



Platte River
Power Authority

Estes Park • Fort Collins • Longmont • Loveland

2024

Platte River Power Authority
Water Resources Reference Document

Eighth Edition

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Summarizing Platte River Power Authority's water supply, background, activity, agreements and operational historical performance.



Table of contents

Introduction	1
Section I – Background and history	1
1. Why Platte River needs water	1
2. Water supply sources	2
3. Water agreements	4
4. Current annual water use - summary	7
Section II – Current activity	10
1. Water for generation operations and Windy Gap Project performance	10
2. History and status of the Windy Gap Firming Project and Chimney Hollow Reservoir	13
3. Firming Project/Chimney Hollow Reservoir project schedule	13
4. Firming Project storage requirements	13
5. Firming Project participants	15
6. Firming Project costs	15
7. Chimney Hollow Reservoir operation	16
Section III – Water Policy and operations	16
1. Water Policy objectives	16
2. Water costs – capital and operating expenses	19
Section IV – Current Water Resources Policy	20
Section V – Going forward	22
Appendix A – Maps	
1. Northern Water: Colorado-Big Thompson Project	
2. Northern Water: water collection and distribution systems	
3. Northern Water: west slope collection system	
4. Northern Water: east slope distribution system	
5. Windy Gap Firming Project: Chimney Hollow Reservoir	
Appendix B – Water Resources Policy Document	
Appendix C – Glossary	

Platte River Power Authority Water Resources Reference Document

Introduction

This document provides a brief background on Platte River's water resources, including the history behind Platte River's assets and operating agreements, a summary of current water-related operations and projects at Platte River and how Platte River's Water Resources Policy guides future planning and operations. Platte River updates this document every three years to refresh the operational data summaries and reflect any changes in Platte River's water policy or asset ownership.

Section I – Background and history

1. Why Platte River needs water

Water and energy systems are intrinsically linked. Platte River uses water for site operations (such as dust suppression, fire water and potable water needs) and electricity generation (thermoelectric, hydropower and renewable technologies). Platte River requires a consistent water supply to ensure reliable operations.

The Rawhide Energy Station (Rawhide) includes coal, natural gas and solar energy resources. Water is currently needed to support Rawhide Unit 1, a coal-fired unit using steam to generate power. Coal-fired electric generation requires a reliable supply of water for two main purposes: cooling water and process water.

Cooling water cools steam to liquid in a condenser before returning it to the boiler. At Rawhide, Platte River stores cooling water in Hamilton Reservoir. Hamilton Reservoir covers 500 surface acres, has a capacity of 16,000 acre-feet (af),¹ and consumes an average of three million gallons of water per day (approximately nine af/day) as evaporation into the atmosphere. On average, Platte River needs approximately 3,300 af of water annually to maintain the reservoir level. However, the annual amount of water pumped into the reservoir can range from 2,500 to 4,500 af of water. The amount of pumping needed to replenish the water varies depending on many conditions, including the evaporation rate (affected by air temperature, wind conditions, humidity, reservoir temperature and similar factors), precipitation and plant performance. The evaporation rate of a cooling reservoir is higher than the natural evaporation rate in a regular lake or reservoir because the water temperature is higher. The annual average temperature of Hamilton Reservoir is 70 degrees Fahrenheit. The typical windy conditions at Rawhide also cause increased evaporation from Hamilton Reservoir. The water Platte River stores in

¹ An acre-foot is 325,851 gallons, or the volume of water that would cover one acre of land to a depth of one foot.



Hamilton Reservoir is treated reusable effluent from the City of Fort Collins' Drake Water Reclamation Facility, pumped to Rawhide via a 24-inch pipeline.

Platte River also needs a separate process water supply, for which treated reusable effluent is unsuitable. This process water is used for boiler makeup water, site service water, fire suppression and drinking water. Platte River pumps approximately 400 af of this water per year directly from Horsetooth Reservoir to Rawhide via a separate 10-inch pipeline. The amount has varied, but conservation efforts and equipment upgrades have reduced the amount of process water needed at Rawhide.

Water conservation is a key element of plant operations. All water Platte River uses at Rawhide is recycled as much as possible and used in other plant processes. Rawhide is a zero-discharge facility, meaning that Platte River uses all cooling and process water to extinction. All water used at Rawhide must be fully consumable and reusable, which is a very specific type of water under Colorado water law.

2. Water supply sources

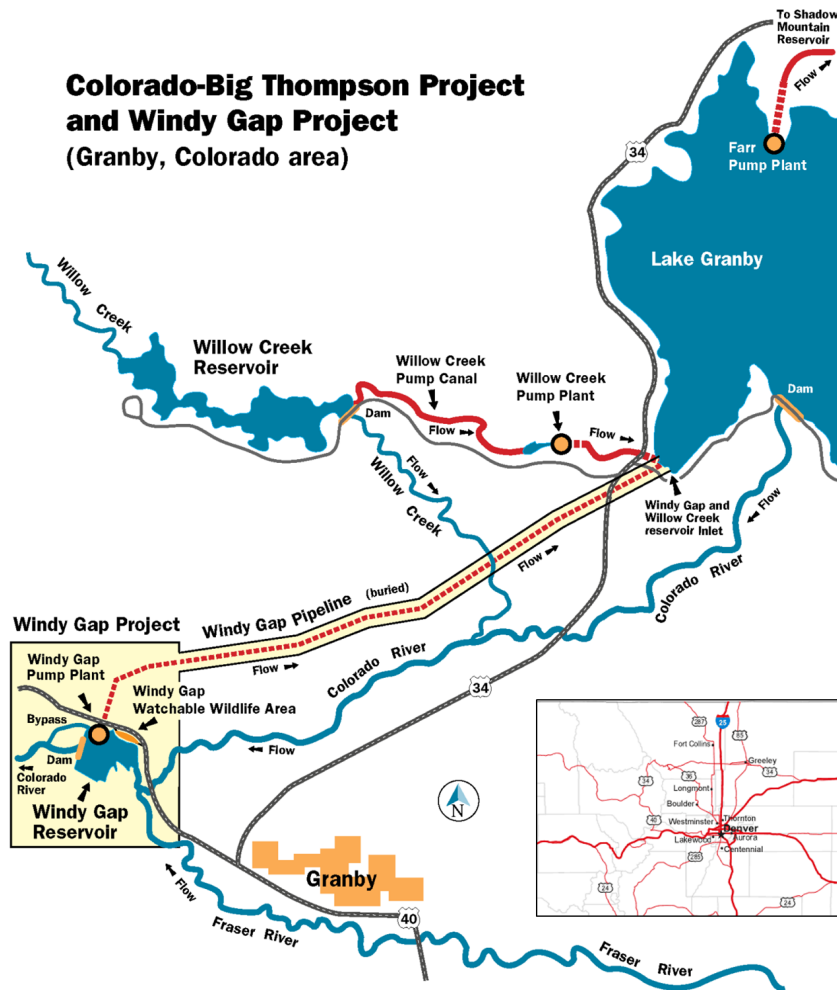
Windy Gap Project

Platte River is a participant in the Windy Gap Project, which delivers water from Colorado's western slope to the front range. Platte River originally owned a contract allocation of 160 units (out of a total of 480 units) of the Windy Gap Project, which Platte River acquired from three of its owner communities in 1974. These allocations included 40 units from the Town of Estes Park, 80 units from the City of Fort Collins and 40 units from the City of Loveland. Each unit of Windy Gap Water is entitled to 1/480th of the annual yield of the project, and yields up to 100 af of water per year, depending on Windy Gap Project production. Platte River presently owns 107 Windy Gap units.

The Windy Gap Project was constructed in the early 1980s and began delivering water in 1985. The Windy Gap Project consists of a diversion dam on the Colorado River, a 255 af reservoir, a pumping plant and a six-mile pipeline to Lake Granby. The Windy Gap Project pumps water to Lake Granby during high flow months, typically April to July, and stores the water in Lake Granby until needed. When needed, the Windy Gap Project delivers water beneath the Continental Divide through the Adams Tunnel under a carriage contract with the U.S. Bureau of Reclamation (Reclamation) for delivery through facilities that are part of the Colorado-Big Thompson (C-BT) project, including Carter Lake and Horsetooth Reservoir (collectively, C-BT Project). The Northern Colorado Water Conservancy District (Northern Water) and Reclamation jointly operate and maintain the C-BT Project (maps shown in Appendix A). Northern Water's Municipal Subdistrict (Municipal Subdistrict) is a separate conservancy district formed by several municipalities to build and operate the Windy Gap Project. The current Windy Gap Project participants and a project map are below:



Windy Gap Project participants	
Platte River Power Authority	City of Fort Lupton
City of Longmont	City of Louisville
City and County of Broomfield	Town of Berthoud
City of Greeley	Town of Frederick
City of Loveland	Town of Firestone
City of Boulder	City of Dacono
Town of Erie	Town of Estes Park
Little Thompson Water District	City of Lafayette
Superior Metropolitan District No. 1	Central Weld County Water District



Northern Colorado Water Conservancy District
<http://www.northernwater.org/waterprojects/CBTWindyGapmaps.aspx>

The Municipal Subdistrict provides Windy Gap Project water (Windy Gap Water) as a “contract allotment” from the Municipal Subdistrict. This means that Platte River does not own Windy Gap Water rights, but has a contractual right to Windy Gap Water deliveries when water is available. For example, during full production years, 100 Windy Gap units can produce up to 10,000 af of water per year, but during years with less production, the actual yield is less. Annual yields range anywhere from zero af per unit to 100 af per unit.

A key benefit of Windy Gap Water is that it is fully consumable (can be used to extinction). Windy Gap allottees can use and reuse Windy Gap Water because it is imported water, not native to the South Platte basin. After first use within Municipal Subdistrict boundaries, participants may use, lease, transfer or sell all successive use rights (reusable return flows) within or outside of Municipal Subdistrict boundaries. Platte River needs fully consumable water at Rawhide because it is a zero-discharge facility.

