

ANNUAL OPERATING PLAN FRYINGPAN-ARKANSAS PROJECT WATER YEAR 2002 OPERATIONS

I. GENERAL

This is the 33rd Annual Operating Plan for the Fryingpan-Arkansas Project (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 powerplant, 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 (87th Congress, 1st Session).

This Annual Operating Plan is a summary of the actual project operation in water year 2002 (October 1, 2001, through September 30, 2002).

II. PROJECT FEATURES IN OPERATION DURING WATER YEAR 2002

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 at a water surface elevation of 7766.0 feet. The reservoir is operated on an annual cycle. Steady winter releases draft the reservoir such that it is filled with the spring snowmelt runoff, while releases to the Fryingpan River are maintained below 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, wildlife habitat, and flood control.

The West Slope Collection System, located upstream of Ruedi Reservoir in the upper Fryingpan River and Hunter Creek watersheds, is a series of 16 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 (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 5 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 5 miles west of Leadville, Colorado. The lake has a total capacity of 129,398 acre-feet at a water surface elevation of 9869.4 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, as is Ruedi Reservoir. 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 Powerplant, 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. All conduit flow which reaches the Mt. Elbert Forebay is used to generate electricity at the Mt. Elbert Powerplant 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-acre-foot 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, 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 capacity of 140,855 acre-feet at a maximum water surface elevation of 9200 feet. 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 the Otero Pipeline. The operation of Twin Lakes also provides for recreation and wildlife habitat.

Pueblo Dam and Reservoir is located on the Arkansas River 6 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 349,940 acre-feet at a water surface elevation of 4898.7 feet. The upper 26,991 acre-feet of storage space are reserved for flood control at all times, and an additional 66,000 acre-feet of space are reserved from April 15 through November 1. Non-project water may be stored in the reservoir under temporary contract. 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. The majority of project water deliveries is made from the reservoir. The Fountain Valley Authority, the Pueblo West Metropolitan District, and the Pueblo Board of Water Works take direct delivery of municipal water through the south outlet works and joint-use manifold. A direct irrigation delivery is made to the Bessemer Ditch. Other project deliveries are made as releases to the Arkansas River for diversion downstream. Pueblo Reservoir is also operated to provide for recreation and wildlife habitat.

III. HYDROLOGIC CONDITIONS AND MAJOR WEATHER EVENTS – WATER YEAR 2002

Precipitation over the Eastern Slope reservoirs of the Fryingpan-Arkansas Project was well below average for water year 2002. In fact, water year 2002 will be one for the books for some time to come. East Slope project storage began the water year at 65 percent of average levels, down 37 percent from the preceding year. Above average precipitation was recorded over the entire Fryingpan-Arkansas Project in early winter, but dry conditions prevailed over the area for the rest of the season. As a result, the water year ended with Turquoise receiving 59 percent, Twin Lakes receiving 55 percent, and Pueblo receiving only 30 percent of average precipitation.

Warm and dry weather, along with wind and low humidity, allowed what little snow there was to melt out about two months earlier than normal. As melting began, much of the moisture soaked into the ground before ever making it into the stream. These conditions made for very little inflow into Turquoise, Twin Lakes, and Pueblo Reservoirs and resulted in below average reservoir storage.

Precipitation over the watershed above Ruedi Reservoir was well below average during the fall and winter of water year 2002, with the total October through March precipitation being only 67 percent of average for the period. This lack of

precipitation resulted in a snowpack of only 61 percent of average by April 1. Warm and dry conditions prevailed during April, resulting in a snowpack of only 27 percent of average by May 1. Extremely dry conditions persisted throughout May and June, with the basin only receiving 15 percent of average precipitation in May and 3 percent of average precipitation in June. These warm, dry conditions resulted in the snowpack being completely exhausted by the end of May. July and August continued dry with about 52 percent of average precipitation for the period. Monsoonal rains brought above average precipitation back to the basin in September (144 percent of average). However, even with the wet September, the annual precipitation over the Ruedi Reservoir watershed was only 60 percent of average.

The extremely dry conditions in the watershed resulted in the lowest annual and runoff period inflows to Ruedi Reservoir ever recorded. Cumulative reservoir inflow for the October through March period was just 57 percent of average. Due to the warm and dry conditions experienced in April, the basin runoff occurred early, causing the reservoir inflow in April to be 110 percent of average. However, reservoir inflow dropped off precipitously for the remainder of the runoff season, with May, June, and July inflows being 45 percent, 26 percent, and 19 percent of average, respectively. Overall, the April through July runoff season produced just 36,400 acre-feet of inflow to the reservoir, while the average for that period is 101,200 acre-feet. Extremely low reservoir inflows continued through August and September, with the total inflow to Ruedi Reservoir during water year 2002 being just 39 percent of average.

IV. REPORT ON OPERATIONS DURING WATER YEAR 2002

A. Ruedi Reservoir

On October 1, 2001, Ruedi Reservoir's content was 78,200 acre-feet, or approximately 83 percent of average for that date. With the cessation of releases to benefit the endangered fish in the 15-Mile Reach of the Colorado River for the 2001 calendar year, Ruedi releases were decreased to approximately 105 cfs on October 10th. The 105 cfs release rate was maintained until early December, when it became evident that reservoir inflow for the winter was going to be well below average, and the releases were reduced to about 58 cfs. As the reservoir inflow continued to remain low, releases were further reduced to the minimum flow level of 39 cfs by early January. Reservoir releases remained at this low level until about mid-April, when the Cameo call came on and all inflow had to be bypassed. The low winter releases allowed the reservoir to maintain a March 31 content of about 62,500 acre-feet, or 101 percent of average for that date.

By May 1, the snowpack in the Fryingpan River basin had dropped to 27 percent of average, and it became clear that Ruedi would not fill. Once the Cameo call came off on May 7, releases were reduced to the minimum allowable in order to

store as much of the spring runoff as possible. Even with Ruedi Reservoir releases being maintained at the minimum allowable, the reservoir fell approximately 24,500 acre-feet short of filling by June 24, when it ceased to be in priority to store. The water year's maximum storage content was attained on June 24, 2002, at approximately 77,800 acre-feet (water surface elevation 7739.17 feet).

Due to the warm and dry conditions, curbs were placed by senior water right holders on the Colorado River at the Cameo gauge throughout the irrigation season. This resulted in contract releases from Ruedi Reservoir of 469 acre-feet in July, 820 acre-feet in August, and 556 acre-feet in September (see Table 1). There were also 625 acre-feet of out-of-priority project diversions through Boustead Tunnel during late April and early May which required replacement releases from Ruedi Reservoir.

Ruedi Reservoir is one of the participating reservoirs in the Coordinated Reservoir Operations (CRO) effort of the Upper Colorado River Endangered Fish Recovery Program (RIP). The effort is directed at augmenting peak flows in the 15-Mile Reach of the Colorado River to benefit habitat improvement and spawning for two of the endangered Colorado River fishes. The 15-Mile Reach is the 15-mile stretch of the Colorado River above the confluence with the Gunnison River in Grand Valley.

Due to the extremely low snowpack conditions in the Upper Colorado River Basin, water supply forecasts indicated that none of the CRO participating reservoirs was likely to fill. In addition, it was unlikely that the natural peak could be sufficiently augmented to achieve the minimum peak threshold established by the Fish and Wildlife Service. For these reasons, the CRO effort was cancelled for water year 2002.

Ruedi Reservoir has 5,000 acre-feet firm and 5,000 acre-feet of water four out of five years through re-regulation obligated for release to assist with recovery of the endangered Colorado River fishes. In water year 2002, Reclamation contracted with the Colorado Water Conservation Board to provide an additional 10,825 acre-feet of water to the Fish and Wildlife Service to assist in meeting target flows in the 15-Mile Reach. However, Ruedi's extremely low storage content this year was deemed insufficient to make the four-out-of-five-years 5,000 acre-feet available to the endangered fish. Therefore, the water available from Ruedi to support the target flows in the 15-Mile Reach was limited to 15,825 acre-feet, 5,000 acre-feet from the firm fish pool and the 10,825 acre-feet of mitigation water.

Recognizing the extremely dry conditions, the Fish and Wildlife Service set the mean monthly target flow for the 15-Mile Reach at 150 cfs. As the summer continued warm and dry, it was clear that the limited flow augmentation supply would be insufficient to maintain the 150 cfs target throughout the summer, and

the target flow was reduced to 85 cfs on July 17. Releases from Ruedi for endangered fish began on June 24 and continued through September 20 at rates varying between 25 cfs and 100 cfs, depending on the flow conditions in the 15-Mile Reach of the Colorado River. The releases were terminated on September 20 for the remainder of the irrigation year due to significant precipitation and runoff in the basin. The 5,000 acre-feet of water in the fish pool were exhausted by July 29, and 5,975 acre-feet of the 10,825 acre-feet of mitigation water were released by September 20. Of the total 15,825 acre-feet available to support the endangered fish target flows, 10,975 acre-feet were released for the year.

During 2002, drawdown limitations were placed on Green Mountain Reservoir due to landslide concerns, effectively "stranding" 20,000 acre-feet of water in the reservoir. This unavailability of water was partially mitigated through a lease, making up to 10,000 acre-feet of Ruedi Reservoir water available to Green Mountain Reservoir beneficiaries. Of the 10,000 acre-feet made available through this lease, a total of 8,894 acre-feet was released between August 24 and September 30, at a rate of up to 255 cfs (see Table 1).

In addition, due to the extremely dry conditions in 2002, a 100 percent shortage was declared for Green Mountain contractors. In an effort to meet the critical needs of the Green Mountain contractors, an agreement was made with the Colorado River Water Conservation District to make contracted-for but unused Ruedi Reservoir water available. Under this agreement, 6,475 acre-feet of Ruedi Reservoir water were made available either directly or by exchange with Wolford Mountain Reservoir. Of this amount, 5,232 acre-feet were released from Ruedi Reservoir between July 16 and September 30 (see Table 1).

Due to the reservoir falling approximately 24,500 acre-feet short of filling, significant releases to meet the endangered fish targets, and the additional draw on the reservoir used to mitigate the hydrologic and operational shortages at Green Mountain Reservoir, Ruedi Reservoir finished the water year with a content of 47,825 acre-feet on September 30. This end-of-year storage represents 51 percent of average and is at an elevation of about 7697.75 feet. Even with the additional draw on the reservoir, with the exception of an 11-day period during late August/early September, flows in the Fryingpan River were maintained below 300 cfs throughout the irrigation/flow augmentation season.

Exhibits 1 and 2 show the precipitation and pan evaporation at Meredith, Colorado, near Ruedi Reservoir. Table 2 and Exhibit 3 depict the monthly operation of the reservoir during water year 2002.

B. West Slope Collection System and Project Diversions

The import of project water through the Boustead Tunnel began on April 14, 2002, and concluded on June 17, 2002. The daily discharge record for the diversion structures is included as Appendix D. A total of 13,188 acre-feet was imported during the 2002 water year, which was 20 percent of average. There were 1,262 acre-feet of Busk-Ivanhoe water imported through the Boustead Tunnel. The maximum mean daily import was 433 cfs on May 31, 2002. The most probable forecasts for the first of February, March, April, and May were 46,800 acre-feet, 42,600 acre-feet, 34,500 acre-feet, and 17,500 acre-feet, respectively.

The total imports for the water year, the accumulated imports to the Arkansas River, the water used for the Twin Lakes Reservoir and Canal Company exchange, and the import water available for allocations by the Southeastern Colorado Water Conservancy District, are shown on Table 5. The 31 years of accumulated imports total 1,500,700 acre-feet, for an average of 48,410 acre-feet per year. A plot of the Boustead Tunnel imports during water year 2002 is shown on Exhibit 5.

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

The Bureau of Reclamation is obligated to maintain minimum streamflows 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 (Company). On October 1, 2001, the Company began bypassing water into the Roaring Fork River on the West Slope in exchange for project water stored in Twin Lakes on the East Slope. The exchange was performed per the operating criteria as shown in Appendix C. The total amount of the exchange at Twin Lakes Reservoir was 1,484 acre-feet. The monthly summary of the exchange is also shown in Appendix C.

D. Turquoise Lake

On September 30, 2001, there were 108,786 acre-feet (elevation 9857.58 feet) of water stored in Turquoise Lake, which was 112 percent of average. Releases to Twin Lakes through the Mt. Elbert Conduit drafted Turquoise Lake to 55,978 acre-feet (elevation 9823.27 feet), the lowest storage of the water year, by March 22, 2002. There were 58,846 acre-feet (elevation 9825.40 feet) of water in storage at the end of the water year, which was 60 percent of average.

Homestake Tunnel imports totaled 26,247 acre-feet during the water year and were 106 percent of average. Busk-Ivanhoe imports totaled 2,612 acre-feet, which were 49 percent of average, and were divided equally between the Pueblo Board

of Water Works and the City of Aurora. Project water imports through the Boustead Tunnel totaled 13,188 acre-feet and were 26 percent of average.

Exhibits 8 and 9 show the precipitation and pan evaporation at Turquoise Lake. Exhibits 5, 6, and 7 show the monthly imports through the Boustead, Homestake, and Busk-Ivanhoe Tunnels, respectively. Table 6 and Exhibit 10 depict the monthly operation of Turquoise Lake during the 2002 water year.

E. Mt. Elbert Conduit/Halfmoon Creek Diversion

During water year 2002, 95,004 acre-feet of water released from Turquoise Lake and 3,376 acre-feet of water diverted from Halfmoon Creek were conveyed through the Mt. Elbert Conduit to the Mt. Elbert Forebay, and subsequently to Twin Lakes through the Mt. Elbert Powerplant. An additional 3,620 acre-feet of water were released into the conduit from Turquoise Lake for use by the Leadville Federal Fish Hatchery. The water delivered to the hatchery was returned to the Arkansas River and stored in Pueblo Reservoir.

F. Twin Lakes/Mt. Elbert Forebay and Mt. Elbert Pumped-Storage Powerplant

The storage in Twin Lakes was 116,666 acre-feet (elevation 9190.55 feet) on September 30, 2001. The combined storage of Twin Lakes and the Mt. Elbert Forebay was 124,075 acre-feet. Twin Lakes releases to Lake Creek were made throughout the winter to pass the entire flow of the Mt. Elbert Conduit, and to transfer the Project water stored in the reservoir to Pueblo Reservoir. The native inflow was stored in the Twin Lakes Reservoir and Canal Company storage space from November 15 through March 15. A total of 24,446 acre-feet of Project water was released to Lake Creek. This water was released such that the flow in the Arkansas River at the Wellsville gage was maintained as close to the average October 15 to November 15 trout-spawning flow as practically possible. The combined reservoir and forebay storage reached a low point of 103,056 acre-feet on August 20, 2002, and was at its high point at the beginning of the water year, October 1, 2002. Due to the extreme drought conditions experienced this year, Reclamation was not able to maintain the Arkansas River at Wellsville flow at the historical 700 cfs level. However, Reclamation was able to maintain the river at 250 cfs to reduce the water temperature for the fishery and also to provide limited rafting. A total of 750 cfs was released between July 18 and August 13.

At least one generating/pumping unit was available at the Mt. Elbert Powerplant throughout the 2002 water year. The capacity of one unit is greater than the capacity of the Mt. Elbert Conduit. A total of 365,379 megawatt-hours of energy was generated at the powerplant, with 829,551 acre-feet of water; 98,849 acre-feet came through the Mt. Elbert Conduit; and the remaining 743,961 acre-feet were first pumped to the Mt. Elbert Forebay from Twin Lakes during off-peak

electric demand hours. Table 8 depicts the monthly powerplant operation for the 2002 water year.

G. Pueblo Reservoir

The storage content of Pueblo Reservoir was 98,800 acre-feet (elevation 4834.92 feet) on September 30, 2001, which was 72 percent of average. Project water released from Turquoise Lake, through the Leadville Federal Fish Hatchery, and from Twin Lakes, was stored in Pueblo Reservoir through the winter and spring. A total of 38,702 acre-feet of native inflow was stored in the reservoir under the Winter Water Storage Program from November 15, 2001, through March 14, 2002. Of that 38,702 acre-feet of winter water stored, 36,255 acre-feet were released upon request, and 2,001 acre-feet evaporated. A total of 446 acre-feet was carried over to the next water year. The reservoir reached a high point in storage of 146,618 acre-feet (elevation 4826.27 feet) on March 17, 2002. There were 78,076 acre-feet (elevation 4826.27) in storage on September 30, 2002. This was 57 percent of average, and 178,873 acre-feet less than a full conservation pool.

Table 9 and Exhibit 20 depict Pueblo Reservoir monthly operations during the 2002 water year. The 2001-2002 winter water storage is shown on Exhibit 17, and the winter water releases are shown on Exhibit 18. The pan evaporation at the reservoir is shown on Exhibit 19.

H. Storage Contracts

There were eight contracts for storage of non-project water in project storage space on the East Slope in effect in water year 2002. Six of those were long-term contracts: the Twin Lakes Reservoir and Canal Company for 54,452 acre-feet; the City of Colorado Springs for 17,416 acre-feet; the City of Aurora for 5,000 acre-feet; the Pueblo Board of Water Works for 5,000 acre-feet; Busk-Ivanhoe, Inc., for 10,000 acre-feet; and the Homestake Project for 30,000 acre-feet. The remaining contracts were interim one-year contracts for "if-and-when" storage space. Under "if-and-when" contracts, non-project water may be stored in project storage space as long as that storage space is not required for project water.

I. Project Water Sales and Deliveries

The Project made available 8,500 acre-feet of water to the Southeastern Colorado Water Conservancy District (District) during water year 2002. The District purchased 8,659 acre-feet and called for 28,551 acre-feet of project and project carryover water during the year. Evaporation reduced the project water in storage by 6,581 acre-feet. By the end of the water year (September 30, 2002), the District had 5,473 acre-feet of 2002 allocated water and 59,201 acre-feet of carryover water remaining in storage. Of the 28,551 acre-feet of project water released, 16,061 acre-feet were for municipal and industrial use, and 12,489 acre-

feet were for irrigation. The monthly release of project water from Pueblo Reservoir is shown on Exhibit 21.

J. Reservoir Storage Allocation Data

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

K. Reservoir Evaporation and Precipitation

Tables 12 and 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. It is assumed that there is no evaporation from a reservoir water surface when the reservoir is completely covered by ice.

L. Flood Control Benefits

The operation of Pueblo Reservoir did not prevent any flood damage in the Arkansas River basin in water year 2002.

The Corps of Engineers estimated that the operation of Ruedi Reservoir, the Boustead Tunnel, and Turquoise Lake did not prevent any flood damage in the Colorado River basin. Table 14 shows the historic flood control benefits provided by Pueblo and Ruedi Dams.

