FORTY-SECOND ANNUAL REPORT OF THE

ARKANSAS RIVER COMPACT ADMINISTRATION

1990 Compact Year

November 1, 1989 to October 31, 1990

****

THE ADMINISTRATION

FRANK G. COOLEY
Chairman and Representative of the United States

J. WILLIAM McDONALD,
CARL G. GENOVA and JAMES G. ROGERS
for Colorado

DAVID L. POPE,
CARL E. BENTRUP, and RONALD OLOMON
for Kansas

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307 South Fifth Street
Lamar, Colorado 81052

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FORTY-SECOND ANNUAL REPORT
1990

TO THE PRESIDENT OF THE UNITED STATES AND THE GOVERNORS OF THE STATES OF COLORADO AND KANSAS, SIRS:

Pursuant to Article VIII of the Arkansas River Compact, the Arkansas River Compact Administration submits its report for the 1990 Report-Year, November 1, 1989 through October 31, 1990, as follows:

1. MEMBERS of the ADMINISTRATION

- Representative of the United States:
  Frank G. Cooley; Meeker, Colorado

- Colorado Representatives:
  J. William McDonald; Denver, Colorado
  Carl G. Genova; Pueblo, Colorado
  James G. Rogers; Lamar, Colorado

- Kansas Representatives:
  David L. Pope; Topeka, Kansas
  Carl E. Bentrup; Deerfield, Kansas
  Ronald Olomon; Garden City, Kansas

2. OFFICERS of the ADMINISTRATION (elected Dec. 12, 1989)

- Chairman: Frank G. Cooley
- Vice Chairman: Carl E. Bentrup
- Treasurer: James G. Rogers
- Recording Secretary: Bernice Carr
- Operations Secretary: Steven J. Witte

3. STANDING COMMITTEES (appointed Dec. 12, 1989)

- Administrative and Legal Committee:
  J. William McDonald (Chairman), Carl E. Bentrup
- Engineering Committee:
  David L. Pope (Chairman), Carl G. Genova
- Operations Committee:
  Ronald Olomon (Chairman), James G. Rogers
- The Representative of the United States, Frank G. Cooley, is an ex-officio member of all standing committees.

4. MEETINGS

- Administrative & Legal Committee: did not meet
- Engineering Committee: did not meet
- Operations Committee: Dec. 11, 1989 & Dec. 10, 1990
- Annual Meeting, Lamar: Dec. 12, 1989 & Dec. 11, 1990

The minutes of the December Annual Meetings are not included in this annual report. Transcripts of the meeting minutes were provided to the Compact Administration and to each state previously. Copies of the minutes are also available upon request from the Administration office in Lamar. The minutes of the Annual Meetings also contain a summary of the Operations Committee discussions.

Prior to coming together for the 1990 Annual Meeting several members of the Administration retired and were replaced by the Governors of their respective states. In Colorado, David W. Walker replaced J. William McDonald as Director of the Colorado Water Conservation Board and took his seat on the Administration. In Kansas, Lola Fox of Syracuse and Randy Hayzlett of Lakin were appointed to the seats formerly held by Ron Olomon and Carl Bentrup. These members assumed their new roles at the December 11, 1990 Annual Meeting. At the 1990 Annual Meeting three resolutions expressing the Administration's appreciation to the retiring members were adopted, see section 13 below.

At its December 10, 1990 meeting the Operations Committee reviewed the "Annual Report of the Operations Secretary Concerning the Operation of John Martin, 1990" (hereinafter "Oper. Sec. 90 Report")

and recommended its acceptance and approval which was given by the full Administration during the December 11, 1990 meeting. Much of the data contained in this annual report is derived from that report.

5. FISCAL

The Administration's Fiscal Year (FY) runs from July 1 to June 30. The fiscal affairs of the Administration for Compact Year 1990 involve portions of the Administration's FY 1989-90 (11/1/89 to 6/30/90) and FY 1990-91 (7/1/90 to 10/31/90). The Treasurer reported on the financial status of the Administration for the relevant periods of those fiscal years at the Annual Meetings held on December 12, 1989 and December 11, 1990.

