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RECLAMATION

Fryingpan-Arkansas Project

Summary of Actual
Operations Water Year
2023

Annual Operating Plans



Eastern Colorado Area Office
Missouri Basin Region

Mission Statements

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; honors its trust responsibilities or special commitments to American Indians, Alaska Natives, Native Hawaiians, and affiliated Island Communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Cover Photo – Pueblo Reservoir in Colorado (Brandon Erchul/Bureau of Reclamation).

Fryingpan-Arkansas Project

**Summary of Annual Operating Plans
Water Year 2023**

**Eastern Colorado Area Office
Missouri Basin Region**

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Project Highlights

Date	Event
August 16, 1962	Project authorized under Public Law 87-590.
August 1964	Construction began on Ruedi Dam.
November 2, 1965	Started excavating Charles H. Boustead Tunnel.
December 1965	Construction began on Sugar Loaf Dam.
April 15, 1968	Breached old Sugar Loaf Dam.
May 1968	Began storing water in Ruedi Reservoir.
June 15, 1969	Charles H. Boustead Tunnel "holed through".
July 1970	Construction began on Pueblo Dam - first contract.
May 16, 1972	Initial Project diversion from Chapman, South Fork, and Fryingpan diversion sites.
June 7, 1972	Initial diversion from Sawyer Creek.
July 1972	Construction began on Pueblo Dam - second contract.
July 1972	First sale of Project trans-mountain water.
January 9, 1974	Began storing water in Pueblo Reservoir.
May 6, 1974	Initial diversion from Lily Pad Creek.
May 4, 1976	Initial diversion from Ivanhoe Creek.
May 1977	First replacement water released from Ruedi Reservoir.
June 1977	First sale of water from Ruedi Reservoir.
November 22, 1977	Adopted the recommended bypass flow of 15 cfs or natural inflow, whichever is less on Lake Creek below Twin Lakes Dam.
June 1, 1979	Initial diversion from Middle Cunningham Creek.
June 4, 1979	Initial diversion from Mormon Creek.
June 14, 1979	Initial diversion from North Cunningham Creek.
May 8, 1980	Initial diversion from Hunter, Midway and No Name Creeks.
June 4, 1980	Initial diversion from North Fork and South Cunningham Creeks.

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December 8, 1980	Federal Register notification of availability of water from Ruedi Reservoir.
April 28, 1981	Initial diversion from Carter Creek.
May 6, 1981	Initial diversion from Granite Creek.
June 1, 1981	Assume operation at Twin Lakes Dam.
June 23, 1981	Mt. Elbert Forebay filled.
September 29, 1981	Mt. Elbert Power Plant dedicated.
October 1, 1981	Mt. Elbert Unit #1 was made commercially available to Western Area Power Administration (WAPA) for their use.
May 5, 1982	Initial diversion from Halfmoon Creek.
July 29, 1982	Turquoise Lake filled for first time.
September 14, 1983	Initial diversion from south outlet works at Pueblo Dam for Pueblo West, CO.
August 9, 1984	Mt. Elbert Unit #2 was made commercially available to WAPA for their use.
May 24, 1985	Began storing water under Arkansas River Decree.
July 1, 1985	Initial diversion through Fountain Valley Conduit.
August 1985	Ruedi Hydroplant began operations.
November 27, 1985	Twin Lakes pipeline began operations.
May 7, 1986	Sugar Loaf Hydroplant began operations.
June 1986	Imports restricted due to high east slope storage.
November 10, 1987	Winter water storage decree approved and signed.
November 17, 1989	Initial release from Twin Lakes Reservoir for recreational benefits on the Arkansas River.
August 14, 1990	Initial release from Ruedi Reservoir for endangered fish (conservation flows pursuant to the biological opinion) in the Colorado River's "15-mile reach" for the U.S. Fish & Wildlife Service from water leased by the Colorado Water Conservation Board.
September 28, 1990	Dedication of Pueblo Fish Hatchery and the completion of construction on the Fryingpan-Arkansas Project ceremony.
November 1990	Final winter storage decree signed by court.
July 21, 1992	Dedication of Leadville Mine Drainage Tunnel Water Treatment Plant.

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September 29, 1994	Transfer of Phase II of the Pueblo Fish Hatchery at Pueblo Reservoir to Colorado Division of Wildlife.
May 15, 1995	Final transfer of recreational facilities at Pueblo to the Department of Parks and Outdoor Recreation.
July 7, 1995	Began storing water under Arkansas River Decree.
July 18, 1995	All Project space filled with Project water. Imports curtailed.
July 1997	Reservoir level at Pueblo Reservoir restricted after a routine risk assessment of Pueblo Dam was completed and raised concern about the foundation below the spillway section of the dam.
May 1999	Pueblo Reservoir restriction lifted.
July 2000	Risk Analysis Study for Pueblo Dam completed.
July 11, 2000	Long-term contract between United States government and the Pueblo Board of Water Works executed.
September 11, 2001	As a result of the terrorist attacks on September 11, 2001, all Fryingpan-Arkansas Project facilities were closed to the public. The facilities remained closed until security measures to safeguard the federal investment were implemented. Reclamation has maintained a heightened level of security at Fry-Ark facilities since that time.
July 23, 2002	Initial release of water through Pueblo Board of Water Works South Outlet Works joint-use manifold.
September 12, 2007	Long-Term Contract between the United States Government and the city of Aurora executed.
May 2010	The upgrade to the control and monitoring system for the Fryingpan-Arkansas collection system was completed.
September 2012	Fiberoptic control of west slope systems from the east slope.
April 28, 2016	Southern Delivery System began water deliveries.
August 10, 2016	Lease of Power Privilege signed with SECWCD for the construction, operation, maintenance, and replacement associated with hydropower at Pueblo Dam.
October 1, 2016	If and When Master Contract in effect.
May 14, 2019	Southeastern Colorado Conservancy District's James W. Broderick Hydropower Plant begins production of electricity at Pueblo Dam.

Annual Operating Plan Fryingpan-Arkansas Project Water Year 2023 Operation

General Overview

This is the fifty-sixth annual operating plan (AOP) for the Fryingpan-Arkansas Project. The project, completed in 1990, imports spring snowmelt runoff from Colorado's west slope to the semi-arid Arkansas River Basin on Colorado's east slope. The project consists of federally owned dams, reservoirs, stream diversion structures, conduits, tunnels, pumping plants, a pumped-storage power plant, electric transmission lines, substations, and recreation facilities. These features are located in the Fryingpan River and Hunter Creek watersheds of the upper Colorado River Basin, and in the Arkansas River Basin in central and southeastern Colorado. The project provides water for irrigation, municipal and industrial use, hydroelectric power generation, recreation, and wildlife habitat. The project also provides for flood control.

The project was authorized under Public Law 87-590 on August 16, 1962. This law provides that the project will be operated under the operating principles adopted by the state of Colorado on April 30, 1959, as amended on December 30, 1959, and on December 9, 1960. These operating principles were published as House Document 130 (Eighty-seventh Congress, First Session), and are included in appendix E.

This annual operating plan is a summary of the actual project operation in water year (WY) 2023 (October 1, 2022, through September 30, 2023). All tables can be found in appendix A and all exhibits can be found in appendix B.

Project Features in Operation during Water Year 2023

Ruedi Dam and Reservoir are located on the Fryingpan River, a tributary of the Roaring Fork River, on Colorado's west slope about 13 miles east of Basalt, Colorado. Ruedi Reservoir has a total capacity of 102,373 acre-feet (AF) at a water surface elevation of 7,766.0 feet. The reservoir is operated on an annual cycle. Steady winter releases draft the reservoir such that it can be filled with the spring runoff, while releases to the Fryingpan River are maintained within the safe channel capacity. The reservoir provides replacement water for out-of-priority depletions to the Colorado River by the project as well as water for west slope irrigation, municipal, and industrial uses on a contractual basis. The reservoir is also operated to provide for recreation and wildlife habitat.

The west slope collection system, located upstream of Ruedi Reservoir in the upper Fryingpan River and Hunter Creek watersheds, is a series of sixteen stream diversion structures and eight tunnels. The system collects spring snowmelt runoff for diversion, by gravity, to the inlet of the

Charles H. Boustead Tunnel. The Boustead Tunnel conveys water collected by the west slope collection system under the continental divide and into Turquoise Lake on the east slope. The tunnel is five miles long and has a water conveyance capacity of 945 cubic feet per second (cfs).

Sugarloaf Dam and Turquoise Lake are located on Lake Fork Creek, a tributary of the Arkansas River, about five miles west of Leadville, Colorado. The lake has a total capacity of 129,398 AF at a water surface elevation of 9,869.4 feet. The lake is operated to provide regulation of both project and non-project water imported from the west slope. Turquoise Lake is operated on an annual cycle. The lake is drafted through the Mt. Elbert Conduit during the winter to provide adequate space for the spring imports of west slope water. Most of the native inflow from Lake Fork Creek is impounded in the lake and returned to the Arkansas River via the Mt. Elbert Conduit, the Mt. Elbert Power Plant, and Twin Lakes. The lake is also operated to provide for recreation and wildlife habitat.

The Mt. Elbert Conduit conveys project, non-project, and native Lake Fork Creek water from Turquoise Lake to Twin Lakes. The conduit is 10.7 miles long and has a water conveyance capacity of 370 cfs. Native water from Halfmoon Creek is also added to the conduit and returned to the Arkansas River from Twin Lakes Dam. The Sugarloaf Powerplant, a privately-operated electrical generation station, runs when water is being conveyed from Sugarloaf Dam to the Mt. Elbert Conduit. All conduit flow reaching the Mt. Elbert Forebay is used to generate electricity at the Mt. Elbert Power Plant as it is delivered to Twin Lakes.

The Mt. Elbert Powerplant is a pumped-storage facility located on the shore of Twin Lakes. It has two 100-megawatt turbine generators, which can be reversed and used as 340,000 horsepower pumps. In addition to being used to generate energy with the Mt. Elbert Conduit flow, the plant is used to follow daily peak power loads. This load following is accomplished by pumping water to the Mt. Elbert Forebay, an 11,143 AF regulating pool at the terminus of the Mt. Elbert Conduit, from Twin Lakes during off-peak load hours using surplus or low-cost energy. That water is then returned to Twin Lakes through the turbines during peak load hours, along with the Mt. Elbert Conduit flow. The energy generated at the plant is transmitted and marketed by the Western Area Power Administration (WAPA), with the revenues applied to the repayment of the project.

Twin Lakes Dam and Twin Lakes are located on Lake Creek, a tributary of the Arkansas River, about 13 miles south of Leadville, Colorado. Twin Lakes has a surveyed capacity of 140,855 AF at a maximum water surface elevation of 9,200 feet. Water surface elevations are measured with respect to mean sea level. The morning glory spillway is slightly tilted which reduces the active storage space by 498 AF. During construction, the dead pool (the elevation below which water cannot physically be released) was determined to be 9,157.5 feet (54,955 AF).

The reservoir is operated to regulate both project and non-project water imported from the west slope. The project water stored in the reservoir is released to Lake Creek for storage in Pueblo Reservoir during the winter months in anticipation of spring imports from the west slope. Native inflows into Turquoise Lake, native flows diverted from Halfmoon Creek, and native inflows

into Twin Lakes, are all released to Lake Creek from the Twin Lakes Dam. The cities of Colorado Springs and Aurora take direct delivery of water from the reservoir through their Otero Pipeline. The operation of Twin Lakes also provides for recreation and wildlife habitat.

Pueblo Dam and Reservoir are located on the Arkansas River six miles west of the city of Pueblo, Colorado. The reservoir is the terminal storage facility for the Fryingpan-Arkansas Project and has a total storage capacity of 338,374 AF at a water surface elevation of 4,898.7 feet. The upper 26,990 AF of storage space are reserved exclusively for flood control at all times, while an additional 66,011 AF of space are reserved for flood control seasonally from April 15 through November 1. Pueblo Reservoir is also operated to provide for recreation, wildlife habitat, and flood control.

Non-project water may be stored in the reservoir under contract with the Bureau of Reclamation (Reclamation). Native inflow can be stored when the project storage right is in priority or under the winter water storage program (WWSP). Under the WWSP, irrigators are permitted to store native Arkansas River water in Pueblo Reservoir during the winter months for an additional supply of irrigation water, on the condition that the water is used before May 1 of the next water year.

Most water deliveries are made from the reservoir. The Fountain Valley Authority, the Pueblo West Metropolitan District, and the Pueblo Board of Water Works can take direct delivery of municipal water through the south outlet works and joint-use manifold. The Southern Delivery System (SDS) in the north outlet works delivers water to the Fountain Valley Authority and Pueblo West. A direct irrigation delivery is made to the Bessemer Ditch. Releases from the fish hatchery outlet at Pueblo Dam support the Pueblo Fish Hatchery. Other project and contract deliveries are made as releases to the Arkansas River for diversion downstream.

Southeastern Colorado Water Conservancy District (SECWCD) signed a Lease of Power Privilege contract with the Bureau to construct, operate, maintain, and replace the James W. Broderick Hydroelectric Power Plant below Pueblo Dam. The design uses an existing hydropower bifurcation at the North Outlet Works Southern Delivery System connection. Power production began in 2019.

Hydrologic Conditions and Weather Events in Water Year 2023

Annual precipitation in the Fryingpan River Basin above Ruedi Reservoir was very close to average for all months in WY2023. Precipitation in the Basin started out the year slightly below average in October and November with cumulative precipitation for the months at 92 and 82 percent of average, respectively. Starting in December, precipitation turned around and was above average at 115 percent of average for the month. January precipitation continued to be above average, receiving 122 percent of average. In February precipitation decreased a little ending the month at 75 percent of average. In March the Basin received several large storms that boosted the total precipitation for the month to 130 percent of average. The basin saw decreases

in precipitation in both April and May and both months were about 70 percent of average. June precipitation increased significantly and the cumulative precipitation for the month was 149 percent of average. July was very dry with a monthly average of about a half an inch in the Basin, 27 percent of average. August returned to above average precipitation with 111 percent of average and September precipitation dropped below average to 82 percent of average. The precipitation for the water year was 94 percent of average.

Snowpack accumulation in the watershed above Ruedi Reservoir remained very close to the historical median accumulation for most of the accumulation season. Snow accumulation started out above median in October but declined in November. December saw modest increases in snow accumulation with some of the year's first major storms. At the end of December snowpack accumulation for the month was 117 percent of median. January snow accumulation was above normal, ending the month at 139 percent of median. The month of February had the lowest snowpack of the winter with 73 percent of median. During March and April, the basin received very high snow accumulation at 165 and 167 percent of median, respectively. These median values for snowpack accumulation were measured in the Fryingpan River Basin group of SNOTEL sites which include Fremont Pass, Independence Pass, Brumley, and Kiln. In early May increased temperatures encouraged snowpack melting however, by mid-month, storms moved back into the Basin and snowpack started building again. May snowpack accumulation was 113 percent of median. June was cooler than average and snowpack accumulation was near median for the month. The snowpack melt rate in June was very close to median rates, losing about three inches of snow water equivalent for the month. On average, all the SNOTEL sites in the Fryingpan River Basin group melted on June 26 which was six days later than the normal melt out date for June.

The average monthly temperatures measured at the Fryingpan River Basin group of SNOTEL sites were above average for over half of the months in WY 2023. The average temperature in October was close to average, measuring only half a degree above average. March was the coldest month with an average monthly temperature of 3.9 degrees Fahrenheit below average. November and June were also cooler than average with temperature deviations of 2.5 and 2.3 degrees below average. July and August were the warmest months with deviations of 2.8 and 2.7 degrees above average. The seasons of the year averaged the following temperature deviations from average: autumn -1, winter 0.8, spring -1.2, and summer 1.2 degrees above average. Overall, the year averaged 0.1 degrees above average.

Import forecasts were made using the PyForecast software package. The forecasts for 2023 were: February 59,200 AF; March 56,200 AF; April 57,200 AF; May 55,400 AF. The total water conveyed through the Boustead Tunnel was 67,255 AF which included 4,110 AF of water conveyed for Pueblo Water from Ivanhoe Lake. Total project imports in WY2023 were 63,150 AF.

The collection system was opened for operation in mid-April. Runoff began April 13, 2023.

The flows through Boustead Tunnel can only be stored when the flow at the Fryingpan River near Thomasville gage is above a minimum flow. When flows are below the minimum, any

imports from seepage are considered developed water and treated as native. Water is diverted from the collection system to the Fryingpan to keep the flow above minimum. See exhibit 5 for flows at the Thomasville gage.

Report on Operations during Water Year 2023

Ruedi Reservoir

Ruedi Reservoir started out WY2023 with a storage content of 71,784 AF, 84 percent of average. Ruedi Reservoir was drawn down to its lowest storage content for the year of 61,714 AF by April 8. In late October the release from Ruedi Reservoir was lowered to the winter flow target of 45 cfs and was held at this rate until mid-December at which point it was increased to 65 cfs. This winter flow increase was in response to the Colorado Water Conservation Board and the Colorado Water Trust leasing water to be released during the coldest months of the winter to alleviate anchor ice in the lower Fryingpan River. All releases during the winter months were made through the city of Aspen's hydroelectric powerplant.

In January the first forecast of undepleted inflow to Ruedi Reservoir was computed by the Colorado Basin River Forecast Center (CBRFC). This forecast indicated that the runoff resulting from melting snowpack would be 97 percent of average, resulting in an April through July runoff volume of 132 kaf. Reservoir storage was below average at the beginning of the month and modeling of reservoir futures based on the January undepleted inflow forecast suggested that continuing at the current release of 65 cfs would allow the reservoir to fill by early July, therefore no release changes were made in January.

In February the first statistical forecast of undepleted inflow was computed by Reclamation. This new estimate of undepleted inflow increased a little from the CBRFC's previous month's forecast to 99 percent of average, resulting in a forecast of 133 kaf for the April through July period. Reservoir storage remained below average and the release from the reservoir was held constant at 65 cfs throughout the month. Modeling of reservoir futures based on the February undepleted inflow forecast indicated that the reservoir would fill by early July.

Reclamations statistical forecast of undepleted inflow to Ruedi Reservoir calculated on March 1 remained very close to February's estimate. The resulting April through July undepleted inflow volume was predicted to be average, 135 kaf. On March 21, the reservoir release was decreased from 65 cfs to 45 cfs because all the leased anchor ice mitigation water had been released. With this flow reduction and the new volumetric forecast of undepleted inflow, modeling of reservoir futures indicated that the reservoir would fill under the most probable assumptions and predicted that inflow in July, after the reservoir filled, would not be above the downstream safe channel capacity of 850 cfs, therefore no further changes were made to the reservoir release in March.

In April the forecast of undepleted inflow for the April through July period increased to 143 kaf, 106 percent of average. This forecast projected that Ruedi Reservoir would fill under all three scenarios: most probable, minimum reasonable and the maximum reasonable hydrologic

conditions. Reservoir modeling using this forecast indicated that there was no risk of exceeding the safe channel capacity once the reservoir filled in early July thus releases remained at 45 cfs for the entire month of April.

On April 14, Reclamation's annual meeting took place as required under stipulation 1.7.b of case numbers 02CW324 and 02CW365 between the following parties: Reclamation, Southeastern, Division 5, and the Colorado River District. A consensus was reached that Ruedi Reservoir would fill under all three operational modeling scenarios allowing Reclamation to divert the additional 45 cfs of Fryingpan River Basin water through the Boustead Tunnel in accordance with stipulation 5 of the above-mentioned case numbers. After this consensus was reached the Boustead Tunnel was allowed to divert up to the maximum rate of 945 cfs from the Fryingpan and Hunter Diversions.

Inflow to Ruedi increased in early May and releases from the reservoir were increased to the minimum required flow of 110 cfs on May 1. Releases were increased again on May 2 to 160 cfs. The most probable forecast of undepleted inflow remained very close to average, 134 kaf for the April to July period. This forecast indicated that the reservoir would fill under all three modeling scenarios and would require releases above the powerplant capacity. Inflow to Ruedi in May continued to be above average and releases were increased to 228 cfs on May 24 and continued at that rate until June. With the inflow forecasts so close to average and reservoir storage below average, it was decided that there would not be enough water to make Coordinated Reservoir Operations (CROs) releases for the 15-Mile reach of the Colorado River.

In June the forecast of the remaining inflow was very close to average, with the April through July volume at 139 kaf, 103 percent of average. This forecast projected that Ruedi Reservoir would fill under all three modeling scenarios. The release from Ruedi was adjusted in June to balance fill rate with the changing inflow. On average, the release for Ruedi for the month of June was 187 cfs with a short period of about a week where the release was above the powerplant capacity.

Ruedi Reservoir was in priority to fill and stored inflow from the first of the water year through September 6, September 11 through September 17, and from October 12 through 31. Outside of these periods, Ruedi Reservoir was required to release inflow, make scheduled contract releases, and provide Boustead Tunnel replacement releases to the Colorado River. Ruedi Reservoir released 68 AF of water for out-of-priority Boustead Tunnel diversions and 1,186 AF for regular scheduled contracts. Ruedi Reservoir also released 3,690 AF for anchor ice prevention in the lower Fryingpan River from December 15 through March 18. This water was leased from the Colorado River District by the Colorado Water Conservation Board and the Colorado Water Trust. Ruedi Reservoir did not participate in the CROS for WY2023 and, beginning on August 5, contracted water was released to support endangered fish recovery efforts in the 15-Mile reach of the Colorado River. A total of 18,637 AF of water was released between August 5 and October 26 for endangered fish. This total includes 3,225 AF water leased from Ute Water and Garfield County; 15,412.5 AF of water which includes 5,000 AF from the firm endangered fish pool; 5,412.5 AF from the mitigation fish pool; and 5,000 AF of the four-out-of-Five fish pool.

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Depleted inflows (inflows remaining after upstream diversions) to Ruedi Reservoir were below average for almost every month of WY2023. April and May were the only months of the year that inflows were above average. The total depleted inflow volume for the April through July runoff period was 75,284 AF, 88 percent of average and the twenty-first ranked runoff volume for the period of record starting in 1975. Ruedi Reservoir storage reached a maximum physical content of 102,114 AF on July 19. This storage content represented 99 percent of the total capacity of the reservoir. Ruedi Reservoir ended the water year at a water surface elevation of 7,743.03 feet, 81,089 AF of storage and 79 percent of average for October 31.

Ruedi releases for contracts are shown in table 2. Releases for endangered fish are shown in table 3. Monthly precipitation data and evaporation data for Ruedi can be found in exhibit 2 and exhibit 3 respectively.

West Slope Collection System and Project Diversions

The most probable forecasts for the first of February, March, April, and May were 59,200 AF, 56,200 AF, 57,200 AF, and 55,400 AF, respectively. Runoff peaked in late May. A total of 67,687 AF of water diverted through the Boustead Tunnel and 63,150 AF of water was stored during WY2023. The imports were 118 percent of average for the period from WY1972 to WY2022 and 114 percent of the May 2023 forecast.

The import of project water through the Boustead Tunnel began on April 13. The maximum mean daily import through Boustead Tunnel was 786 cfs on May 30. The diversion system was shut down in early August. Boustead Tunnel seepage was recorded whenever the Fry-Ark Project water rights were in priority. There was 4,110 AF of Busk-Ivanhoe water conveyed through the Boustead Tunnel. The daily discharge record for the diversion structures is included as appendix D. An aggregated discharge record is shown in table 4. The 52 years of accumulated imports total 2,739,723 AF, for an unimpeded average of 55,530 AF per year, shown in table 5. A plot of the Boustead Tunnel imports during WY2023 is shown on exhibit 6.

Since Ruedi Reservoir was forecast to fill this year imports through the Boustead Tunnel were allowed to a maximum of 945 cfs.

Twin Lakes Reservoir and Canal Company/Fryingpan-Arkansas Project Exchange

The Bureau of Reclamation is obligated to maintain minimum stream flows in the Roaring Fork River by the authorizing legislation of the project. This is accomplished through an exchange of water with the Twin Lakes Reservoir and Canal Company (TLCC). The total amount of the TLCC exchange was 3,000 AF. The operating criteria and the monthly summary of the exchange are shown in appendix C.

Turquoise Lake

On September 30, 2022, there was 86,030 AF of water (elevation 9,843.77 feet) stored in Turquoise Lake, 82 percent of average. The maximum storage was 124,439 AF of water (elevation 9,866.61 feet) on July 2. Releases made down Lake Fork Creek and to Twin Lakes drafted Turquoise Lake to 56,660 AF (98,823.78 feet), the lowest storage of the water year, on April 29. On September 30, 2023, there was 83,864 AF (elevation of 9,842.4 feet), 80 percent of average. Turquoise Lake was partially drafted early for Spring 2024 imports because Mt. Elbert Powerplant had maintenance scheduled that would keep Sugarloaf Dam from passing flows through Mt. Elbert conduit from December to February.

Exhibits 8 and 9 show the precipitation and pan evaporation at Turquoise Lake. Table 6 and exhibit 10 depict the monthly operation of Turquoise Lake during WY2023.

There was 24,161 AF imported through Homestake Tunnel to the account in Turquoise Reservoir.

Busk-Ivanhoe imports through the Carlton Tunnel totaled 2,047 AF, all of which was stored by Aurora. Pueblo Water imported 4,110 AF from Ivanhoe Reservoir through the Boustead Tunnel.

Project water imports through the Boustead Tunnel totaled 63,150 AF.

Exhibits 6, 7, and 8 show the monthly imports through the Boustead, Homestake, and Busk-Ivanhoe Tunnels, respectively.

