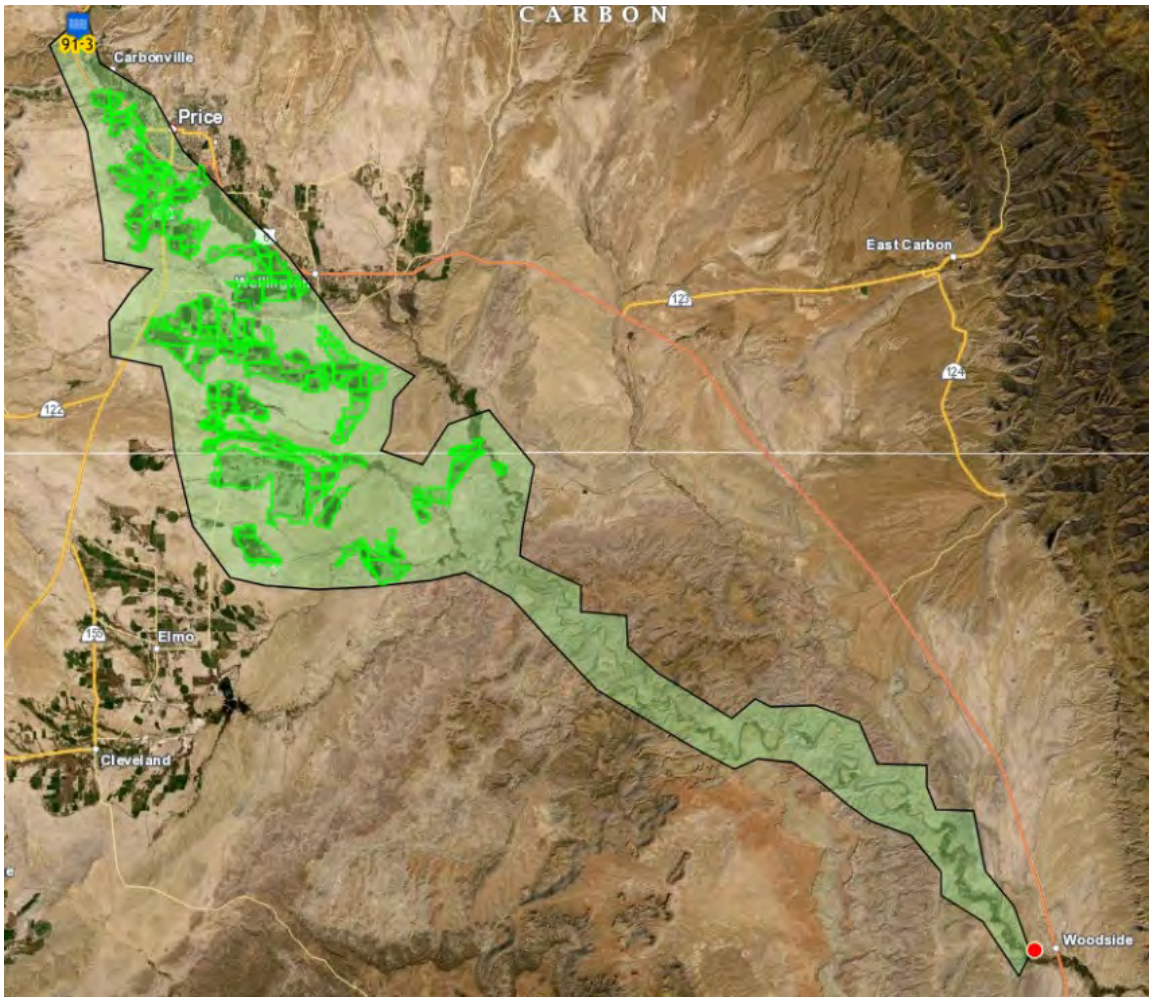
Organization

The Price Water Bank is formed as a contract water bank under the Act. Guidelines for establishment of a contract water bank are contained in Appendix A. For contract water banks, the Act requires lessors and lessees to execute an agreement stipulating the terms of water transfer prior to approval of the bank by the UDWIR. A water rights change is also required to allow use of the rights in the water bank. The Price Water Bank is temporary and will be operational through 2030.