Ruedi Reservoir Contract/Lease Releases
Water Year 2002
Unit: Acre-Feet

Table 1

Month	Water Released for Ruedi Contractors	Contracted for but Unused Water for Green Mountain Contractors	Leased Water to Mitigate for "Stranded" Water in Green Mountain Reservoir
Oct	13		
Nov			
Dec			
Jan			
Feb			
Mar			
Apr			
May			
Jun			
Jul	469	1232	
Aug	820	4000	3131
Sep	556	0	5763
Total	1858	5232	8894

Table 2

Ruedi Reservoir
Water Year 2002 Operations
Unit: 1,000 Acre-Feet

Year	Month	Inflow	Evaporation	Outflow	End of month content	Water surface elevation (FEET)
2001	Sep				78.2	7739.60
	Oct	2.8	0.1	8.5	72.5	7732.61
	Nov	2.3	0	6.2	68.6	7727.63
	Dec	1.8	0	4.0	66.3	7724.67
2002	Jan	1.1	0	2.4	65.0	7722.94
	Feb	0.7	0	2.0	63.7	7721.18
	Mar	1.1	0	2.3	62.5	7719.57
	Apr	7.7	0	3.2	67.0	7725.55
	May	13.4	0.2	7.7	72.5	7732.69
	Jun	11.7	0.5	7.0	76.7	7737.85
	Jul	3.6	0.3	11.3	68.6	7727.75
	Aug	1.5	0.2	14.0	55.9	7710.14
	Sep	2.8	0.1	10.8	47.8	7697.75
Total		50.5	1.4	79.4		

FRYINGPAN-ARKANSAS PROJECT
 RUEDI RESERVOIR
 RELEASES FOR ENDANGERED FISH
 WATER YEAR 2002
 June-02

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? (1= YES) (0= NO)	REQUIRED MIN FLOW BELOW RUEDI w/o FISH REL (CFS)	ENDANGERED FISH RELEASE (CFS)	CUMULATIVE FISH RELEASE (AC-FT)	PALISADE GAGE (CFS)
SAT	6/1/2002	7,733.23	72949	292	7.79	66	53	119	0	110	0	0	2,610
SUN	6/2/2002	7,733.71	73335	254	7.34	52	69	121	0	110	0	0	2,780
MON	6/3/2002	7,734.12	73666	222	9.10	46	75	121	0	110	0	0	2,640
TUE	6/4/2002	7,734.56	74020	240	6.42	55	67	122	0	110	0	0	2,340
WED	6/5/2002	7,734.80	74214	210	4.54	108	13	121	0	110	0	0	1,820
THU	6/6/2002	7,735.20	74540	276	3.84	108	13	121	0	110	0	0	1,470
FRI	6/7/2002	7,735.61	74874	289	12.01	109	12	121	0	110	0	0	1,380
SAT	6/8/2002	7,736.02	75210	289	12.05	108	12	120	0	110	0	0	1,490
SUN	6/9/2002	7,736.41	75530	282	12.08	108	11	119	0	110	0	0	1,500
MON	6/10/2002	7,736.75	75809	256	6.54	109	10	119	0	110	0	0	1,490
TUE	6/11/2002	7,737.10	76099	261	6.80	108	10	118	0	110	0	0	1,400
WED	6/12/2002	7,737.42	76363	254	13.62	107	10	117	0	110	0	0	1,110
THU	6/13/2002	7,737.71	76603	235	6.34	107	9	117	0	110	0	0	951
FRI	6/14/2002	7,737.96	76810	219	7.33	107	9	116	0	110	0	0	728
SAT	6/15/2002	7,738.18	76993	207	7.34	107	9	116	0	110	0	0	571
SUN	6/16/2002	7,738.34	77127	182	7.35	108	8	116	0	110	0	0	484
MON	6/17/2002	7,738.50	77260	187	10.54	110	8	117	0	110	0	0	471
TUE	6/18/2002	7,738.63	77368	174	9.07	111	7	118	0	110	0	0	415
WED	6/19/2002	7,738.74	77461	168	10.56	111	7	118	0	110	0	0	330
THU	6/20/2002	7,738.83	77531	153	7.37	111	7	118	0	110	0	0	267
FRI	6/21/2002	7,738.89	77586	146	7.37	111	7	118	0	110	0	0	212
SAT	6/22/2002	7,738.96	77638	146	7.38	112	6	118	0	110	0	0	187
SUN	6/23/2002	7,739.00	77674	136	7.38	111	6	116	0	110	0	0	196
MON	6/24/2002	7,739.02	77693	136	5.17	121	5	126	0	110	15	30	185
TUE	6/25/2002	7,738.88	77578	122	4.67	175	5	180	1	130	50	129	160
WED	6/26/2002	7,738.66	77388	130	6.62	219	5	224	1	138	50	228	148
THU	6/27/2002	7,738.41	77182	94	10.04	188	5	193	1	102	50	327	166
FRI	6/28/2002	7,738.19	77701	108	11.01	188	5	193	1	116	50	426	206
SAT	6/29/2002	7,737.95	76804	99	11.23	188	5	193	1	107	50	526	188
SUN	6/30/2002	7,737.72	76607	99	10.73	188	5	192	1	107	50	625	153
Averages		7,737.25	76230	196	8.32	119	16	134			11		935
Totals (acft)				11638	495	7052	937	7989			625	625	55,633

NOTES: Releases to support Recovery Program 15 Mile Reach target flows began on Monday, June 24.

FRYINGPAN-ARKANSAS PROJECT
 RUEDI RESERVOIR
 RELEASES FOR ENDANGERED FISH
 WATER YEAR 2002
 July-02

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? (1= YES) (0= NO)	REQUIRED MIN FLOW BELOW RUEDI w/o FISH REL (CFS)	ENDANGERED FISH RELEASE (CFS)	CUMULATIVE FISH RELEASE (AC-FT)	PALISADE GAGE (CFS)
MON	7/1/2002	7,737.59	76503	89	9.25	188	5	192	1	102	50	724	215
TUE	7/2/2002	7,737.31	76274	80	7.53	188	5	192	1	92	50	823	290
WED	7/3/2002	7,737.06	76066	84	0.00	189	4	192	1	95	50	922	169
THU	7/4/2002	7,736.84	75885	101	3.15	189	4	193	1	112	50	1021	151
FRI	7/5/2002	7,736.67	75745	121	3.15	189	4	192	1	133	50	1121	173
SAT	7/6/2002	7,736.46	75572	105	3.14	188	4	193	1	116	50	1220	491
SUN	7/7/2002	7,736.22	75378	90	0.05	188	6	193	1	103	50	1319	497
MON	7/8/2002	7,735.99	75188	89	0.00	185	8	193	1	105	50	1418	379
TUE	7/9/2002	7,735.71	74958	78	3.26	190	3	194	1	89	50	1517	287
WED	7/10/2002	7,735.41	74713	74	7.19	190	3	193	1	85	50	1617	255
THU	7/11/2002	7,735.11	74469	68	7.42	184	3	188	1	79	50	1716	217
FRI	7/12/2002	7,734.79	74209	55	9.55	176	3	179	1	65	75	1864	110
SAT	7/13/2002	7,734.45	73931	31	9.53	161	3	164	1	41	100	2063	70
SUN	7/14/2002	7,734.05	73613	61	9.51	212	3	215	1	72	100	2261	85
MON	7/15/2002	7,733.84	73442	46	8.30	124	3	126	1	56	100	2460	76
TUE	7/16/2002	7,733.34	73040	12	5.35	209	2	211	1	22	100	2658	79
WED	7/17/2002	7,732.96	72735	60	4.95	209	2	211	1	70	100	2856	85
THU	7/18/2002	7,732.52	72383	38	6.57	209	2	212	1	48	100	3055	89
FRI	7/19/2002	7,732.08	72033	36	3.01	209	2	212	1	46	100	3253	111
SAT	7/20/2002	7,731.64	71683	40	6.53	209	2	211	1	49	100	3451	88
SUN	7/21/2002	7,731.20	71335	37	3.02	209	2	211	1	46	100	3650	89
MON	7/22/2002	7,730.75	70980	33	2.78	209	2	211	1	43	100	3848	108
TUE	7/23/2002	7,730.30	70626	31	0.59	209	2	211	1	41	100	4046	88
WED	7/24/2002	7,729.86	70281	41	5.52	209	2	211	1	51	100	4245	85
THU	7/25/2002	7,729.40	69922	28	0.00	209	2	211	1	38	100	4443	86
FRI	7/26/2002	7,729.04	69642	67	7.54	200	2	203	1	77	90	4621	92
SAT	7/27/2002	7,728.74	69410	40	7.75	149	2	151	1	50	75	4770	116
SUN	7/28/2002	7,728.48	69205	40	7.74	135	2	137	1	49	75	4919	114
MON	7/29/2002	7,728.24	69020	49	7.72	135	2	137	1	59	75	5068	95
TUE	7/30/2002	7,727.98	68819	39	5.21	135	2	137	1	48	75	5217	102
WED	7/31/2002	7,727.70	68604	35	8.60	135	2	137	1	44	75	5365	100
Averages		7,732.96	72763	58	5.29	185	3	188			77		161
Totals (acft)				3564	325	11351	186	11537			4741	5365	9,902

NOTES: The 5,000 acre-foot firm fish pool was released as of Monday, July 29.

FRYINGPAN-ARKANSAS PROJECT
 RUEDI RESERVOIR
 RELEASES FOR ENDANGERED FISH
 WATER YEAR 2002
 August-02

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? (1= YES) (0= NO)	REQUIRED MIN FLOW BELOW RUEDI w/o FISH REL (CFS)	ENDANGERED FISH RELEASE (CFS)	CUMULATIVE FISH RELEASE (AC-FT)	PALISADE GAGE (CFS)
THU	8/1/2002	7,727.44	68404	36	1.58	135	2	137	1	51	75	5514	73
FRI	8/2/2002	7,727.00	68067	12	1.12	180	2	183	1	27	75	5663	81
SAT	8/3/2002	7,726.58	67746	48	1.12	209	2	211	1	63	75	5812	90
SUN	8/4/2002	7,726.14	67412	39	0.00	208	2	210	1	55	75	5960	94
MON	8/5/2002	7,725.68	67063	37	4.19	209	2	211	1	52	75	6109	104
TUE	8/6/2002	7,725.30	66776	66	1.87	209	2	211	1	82	75	6258	349
WED	8/7/2002	7,724.87	66452	50	4.45	209	2	211	1	66	75	6407	290
THU	8/8/2002	7,724.48	66159	65	3.31	210	2	212	1	81	75	6555	226
FRI	8/9/2002	7,724.05	65837	50	3.30	209	2	211	1	65	75	6704	269
SAT	8/10/2002	7,723.58	65486	35	3.29	209	2	211	1	50	75	6853	264
SUN	8/11/2002	7,723.10	65129	32	3.50	209	2	211	1	48	75	7002	124
MON	8/12/2002	7,722.58	64743	19	4.14	209	2	211	1	34	75	7150	99
TUE	8/13/2002	7,722.08	64374	29	4.56	210	2	212	1	44	75	7299	87
WED	8/14/2002	7,721.57	63998	27	4.76	211	2	213	1	42	75	7448	78
THU	8/15/2002	7,721.06	63623	30	7.98	211	2	213	1	46	75	7597	76
FRI	8/16/2002	7,720.54	63242	26	7.95	210	2	212	1	41	75	7745	74
SAT	8/17/2002	7,719.98	62834	12	7.93	210	2	212	1	27	75	7894	72
SUN	8/18/2002	7,719.46	62456	28	8.32	210	2	212	1	43	75	8043	66
MON	8/19/2002	7,718.96	62094	34	7.45	210	2	211	1	50	75	8192	58
TUE	8/20/2002	7,718.46	61733	28	0.00	210	2	212	1	43	75	8341	61
WED	8/21/2002	7,717.95	61366	24	0.00	209	2	211	1	39	75	8489	104
THU	8/22/2002	7,717.42	60993	27	3.16	212	2	214	1	42	75	8638	122
FRI	8/23/2002	7,716.85	60586	40	3.15	242	2	244	1	55	75	8787	124
SAT	8/24/2002	7,716.04	60002	41	3.13	332	2	333	1	55	75	8936	101
SUN	8/25/2002	7,715.21	59422	40	2.37	330	2	332	1	55	75	9084	79
MON	8/26/2002	7,714.37	58832	35	3.51	329	2	331	1	50	50	9184	75
TUE	8/27/2002	7,713.51	58230	30	4.31	329	2	330	1	45	25	9233	73
WED	8/28/2002	7,712.65	57632	30	4.08	327	2	329	1	45	25	9283	71
THU	8/29/2002	7,711.79	57037	28	3.04	324	1	326	1	42	25	9332	68
FRI	8/30/2002	7,710.94	56453	30	3.02	321	1	323	1	45	25	9382	64
SAT	8/31/2002	7,710.08	55865	28	3.00	322	1	323	1	43	25	9431	61
Averages		7,719.99	62905	34	3.66	238	2	239			66		115
Totals (acft)				2095	225	14609	112	14721			4066	9431	7,095

FRYINGPAN-ARKANSAS PROJECT
 RUEDI RESERVOIR
 RELEASES FOR ENDANGERED FISH
 WATER YEAR 2002
 September-02

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? (1= YES) (0= NO)	REQUIRED MIN FLOW BELOW RUEDI w/o FISH REL (CFS)	ENDANGERED FISH RELEASE (CFS)	CUMULATIVE FISH RELEASE (AC-FT)	PALISADE GAGE (CFS)
SUN	9/1/2002	7,709.31	55340	42	2.99	323	1	325	1	53	25	9481	60
MON	9/2/2002	7,708.46	54765	42	2.97	328	1	330	1	52	25	9531	61
TUE	9/3/2002	7,707.61	54193	37	3.35	322	1	324	1	48	25	9580	60
WED	9/4/2002	7,706.83	53672	37	3.92	296	1	297	1	48	25	9630	59
THU	9/5/2002	7,706.03	53139	26	2.73	292	2	293	1	37	25	9679	62
FRI	9/6/2002	7,705.22	52604	25	2.72	292	2	294	1	36	25	9729	74
SAT	9/7/2002	7,704.43	52084	33	2.70	292	2	294	1	44	25	9779	80
SUN	9/8/2002	7,703.63	51561	30	1.32	292	2	294	1	41	25	9828	109
MON	9/9/2002	7,702.85	51055	38	1.02	292	2	294	1	49	25	9878	100
TUE	9/10/2002	7,702.11	50577	53	1.61	292	2	294	1	64	25	9927	106
WED	9/11/2002	7,701.47	50167	49	2.29	253	1	255	1	60	25	9977	120
THU	9/12/2002	7,701.11	49937	74	1.79	189	1	190	1	85	48	10071	249
FRI	9/13/2002	7,700.81	49746	42	2.62	135	1	136	1	52	75	10220	277
SAT	9/14/2002	7,700.57	49594	61	2.61	135	1	136	1	71	62	10344	351
SUN	9/15/2002	7,700.29	49417	47	1.14	135	1	136	1	57	75	10492	341
MON	9/16/2002	7,700.00	49233	43	0.49	135	1	136	1	54	75	10641	278
TUE	9/17/2002	7,699.72	49057	46	0.00	135	1	136	1	57	75	10790	240
WED	9/18/2002	7,699.44	48881	48	1.13	136	1	137	1	59	75	10939	363
THU	9/19/2002	7,699.45	48887	140	2.03	135	1	137	1	151	0	10939	489
FRI	9/20/2002	7,699.35	48824	75	2.03	105	1	105	1	85	18	10975	490
SAT	9/21/2002	7,699.39	48849	78	2.03	64	1	64	1	88	0	10975	477
SUN	9/22/2002	7,699.41	48862	88	2.59	79	1	80	1	98	0	10975	311
MON	9/23/2002	7,699.19	48724	70	1.66	138	1	139	1	80	0	10975	267
TUE	9/24/2002	7,698.94	48569	61	2.03	137	1	138	1	71	0	10975	233
WED	9/25/2002	7,698.59	48350	55	0.18	165	1	166	1	65	0	10975	191
THU	9/26/2002	7,698.33	48188	110	0.73	191	1	192	1	121	0	10975	170
FRI	9/27/2002	7,698.13	48063	114	0.73	177	1	178	1	125	0	10975	146
SAT	9/28/2002	7,697.99	47976	94	0.73	137	1	138	1	104	0	10975	281
SUN	9/29/2002	7,697.85	47889	94	0.08	138	1	139	1	104	0	10975	466
MON	9/30/2002	7,697.75	47827	96	1.64	126	1	127	1	107	0	10975	715
Averages		7,701.48	50201	62	1.80	196	1	197			26		241
Totals (acft)				3667	107	11638	74	11711			1543	10975	14,333

NOTES: Releases of water to support 15 Mile Reach target flows ceased on 9/20. A total of 10,975 acre feet were released to support Recovery Program target flows in the 15 Mile Reach.

Table 4

Fryingpan-Arkansas Project
Transmountain Diversions
Water Year 2002
Unit: Acre-Feet

Diversion	Apr	May	Jun	Jul	Aug	Sep	Total
No Name							1,123
Hunter	48	1,075					298
Sawyer	2	296					1,670
Midway	6	1,085	579				2,832
Chapman'		920	1,912				1,397
South Fork		1,121	276				
Subtotal	56	4,497	2,767				7,320
Carter		270	149				419
North Fork							463
Mormon	36	262	165				419
N. Cunningham ²	12	357	50				73
M. Cunningham		73					145
Ivanhoe	8	137					
Lily Pad							
Granite							
Fryingpan	48	1,498	1,053				2,599
Subtotal	104	2,597	1,417				4,118
Total	160	7,094	4,184				11,438
Charles H. Boustead Tunnel ³	205	8,654	4,328				13,187

Does not include No Name, Hunter, Sawyer and Midway

² Includes South Cunningham

³ The difference between total diversion and Charles H. Boustead Tunnel results from the accuracy limitations of the measurement

Table 5

Fryingpan-Arkansas Project Imports
 Charles H. Boustead Tunnel Outlet
 Unit: 1,000 Acre-feet

Year	Imports	Accumulated Imports	Twin Lakes Exchange	Available for Allocations
1972	32.0	32.0	0	0.0
1973	36.8	68.8	0	16.0
1974	34.1	102.9	0	18.6
1975	37.2	140.1	0	25.0
1976	26.9	167.0	0	24.0
1977	11.4	178.4	0	25.0
1978	49.2	227.6	0	25.0
1979	53.7	281.3	0	25.6
1980	55.7	337.0	0	70.0
1981	34.6	371.6	0	25.0
1982	75.2	446.8	2.7	68.0
1983	90.84	537.6	0.3	125.0
1984	110.15	647.7	1.9	210.0
1985	70.2	717.9	1.7	289.9
1986	30.3	748.2	1.5	300.3
1987	2.2	750.4	1.1	288.0
1988	13.4	763.8	2.0	247.8
1989	36.2	800.0	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	55.0
1996	36.9	1,226.7	1.8	110.0
1997	78.6	1,305.3	1.8	116.0
1998	51.3	1,356.6	2.6	102.0
1999	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

Restriction: Not to exceed 120,000 acre-feet in 1 year but not to exceed 2,352,800 acre-feet in 34 consecutive years.

⁴ Includes 3,120 acre-feet imported through Twin Lakes Tunnel

⁵ Includes 2,080 acre-feet imports through Boustead Tunnel in October and 420 acre-feet in November. All other years are water year totals.