Mt. Elbert Conduit/Halfmoon Creek Diversion

Between October 1 and September 30 there was 108,106 AF of water released from Turquoise Lake through the Sugarloaf Powerplant and into Mt. Elbert Conduit. There was 5,802 AF of water diverted from Halfmoon Creek and conveyed through the Mt. Elbert Conduit to the Mt. Elbert Forebay, and subsequently to Twin Lakes through the Mt. Elbert Power Plant. An additional 3,909 AF of water were released into the conduit from Turquoise Lake for use by the Leadville Federal Fish Hatchery. The water was diverted from the conduit and delivered to the hatchery. It was then returned to the Arkansas River and stored in Pueblo Reservoir. The conduit operations are shown on exhibit 11.

Twin Lakes/Mt. Elbert Forebay and Mt. Elbert Pumped-Storage Power Plant

On September 30, 2022, Twin Lakes had 119,120 AF of water in storage (elevation 9,191.59 feet), and Mt. Elbert Forebay had 8,229 AF (elevation 9,634.68 feet). The Twin Lakes/Mt. Elbert Forebay combined water storage reached a minimum of 105,871 AF on May 15 and was at its maximum 141,777 AF on July 17. The storage in Twin Lakes was 126,018 AF and in Mt. Elbert Forebay was 7,563 AF (Twin Lakes elevation 9,194.41 feet and Mt. Elbert Forebay elevation 9,632.03 feet) on September 30, 2022, 109 percent of average. Turquoise Lake was

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drafted early, and water was stored in Twin Lakes beginning in the late summer in anticipation of maintenance at Mt. Elbert Powerplant. Since water can't be conveyed from Turquoise Lake to Twin Lakes when the powerplant isn't operational, water was stored in Twin Lakes to supply anticipated operations of the Homestake (Otero) Pipeline and other necessary releases during the winter.

Twin Lakes releases to Lake Creek were made throughout the winter to pass the flow of the Mt. Elbert Conduit, and to transfer project water stored in Twin Lakes to Pueblo Reservoir.

The native inflow of 4,308 AF was stored in the TLCC storage space from November 15 through March 15 as winter water storage. A total of 52,674 AF of project water was released to Lake Creek during this time.

Exhibits 13 and 14 show the precipitation and pan evaporation at Twin Lakes. Table 7 and exhibit 15 depict the monthly operation of Twin Lakes during WY2023.

A total of 10,000 AF of Fry-Ark Project water was made available at the beginning of the season to the Upper Arkansas Voluntary Flow Management Program (VFMP) to augment flows at the gage Arkansas River at Wellsville. Colorado Parks and Wildlife called for 10,000 AF. While the Bureau of Reclamation is not a party to the agreement between Southeastern Colorado Water Conservancy District; Colorado Parks and Wildlife; Chafee County; the Arkansas River Outfitters Association; and Trout Unlimited, project water is made available, when possible, to support this agreement. Water may be called for year-round to support fishery flows at 250 cfs. Recreational flows may be provided from July 1 to August 15 if the flow at Wellsville is below 700 cfs. The flows may be ramped down to prevent streambank erosion after August 15. The 10,000 AF of water wasn't called for in the summer of 2023. An unusual combination of maintenance on the Mt. Elbert Powerplant, and various construction projects in the Arkansas River meant part of the water that was normally released to draft Turquoise during the winter was released before the fall instead. Moving this water from Turquoise to Twin and then to Pueblo kept flows sufficient for recreational boating in the Arkansas River until the first week of September.

A total of 172,133 megawatt hours of energy was generated at the power plant, with 469,900 AF of water; 88,175 AF came through the Mt. Elbert Conduit; and 378,871 AF were first pumped to the Mt. Elbert Forebay from Twin Lakes during off-peak electric demand hours. Table 8 depicts the monthly power plant operation for WY2023.

Pueblo Reservoir

The water storage content of Pueblo Reservoir was 178,121 AF (elevation 4,863.9 feet) on September 30, 2022. The reservoir reached a storage maximum of 229,564 AF (elevation 4,876.73 feet) on August 9 and a minimum, on October 23, 2022, of 177,165 AF (elevation 4,863.12 feet). The ending balance of 217,847 AF (4,873.89 feet) was 134 percent of average.

A total of 32,237 AF of native inflow was stored in the reservoir under the Pueblo Reservoir winter water storage program between November 15, 2022, and March 14, 2023. This program allows agricultural entities to store native flows during the winter to be used during irrigation season. On March 14 it was distributed to agricultural entities.

Table 9 and exhibit 19 depict Pueblo Reservoir monthly operations during WY 2023. The 2022–2023 winter water storage is shown on exhibit 16 and the winter water releases are shown on exhibit 17. The precipitation and evaporation at the reservoir are shown on exhibits 15 and 18. Project water releases are shown on exhibit 20.

Storage Contracts

There were four long term storage contracts for a total of 57,416 AF of non-project storage in Turquoise Lake, one for 54,452 AF in Twin Lakes and eight for 60,824 AF in Pueblo Reservoir.

There were five short-term if-and-when contracts totaling 1,840 AF for 1-year contracts in Pueblo Reservoir. Sixteen contracts totaling 7,585 AF under the Master Contract were used for “if-and- when” storage. Under "if and when" contracts, non-project water may be stored in project storage space if that storage space is not required for project water.

Project Water Sales and Deliveries

There was 45,300 AF of Fryingpan-Arkansas Project water made available to the Southeastern Colorado Water Conservancy District (SECWCD) during WY2023 for allocation based on an expected import of 55,400 AF. Municipal and industrial accounts received a total of 11,690 AF and agricultural accounts received 46,336 AF. Entities called for 13,596 AF of project and 7,334 AF of project carryover water during the year. In the past, agricultural accounts were not allowed to carry over project allocations from a previous water year but had to release it back to SECWCD on May 1. This year a pilot project was instituted to allow agricultural entities to use WY2023 project water during the WY2024+ irrigation season.

Evaporation reduced the project carryover water in storage by 7,916 AF. By the end of the water year, there was 30,680 AF of WY2023 allocated water and 106,271 AF of carryover water remaining in storage. The monthly release of project water from Pueblo Reservoir is shown on exhibit 19.

Reservoir Storage Allocation Data

Table 10 presents the reservoir storage allocations for the five project reservoirs.

Reservoir Evaporation and Precipitation

Table 12 and table 13 present the monthly average evaporation and precipitation at the four weather stations near project facilities. When an evaporation pan is not in service and a reservoir is not completely ice-covered, the daily water surface evaporation is computed using seasonal evaporation factors. Those factors are listed in table 11. The assumption is that there is no evaporation from a reservoir water surface when ice completely covers the reservoir.

Flood Control Benefits

The gauge at Arkansas River near Avondale (ARKAVOCO) exceeded 6,000 cfs on June 13, 2023, and on June 22, 2023. Flows from Pueblo Dam were briefly reduced at the direction of CODWR and United States Corps of Engineers (USACE) to relieve flooding.

Table 14 shows the historic flood control benefits provided by Pueblo and Ruedi Dams.

Appendix A

Tables

Table 1.—Ruedi Reservoir operations WY 2023 Fryingpan-Arkansas Project (units = 1,000 AF)

Month	Inflow	Evaporation	Outflow	End of month content	Water surface elevation (feet)
OCT. 2022	3.30	0.10	7.40	68.20	7,727.14
NOV. 2022	2.60	0.00	3.10	67.70	7,726.57
DEC. 2022	2.50	0.00	3.50	66.70	7,725.22
JAN. 2023	2.30	0.00	4.00	65.00	7,722.96
FEB. 2023	1.90	0.00	3.60	63.30	7,720.60
MAR. 2023	2.10	0.00	3.50	61.80	7,718.61
APR. 2023	7.20	0.00	2.70	66.30	7,724.73
MAY 2023	28.00	0.20	9.70	84.40	7,746.81
JUN. 2023	28.20	0.60	11.10	100.90	7,764.50
JUL. 2023	12.10	0.60	10.40	102.00	7,765.66
AUG. 2023	5.60	0.40	14.80	92.40	7,755.68
SEP. 2023	3.10	0.20	11.20	84.10	7,746.44
Total* (acre-feet)	98,915	2,081	85,150		

*Rounding may introduce discrepancies between monthly and yearly totals

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Table 2.—Ruedi Reservoir releases for contracts WY 2023 (units = AF)

Month	Round 1: Non-fish	Round 1: Fish	Round 2: Non-fish	Round 2: Fish
October 2022				
November 2022				
December 2022			650	
January 2023			1,230	
February 2023			1,111	
March 2023			700	
April 2023				
May 2023				
June 2023				
July 2023				
August 2023		3,167		5,412
September 2023	253	6,833	560	853
October 2023	108		264	2,372
TOTAL	361	10,000	4,515	8,637

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Table 3.—Ruedi Reservoir releases for endangered fish WY 2023

FRYINGPAN-ARKANSAS PROJECT RUEDI RESERVOIR RELEASES FOR ENDANGERED FISH WATER YEAR 2023 April													
DAY	DATE	ELEV. (FT)	STORAGE (AC-FT)	INFLOW (CFS)	EVAP. (CFS)	TOTAL RESERVOIR RELEASE (CFS)	ROCKY FORK CREEK (CFS)	FRYINGPAN RIVER GAGE BELOW DAM (CFS)	RUEDI CALLED OUT? (Y= YES) (N= NO)	REQUIRED MIN FLOW BELOW RUEDI w/o FISH REL (CFS)	REQUIRED FISH RELEASE (CFS)	CUMULATIVE FISH RELEASE (AC-FT)	PALISADE GAGE (CFS)
SAT	4/1/2023	7,718.58	61,822	34	-	45	3	48	N	37	-	-	1,509
SUN	4/2/2023	7,718.55	61,800	34	-	45	3	48	N	37	-	-	1,558
MON	4/3/2023	7,718.52	61,779	34	-	45	3	48	N	37	-	-	1,723
TUE	4/4/2023	7,718.52	61,779	45	-	45	2	47	N	39	-	-	1,849
WED	4/5/2023	7,718.48	61,750	30	-	44	2	47	N	32	-	-	1,745
THU	4/6/2023	7,718.48	61,750	44	-	44	2	47	N	39	-	-	1,745
FRI	4/7/2023	7,718.44	61,721	30	-	44	2	47	N	32	-	-	1,575
SAT	4/8/2023	7,718.43	61,714	41	-	45	2	47	N	39	-	-	1,544
SUN	4/9/2023	7,718.44	61,721	49	-	45	2	47	N	39	-	-	1,652
MON	4/10/2023	7,718.49	61,757	64	-	45	3	48	N	39	-	-	1,714
TUE	4/11/2023	7,718.63	61,858	96	-	45	4	49	N	39	-	-	2,131
WED	4/12/2023	7,718.89	62,046	140	-	45	5	50	N	39	-	-	3,094
THU	4/13/2023	7,719.38	62,400	224	-	45	6	51	N	39	-	-	4,440
FRI	4/14/2023	7,719.87	62,756	224	-	45	6	51	N	39	-	-	5,416
SAT	4/15/2023	7,720.24	63,026	181	-	45	6	51	N	39	-	-	4,811
SUN	4/16/2023	7,720.53	63,237	152	-	45	7	52	N	39	-	-	3,578
MON	4/17/2023	7,720.85	63,472	164	-	45	7	53	N	39	-	-	2,967
TUE	4/18/2023	7,721.27	63,779	200	-	45	8	53	N	39	-	-	3,507
WED	4/19/2023	7,721.73	64,118	215	-	44	8	53	N	39	-	-	4,218
THU	4/20/2023	7,722.04	64,346	160	-	44	8	53	N	39	-	-	3,924
FRI	4/21/2023	7,722.27	64,516	130	-	44	8	53	N	39	-	-	3,186
SAT	4/22/2023	7,722.50	64,686	130	-	44	8	52	N	39	-	-	2,686
SUN	4/23/2023	7,722.68	64,819	111	-	44	8	52	N	39	-	-	2,297
MON	4/24/2023	7,722.92	64,997	133	-	44	8	52	N	39	-	-	2,151
TUE	4/25/2023	7,723.21	65,213	152	-	44	8	52	N	39	-	-	2,380
WED	4/26/2023	7,723.47	65,406	142	-	44	8	52	N	39	-	-	2,435
THU	4/27/2023	7,723.75	65,615	150	-	44	8	52	N	39	-	-	2,614
FRI	4/28/2023	7,724.06	65,846	161	-	45	8	52	N	39	-	-	3,513
SAT	4/29/2023	7,724.37	66,078	161	-	44	8	52	N	39	-	-	4,205
SUN	4/30/2023	7,724.73	66,348	228	-	92	8	100	N	39	-	-	5,304
Averages		7,720.74	63,405	122	-	46	6	52		38	-	-	2,849
Totals (acft)				7,256	-	2,752	341	3,093		2,282	-	-	169,531

NOTES: Releases of water to support 15-Mile Reach target started 8/5 and ceased 10/26. A total of 18,637 acre-feet was released to support Recovery Program target flows.

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FRYINGPAN-ARKANSAS PROJECT RUEDI RESERVOIR RELEASES FOR ENDANGERED FISH WATER YEAR 2023 May														
DAY	DATE	ELEV. (FT)	STORAGE (AC-FT)	INFLOW (CFS)	EVAP. (CFS)	TOTAL RESERVOIR RELEASE (CFS)	ROCKY FORK CREEK (CFS)	FRYINGPAN RIVER GAGE BELOW DAM (CFS)	RUEDI CALLED OUT? (Y= YES) (N= NO)	REQUIRED MIN FLOW BELOW RUEDI w/o FISH REL (CFS)	ENDANGERED FISH RELEASE (CFS)	CUMULATIVE FISH RELEASE (AC-FT)	PALISADE GAGE (CFS)	
MON	5/1/2023	7,725.16	66,672	275	3	109	8	118	N	110	-	-	7,199	
TUE	5/2/2023	7,725.59	66,996	299	3	133	9	142	N	110	-	-	8,866	
WED	5/3/2023	7,726.08	67,367	329	3	139	11	150	N	110	-	-	10,388	
THU	5/4/2023	7,726.73	67,861	394	3	142	14	157	N	110	-	-	11,825	
FRI	5/5/2023	7,727.30	68,297	369	3	147	18	164	N	110	-	-	13,285	
SAT	5/6/2023	7,727.78	68,665	335	3	147	18	165	N	110	-	-	12,673	
SUN	5/7/2023	7,728.21	68,997	318	3	147	18	165	N	110	-	-	11,563	
MON	5/8/2023	7,728.21	68,997	151	3	147	18	165	N	110	-	-	11,563	
TUE	5/9/2023	7,729.05	69,647	479	3	147	17	165	N	110	-	-	10,531	
WED	5/10/2023	7,729.67	70,130	394	3	147	20	168	N	110	-	-	12,039	
THU	5/11/2023	7,730.41	70,710	444	3	148	21	169	N	110	-	-	12,718	
FRI	5/12/2023	7,731.16	71,301	449	3	148	20	168	N	110	-	-	13,414	
SAT	5/13/2023	7,731.80	71,807	407	3	148	20	168	N	110	-	-	13,549	
SUN	5/14/2023	7,732.42	72,301	401	3	148	20	168	N	110	-	-	13,594	
MON	5/15/2023	7,733.14	72,877	443	3	149	20	168	N	110	-	-	13,955	
TUE	5/16/2023	7,733.89	73,480	456	3	149	21	170	N	110	-	-	14,652	
WED	5/17/2023	7,734.72	74,151	491	4	149	24	173	N	110	-	-	16,092	
THU	5/18/2023	7,735.56	74,835	497	4	149	25	174	N	110	-	-	16,446	
FRI	5/19/2023	7,736.42	75,539	508	4	150	25	175	N	110	-	-	16,239	
SAT	5/20/2023	7,737.26	76,230	502	4	150	25	175	N	110	-	-	15,953	
SUN	5/21/2023	7,738.08	76,909	496	4	150	26	176	N	110	-	-	16,150	
MON	5/22/2023	7,739.00	77,675	541	4	151	27	178	N	110	-	-	16,320	
TUE	5/23/2023	7,739.94	78,463	552	4	151	27	178	N	110	-	-	16,484	
WED	5/24/2023	7,740.87	79,248	577	4	178	27	205	N	110	-	-	16,920	
THU	5/25/2023	7,741.69	79,943	553	4	199	28	227	N	110	-	-	17,129	
FRI	5/26/2023	7,742.54	80,669	567	4	198	30	227	N	110	-	-	17,114	
SAT	5/27/2023	7,743.44	81,442	590	4	197	31	228	N	110	-	-	16,960	
SUN	5/28/2023	7,744.30	82,185	575	4	197	32	229	N	110	-	-	16,249	
MON	5/29/2023	7,745.08	82,863	543	4	197	33	230	N	110	-	-	15,520	
TUE	5/30/2023	7,746.02	83,685	615	4	197	35	232	N	110	-	-	15,974	
WED	5/31/2023	7,746.81	84,379	551	4	197	35	232	N	110	-	-	16,089	
Averages		7,734.78	74,333	455	3	158	23	181		110	-	-	14,111	
Totals (act)				27,967	210	9,727	1,400	11,126		6,764	-	-	867,681	

NOTES: Releases of water to support 15-Mile Reach target started 8/5 and ceased 10/26. A total of 18,637 acre-feet was released to support Recovery Program target flows.

Summary of Annual Operating Plans Water Year 2023 – Appendix A

FRYINGPAN-ARKANSAS PROJECT RUEDI RESERVOIR RELEASES FOR ENDANGERED FISH WATER YEAR 2023 June													
DAY	DATE	ELEV. (FT)	STORAGE (AC-FT)	INFLOW (CFS)	EVAP. (CFS)	TOTAL RESERVOIR RELEASE (CFS)	ROCKY FORK CREEK (CFS)	FRYINGPAN RIVER GAGE BELOW DAM (CFS)	RUEDI CALLED OUT? (Y= YES) (N= NO)	REQUIRED MIN FLOW BELOW RUEDI w/o FISH REL (CFS)	ENDANGERED FISH RELEASE (CFS)	CUMULATIVE FISH RELEASE (AC-FT)	PALISADE GAGE (CFS)
THU	6/1/2023	7,747.58	85,059	550	9	198	35	233	N	110	-	-	14,908
FRI	6/2/2023	7,748.33	85,724	545	9	200	36	235	N	110	-	-	14,096
SAT	6/3/2023	7,748.95	86,276	487	9	199	34	233	N	110	-	-	13,577
SUN	6/4/2023	7,749.45	86,723	434	9	199	33	232	N	110	-	-	12,301
MON	6/5/2023	7,749.98	87,198	448	10	200	32	232	N	110	-	-	11,810
TUE	6/6/2023	7,750.52	87,684	454	10	199	34	233	N	110	-	-	12,375
WED	6/7/2023	7,751.21	88,307	524	10	200	35	235	N	110	-	-	13,245
THU	6/8/2023	7,752.06	89,079	599	10	201	37	237	N	110	-	-	14,428
FRI	6/9/2023	7,752.06	89,079	210	10	201	37	237	N	110	-	-	14,428
SAT	6/10/2023	7,753.57	90,460	916	10	209	38	248	N	110	-	-	14,654
SUN	6/11/2023	7,754.11	90,957	501	10	240	38	279	N	110	-	-	13,772
MON	6/12/2023	7,754.69	91,494	526	10	246	38	284	N	110	-	-	13,215
TUE	6/13/2023	7,755.25	92,013	517	10	246	37	282	N	110	-	-	12,702
WED	6/14/2023	7,755.64	92,376	439	10	246	35	281	N	110	-	-	11,771
THU	6/15/2023	7,756.05	92,759	449	10	246	35	281	N	110	-	-	12,063
FRI	6/16/2023	7,756.54	93,218	457	10	215	36	251	N	110	-	-	13,924
SAT	6/17/2023	7,757.10	93,744	482	10	207	35	242	N	110	-	-	13,615
SUN	6/18/2023	7,757.56	94,178	435	10	206	33	240	N	110	-	-	13,102
MON	6/19/2023	7,757.97	94,566	412	10	207	33	239	N	110	-	-	12,644
TUE	6/20/2023	7,758.50	95,068	451	10	187	32	220	N	110	-	-	12,925
WED	6/21/2023	7,759.14	95,678	480	10	163	32	195	N	110	-	-	13,371
THU	6/22/2023	7,759.78	96,290	462	10	144	33	176	N	110	-	-	14,265
FRI	6/23/2023	7,760.48	96,962	466	10	117	34	151	N	110	-	-	15,099
SAT	6/24/2023	7,761.17	97,628	463	10	117	32	149	N	110	-	-	15,010
SUN	6/25/2023	7,761.81	98,249	440	10	117	30	147	N	110	-	-	14,248
MON	6/26/2023	7,762.39	98,813	413	10	118	29	147	N	110	-	-	13,558
TUE	6/27/2023	7,763.00	99,409	429	10	119	28	146	N	110	-	-	13,081
WED	6/28/2023	7,763.58	99,978	430	10	133	27	160	N	110	-	-	12,556
THU	6/29/2023	7,764.06	100,450	412	10	163	25	188	N	110	-	-	11,595
FRI	6/30/2023	7,764.50	100,884	398	10	169	24	193	N	110	-	-	10,623
Averages		7,756.23	93,010	474	10	187	33	220		110	-	-	13,299
Totals (act)				28,227	591	11,131	1,976	13,107		6,546	-	-	791,338

NOTES: Releases of water to support 15-Mile Reach target started 8/5 and ceased 10/26. A total of 18,637 acre-feet was released to support Recovery Program target flows.

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FRYINGPAN-ARKANSAS PROJECT RUEDI RESERVOIR RELEASES FOR ENDANGERED FISH WATER YEAR 2023 July														
DAY	DATE	ELEV. (FT)	STORAGE (AC-FT)	INFLOW (CFS)	EVAP. (CFS)	TOTAL RESERVOIR RELEASE (CFS)	ROCKY FORK CREEK (CFS)	FRYINGPAN RIVER GAGE BELOW DAM (CFS)	RUEDI CALLED OUT? (Y= YES) (N= NO)	REQUIRED MIN FLOW BELOW RUEDI w/o FISH REL (CFS)	ENDANGERED FISH RELEASE (CFS)	CUMULATIVE FISH RELEASE (AC-FT)	PALISADE GAGE (CFS)	
SAT	7/1/2023	7,764.69	101,072	291	9	187	23	209	N	110	-	-	10,079	
SUN	7/2/2023	7,764.83	101,210	266	9	187	21	208	N	110	-	-	9,733	
MON	7/3/2023	7,764.96	101,339	261	9	187	20	207	N	110	-	-	9,361	
TUE	7/4/2023	7,765.06	101,438	246	9	187	19	206	N	110	-	-	9,240	
WED	7/5/2023	7,765.17	101,547	251	9	187	18	204	N	110	-	-	8,865	
THU	7/6/2023	7,765.25	101,626	237	9	187	16	204	N	110	-	-	8,324	
FRI	7/7/2023	7,765.32	101,696	232	9	188	16	204	N	110	-	-	7,860	
SAT	7/8/2023	7,765.41	101,786	243	9	188	15	203	N	110	-	-	7,327	
SUN	7/9/2023	7,765.48	101,855	233	9	188	14	202	N	110	-	-	6,958	
MON	7/10/2023	7,765.54	101,915	228	9	188	13	201	N	110	-	-	6,520	
TUE	7/11/2023	7,765.54	101,915	198	9	188	13	201	N	110	-	-	6,520	
WED	7/12/2023	7,765.58	101,954	223	9	194	12	206	N	110	-	-	5,897	
THU	7/13/2023	7,765.59	101,964	210	9	196	11	207	N	110	-	-	5,765	
FRI	7/14/2023	7,765.58	101,954	201	9	196	11	207	N	110	-	-	5,277	
SAT	7/15/2023	7,765.56	101,935	195	9	196	10	206	N	110	-	-	4,871	
SUN	7/16/2023	7,765.53	101,904	184	9	190	10	200	N	110	-	-	4,430	
MON	7/17/2023	7,765.53	101,904	176	9	166	10	176	N	110	-	-	3,870	
TUE	7/18/2023	7,765.61	101,984	199	9	149	9	158	N	110	-	-	3,677	
WED	7/19/2023	7,765.68	102,054	194	9	149	9	158	N	110	-	-	3,524	
THU	7/20/2023	7,765.74	102,114	213	10	173	9	182	N	110	-	-	3,214	
FRI	7/21/2023	7,765.67	102,044	169	9	195	8	203	N	110	-	-	3,232	
SAT	7/22/2023	7,765.58	101,954	158	9	193	8	201	N	110	-	-	3,212	
SUN	7/23/2023	7,765.50	101,875	153	9	183	8	191	N	110	-	-	3,006	
MON	7/24/2023	7,765.50	101,875	159	9	149	8	157	N	110	-	-	2,588	
TUE	7/25/2023	7,765.48	101,855	149	9	149	7	157	N	110	-	-	2,226	
WED	7/26/2023	7,765.49	101,865	149	9	134	7	142	N	110	-	-	2,019	
THU	7/27/2023	7,765.50	101,875	145	9	130	7	138	N	110	-	-	1,892	
FRI	7/28/2023	7,765.54	101,915	141	9	111	7	119	N	110	-	-	1,722	
SAT	7/29/2023	7,765.58	101,954	135	9	105	7	112	N	110	-	-	1,587	
SUN	7/30/2023	7,765.61	101,984	129	9	105	7	112	N	110	-	-	1,574	
MON	7/31/2023	7,765.66	102,034	141	9	106	7	113	N	110	-	-	1,498	
Averages		7,765.44	101,819	197	9	169	12	180		110	-	-	5,028	
Totals (act)				12,112	583	10,379	714	11,092		6,764	-	-	309,165	

NOTES: Releases of water to support 15-Mile Reach target started 8/5 and ceased 10/26. A total of 18,637 acre-feet was released to support Recovery Program target flows.