Contracting parties for the Price Water Bank are the CCC, TNC, TU, and UDWiR. Transfer of water rights is limited to only these contracting parties. Initially, the PRWUA was party to the contract as the water bank anticipated transfer of late season water from Scofield Reservoir. However, PRWUA later elected not to participate in the project. Applications to establish water banks must be made by a public entity. The bank applicant is the Price River Watershed Conservation District ("PRWCD"), a public entity that assists Carbon County landowners manage land and water resources. The Price Water Bank is administered by a five-member committee made up of one appointee each of the participating parties (the four contracting parties plus PRWCD as the bank entity). The CCC acts as the manager for the water bank.

The Price Water Bank's geographic area includes all land irrigated under the CCC, the Price River from the Carbon Canal point of diversion to the Woodside streamflow gage, Marshing Wash, and Olsen Reservoir. The service area is shown in Figure 3 below.

Figure 3: Price Water Bank service area



Operations

The Price Water Bank allows leasing of CCC's direct flow water rights sourced from the Price River. Shareholders of the CCC own a pro-rata interest to the CCC's water rights. The amount of water shareholders may lease through the water bank is quantified based on the variable share delivery. Leased water shepherded at the Price River is quantified based on the consumptive use ("CU") of the irrigated lands on which the shares were historically applied within the CCC service area. Importantly, the leased water cannot include that portion of CU associated with late-season storage water sourced from PRWUA.

The leases reduce or eliminate CU associated with the shares during the lease term. Various water conservation activities that reduce consumptive water use may be employed by participating fields including full- and partial-season fallowing. Conservation activities are assigned a uniform per-AF reduction in CU such that the volume of water available for lease and shepherding can be calculated from the participating acreage.

Leased water is delivered to the end of the Carbon Canal back to the Price River via Olsen Reservoir. The water bank does not alter CCC's river diversions, and the State Engineer's approval of the water right Change Application specifically precludes expanding diversions of the canal through operation of the water bank. Within the ditch, the leases only change the location of delivery of leased water from participating fields to the end of the canal. CCC shares leased through the water bank are subject to the same pro-rata allocation of and adjustments to water deliveries as shares used for irrigation.

Shareholders annually elect whether to participate in the water bank. In non-participating years, shares may be used for continued irrigation, but at no time can the shares be simultaneously both leased and used for irrigation. The Price Water Bank does not limit use of the CCC's water right for irrigation purposes in the CCC service area.

Administration

The CCC annually administers and accounts for all water bank leases as follows:

- Starting December 1 of each year, CCC sends interest forms to all CCC shareholders providing shareholders an opportunity to participate in water bank water leases in the coming calendar year.
- By January 1, interested shareholders return interest statement forms indicating the volume of water they wish to lease, the associated number of CCC shares, and the acres of land to be fallowed, along with the per-acre foot price they request for the lease. The CCC aggregates the interest forms and provides a summary to the Leasing Entities.
- By January 15, the Leasing Entities review the lease rates and volumes offered and set an offer price for the water (the "Annual Lease Price"). The CCC sends notice of the Annual Lease Price to all shareholders that submitted interest statements.
- By February 1, CCC shareholders elect whether to accept the Annual Lease Price and if so, what volume of water they wish to lease and what corresponding acreage they will fallow in the coming year. At this time, the shareholders deposit their shares in the water bank. The CCC then sends notice to the Leasing Entities of the total volume of water available for lease at the Annual Lease Price.
- By March 1, the Leasing Entities notify CCC of the volume they wish to lease for the coming year and provide CCC annual contracts for leasing water through the water bank. The lease contract defines the volume, price, and delivery terms for exercise of the water bank lease for the calendar year.

- By April 1, all lease contracts for use of the water bank for the calendar year will be executed. Shareholders who have leased their shares will not receive water under those shares for the duration of the lease. Any shares that were deposited water into the water bank but were not leased are returned the depositor.

- By June 1, the Leasing Entities provide to CCC a desired delivery schedule for the calendar year. A final delivery schedule will be determined by July 1, which will provide a daily schedule of releases of all leased water.

- By November 30, PRWCD submits an annual report to UDWRe detailing operation of the water bank in the previous year.