Turquoise Lake
Water Year 2002 Operations
Unit: 1,000 Acre-Feet

Inflow

Year	Month	Busk-Ivanhoe Imports		Homestake Imports	Project Imports	Native Inflow	Total Inflow	Evap	Total Outflow	End of Month Content (FEET)	Water Surface Elevation
		Through Carlton	Through Boustead								
2001	Sep									106.5	9856.21
	Oct	0.1	0	1.1	0	0.2	1.4	0.3	2.7	104.8	9855.22
	Nov	0	0	3.7	0	0.8	4.5	0.2	6.9	102.2	9853.67
	Dec	0	0	0	0	0.9	0.9	0	13.3	89.7	9846.08
2002	Jan	0	0	0	0	1.1	1.1	0	14.5	76.3	9837.52
	Feb	0	0	0	0	0.8	0.8	0	12.7	64.4	9829.42
	Mar	0	0	5.3	0	1.3	6.6	0	13.6	57.4	9824.35
	Apr	0.1	0	10.6	0.2	2.2	13.0	0	10.5	60.0	9826.21
	May	1.4	0	0	8.7	4.2	14.3	0.5	1.7	72.1	9834.71
	Jun	1.0	0	0	4.3	2.8	8.1	0.8	1.7	77.6	9838.40
	Jul	0.1	0	0	0	0.9	1.0	0.6	1.5	76.5	9837.65
	Aug	0	0	3.0	0	0.8	3.8	0.6	7.7	72.0	9834.69
	Sep	0	0	2.6	0	1.3	3.9	0.3	16.8	58.8	9825.40
Subtotal		2.7	0								
Total		2.7		26.3	13.2	17.3	59.4	3.3	103.6		

Twin Lakes/Mt. Elbert Forebay
Water Year 2002 Operations
Unit: 1,000 Acre-Feet

Inflow

Year	Month	Twin Lakes Canal Company		Mt. Elbert Conduit Halfmoon	Project Water	Native Inflow	Total Inflow	Evap	Total Outflow	End of Month Content	Water Surface Elevation' (FEET)
		Imports	Other								
2001	Sep									124.1	9190.55
	Oct	0.4	0.9		1.7	1.5	4.5	0.5	10.4	117.3	9186.90
	Nov	0.5	0.2	0	6.3	0.5	7.5	0.2	11.3	113.2	9185.32
	Dec	0.2	0	0	12.6	0.4	13.2	0	15.9	109.7	9183.85
2002	Jan	0.1	0	0	14.0	0.4	14.5	0	14.3	108.8	9183.58
	Feb	0.1	0	0	12.3	0.8	13.2	0	12.9	107.7	9182.26
	Mar	0.1	0.5	0	13.1	0.1	13.8	0.1	11.6	108.4	9182.90
	Apr	1.1	0.6	0	10.0	1.6	13.3	0.3	12.6	108.1	9182.40
	May	9.6	3.4	1.3	0.5	9.6	24.4	1.0	16.3	111.9	9184.90
	Jun	7.7	4.8	2.0	0.5	10.0	25.0	1.4	8.4	122.2	9189.57
	Jul	0.1	0	0.1	0.5	3.0	3.7	1.1	13.4	111.4	9184.59
	Aug	0.1	0	0	7.1	2.1	9.3	1.1	15.2	104.5	9180.72
	Sep	0	0	0	<u>16.4</u>	0.5	16.9	0.6	10.2	110.7	9183.75
Subtotal		20.0	10.4	3.4	95.0						
Total		30.4		98.4		30.5	159.3	6.3	152.5		

⁶ Contents of both Twin Lakes and Mt. Elbert Forebay

⁷ Elevation of Twin Lakes

Table 8

Mt. Elbert Pumped-Storage Powerplant Operations
Water Year 2002

Year	Month	Mt. Elbert Conduit Inflow to Mt. Elbert Forebay (acre-ft)	Water Pumped from Twin Lakes to Mt. Elbert Forebay (acre-ft)	Water through Generator (acre-ft)	Megawatt- Hours Net Generation* (mWh)
2001	Oct	2,116	45,379	46,326	16,552
	Nov	6,430	73,728	79,395	29,049
	Dec	12,877	68,143	79,290	28,729
2002	Jan	14,043	62,718	75,943	27,475
	Feb	12,176	35,917	44,493	16,290
	Mar	12,990	47,948	59,511	21,698
	Apr	9,927	50,808	59,997	21,985
	May	1,676	66,558	69,425	25,735
	Jun	2,425	76,951	76,390	28,753
	Jul	640	95,265	95,386	35,566
	Aug	7,105	64,133	71,252	26,681
	Sep	16,444	56,413	72,143	26,866
Total		98,849	743,961	829,551	305,379

*Net Generation is gross plant generation less station service.

Pueblo Reservoir
Water Year 2002 Operations
Unit: 1,000 Acre-Feet

Inflow

Year	Month	Project Water	Other	Native	Total Inflow	Evapo-ration	Outflow	End of month content	Water surface elevation (FEET)
2001	Sep							96.6	4834.08
	Oct	0.3	2.6	13.3	16.2	0.8	19.6	92.4	4832.37
	Nov	1.6	2.5	17.1	21.2	0.4	14.5	98.7	4834.90
	Dec	6.0	2.4	19.0	27.4	0.4	9.0	116.8	4841.62
2002	Jan	6.0	2.5	15.6	24.1	0.3	9.3	131.3	4846.67
	Feb	4.7	2.6	12.2	19.5	0.4	8.3	142.1	4850.23
	Mar	2.3	3.1	13.3	18.7	0.9	14.2	145.8	4851.40
	Apr	2.5	2.3	7.7	12.5	1.8	18.6	137.8	4848.84
	May	0.5	5.4	11.0	16.9	2.1	33.1	119.5	4842.61
	Jun	0.3	4.2	12.7	17.2	2.5	32.8	101.5	4835.96
	Jul	0.4	3.4	8.7	12.5	2.0	27.5	84.5	4829.08
	Aug	0.8	3.7	4.1	8.6	1.7	11.0	80.2	4827.24
	Sep	0.6	1.4	5.5	7.5	1.2	8.5	78.1	4826.27
Subtotal		26.0	36.1	140.2					
Total					202.3	14.5	206.4		

Table 10

Fryingpan-Arkansas Project
Reservoir Storage Allocation Data
Unit: Acre-Feet

Reservoir	Dead	Inactive	Active conservation	Joint use	Flood control	Total capacity storage
Ruedi	63	1,095	101,278	0	0	102,373'
Turquoise	2,810	8,920	120,478	0	0	129,398'
Pueblo	2,329	28,121	228,828	66,000	26,991	349,9402
Twin Lakes	63,324	72,938	67,917	0	0	140,855
Mt. Elbert Forebay	561	3,825	7,318	0	0	11,143'

New area-capacity tables (1984)

² New area-capacity table (1994)

Note: Inactive includes dead storage

Fryingpan-Arkansas Project
Monthly Evaporation Factors

Meredith		Sugar Loaf	Twin Lakes	Pueblo
Month	Factor	Factor	Factor	Factor
Oct	1/	.220	.220	.247
Nov		.100	.100	.155
Dec		.030	.030	.133
Jan		.050	.050	.128
Feb		.080	.080	.173
Mar		.140	.140	.280
Apr		.233	.233	.308
May		.363	.363	-
Jun		.448	.448	-
Jul		.405	.405	-
Aug		.318	.318	-
Sep		.290	.290	-

Note: Factor is used when pan is not in operation. Factor divided by number of days in the month times reservoir area not covered by ice equals daily water surface evaporation in acre-feet.

1/ Factors have not been determined for Meredith. Factors from Twin Lakes are used for Meredith.

Table 12

Fryingpan-Arkansas Project
 Monthly Average vs. Current Water Year Evaporation
 (Unit = Inches)

Month	Meredith		Sugar Loaf		Twin Lakes		Pueblo	
	Ave Pan (In.)	WY 02	Ave Pan (In.)	WY 02	Ave Pan (In.)	WY 02	Ave Pan (In.)	WY 02
Oct	0.84	0.70	2.16	3.32	2.56	3.30	5.29	5.65
Nov	0	0	1.70	1.64	1.70	1.70	2.62	2.66
Dec	0	0	0.27	0.44	0.35	0.44	2.28	2.28
Jan	0.24	0	0	0	0	0	2.19	2.19
Feb	0	0	0	0	0	0	2.97	2.97
Mar	0	0	0	2.40	0.22	2.40	4.86	4.80
Apr	0.18	0	0.14	3.99	1.49	3.99	6.19	9.98
May	2.35	3.83	0.96	6.93	4.08	7.44	8.57	12.23
Jun	7.50	10.29	5.25	9.41	7.24	9.63	10.02	15.82
Jul	7.70	6.93	5.14	6.62	6.90	7.24	10.71	14.46
Aug	6.24	5.34	4.21	6.61	5.67	7.85	8.78	13.27
Sep	4.16	3.07	3.46	2.19	4.97	3.90	7.12	9.37

Table 13

Fryingpan-Arkansas Project
 Monthly Average Vs. Current Water Year Precipitation
 (Unit = Inches)

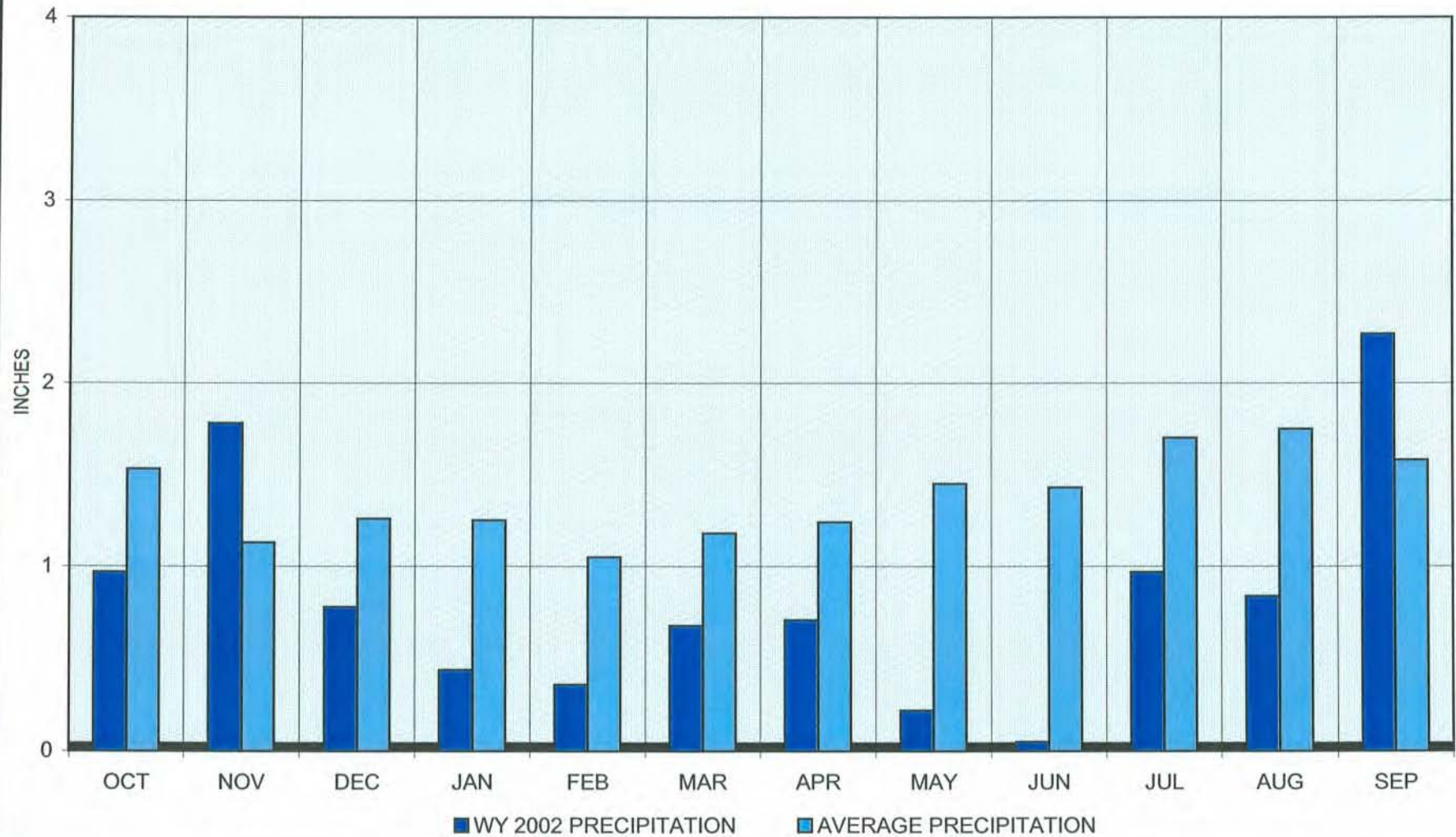
Month	Meredith		Sugar Loaf		Twin Lakes		Pueblo		Rocky Ford	
	Avg.	WY 02	Avg.	WY 02	Avg.	WY 02	Avg.	WY 02	Avg.	WY 02
Oct	1.53	0.97	1.01	0.34	0.67	0.12	0.99	0.12	0.78	0.02
Nov	1.13	1.78	1.30	1.09	0.52	0.25	0.91	0.39	0.45	0.68
Dec	1.26	0.78	1.29	0.69	0.51	0.22	0.52	0.22	0.33	0.42
Jan	1.25	0.44	1.50	0.62	0.40	0.16	0.39	0.35	0.26	0.31
Feb	1.05	0.36	1.23	0.99	0.48	0.31	0.34	0.13	0.29	0.14
Mar	1.18	0.68	1.46	0.82	0.72	0.59	0.72	0.07	0.64	0.09
Apr	1.24	0.71	1.40	0.28	0.78	0.11	0.94	0.09	1.31	0.14
May	1.45	0.22	1.33	0.06	0.96	0.26	1.39	0.36	1.84	0.08
Jun	1.43	0.05	1.14	0.22	0.85	0.29	1.43	0.21	1.38	0.66
Jul	1.70	0.97	1.98	2.00	1.49	1.26	2.12	0.75	1.95	0.06
Aug	1.75	0.84	1.98	0.83	1.51	0.66	1.92	0.35	1.52	0.49
Sep	1.58	2.27	1.32	2.17	0.93	1.21	1.04	0.73	0.92	0.64
Total	116.55	10.07	16.94	10.11	9.82	5.44	12.71	3.77	11.67	3.73
Max. Annual	26.70	(1984)	25.95	(1957)	17.27	(1952)	17.73	(1995)	22.75	(1999)

Table 14

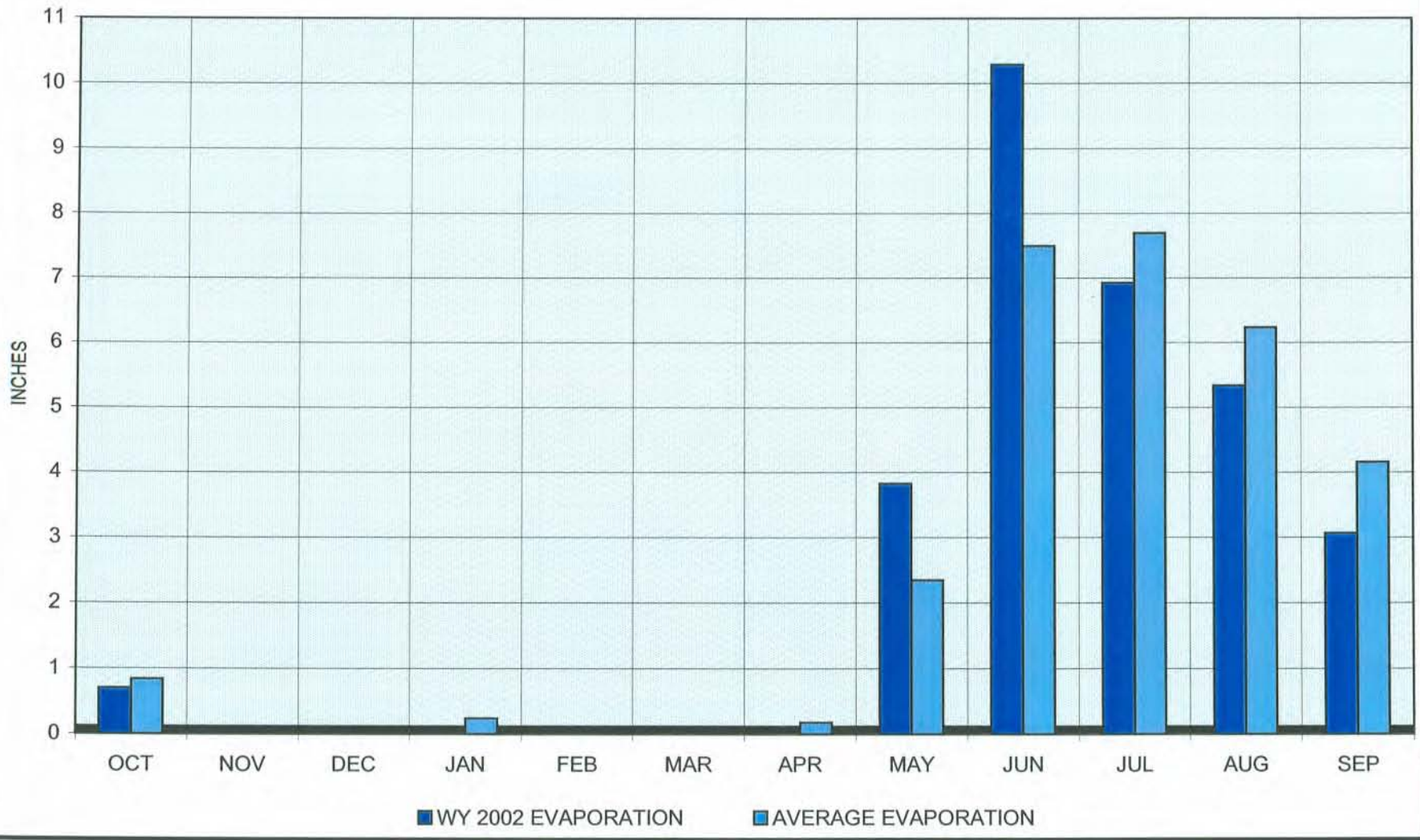
Fryingpan-Arkansas Project
Flood Control Benefits in Dollars

	Ruedi Reservoir		Pueblo Reservoir	
	Benefits	Accumulated Benefits	Benefits	Accumulated Benefits
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
2001	0	6,559,000	0	11,317,000
2002	0	6,559,000	0	11,317,000