At the December 12, 1989 Annual Meeting the following budget actions were taken:

- FY 1989-90 budget previously adopted was reviewed and left unchanged with anticipated expenses of $38,525;
- FY 1990-91 budget previously adopted was revised to reflect anticipated expenses of $40,780;
- FY 1991-92 was adopted with anticipated expenses of $38,550.

Copies of these budgets are included in this report as Appendix A-1.

At the close of the fiscal year on June 30, 1990 the Administration had a cash balance of $34,890 as shown in the FY 1989-90 Auditor's Report accepted at the December 11, 1990 Annual Meeting. The Auditor's Report is included herein as Appendix A-2. On December 10, 1990 the Administration had a cash balance of $41,462 as reported by the Treasurer and shown on Appendix A-3.

6. FACTS ABOUT THE JOHN MARTIN RESERVOIR PROJECT

The John Martin Reservoir ("JMR") Project was built by the United States Army Corps of Engineers ("Corps of Engineers"). The project was authorized by Congress in the Flood Control Act of June 22, 1936 when the federal responsibility for flood control throughout the country was assigned to the Corps of Engineers. It is located on the Arkansas River, 58 miles upstream from the Colorado-Kansas Stateline and 18 miles upstream from the City of Lamar, Colorado. Construction of the project began in the fall of 1939, but work was suspended due to World War II from the spring of 1943 to the spring of 1946. The project was completed in October, 1948, at a cost of about $15 million. The War Department Civil Appropriation Act of June 24, 1940 changed the name of the project from Caddoa Reservoir Project to John Martin Reservoir Project, in honor of the late Congressman John A. Martin of Colorado. It is operated by the United States Army Engineer District, Albuquerque, New Mexico. Mr. Russell Smith has been the resident superintendent of the project since October, 1976.

The JMR Project is a part of the comprehensive plan for the control of floods and the development of water resources in the Arkansas River Basin. A 1986 survey of the reservoir, in official use since February 1, 1988, shows 259,562 acre-feet of storage capacity above elevation 3851.87 for flood control protection of the fertile Arkansas River Valley downstream of the dam. The release of stored flood waters is planned so that, when combined with flows originating downstream from the dam, the capacity of the river channel will not be exceeded. Downstream flood damages prevented by JMR already exceed the cost of the project, and total project benefits to date have surpassed the $116 million mark.

The reservoir also provides 348,683 acre-feet of storage space for conservation and recreation purposes below elevation 3851.87. JMR supplies water to irrigated lands as far downstream as Garden City, Kansas. The conservation pool can store up to 338,639 acre-feet of water for irrigation. Upon request of the Arkansas River Compact Administration, irrigation water for downstream water users is released by the Corps of Engineers through outlet works in the base of the dam.

Recreation and favorable fish and wildlife habitats are also provided by the project. In 1965 Congress authorized a permanent pool to improve habitat and recreation values at JMR. The Administration subsequently approved the use of up to 15,000 acre-feet of storage space at JMR for these purposes. Colorado provides water to the permanent pool

pursuant to procedures adopted by the Administration. Reservoir lands are open to public use for outdoor recreation, water sports, fishing and boating, and camping. During construction some embankment material was obtained from a 75-acre tract of land immediately downstream of the dam. This excavated area, averaging 12 feet deep, filled with water and formed Lake Hasty, now used for year-round recreation. North of the reservoir, a half-mile segment of the historic Santa Fe Trail has been enclosed by a fence and marked with an appropriate sign.