Summary of Annual Operating Plans Water Year 2023 – Appendix A

FRYINGPAN-ARKANSAS PROJECT RUEDI RESERVOIR RELEASES FOR ENDANGERED FISH WATER YEAR 2023 August														
DAY	DATE	ELEV. (FT)	STORAGE (AC-FT)	INFLOW (CFS)	EVAP. (CFS)	TOTAL RESERVOIR RELEASE (CFS)	ROCKY FORK CREEK (CFS)	FRYINGPAN RIVER GAGE BELOW DAM (CFS)	RUEDI CALLED OUT? (Y= YES) (N= NO)	REQUIRED MIN FLOW BELOW RUEDI w/o FISH REL (CFS)	ENDANGERED FISH RELEASE (CFS)	CUMULATIVE FISH RELEASE (AC-FT)	PALISADE GAGE (CFS)	
TUE	8/1/2023	7,765.75	102,124	179	7	127	7	134	N	110	-	-	1,690	
WED	8/2/2023	7,765.68	102,054	156	7	184	7	191	N	110	-	-	1,932	
THU	8/3/2023	7,765.56	101,935	147	7	200	7	207	N	110	-	-	2,333	
FRI	8/4/2023	7,765.42	101,795	122	7	186	7	193	N	110	-	-	2,772	
SAT	8/5/2023	7,765.32	101,696	120	7	164	7	170	N	110	50	99	2,616	
SUN	8/6/2023	7,765.20	101,577	120	7	174	6	180	N	110	58	215	2,019	
MON	8/7/2023	7,764.98	101,359	98	7	202	6	208	N	104	100	413	1,739	
TUE	8/8/2023	7,764.76	101,141	98	7	202	6	208	N	104	100	612	1,621	
WED	8/9/2023	7,764.52	100,904	89	7	201	6	207	N	94	100	810	1,485	
THU	8/10/2023	7,764.22	100,608	93	7	235	6	241	N	98	131	1,070	1,225	
FRI	8/11/2023	7,763.89	100,282	95	7	252	5	257	N	100	150	1,368	1,119	
SAT	8/12/2023	7,763.89	100,282	83	7	252	5	257	N	89	150	1,665	1,119	
SUN	8/13/2023	7,763.18	99,585	83	7	253	5	258	N	89	150	1,963	1,109	
MON	8/14/2023	7,762.81	99,223	77	7	253	5	258	N	82	150	2,260	1,097	
TUE	8/15/2023	7,762.41	98,833	81	7	271	5	276	N	86	185	2,628	1,049	
WED	8/16/2023	7,761.98	98,414	75	7	280	5	285	N	80	200	3,025	987	
THU	8/17/2023	7,761.55	97,996	76	7	280	5	285	N	81	200	3,422	1,005	
FRI	8/18/2023	7,761.11	97,570	72	7	280	5	285	N	76	200	3,818	1,035	
SAT	8/19/2023	7,760.65	97,126	62	7	279	5	284	N	67	200	4,215	1,083	
SUN	8/20/2023	7,760.20	96,693	68	7	279	5	284	N	72	200	4,612	1,036	
MON	8/21/2023	7,759.73	96,242	58	7	278	5	283	N	62	200	5,008	964	
TUE	8/22/2023	7,759.26	95,792	57	7	277	4	282	N	62	200	5,405	921	
WED	8/23/2023	7,758.82	95,372	73	7	278	4	282	N	77	200	5,802	875	
THU	8/24/2023	7,758.37	94,945	68	7	277	4	282	N	73	200	6,198	861	
FRI	8/25/2023	7,757.98	94,575	86	6	266	4	270	N	90	200	6,595	1,719	
SAT	8/26/2023	7,757.63	94,244	98	6	258	4	262	N	102	200	6,992	1,536	
SUN	8/27/2023	7,757.28	93,913	98	6	258	4	262	N	102	200	7,389	1,542	
MON	8/28/2023	7,756.90	93,556	83	6	257	4	262	N	88	200	7,785	1,333	
TUE	8/29/2023	7,756.52	93,199	83	6	257	4	261	N	88	200	8,182	1,302	
WED	8/30/2023	7,756.10	92,806	64	6	255	4	260	N	68	200	8,579	1,169	
THU	8/31/2023	7,755.68	92,414	65	6	256	4	260	N	69	200	8,975	1,074	
Averages		7,761.53	98,008	91	7	241	5	246		89	146	3,637	1,399	
Totals (act)				5,608	409	14,819	322	15,141		5,483	8,975	8,975	86,014	

NOTES: Releases of water to support 15-Mile Reach target started 8/5 and ceased 10/26. A total of 18,637 acre-feet was released to support Recovery Program target flows.

Summary of Annual Operating Plans Water Year 2023 – Appendix A

FRYINGPAN-ARKANSAS PROJECT RUEDI RESERVOIR RELEASES FOR ENDANGERED FISH WATER YEAR 2023 September														
DAY	DATE	ELEV. (FT)	STORAGE (AC-FT)	INFLOW (CFS)	EVAP. (CFS)	TOTAL RELEASE (CFS)	ROCKY FORK CREEK (CFS)	FRYINGPAN RIVER GAGE BELOW DAM (CFS)	RUEDI CALLED OUT? (Y= YES) (N= NO)	REQUIRED MIN FLOW BELOW RUEDI w/o FISH REL (CFS)	ENDANGERED FISH RELEASE (CFS)	CUMULATIVE FISH RELEASE (AC-FT)	PALISADE GAGE (CFS)	
FRI	9/1/2023	7,755.25	92,013	58	4	256	4	261	N	63	200	9,372	1,036	
SAT	9/2/2023	7,754.83	91,623	63	4	255	4	260	N	67	200	9,769	1,229	
SUN	9/3/2023	7,754.40	91,225	59	4	255	4	260	N	63	200	10,165	1,227	
MON	9/4/2023	7,753.98	90,838	63	4	255	4	259	N	67	200	10,562	1,160	
TUE	9/5/2023	7,753.52	90,414	45	4	255	4	259	N	49	200	10,959	1,142	
WED	9/6/2023	7,753.06	89,992	45	4	254	4	257	N	48	200	11,356	1,089	
THU	9/7/2023	7,752.68	89,644	32	4	203	4	207	Y	36	125	11,603	1,025	
FRI	9/8/2023	7,752.37	89,361	47	4	186	4	190	Y	51	125	11,851	972	
SAT	9/9/2023	7,752.04	89,060	43	4	191	4	195	Y	47	125	12,099	899	
SUN	9/10/2023	7,751.73	88,779	53	4	191	4	195	Y	57	125	12,347	862	
MON	9/11/2023	7,751.44	88,515	62	4	191	4	195	N	66	125	12,595	975	
TUE	9/12/2023	7,751.11	88,216	43	4	190	4	194	N	47	125	12,843	1,036	
WED	9/13/2023	7,751.11	88,216	194	4	190	4	194	N	110	125	13,091	1,036	
THU	9/14/2023	7,750.53	87,693	(71)	4	190	4	193	N	(67)	125	13,339	1,200	
FRI	9/15/2023	7,750.31	87,495	79	4	175	4	179	N	83	125	13,587	1,239	
SAT	9/16/2023	7,750.10	87,306	80	4	172	3	175	N	83	125	13,835	1,297	
SUN	9/17/2023	7,749.85	87,081	62	4	171	4	175	N	66	125	14,083	1,265	
MON	9/18/2023	7,749.59	86,848	57	4	171	4	175	Y	61	100	14,281	1,218	
TUE	9/19/2023	7,749.33	86,616	58	4	171	4	175	Y	61	100	14,480	1,191	
WED	9/20/2023	7,749.07	86,383	55	4	168	6	175	Y	61	100	14,678	1,215	
THU	9/21/2023	7,748.81	86,151	58	4	171	4	175	Y	62	100	14,876	1,185	
FRI	9/22/2023	7,748.53	85,902	45	4	167	7	174	Y	52	100	15,075	1,149	
SAT	9/23/2023	7,748.24	85,644	40	4	166	8	174	Y	48	100	15,273	1,108	
SUN	9/24/2023	7,747.96	85,395	42	4	164	9	174	Y	52	100	15,471	1,067	
MON	9/25/2023	7,747.66	85,130	32	4	162	11	174	Y	43	100	15,670	1,038	
TUE	9/26/2023	7,747.41	84,908	36	4	144	12	156	Y	48	75	15,818	997	
WED	9/27/2023	7,747.19	84,714	47	4	142	9	151	Y	56	75	15,967	972	
THU	9/28/2023	7,746.95	84,502	46	4	149	3	152	Y	49	75	16,116	947	
FRI	9/29/2023	7,746.72	84,300	50	4	149	3	152	Y	53	75	16,265	876	
SAT	9/30/2023	7,746.44	84,053	27	4	147	4	151	Y	31	75	16,413	865	
Averages		7,750.41	87,601	52	4	188	5	193		54	125	13,461	1,084	
Totals (acft)				3,076	224	11,213	296	11,509		3,199	7,438	16,413	64,492	

NOTES: Releases of water to support 15-Mile Reach target started 8/5 and ceased 10/26. A total of 18,637 acre-feet was released to support Recovery Program target flows.

Summary of Annual Operating Plans Water Year 2023 – Appendix A

FRYINGPAN-ARKANSAS PROJECT RUEDI RESERVOIR RELEASES FOR ENDANGERED FISH WATER YEAR 2023 October														
DAY	DATE	ELEV. (FT)	STORAGE (AC-FT)	INFLOW (CFS)	EVAP. (CFS)	TOTAL RESERVOIR RELEASE (CFS)	ROCKY FORK CREEK (CFS)	FRYINGPAN RIVER GAGE BELOW DAM (CFS)	RUEDI CALLED OUT? (Y= YES) (N= NO)	REQUIRED MIN FLOW BELOW RUEDI w/o FISH REL (CFS)	ENDANGERED FISH RELEASE (CFS)	CUMULATIVE FISH RELEASE (AC-FT)	PALISADE GAGE (CFS)	
SUN	10/1/2023	7,746.22	83,860	50	1	146	5	151	Y	55	75	16,562	890	
MON	10/2/2023	7,746.05	83,711	74	1	148	3	151	Y	77	75	16,711	1,020	
TUE	10/3/2023	7,745.84	83,527	57	1	148	3	151	Y	60	75	16,860	1,159	
WED	10/4/2023	7,745.63	83,343	57	1	149	3	152	Y	60	75	17,009	1,142	
THU	10/5/2023	7,745.41	83,151	53	1	149	3	152	Y	56	50	17,108	1,125	
FRI	10/6/2023	7,745.21	82,976	57	1	143	3	146	Y	60	50	17,207	1,093	
SAT	10/7/2023	7,745.04	82,828	55	1	128	3	132	Y	58	50	17,306	1,111	
SUN	10/8/2023	7,744.86	82,672	51	1	128	3	132	Y	54	50	17,405	1,083	
MON	10/9/2023	7,744.68	82,515	51	1	128	3	132	Y	54	50	17,504	1,059	
TUE	10/10/2023	7,744.50	82,359	51	1	128	3	131	Y	54	50	17,604	1,054	
WED	10/11/2023	7,744.34	82,220	60	1	128	3	132	Y	63	50	17,703	1,033	
THU	10/12/2023	7,744.22	82,116	77	1	128	3	132	N	81	50	17,802	1,661	
FRI	10/13/2023	7,744.07	81,986	64	1	128	4	132	N	67	50	17,901	1,413	
SAT	10/14/2023	7,743.91	81,848	60	1	128	4	132	N	64	50	18,000	1,329	
SUN	10/15/2023	7,743.91	81,848	130	1	128	4	132	N	110	50	18,099	1,329	
MON	10/16/2023	7,743.64	81,615	(10)	1	106	4	109	N	(7)	25	18,149	1,317	
TUE	10/17/2023	7,743.56	81,546	59	1	92	4	96	N	62	25	18,199	1,329	
WED	10/18/2023	7,743.49	81,485	63	1	92	4	96	N	67	25	18,248	1,300	
THU	10/19/2023	7,743.42	81,425	63	1	93	4	96	N	67	25	18,298	1,306	
FRI	10/20/2023	7,743.34	81,356	59	1	93	4	96	N	63	25	18,347	1,329	
SAT	10/21/2023	7,743.26	81,287	59	1	93	4	96	N	63	25	18,397	1,319	
SUN	10/22/2023	7,743.18	81,218	59	1	93	4	96	N	63	25	18,447	1,307	
MON	10/23/2023	7,743.13	81,175	52	1	72	4	76	N	56	25	18,496	1,278	
TUE	10/24/2023	7,743.09	81,141	44	1	60	4	64	N	48	25	18,546	1,300	
WED	10/25/2023	7,743.06	81,115	48	1	60	4	64	N	52	25	18,595	1,308	
THU	10/26/2023	7,743.02	81,081	44	1	60	4	64	N	48	21	18,637	1,249	
FRI	10/27/2023	7,743.01	81,072	57	1	60	4	64	N	60	-	18,637	1,365	
SAT	10/28/2023	7,743.09	81,141	96	1	60	4	64	N	100	-	18,637	1,494	
SUN	10/29/2023	7,743.09	81,141	61	1	60	4	64	N	65	-	18,637	1,681	
MON	10/30/2023	7,743.06	81,115	48	1	60	4	64	N	52	-	18,637	2,105	
TUE	10/31/2023	7,743.03	81,089	48	1	60	4	63	N	52	-	18,637	2,158	
Averages		7,744.04	81,966	58	1	105	4	108		61	36	17,992	1,311	
Totals (act)				3,564	83	6,445	215	6,660		3,733	2,224	18,637	80,623	

NOTES: Releases of water to support 15-Mile Reach target started 8/5 and ceased 10/26. A total of 18,637 acre-feet was released to support Recovery Program target flows.

Summary of Annual Operating Plans Water Year 2023 – Appendix A

Table 4.—Fryingpan-Arkansas Project transmountain diversions WY 2023 (units = AF)

	APR.	MAY	JUN.	JUL.	AUG.	SEP.	TOTAL
South Fork		3,097	4,126	801			8,024
No Name		939	1,804	124			2,867
Hunter		1,818	3,238	509			5,565
Midway		1,607	2,311	556			4,474
Sawyer	33	501	1,397	428			2,359
Chapman ¹	93	2,422	4,179	1,115			7,808
Subtotal							
	126	1,0387	17,055	3,534			31,097
Carter	54	1,357	1,737	777			3,924
North Fork	1	382	634	109			1,127
Mormon	108	1,675	1,832	183			3,798
North Cunningham	30	846	939	61			1,875
Middle Cunningham ²		863	1,364	157			2,384
Ivanhoe ⁴	310	2,609	2,964	324			6,207
Granite		452	1,017	306			1,775
Fryingpan	105	4,675	5,945	1,858	570		13,153
Lily Pad	10	543	539	122	3		1,217
Subtotal							
	618	13,402	16,971	3,897	573		35,468
Total							
	744	23,789	34,026	7,431	573		66,563
Boustead Tunnel^{3,4}							
	Oct.-Apr. 1,239	25,348	34,360	7,198	235	61	67,867

¹ Does not include No Name, Hunter, Sawyer and Midway.

² Includes South Cunningham.

³ The difference between the west slope diversion and Charles H. Boustead Tunnel diversion results from the accuracy limitations of the measurement, rounding and seepage.

⁴ This includes 4,110 AF of water conveyed from Ivanhoe Lake.

Summary of Annual Operating Plans Water Year 2023 – Appendix A

Table 5.—Fryingpan-Arkansas Project imports – Charles H. Boustead tunnel outlet (units = 1,000 AF)

Water year	Imports	Accumulated imports	Twin Lakes exchange	Available to SECWCD
1972	32	32	0	0
1973	36.8	68.8	0	16
1974	34.1	102.9	0	18.6
1975	37.2	140.1	0	25
1976	26.9	167	0	24
1977	11.4	178.4	0	25
1978	49.2	227.6	0	25
1979	53.7	281.3	0	25.6
1980	55.7	337	0	70
1981	34.6	371.6	0	25
1982	75.2	446.8	2.7	68
1983	90.8	537.6	0.3	125
1984	110.1	647.7	1.9	210
1985 ¹	70.2	717.9	1.7	289.9
1986 ¹	30.3	748.2	1.5	300.3
1987 ¹	2.2	750.4	1.1	288
1988 ¹	13.4	763.8	2	247.8
1989	36.2	800	1.7	197.6
1990	46.6	846.6	1.7	142.1
1991	59.1	905.7	1.5	58.7
1992	54.8	960.5	1.2	32.9
1993	86.6	1,047.1	2.3	70.1
1994	52.2	1,099.3	1.3	51.7
1995	90.5	1,189.8	2.3	55
1996 ¹	36.9	1,226.7	1.8	110
1997	78.6	1,305.3	1.8	116
1998	51.3	1,356.6	2.6	102
1999 ¹	40.8	1,397.4	2.1	127.5
2000	44.8	1,442.2	1.7	171.6
2001	45.3	1,487.5	2.1	67.5
2002	13.2	1,500.7	1.5	8.5
2003	54.9	1,555.6	2.4	37.5

Summary of Annual Operating Plans Water Year 2023 – Appendix A

Water year	Imports	Accumulated imports	Twin Lakes exchange	Available to SECWCD
2004	27.4	1,583	1.3	15.3
2005	54.6	1,637.6	3	40.8
2006	61.2	1,698.8	3	49.2
2007	54.2	1,753	3	40.4
2008	90	1,843	3	83
2009	82.7	1,925.7	3	78
2010	56.5	1,982.2	3	44
2011	98.9	2,081.1	2.3	75
2012	13.4	2,094.5	1.5	9.9
2013	46.7	2,141.2	2.8	37.6
2014	80.3	2,221.5	3	56
2015	72.2	2,293.7	1.9	67.9
2016	59.2	2,353	2.5	39.1
2017	67	2,420	2	46.3
2018	39.2	2,459.2	3	41.3
2019	95.8	2,555	0.1	42.6
2020	51	2,606	2.7	62.9
2021	31.9	2,637.9	3	25.8
2022	47.2	2,685.1	3	32.8
2023	63.2	2,739.7	3	45.3

¹Imports impeded.

Restriction: Not to exceed 120 KAF in one year.

Not to exceed 2,352.8 KAF acre-feet in 34 consecutive years. The imports between 1991 and 2023 are 1,948.2 KAF.

1983 includes 3,120 AF imported through the Twin Lakes Tunnel.

Table 6.—Turquoise Lake operations WY 2023 (units = 1,000 AF)

Month	Busk-Ivanhoe imports through Carlton Tunnel	Busk-Ivanhoe imports through Boustead Tunnel	Imports through Homestake Tunnel	Project imports	Native inflow	Total inflow	Evap.	Total outflow	End of month content	Water surface elevation (feet)
OCT. 2022	0.1	0	0.0	0.0		0.7	0.3	1.1	85.3	9,843.3
NOV. 2022	0.0	0	0.0	0.0		0.4	0.2	1.1	84.5	9,842.8
DEC. 2022	0.0	0	0.0	0.0		0.5	0.0	1.0	84.0	9,842.5
JAN. 2023	0.0	0	0.0	0.0		-0.5	0.0	6.1	77.3	9,838.2
FEB. 2023	0.0	0	0.8	0.0		1.1	0.0	14.6	63.8	9,829.0
MAR. 2023	0.0	0	14.9	0.0		15.3	0.0	15.6	63.4	9,828.7
APR. 2023	0.0	0	2.4	0.6		4.0	0.0	10.7	56.7	9,823.8
MAY 2023	1.1	0	6.0	25.3		40.4	0.2	1.9	95.0	9,849.3
JUN. 2023	0.8	0	0.0	34.1		43.4	0.5	13.6	124.3	9,866.5
JUL. 2023	0.0	0	0.0	7.1		10.1	0.9	18.6	114.8	9,861.1
AUG. 2023	0.0	0	0.0	0.1		3.1	0.7	20.9	96.3	9,850.1
SEP. 2023	0.0	0	0.0	0.0		0.9	0.4	12.9	83.9	9,842.4
Total* (acre-feet)	2,046	0	24,160	63,150		119,196	3,223	118,139		

* Rounding may introduce discrepancies between monthly and yearly totals

Summary of Annual Operating Plans Water Year 2023 – Appendix A

Table 7.—Twin Lakes/Mt. Elbert Forebay WY 2023 operations (units = 1,000 Acre-feet)

Date	Twin Lakes Canal Company			Mt. Elbert Conduit				Twin Lakes					
	Imports	Winter water	Priority / native	Leadville Fish Hatchery ⁴	Halfmoon	Sugarloaf Bypass	Sugarloaf Powerplant/sleeve valve	Native Inflow	Total Inflow	Evap. ²	Total outflow	End of month content ²	Water elevation ³ (feet)
OCT. 2022	1.0	0.0	0.3	0.3	0.0	0.0	0.8	1.6	3.1	0.6	1.6	128.3	9,192.44
NOV. 2022	0.8	0.6	0.0	0.3	0.0	0.0	0.8	1.2	2.5	0.3	7.2	123.3	9,189.70
DEC. 2022	0.6	1.2	0.0	0.3	0.0	0.0	0.8	1.6	2.7	0.0	11.7	114.3	9,185.79
JAN. 2023	0.5	1.6	0.0	0.3	0.0	0.0	5.3	2.5	8.6	0.0	14.6	108.3	9,182.66
FEB. 2023	0.4	0.6	0.0	0.3	0.0	0.0	14.4	1.0	15.4	0.0	14.0	109.7	9,183.23
MAR. 2023	0.4	0.3	0.0	0.3	0.0	0.0	15.4	-0.5	15.0	0.0	15.3	109.4	9,183.14
APR. 2023	0.7	0.0	0.0	0.3	0.0	0.2	10.0	1.1	11.8	0.0	10.8	110.3	9,183.76
MAY 2023	13.3	0.0	7.9	0.3	2.1	0.6	0.0	15.1	31.1	0.6	21.0	119.8	9,187.83
JUN. 2023	14.4	0.0	2.7	0.3	2.2	0.6	11.0	27.5	55.5	0.9	43.3	131.1	9,192.92
JUL. 2023	8.1	0.0	0.3	0.3	1.2	0.6	17.2	13.6	40.4	1.3	32.1	138.1	9,196.25
AUG. 2023	0.3	0.0	0.4	0.3	0.2	0.5	19.5	3.5	24.3	1.0	35.3	126.1	9,191.50
SEP. 2023	0.6	0.0	0.0	0.3	0.0	0.5	12.0	1.8	14.8	0.9	6.4	133.6	9,194.41
TOTAL¹ (acre-feet)	41,150	4,308	11,638	3,909	5,802	3,055	107,250	70,050	225,321	5,624	213,465		

¹ Rounding may introduce discrepancies between monthly and yearly totals.

² Both Twin Lakes and Mt. Elbert Forebay

³ Elevation of Twin Lakes

⁴ Leadville Fish Hatchery diverts from Mt Elbert Conduit

Table 8.—Mt. Elbert Pumped-Storage Power Plant WY 2023 operations

Month	Year	Net generation (MWH)	Gross generation (MWH)	Inflow to Mt. Elbert (KAF)	Water through generator (KAF)	Water pumped from Twin Lakes to Forebay (KAF)
OCT.	2022	3,594.0	3,642.2	0.6	10.5	9.6
NOV.	2022	17,459.0	17,788.1	0.5	52.3	53.3
DEC.	2022	13,299.0	13,641.6	0.6	38.1	38.8
JAN.	2023	3,736.0	4,088.7	3.1	14.4	13.2
FEB.	2023	12,295.0	12,620.9	3.6	32.2	26.1
MAR.	2023	4,998.0	5,309.5	3.7	13.5	0.0
APR.	2023	4,302.0	4,605.2	10.7	12.7	2.7
MAY	2023	6,438.0	6,704.4	2.8	17.4	16.9
JUN.	2023	11,525.0	11,763.7	12.3	32.5	20.2
JUL.	2023	24,562.0	24,744.4	18.8	66.0	47.9
AUG.	2023	38,560.0	38,757.0	19.5	101.4	83.3
SEP.	2023	28,266.0	28,467.8	12.0	78.5	66.9
	TOTALS	169,034.0	172,133.5	88.2	469.6	378.9

Summary of Annual Operating Plans Water Year 2023 – Appendix A

Table 9.—Pueblo Reservoir WY 2023 operations (units = 1,000 AF)

Month	Inflow				Evap.	Total outflow	End of month content	Water surface elevation (feet)
	Project	Contract	Native ²	Total				
OCT. 2022	0.3	3.2	23.1	26.6	1.3	25.9	177.6	4,863.24
NOV. 2022	0.8	3.5	22.8	27.1	0.7	19.9	184.1	4,865.06
DEC. 2022	1.3	0.1	23.3	24.7	0.5	13.7	194.6	4,867.92
JAN. 2023	2.5	2.2	21.4	26.1	0.4	14.6	205.8	4,870.85
FEB. 2023	4.2	2.3	14.1	20.6	0.5	9.8	216.1	4,873.45
MAR. 2023	4.5	2.2	18.2	24.9	1.1	18.6	221.3	4,874.74
APR. 2023	1.7	1.7	24.2	27.6	2.0	30.7	216.1	4,873.47
MAY 2023	0.8	6.2	105.5	112.5	1.9	119	207.7	4,871.34
JUN. 2023	7.5	14.4	172.1	194	2.4	175.4	223.9	4,875.38
JUL. 2023	7.4	10.4	94.7	112.5	3.4	105.1	227.9	4,876.34
AUG. 2023	16.7	8.5	48.5	73.7	3.2	74.9	223.5	4,875.27
SEP. 2023	3.8	3.9	30.6	38.3	2.3	41.7	217.8	4,873.89
Total¹ (acre-feet)	51,470	109,896	547,315	708,681	19,721	649,235		

¹ Rounding may introduce discrepancies.