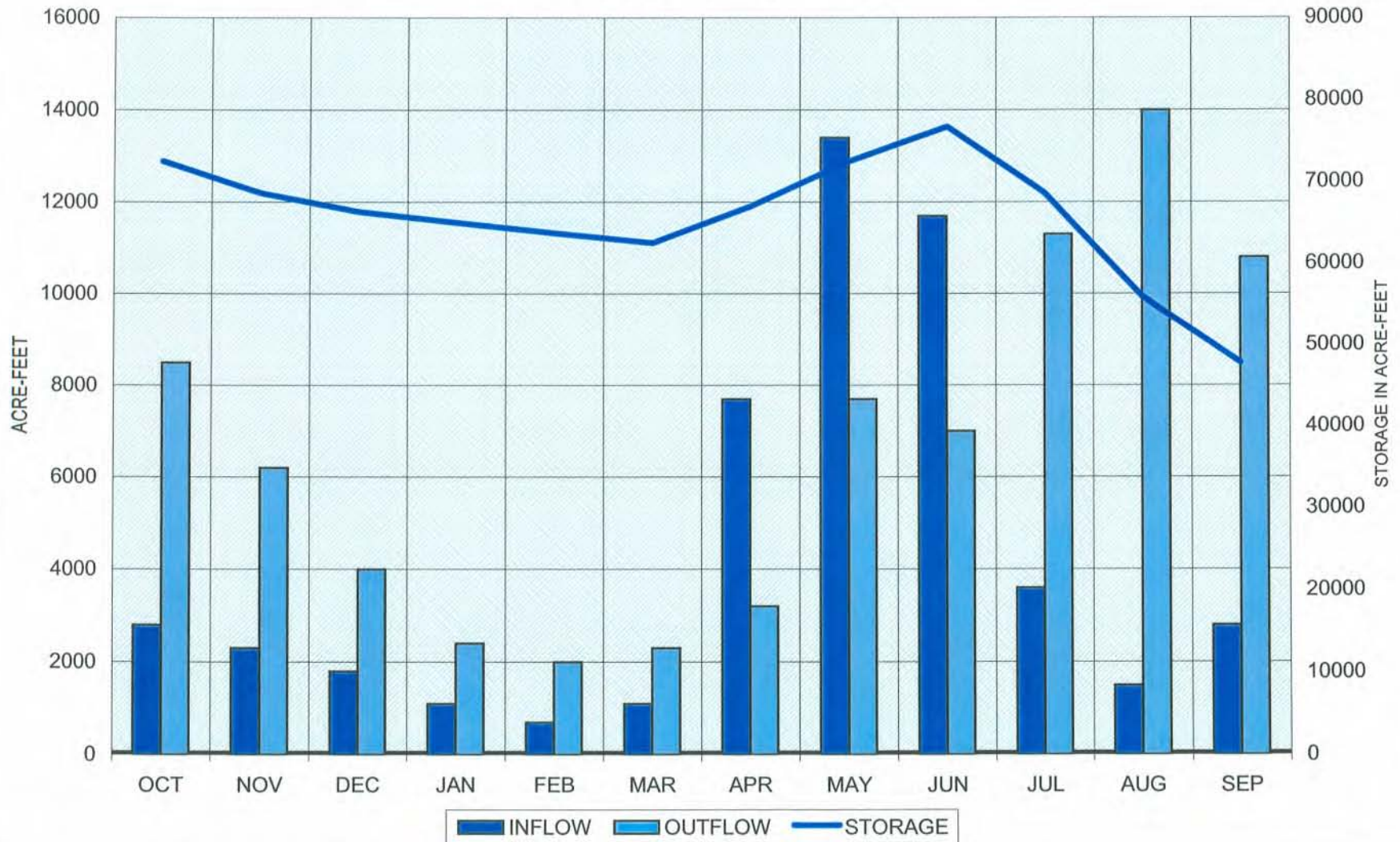
MONTHLY PRECIPITATION AT MEREDITH, CO WATER YEAR 2002



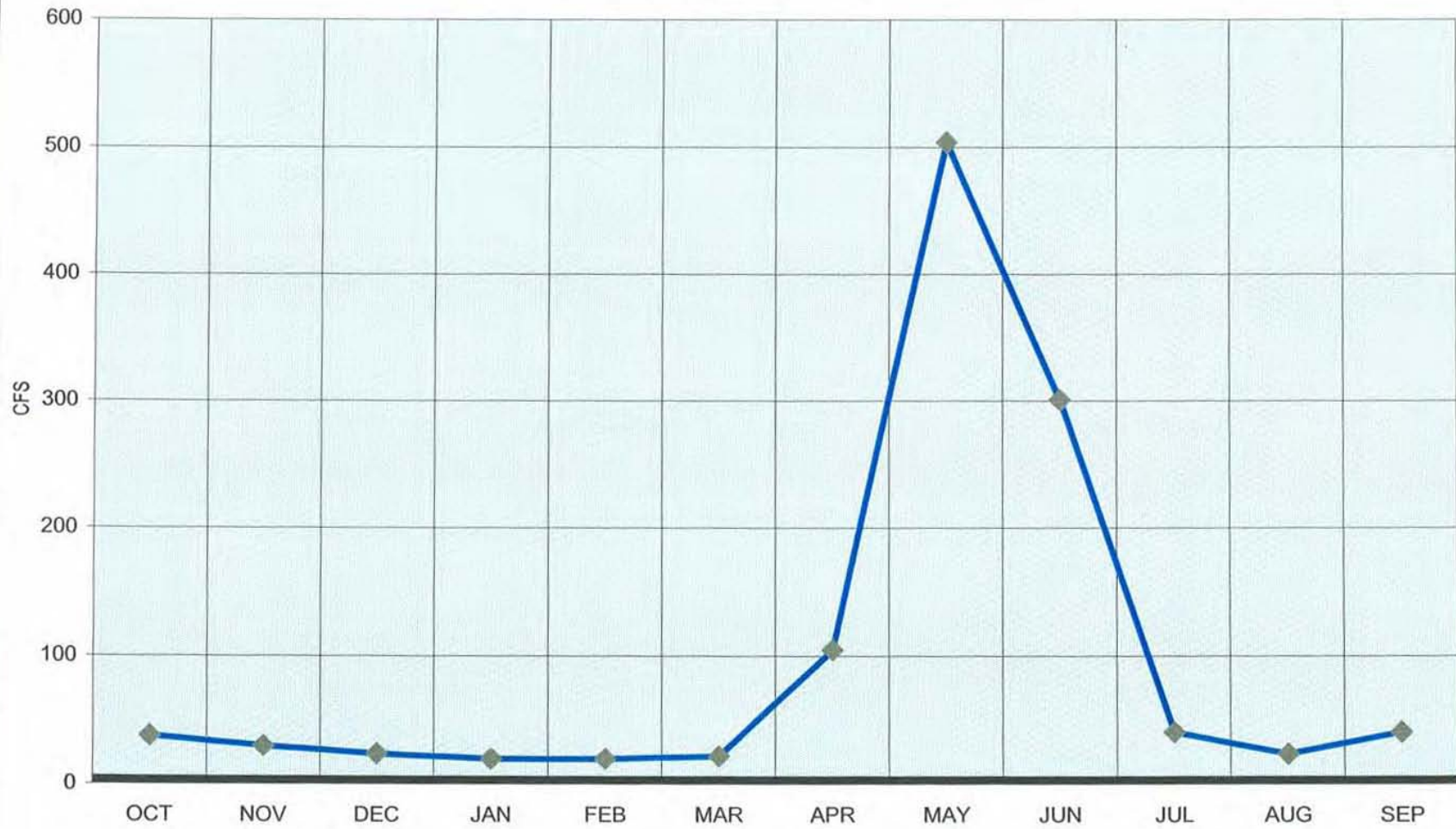
MONTHLY EVAPORATION AT MEREDITH, CO WATER YEAR 2002



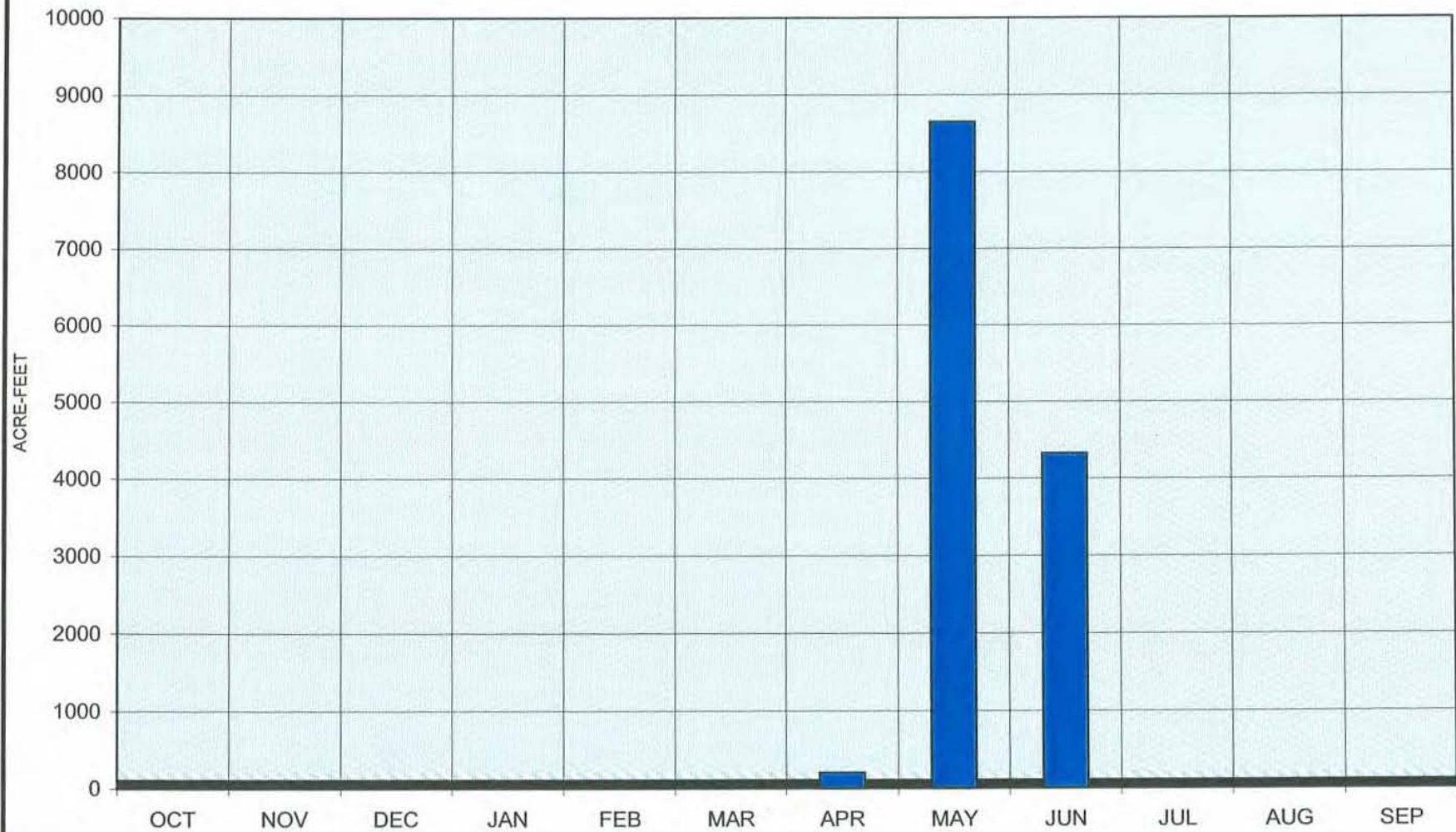
RUEDI RESERVOIR WATER YEAR 2002 ACTUAL OPERATIONS



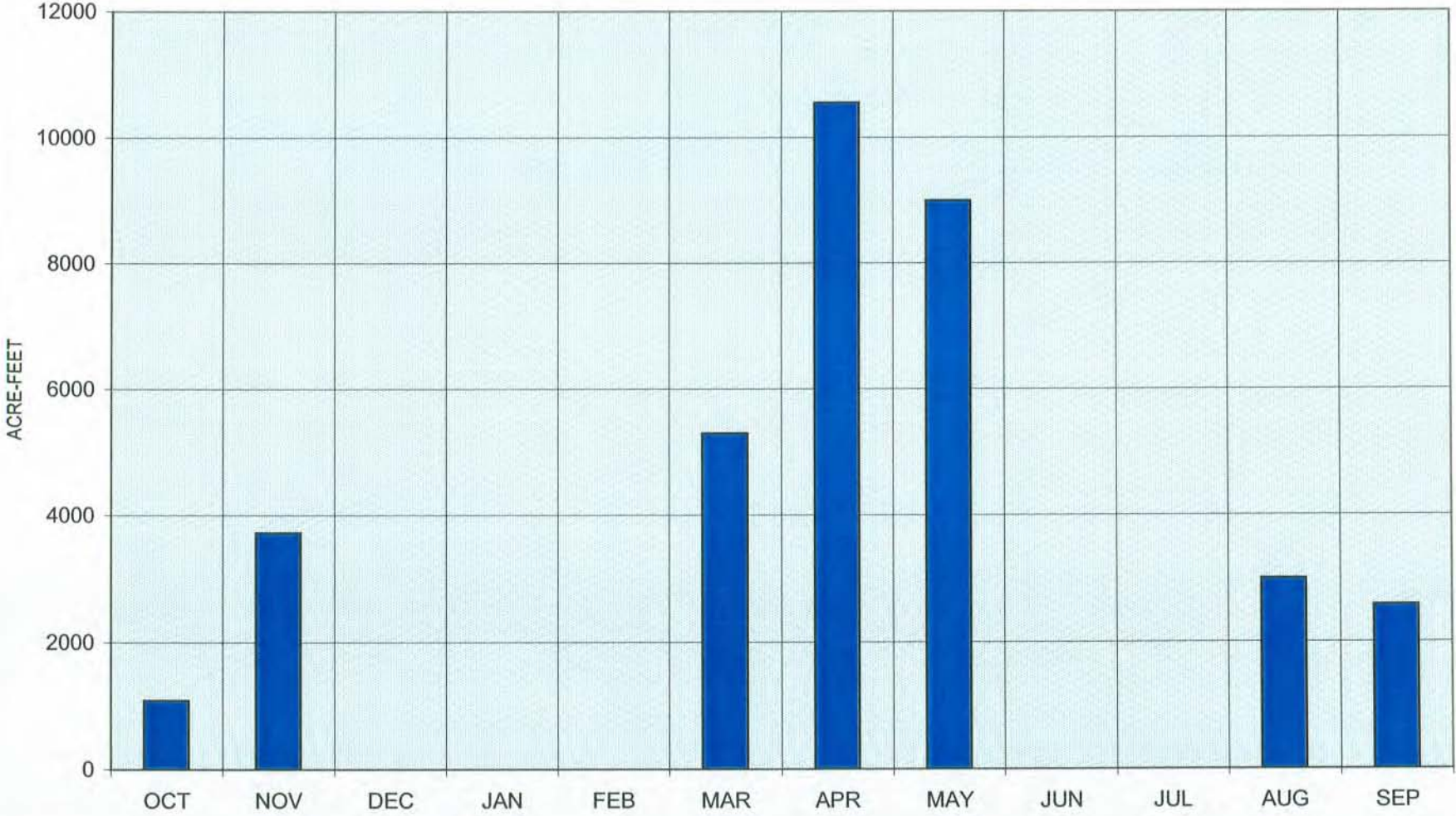
FRYINGPAN RIVER NEAR THOMASVILLE WATER YEAR 2002



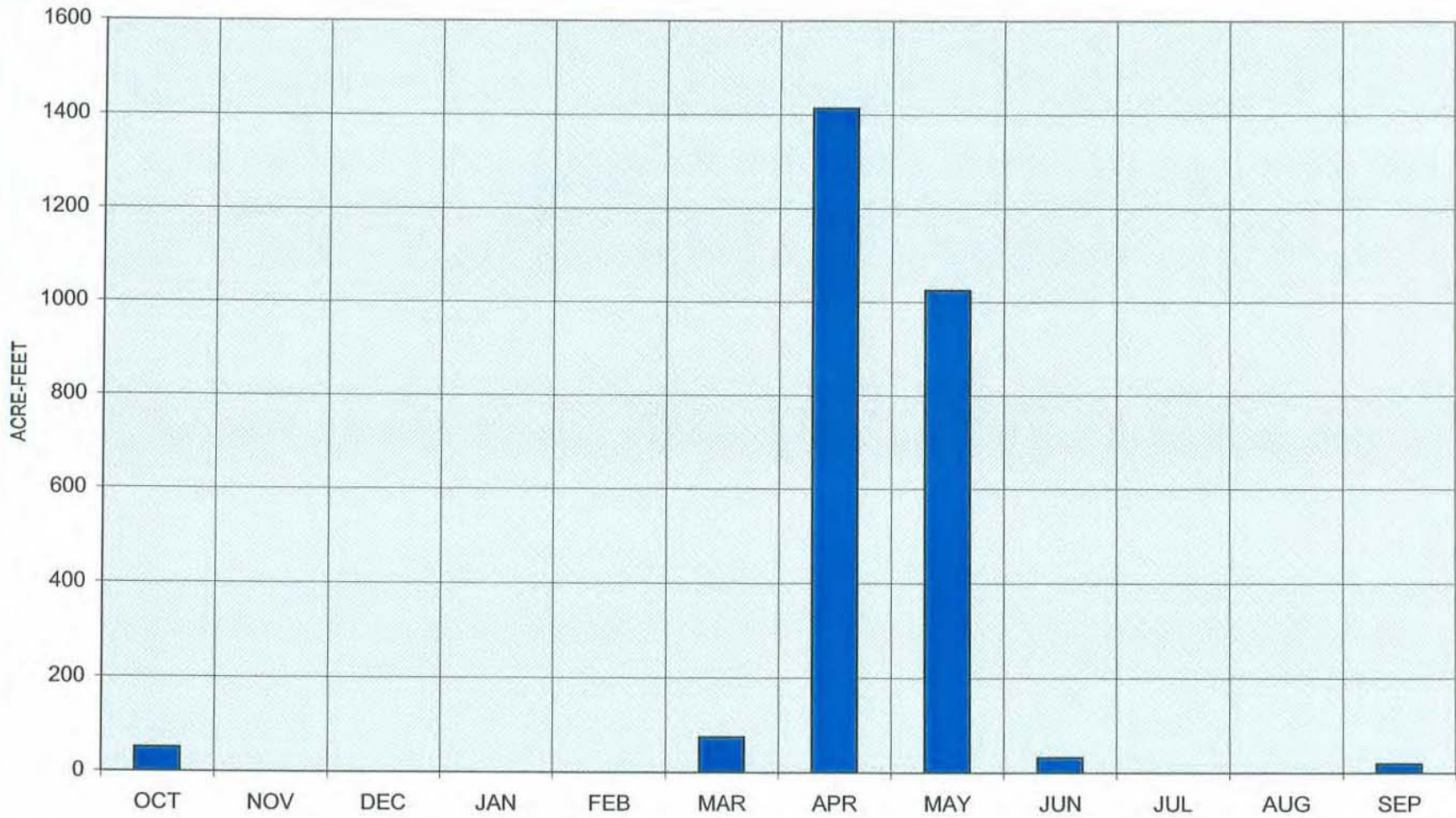
BOUSTEAD TUNNEL IMPORTS WATER YEAR 2002



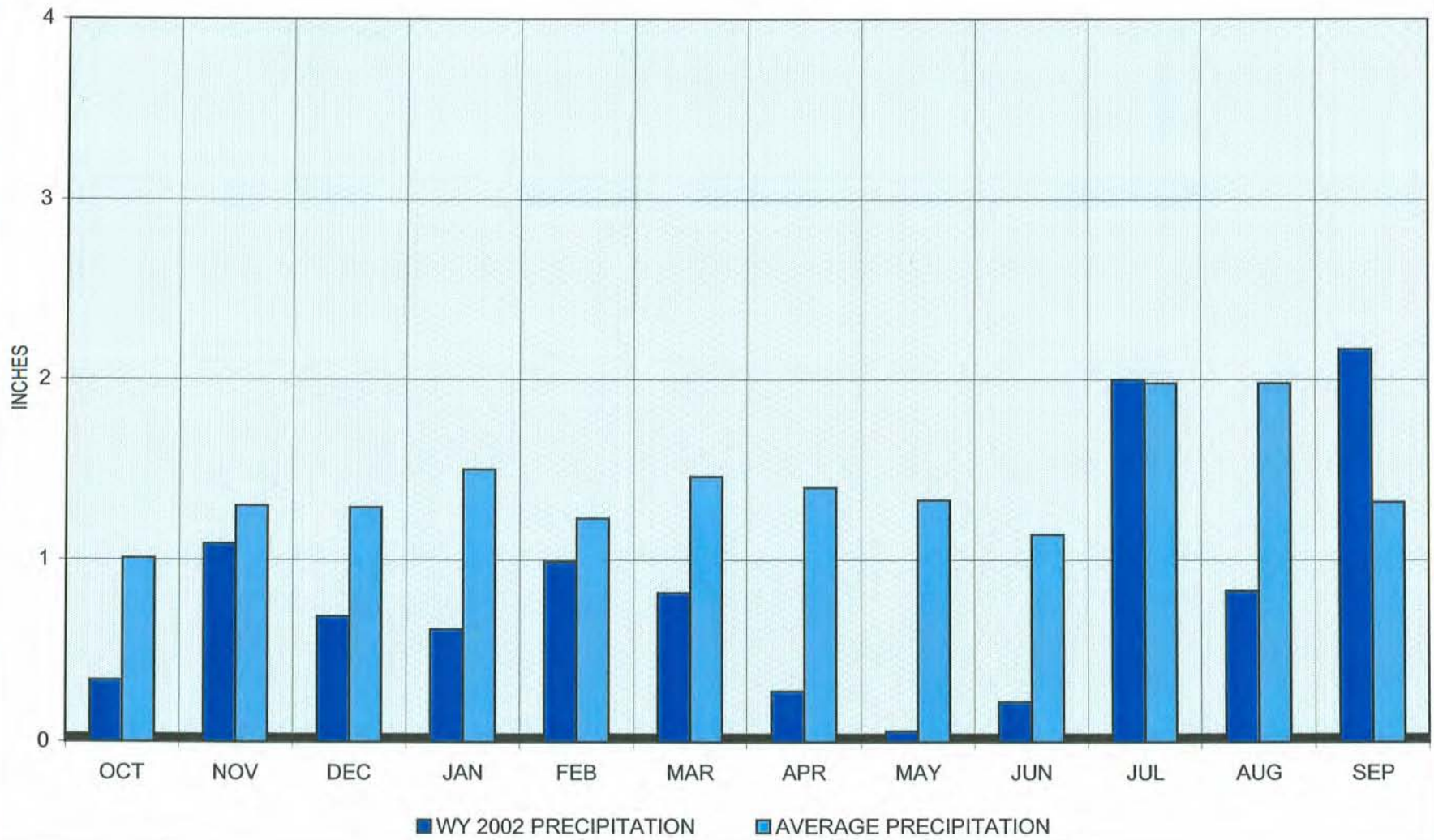
HOMESTAKE TUNNEL IMPORTS WATER YEAR 2002