John Martin Dam consists of a concrete gravity structure 1,644 feet long and 120 feet high, and an earthfill structure 2,600 feet long. The concrete gravity structure contains a spillway controlled by sixteen 30 foot by 64 foot tainter gates and their operating machinery. There are earthen wing dams on either side of the main dam. The north wing dam is 3,880 feet long, connecting to the earthfill structure of the main dam at the north abutment. The south wing dam is 5,807 feet long and connects to the south end of the concrete structure of the main dam. A bituminous-surfaced roadway, 21 feet wide, extends along the crest of the north wing dam, main dam, and south wing dam. The overall length of the structure is 2.6 miles. Detailed project data follows:

DAM

Total length, feet	13,945
Maximum height above streambed, feet	118
Width of roadway on dam, feet	21

SPILLWAY

Total length, including piers, feet	1,174
Crest gates, 30' x 64', each	16
Discharge capacity, cubic feet per second	639,200

OUTLET WORKS

Sluicing conduits, 6' x 7.5', each	4
Regulating conduits, 4' x 4', each	2

RESERVOIR

Capacity, acre-feet at elevation 3,870.00	608,245
Flood control storage, acre-feet	259,562
Conservation and recreation storage, acre-feet	348,683
Water surface at spillway crest, acres	8,975
Water surface at top of conservation pool, acres	11,645
Water surface at top of flood control pool, acres	17,151
Drainage areas, square miles	18,915

7. COOPERATIVE STUDIES and ACTIVITIES

Article VIII.G.(1) of Arkansas River Compact requires the Administration to cooperate with the chief official of each of the states of Colorado and Kansas charged with the administration of water rights in their respective states, and with the Federal agencies in systematically determining and correlating the facts pertaining to the flow and diversion of the water of the Arkansas River and to the operation and siltation of John Martin Reservoir and other related structures. Article VIII.G.(2) requests the Director of the United States Geological Survey ("USGS"), the Commissioner of the United States Bureau of Reclamation, and the Chief of Engineers, United States Army, to cooperate and collaborate with the Administration and with appropriate state officials in such determinations and correlations of stream flow and related data. Under the By-Laws of the Administration, these cooperative studies and activities are assigned to the Engineering Committee of the Administration.

During the year covered by this report the Administration has received excellent cooperation from all agencies referred to in the foregoing provisions of the Compact. The USGS has continued the operation of the compact gaging stations and the analysis of and compilation of the hydrologic data presented in this report and used in the administration of the Compact. The Corps of Engineers continued to operate the conservation pool of John Martin Reservoir in accordance with the terms of the Compact and the resolutions and orders of the Administration.

8. WATER SUPPLY, RESERVOIR OPERATION, and HYDROLOGIC DATA

John Martin Reservoir ("JMR") is operated pursuant to the "Resolution Concerning an Operating Plan for John Martin Reservoir" ("Operating Plan" or "Operation Plan") adopted by the Compact Administration on April 24, 1980. Minor revisions to the Operating Plan were made on May 10, 1984 and December 11, 1984, but the plan has remained unchanged since 1984. Accordingly, a system of water storage accounts exists at JMR into which reservoir inflows are distributed for physical release at a later date. While these accounts have often been referred to as "Article II" and "Article III" accounts, the correct designation, based on the organization of the Operating Plan Resolution, is "Section II" and "Section III" accounts. This report uses the term "Section" or "agreement" whenever referring to the various accounts established pursuant to the Operating Plan. More specifically, the Operating Plan created the following account system at JMR:

- Accounts established by Section II
  - Kansas account
  - Colorado Irrigation District 67 ditch accounts (Fort Bent Canal, Keesee Canal, Amity Canal, Lamar Canal, Hyde Canal, Manvel Ditch, X-Y/Graham Ditch, Buffalo Canal, Sisson-Stubbs Ditch)
  - Kansas transit loss account

- Accounts established by Section III
  - Amity Great Plains Reservoir account
  - Fort Lyon Canal account
  - Las Animas Consolidated Ditch account

In addition to these accounts, water is also accounted for at JMR as conservation storage and in the permanent and the flood control pools.

An overview of general reservoir operations during Compact Year 1990 is summarized in Table 1. This table reflects actual reservoir operations showing the volumes of water physically stored, released, and evaporated at JMR between November 1, 1989 and October 31, 1990. During the year 79,902.21 acre-feet of water was stored in JMR, 15,457 acre-feet evaporated, and 74,263.17 acre-feet was released to downstream users. This operation resulted in a reduction in contents for the year of slightly over 9,800 acre-feet. The remainder of this section provides a detailed description of reservoir operations.