Typically, Platte River places an annual Windy Gap order of approximately 4,800 af, 4,200 af of which Platte River provides to the City of Fort Collins in exchange for a like amount of reusable effluent pumped to Rawhide for cooling purposes. Platte River uses the remaining water for Rawhide process water, augmentation and other obligations.

Cache la Poudre River decrees

In addition to its Windy Gap allotment, Platte River historically held two junior water rights on the Cache la Poudre River (Poudre River). Because these rights have a junior (recent) priority date, this water is not available every year and does not give Platte River a firm, reliable supply. In 2022, Platte River exchanged its Poudre River rights with the City of Greeley for leased C-BT rental water from the 2023 water year through the 2030 water year.

3. Water agreements

Along with the contract allotments for Windy Gap Water, Platte River is party to the following agreements and decrees that help us exchange, receive, and store water.

Reuse Agreement

When planning Rawhide, Platte River knew that Rawhide would require adequate cooling water and process water. Platte River also recognized that the front range of Colorado is an arid region, so a primary objective was to use water in a responsible and sustainable way. Platte River incorporated the use of treated effluent into the original plant design. In 1978, Platte River and the City of Fort Collins (Fort Collins) developed the Agreement for the Reuse of Water for Energy Generation (Reuse Agreement) allowing Fort Collins to use consumable and reusable water first, and then pump return flows of treated effluent to Hamilton Reservoir at Rawhide for



cooling.² This arrangement ensured that Rawhide's water use would not disadvantage any existing water users or water supplies.

In addition to the 4,200 af of effluent from the Reuse Agreement, Platte River is also entitled to return flows from Windy Gap Water supplied to Fort Collins. The estimated return flows from Fort Collins' use of 4,200 af of Windy Gap Water are approximately 2,310 af, or an average of 55% of the Windy Gap Water Fort Collins uses. The total water available to Platte River under the Reuse Agreement, absent water received under the three-party Memorandum of Understanding (MOU) described below, includes 4,200 af of reusable effluent plus approximately 2,310 af of Windy Gap return flows, for a total of 6,510 af.

Memorandum of Understanding

When Anheuser-Busch, Inc., now Anheuser-Busch InBev (AB InBev), came to Fort Collins, it needed a fully consumable water supply for its operations. In 1988, Platte River, Fort Collins and AB InBev signed an MOU allowing Fort Collins to designate the Windy Gap Water owed to Fort Collins under the Reuse Agreement for the AB InBev brewery³. The parties expected that AB InBev using Windy Gap Water would reduce the return flows available to Platte River under the Reuse Plan. To compensate Platte River for the reduced return flows, AB InBev agreed to pay a portion of Platte River's annual variable operating costs for Windy Gap Water. The total amount of reusable effluent usually available to Platte River is around 5,400 af per year, as shown in the table below. This meets Platte River's current cooling water needs for Rawhide with some reserve water available for future generation or other uses.

² The Reuse Agreement is a three-way agreement between Fort Collins, Water Supply and Storage Company (WSSC) and Platte River. The Reuse Agreement and associated Decree W-9322-78 are based on a series of exchanges that use "new foreign water" supplied by Fort Collins and WSSC to produce 4,200 af of reusable effluent for Platte River's use each year. Fort Collins uses the new foreign water to generate reusable effluent return flows of 4,200 af that it provides to Platte River. To compensate Fort Collins and WSSC for this reusable effluent, Platte River transfers a total of 4,200 af of Windy Gap Water to Fort Collins annually.

³ Coincidentally, AB InBev's estimated water need of 4,200 af matched the amount of Windy Gap Water provided to Fort Collins under the Reuse Agreement. Because AB InBev uses a land application process to treat brewery waste, it does not send as much wastewater to Fort Collins' Drake Water Reclamation Facility, reducing return flows into the system. Under the MOU, Platte River agreed to accept less Windy Gap Water return flows, approximately 800 af instead of the 2,310 af expected under the Reuse Agreement, in exchange for payments toward variable operating costs for Windy Gap Water and other costs incurred when Windy Gap Water is in short supply.

Average annual reusable effluent water available to Platte River

Reusable effluent water sources	Annual quantity (af)	Comments
Reuse Agreement exchange	4,200	Contractual quantity
MOU: Windy Gap return flows	1,200	Estimate
Total reusable effluent available	5,400	Estimate

North Poudre storage agreement

In 1979, Platte River entered an agreement with the North Poudre Irrigation Company (North Poudre) allowing Platte River to use North Poudre’s Fossil Creek Reservoir inlet ditch and temporarily store reusable effluent in Fossil Creek Reservoir when space is available and storage does not harm North Poudre. This agreement, which expires in 2024, preserves treated effluent that cannot be pumped to Rawhide at the same rate that Fort Collins delivers it to the Drake Water Reclamation Facility. This agreement allows Platte River to store and withdraw treated effluent from Fossil Creek Reservoir. When the agreement expires, Platte River will no longer be able to store and withdraw treated effluent from Fossil Creek Reservoir, but will maintain the perpetual right to use the Fossil Creek inlet ditch. Platte River seeks to negotiate a new storage agreement with North Poudre soon.

Water Platte River holds in Fossil Creek Reservoir would be lost when the reservoir fills and spills (annually). The Platte River board of directors authorized Platte River to lease unpumped reusable effluent, beginning in 1994, to avoid this uncompensated loss. When Platte River leases Fossil Creek Reservoir water it shares a percentage of the proceeds with North Poudre.

Soldier Canyon outlet agreement

In 1981, Platte River entered into an agreement with Fort Collins for three cubic feet per second (cfs) of capacity in the Soldier Canyon outlet to pump process water from Horsetooth Reservoir to Rawhide via the 10-inch pipeline.⁴

Larimer County agreement – Strang Gravel Pit augmentation

Platte River and Larimer County entered an agreement in 1993 allowing the county to receive up to 100 af of reusable effluent Platte River receives under the MOU to augment water needs for Larimer County’s Strang Gravel Pit. Larimer County notifies Platte River each year of the actual quantity of water it needs for augmentation. Larimer County’s augmentation is typically less than 12 af per year.

⁴ The Soldier Canyon outlet agreement allows Platte River to connect to and operate a tap from the existing Fort Collins raw water delivery system at a point on the system below where the system connects to the Soldier Canyon outlet from Horsetooth Reservoir. From that point, the water is pumped via Platte River’s 10-inch pipeline from the tap to Rawhide.



Carter Lake outlet agreements

The Carter Lake outlet agreements, part of the Southern Water Supply Project, are allotment contracts signed in 1994 and 2001 that provide Platte River with total delivery capacity of up to 18 cfs⁵ from the Carter Lake outlet. After assessing potential water needs for a future generation resource on the southern end of the Platte River system, Platte River sold 13 cfs of outlet capacity to other project participants, retaining five cfs⁶ of capacity. Platte River does not currently use this capacity, but maintains it for its future value to either deliver water to a generation resource on the southern end of Platte River's system or to deliver leased Windy Gap Water out of Carter Lake.

Water decrees

There are several water rights decrees that support how Platte River exchanges, delivers and stores water. Two of these are the reuse decree, which authorizes the exchanges needed for the Reuse Agreement, and the Hamilton Reservoir storage decree, which allows Platte River to store and operate the 16,000 af cooling reservoir at Rawhide. The 24-inch pipeline that supplies water to Hamilton Reservoir has several associated exchange decrees that provide flexibility in pumping water through the pipeline.

4. Current annual water use – summary

Cooling water

As described above, Platte River currently uses an annual average of approximately 3,300 af of reusable effluent for cooling water. Cooling water use at Rawhide varies from 2,500 to 4,500 af annually, depending on weather and operating conditions.

Augmentation water

Each year, Platte River provides approximately 200 af of additional reusable effluent to Fort Collins and the Poudre River to meet the augmentation requirements of the Reuse Agreement, the Rawhide Energy Station property (Rawhide Creek), Platte River's headquarters property (headquarters well), and the Larimer County Strang Gravel Pit augmentation agreement.

Process water

Platte River pumps an average of 400 af of Windy Gap Water directly from Horsetooth Reservoir to Rawhide via the 10-inch pipeline from the Soldier Canyon outlet. Platte River uses this water for process water at the plant.

⁵ Capacity of 18 cfs equates to 35.7 af/day.