The Price Water Bank makes use of a water accounting program jointly developed by the parties that is used to provide accurate water delivery records to the UDWiR. The accounting program tabulates the irrigated acres, crop type, irrigation method, monthly farm headgate delivery volume, and monthly consumptive use volume for all irrigated lands served by the CCC. For shareholder lands participating in the Price Water Bank, the accounting includes the participating acres, conservation practice, conserved CU, and annual lease volume. Verification of fallowing is a critical component. Additionally, all water used in the water bank must be metered and reported to the Price River Water Commissioner.

Additional annual reporting is also required under the Act. Annual reporting is submitted by the PRWCD to the UBWR annually in November and, among other information, provides the volume of water leased through the water bank and the nature of use of the loaned water.

Price Setting

The price of water transacted through the Price Water Bank is set through a bid/ask process. First, CCC shareholders submit an asking price. The Leasing Entities review all asks and then set an Annual Lease Price which shareholders can elect to accept or decline. Price setting occurs concurrent with the water bank participation process described above. Payments for the leased water occur after the irrigation year.

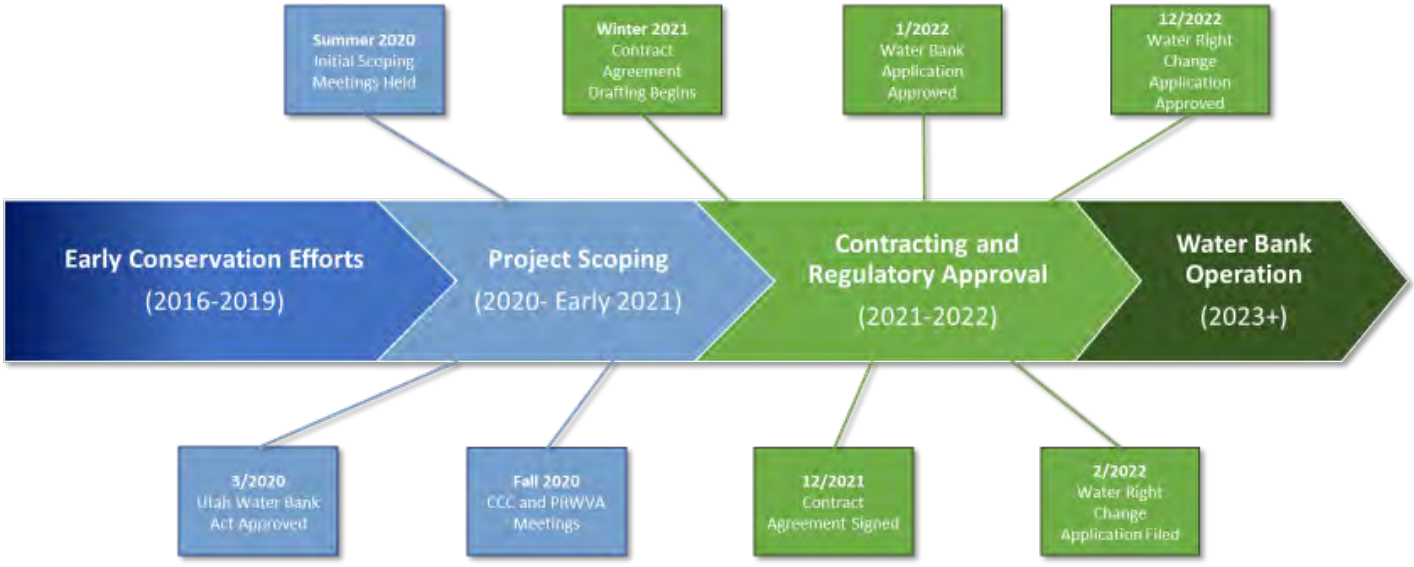
In June 2022, WestWater prepared a valuation analysis to assist stakeholder understanding of potential lease prices. That analysis estimated the net benefit provided by use of water in irrigated agriculture in the Price River Basin is approximately $60 per AF on a diversion basis or $121 per AF on a depletion (i.e., consumptive use) basis. It can be inferred that, on average, CCC irrigators are unlikely to enter leases through the Price Water Bank at rates lower than these, although lease prices are likely to vary depending on farm-specific conditions and annual farm production costs. These prices are supported by leases prices for water lease programs from Scofield Reservoir.