² Native inflows are the total inflows less the account and project inflow. If the result is negative because of exchanges, 0 is recorded.

Table 10.—Reservoir storage allocation data (unit = acre-feet)

Reservoir	Dead	Inactive	Active conservation	Joint Use	Exclusive flood control	Total capacity storage
Ruedi ¹	63	1,095	101,278	0	0	102,373
Turquoise ¹	2,810	8,920	120,478	0	0	129,398
Twin Lakes ¹	63,324	72,938	67,917	0	0	140,855 ²
Mt. Elbert ¹ Forebay	561	3,825	3,493	0	0	11,143
Pueblo ³	1,895	25,601	219,772	66,011	26,990	469,878

¹ Area Capacity Table from 1984

² The top of the active conservation pool at Twin Lakes corresponds to 140,855 AF. A tilted morning glory spillway reduces the actual storage available to 140,357 AF.

³ Area Capacity Table from 2012 Note: Inactive includes dead storage.

Table 11.—Monthly evaporation factors

Month	Ruedi	Turquoise	Twin Lakes	Pueblo
October	0.0530	0.1217	0.1217	0.1366
November	0	0.0566	0.0566	0.0886
December	0	0.0171	0.0171	0.0735
January	0	0.0274	0.0274	0.07078
February	0	0.0497	0.0497	0.10592
March	0	0.0771	0.0771	0.1548
April	0	0.1337	0.1337	0.1760
May	0.1470	0.2006	0.2006	
June	0.3605	0.2554	0.2554	
July	0.3244	0.2246	0.2246	
August	0.2332	0.1766	0.1766	
September	0.1419	0.1663	0.1663	

Note: These factors are used only when the pan is frozen or unavailable. Ruedi doesn't have a pan. Factor is derived from $((\text{the average monthly evaporation volume} \times 12) / 0.7) / (\# \text{ days in month})$ Evaporation in acre-feet = monthly factor * surface area of the lake * (one percent ice cover)

Summary of Annual Operating Plans Water Year 2023 – Appendix A

Table 12.—Monthly evaporation for Fryingpan-Arkansas Project (unit = acre-feet)

Month	Ruedi		Turquoise		Twin Lakes		Pueblo	
	AVG	WY 2023	AVG	WY 2023	AVG	WY 2023	AVG	WY 2023
October 2022	57	74	362	343	524	506	1,130	1,282
November 2022	0	0	161	157	228	233	583	712
December 2022	0	0	15	5	26	22	455	461
January 2023	0	0	0	0	2	1	420	432
February 2023	0	0	0	0	3	8	602	481
March 2023	0	0	0	0	22	15	1,267	1,093
April 2023	5	0	10	0	186	44	1,781	2,049
May 2023	167	210	262	174	816	519	2,170	1,935
June 2023	480	591	702	511	1,169	827	2,711	2,365
July 2023	517	583	611	905	962	1,199	2,572	3,418
August 2023	323	409	494	691	769	886	2,180	3,216
September 2023	179	224	432	438	700	827	1,769	2,277

Average between 1996 and 2023

Summary of Annual Operating Plans Water Year 2023 – Appendix A

Table 13.—Monthly precipitation data for Fryingpan-Arkansas Project (unit = inches)

Month	Chapman ¹ near Ruedi		Turquoise		Twin lakes		Pueblo	
	AVG.	WY 2023	AVG.	WY 2023	AVG.	WY 2023	AVG.	WY 2023
OCT. 2022	2.5	2.5	1.13	1.25	0.85	0.76	0.83	0.14
NOV. 2022	2.2	2.0	1.24	1.23	0.49	0.62	0.31	0.22
DEC. 2022	3.1	3.4	1.35	0.42	0.45	0.28	0.27	0.14
JAN. 2023	3.0	2.9	1.66	1.59	0.51	0.44	0.34	0.22
FEB. 2023	2.8	1.9	1.52	0.78	0.53	0.63	0.39	0.38
MAR. 2023	3.0	4.3	1.47	0.77	0.61	0.4	0.85	0.17
APR. 2023	3.7	3.5	1.67	1.28	0.86	0.55	1.66	2.71
MAY 2023	3.1	1.7	1.47	0.98	0.91	0.87	1.68	2.84
JUN. 2023	1.0	1.0	0.85	0.89	0.77	0.46	0.98	3.11
JUL. 2023	2.7	0.3	1.95	0.07	1.82	0.08	1.96	1.3
AUG. 2023	2.5	2.1	2.1	2.25	1.57	1.79	1.96	1.15
SEP. 2023	2.5	1.5	1.41	1.03	1.08	0.26	0.76	1.17
TOTAL	29.6	27.1	17.82	12.54	10.45	7.14	11.99	13.55
Max. annual	40.9	(2011)	25.95	(1957)	17.27	(1952)	20.32	(2007)

¹ The USGS weather station at Ruedi was out of service for WY2023. The precipitation averages and totals from the Chapman SNOTEL have been substituted. The SNOTEL has been in operation since 2008.

Summary of Annual Operating Plans Water Year 2023 – Appendix A

Table 14: Flood Control Benefits of the Fryingpan-Arkansas Project.

Water year	Ruedi benefits	Ruedi benefits cumulative	Pueblo benefits	Pueblo benefits cumulative
1976			\$320,000	\$320,000
1979			\$90,000	\$410,000
1980			\$86,000	\$496,000
1981			\$111,000	\$607,000
1982			\$836,000	\$1,443,000
1983	\$80,000	\$80,000	\$47,000	\$1,490,000
1984	\$330,000	\$410,000	\$1,039,000	\$2,529,000
1985	\$91,000	\$501,000	\$234,000	\$2,763,000
1986	\$70,000	\$571,000	\$0	\$2,763,000
1987	\$0	\$571,000	\$90,000	\$2,853,000
1988	\$0	\$571,000	\$0	\$2,853,000
1989	\$0	\$571,000	\$0	\$2,853,000
1990	\$0	\$571,000	\$0	\$2,853,000
1991	\$0	\$571,000	\$482,000	\$3,335,000
1992	\$0	\$571,000	\$266,000	\$3,601,000
1993	\$4,000	\$575,000	\$496,000	\$4,097,000
1994	\$280,000	\$855,000	\$290,000	\$4,387,000
1995	\$1,770,000	\$2,625,000	\$832,000	\$5,219,000
1996	\$1,550,000	\$4,175,000	\$0	\$5,219,000
1997	\$1,207,000	\$5,382,000	\$320,200	\$6,539,200
1998	\$0	\$5,382,000	\$0	\$6,539,200
1999	\$116,000	\$5,498,000	\$4,778,000	\$11,317,200
2000	\$1,061,000	\$6,559,000	\$0	\$11,317,200

Summary of Annual Operating Plans Water Year 2023 – Appendix B

WY	Ruedi benefits	Ruedi benefits cumulative	Pueblo benefits	Pueblo benefits cumulative
2001	\$0	\$6,559,000	\$0	\$11,317,200
2002	\$0	\$6,559,000	\$0	\$11,317,200
2003	\$1,515,100	\$8,074,100	\$0	\$11,317,200
2004	\$0	\$8,074,100	\$0	\$11,317,200
2005	\$970,200	\$9,044,300	\$0	\$11,317,200
2006	\$799,000	\$9,843,300	\$20,159,000	\$31,476,200
2007	\$103,000	\$9,946,300	\$0	\$31,476,200
2008	\$1,635,000	\$11,581,300	\$0	\$31,476,200
2009	\$740,100	\$12,321,400	\$0	\$31,476,200
2010	\$2,993,000	\$15,314,400	\$0	\$31,476,200
2011	\$3,002,000	\$18,316,400	\$0	\$31,476,200
2012	\$0	\$18,316,400	\$0	\$31,476,200
2013	\$0	\$18,316,400	\$383,900	\$31,860,100
2014	\$0	\$18,316,400	\$431,900	\$32,292,000
2015	\$1,402,300	\$19,718,700	\$4,493,000	\$36,785,000
2016	\$0	\$19,718,700	\$0	\$36,785,000
2017	\$0	\$19,718,700	\$0	\$36,785,000
2018	\$0	\$19,718,700	\$0	\$36,785,000
2019	\$0	\$19,718,700	\$189,100	\$36,974,100
2020	\$0	\$19,718,700	\$0	\$36,974,100
2021	\$0	\$19,718,700	\$0	\$36,974,100
2022	\$0	\$19,718,700	\$0	\$36,974,100
2023	\$163,300	\$19,882,000	\$1,237,900	\$38,212,000

Appendix B

Exhibits

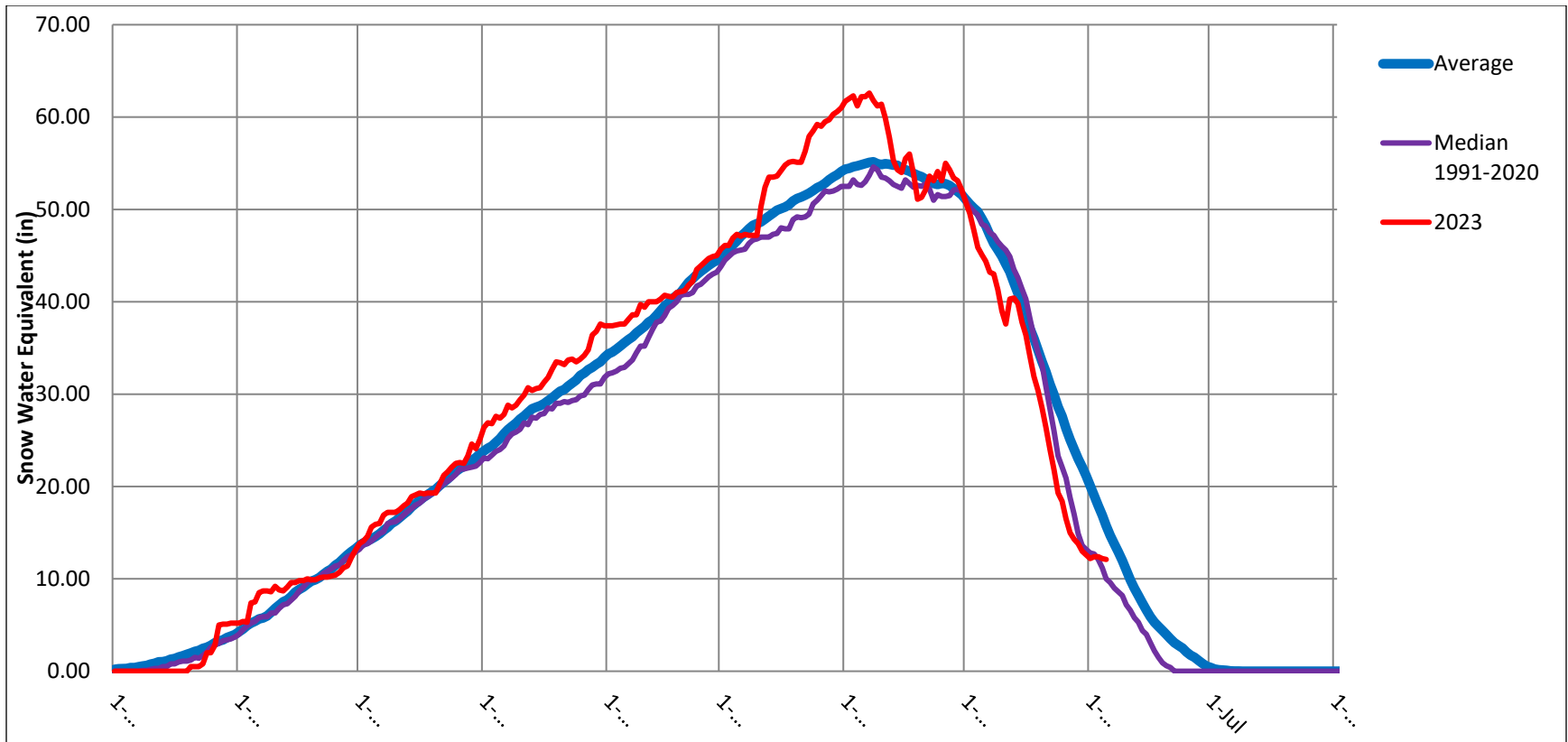


Exhibit 1.—Combined Snow Water Equivalent of Fremont Pass, Independence Pass, Ivanhoe Lake, and Nast SNOTEL sites.

Summary of Annual Operating Plans Water Year 2023 – Appendix B

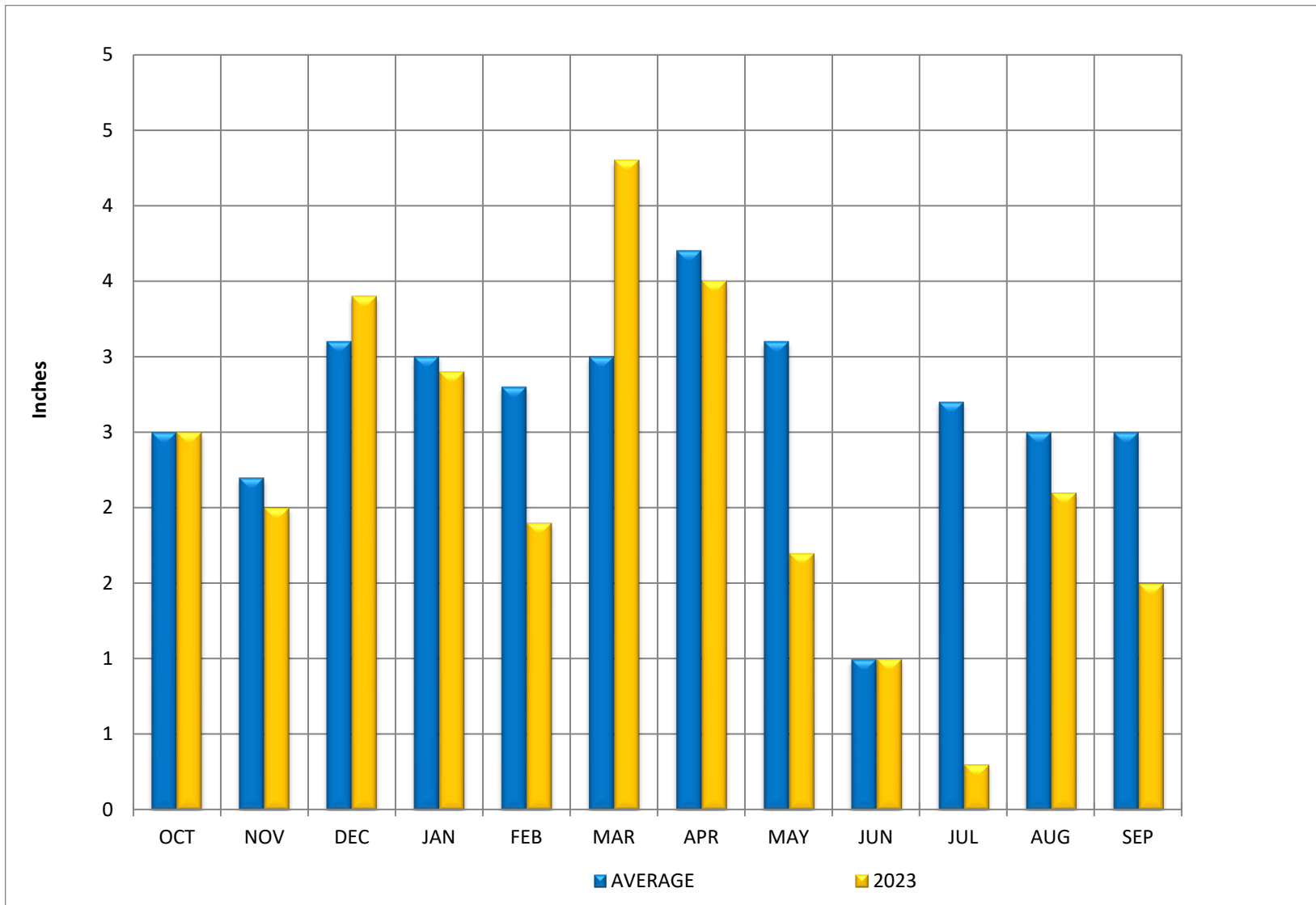


Exhibit 2.—Chapman SNOTEL monthly precipitation WY2023.

The weather station at Ruedi was out of service for the year. These precipitation values are from the Chapman SNOTEL gage.

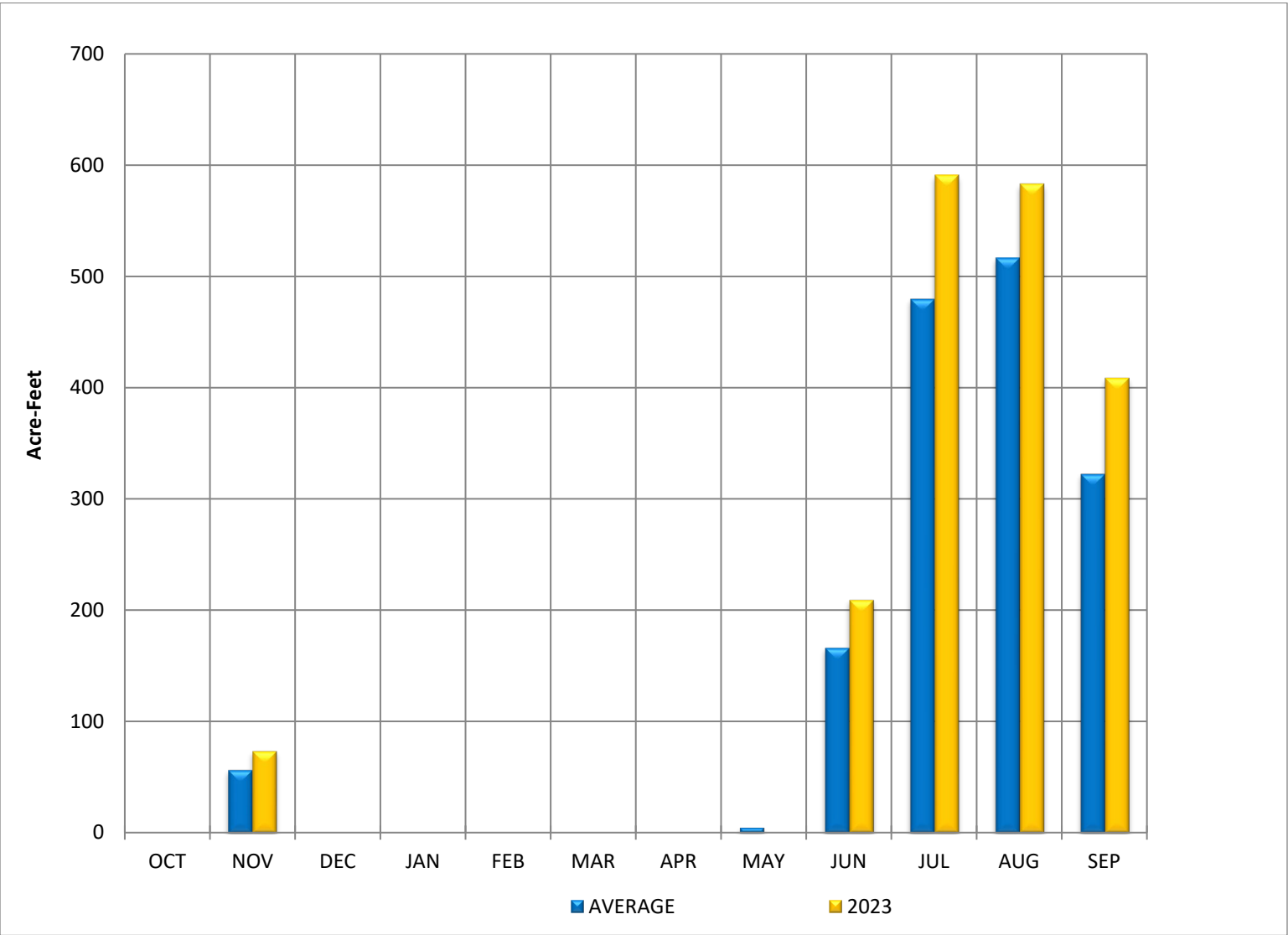


Exhibit 3.—Ruedi Reservoir monthly evaporation WY2023.

Summary of Annual Operating Plans Water Year 2023 – Appendix B

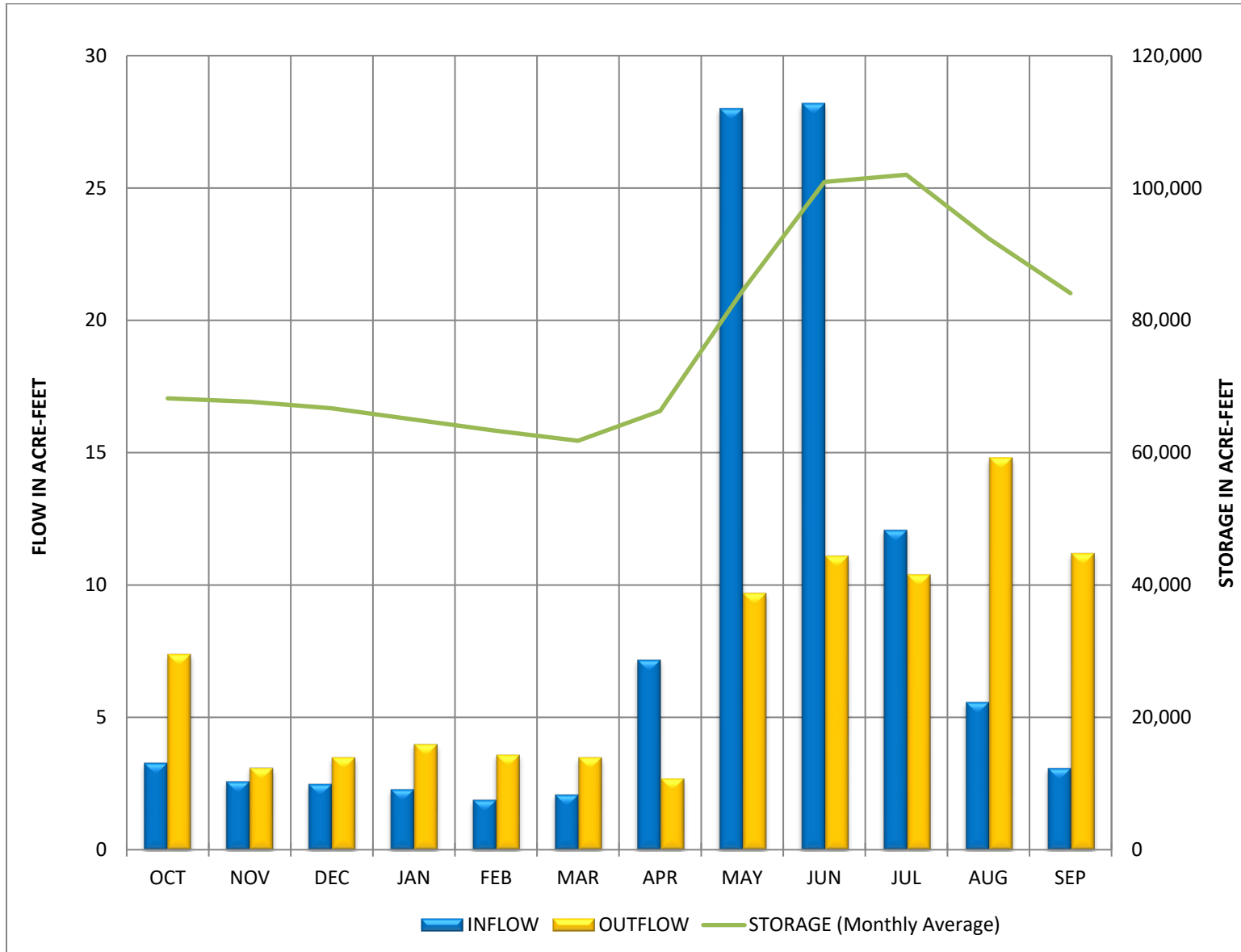


Exhibit 4.—Ruedi Reservoir actual operations WY2023.