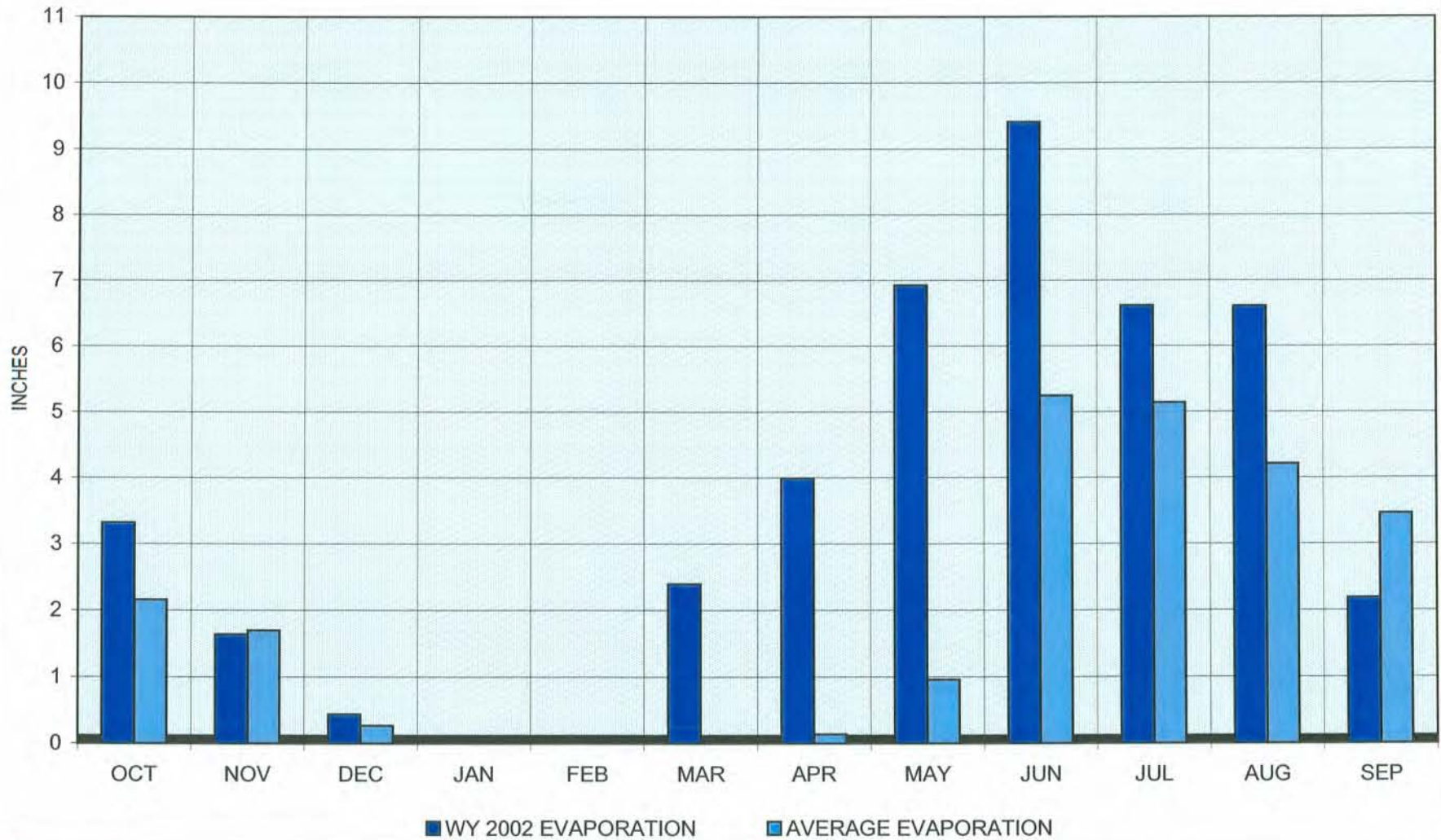
BUSK-IVANHOE TUNNEL IMPORTS WATER YEAR 2002



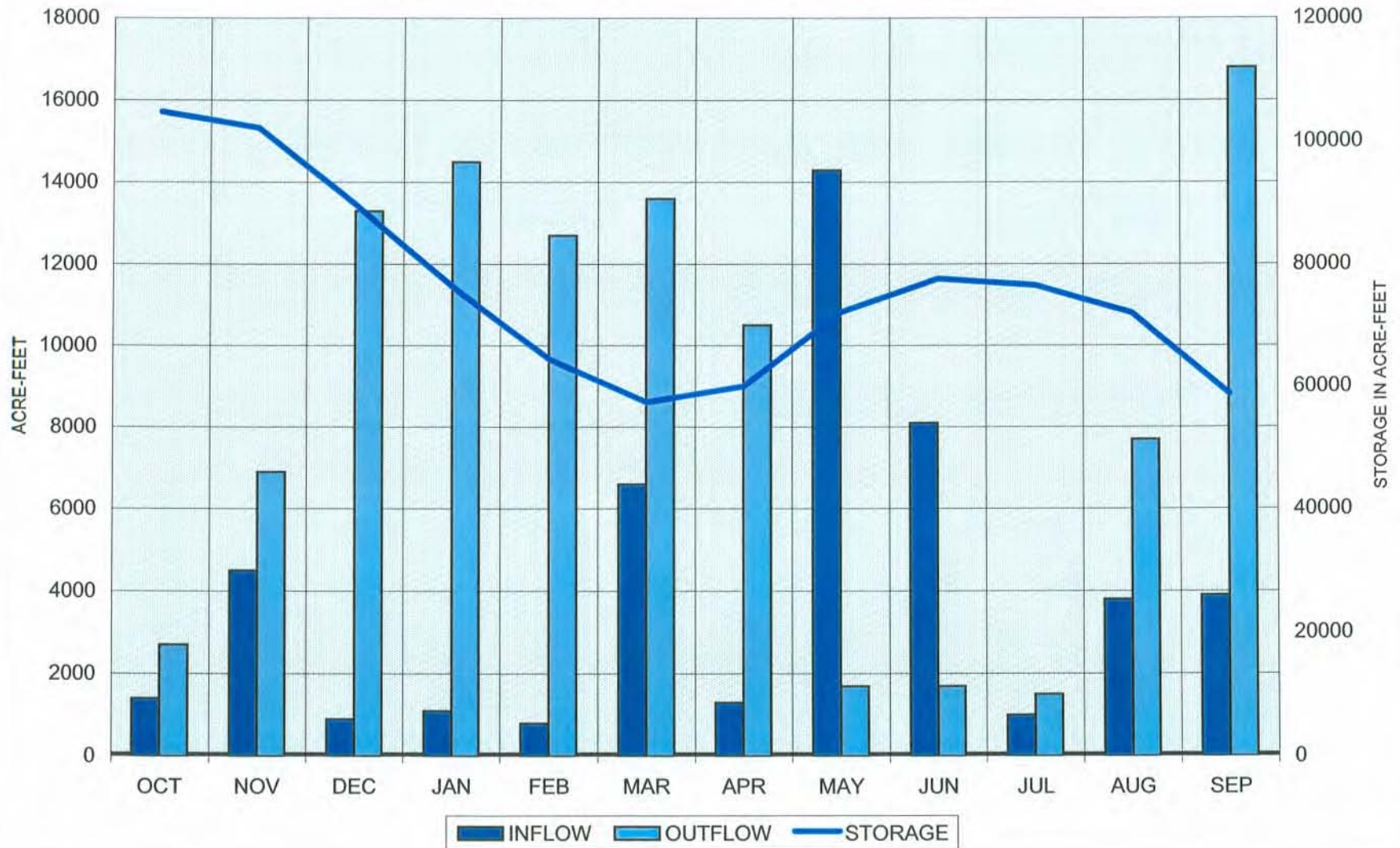
MONTHLY PRECIPITATION AT SUGAR LOAF DAM WATER YEAR 2002



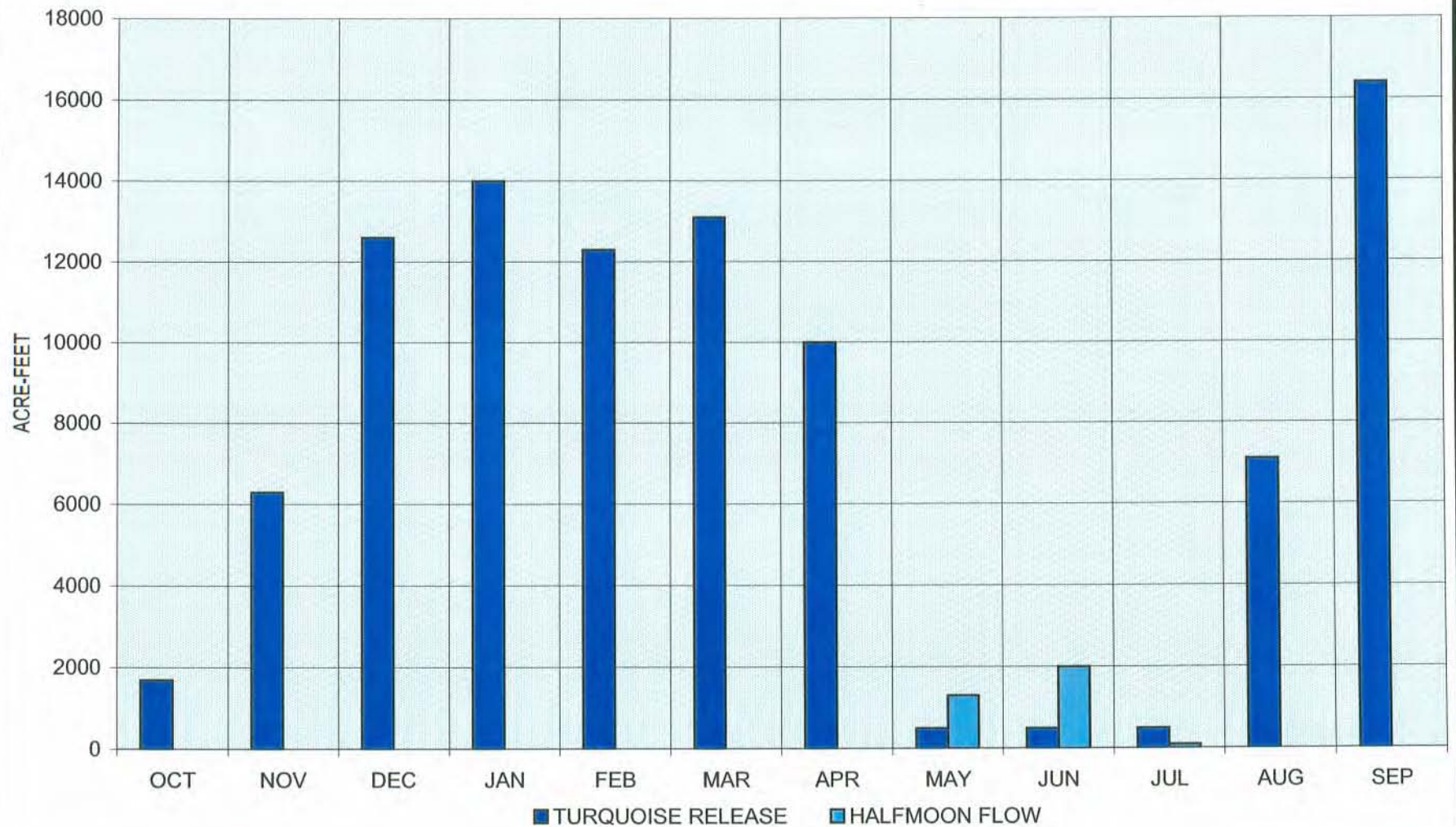
MONTHLY EVAPORATION AT SUGARLOAF DAM WATER YEAR 2002



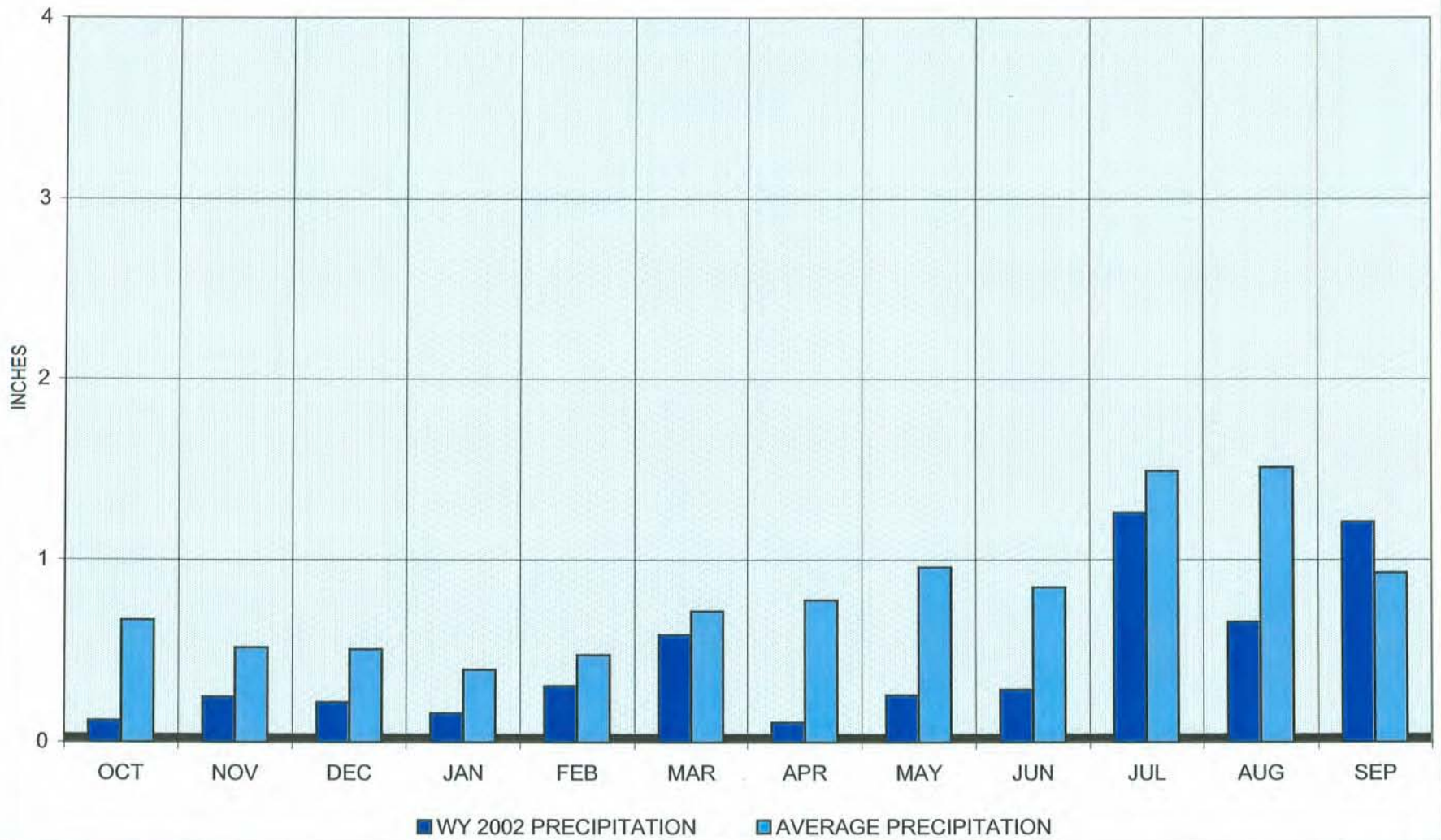
TURQUOISE LAKE WATER YEAR 2002 ACTUAL OPERATIONS