WATER BANK FORMATION

The Price Water Bank is the first water bank formed in Utah following passage of the 2020 Utah Water Bank Act. Experiences from the formation of the Price Water Bank will inform future water banking efforts across the state.

Establishment of the Price Water Bank resulted from two-year stakeholder-driven process. A detailed recounting of the bank's formation is beyond the scope of this report; however, the sections below provide a useful summary of certain critical processes and key insights to the successful establishment of the bank. Key lessons learned are highlighted. A summary of principal phases and milestones in the development of the water bank is shown in Figure 4 below.

Figure 4: Price Water Bank Formation Process



Project Team

Inception of the Price Water Bank was assisted by the UDWRe through a WaterSMART grant awarded by the U.S. Bureau of Reclamation ("USBR"). The objective of the grant project is to develop and apply water marketing concepts in Utah, including by establishing and assessing pilot water bank projects. UDWRe formed a project team of attorneys, engineers, economists, and communication specialists to assist the project. This Project Team early on identified the Price River Basin as a strong candidate for a water bank pilot project given the history of TNC's and TU's efforts in the basin. As summarized below, standing up the Price Water

Bank was a large effort, and the time and resources provided by the Project Team proved invaluable.

Lesson Learned: Setting up a water bank can require significant time and resources. Grant funding and third-party teams can assist water bank formation, especially large-scale or complex banks.

Project Scoping Phase

The Project Team engaged stakeholders in the Price River Basin shortly after passage of the Act in March 2020 to solicit interest and collect input. Meetings were held between the Project Team and the CCC, CCC shareholders, PRWUA, PRWID, TU, TNC, county officials, UDWRe, UDWRi, UDWiR, and other interest parties throughout the second half of 2020. Internal Project Team coordination meetings were generally held weekly or bi-weekly throughout the project.

Initial scoping meetings were held in the summer of 2020[8] bringing together potential project participants to conceptualize operations of the water bank. Meetings focused on understanding operations of the CCC, Price River environmental flow conditions, and the regulatory process for water bank formation. Given that the Act had passed just months before the scoping phase, the scoping process also included extensive meetings with UDWRe staff to establish the processes and forms for applying for and Board approval of a water bank. This effort to interpret the Act and devise the regulatory process for the application and approval of water banks was substantial.

Lesson Learned: Outreach and education during project scoping are critical to successful formation of a water bank but can require significant resources.

In total, the Project Team held over 20 meetings in 2020 to establish the basic framework of the Price Water Bank. A summary table of Project Team meetings is found in Appendix B. Despite these many early meetings, and many more in later phases of the project, the Project Team later recognized even more outreach with local stakeholders would have been beneficial, as discussed below. Easing the initial scoping effort was that the CCC, PRWUA, TNC, and TU already had long-standing relationships related to Price River water conservation efforts. The parties had well-developed understanding of each other's objectives and operations. By late 2020, discussions progressed to the board of directors for the CCC and PRWUA, at which time the formal contract phase commenced.

[8] There had been many informal meetings amongst interested parties prior to this time; summer 2020 represents the start of the formal pilot project.

Technical Studies

Formation of the Price Water Bank required a firm understanding of Price River Basin water right administration, CCC and PRWUA operations, farming practices, and the water balance in the CCC service area. During the scoping phase, several technical and engineering studies were conducted. Key technical studies are described below.

1. Water Balance Study. Concurrent with the scoping phase, TNC and TU initiated a study to confirm the water balance on farms in the CCC service area and the CCC irrigation system as whole. This ongoing study is to be used for a project separate from the Price Water Bank and funded by the Walton Family Foundation that could compensate farmers for fallowing and conservation activities, and then monitor and quantify the water saving benefits. At first, the water bank efforts and the Walton Family Foundation project were combined, which ultimately led to confusion between stakeholders. After some time, the Project Team separated the two projects.

   The water balance study consisted of three primary parts: estimating water losses in the Carbon Canal; determining CU of irrigation deliveries from the canal; and evaluating monitoring requirements and shepherding mechanisms. The water balance study is ongoing and could be used to inform the Price Water Bank in the future. However, given the time required to complete the water balance study, it was decided to not wait for its completion to proceed with the water bank pilot project.