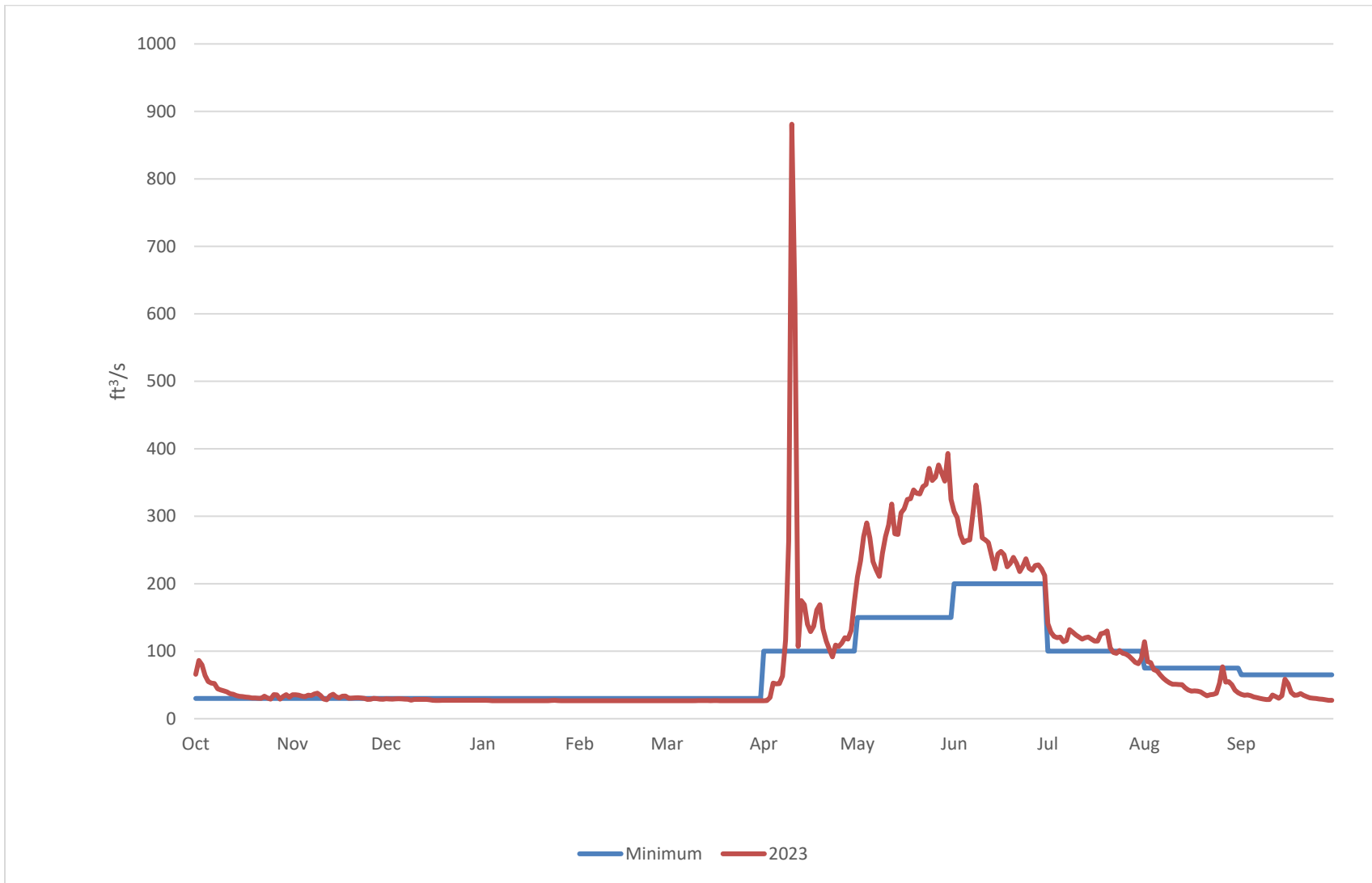


Exhibit 5.—Fryngpan River near Thomasville daily discharge WY2023.

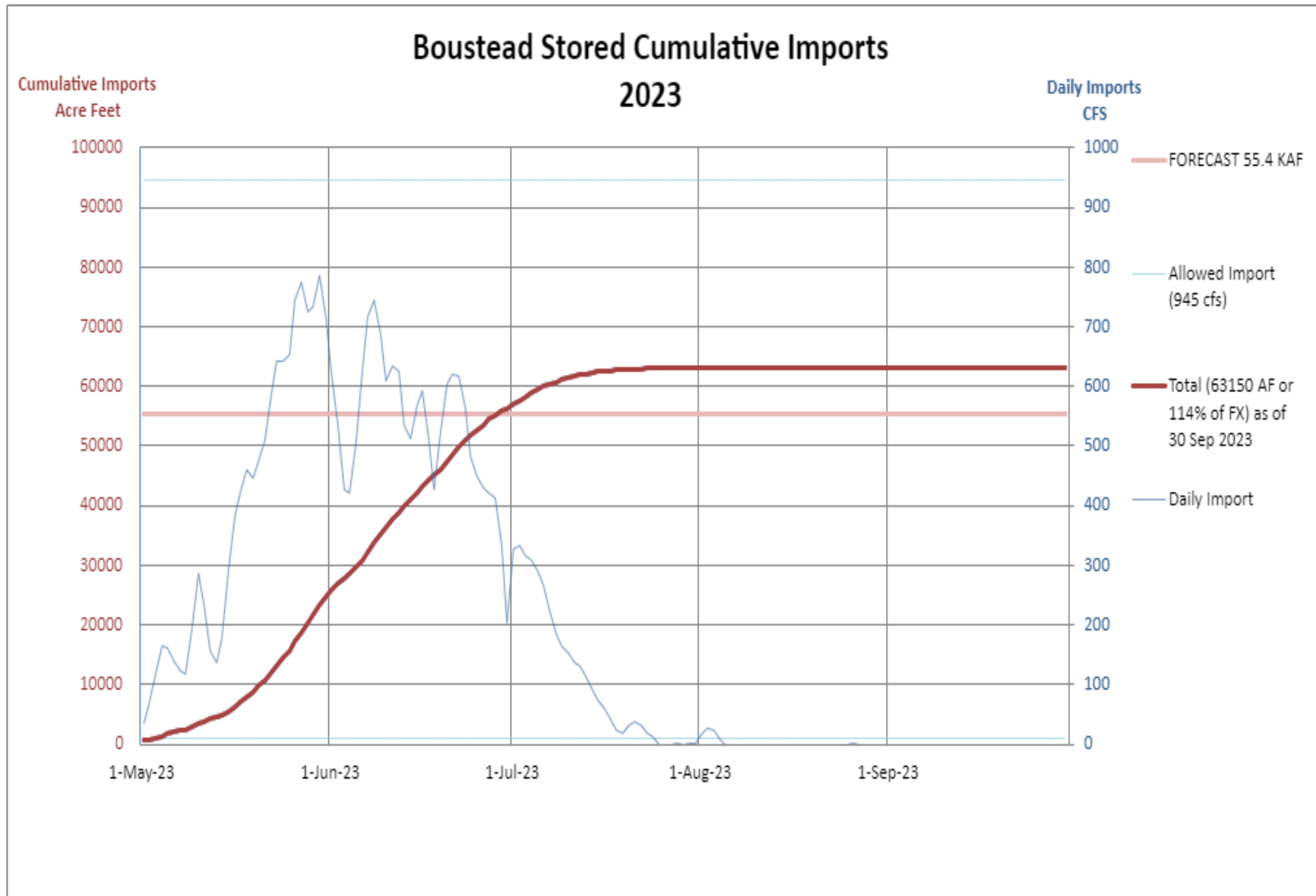


Exhibit 6.—Boustead Tunnel actual operations WY2023.

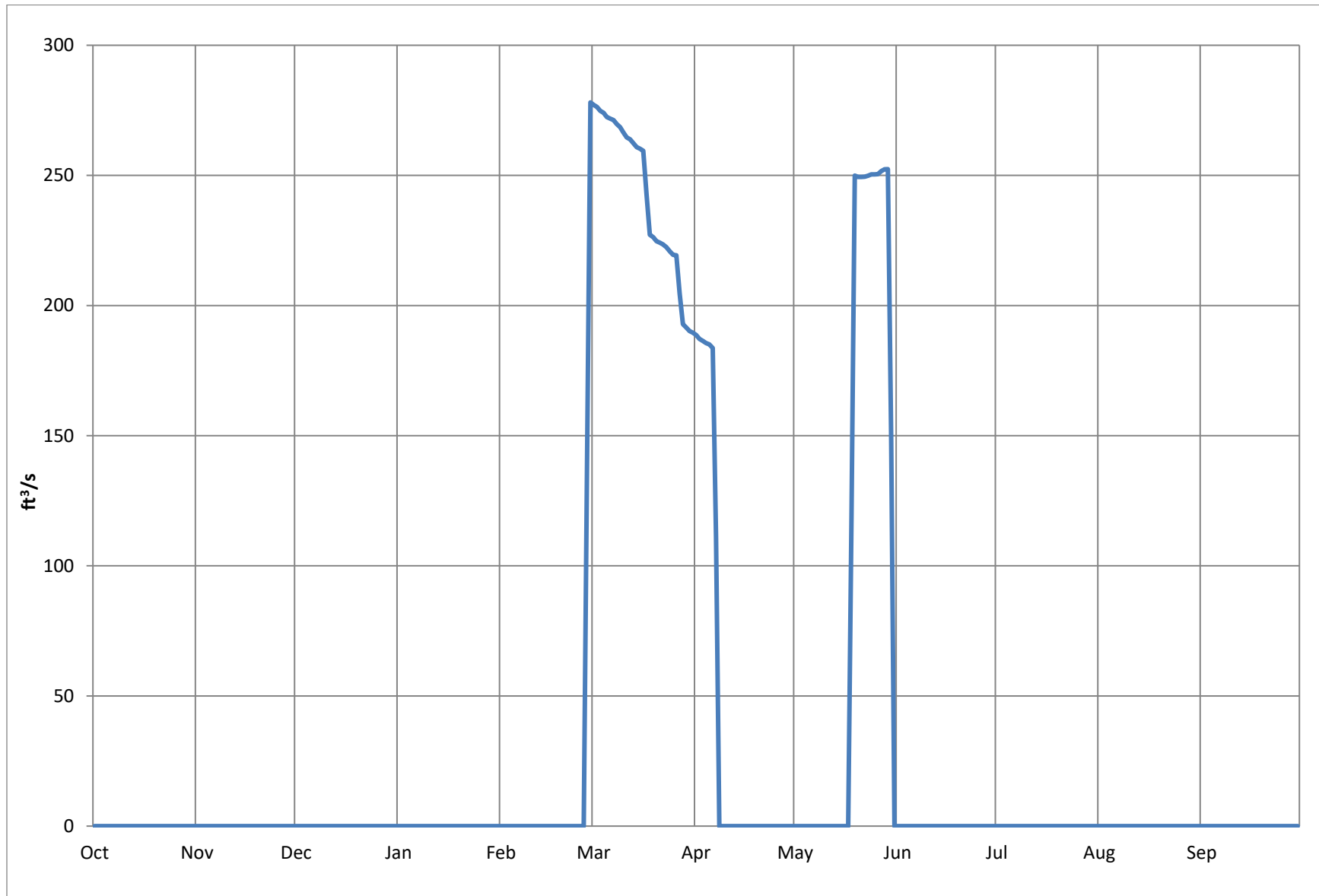


Exhibit 7.—Homestake Tunnel actual operations WY2023.

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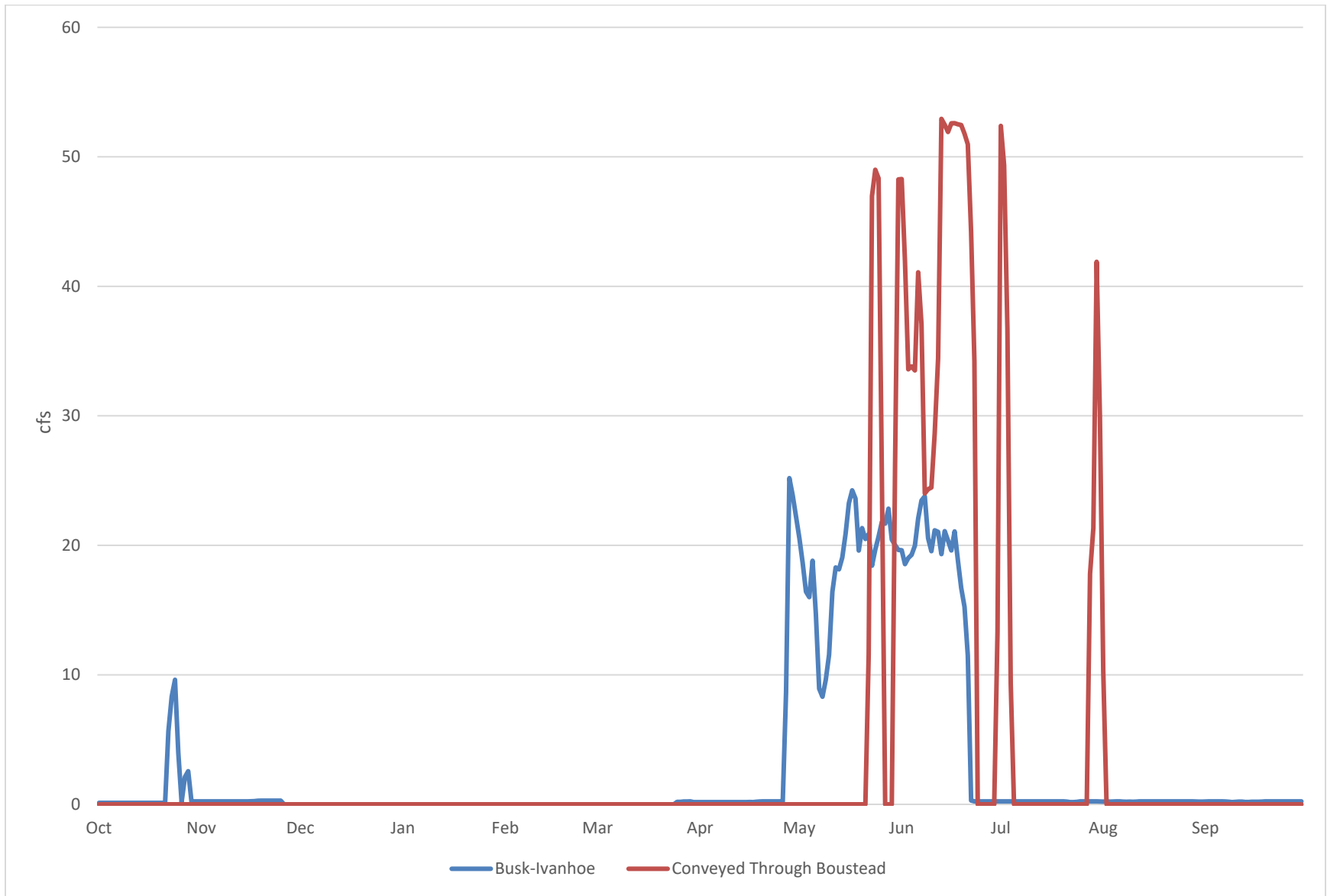


Exhibit 8.—Busk-Ivanhoe Tunnel actual operations WY2023.

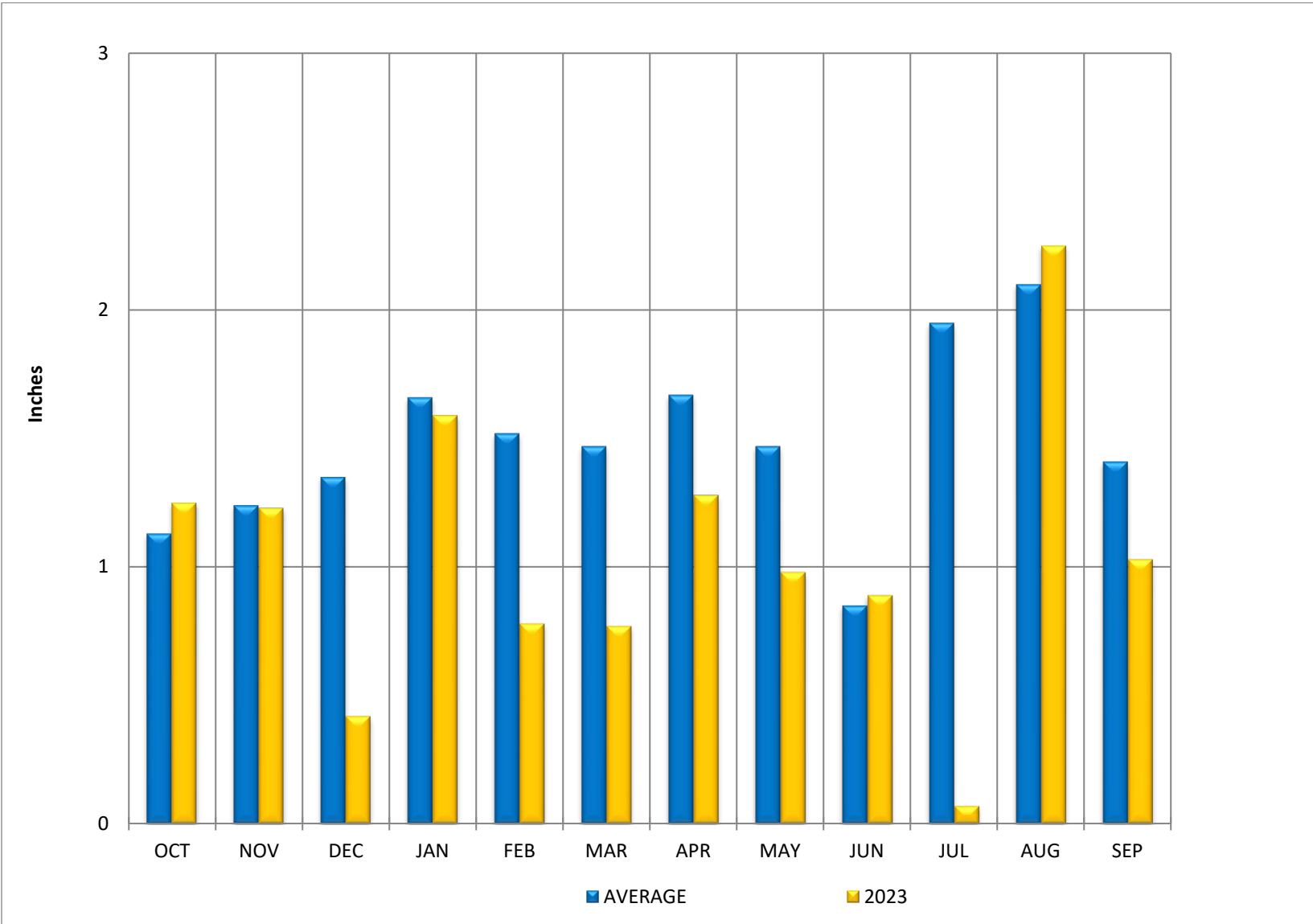


Exhibit 9.—Turquoise Lake (Sugar Loaf Dam) monthly precipitation WY2023.

Summary of Annual Operating Plans Water Year 2023 – Appendix B

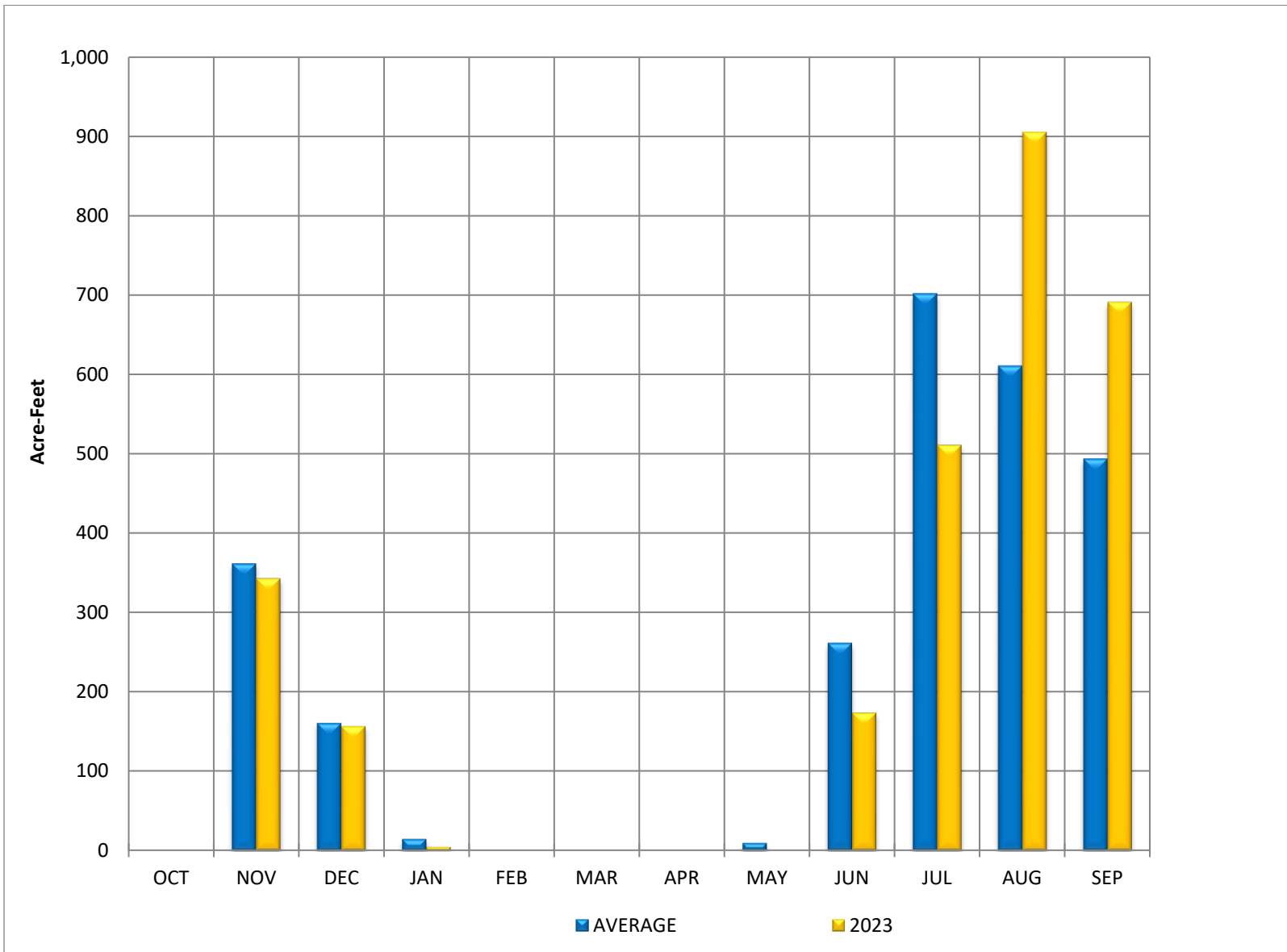


Exhibit 10.—Turquoise Lake (Sugar Loaf Dam) monthly evaporation WY2023.

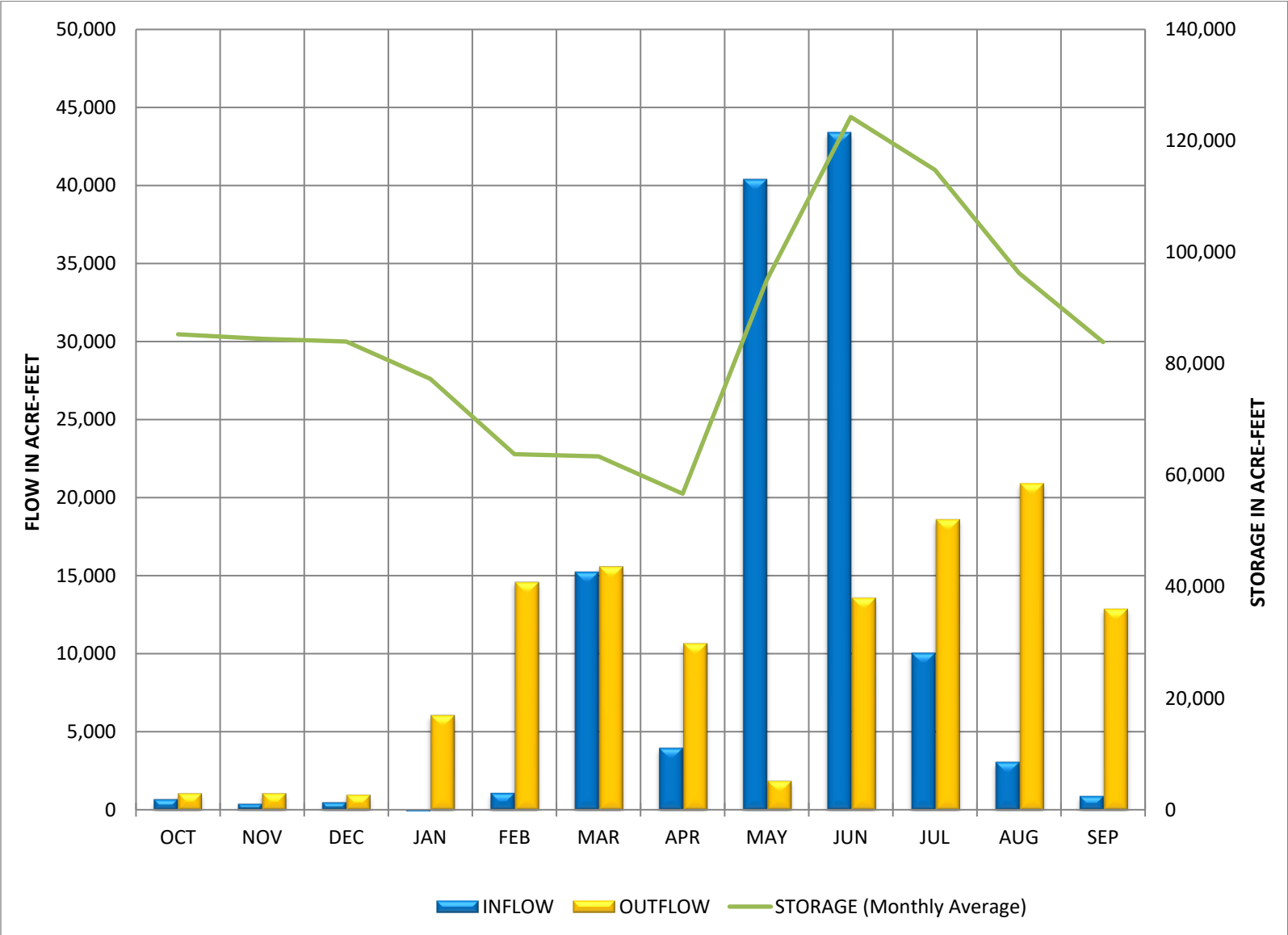


Exhibit 11.—Turquoise Lake (Sugarloaf Dam) actual operations WY2023.