TABLE 1
JOHN MARTIN RESERVOIR
ANNUAL OPERATION [AF]
COMPACT YEAR 1990

Month	Contents Begin Month	Inflow to Storage	Evaporation	Storage Release	Contents End Month
Nov. '89	27,406.78	7,931.22	448.00	0.00	34,890.00
Dec.	34,890.00	8,896.00	216.00	0.00	43,570.00
Jan. '90	43,570.00	9,881.00	0.00	0.00	53,451.00
Feb.	53,451.00	10,381.00	176.00	0.00	63,656.00
Mar.	63,656.00	10,339.00	1,546.00	0.00	72,449.00
Winter Subtotal		47,428.22	2,386.00	0.00	
Apr.	72,449.00	2,918.08	1,871.00	7,910.49	65,585.59
May	65,585.59	2,248.97	2,312.00	9,147.56	56,375.00
June	56,375.00	4,830.83	3,194.00	19,277.41	38,734.42
July	38,734.42	21,773.62	1,915.00	17,357.85	41,235.19
Aug.	41,235.19	538.65	1,847.00	9,006.10	30,920.74
Sept.	30,920.74	163.84	1,244.00	11,563.76	18,276.82
Oct. '90	18,276.82	0.00	688.00	0.00	17,588.82
Summer Subtotal		32,473.99	13,071.00	74,263.17	
Year Total		79,902.21	15,457.00	74,263.17	

NOTES

[1] Inflows per Oper. Sec. 90 Report as follows:
Tables I and II for conservation storage and Section III accounts winter inflow
Table IV for Amity Section III storage May - August at 15,896.12 AF
Table VIII for permanent pool at 1,197.79 AF
Storage of 1,428.51 AF of Lamar Fry-Ark water in July and September
[2] Evaporation per Oper. Sec. 90 Report Tables I, II, VI, and VIII (includes Lamar temporary operation in the amount of 67.23 AF).
[3] Releases per Oper. Sec. 90 Report, Table VI (includes Lamar at 1,361.28 AF).
[4] Peak contents, 74,203 AF, reached on April 19, 1990.
[5] Conservation storage first exhausted April 19, 1990.

The 1990 Arkansas River Compact Year and the winter season for JMR began at 0001 hours November 1, 1989 with 27,406.78 acre-feet in the reservoir distributed as shown in Table 2. Winter storage officially ended at 2400 hours on March 31, 1990 with a total inflow to the reservoir of 47,428.22 acre-feet. Conservation storage received 24,181.44 acre-feet of water which was held for subsequent release to the various Section II accounts after March 31, pursuant to the Operating Plan. An additional 23,246.78 acre-feet was stored at JMR during the period November 15, 1989 to March 15, 1990 pursuant to Section III of the 1980 Operating Plan and the Pueblo Winter Water Storage Program ("WWSP"), as shown on Table 3.

TABLE 2
JOHN MARTIN RESERVOIR
CONTENTS DISTRIBUTION [AF]
NOVEMBER 1,1989

Storage Component	Subtotal	Contents
Conservation Storage		0.00
Agreement Accounts		
Section II Agreement Accounts		
Kansas Account	4,924.15	
Dist. 67 Accounts	10,557.51	
Transit Loss Account	4,808.84	
Subtotal Section II	20,290.50	
Section III Agreement Accounts		
Amity	1,663.32	
Ft. Lyon	0.00	
Las Animas Cons.	0.00	
Subtotal Section III	1,663.32	
Total All Accounts	21,953.82	21,953.82
Flood Pool		0.00
Permanent Pool		5,452.96
Total Reservoir Contents		27,406.78

NOTES

[1] Source: Oper. Sec. 90 Report, November accounting sheets, and Oper. Sec. 89 Report, Table XIII.