   Lesson Learned: Technical studies are important to understand water bank operations and useful when seeking regulatory approval. However, "analysis-paralysis" should be avoided - a detailed water balance study proved unnecessary in establishing the Price Water Bank. The Price Water Bank benefited from technical studies generated from the SCPP and TU's and TNC's past conservation efforts.

2. Valuation Analysis: Project participants sought to understand the pricing of leases that could be expected under the Price Water Bank, and an economic study was conducted to value water rights in the Price River Basin. Two pricing methods were applied: 1) a review of comparable sales and 2) a calculation of the net income benefit derived from the use of water for irrigation. Study results are explained in the Price Setting section above.

3. Olsen Reservoir Studies. TNC and UDWiR had sponsored studies of enlarging and improving Olsen Reservoir between 2017 and 2019. Olsen Reservoir is filled from the Carbon Canal via Marsing Wash and can be operated to deliver late-season water to the Price River for environmental flow benefits. Prior to the water banking effort, TNC developed an agreement with the CCC to store carrier water (a.k.a. push water) in Olsen Reservoir. The Price Water Bank provides opportunity to store additional water leased from CCC shareholders.

Contracting and Water Bank Application

Following initial scoping, the CCC, PRWUA, and Leasing Entities began developing a contract agreement stipulating lease terms; operations, administration, and accounting; and governance of the water bank. A contract between water bank lessors and lessees stipulating the terms of water transfers is required to apply for a contract water bank to the UBWR. Thus, the contract and application were developed generally at the same time. The contract and application must meet state statute requirements, and the Project Team and UDWRe have developed template forms to assist future water bank applicants.

Lesson Learned: Defining the needs of water users should come first. Local conditions will dictate the form of and participation in water banks.

Contract negotiations began in earnest late in 2020. Negotiations and approval required several meetings with the Boards for the CCC and PRWUA. The PRWUA initially participated in scoping meetings and early contract negotiations but withdrew from the process while the contract was being developed. This required a sudden reevaluation of the water available to lease through the water bank and the bank's overall operations. Ultimately, it was found the bank could operate successfully with the CCC's direct flow rights and without the storage rights initially offered by the PRWUA. The water bank contract and application went forward without PRWUA.

Applications for a contract water bank require several public notice and review steps prior to the UBWR considering the application. The application process includes the following steps:

1. Pre-Application Activities. Pre-application activities center on contract development. The Boards or authorized agents of the contract parties (e.g., the Board of Directors for the CCC) must first execute the contract. The contract should have a provision that it terminates if the water bank application is later denied by the UBWR. It is recommended that Board meetings be publicly noticed and that meeting minutes be developed in the event they are needed for the UBWR hearing to review the bank application. It is also recommended that UDWRe and UDWRi be kept apprised of contract development and negotiation at this stage, and that the contract parties begin discussions with the agencies on a water rights Change Application. The pre-application activities for the Price Water Bank are described under the scoping section above.
2. Application and Public Notice. Once the contract is signed, the water bank application may be submitted to the UDWRe. Template forms and fact sheets with application requirements are available from UDWRe to assist applicants. The water bank applicant (PRWCD for the Price Water Bank) must notice and hold a public meeting that offers the public opportunity to comment on the application for a water bank. The public notice for such meeting must be made prior to submittal of the water bank application. PRWCD submitted an application for the Price Water Bank in December 2021.

3. UDWRe Review. The UDWRe reviews the water bank application for completeness and adherence to state statute. UDWRe then prepares a staff report on the application and notices a hearing on the application at an upcoming (within 30 days) meeting of the UBWR. UDWRe's review of the Price Water Bank was completed in December 2021 and January 2022.

Lesson Learned: Involving state agencies early and often is critical. Submitting a draft or working copy of the water rights Change Application can assist UDWRe review.

4. Applicant Public Meeting. The applicant holds a public meeting on the water bank application, the notice of which is included in the application. At this meeting, the applicant collects and incorporates public comments and then votes to ratify the water bank contract. If ratified, the applicant sends notice to the UBWR. The PRWCD held a special meeting in January 2022 for the Price Water Bank and approved the contract.

5. UBWR Approval. The UBWR considers the water bank application at a public meeting taking into consideration public comment, application materials, the vote of applicant, and the UDRWe staff report in making its decision. The UBWR approved the Price Water Bank application in January 2022.