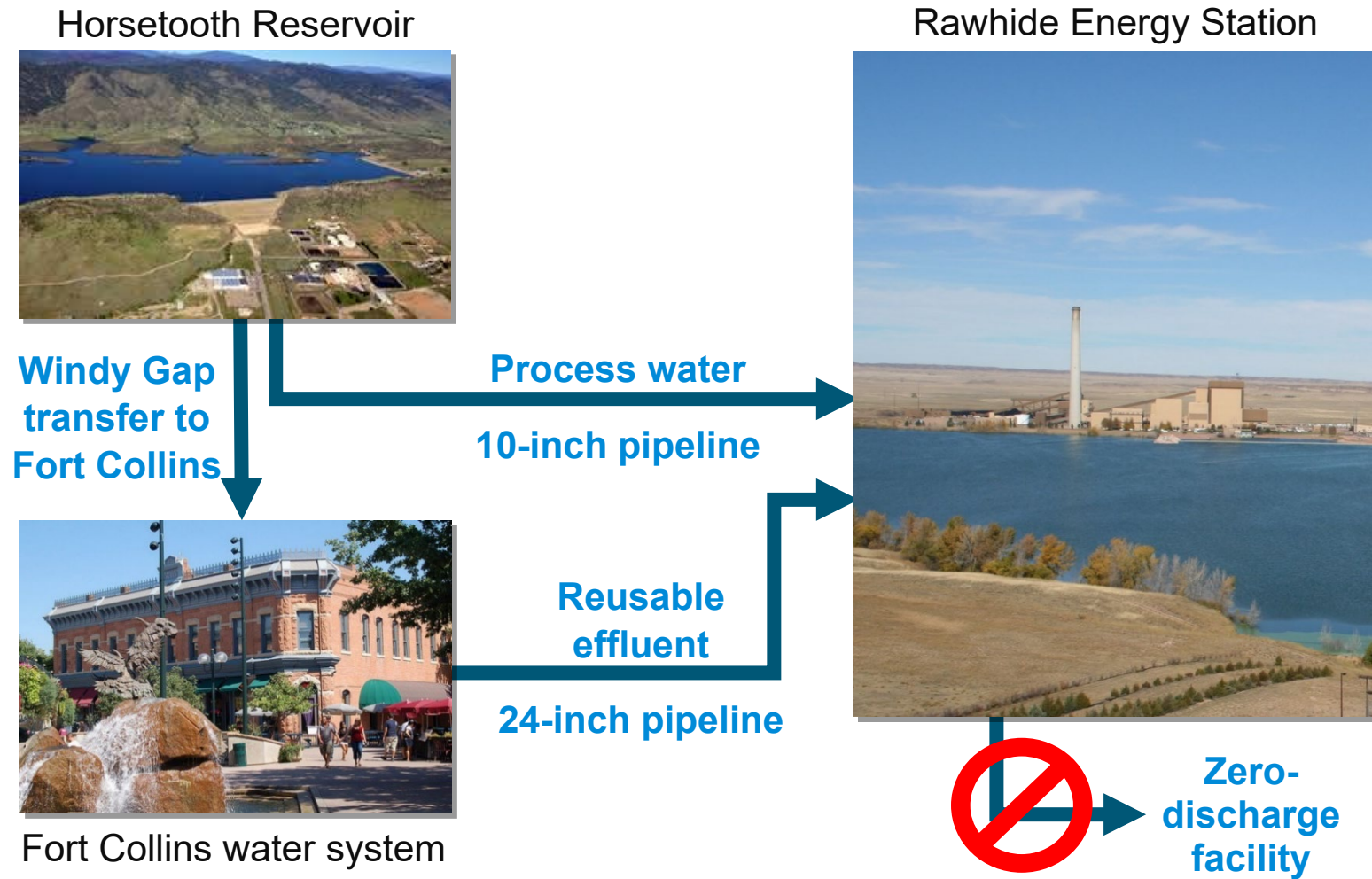
⁶ Capacity of five cfs equates to 9.9 af/day.

Platte River's water use summary

Platte River water use	Typical annual quantity (af)	Type of water
Rawhide cooling water: 24-inch pipeline	3,300	Reusable effluent
Augmentation requirements	200	Reusable effluent
Rawhide process water: 10-inch pipeline	400	Windy Gap
Total use	3,900	

A diagram showing the general arrangement for Rawhide water supply and use follows:

Rawhide Energy Station water supply



Section II – Current activity

1. Water for generation operations and Windy Gap Project performance

Platte River requires a minimum of 4,200 af of Windy Gap Water per year to complete the water exchanges under the Reuse Agreement and MOU. Without Windy Gap Water to exchange, Platte River would receive significantly less reusable treated effluent under the Reuse Agreement and MOU. Platte River also needs approximately 400 to 600 af of Windy Gap Water each year for direct pumping to Rawhide as service and process water. Both water sources are critical to Rawhide's reliable operation. Historically, Platte River's annual Windy Gap order has been approximately 4,800 af, as shown in the following breakdown:

Platte River's average annual water requirements and contractual obligations

Windy Gap Project order components	Average annual quantity (af)
Reuse Plan, contractual requirement	4,200
Process water, 10-inch pipeline pumped to Rawhide	600
Total average annual order	4,800

Windy Gap Water is Platte River's primary water source and is needed every year. During the early years of Windy Gap's operation, orders and the volumes delivered to other project participants were relatively small. But delivery issues emerged as other water users began to increase their orders because the Windy Gap Water rights are junior to other rights and because the C-BT Project through which Windy Gap Water is stored and delivered has some inherent limitations. This means that, during its lifetime, the Windy Gap Water supply has been less reliable than anticipated. Weather conditions such as severe drought or extreme snowpack limit Windy Gap Water availability. Although Rawhide has never been curtailed due to a lack of water, continued dependence on favorable weather to secure Platte River's water supply is not a reliable long-term strategy.

For example, in dry years, the Windy Gap Water decrees are not in priority and the Windy Gap Project cannot pump because water is not available. In some especially wet years, the Windy Gap Project would be able to pump but cannot due to lack of storage. Currently, Lake Granby is the only storage option for Windy Gap Water. However, water conveyed and stored for the C-BT Project has priority over water conveyed and stored for the Windy Gap Project. Therefore, in wet years, when the C-BT system is full, there is no conveyance or storage capacity for Windy Gap Project water. This means that the Windy Gap Project cannot store water in wet years to use in dry years. And if Lake Granby reaches capacity and spills due to wet year inflows, Windy Gap Water is the first to spill.



Because the Windy Gap Project yields are unreliable in both wet and dry years, the project's current firm yield is zero. Firm yield is the amount of water that can be delivered on a reliable basis, in all years, and is typically determined by yield in a critical drought period.

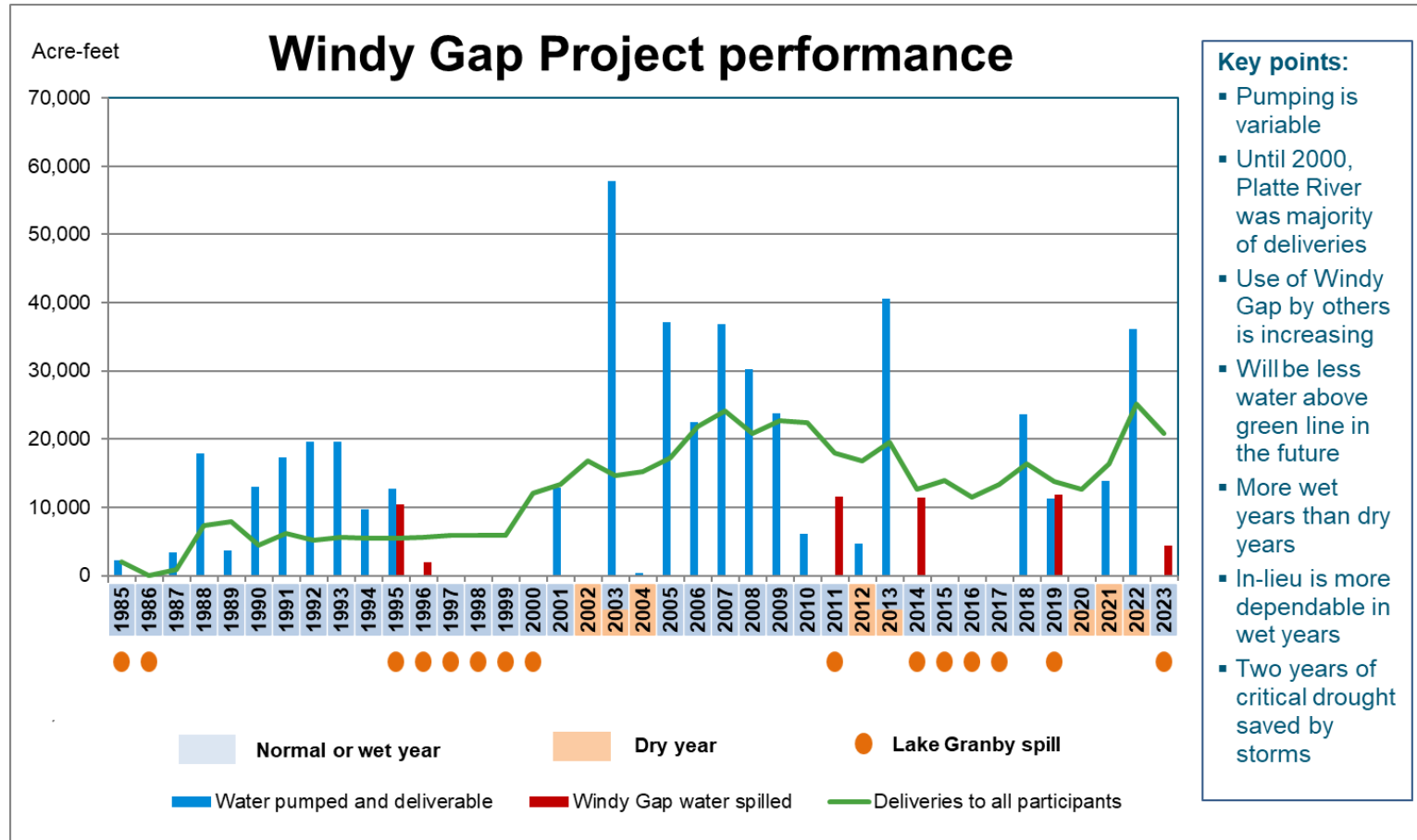
To address uncertain deliveries, Northern Water developed the "Criteria for Integrated Operations of the Colorado-Big Thompson and Windy Gap Projects" (Integrated Operations) in 1991. Through Integrated Operations, Northern Water may deliver C-BT Project water to Windy Gap participants in lieu of Windy Gap Water. The Windy Gap Project must replace all C-BT Project water attributable to these in-lieu deliveries with later-pumped Windy Gap Water. Northern Water may require Windy Gap Project participants who request in-lieu deliveries to incur additional expenses or make other water available as collateral so that in-lieu deliveries do not harm C-BT Project beneficiaries.

In extremely dry years, even Integrated Operations may not allow use of in-lieu Windy Gap Water. This situation occurred during the 2002-2003 water year, when the C-BT system did not have enough unallocated reserve water in storage to support the in-lieu program. During that period, Platte River had to lease reusable water from a front range municipality. This water was used for critical process water needs and enabled Rawhide Unit 1 to continue operations. Fortunately, a large snowfall in March 2003 provided enough water to enable the Windy Gap Project to pump and Windy Gap Water became available. It is uncertain how Platte River would have obtained the water for Rawhide operations without this snowfall.