Summary of Annual Operating Plans Water Year 2023 – Appendix B

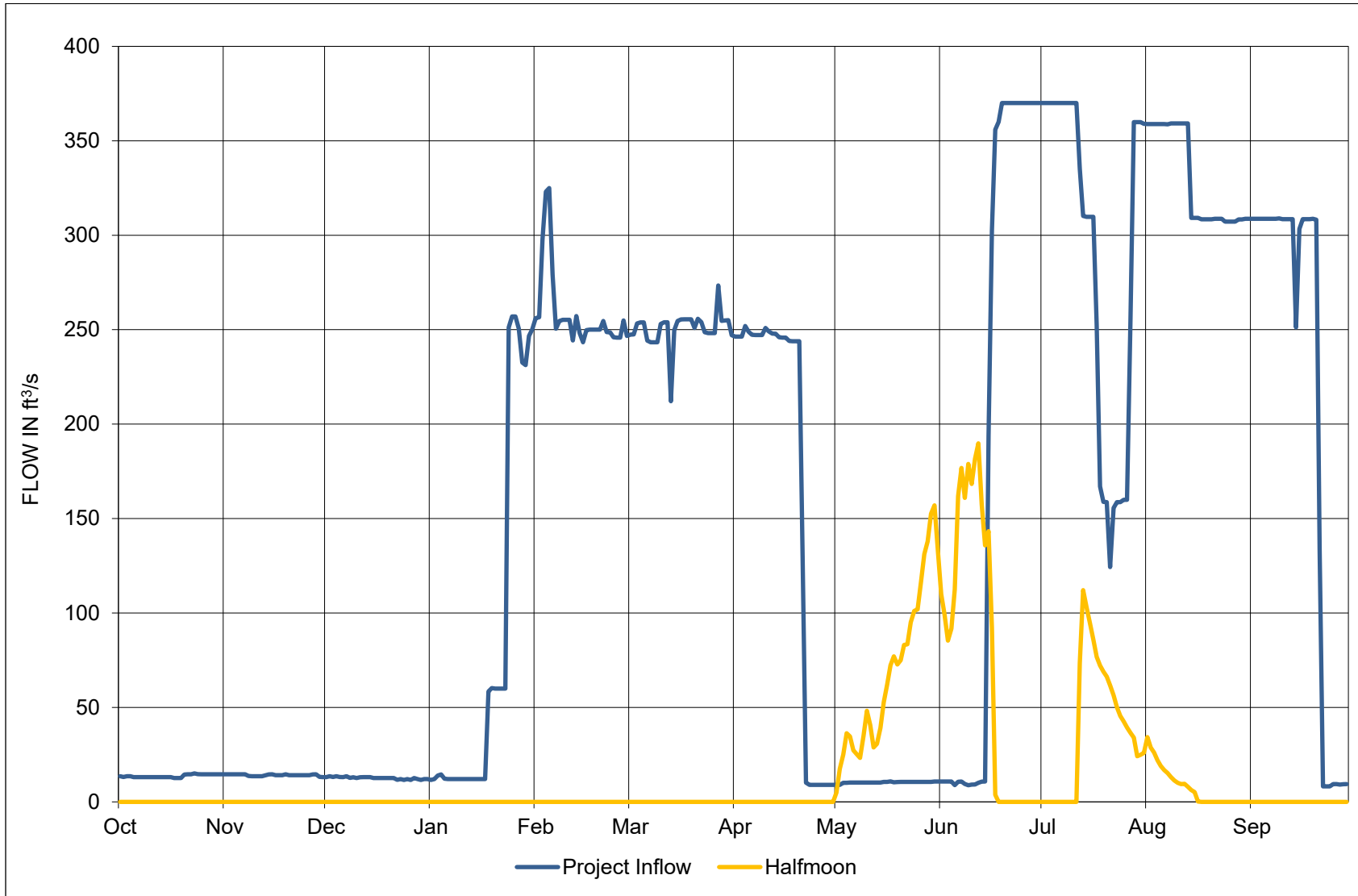


Exhibit 12.—Mt. Elbert conduit inflow actual operations WY2023.

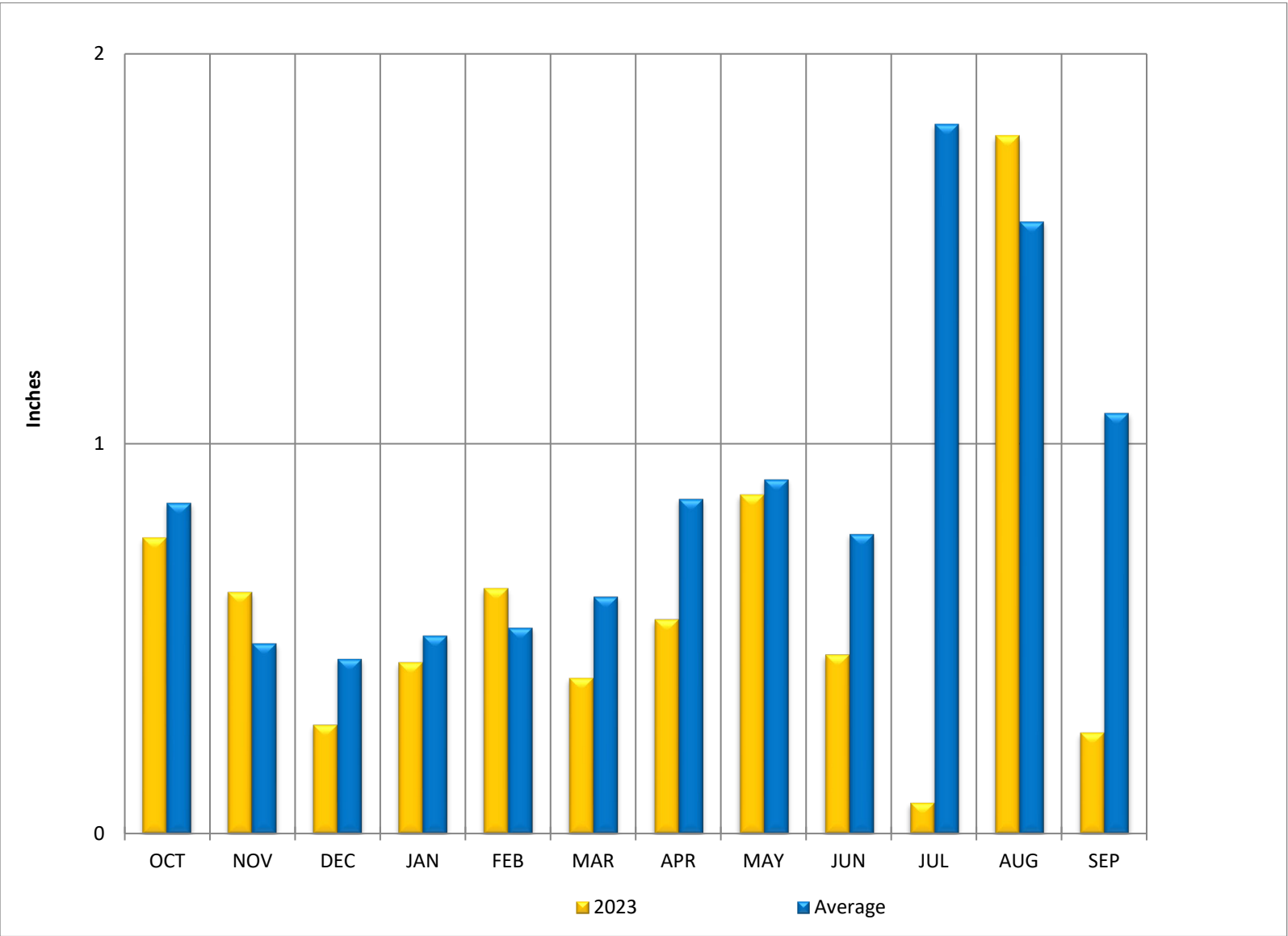


Exhibit 13.—Twin Lakes monthly precipitation WY2023.

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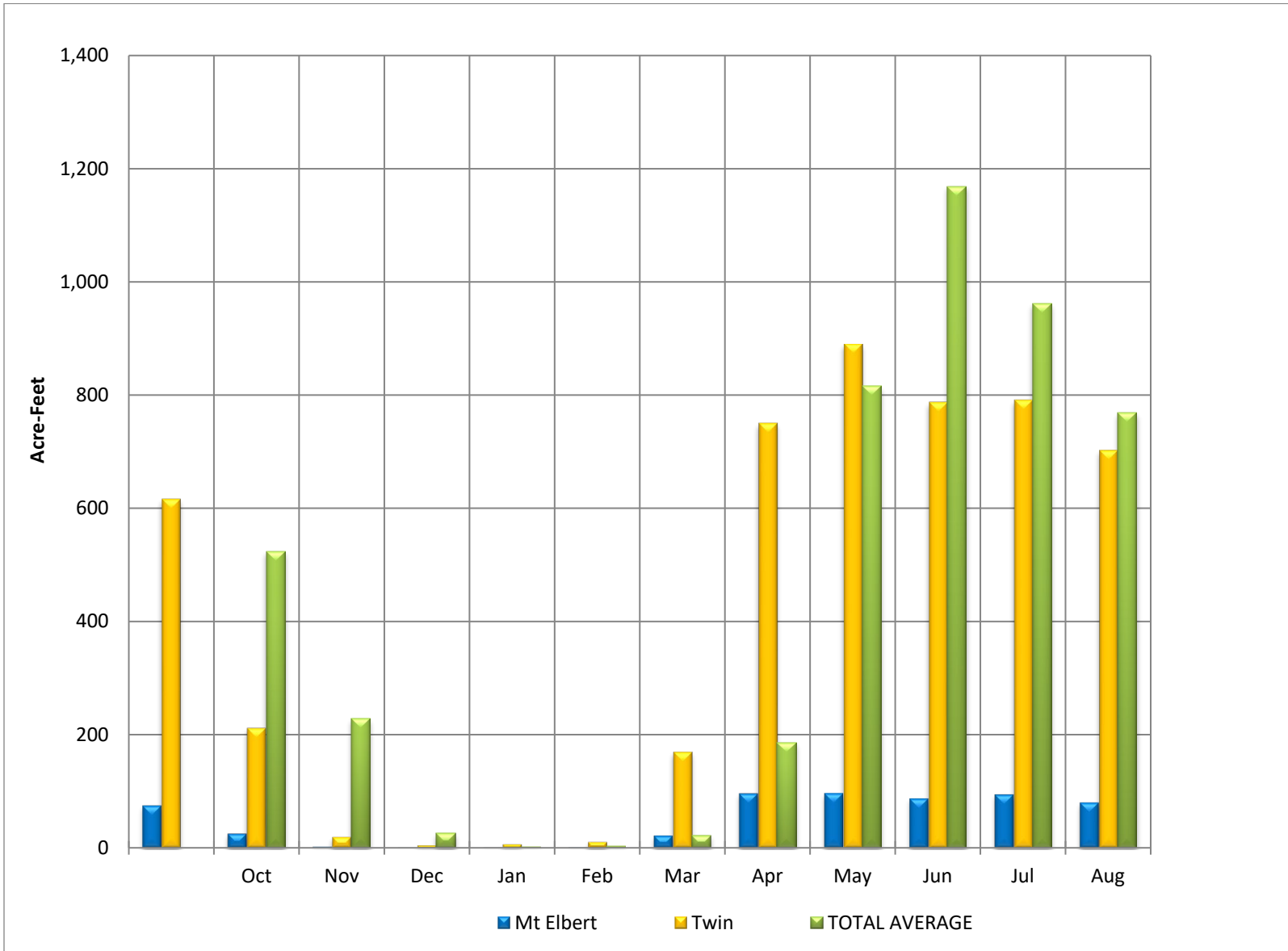


Exhibit 14.—Twin Lakes Dam and Mt. Elbert Forebay monthly evaporation WY2023.

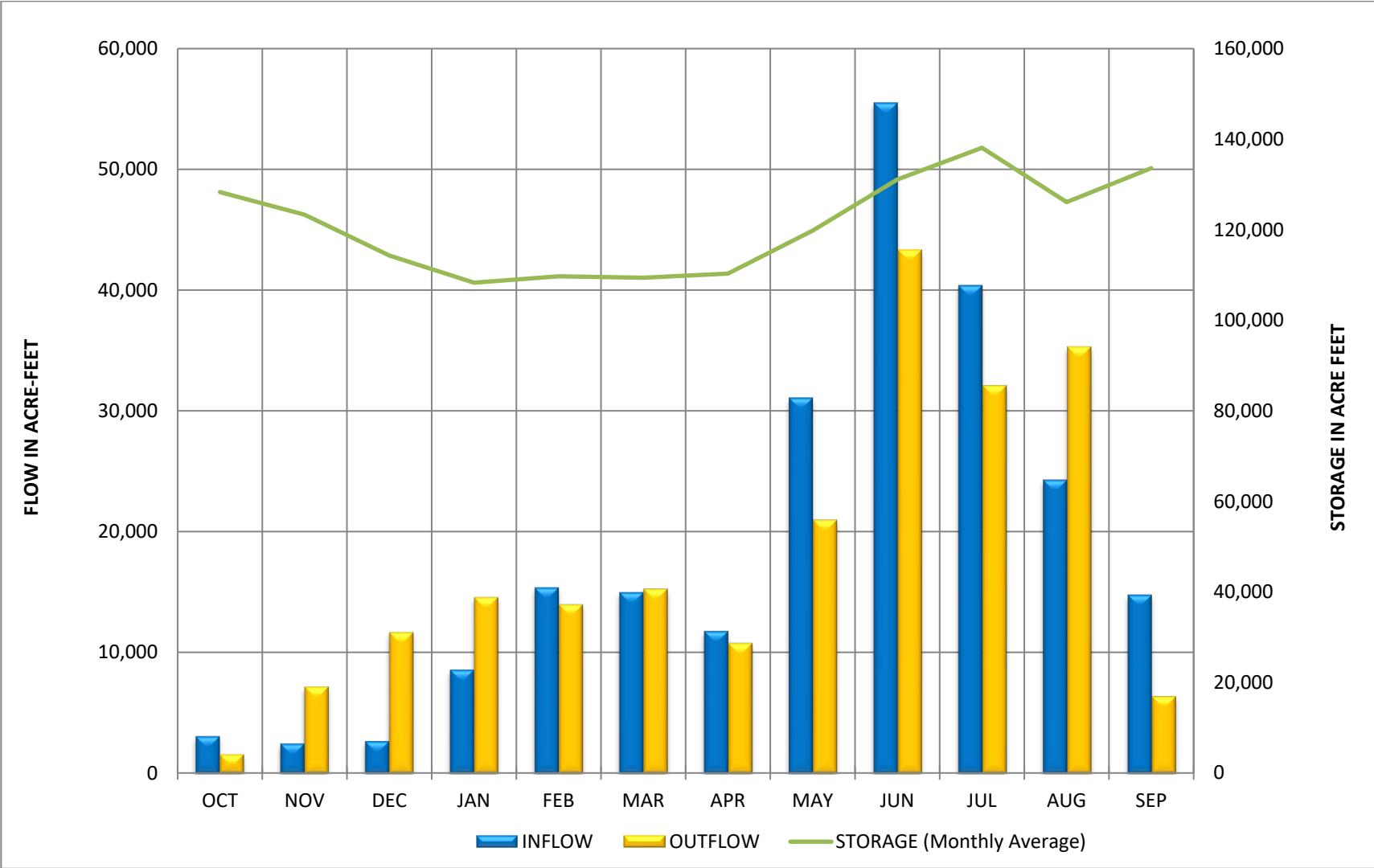


Exhibit 15.—Twin Lakes/Mt. Elbert Forebay actual operations WY2023.

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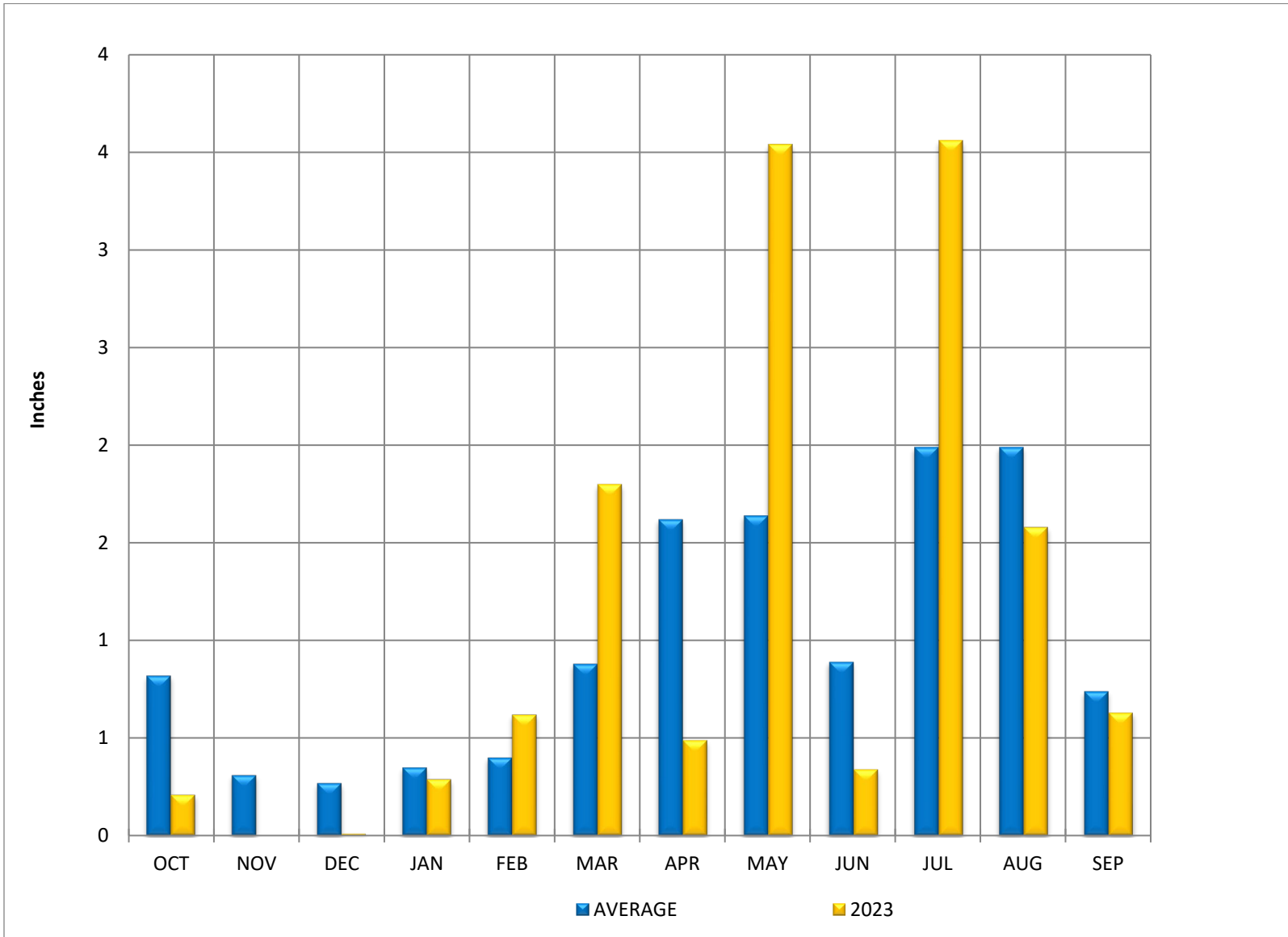


Exhibit 16.—Pueblo Dam monthly precipitation WY2023.

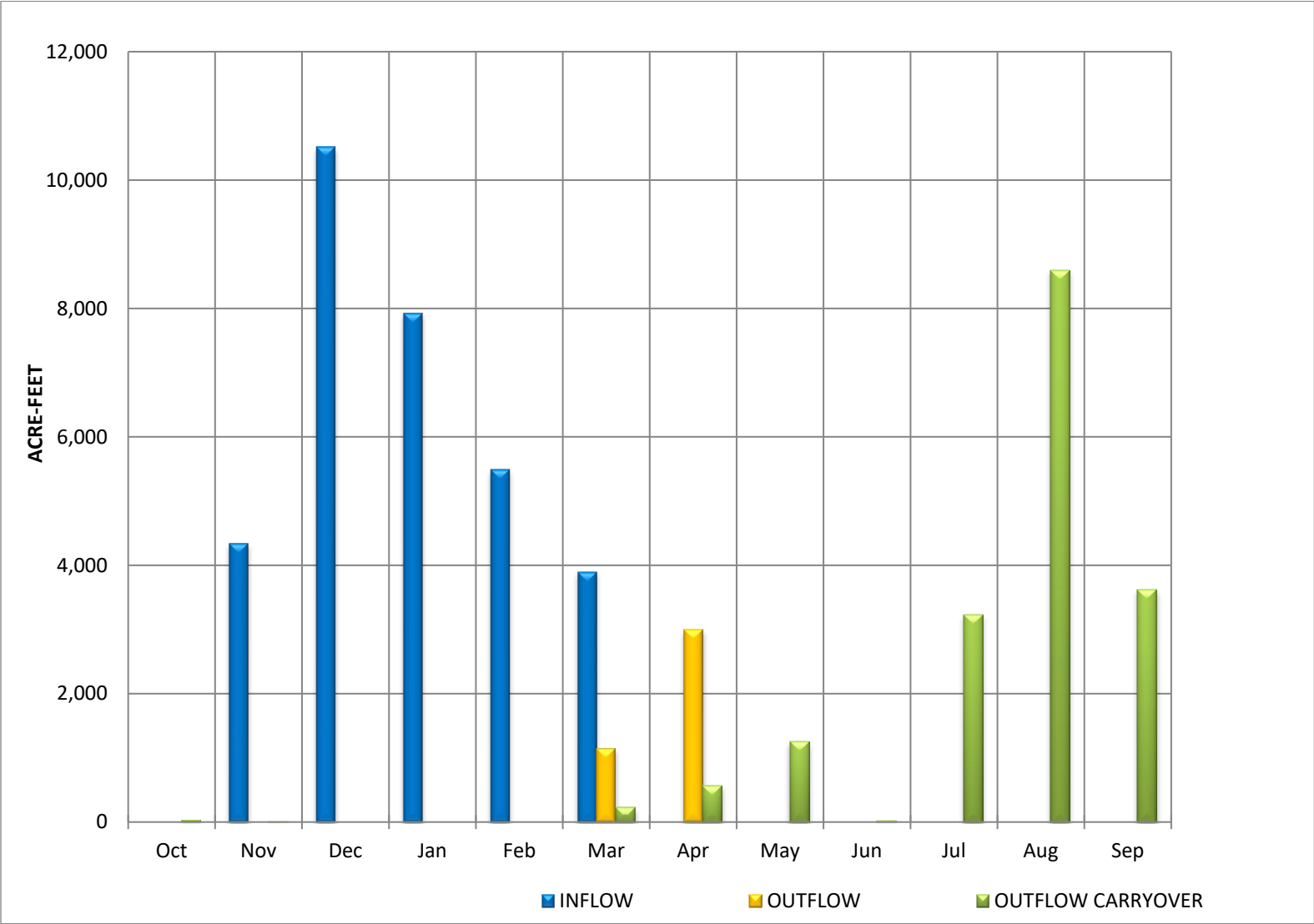


Exhibit 17.—Pueblo Reservoir winter water WY2023.

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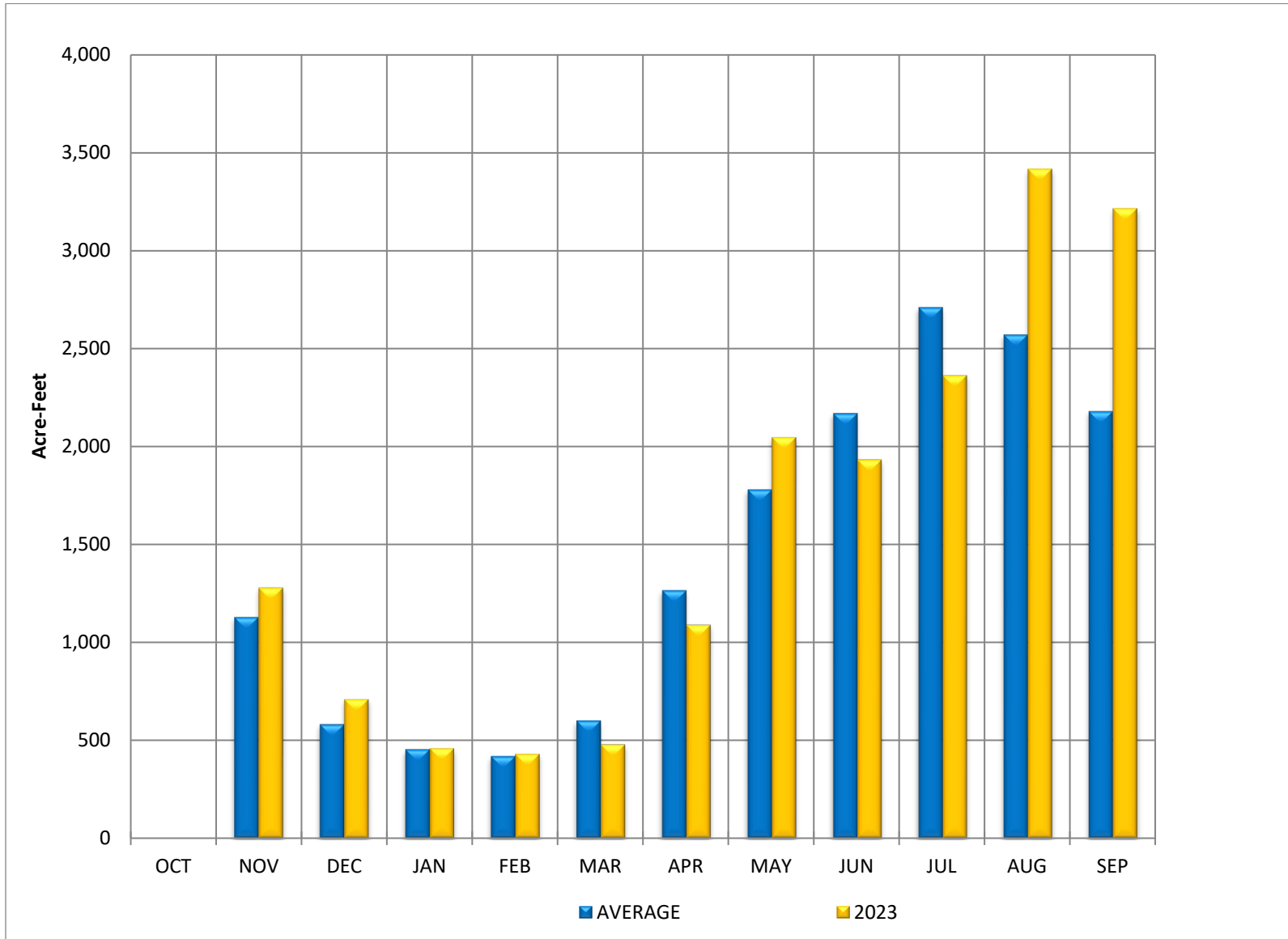


Exhibit 18.—Pueblo Dam monthly evaporation WY2023.