TABLE 3
JOHN MARTIN RESERVOIR
SECTION III ACCOUNTS WINTER INFLOW DISTRIBUTION [AF]
NOV. 15, 1989 - MAR. 15, 1990

Month	Contents Begin Month	Inflow to Storage	Evaporation	Storage Release	Release End Month
Nov. '89	0.00	3,480.50	10.29	0.00	3,470.21
Dec.	3,470.21	5,498.24	28.00	0.00	8,940.45
Jan. '90	8,940.45	5,450.54	0.00	0.00	14,390.99
Feb.	14,390.99	5,995.39	55.24	0.00	20,331.14
Mar.	20,331.14	2,822.11	319.21	22,834.04	0.00
Winter Total		23,246.78	412.74	22,834.04	

NOTES:

[1] Inflow stored at JMR during the period Nov. 15 through March 15 pursuant to the 1980 Operating Plan and Pueblo WWSP.

[2] Not a physical release from JMR, WWSP water allocated to individual Section III Operating Plan accounts on March 20, 1990 as follows:
Amity 19,630.42 AF gross, less 6,870.65 AF to transit loss, 12,759.77 AF net
Ft Lyon 0.00 AF gross, less 0.00 AF to transit loss, 0.00 AF net
Las Animas 3,203.62 AF gross, less 1,121.26 AF to transit loss, 2,082.36 AF net

[3] Source: Oper. Sec. 90 Report, Table II, and monthly accounting sheet for Section III account distribution.

No water was bypassed through the reservoir or physically released from storage during the winter season. However, several transfers into and between accounts did occur. These transfers adjusted the volume of water owned by individual entities, but did not change the total contents of JMR. In December the excess water in the transit loss account, 4,717.87 acre-feet, was reallocated to the Kansas and District 67 Section II accounts. On March 20, 1990 22,834.04 acre-feet of WWSP water was distributed into the appropriate Section III agreement accounts. Following this distribution, 35% of each individual Section III account's inflow was reallocated to the transit loss account, a total of 7,991.91 acre-feet. After these actions, the allocation of the reservoir contents at the conclusion of the winter compact storage period on March 31, 1990 was as shown on Table 4. The total contents on March 31, as reported by the USGS, was 72,449 acre-feet which agrees exactly with the Operations Secretary accounting.

TABLE 4
JOHN MARTIN RESERVOIR
CONTENTS DISTRIBUTION [AF]
MARCH 31,1990

Storage Component	Subtotal	Contents
Conservation Storage		23,617.78
Agreement Accounts		
Section II Agreement Accounts		
Kansas Account	6,146.86	
Dist. 67 Accounts	13,233.52	
Transit Loss Account	7,928.84	
Subtotal Section II	27,309.22	
Section III Agreement Accounts		
Amity	14,275.20	
Ft. Lyon	0.00	
Las Animas Cons.	2,038.44	
Subtotal Section III	16,313.64	
Total All Accounts	43,622.86	43,622.86
Flood Pool		0.00
Permanent Pool		5,208.36
Total Reservoir Contents		72,449.00

NOTES
[1] Source: Oper. Sec. 90 Report, March accounting sheets.

The summer storage season began at 0001 hours April 1, 1990. Transfer of 23,617.78 acre-feet of winter conservation storage into the Section II accounts began on April 7, 1990 in accordance with the Operation Plan and was completed on April 19, 1990. Conservation storage operations are detailed in Table 5. During the period April 1 to 19, 2,918.08 acre-feet of summer conservation storage was accumulated. After a reduction for evaporation this water was also distributed to the Section II accounts. Kansas received 40% of these April conservation storage transfers (10,521.95 acre-feet) and the Colorado District 67 ditches received 60% (15,782.92 acre-feet). With moderate runoff there were no flood control operations during Compact Year 1990, as reflected in Table 5A, Flood Pool Operations. Peak contents in JMR of 74,203 acre-feet was reached on April 19, 1990.