Like the extreme dry year of 2002-2003, the 2012-2013 water year had no Windy Gap Water available, but Platte River was able to obtain water using the in-lieu process. Had the reserves in the C-BT system been depleted, or if C-BT water were unavailable on the rental market, Integrated Operations would not have been an option. In some years, Platte River and Fort Collins have been able to work out an arrangement during these "Windy Gap short" periods to provide water for the MOU and cooling water. In particular, the 2012-2013 drought period would have been much more costly to Platte River had this agreement not been in place and had the Windy Gap Project not pumped in the late spring of 2013. This enabled Platte River to revert to normal operations halfway through the year. But acquiring reusable water through the rental market can be uncertain, unreliable and, at times, very expensive.

Although rental water is easier to acquire in wet years, availability and pricing are subject to market volatility. Platte River first seeks rental water from the owner communities. If water is not available from the owner communities, Platte River reaches out to other regional partners to lease C-BT water. In some cases, Platte River has secured long-term C-BT lease agreements and rights of first refusal to lease C-BT water when available from other municipalities. These resources provide additional security for Rawhide's process water needs. On average, Platte River leases around 1,300 af of C-BT water for use as collateral, and in some years has required as much as 2,200 af of leased water to meet its water needs.

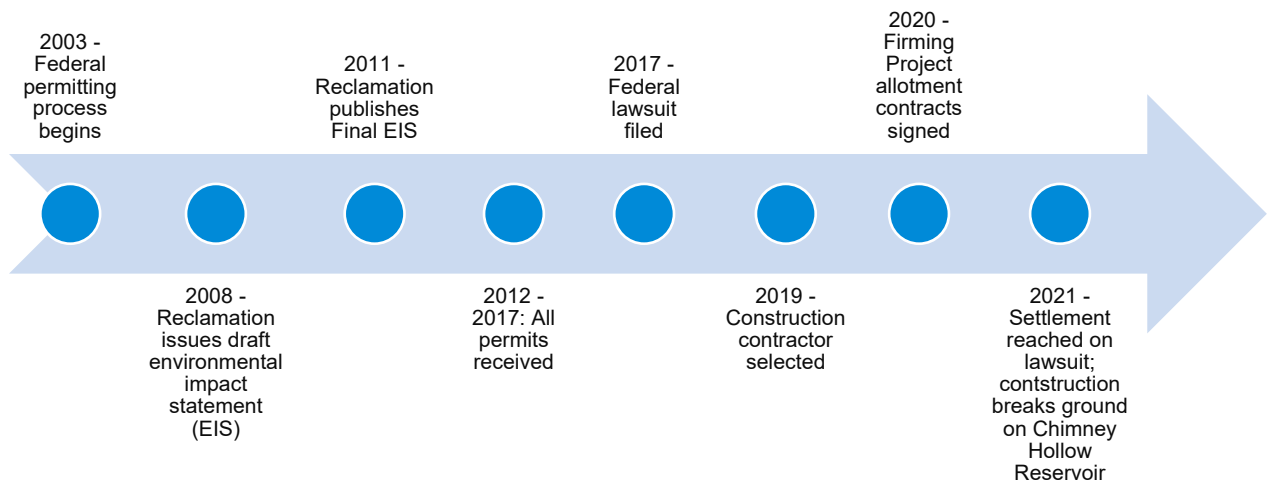
The chart below shows the historical Windy Gap Project performance and the associated impacts of both wet and dry years, as discussed above:



2. History and status of the Windy Gap Firming Project and Chimney Hollow Reservoir

As described above, the Windy Gap Project was completed in 1985, and six years later the participants adopted Integrated Operations to address deliverability issues. The participants recognized that Integrated Operations could provide relief under certain conditions but would be ineffective during extreme weather. In the mid-1990s, the participants began to discuss the Windy Gap Firming Project (Firming Project) to better resolve deliverability issues.

The Firming Project is a new reservoir, named Chimney Hollow Reservoir, into which Windy Gap Water will be pumped in wet years and stored for use in dry years (when the Windy Gap Project does not pump), significantly improving operational reliability and reducing volatility. Platte River commissioned a study of water supply alternatives, which confirmed that participation in the Firming Project was the most effective means to secure Platte River's water supply. In July 2000, Platte River signed an interim agreement with Northern Water and the Municipal Subdistrict to continue its participation in the Firming Project. Major Firming Project milestones include:



3. Firming Project/Chimney Hollow Reservoir project schedule

Chimney Hollow Reservoir construction is expected to be complete by the fall of 2025, with initial filling beginning in late 2025 or early 2026.

4. Firming Project storage requirements

Platte River's storage allotment in Chimney Hollow Reservoir is 16,000 af. Over the course of the project's development, this volume fluctuated based on the results of multiple water

resources studies and changes in estimated project costs and schedule. Ecological Resource Consultants completed the most recent water resources model in 2020, incorporating updated forecasts for Platte River's water needs and the latest operational parameters of the Firming Project to determine Platte River's expected annual firm yield across a variety of storage and Windy Gap unit ownership combinations.

The model indicated that for a one-in-57-year drought (two consecutive years of no Windy Gap pumping) 16,000 af of Chimney Hollow storage will provide Platte River at least 5,200 af per year of firm supply if Platte River owns 80 or more Windy Gap units. This yield would meet Platte River's current operational demand of approximately 4,800 af per year. The study also concluded that no combination of storage and supply would yield enough for a one-in-250-year drought (three consecutive years with no Windy Gap pumping). In these years, Platte River will need to modify operations, including reduced effluent pumping and leasing rental water.

Firming Project model analysis (based on 60-120 units)*

Firming Project storage (af)	Windy Gap unit ownership level	Annual firming Windy Gap (af) <i>historic hydrology: 1 in 50 years</i>	Annual firming Windy Gap (af) with two years of no pumping <i>occurrence interval: 1 in 57 years</i>	Annual firming Windy Gap (af) with three years of no pumping <i>occurrence interval: 1 in 250 years</i>
8,000	60 - 100	3,050 - 3,415	2,875 - 2,985	2,060 - 2,140
10,000	60 - 100	3,545 - 4,150	3,365 - 3,735	2,410 - 2,675
12,000	60 - 100	3,955 - 4,750	3,910 - 4,445	2,800 - 3,180
14,000	100 - 120	5,265 - 5,595	4,970 - 5,230	3,560 - 3,745
16,000	60 - 120	4,410 - 6,110	4,410 - 5,755	3,575 - 4,120

* All scenarios are based on the provisions of the updated carriage contract that includes prepositioning, diversion shrink, carryover shrink and environmental impact mitigation measures.

Platte River has begun to assess the water needs of its future energy mix. When Platte River retires Rawhide Unit 1, the total water needs at the Rawhide site will likely change, but the magnitude and direction of that change are not yet clear. Potential water demands for future generation vary significantly depending on generation type, and as Platte River implements a new resource mix, the Firming Project will ensure that water supply will not limit Platte River's planning. Ultimately, Chimney Hollow Reservoir will change the Windy Gap Project's total reliable annual yield from zero af of water to about 30,000 af, improving the reliability of water deliveries to participants. There is a significant value to a firm and reliable water supply for both immediate and future needs.

5. Firming Project participants

Firming Project participants	WG units	Storage (af)	Percentage of project	Ratio of volume/units <i>Years to fill*</i>
City and County of Broomfield	56	26,464	29.4%	4.7
Platte River Power Authority	107	16,000	17.8%	1.5
City of Loveland	40	10,000	11.1%	2.5
City of Greeley	49	9,189	10.2%	1.9
City of Longmont	80	7,500	8.3%	0.9
Town of Erie	20	6,000	6.7%	3.0
Little Thompson Water District	20	4,850	5.4%	2.4
Superior Metropolitan District No. 1	15	4,726	5.2%	3.2
City of Fort Lupton	13	1,190	1.3%	0.9
City of Louisville	9	2,835	3.1%	3.2
City of Lafayette	3	900	1.0%	3.0
Central Weld County Water District	1	346	0.4%	3.5
Total	413	90,000	100%	Avg = 2.56

* Based on the assumption of full Windy Gap Project pumping and allocation.

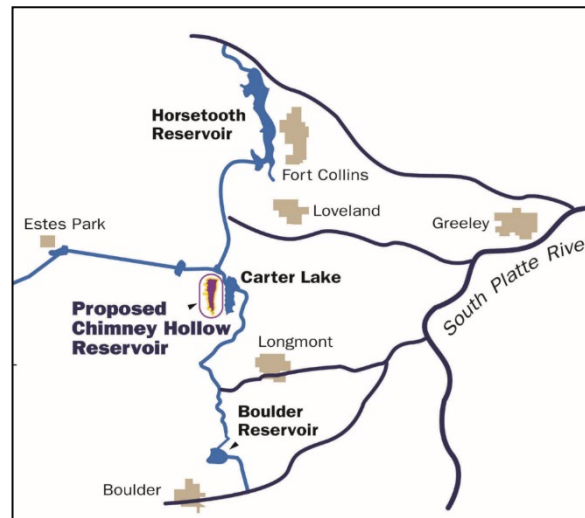
6. Firming Project costs

The Firming Project's estimated cost is \$755 million. Cash assessments made separately from construction financing totaled \$90 million and were used for permitting, planning, design, environmental mitigation and enhancements and to settle a federal lawsuit that challenged the Firming Project before construction began. Initial Costs and Expenses (C&E) for the construction phase were estimated at \$600 million and Completion C&E was estimated at \$65 million.⁷ Platte River's estimated total cost of the project, based on 16,000 af of storage, is \$141.6 million. Of that amount, Platte River funded approximately \$117.9 million through a pooled financing arrangement with other Firming Project participants. The pooled financing includes bonds issued by the Municipal Subdistrict and a loan from the Colorado Water Conservation Board.