An abbreviated timeline of the contracting and contract water bank application process for the Price Water Bank is shown in Table 1 below. Throughout this phase, the Project Team held over 10 meetings. This count does not include some of the many coordination calls that did not involve the full Project Team. A summary table of Project Team meetings is found in Appendix B.

Table 1: Abbreviated Timeline of Price Water Bank Contracting and Application

Date	Event
December 2020 - December 2021	CCC, PRWUA, TNC, TU, and UDWiR negotiate water bank contract terms
October 2021	CCC and PRWUA boards meet to review contract terms
	UBWR members tour the CCC Service Area
	Water bank requirements and the Price Water Bank concept presented to the UBWR at regular meeting
November 2021	Water bank contract and application revised following withdrawal of PRWUA
	Water bank application prepared
	Project team reviews water bank contract and application with UDWRe staff
December 2021	All parties execute water bank contract
	PRWCD submits water bank application for UDWRe review
	UDWRe reviews application and marks complete
	Public notices of PRWCD meeting to hear water bank application
January 2021	PRWCD holds public meeting to hear and approve water bank application
	UDWRe staff prepare and submit report on water bank application to UBWR
	UBWR approves Price Water Bank application

Water Right Change Application

Following approval of the water bank application, the CCC applied for a water right Change Application to the State Engineer. The Change Application allows CCC's direct flow rights to be used for irrigation as historically practiced and for water banking through the Price Water Bank, including for the purposes of providing environmental benefits. In other words, the Change Application added the new use of water banking to CCC's water rights. The change is fixed in length and will expire at the end of 2030. The Change Application was submitted in February 2022, the drafting of which required several rounds of edits from contract parties and the Project Team.

Other water users are noticed of Change Applications and have an opportunity to protest the change. For the Price Water Bank, 81 protests were received, a relatively high number for most Change Applications. Protestors raised injury concerns, and many of the protests focused on inter-operation of the water bank with storage rights from Scofield Reservoir and the perceived reduction in water available to PRWUA shareholders. Protesters were apparently unaware of the water bank

Lesson Learned: Despite the many efforts to engage stakeholders in the Price Basin, the high number of Change Application protests reveals more engagement could have been done. In setting up a water bank, stakeholder engagement should start early and be done often.

proposal in the CCC service area, despite the outreach that had occurred over the past 18 months.

The Project Team assisted the CCC in responding to the various protests, with numerous responses provided to the State Engineer. At least six additional Project Team meetings focused on the Change Application. A hearing on the Change Application was held in June 2022. Ultimately, the Change Application was approved in late December 2022, allowing the Price Water Bank to proceed. The approved change allowed use of five of the six water rights held by the CCC to be used in the water bank. The change allows just over 134 cfs of CCC's direct flow water rights to be operated in the Price Water Bank.

Next Steps and Improvements

The Price Water Bank is now fully and successfully formed. The State Engineer's approval of the Change Application was received late in the proposed process of enrolling CCC shareholders for 2023 (the enrollment process is described in the Administration section above). At the time of the writing of this report, the Price Water Bank bid process will be implemented in late 2023 and will operate during the 2024 growing season.

Ongoing Monitoring

As Utah's first fully formed water bank, additional monitoring and study of the Price Water Bank is needed. Water bank operations may need to be adjusted periodically to reflect unanticipated or changing conditions. Key questions to monitor and address during future operation of the bank include:

1. Price setting: is the price offered by the Leasing Parties sufficient to incent CCC shareholders to participate in the water bank?

2. Stakeholder feedback: what is the general community perception of the water bank after it is fully operational?

3. Environmental benefits: is the money spent to lease water through the water bank a positive return on investment in terms of delivering and maintaining environmental flows in the Price River?

4. Monitoring: are existing flow measurements adequate to administer the water bank or is additional data collection needed?

5. Shepherding: is CU adequately quantified and what are the obstacles in shepherding water downstream?

6. State administration: does the water bank create water administration or water rights issues in the Price River Basin?

The Project Team recommends continued evaluation of the Price Water Bank by the Leasing Parties to ascertain the long-term effectiveness of the program.