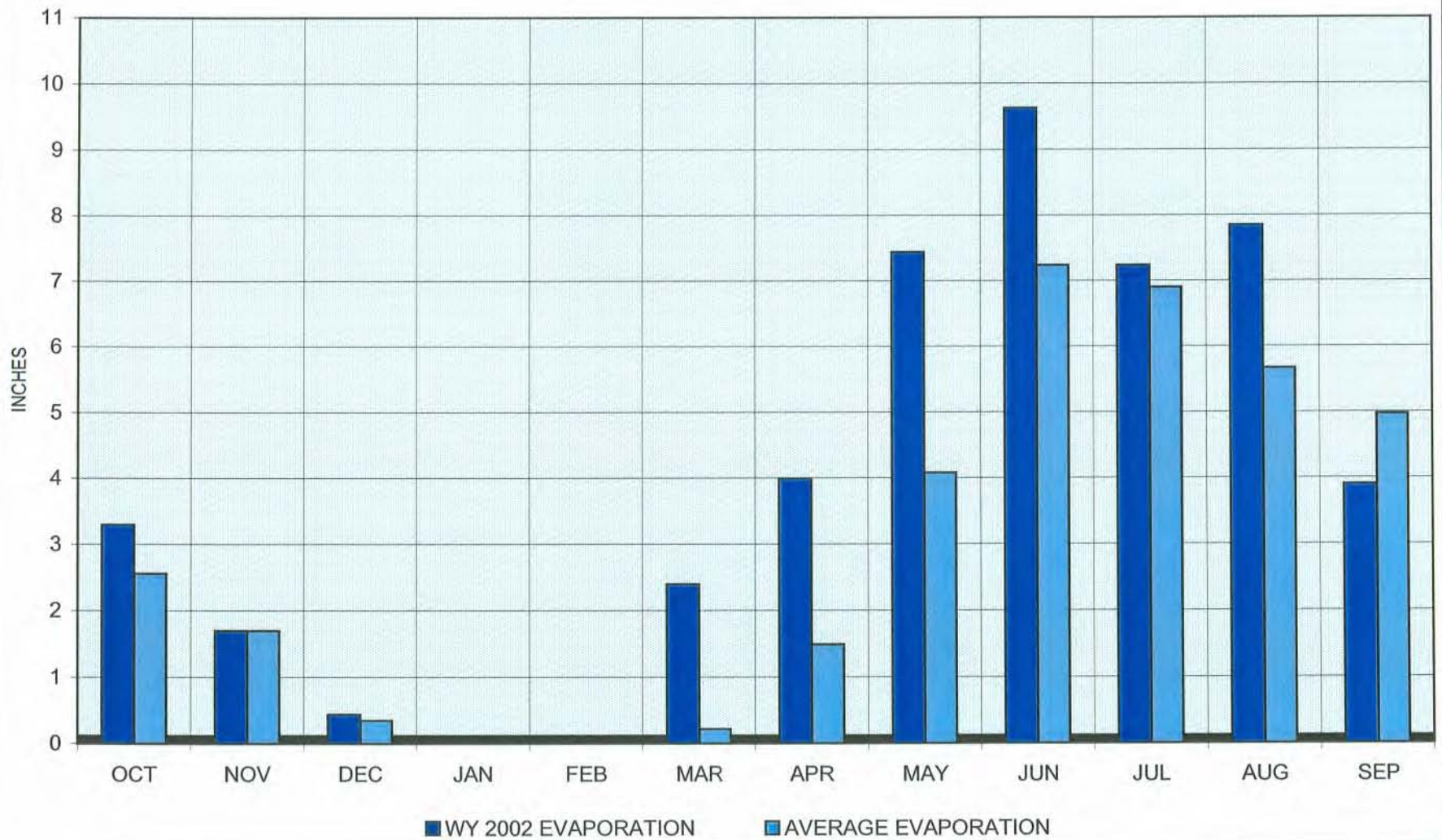
MT. ELBERT CONDUIT FLOW WATER YEAR 2002 ACTUAL OPERATIONS



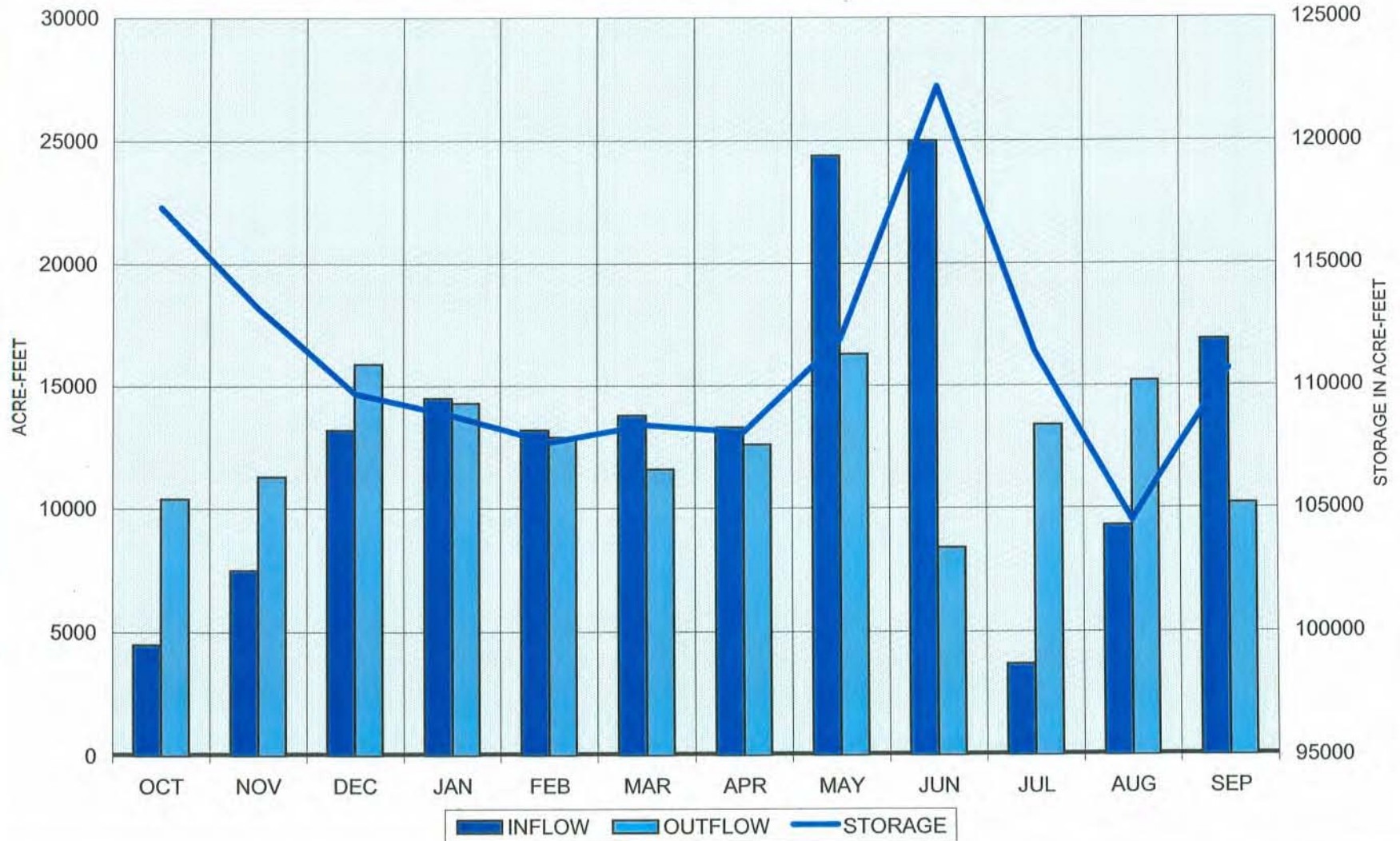
MONTHLY PRECIPITATION AT TWIN LAKES DAM WATER YEAR 2002



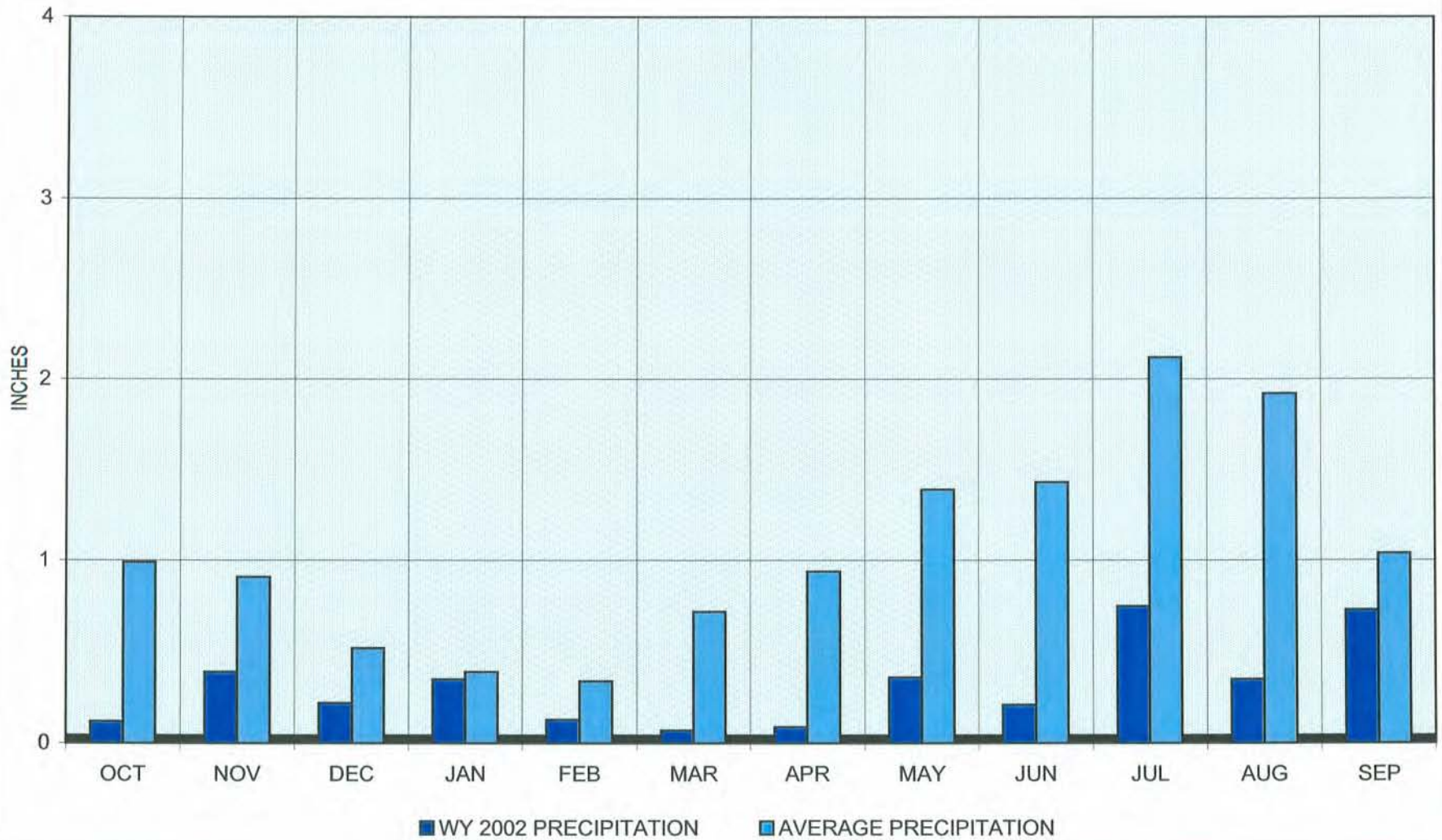
MONTHLY EVAPORATION AT TWIN LAKES DAM WATER YEAR 2002



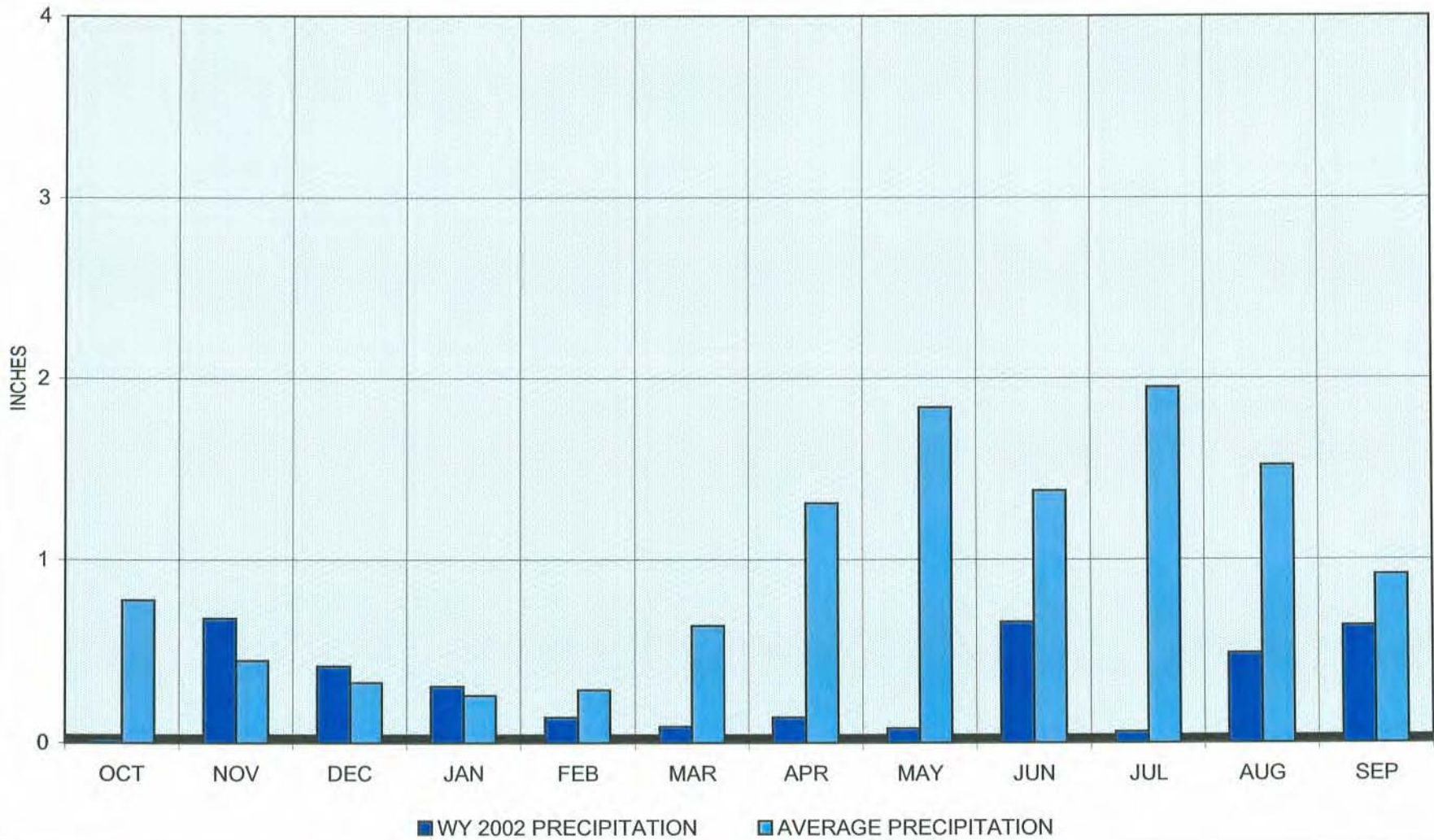
TWIN LAKES WATER YEAR 2002 ACTUAL OPERATIONS