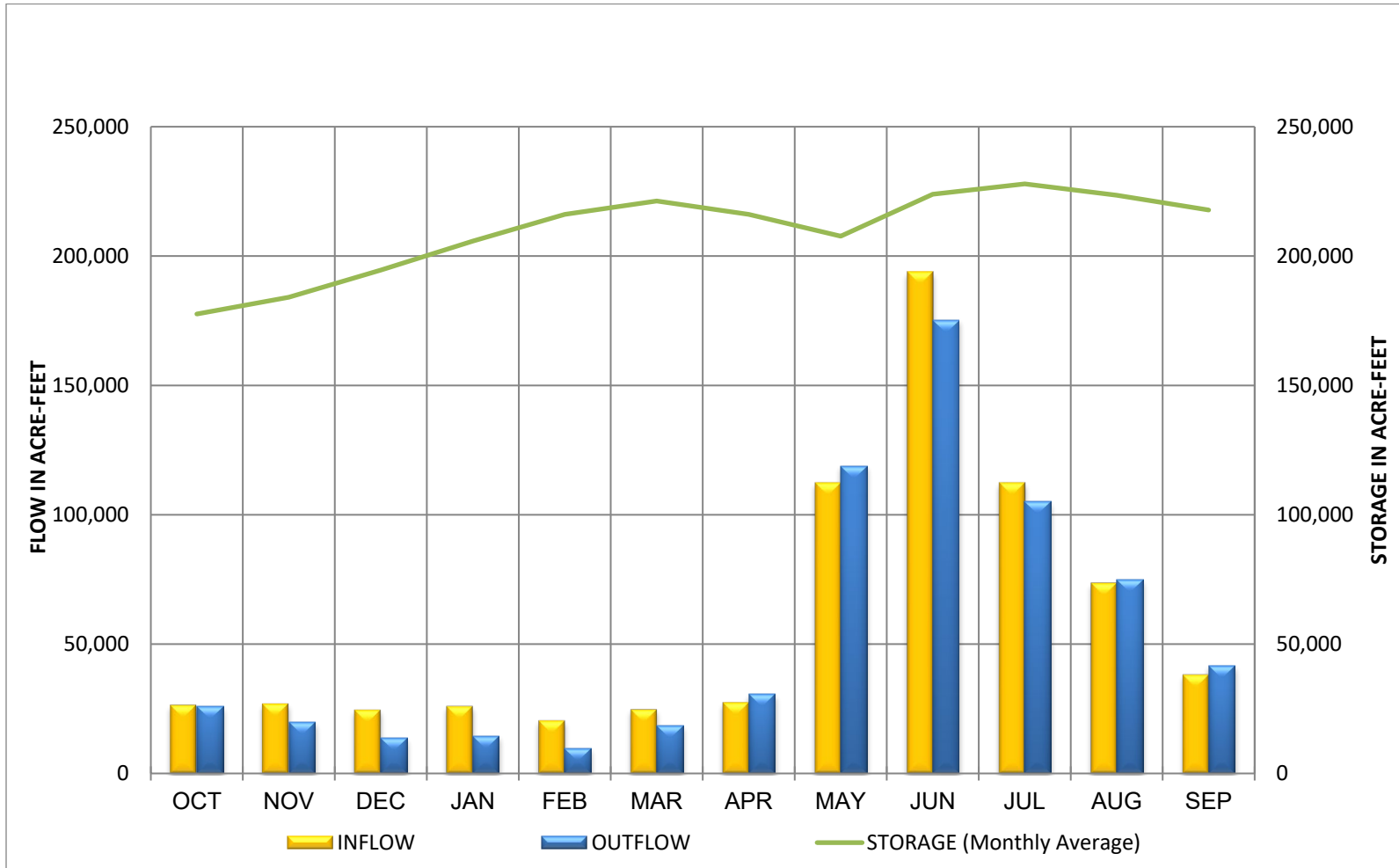


Exhibit 19.—Pueblo Reservoir actual operations WY2023.

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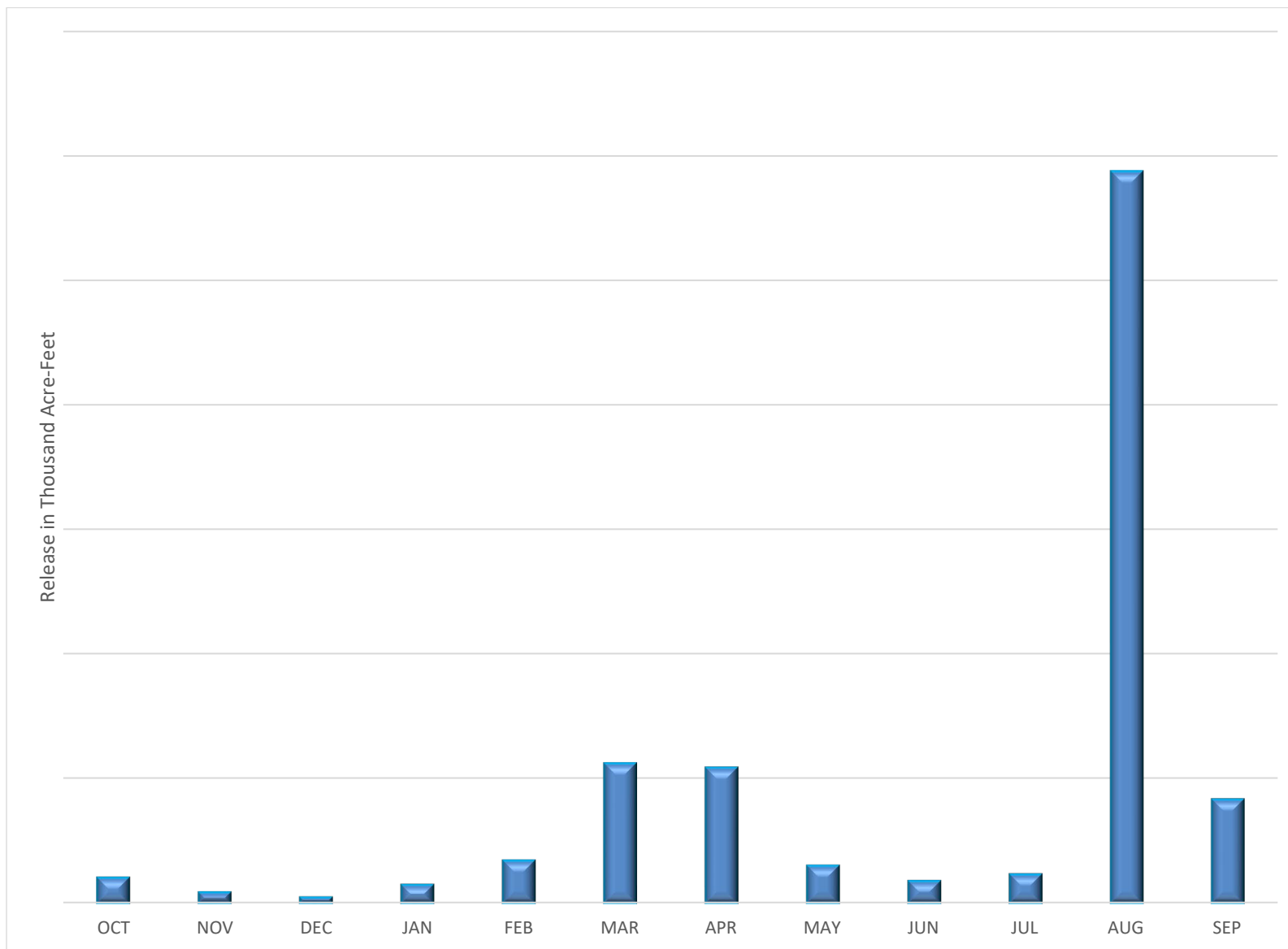


Exhibit 20.—Releases of Frylingpan-Arkansas Project water WY2023.

Appendix C

Twin Lakes Reservoir and Canal Company Exchange
with Fryingpan-Arkansas Project Water

Table C-1.—Twin Lakes Canal Company exchanges with Fryingpan-Arkansas Project Water
(units = acre-ft)

	Lincoln Creek below Grizzly Reservoir	Roaring Fork above Lost Man	Total exchanged	Twin Lakes storage (3) x 0.9913 ¹
October 2022	0	0	0.0	0.0
November 2022	0	0	0.0	0.0
December 2022	0	0	0.0	0.0
January 2023	0	0	0.0	0.0
February 2023	0	0	0.0	0.0
March 2023	0	0	0.0	0.0
April 2023	0	0	0.0	0.0
May 2023	0	0	0.0	0.0
June 2023	0	0	0.0	0.0
July 2023	1,293.00	62.24	1,355.24	1,343.44
August 2023	1,427.86	240.4	1,427.86	1,415.44
September 2023	86.94	129.96	216.90	215.01
Total	2,567.40	432.60	3,000	2,973.89

¹ Transit loss from the outlet of Twin Lakes Tunnel to Twin Lakes normally taken on all Twin Lakes Reservoir and Canal Company imported water.

Operating Criteria may prevent 3 KAF from being stored.

Please see the discussion in Chapter IV, Paragraph C for a full discussion of the Twin Lakes Canal Company Exchange in WY2023.

Operating Criteria

1. The water exchange will be implemented October 1 through September 30.
2. The releases to the Roaring Fork River at the Roaring Fork Diversion Dam and Lincoln Creek at the Grizzly Diversion Dam shall be determined by agreement between the State Engineer, the Roaring Fork Conservancy District and Southeastern Colorado Water Conservancy District in consultation with other relevant parties.
3. At any time when the Twin Lakes Reservoir and Canal Company (TLCC) is bypassing water, in addition to that designated above, it will be assumed that the Company could not have diverted that water and will not receive any credit for exchange in excess of the above amounts.

Summary of Annual Operating Plans Water Year 2023 – Appendix C

4. In the event less water than the above amounts are bypassed, only the amount actually bypassed will be credited.
5. The total volume of the release at both gages combined shall not exceed 3,000 acre-feet in any one water year.
6. No credit for exchange will be made on days when there is no documentation of such bypasses.
7. No credit will be given for water bypassed when diversions are called out by the State Engineer.

Appendix D

Daily Discharge Records, Fryingpan-Arkansas Project Collection System

Carter Feeder Conduit near Norrie, Colorado

Table D-1.—WY2023 daily data for Carter Feeder Conduit near Norrie, Colorado. (units: cubic feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1		5.3	26.9	19.6		
2		7.7	22.6	21.1		
3		12.8	17.2	21.5		
4		13.5	16.8	24.5		
5		11.8	23.6	24.7		
6		9.4	32.7	23.3		
7		7.1	40.6	22.2		
8		7.0	41.8	20.7		
9		11.2	35.0	19.9		
10		14.9	30.4	18.0		
11		13.6	33.3	18.4		
12		9.6	31.8	17.5		
13	0.3	9.3	24.6	15.9		
14	10.4	13.8	18.3	13.5		
15	4.0	22.6	23.8	11.9		
16	1.5	25.1	32.0	10.9		
17	0.7	26.3	27.4	10.3		
18	2.3	25.5	20.3	10.1		
19	3.1	23.3	25.5	12.0		
20	1.1	26.3	36.9	12.6		
21	0.2	32.7	37.1	11.4		
22	0.0	35.6	33.6	8.7		
23	0.0	36.2	32.7	6.9		
24	0.0	38.7	32.1	6.0		
25	0.0	32.4	29.9	4.0		
26	0.0	37.4	31.2	1.9		
27	0.0	38.5	35.6	1.6		
28	0.0	34.1	33.2	1.0		
29	0.4	36.7	27.9	0.4		
30	2.9	35.8	21.1	0.7		
31		29.6		0.6		
TOTAL	27	683.9	875.7	391.6		
AVERAGE	1	22.1	29.2	12.6		
MAX.	10.4	38.7	41.8	24.7		

WY2023 Total: 3,924 AF

Maximum Instantaneous Peak: 51.3 cfs on June 7, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

North Fryingpan River Feeder Conduit near Norrie, Colorado

Table D-2.—WY2023 daily data for North Fryingpan River Feeder Conduit near Norrie, Colorado.
(units: cubic feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1			10.5	5.3		
2		0.2	8.5	4.9		
3		1.1	6.4	4.4		
4		1.6	5.9	4.2		
5		1.8	7.1	4.1		
6		1.8	10.4	3.9		
7		1.6	15.1	3.5		
8		1.7	16.7	3.1		
9		2.8	15.0	2.7		
10		3.6	12.4	2.4		
11		3.4	12.5	2.3		
12		2.6	13.0	2.2		
13		2.0	11.2	2.0		
14		2.0	8.7	1.8		
15		3.2	11.3	1.5		
16		4.6	13.6	1.2		
17		5.6	11.0	0.9		
18		5.8	8.8	0.8		
19		5.6	9.8	0.9		
20		6.4	13.2	1.0		
21		7.9	13.5	0.9		
22		10.1	13.2	0.6		
23		10.7	12.4	0.3		
24		12.3	10.9	0.1		
25		11.6	9.2			
26		13.4	8.6			
27		15.0	8.8			
28		13.4	8.9			
29		13.9	7.3			
30		14.5	5.9			
31		12.2				
TOTAL		192.7	319.8	55.2		
AVERAGE		6.2	10.7	1.8		
MAX.		15	16.7	5.3		

WY2023 Total: 1,126.9 AF

Maximum Instantaneous Peak: 18.7 cfs on June 7, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

South Fork Fryingpan River Feeder Conduit near Norrie, Colorado

Table D-3.—WY2023 daily data for South Fork Fryingpan River Feeder Conduit near Norrie, CO. (units: cubic feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1		0.9	82.1	52.3		
2		5.0	70.8	53.9		
3		11.7	55.3	52.8		
4		18.7	55.8	44.9		
5		17.9	71.2	40.4		
6		15.4	91.3	36.5		
7		14.3	95.3	25.9		
8		14.0	100.9	18.1		
9		24.4	93.4	15.3		
10		36.1	84.5	14.4		
11		27.9	87.7	12.5		
12		19.0	84.2	11.5		
13		16.8	71.7	9.7		
14		23.5	68.5	7.3		
15		37.9	73.6	4.4		
16		49.3	81.3	2.1		
17		57.2	68.7	0.8		
18		59.6	53.3	0.3		
19		57.5	71.3	0.1		
20		58.6	85.9			
21		64.2	91.9			
22		78.1	84.0			
23		88.2	74.0			
24		89.4	56.2			
25		85.8	49.3			
26		94.6	47.8			
27		97.8	38.6			
28		91.9	30.5			
29		103.3	28.5			
30		107.9	33.3			
31		94.9				
TOTAL		1,561.7	2,080.9	403.2		
AVERAGE		50.4	69.4	13		
MAX.		107.9	100.9	53.9		

WY2023 Total: 8,025.1 AF

Maximum Instantaneous Peak: 151.5 cfs on May 29, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

Mormon Creek Feeder Conduit near Norrie, Colorado

Table D-4.—WY2023 daily data for Mormon Creek Feeder Conduit near Norrie, CO. (units: cubic Feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1		5.5	33.5	14.3		
2		8.7	27.3	13.1		
3		12.4	20.3	11.8		
4		14.5	22.0	9.9		
5		14.7	29.7	8.6		
6		13.3	38.6	7.5		
7		11.6	50.2	6.0		
8		10.6	50.7	5.1		
9		15.8	40.6	4.1		
10		22.4	35.4	3.3		
11		19.0	36.9	2.6		
12		14.2	37.6	2.2		
13	2.2	13.5	30.2	1.7		
14	3.9	16.9	27.4	1.2		
15	5.9	27.5	34.6	0.7		
16	4.2	31.9	34.7	0.3		
17	3.2	34.6	27.6			
18	4.2	33.4	22.9			
19	5.6	31.9	30.0			
20	4.9	35.6	34.9			
21	3.5	38.8	34.7			
22	2.8	40.6	36.1			
23	2.5	40.2	32.9			
24	2.5	42.4	27.8			
25	1.1	37.1	24.9			
26	0.0	46.3	23.6			
27	0.3	48.4	23.9			
28	1.4	41.5	21.2			
29	2.2	42.5	17.9			
30	3.8	41.1	15.4			
31		37.9				
TOTAL	54.2	844.7	923.4	92.5		
AVERAGE	1.9	27.2	30.8	3		
MAX.	5.9	48.4	50.7	14.3		

WY2023 Total: 3,798.1 AF

Maximum Instantaneous Peak: 79.5 cfs on June 7, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

North Cunningham Feeder Conduit near Norrie, Colorado

Table D-5.—WY2023 daily data for North Cunningham Feeder Conduit near Norrie, CO. (units: cubic feet per second. Source: Bureau of Reclamation).

Day	April	May	June	July	August	September
1		2.5	17.3	6.0		
2		5.1	14.3	5.6		
3		7.1	10.6	5.2		
4		8.9	12.4	4.7		
5		8.0	16.8	4.1		
6		6.5	21.1	3.2		
7		5.3	23.1	1.9		
8		4.7	24.6	1.4		
9		8.3	18.5	0.8		
10		11.9	18.0	0.5		
11		9.3	18.8	0.2		
12		5.6	19.0	0.1		
13	1.9	5.2	15.6			
14	3.4	7.7	15.0			
15	2.2	14.2	17.5			
16	0.6	16.8	16.9			
17	0.5	17.6	13.6			
18	1.3	16.5	12.4			
19	1.8	16.0	17.6			
20	1.6	17.9	18.4			
21	0.4	18.7	18.3			
22	0.0	19.7	18.7			
23	0.0	22.1	17.0			
24	0.0	21.8	14.4			
25	0.0	19.9	13.1			
26	0.0	23.6	12.3			
27	0.0	23.9	12.5			
28	0.0	20.2	10.7			
29	0.1	21.9	8.2			
30	0.8	20.7	6.6			
31		19.2				
TOTAL	14.9	426.7	473.2	33.7		
AVERAGE	.5	13.8	15.8	1.1		
MAX	3.4	23.9	24.6	6		

WY2023 Total: 1,881.2 AF

Maximum Instantaneous Peak: 34.1 cfs on May 23, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

Middle Cunningham Feeder Conduit near Norrie, Colorado

Table D-6.—WY2023 daily data for Middle Cunningham Feeder Conduit near Norrie, CO. (units: cubic feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1		0.1	25.3	10.3		
2		0.7	21.3	9.7		
3		2.1	16.5	8.7		
4		3.1	16.6	7.7		
5		3.5	21.5	6.9		
6		3.4	26.1	6.1		
7		2.9	31.1	5.1		
8		2.3	34.0	4.4		
9		4.6	29.0	3.8		
10		7.4	26.1	3.2		
11		6.8	27.3	2.6		
12		4.3	27.7	2.3		
13		3.8	23.1	1.9		
14		5.0	21.0	1.6		
15		9.9	23.4	1.3		
16		14.0	24.3	1.0		
17		16.2	20.8	0.7		
18		16.1	18.3	0.5		
19		16.1	22.4	0.3		
20		18.8	25.1	0.3		
21		19.7	26.3	0.2		
22		22.8	28.2	0.2		
23		24.6	26.1	0.1		
24		26.9	22.0			
25		24.4	19.2			
26		29.5	17.8			
27		30.7	17.5			
28		28.0	15.7			
29		29.6	13.4			
30		30.3	11.7			
31		27.7				
TOTAL		435.2	678.9	78.9		
AVERAGE		14	22.6	2.6		
MAX.		30.7	34	10.3		

WY2023 Total: 1,193.0 AF

Maximum Instantaneous Peak: 40.3 cfs on June 8, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

Ivanhoe Creek Feeder Conduit near Norrie, Colorado

Table D-7.—WY2023 daily data for Ivanhoe Creek Feeder Conduit near Norrie, Colorado. (units: cubic feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1		7.4	68.1	56.2		
2		4.3	66.4	51.5		
3		1.4	61.3	39.3		
4		1.4	62.2	11.6		
5		1.4	68.1	2.5		
6		4.6	77.7	2.4		
7		18.2	71.0			
8		30.7	58.1			
9		39.9	58.2			
10		48.1	58.9			
11	0.7	63.0	62.4			
12	2.2	61.5	64.9			
13	4.0	49.7	76.8			
14	9.3	53.7	71.6			
15	14.7	71.0	66.5			
16	11.3	70.0	63.6			
17	10.2	65.4	63.4			
18	11.7	74.5	62.9			
19	12.9	73.0	64.0			
20	10.5	46.4	59.8			
21	5.5	27.5	56.8			
22	7.3	32.0	50.0			
23	8.3	69.8	39.4			
24	9.2	68.9	6.4			
25	7.5	61.7	3.9			
26	6.6	45.6	4.2			
27	6.1	33.8	4.5			
28	6.0	38.0	3.1			
29	5.9	31.4	2.2			
30	6.4	53.3	17.9			
31		68.2				
TOTAL	156.2	1,315.6	1,494.3	163.5		
AVERAGE	5.6	42.4	49.8	27.2		
MAX.	14.7	74.5	77.7	56.2		

WY2023 Total: 6,207.6 AF

Maximum Instantaneous Peak: 103.8 cfs on May 15, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

Includes Ivanhoe Lake releases conveyed through the Boustead Tunnel

Lily Pad Creek Feeder Conduit near Norrie, Colorado

Table D-8.—WY2023 daily data for Lily Pad Creek Feeder Conduit near Norrie, Colorado. (units: cubic feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1		1.3	12.1	4.5	1.7	
2		1.7	10.3	4.3		
3		2.6	9.7	4.0		
4		3.6	11.4	3.8		
5		4.0	12.0	3.5		
6		3.8	12.1	3.2		
7		3.6	11.7	2.9		
8		4.1	12.4	2.6		
9		5.6	10.8	2.4		
10		6.8	10.0	2.3		
11		6.6	10.2	2.1		
12		5.1	10.0	2.0		
13		4.5	9.2	1.9		
14		5.1	8.7	1.7		
15		6.7	9.5	1.6		
16		7.5	9.7	1.5		
17		8.6	9.4	1.4		
18		9.5	8.3	1.4		
19		9.3	8.5	1.3		
20		8.3	8.8	1.4		
21	0.6	9.5	8.6	1.3		
22	0.5	10.4	8.5	1.2		
23	0.5	12.7	8.0	1.2		
24	0.5	16.5	7.1	1.1		
25	0.4	17.7	6.4	1.1		
26	0.4	18.2	6.1	1.0		
27	0.4	17.6	6.1	1.0		
28	0.4	15.4	5.8	1.0		
29	0.5	16.2	5.2	1.0		
30	0.8	16.8	4.9	1.0		
31		14.6		1.1		
TOTAL	5.1	273.9	271.7	61.7	1.7	
AVERAGE	.5	8.8	9.1	2	1.7	
MAX	.8	18.2	12.4	4.5	1.7	

WY2023 Total: 1,218.1 AF

Maximum Instantaneous Peak: 24.7 cfs on May 29, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

Granite Creek Feeder Conduit near Norrie, Colorado

Table D-9.—WY2023 daily data for Granite Creek Feeder Conduit near Norrie, Colorado. (units: cubic feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1			8.3	9.5		
2			11.2	7.6		
3			14.1	7.6		
4			15.7	6.9		
5			18.3	8.3		
6		0.1	21.1	7.4		
7		0.4	25.2	6.3		
8		1.1	28.4	5.7		
9		1.8	29.8	5.2		
10		2.8	30.5	4.8		
11		4.8	29.9	4.3		
12		6.3	28.3	4.1		
13		5.5	25.4	5.1		
14		6.7	22.5	5.2		
15		10.2	19.1	8.2		
16		14.3	17.5	7.9		
17		15.2	17.3	5.9		
18		17.1	16.9	5.0		
19		20.1	18.4	4.6		
20		17.2	15.0	4.3		
21		10.6	12.5	4.1		
22		7.9	11.0	3.6		
23		6.3	10.3	3.4		
24		5.3	10.1	4.8		
25		4.9	9.0	4.9		
26		6.7	10.8	3.8		
27		12.2	10.4	3.3		
28		16.1	8.5	2.4		
29		14.2	7.7	1.3		
30		11.6	9.4			
31		8.9				
TOTAL		228	512.7	154.2		
AVERAGE		7.4	17.1	5.1		
MAX		20.1	30.5	9.5		

WY2023 Total: 1,775.0 AF

Maximum Instantaneous Peak: 39.5 cfs on June 10, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