⁷ Initial C&E and Completion C&E are defined in Platte River's Firming Project allotment contract and were intended to include all funds necessary to construct and complete the Firming Project.

7. Chimney Hollow Reservoir operation

The Municipal Subdistrict and participants will develop a set of operating guidelines before Chimney Hollow Reservoir is completed. The Municipal Subdistrict and participants currently expect Chimney Hollow Reservoir to fill and discharge water via gravity flow. The operating guidelines will cover routine operation, scheduling water in and out of Chimney Hollow Reservoir and evaporation/seepage loss calculation methodology. A general map of the proposed Chimney Hollow Reservoir follows with a more detailed map shown in Appendix A-6:



Northern Colorado Water Conservancy District
<http://www.northernwater.org/waterprojects/CBTWindyGapmaps.aspx>

Section III – Water Policy and operations

Platte River's water operations are based on three guiding principles: (a) securing and protecting a water supply for Platte River's current operational needs, (b) planning for Platte River's future water supply needs while contemplating the future needs of the owner communities, and (c) maximizing the value of water resources by managing water as an asset.

1. Water Policy objectives

a. Securing and protecting a water supply for Platte River's operational needs

As described in Section II, Platte River currently needs approximately 4,800 af of water per year. This meets operational needs when water and weather conditions are normal. In years with extreme wet or dry conditions, Platte River has met its water supply needs either through the leverage achieved from the Windy Gap units (because Platte River's pro-rata allocation is

higher based on contract allotment ownership level) or through alternative arrangements. Participation in the Firming Project will provide additional supply security.

b. Planning for Platte River's future water supply needs

Platte River's primary future consideration for water is future generation needs. Platte River must also consider future uncertainties, including climate impacts and new environmental legislation and regulation.

Various power generation methods, ranging from emerging technologies to mature processes, could satisfy Platte River's strategic initiatives and future load growth. Several shifts in the energy industry could influence Platte River's future resource mix, including:

- Potential federal regulation of greenhouse gases
- Changes in the price of solar generation and wind resources
- Sustained low natural gas prices
- Advancements in energy storage
- Growth of distributed energy resources

Platte River considered many generation technologies as it developed its integrated resource plans. Most potential future generation sources would require less water than traditional coal-fired units. Platte River will research future resource water requirements, but expects the identified reserve of approximately 4,000 af to be more than adequate to serve any future generation resources Platte River might consider.

Platte River faces other future uncertainties, such as new water agreements or changes to existing water agreements, water usage and water rights appropriation. Platte River's regional water partnerships, resiliency and a firm water supply will remain critical. Platte River's participation in the Firming Project and the water exchange agreement with the City of Greeley are both prime examples of working toward a sustainable water supply and resilient infrastructure.

c. Maximizing the value of water resources by managing water as an asset

Platte River's practice is to maximize the operational and economic value of water resources through various activities within limits the board of directors has defined as discussed below.

Platte River leases unpumped reusable effluent generated under the Reuse Agreement and MOU. The amount of unpumped reusable effluent varies, but averages approximately 1,900 af annually, based on a typical supply of 5,400 af and a typical use of 3,500 af. Platte River does not deliberately accumulate unpumped water but accumulates some water in years when it

either cannot be pumped or does not need to be pumped. Variations in unpumped reusable effluent occur based on the availability of water under the Reuse Agreement, the amount of return flows from Fort Collins and AB InBev and the amount of water needed at Rawhide. Unpumped effluent is stored in Fossil Creek Reservoir (when space is available) for later pumping or leasing to others.

Summary of Platte River's reusable effluent supply and use

Water supply and use – reusable effluent	Annual quantity available (af)	Annual quantity used (af)	Total (af)
Supply			
Reuse Agreement	4,200		
Windy Gap return flows	1,200		
Total supply	5,400		
Use			
Pump to Rawhide		3,300	
Augmentations		200	
Total use		3,500	
Approximate unpumped reusable effluent (annual)			1,900

*This table reflects normal water use and availability.

Historically, reusable effluent has had only a few lease markets with modest value, mainly agriculture and industrial augmentation. Platte River's supply of unpumped effluent has been limited over the past several years due to water supply conditions, but when unpumped effluent is available, Platte River seeks lease opportunities.

Platte River also leases Windy Gap units to others. This type of lease involves Windy Gap units that Platte River does not need for current operations.

Beyond leasing activities and once Chimney Hollow Reservoir is complete, Platte River will continue to maximize the value of its water portfolio by finding the optimal balance of Windy Gap units and storage capacity in Chimney Hollow Reservoir. Through selling a select amount of its Windy Gap units and pairing the remaining units with storage capacity in Chimney Hollow Reservoir, Platte River will achieve a more reliable and resilient water portfolio going forward. A summary of Windy Gap unit sales to date is provided in Section IV.

2. Water costs –operating expenses

The following table summarizes Platte River’s average annual operating costs for the Windy Gap Project and Chimney Hollow Reservoir. These figures do not include pumping and treatment costs at Rawhide. There may be some additional operational costs for the a few years during the first fill and start-up of the Chimney Hollow Reservoir, which are not reflected below. The amounts shown are Platte River’s typical costs, excluding the amounts allocated and charged to AB InBev.

Platte River’s net annual water cost summary

Operating costs*	Typical annual amount	Comments
Windy Gap pumping cost	\$15k	Windy Gap Project pumping costs
Windy Gap carriage costs	\$55k	Carriage costs for use of C-BT system to convey Windy Gap Water to Horsetooth Reservoir
Windy Gap assessment costs (operations and maintenance expenses)	\$250k	Annual charges based on Windy Gap unit ownership
Windy Gap excess capacity charge/in-lieu borrowing charge	\$15k	Assessed on water delivered or exchanged to east slope
Windy Gap indirect cost allocation	\$50k	Assessed annually based on Windy Gap unit ownership
Chimney Hollow Reservoir operations and maintenance	\$355k	Estimated annual charges based on Platte River’s storage allotment in Chimney Hollow Reservoir – charges incurred once the reservoir is put into operation upon completion of construction
Chimney Hollow Reservoir indirect cost allocation	\$85k	Assessed annually based on Chimney Hollow Reservoir capacity
Typical annual costs	\$825k	

* Platte River’s net costs are shown, excluding the charges covered by AB InBev through the MOU.

Section IV – Current Water Resources Policy

Platte River's board-approved Water Resources Policy directs and authorizes the general manager/CEO to:

1. Maintain adequate water supplies for all existing and projected future operations.

- a. Maintain Platte River's participation level in the Windy Gap Firming Project at a storage level of 16,000 af.
- b. Lease water required for Platte River operations and contractual commitments when needed.
- c. Participate in resource planning efforts to incorporate planning for future water needs, with considerations for type and location of future generation resources.
- d. Continue to research and explore alternative water supply opportunities.
- e. Review and modify existing water agreements and pursue new agreements to improve operations, increase reliability and maximize the value of water resource assets.

2. Manage water as an asset.

- a. Lease water to others when available (effluent or Windy Gap units).
- b. Sell Windy Gap units while maintaining a minimum level of 100 units. Compensation may be monetary, may involve storage rights or may involve some other consideration that provides value to Platte River.
- c. Maintain a minimum of five cfs of Carter Lake Outlet Capacity while leasing excess capacity.

The complete Water Resources Policy is included in Appendix B for reference.

This Water Resources Policy allows Platte River to pursue activities that help Platte River meet contractual commitments and operational needs while maximizing the operational and economic value of its water resources. Below is an overview of some of the actions Platte River has taken under the Water Policy:

- In late 2017, Platte River completed a series of transactions that increased its Firming Project capacity from 12,000 af to 14,136 af. Platte River also sold 23 Windy Gap units and secured short-term C-BT water lease options, generating approximately \$39 million in total revenue.



Platte River Power Authority

- In early 2018, Platte River acquired additional storage which resulted in a final Firming Project participation level of 16,000 af.
- In 2019, Platte River sold 17 Windy Gap units and 13 cfs of surplus Carter Lake outlet capacity. These agreements generated additional revenue of approximately \$37 million, helping offset future project costs, securing C-BT water lease options and providing added water security until the Firming Project is complete.
- In 2020, Platte River sold 10 Windy Gap units at a combined price of \$27 million.
- Platte River commissioned a study by the Burns & McDonnell engineering firm, completed in 2020, to explore options for additional raw process water storage at Rawhide. Because Rawhide Unit 1 is scheduled to retire by 2030, Platte River may not need this project. Platte River will retain the study results in case Platte River needs additional on-site water storage in the future.
- In 2022, Platte River leased C-BT water from the City of Greeley from the 2023 water year through the 2030 water year in exchange for Platte River's transfer of its Poudre River rights. Under the lease agreement, Platte River retains use of the Poudre River rights through 2030. This lease secures Platte River's estimated process water needs through Rawhide Unit 1's retirement. The agreement is a notable example of a mutually beneficial regional water partnership.
- In 2022, Platte River relinquished its remaining conditional exchanges associated with its 24-inch pipeline. These exchanges were originally contemplated as contract exchanges of water between Platte River and entities owning structures that intersect the 24-inch pipeline, but they have never been used. Platte River, with the help of an outside consultant, determined that these potential exchanges were not needed for current or future Platte River operations. If Platte River identifies a future opportunity, Platte River can accomplish exchanges of this type through mutual agreement.
- In 2023, Platte River issued a request for proposals for the sale of up to five unfirmed Windy Gap units. By late 2023, Platte River completed transactions with two different entities for the sale of three Windy Gap units for a total price of \$12.3 million. Platte River expects to complete the sale of the other two Windy Gap units in 2024.