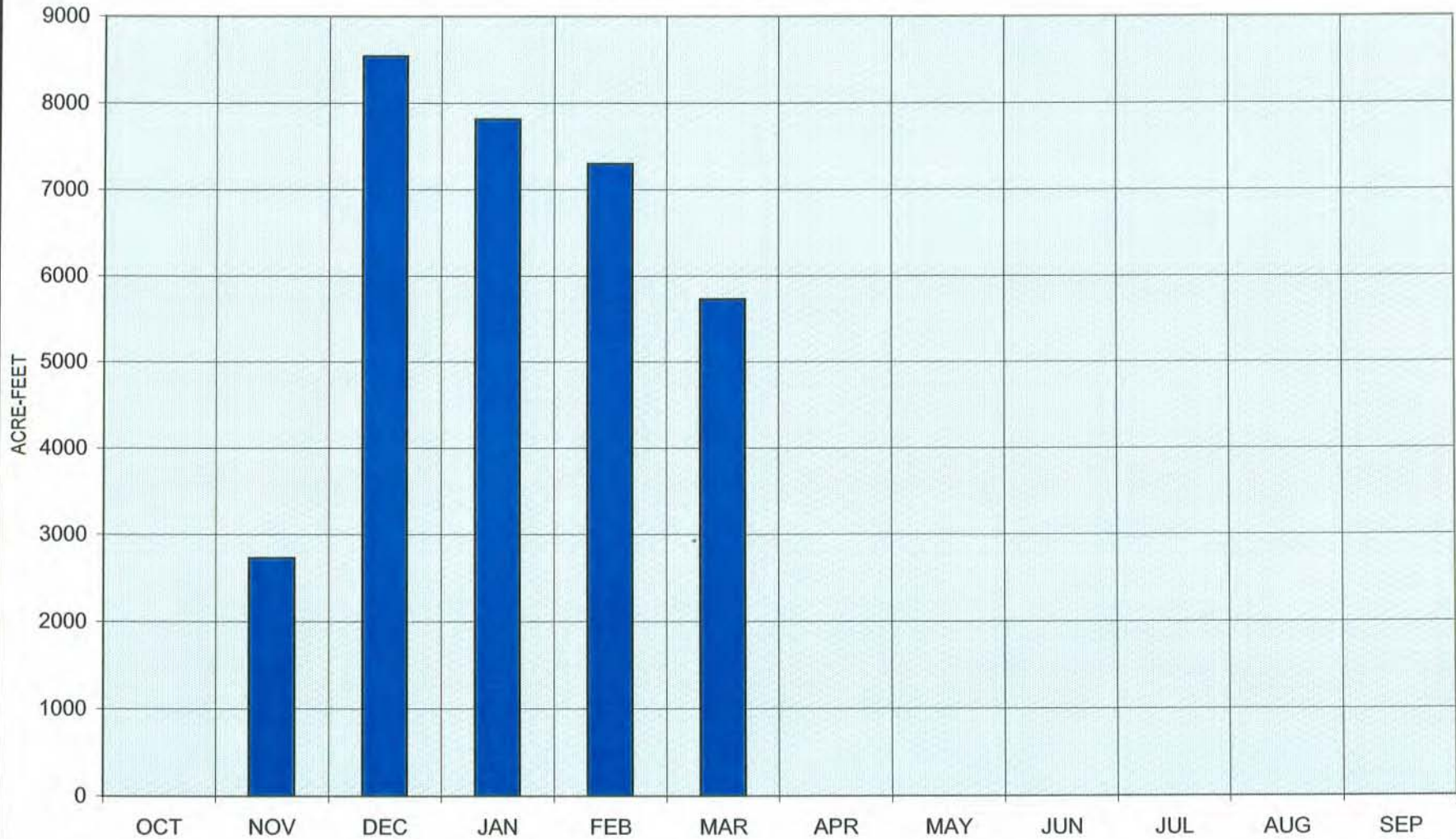
MONTHLY PRECIPITATION AT PUEBLO DAM WATER YEAR 2002



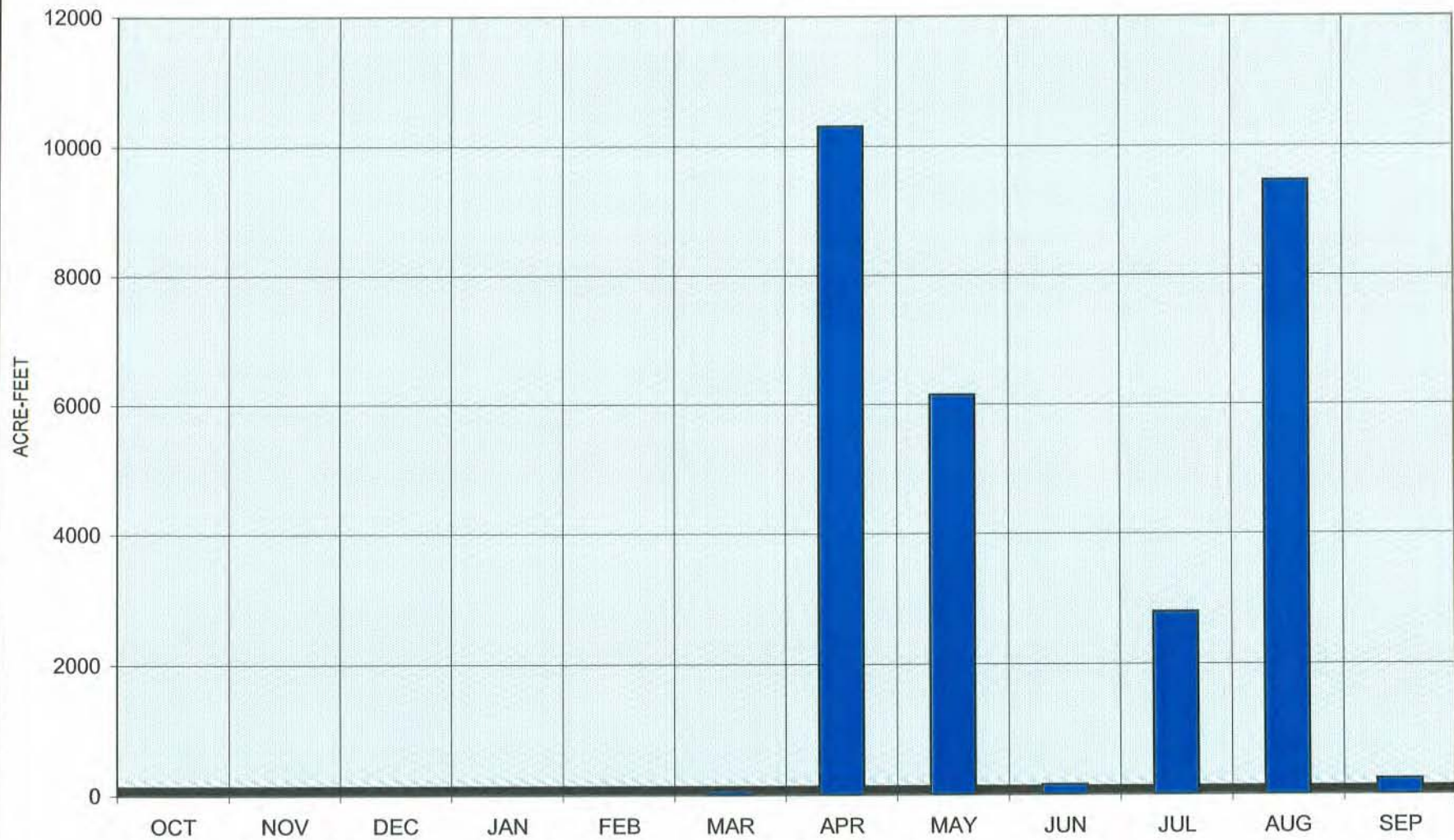
MONTHLY PRECIPITATION AT ROCKY FORD WATER YEAR 2002



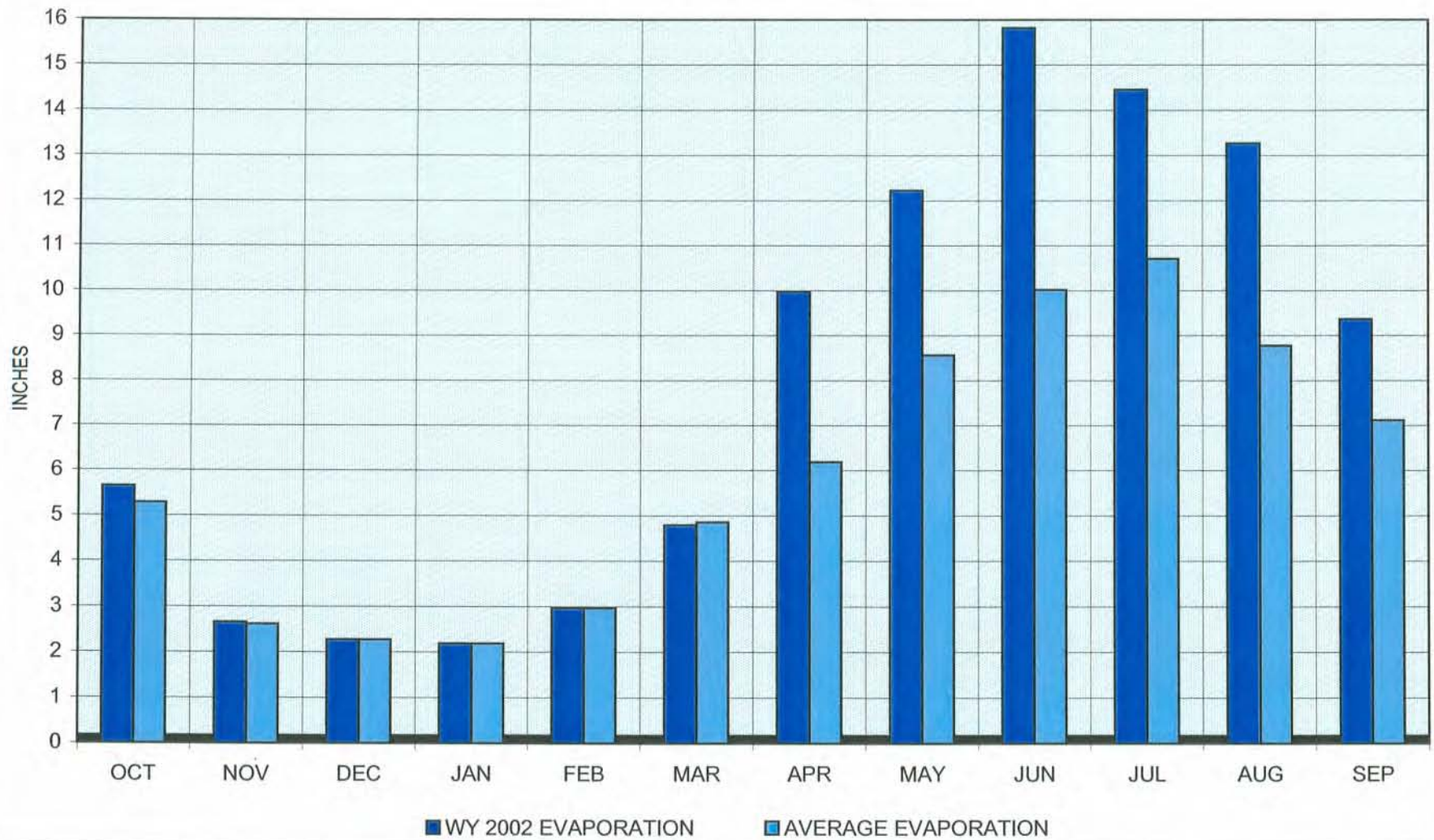
PUEBLO RESERVOIR WINTER WATER STORAGE WATER YEAR 2002



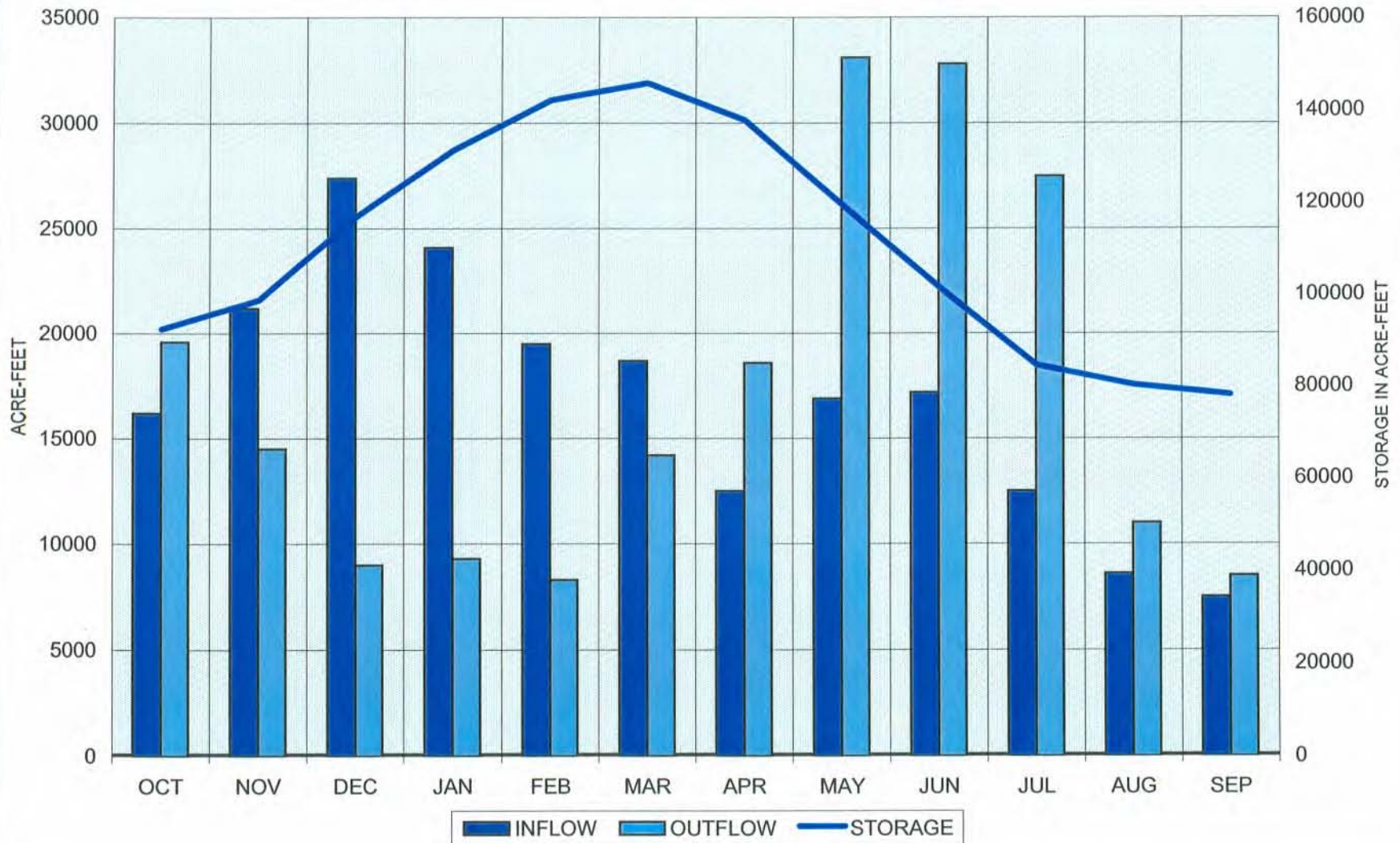
PUEBLO RESERVOIR WINTER WATER RELEASES WATER YEAR 2002



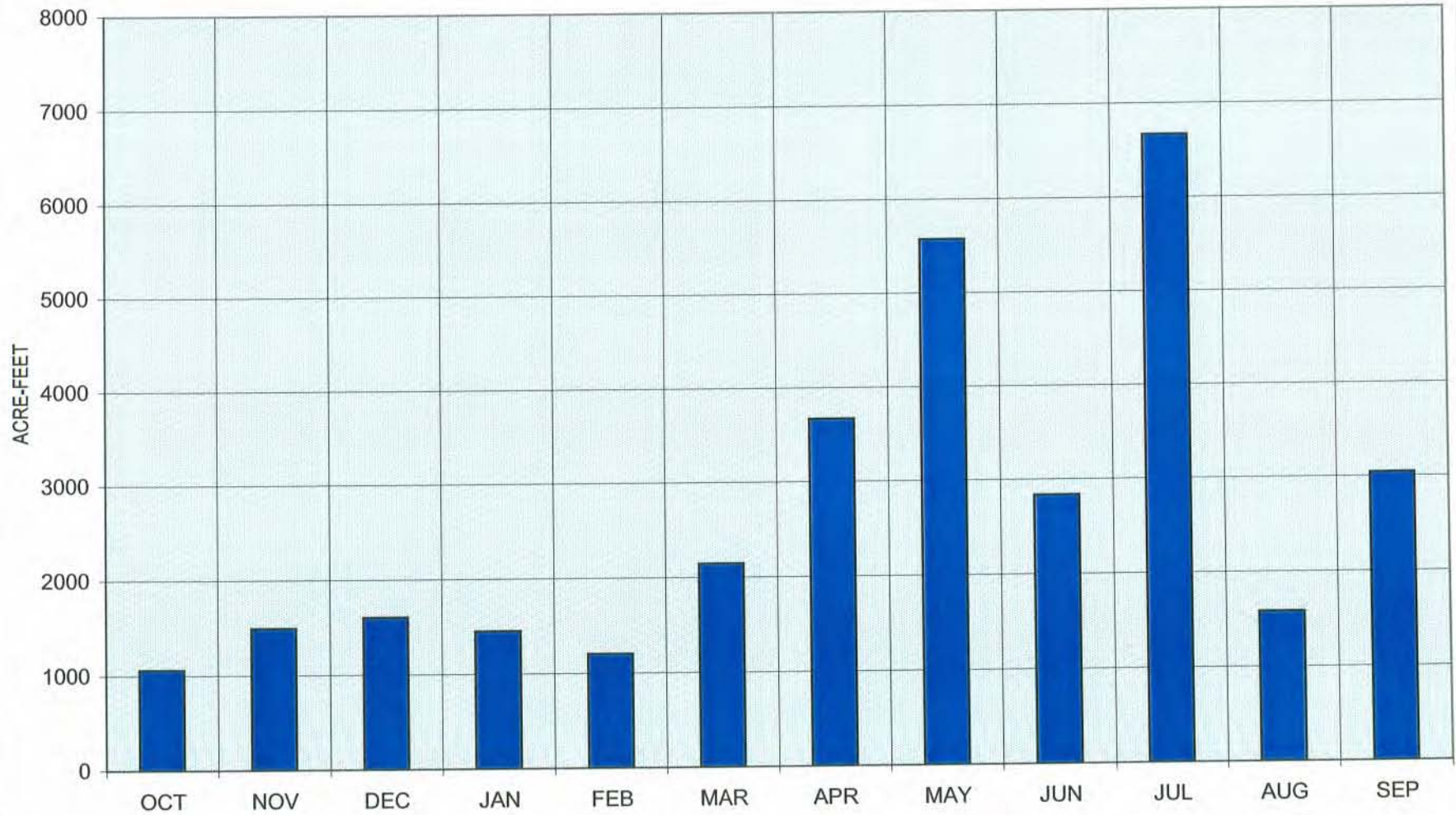
MONTHLY EVAPORATION AT PUEBLO DAM WATER YEAR 2002



PUEBLO RESERVOIR WATER YEAR 2002 ACTUAL OPERATIONS



PUEBLO RESERVOIR PROJECT WATER RELEASES WATER YEAR 2002



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 accounted as follows:

<u>Month</u>	<u>Grizzly Diversion</u>	<u>Roaring Fork Diversion</u>
	(ft ³ /s)	(ft ³ /s)
October	3.0	4.0
November	3.0	0.0
December	3.0	0.0
January	3.0	0.0
February	3.0	0.0
March	3.0	0.0
April	3.0	0.0
May	3.0	1.0
June	2.0	1.5
July	2.0	1.5
August	3.0	4.0
September	3.0	4.0

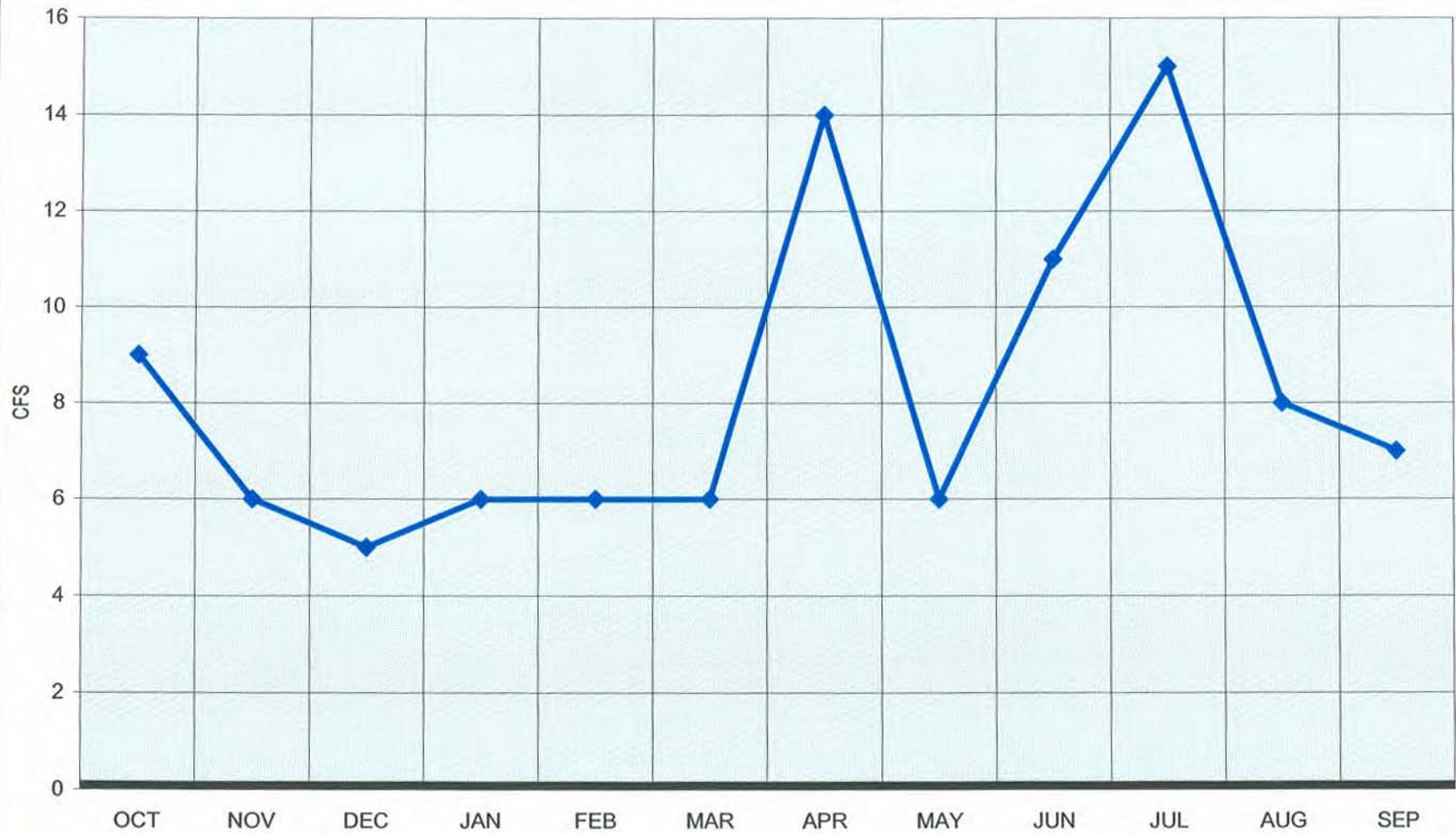
3. At any time the Twin Lakes Reservoir and Canal Company (Company) is bypassing water, in addition to that designated above, it will be assumed that the Company could not have diverted that water and will not receive any credit for exchange in excess of the above amounts.
4. In the event less water than the above amounts is 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.

Twin Lakes Reservoir and Canal Company Exchange
with Fryingpan-Arkansas Project Water
2001-2002
Units = Acre-Feet

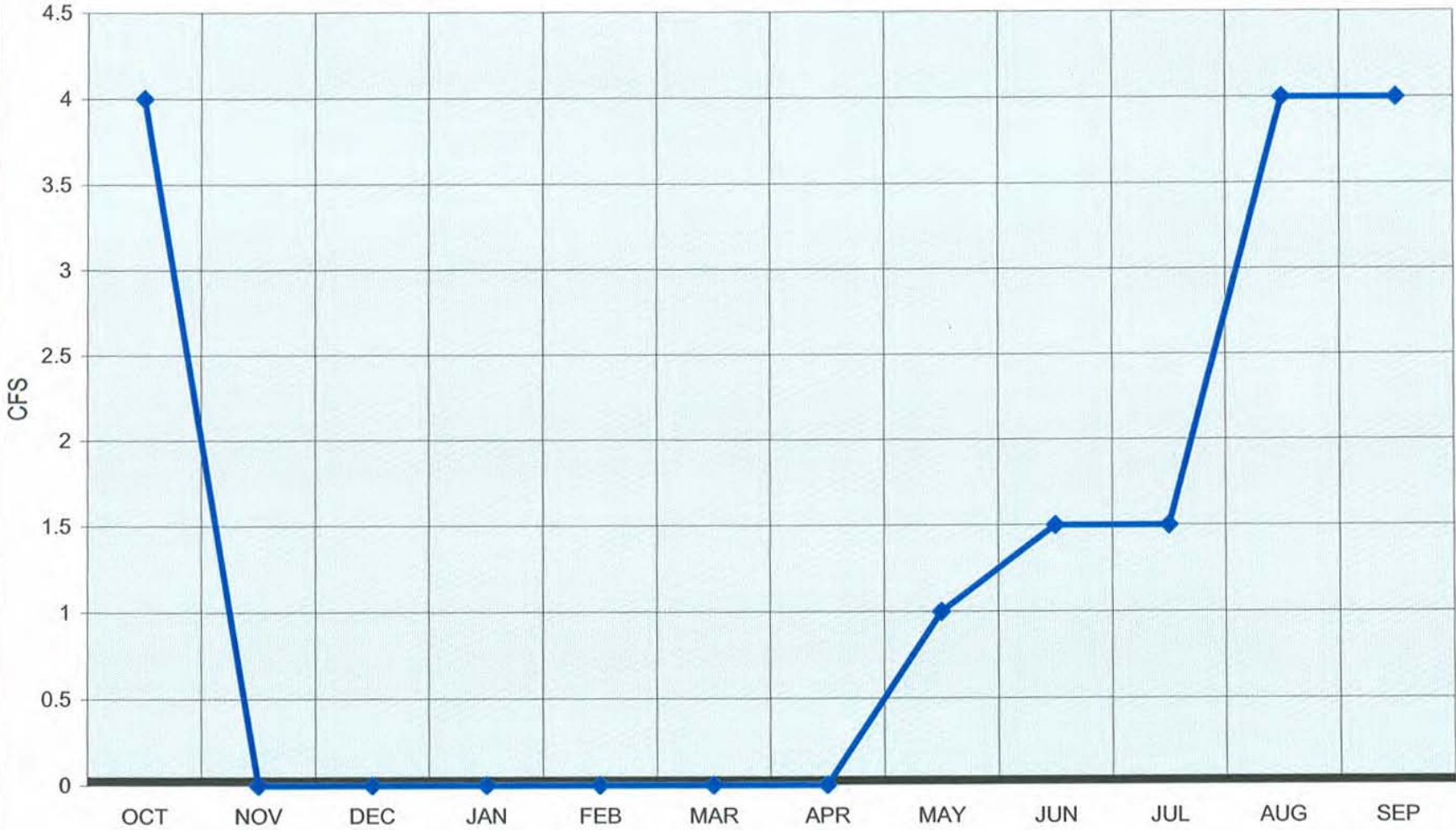
	Lincoln Creek below Grizzly Reservoir (1)	Roaring Fork River above Lost Man Creek (2)	Total (1 + 2) (3)	Twin Lakes storage (3) x 0.99138 (4)
October	82	109	191	189
November	162	0	162	161
December	164	0	164	163
January	169	0	169	167
February	162	0	162	161
March	179	0	179	177
April	143	0	143	142
May	171	1	172	170
June	89	66	155	154
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
Total	1,321	176	1,497	1,484