TABLE 5
JOHN MARTIN RESERVOIR
CONSERVATION STORAGE OPERATION (AF)
COMPACT YEAR 1990

Month	Contents Begin Month	Inflow to Storage	Evaporation	Storage Release	Contents End Month
Nov.'89	0.00	4,450.72	39.03	0.00	4,411.69
Dec.	4,411.69	3,397.76	30.81	0.00	7,778.64
Jan. '90	7,778.64	4,430.46	0.00	0.00	12,209.10
Feb.	12,209.10	4,385.61	44.72	0.00	16,549.99
Mar.	16,549.99	7,516.89	449.10	0.00	23,617.78
Winter Subtotal		24,181.44	563.66	0.00	
Apr.	23,617.78	2,918.08	230.96	26,304.90	0.00
May	0.00	0.00	0.00	0.00	0.00
June	0.00	0.00	0.00	0.00	0.00
July	0.00	11,033.49	8.28	11,025.21	0.00
Aug.	0.00	0.00	0.00	0.00	0.00
Sept.	0.00	0.00	0.00	0.00	0.00
Oct. '90	0.00	0.00	0.00	0.00	0.00
Summer Subtotal		13,951.57	239.24	37,330.11	
Year Total		38,133.01	802.90	37,330.11	

NOTES:
[1] Not a physical release from JMR, transferred to operating plan accounts.
[2] Source: Oper. Sec. 90 Report, Table I.

TABLE 5A
JOHN MARTIN RESERVOIR
FLOOD POOL OPERATION (AF)
COMPACT YEAR 1990

Month	Contents Begin Month	Inflow to Storage	Evaporation	Storage Release	Contents End Month
Nov. '89	0.00	0.00	0.00	0.00	0.00
Dec.	0.00	0.00	0.00	0.00	0.00
Jan. '90	0.00	0.00	0.00	0.00	0.00
Feb.	0.00	0.00	0.00	0.00	0.00
Mar	0.00	0.00	0.00	0.00	0.00
Winter Subtotal		0.00	0.00	0.00	
Apr.	0.00	0.00	0.00	0.00	0.00
May	0.00	0.00	0.00	0.00	0.00
June	0.00	0.00	0.00	0.00	0.00
July	0.00	0.00	0.00	0.00	0.00
Aug.	0.00	0.00	0.00	0.00	0.00
Sept.	0.00	0.00	0.00	0.00	0.00
Oct. '90	0.00	0.00	0.00	0.00	0.00
Summer Subtotal		0.00	0.00	0.00	
Year Total		0.00	0.00	0.00	

NOTES
[1] No flood pool operations in CY 1990.
[2] Source: Oper. Sec. 90 Report, Table IX.

On July 21, 1990 a six day period of high runoff resulted in additional summer inflow of 11,033.49 acre-feet to conservation storage. After reduction for evaporation, 11,025.21 acre-feet was subsequently transferred to the Section II accounts, Kansas receiving 40% - 4,410.08 acre-feet, and Colorado District 67 ditches 60% - 6,615.13 acre-feet. No other inflows to conservation storage occurred during the remainder of the year.

During the summer storage season 15,896.12 acre-feet was stored in the Amity Canal's Section III account pursuant to the Great Plains Reservoir ("GPR") decree. Another 1,428.51 acre-feet was temporarily stored in a sub-account of the Ft. Bent Canal's account for reregulation of the City of Lamar's transmountain Fry-Ark water under procedures approved by the Administration and described in the Operations Secretary Report. In addition, 1,197.79 acre-feet of transmountain water was stored in the permanent pool at JMR during the summer season. Combined operations of all the accounts established by Sections II and III of the Operating Plan are shown in Table 6. Operations of the Section II and III accounts during Compact Year 1990 are separately shown in Tables 7 and 8.