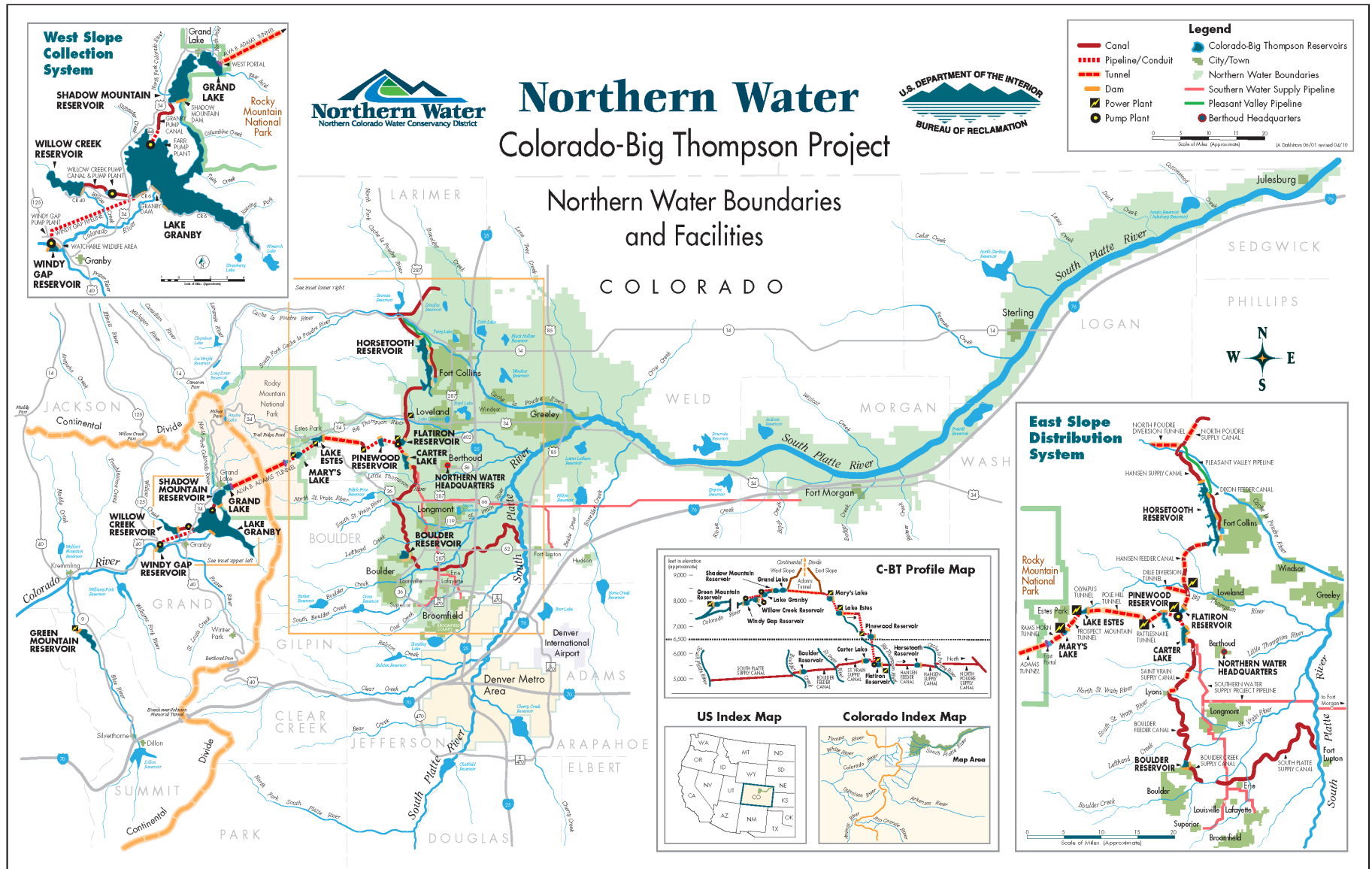
These water transactions have given Platte River the additional storage capacity needed to reduce operational risks during droughts, generated revenue of approximately \$115 million and strengthened Platte River's relationships and partnerships within the Northern Colorado water community.

Section V – Going forward

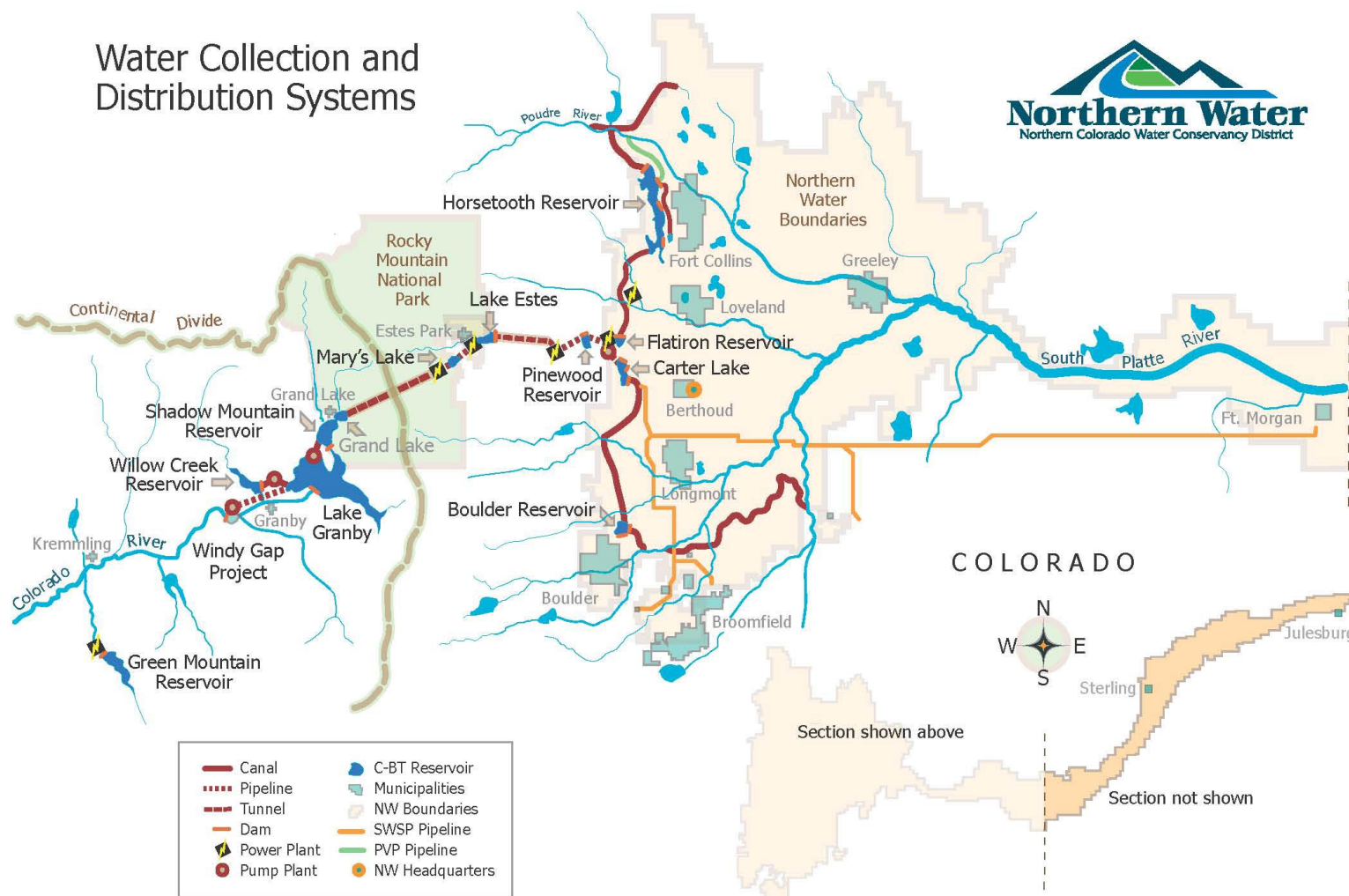
Platte River has actively assessed, managed and optimized its water resources portfolio under the guidance of the Water Resources Policy. The resulting transactions, including the sale of Windy Gap units and acquisition of additional storage in Chimney Hollow Reservoir give Platte River a more balanced and firm water portfolio for reliable operations.

Aside from the Windy Gap Project and the Firming Project, Platte River will continue to assess various aspects of its water resources and seek further opportunities to manage water as an asset.