Comparison with Other Programs

Other funded programs are anticipated in the Upper Colorado River Basin to reduce consumptive use in the years to come. For example, the USBR recently announced $125 million towards restarting the SCPP. The effectiveness of these programs should be evaluated relative to the Price Water Bank. Other such programs, while helpful in conserving water and/or improving environmental flows, could create complications and confusion among Price Water Bank stakeholders. Depending on the price for conserved water offered by and the complexity of other programs, participation in the Price Water Bank could decline. Another possibility is to merge

the operations of the Price Water Bank with SCPP activities. The water and funding situation in the Colorado River Basin is very dynamic, which makes it difficult to establish decades-long plans with certainty.

A key lesson learned in the formation of the Price Water Bank is that contract water banks require significant time and resources to form. Forming the Price Water Bank required over 50 meetings, multiple technical studies, and drafting several summary and explanatory documents. Many of these efforts centered on developing the procedures that the UDWRe needed to set up a water banking program. Such efforts for the UDWRe will not be required for future water banks, and it is anticipated that the Price Water Bank paved the way for more straightforward approval processes.

The effort required to set up a water bank in Utah should be compared to other mechanisms to establish water transaction mechanisms. Simply put, it will be unclear whether water banks are the best mechanism to meet local water management needs in the Price River Basin until the Price Water Bank pilot project is operational and its effectiveness and return on investment can be compared with other programs.

APPENDIX A: CONTRACT WATER BANK PROGRAM GUIDELINES

Utah Code Ann. § 73-31-303 authorizes the Board of Water Resources to approve complete applications to be a contract water bank under the Water Banking Act. A contract water bank is based on and governed by a voluntary agreement to lease water between local parties. The statute requires a willing public entity be a party to the contract and act as the bank applicant.

Program Guidelines:

1. A public entity may seek to have a contract for water use approved as a contract water bank by submitting an application to the Board of Water Resources.
2. A contract water bank application must contain the following:
    - Name of bank
    - Proposed service map
    - Description of the structure of bank's governing body, and how it will operate
    - Description of how delivery requests and loaned water rights are to be administered
    - Criteria for the participation of non-public entities (if any)
    - Copy of underlying contract
    - Location where the public can learn when the application, or underlying contract, is on the agenda of the Applicant's public meeting
    - Type of water rights accepted by bank – ground or surface, but not both
    - Description of how the bank will unwind if terminated, dissolved, or revoked, including how the bank will return banked water rights and monies owed to depositors
3. Once all application criteria are complete and notice has been issued, the Board of Water Resources will issue an order approving the contract water bank and publish a summary of information submitted.
4. If the Board of Water Resources denies an application, it must provide written comments explaining the denial.
5. The bank will use the existing change application process to approve water rights for general use in the service area.
6. The bank is responsible for distribution costs to deliver a banked water right.
7. On or before November 30th each year, the governing body of a water bank shall make a report to the Board of Water Resources regarding the water bank's operation.

APPENDIX B: SUMMARY OF PROJECT MEETINGS[9]

Date	Attendance	Pilot Project(s)	Topic(s)
Spring-Summer 2020	TU TNC CCC UDWRe Project Team	Price	Initial meetings (3) to discuss water bank concept and application to Price River Basin
7/10/2020	Trout Unlimited The Nature Conservancy Mabey Wright & James Smith Hartvigsen, PLLC UDWRe Project Team	Price	Conservation efforts in Price River Basin; water bank formulation
7/16/2020	Project Team	Multiple	Project tracking and administration
7/28/2020	Project Team	Multiple	Project tracking and administration; pilot project operations
8/4/2020	UDWRe Audubon Society Smith Hartvigsen, PLLC TNC Project Team	Multiple	Project scoping and grant administration
8/19/2020	Bureau of Reclamation UDWRe Project Team	Multiple	Project scoping and grant administration
8/27/2020	UDWRe UDWRi Project Team	Multiple	Contract Review
9/2/2020	TU TNC Emery Water Conservancy District Project Team	Price	CCC operations, water budget, and technical studies

[9] Appendix B is not a full recounting of all meetings held during the formation of the Price Water Bank; it does not include certain weekly coordination meetings or the many individual calls with stakeholders. In total, well over 50 meetings were held.