⁸ .87% transit loss from the outlet of Twin Lakes Tunnel to Twin Lakes normally taken on all Twin Lakes Reservoir and Canal Company imported water

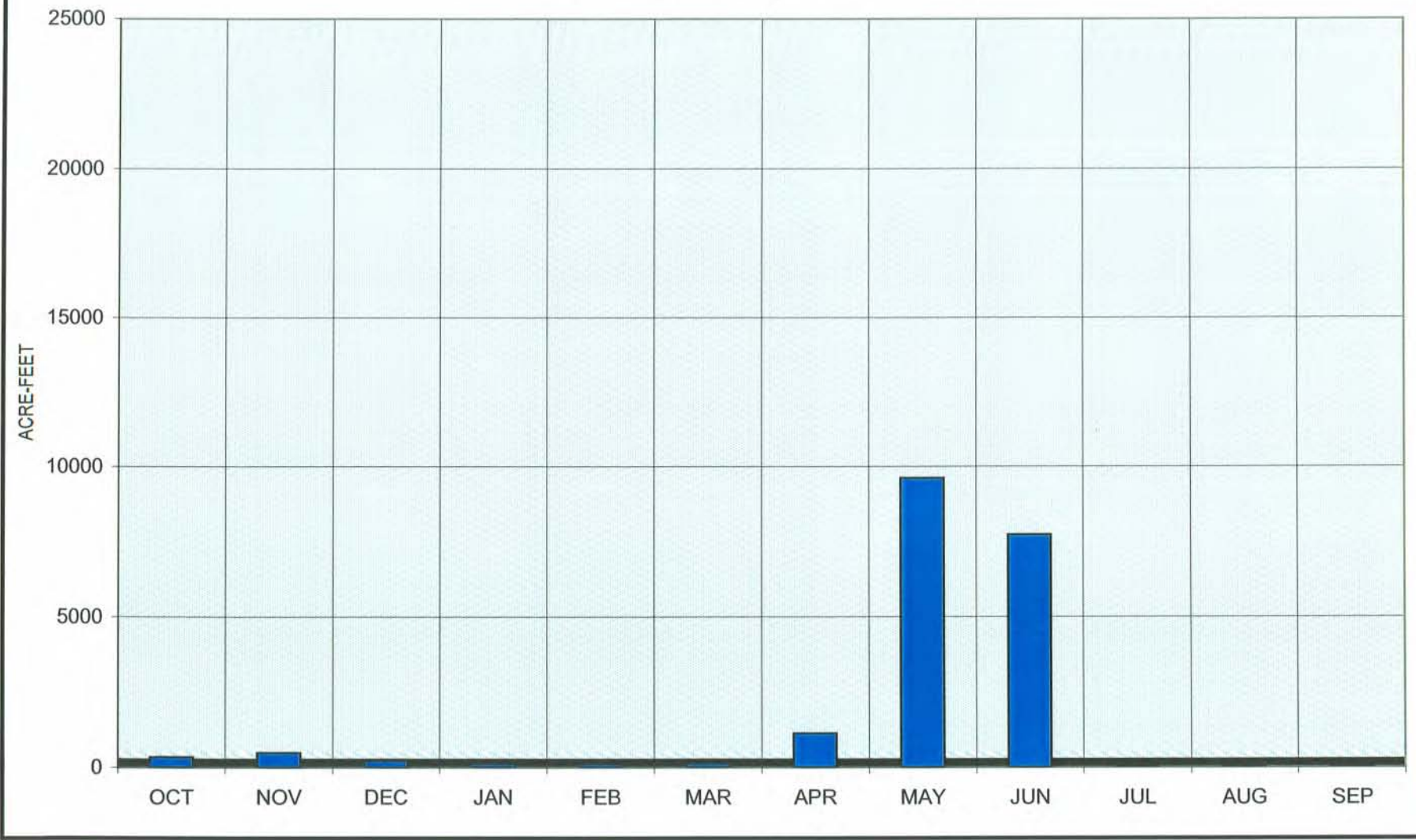
LINCOLN CREEK BELOW GRIZZLY RESERVOIR WATER YEAR 2002



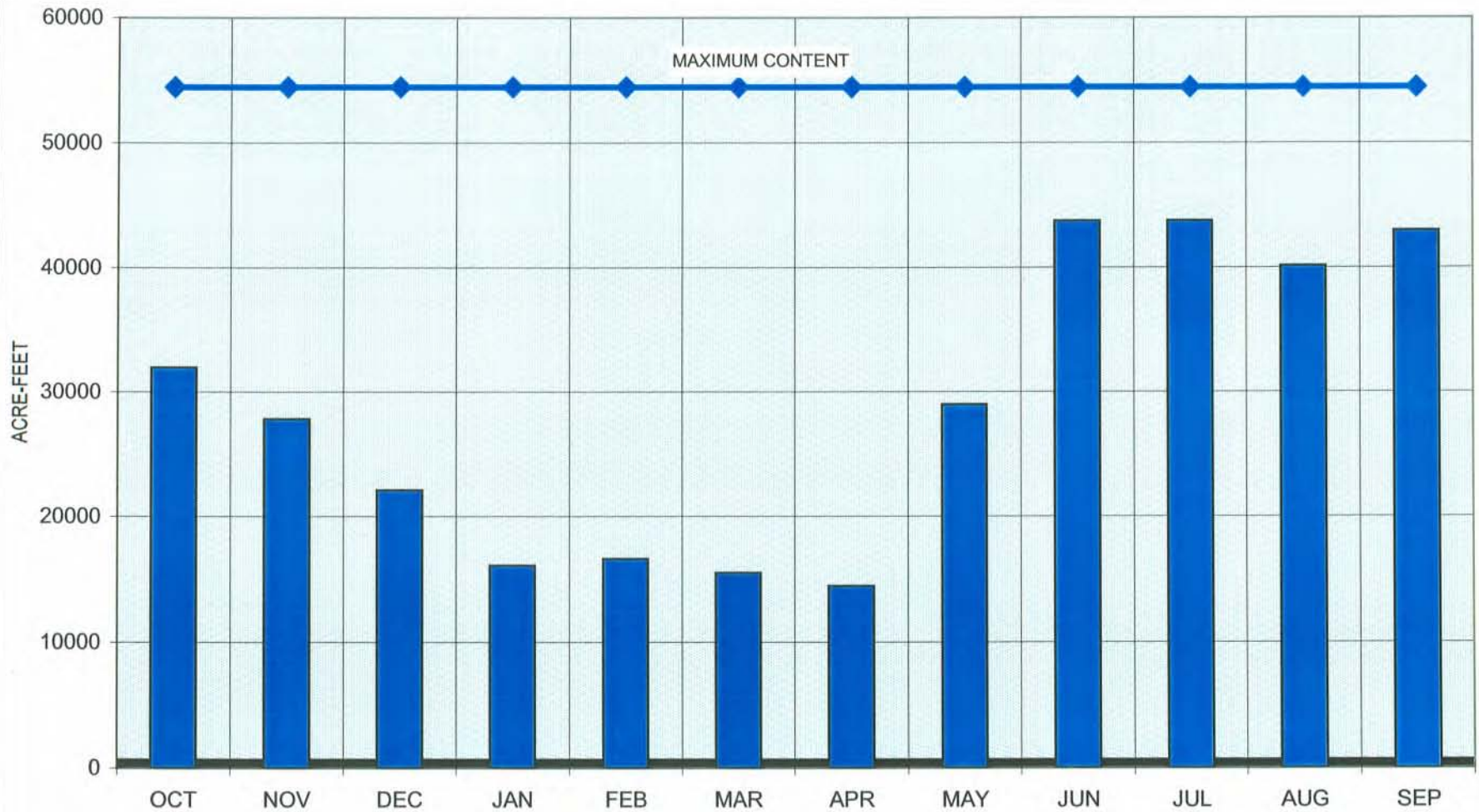
ROARING FORK ABOVE LOST MAN WATER YEAR 2002



TWIN LAKES TUNNEL IMPORTS WATER YEAR 2002



TWIN LAKES CANAL COMPANY STORAGE WATER YEAR 2002



Appendix D (1 of 15)
 Carter Creek Feeder Conduit near Norrie, CO
 Water Year 2002
 Unit: Cubic Feet Per Second
 Source: U.S. Bureau of Reclamation

Day	April	May	June	July	August	September
1			31			
2			30			
3			14			
4						
5						
6						
7		5				
8		1				
9						
10						
11						
12						
13						
14						
15						
16						
17						
18		9				
19		18				
20		18				
21		21				
22		15				
23		9				
24		1				
25						
26						
27						
28						
29						
30		7				
31		32				
Total		136	75			
Mean		12	25			
Max		32	31			
Min		1	14			
Acre-Feet		270	149			

Water year total - 419 acre-feet

Maximum instantaneous peak - 41 cubic feet per second - May 31

Note: All blank spaces: Recorder was not operated. No water was diverted.

Appendix D (2 of 15)
North Fork Fryingpan River Feeder Conduit near Norrie, CO
Water Year 2002
Unit: Cubic Feet Per Second
Source: U.S. Bureau of Reclamation

Day	April	May	June	July	August	September
1						
2						
3						
4						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
Total						
Mean						
Max						
Min						
Acre-Feet						

Note: Recorder was not operated. No water was diverted.

Appendix D (3 of 15)
Mormon Creek Feeder Conduit near Norrie, CO
Water Year 2002
Unit: Cubic Feet Per Second
Source: U.S. Bureau of Reclamation

Pay	April	May	June	July	August	September
1		10	35			
2		1	32			
3			16			
4						
5		2				
6		13				
7		15				
8		6				
9		1				
10						
11						
12						
13						
14		5				
15		2				
16						
17						
18						
19						
20	1					
21						
22						
23						
24	1					
25	1					
26	1	2				
27	1					
28	1	1				
29	3	15				
30	9	24				
31		35				
Total	18	132	83			
Mean	2	9	28			
Max	9	35	35			
Min	1	1	16			
Acre-Feet	36	262	165			

Water year total - 463 acre-feet

Maximum instantaneous peak - 45 cubic feet per second – May 31

Note: All blank spaces: Recorder was not operated. No water was diverted.

Appendix D (4 of 15)
 North Cunningham Feeder Conduit near Norrie, CO
 Water Year 2002
 Unit: Cubic Feet Per Second
 Source: U.S. Bureau of Reclamation

Day	April	May	June	July	August	September
1		6	11			
2		1	9			
3			5			
4						
5		1				
6		8				
7		8				
8		6				
9		1				
10						
11						
12						
13						
14						
15						
16		5				
17		9				
18		12				
19		12				
20		13				
21		15				
22		10				
23		6				
24		4				
25		4				
26		5				
27		6				
28	1	8				
29	5	11				
30		14				
31		15				
Total	6	180	25			
Mean	3	8	8			
Max	5	15	11			
Min	1	1	5			
Acre-Feet	12	357	50			

Water year total – 419 acre-feet

Maximum instantaneous peak - 24 cubic feet per second – May 31

Note: All blank spaces: Recorder was not operated. No water was diverted.

Appendix D (5 of 15)
 Middle Cunningham Feeder Conduit near Norrie, CO
 Water Year 2002
 Unit: Cubic Feet Per Second
 Source: U.S. Bureau of Reclamation

Day	April	May	June	July	August	September
1						
2						
3						
4						
5						
6						2
7						3
8						2
9						1
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						9
22						11
23						7
24						1
25						
26						1
27						
28						
29						
30						
31						
Total						37
Mean						4
Max						11
MM						1
Acre-Feet						73

Water year total - 73 acre-feet

Maximum instantaneous peak - 20 cubic feet per second – May 21

Note: All blank spaces: Recorder was not operated. No water was diverted.

Appendix D (6 of 15)
 Ivanhoe Creek Feeder Conduit near Norrie, CO
 Water Year 2002
 Unit: Cubic Feet Per Second
 Source: U.S. Bureau of Reclamation

My	April	May	June	July	August	September
1		5				
2						
3						
4						
5						
6		6				
7		8				
8		2				
9						
10						
11						
12						
13						
14		2				
15		1				
16		2				
17		6				
18		6				
19		7				
20		7				
21		10				
22		5				
23		1				
24						
25						
26		1				
27						
28						
29						
30	4					
31						
Total	4	69				
Mean	4	5				
Max	4	10				
Min	4	1				
Acre-Feet	8	137				

Water year total - 145 acre-feet

Maximum instantaneous peak - 16 cubic feet per second — May 17

Note: All blank spaces: Recorder was not operated. No water was diverted.

Appendix D (7 of 15)
Lily Pad Creek Feeder Conduit near Norrie, CO
Water Year 2002
Unit: Cubic Feet Per Second
Source: U.S. Bureau of Reclamation

l y	April	May	June	July	August	September
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
Total						
Mean						
Max						
Min						
Acre-Feet						

Note: Recorder was not operated. No water was diverted.

Appendix D (8 of 15)
Granite Creek Feeder Conduit near Norrie, CO
Water Year 2002
Unit: Cubic Feet Per Second
Source: U.S. Bureau of Reclamation

Day	April	May	June	July	August	September
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
Total						
Mean						
Max						
Min						
Acre-Feet						

Note: Recorder was not operated. No water was diverted.

Appendix D (9 of 15)
No Name Creek Feeder Conduit near Norrie, CO
Water Year 2002
Unit: Cubic Feet Per Second
Source: U.S. Bureau of Reclamation

Day	April	May	June	July	August	September
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
Total						
Mean						
Max						
Min						
Acre-Feet						

Note: Recorder was not operated. No water was diverted.

Appendix D (10 of 15)
 Midway Creek Feeder Conduit near Norrie, CO
 Water Year 2002
 Unit: Cubic Feet Per Second
 Source: U.S. Bureau of Reclamation

Day	April	May	June	July	August	September
1		8	37			
2		4	32			
3			28			
4			26			
5		3	25			
6		14	25			
7		17	25			
8		13	25			
9		10	24			
10		4	21			
11			17			
12		4	7			
13		5				
14		13				
15		19				
16		20				
17		25				
18		31				
19		35				
20		40				
21		40				
22		31				
23		21				
24		14				
25		14				
26		18				
27		24				
28		31				
29		41				
30	3	48				
31						
Total	3	547	292			
Mean	3	20	24			
Max	3	48	37			
Min	3	3	7			
Acre-Feet	6	1,085	579			

Water Year Total - 1,670 acre-feet

Maximum instantaneous peak - 83 cubic feet per second - May 30

Note: All blank spaces: Recorder was not operated. No water was diverted.

Appendix D (11 of 15)
 Hunter Creek Feeder Conduit near Norrie, CO
 Water Year 2002
 Unit: Cubic Feet Per Second
 Source: U.S. Bureau of Reclamation

Day	April	May	June	July	August	September
1		11				
2		2				
3						
4		1				
5		1				
6		3				
7		12				
8		11				
9		28				
10		34				
11		31				
12		24				
13		12				
14		2				
15		6				
16		11				
17		23				
18		30				
19		45				
20		53				
21		47				
22		25				
23		16				
24		18				
25	4	27				
26	4	25				
27		21				
28		15				
29	4	8				
30	12					
31						
Total	24	542				
Mean	6	19				
Max	12	53				
Min	4	1				
Acre-Feet	48	1,075				

Water year total - 1,123 acre-feet

Maximum instantaneous peak - 101 cubic feet per second – May 19

Note: All blank spaces: Recorder was not operated. No water was diverted.

Appendix D (12 of 15)
 Sawyer Creek Feeder Conduit near Norrie, CO
 Water Year 2002
 Unit: Cubic Feet Per Second
 Source: U.S. Bureau of Reclamation

Day	April	May	June	July	August	September
1			2			
2			1			
3			1			
4						
5						
6			17			
7			20			
8			20			
9			20			
10			20			
11			19			
12			17			
13			15			
14			11			
15			10			
16			10			
17			10			
18			11			
19			11			
20			11			
21			11			
22			11			
23			9			
24			9			
25			4			
26						
27						
28						
29						
30		1				
31						
Total		1	149			
Mean		1	6			
Max		1	13			
Min		1	1			
Acre-Feet		2	296			

Water year total — 1,254 acre-feet

Maximum instantaneous peak - 32 cubic feet per second - June 2

Note: All blank spaces: Recorder was not operated. No water was diverted.

Appendix D (13 of 15)
 Chapman Gulch Feeder Conduit near Norrie, CO
 Water Year 2002
 Unit: Cubic Feet Per Second
 Source: U.S. Bureau of Reclamation

Day	April	May	June	July	August	September
1		7	185			
2		34	164			
3		18	146			
4		2	109			
5			83			
6		4	69			
7		50	82			
8		66	84			
9		53	84			
10		33	82			
11		17	72			
12			54			
13		9	42			
14		7				
15		42				
16		56				
17		72				
18		74				
19		100				
20		112				
21		125				
22		139				
23		103				
24		74				
25		44				
26		34				
27		45				
28		60				
29		84				
30		122				
31		158				
Total		1,744	1,256			
Mean		60	97			
Max		158	185			
Min		2	42			
Acre-Feet		3,459	2,491			

Water year total - 5,950 acre-feet

Maximum instantaneous peak - 275 cubic feet per second – May 31

Note: All blank spaces: Recorder was not operated. No water was diverted.

Appendix D (14 of 15)
 South Fork Fryingpan River Feeder Conduit near Norrie, CO
 Water Year 2002
 Unit: Cubic Feet Per Second
 Source: U.S. Bureau of Reclamation

Day	April	May	June	July	August	September
1			52			
2			46			
3			21			
4			2			
5			1			
6		1	4			
7		13	5			
8		22	5			
9		17	3			
10		10				
11		6				
12		11				
13		13				
14		19				
15		27				
16		27				
17		30				
18		37				
19		45				
20		52				
21		54				
22		37				
23		27				
24		17				
25		2				
26						
27						
28						
29		1				
30		43				
31		54				
Total		565	139			
Mean		25	15			
Max		54	52			
Min		1	1			
Acre-Feet		1,121	276			

Water year total - 1,397 acre-feet

Maximum instantaneous peak - 96 cubic feet per second – May 30

Note: All blank spaces: Recorder was not operated. No water was diverted.

Appendix D (15 of 15)
 Fryingpan River Feeder Conduit near Norrie, CO
 Water Year 2002
 Unit: Cubic Feet Per Second
 Source: U.S. Bureau of Reclamation

Day	April	May	June	July	August	September
1		19	88			
2		6	84			
3			69			
4		1	56			
5		8	40			
6		30	34			
7		40	40			
8		35	40			
9		6	40			
10			33			
11		1	7			
12		1				
13		1				
14		21				
15		31				
16		37				
17		19				
18	1	23				
19	1	2				
20		73				
21		74				
22		57				
23		10				
24						
25		2				
26		12				
27		5				
28		29				
29	5	50				
30	17	72				
31		90				
Total	24	755	531			
Mean	6	27	48			
Max	17	90	88			
Min	1	1	7			
Acre-Feet	48	1,498	1,053			

Water year total - 2,599 acre-feet

Maximum instantaneous peak - 118 cubic feet per second – May 30

Note: All blank spaces: Recorder was not operated. No water was diverted.