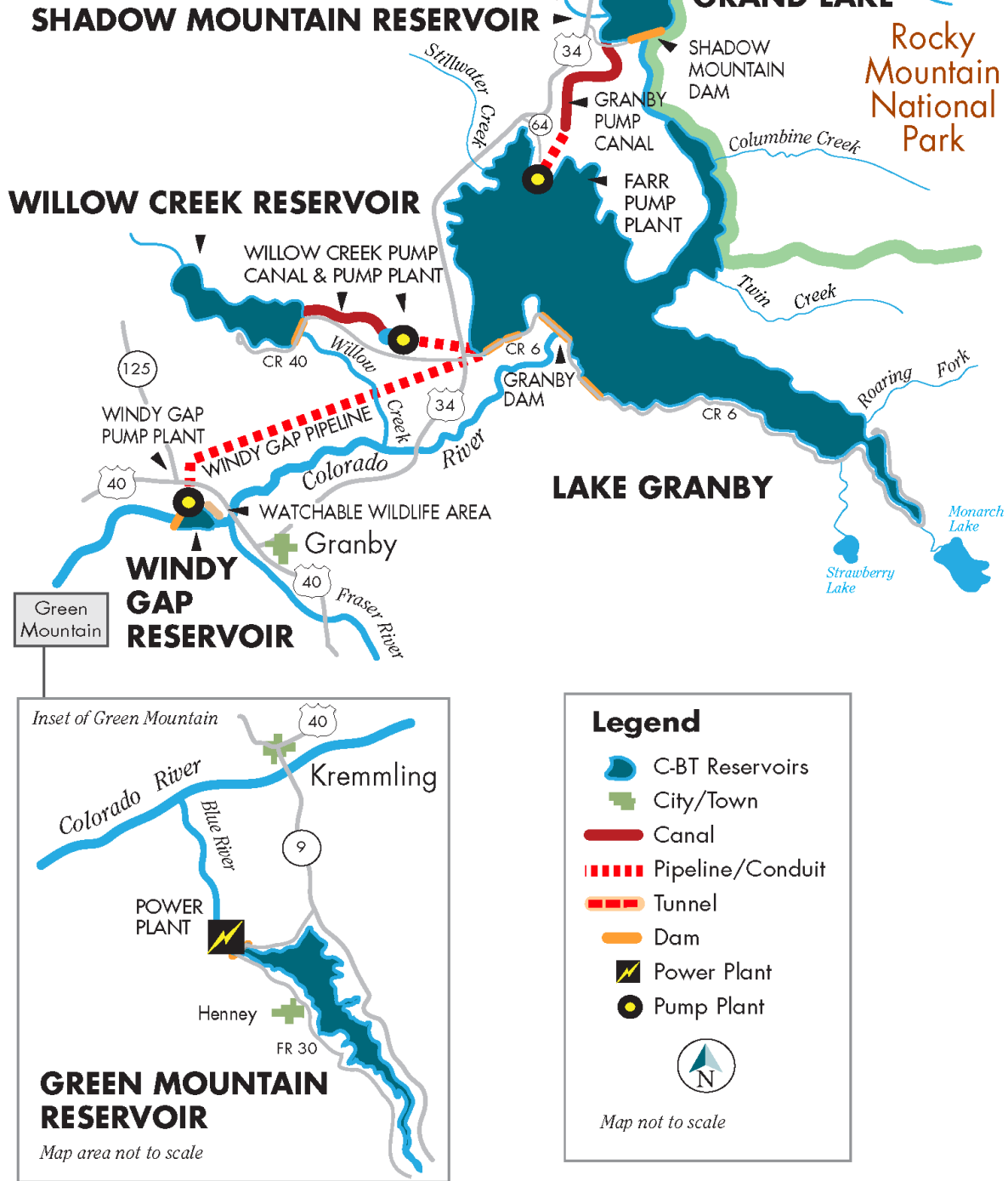
Appendix A – Maps

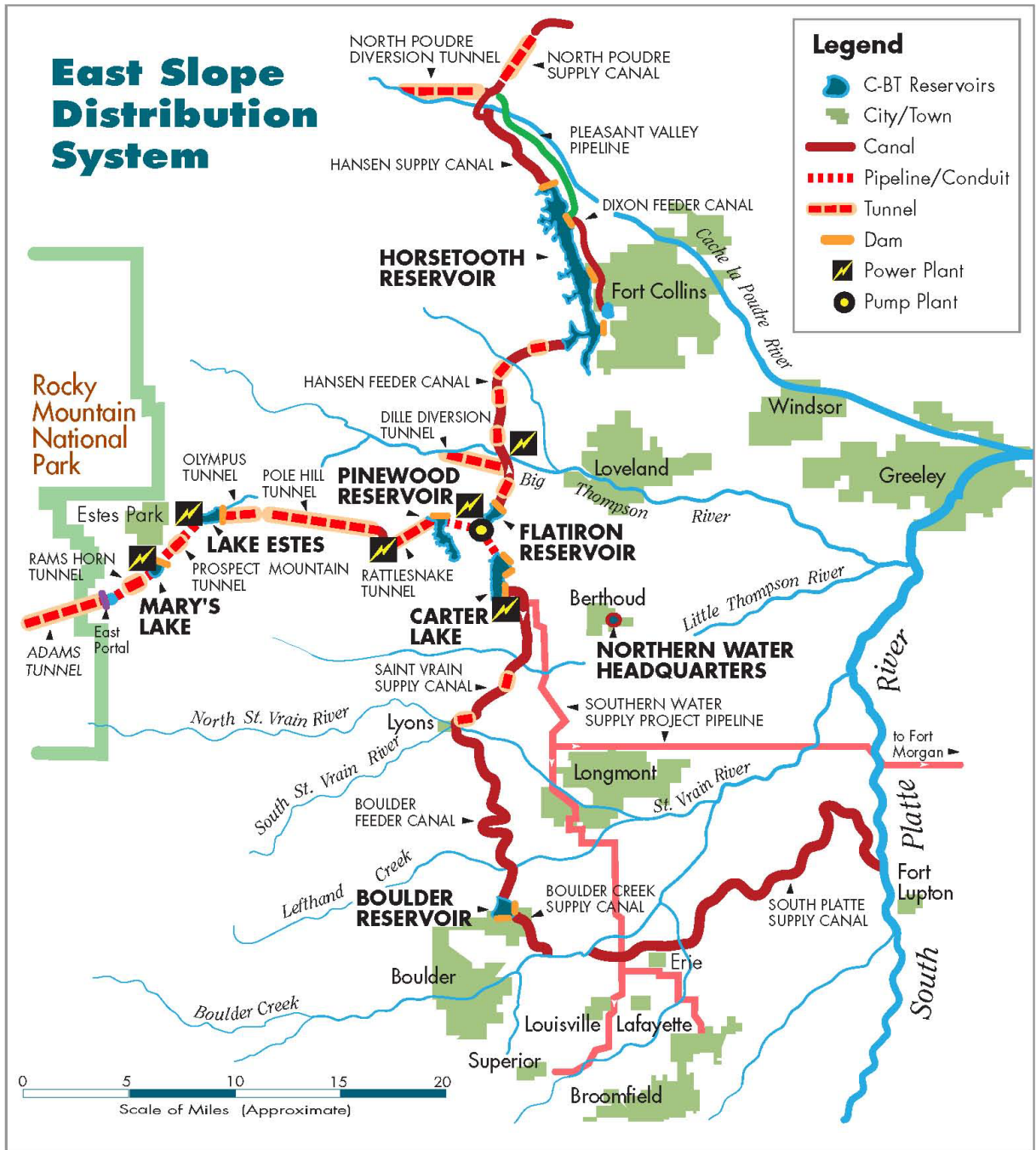


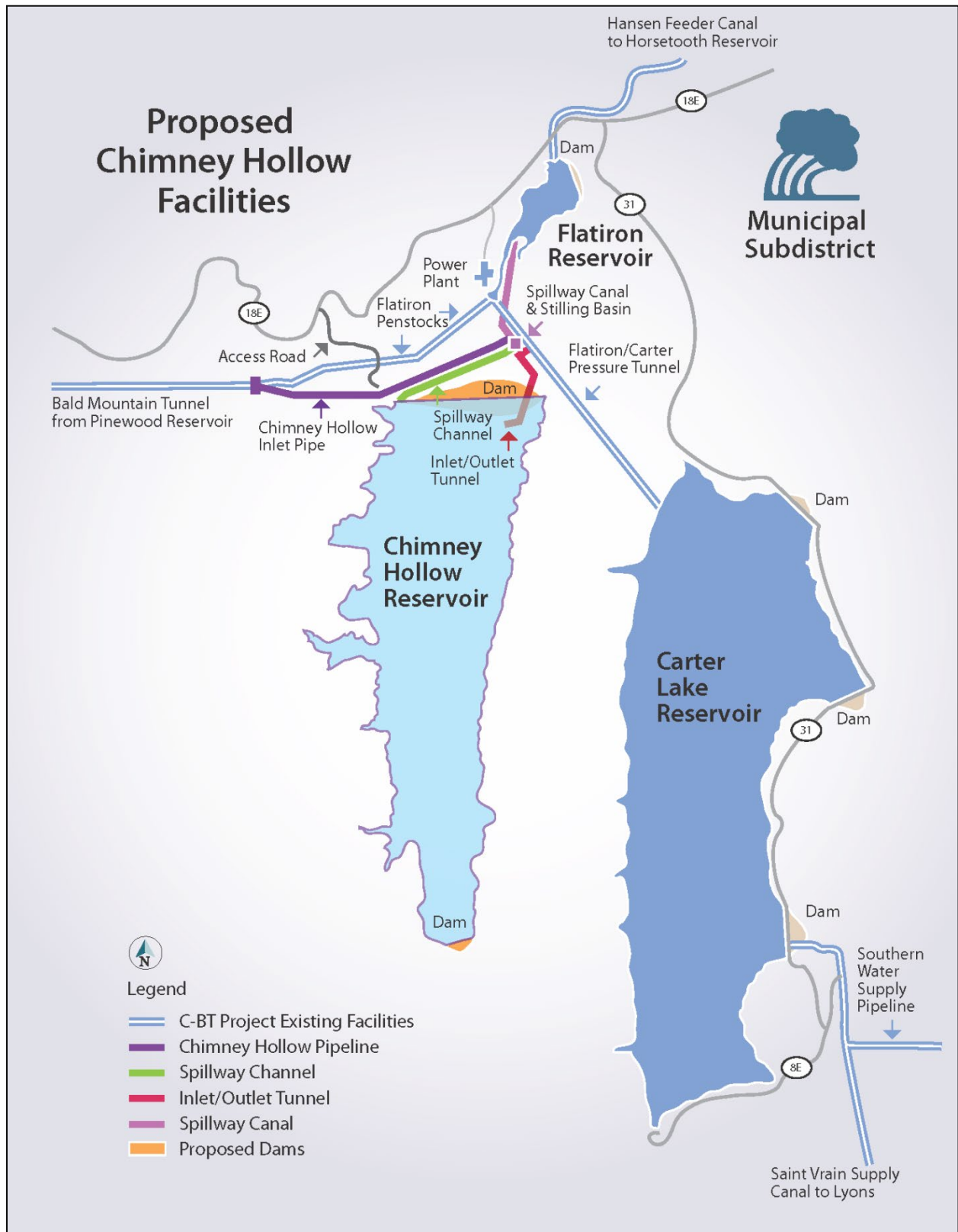
Water Collection and Distribution Systems




West Slope Collection System







Appendix B – Water Resources Policy Document

 Platte River Power Authority	<h1>Policy</h1>	Version #: 1.2 Effective date: 05/10/2023 Next review date: 05/10/2026
	TITLE: Water Resources Policy	Page 1 of 3

Purpose:

This policy provides direction to the Platte River General Manager/CEO on activities related to securing a reliable source of water for operations and the management of water rights and resources as an asset of the organization.