Date	Attendance	Pilot Project(s)	Topic(s)
9/11/2020	Mabey Wright & James CCC TU TNC UDWRe Smith Hartvigsen, PLLC Project Team	Price	Water bank scope and operations
9/17/2020	TU TNC PacifiCorp Smith Hartvigsen, PLLC Project Team	Price	Scoping and stakeholder outreach
9/18/2020	Bonneville Environmental Foundation TU Project Team	Multiple	Pilot project scoping, participation, and operations
9/24/2020	Smith Hartvigsen, PLLC UDWRe UDWRi TNC Project Team	Multiple	Pilot project scoping, funding, and technical studies
9/30/2020	UDWR Project Team	Multiple	Project tracking and administration; pilot project updates and outreach
10/15/2020	TNC Jones DeMillle Engineering UDWRe TU Project Team	Price	Water balance study
10/22/2020	TNC Keller-Bliesner Engineering Project Team	Price	Pilot project scoping, funding, and technical studies
11/2/2020	TNC TU Keller-Bliesner Engineering Central Utah Water Conservancy District Project Team	Price	Water balance study
11/16/2020	TNC Price River Water Users Association Project Team	Price	Pilot project scope and operations

Date	Attendance	Pilot Project(s)	Topic(s)
11/30/2020	TU Keller Bliesner Engineering TNC UDWRe Jones & DeMille Central Utah Water Conservancy District Parsons Behle & Latimer Project Team	Price	Pilot project operations, technical studies, and monitoring
12/14/2020	TU TNC UDWRe UDWRi Project Team	Price	Pilot project operations, water bank application, water right change application
12/15/2020	Central Utah Water Conservancy District Utah Geological Survey Jones & Demille Keller-Bliesner Engineering TU CCC Board of Directors Project Team	Price	Water bank operations, technical studies, contract
12/15/2020	UDWRi Project Team	Price	Water bank operations, accounting, and water right change application
12/29/2020	UDWRe Project Team	Multiple	Contract, water bank application, and water right change application
1/8/2021	UDWiR Attorney General's Office Project Team	Price	UDWiR paricipation and water bank application
1/12/2021	Project Team	Multiple	Project tracking and administration
1/15/2021	Project Team	Multiple	Outreach for pilot project
1/27/2021	TU Project TeamAMP Insights Project Team	Multiple	Outreach for pilot project
February - June 2021	UBWRe UDWRi Project Team	Price	Multiple meetings on water right change application
2/5/2021	UDWRi Project Team	Multiple	Pilot project operations, monitoring, and accounting

Date	Attendance	Pilot Project(s)	Topic(s)
2/23/2021	UDWRe Project Team	Multiple	Pilot project update; project tracking and administration
3/3/2021	Mountain Regional Special Service District UDWRe Smith Hartvigsen PLLC Project Team	Multiple	Pilot project operations; shepherding
10/20/2021	PRWCD Project Team	Price	Public meeting of PRWCD on water bank application
10/28/2021	UBWR UDWRe Project Team	Price	Presentation to UBWR
1/12/2022	PRWCD Project Team	Price	Public meeting of PRWCD on water bank application
1/27/2022	UBWR UDWRe Project Team	Price	UBWR approval of water bank application
May - December 2021	CCC PRWUA UDWRe Project Team	Price	Multiple meetings to negotiate contract
6/21/2022	UDWRe Project Team	Multiple	Leasing contracts with CCC shareholders; lease pricing; outreach; water right change application
6/29/2022	UDWRe Project Team	Multiple	Pilot project update and planning; project tracking and administration
7/11/2022	UDWRe Project Team	Multiple	Water bank application process and forms; pilot project update
7/19/2022	Project Team	Multiple	Project tracking and administration
8/16/2022	UDWRe Project Team	Multiple	Outreach and education on water banking; pilot project status
9/13/2022	UDWRe Project Team	Multiple	Water bank application process and forms; pilot project update

Date	Attendance	Pilot Project(s)	Topic(s)
9/27/2022	UDWRe Project Team	Multiple	Pilot project update, outreach, and application process improvements
10/18/2022	Project Team	Multiple	Project status and documentation
11/8/2022	UDWRe Project Team	Multiple	Water right change application; grant administration
12/20/2022	UDWRe Project Team	Multiple	Project status and documentation