No Name Creek Feeder Conduit near Norrie, Colorado

Table D-10.—WY2023 daily data for No Name Creek Feeder Conduit near Norrie, Colorado. (units: cubic feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1			36.0	11.7		
2			31.3	10.4		
3			22.3	10.0		
4			22.5	8.4		
5			27.6	7.0		
6			41.1	5.4		
7			42.3	3.5		
8			41.6	2.5		
9			41.0	1.5		
10		5.7	33.7	1.2		
11		3.8	35.1	0.9		
12		0.8	35.6			
13		0.3	32.3			
14		0.3	29.5			
15		2.2	34.7			
16		7.5	37.7			
17		16.9	31.6			
18		20.5	24.4			
19		17.0	29.2			
20		19.1	35.0			
21		26.5	34.6			
22		23.6	33.4			
23		27.2	31.2			
24		28.2	28.1			
25		28.4	23.1			
26		37.7	21.8			
27		41.3	21.9			
28		41.1	20.1			
29		38.6	16.6			
30		45.2	14.1			
31		41.5				
TOTAL		473.3	909.4	62.5		
AVERAGE		21.5	30.3	5.7		
MAX		45.2	42.3	11.7		

WY2023 Total: 2,866.7 AF

Maximum Instantaneous Peak: 56.9 cfs on June 6, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

Midway Creek Feeder Conduit near Norrie, Colorado

Table D-11.—WY2023 daily data for Midway Creek Feeder Conduit near Norrie, Colorado. (units: cubic feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1			63.8	26.4		
2		0.2	55.4	26.5		
3		2.0	43.6	26.3		
4		4.2	38.7	25.9		
5		5.0	41.2	24.8		
6		2.7	58.2	23.0		
7		3.1	58.1	20.5		
8		1.7	54.1	17.8		
9		6.3	45.6	15.5		
10		13.5	41.4	14.6		
11		10.5	41.3	12.9		
12		5.1	40.7	11.3		
13		4.8	39.0	9.8		
14		4.4	38.9	8.7		
15		8.9	39.8	7.2		
16		19.5	39.2	5.9		
17		21.5	37.7	3.9		
18		30.2	35.7	0.0		
19		29.4	37.7	0.0		
20		30.3	33.5	0.0		
21		37.8	30.8	0.0		
22		40.1	29.5			
23		46.8	28.9			
24		36.6	28.1			
25		49.4	27.9			
26		62.7	27.6			
27		68.2	27.7			
28		66.7	27.3			
29		61.5	27.2			
30		70.7	27.1			
31		66.7				
TOTAL		810.6	1,165.8	280.9		
AVERAGE		27	38.9	13.4		
MAX		70.7	63.8	26.5		

WY2023 Total: 4,477.4 AF

Maximum Instantaneous Peak: 82.7 cfs on May 27, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

Hunter Creek Feeder Conduit near Norrie, Colorado

Table D-12.—WY2023 daily data for Hunter Creek Feeder Conduit near Norrie, Colorado. (units: cubic feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1			58.9	29.3		
2			49.5	30.3		
3			35.6	30.1		
4		10.2	35.2	26.4		
5		9.5	41.7	24.1		
6		4.3	55.8	21.4		
7		1.7	69.1	16.9		
8		1.0	69.5	14.4		
9		9.6	68.0	12.6		
10		21.4	59.5	11.7		
11		12.1	65.4	10.3		
12		2.8	61.6	9.8		
13		0.7	50.1	8.1		
14		0.9	53.4	5.8		
15		11.9	59.8	3.6		
16		27.1	59.6	2.2		
17		37.1	44.8			
18		33.1	37.0			
19		30.2	57.8			
20		31.9	67.8			
21		37.4	68.7			
22		49.4	67.6			
23		56.9	64.8			
24		58.5	57.1			
25		60.7	52.1			
26		68.9	50.9			
27		68.5	50.8			
28		67.0	45.5			
29		65.2	40.4			
30		70.2	33.6			
31		68.1				
TOTAL		916.3	1,631.8	257		
AVERAGE		32.7	54.4	16.1		
MAX.		70.2	69.5	30.3		

WY2023 Total: 5,563.8 AF

Maximum Instantaneous Peak: 93.6 cfs on May 25, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

Sawyer Creek Feeder Conduit near Norrie, Colorado

Table D-13.—WY2023 daily data for Sawyer Creek Feeder Conduit near Norrie, Colorado. (units: cubic feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1		1.1	21.0	16.6		
2		1.5	18.6	15.7		
3		1.9	15.7	15.1		
4		2.0	14.8	14.4		
5		2.1	15.4	13.5		
6		2.0	17.8	12.6		
7		2.0	23.7	11.4		
8		2.0	28.4	10.5		
9		2.6	27.2	9.6		
10		3.2	24.3	9.0		
11	0.7	3.3	25.6	8.3		
12	0.8	3.1	25.6	7.9		
13	0.8	3.1	23.0	7.4		
14	0.7	3.1	22.4	6.9		
15	0.7	3.5	26.2	6.4		
16	0.7	4.4	27.5	5.9		
17	0.8	5.1	23.4	5.5		
18	0.9	5.9	20.8	5.1		
19	0.8	6.4	25.3	4.8		
20	0.8	7.0	28.4	4.8		
21	0.8	7.7	29.9	4.4		
22	0.8	9.5	30.7	4.1		
23	0.7	12.0	30.2	3.9		
24	0.7	14.4	27.4	3.6		
25	0.8	14.0	24.4	3.4		
26	0.8	16.5	23.8	3.1		
27	0.8	20.3	23.5			
28	0.8	21.9	21.6			
29	0.9	25.2	20.0			
30	1.0	24.5	18.5			
31		21.7				
TOTAL	15.9	253.1	705	213.8		
AVERAGE	.8	8.2	23.5	8.2		
MAX.	1	25.2	30.7	16.6		

WY2023 Total: 2,356.1 AF

Maximum Instantaneous Peak: 34.4 cfs on Jun 21, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

Chapman Gulch Feeder Conduit near Norrie, Colorado

Table D-14.—WY2023 daily data for Chapman Gulch Feeder Conduit near Norrie, Colorado. (units: cubic feet per second. Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1		4.2	225.3	115.4		
2		7.8	194.4	118.5		
3		18.1	153.2	116.2		
4		30.7	149.2	108.4		
5		31.0	173.0	101.1		
6		20.5	223.0	92.8		
7		17.3	251.6	80.2		
8		15.6	255.5	70.8		
9		37.3	239.2	63.5		
10	1.1	69.3	211.2	60.1		
11	1.9	51.1	222.8	54.1		
12	1.9	26.1	215.4	50.5		
13	3.7	21.4	190.6	38.5		
14	7.3	21.9	195.1	28.7		
15	3.3	49.6	213.2	22.4		
16	1.8	91.8	215.0	16.8		
17	1.9	97.1	178.8	11.7		
18	2.5	125.3	157.6	5.2		
19	2.2	117.0	206.1	4.8		
20	1.7	127.4	224.4	2.1		
21	1.7	145.9	222.2			
22	1.7	171.7	216.8			
23	1.8	196.7	202.0			
24	1.8	164.5	185.5			
25	1.7	207.4	174.2			
26	1.8	251.9	163.9			
27	1.6	263.0	157.5			
28	1.6	252.8	146.1			
29	1.7	252.2	133.3			
30	2.1	279.4	118.1			
31		256.7				
TOTAL	46.7	3,422.8	5,814	1,161.8		
AVERAGE	1.7	110.4	193.8	37.5		
MAX	7.3	279.4	255.5	118.5		

WY2023 Total: 2,0718.4 AF

Maximum Instantaneous Peak: 321.6 cfs on May 29, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

Fryingpan River Feeder Conduit near Norrie, Colorado

Table D-15.—WY2023 daily data for Fryingpan River Feeder Conduit near Norrie, Colorado. (units: cubic feet per second Source: Bureau of Reclamation)

Day	April	May	June	July	August	September
1		2.8	121.8	76.0	10.9	
2		9.2	107.1	78.4	15.5	
3		18.7	88.1	76.6	14.5	
4		25.3	85.4	77.2	14.5	
5		26.8	95.9	75.3	14.5	
6	0.5	28.4	111.6	73.2	14.5	
7	0.0	24.9	122.8	61.8	14.5	
8	0.0	26.7	125.9	48.7	14.5	
9	0.0	40.0	125.2	44.6	14.5	
10	0.0	48.8	117.0	42.2	14.5	
11	0.8	42.3	121.5	38.4	14.5	
12	1.2	32.9	120.9	38.1	14.5	
13	2.6	31.9	104.9	35.0	14.5	
14	6.3	44.7	99.0	31.0	14.5	
15	1.5	60.5	105.7	27.7	14.5	
16	1.3	73.5	108.0	23.7	14.5	
17	2.0	83.0	99.3	13.3	14.5	
18	2.9	88.8	80.2	3.7	14.5	
19	2.8	86.8	82.7	2.9	14.5	
20	1.3	91.2	99.4	15.3	14.5	
21	1.6	99.7	112.3	20.5		
22	2.1	112.1	119.6	17.3		
23	3.1	125.3	109.6	6.2		
24	4.9	135.3	90.7	1.2		
25	6.4	129.9	83.2	1.2		
26	6.7	140.5	81.4	1.2		
27	1.2	145.7	81.7	1.2		
28	1.2	140.5	72.3	1.2		
29	1.3	148.4	59.5	1.2		
30	1.2	154.4	64.3	1.2		
31		137.9		1.2		
TOTAL	53	2,357.1	2,997	936.8	287.5	
AVERAGE	1.9	76	99.9	30.2	14.4	
MAX	6.7	154.4	125.9	78.4	15.5	

WY2023 Total: 13,153.4 AF

Maximum Instantaneous Peak: 189.5 cfs on May 29, 2023

Blank: Recorder not operated. No water diverted

M: Missing Data

Appendix E

Fryingpan-Arkansas Project Operating Principles

OPERATING PRINCIPLES

FRYINGPAN-ARKANSAS PROJECT

ADOPTED BY THE STATE OF COLORADO

APRIL 30, 1959

(As amended December 30, 1959,
and December 9, 1960)

MARCH 15, 1961 -- Ordered to be printed.

U. S. GOVERNMENT PRINTING OFFICE

WASHINGTON: 1961

H. RES. 91

In the House of Representatives, U. S.,

March 15, 1961.

Resolved, that there be printed as a House document the publication entitled “Operating Principles, Fryingpan-Arkansas Project, Adopted by the State of Colorado, April 30, 1959 (as amended December 30, 1959 and December 9, 1960)”, and that there be printed for the use of the Committee on Interior and Insular Affairs one thousand additional copies.

Attest:

Ralph R. Roberts, Clerk.

OPERATING PRINCIPLES, FRYINGPAN-ARKANSAS PROJECT

ADOPTED BY THE STATE OF COLORADO, APRIL 30, 1959

(As Amended December 30, 1959, and December 9, 1960)

The construction and operation of the project involve the diversion of water from the headwaters of the Fryingpan River and other tributaries of the Roaring Fork River to the Arkansas River Basin. The project contemplates—

- (a) The maximum conservation and use of water.
- (b) The protection of western Colorado water uses, both existing and potential, in accordance with the declared policy of the State of Colorado; and
- (c) The preservation of recreational values.

In order to accomplish such purposes, the project shall be operated by the United States in compliance with the Federal reclamation laws, the laws of the State of Colorado relating to the appropriation, use, or distribution of water, and the following operating principles:

1. As used herein:

- (a) “Project” means that certain enterprise planned and designed by the Bureau of Reclamation, Department of the Interior, for the transmountain diversion of water from the headwaters of the Fryingpan River and other tributaries of the Roaring Fork River to the basin of the Arkansas River, together with all of its appurtenant works and facilities in both eastern and western Colorado.
 - (b) “Eastern Colorado” means that portion of the State of Colorado lying within the natural drainage basin of the Arkansas River.
 - (c) “Western Colorado” means that portion of the State of Colorado lying within the natural drainage basin of the Colorado River and served by diversions made from the Colorado River, or its tributaries, above its confluence with the Gunnison River.
 - (d) “Southeastern Colorado Water Conservancy District” means that entity created to contract for payment to the United States of an appropriate portion of project cost allocated to certain water uses in eastern Colorado.
 - (e) “Colorado River Water Conservation District” means that entity created by Colorado Revised Statutes 1953, 149-8, as amended.
 - (f) “Southwestern Water Conservation District” means that entity created by Colorado Revised Statutes 1953, 149-9, as amended.
 - (g) “Ruedi Reservoir” means the reservoir presently planned for construction on the Fryingpan River above the town of Basalt as part of the project.
 - (h) “Ashcroft Reservoir” means not only the reservoir contemplated for construction on Castle Creek, a tributary of the Roaring Fork River, but also, unless the context requires otherwise, any other reservoir that may be constructed in the Roaring Fork basin above the town of Aspen in lieu of that reservoir.
 - (i) cfs means cubic feet of water per second of time.
2. The Ruedi Reservoir shall be constructed and maintained on the Fryingpan River above the town of Basalt with an active capacity of not less than 100,000 acre-feet. In addition thereto and in order to offset adverse streamflow conditions on the Roaring Fork River above the town of Aspen which might occur as a result of the project enlargement of the Twin Lakes Reservoir, the Ashcroft Reservoir on Castle Creek, or some reservoir in lieu thereof, shall be constructed on the Roaring Fork drainage above Aspen to a capacity of approximately 5,000 acre-feet: Providing, However, That the Ashcroft Reservoir shall be constructed only if the Secretary of the Interior after appropriate study shall determine that its benefits exceed the costs: And providing further, That no part of the construction, operation, or maintenance of said Ashcroft Reservoir shall be chargeable to the Fryingpan-Arkansas project.

All of such stored water shall be released under the conditions and limitations hereinafter set forth.

3. The receipts from the sale of water from Ruedi Reservoir, as permitted in paragraph 6(b) hereof, shall be applied solely to the operation and maintenance costs and to those

reimbursable construction costs of said reservoir which exceed \$7,600,000. The cost of perpetual operation and maintenance of the Ruedi Reservoir shall be borne by users of project water and users of water stored in Ruedi Reservoir in such proportion as may be determined by the Secretary of the Interior.

4. The inclusion of the Ruedi Reservoir in the project shall not preclude the construction of any other replacement or regulatory reservoirs on the Colorado River or its tributaries above Cameo gaging station.
5. The Ruedi Reservoir shall be completed and in operation before any water is diverted to eastern Colorado by means of the project.
6.
 - (a) The replacement capacity of Ruedi Reservoir, and any reservoir constructed in addition thereto, is that portion of the total reservoir capacity required to permit project diversions at times when such diversions could not otherwise be made because of simultaneous demands of senior diversions in western Colorado existing at the time of the adoption of these operating principles, and shall be so operated to accomplish this purpose. Water stored in such capacity shall be released by the United States, upon the request of the Colorado State engineer, to the extent that water would have been available to said decreed rights except for stream depletion resulting from diversions by this project to the Arkansas Valley.
 - (b) The regulatory capacity of Ruedi Reservoir, and any reservoir constructed in addition thereto, is that portion of the total reservoir capacity not needed for replacement purposes. Water stored in such category may be sold or leased by the United States to water users in Colorado for any purpose recognized by the laws of the United States: Provided, that the sale of water for use outside the natural basin of the Colorado River can only be made with the consent of the Colorado River Water Conservation District. Charges for the use of such water shall be established by the Secretary of the Interior by appropriate contract in accordance with the payment ability of such water users.
7. The primary purpose of Ruedi Reservoir, and any reservoir constructed in addition thereto, is to furnish, to the extent of its capacity, in like manner as if the project were constructed by a water conservancy district organized pursuant to the laws of the State of Colorado, the water required for the protection of western Colorado water users by the provisions of Colorado Revised Statutes 1953, 149-6-13, reading as follows:

However, any works or facilities planned and designed for the exportation of water from the natural basin of the Colorado River and its tributaries in Colorado, by any district created under this article, shall be subject to the provisions of the Colorado River Compact and the Boulder Canyon Project Act. Any such works or facilities shall be designed, constructed and operated in such a manner that the present appropriations of water, and in addition thereto

prospective uses of water for irrigation and other beneficial consumptive use purposes, including consumptive uses for domestic, mining, and industrial purposes, within the natural basin of the Colorado River in the State of Colorado, from which water is exported, will not be impaired nor increased in cost at the expense of the water users within the natural basin. The facilities and other means for the accomplishment of said purpose shall be incorporated in, and made a part of any project plans for the exportation of water from said natural basin in Colorado.

8. Project diversions from Lime Creek shall be made only in the months of May and June of each year, unless the Colorado River Water Conservation District shall, by written communication, advise the Colorado State Engineer that additional diversions can be made.
9. The respective decrees which may be or have been awarded to the parties hereto as a part of the Fryingpan-Arkansas project and Basalt project shall be administered by the proper officials of the State of Colorado, in accordance with the applicable laws of the State of Colorado, and with the following principles and procedures, to wit:
 - (1) That the demand on the waters available under such decrees shall be allocated in the following sequence:
 - (a) For diversion to the Arkansas Valley through the collection system and the facilities of the Fryingpan-Arkansas project in an amount not exceeding an aggregate of 120,000 acre-feet of water in any year, but not to exceed a total aggregate of 2,352,800 acre-feet in any period of 34 consecutive years reckoned in continuing progressive series starting with the first full year of diversions, both limitations herein being exclusive of Roaring Fork exchanges as provided in (c) below, and exclusive of diversions for the Busk-Ivanhoe decree; and with the further and absolute limitation that in order to protect existing and future beneficial uses of water in Western Colorado, including recreational and fishing values, the State engineer shall so regulate the transmountain diversions above referred to, to the end that no diversions shall be made which will reduce the remaining aggregate stream flows to less than either of the following minimum standards:
 - (i) The Fryingpan collection system at the points of diversion collectively, exclusive of Lime Creek: 15 cfs October 1 through March 31; 30 cfs April 1 through September 30.
 - (ii) Near Norrie (immediately below the junction of North Fork and Fryingpan River): 30 cfs October 1 through March 31; 100 cfs April 1 through April 30; 150 cfs May 1 through May 31; 200 cfs June 1 through June 30; 100 cfs July 1 through July 31; 75 cfs August 1 through August 31; 65 cfs September 1 through September 30.

Summary of Annual Operating Plans Water Year 2023 – Appendix E

In maintaining the above minimum standards, the project diversions shall be regulated, so far as is practicable, in such a manner that the North Fork of the Fryingpan River, the Fryingpan River, and each of the tributaries of those streams, shall contribute to the residual stream flows required by those minimum standards quantities of water in proportion to their natural contributions.

- (b) For storage in Ruedi Reservoir to the extent of its actual capacity, which is to be not less than 100,000 acre-feet.
 - (c) For 3,000 acre-feet annually, to the extent that it is available in excess of (a) and (b) above, or such part thereof as may be required, to be delivered to the Twin Lakes Reservoir and Canal Company in exchange for equivalent releases from the headwaters of the Roaring Fork River which would otherwise be diverted through such Twin Lakes Reservoir and Canal Company collection and diversion system.
 - (d) For any other beneficial use in western Colorado in accordance with court decree, but not herein contemplated.
- (2) The effectuation of the above principles requires concurrent Fryingpan-Arkansas project diversion and Ruedi Reservoir storage to be accomplished in the manner following: The State engineer annually shall collect pertinent data, including information pertaining to snowpack and all other available evidence, and shall thereafter so divide and apportion the surface runoff as to achieve, as nearly as possible, the foregoing division of water and the maximum of concurrent diversions and storage. The diversions herein contemplated shall be on the basis of a water year hereby defined as that interim of October 1 through the following September 30.
10. For the protection of recreational values, including fishing, on the Fryingpan River below Ruedi Reservoir, releases of water from said reservoir, not to exceed the stream inflow, shall be made so that the streamflow immediately below the junction of the Fryingpan River and Rocky Fork shall not be reduced below 39 cfs from November 1 to April 30, and 110 cfs from May 1 to October 30, or as actual experience or court decree hereafter dictate.
11. An appropriate written contract may be made whereby Twin Lakes Reservoir and Canal Company shall refrain from diverting water whenever the natural flow of the Roaring Fork River and its tributaries shall be only sufficient to maintain a flow equal to or less than that required to maintain the recommended average flows in the Roaring Fork River immediately above its confluence with Difficult Creek in a quantity proportionate to the respective natural flow of the Roaring Fork River. The recommended average flows above mentioned are flows in quantities equal to those recommended as a minimum immediately above its confluence with Difficult Creek according to the following schedule submitted by the United States Fish and Wildlife Service and the Colorado Game and Fish Commission:

Summary of Annual Operating Plans Water Year 2023 – Appendix E

Month	Average	Acre-feet	Month	Average	
		Acre-feet		Second-feet (thousands)	
		Second feet (thousands)			
October	44	2.7	May	100	6.2
November	35	2.1	June	120	7.1
December	29	1.8	July	100	6.2
January	26	1.6	August	63	3.9
February	25	1.4	September	44	<u>2.6</u>
March	24	1.5			
April	64	3.8	Total	----	40.9

In maintaining the above averages, at no time shall the flow be reduced below 15 cfs during the months of August to April, inclusive, or below 60 cfs during the months of May to July, inclusive, providing the natural flow during said period is not less than these amounts. The obligation to supply the minimum streamflow as set forth in the above table on the Roaring Fork River shall, to the extent of 3,000 acre-feet annually, be a project obligation to be supplied from any waters diverted from the south tributaries of Hunter Creek, Lime Creek, Last Chance Creek, or any of them.

The Twin Lakes Reservoir and Canal Company shall not be required to refrain from diverting water under its existing decrees from the Roaring Fork River except to the extent that a like quantity of replacement water is furnished to said company without charge therefore through and by means of project diversions and storage.

If by reason of storage capacity in the Ruedi Reservoir, or any reservoir constructed in addition thereto, the Twin Lakes Reservoir and Canal Company derives additional water or other benefits or advantages it would not have realized had this project not been constructed, then nothing herein contained shall prevent the project from making appropriate charges for such water or other benefits or advantages. All revenues derived from the use of water stored in Ashcroft Reservoir shall be used to assist in the repayment of the construction, operation, and maintenance costs of that reservoir, or any reservoir constructed in lieu thereof, as may be determined by the Secretary of the Interior.

Summary of Annual Operating Plans Water Year 2023 – Appendix E

12. All lands acquired and held for project construction and operation and water surfaces of project reservoirs will be open to the public for recreational purposes, excepting those areas reserved by the operating agency.
13. The project will be operated in such a manner that those in eastern Colorado using project water imported from the Colorado River Basin for domestic purposes shall have preference over those claiming or using water for any other purpose.
14. The project is to be operated in such a manner as to secure the greatest benefit from the use and reuse of imported project waters within project boundaries in the State of Colorado
15. Any and all benefits and rights of western Colorado water users in and to water stored in Green Mountain Reservoir, as described, and defined in Senate Document 80, Seventy-fifth Congress, first session, shall not be impaired or diminished by this project.
16. The project, its operation, maintenance, and use shall be subject to the provisions of the Upper Colorado River Basin Compact of October 11, 1948 (Public Law 37, eighty-first Congress, first session), and the Colorado River Compact of November 24, 1922 (House Document 605, sixty-seventh Congress, fourth session).
17. The Colorado River Water Conservation District of the State of Colorado shall acquire title to storage of water in Ruedi Reservoir and any reservoir constructed in addition thereto, by appropriate proceedings in the courts of the State of Colorado. The Southeastern Colorado Water Conservancy District of the State of Colorado shall likewise acquire title to the water required by the project for diversion to the Arkansas Valley. The Secretary of the Interior shall at any time after the authorization of the project have the option to obtain or require the transfer to the United States of any and all rights initiated or acquired by appropriation as herein set forth: Provided, however, that the rights so taken shall be subject to a beneficial use of such water as may be provided in the repayment contract or contracts, and subject to all the operating principles herein set forth.
18. No transmountain diversion of water shall ever be made through the collection and diversion system of the Fryingpan-Arkansas Project in excess of the quantitative limitations and conditions established by this document: Provided, however, that when under the laws of the State of Colorado, there may be additional water available for such collection and diversion which is not at the time of diversion required for beneficial use in western Colorado or for filling interstate water compact agreements, then such water may be collected and diverted for beneficial use in the Arkansas Valley: Provided further, that such additional diversion shall only be made with the mutual consent of each of the following agencies of the State of Colorado, to wit: the Colorado Water Conservation Board, the Southwestern Water Conservation

District, the Colorado River Water Conservation District, and the Southeastern Colorado Water Conservancy District.

19. To assure project operation in conformity with the operating principle heretofore stated, to provide a means for the collection and interchange of information, and to provide a method for the continued study of project operations to the end that, if the stated operating principles may be improved upon, recommendations for changes may be made to the contracting parties, a commission shall be created in an appropriate manner to be composed of one representative of the Southeastern Colorado Water Conservancy District, one representative of the Colorado River Water Conservation District, two representatives of the United States, and one representative of the State of Colorado appointed by the Colorado Water Conservation Board after consultation with the Colorado Game and Fish Commission. The powers of such commission shall be limited to the collection of data, the making of findings of fact, and the suggestion of changes in operating principles.

These operating principles shall be deemed to have amended and take the place of those operating principles signed and executed on April 30, 1959. These operating principles shall be and do constitute a contract between the signatory parties, and shall inure to the benefit of and shall be and remain binding upon said parties, their respective successors and assigns.

Executed as amended at Denver, Colorado, this 9 day of December 1960.

Attest:

Felix L. Sparks, Director and Secretary

Attest:

J. G. Shoun, Secretary

Attest:

Philip P. Smith, Secretary

Attest:

Archie B. Toner, Secretary

COLORADO WATER CONSERVATION BOARD

Steve McNichols, Chairman; Governor, State of Colorado

SOUTHEASTERN COLORADO WATER CONSERVANCY

DISTRICT

By J. Selby Young, President

COLORADO RIVER WATER CONSERVATION DISTRICT

By A. Allen Brown, President

SOUTHWESTERN WATER CONSERVATION DISTRICT

By Ira E. Kelly, President