Policy:

Water is critical to the reliable operation of the Rawhide Energy Station (Rawhide) and may be necessary for the reliable operation of future generation resources. Platte River's initial ownership of 160 units of the Windy Gap Project (one third of the total project) was anticipated to be sufficient supply for the initial and future needs of the organization. Based on this assumption, and in an effort to make the most efficient and responsible use of water, Platte River entered into several significant water agreements, including but not limited to the Reuse Agreement, the Memorandum of Understanding, the North Poudre Storage Agreement, the Soldier Canyon Outlet Agreement and the Carter Lake Outlet Agreement. These agreements are discussed in detail in the **Platte River Power Authority Water Resources Reference Document**.

Operational history has revealed the limitations of the Windy Gap Project; it is often constrained by the junior priority of its water rights as well as by the project's dependence on the use of Colorado-Big Thompson infrastructure for storage and delivery of water. While ownership of a significant number of Windy Gap units proved advantageous during periods in which the Windy Gap Project failed to fully deliver water, the Windy Gap Firming Project (of which Chimney Hollow Reservoir is the primary component) will offer greater reliability than unit ownership alone. Moreover, growth in the Northern Colorado region has placed increased pressure on water resources and necessitates more active management of the Platte River water resources as an asset of the organization and member communities. By participating in the Windy Gap Firming Project, Platte River will reduce its overall need for Windy Gap Project units and gain flexibility to manage the units as an asset in future water resources operations.

It is the intent of the board that this policy will position Platte River to pursue activities that will: increase the reliability of water deliveries to meet contractual commitments and the operational needs of the organization; and, maximize the operational and economic value of its water resources, which include but are not limited to Windy Gap units, outlet capacity, storage allocations in the Windy Gap Firming Project, and treated effluent received through the operation of water exchanges.

Consequently, the General Manager/CEO is instructed to:

1. Maintain adequate water supplies for all existing and projected future operations. To do so, the General Manager/CEO is authorized to:




Policy

TITLE: Water Resources Policy

Page 2 of 3

- a. Maintain Platte River's participation level in the Windy Gap Firming Project (Chimney Hollow Reservoir) at a storage level of 16,000 acre feet.
 - b. Lease water required for Platte River operations and contractual commitments as needed.
 - c. Participate in Platte River's resource planning efforts to incorporate planning for future water needs, with considerations for type and location of future generation resources.
 - d. Continue to research and explore alternative water supply opportunities.
 - e. Review and modify existing water agreements and pursue new agreements to improve operations, increase reliability, and maximize the value of water resources assets.
2. Manage water as an asset. To do so, the General Manager/CEO is authorized to:
- a. Lease water:
 - i. Lease reusable effluent
 - o Water that cannot be pumped or exchanged from Fossil Creek Reservoir is at risk of uncompensated loss. Pumping activity should be managed to minimize storage of effluent, but Platte River will also be proactive in the markets through which any at-risk water may be leased.
 - ii. Lease of Windy Gap units
 - o Leases of Windy Gap units can be of any duration and/or quantity, so long as Platte River maintains control of a minimum of one hundred (100) units.
 - iii. The General Manager/CEO will inform the board of leasing activity.
 - b. Sell Windy Gap Units:
 - i. Platte River may sell Windy Gap units, so long as Platte River maintains control of a minimum of one hundred (100) units.
 - ii. Compensation may be monetary, may involve water storage rights, or may involve other forms of consideration that provide value.
 - iii. The General Manager/CEO will inform the board of any sale of Windy Gap units.
 - c. Sell/Lease Carter Lake outlet capacity
 - i. Maintain a minimum of five (5) cfs of Carter Lake outlet capacity.
 - ii. Platte River may lease Carter Lake outlet capacity, so long as five (5) cfs can be made available for operational needs when required.
 - iii. The General Manager/CEO will inform the board of the sale or lease of Carter Lake outlet capacity.

 Platte River Power Authority	<h1>Policy</h1>		Version #: 1.2 Effective date: 05/10/2023 Next review date: 05/10/2026
	TITLE: Water Resources Policy		Page 3 of 3

Document owner: Fuels and Water Manager	Effective date: 05/10/2023
Authority: Board of Directors	Review frequency: Every 3 years
Counsel review: General Counsel	Review date: 05/10/2026
Implementing parties and assigned responsibilities:	
The General Manager/CEO will have primary responsibility for implementation.	
Associated Items (if applicable):	
Platte River has prepared, and annually updates, the Platte River Power Authority Water Resources Reference Document . This reference provides a detailed explanation of Platte River's water resources and infrastructure, the operational uses of water, and the underlying agreements that support our water portfolio and define the rights and obligations associated with our water assets. The Water Resources Reference Document forms the underpinnings for this policy.	
Definitions (if applicable):	

Version	Date	Action	Author	Change tracking (new, review, revision)
Original	12/08/2016	Original policy by Board Resolution 24-16	Heather Banks	Original
1.1	02/27/2020	Updated to AP style and revised to account for current asset ownership	Heather Banks	Revision
1.2	05/10/2023	Updated to incorporate "Chimney Hollow Reservoir" reference	Heather Banks	Revision



Platte River
Power Authority

Appendix C – Glossary

Glossary of water terms

for Platte River Water Resources Reference Document

A

Acre-foot (af): The volume of water that would cover one acre of land to a depth of one foot.

Augmentation: A requirement to put water into a stream to prevent reductions in streamflow caused by pumping from a well (or some other water use) from affecting the amount of water available to water rights holders on that stream and the remainder of the stream system.

C

C-BT: Colorado-Big Thompson Project. The Colorado-Big Thompson Project collects water from the upper Colorado River basin on the Western Slope and delivers the water beneath the Continental Divide to Colorado's Eastern Slope. The C-BT Project uses a complex system of reservoirs, pump plants, tunnels, pipelines and power plants, and relies on two basic forces of nature: melting snow and gravity. After flowing through the power generation facilities, water is stored in three Eastern Slope terminal reservoirs: Horsetooth Reservoir west of Fort Collins; Carter Lake southwest of Berthoud; and Boulder Reservoir northeast of Boulder.

cfs: Cubic feet per second. One cfs equals 1.98 af per day.

Chimney Hollow Reservoir Project: The central component of the Windy Gap FIRMing Project, Chimney Hollow Reservoir is the result of a collaborative effort by 12 project participants to improve the reliability of the Windy Gap Project. The reservoir will be located just west of Carter Lake in Larimer County. Its 90,000 af of dedicated storage capacity will supply a reliable 30,000 af of water each year to project participants. This project will not take water away from irrigated agriculture or other users but will utilize the existing water rights currently associated with the Windy Gap Project.

Colorado Water Division 1: One of seven water divisions in the state of Colorado. Division 1 includes the South Platte River Basin, the Republican River Basin and the Laramie River Basin. Geographically, Division 1 is located in the northeast quadrant of Colorado.

Cooling water: Reusable effluent water stored in Hamilton Reservoir and used to cool Rawhide Unit 1.

E

EIS: Environmental Impact Statement—a document prepared to describe the potential environmental impacts of a proposed action. It also describes impacts of alternatives and plans to mitigate the consequences.

F

Firm water: Water that can be relied upon and is available even during a drought.

Fully consumable water: Water that can be used and reused to extinction. Imported, non-native water in which the return flows have not been historically relied upon.

I

Integrated Operations: A protocol in which C-BT Project water may be delivered to Windy Gap participants in-lieu of Windy Gap Water when it is not available. In-lieu recipients must replace in-lieu C-BT water with Windy Gap Water pumped in subsequent periods.

M

Municipal Subdistrict: The Municipal Subdistrict is a separate conservancy district within the Northern Colorado Water Conservancy District, formed by several municipalities to build and operate the Windy Gap Project.

N

New foreign water: Water introduced into the Cache la Poudre Basin from the Colorado and Michigan River Basins and whose return flows historically have not been used by others.

Northern Water: Northern Colorado Water Conservancy District. Along with Reclamation, jointly operates and maintains the C-BT Project.

P

Process water: Reusable Windy Gap Water used at Rawhide for service water, boiler water, fire water and other plant processes as appropriate.

R

Reclamation: United States Bureau of Reclamation

Return flows: As pertaining to the Reuse Agreement, wastewater collection and return flow includes wastewater collected from domestic, commercial and industrial users, treated at wastewater treatment facilities, and returned to the hydrologic system or released for reuse as reclaimed wastewater (reusable effluent). This is typically an average of 55% of the original quantity of water first used by the municipality.

Reusable effluent: Fully consumable water used by a municipality and treated in a water reclamation facility. This water can be used to extinction.

W

Windy Gap Firming Project: A water reservoir project in the Front Range designed to store, or “firm,” the supply of Windy Gap Water. The Firming Project (of which Chimney Hollow Reservoir is the major component), was reviewed and approved under the National Environmental Policy Act and by state and local governments through substantial negotiations. Windy Gap Water will be pumped into Chimney Hollow Reservoir in wet years and stored for use in dry years when the Windy Gap Project does not pump.

Windy Gap Project: The Windy Gap Project consists of a diversion dam on the Colorado River, a 445 af reservoir, a pumping plant and a six-mile pipeline to Lake Granby. Windy Gap Water is pumped and stored in Lake Granby before delivery to water users via the Colorado-Big Thompson Project's East Slope distribution system.

Windy Gap unit: A Windy Gap unit is equivalent to 100 af of water during years of full Windy Gap production.

WSSC: Water Supply and Storage Company.