TABLE 6
JOHN MARTIN RESERVOIR
AGREEMENT ACCOUNTS OPERATION [AF]
COMPACT YEAR 1990

Month	Contents Begin Month	Inflow to Storage	Evaporation	Storage Release	Contents End Month
Nov. '89	21,953.82	0.00	319.36	0.00	21,634.46
Dec.	21,634.46	0.00	125.89	0.00	21,508.57
Jan. '90	21,508.57	0.00	0.00	0.00	21,508.57
Feb.	21,508.57	0.00	60.91	0.00	21,447.66
Mar.	21,447.66	22,834.04	658.84	0.00	43,622.86
Winter Subtotal		22,834.04	1,165.00	0.00	
Apr.	43,622.86	26,304.90	1,507.80	7,910.49	60,509.47
May	60,509.47	2,248.97	2,125.18	9,147.56	51,485.70
June	51,485.70	4,830.83	2,902.56	19,277.41	34,136.56
July	34,136.56	20,731.39	1,632.98	17,357.85	35,877.12
Aug.	35,877.12	538.65	1,583.71	9,006.10	25,825.96
Sept.	25,825.96	0.00	981.88	11,563.76	13,280.32
Oct. '90	13,280.32	0.00	499.96	0.00	12,780.36
Summer Subtotal		54,654.74	11,234.07	74,263.17	
Year Total		77,488.78	12,399.07	74,263.17	

NOTES

[1] Agreement Accounts include the sum of accounts established in Section II and III of the Operating Plan Resolution and City of Lamar temporary operations with Fry-Ark water using the Ft. Bent Canal.

[2] Transfers of water between agreement accounts not included as either an inflow or a release in Table 6 values.

[3] Source: Oper. Sec. 90 Report, Table VI

TABLE 7
JOHN MARTIN RESERVOIR
SECTION II AGREEMENT ACCOUNTS OPERATION [AF]
COMPACT YEAR 1990

Month	Contents Begin Month	Inflow to Storage	Evaporation	Storage Release	Contents End Month
Nov. '89	20,290.50	0.00	295.14	0.00	19,995.36
Dec	19,995.36	0.00	116.34	0.00	19,879.02
Jan. '90	19,879.02	0.00	0.00	0.00	19,879.02
Feb.	19,879.02	0.00	56.30	0.00	19,822.72
Mar.	19,822.70	7,991.91	505.41	0.00	27,309.22
Winter Subtotal		7,991.91	973.19	0.00	
Apr.	27,309.22	26,304.90	1,093.57	7,910.49	44,610.06
May	44,610.06	787.13	1,552.44	4,961.37	38,883.38
June	38,883.38	2,619.32	2,073.21	18,849.70	20,579.79
July	20,579.79	14,422.37	862.97	14,719.39	19,419.80
Aug.	19,419.80	188.53	881.37	3,251.79	15,475.17
Sept.	15,475.17	0.00	719.06	1,475.79	13,280.32
Oct. '90	13,280.32	0.00	499.96	0.00	12,780.36
Summer Subtotal		44,322.25	7,682.58	51,168.53	
Year Total		52,314.16	8,655.77	51,168.53	

NOTES

[1] Sect. II accounts: Kansas account, see Table 9; transit loss account, see Table 11; District 67 ditch accounts, see Table 12A; City of Lamar temporary sub-account, included in District 67 totals.

[2] Inflows include 13,555.54 AF of water transferred to transit loss account from Section III accounts, see Tables 8 and 11.

[3] Inflows and releases do not include transfers between various accounts.

[4] Source: Oper. Sec. 90 Report, Table VI.

TABLE 8
JOHN MARTIN RESERVOIR
SECTION III ACCOUNTS OPERATION [AF]
COMPACT YEAR 1990

Month	Contents Begin Month	Inflow to Storage	Evaporation	Storage Release	Contents End Month
Nov. '89	1,663.32	0.00	24.22	0.00	1,639.10
Dec	1,639.10	0.00	9.55	0.00	1,629.55
Jan. '90	1,629.55	0.00	0.00	0.00	1,629.55
Feb.	1,629.55	0.00	4.61	0.00	1,624.94
Mar.	1,624.94	22,834.04	153.43	7,991.91	16,313.64
Winter Subtotal		22,834.04	191.81	7,991.91	
Apr.	16,313.64	0.00	414.23	0.00	15,899.41
May	15,899.41	2,248.97	572.74	4,973.32	12,602.32
June	12,602.32	3,402.32	829.35	1,618.52	13,556.77
July	13,556.77	9,706.18	770.01	6,035.62	16,457.32
Aug.	16,457.32	538.65	702.34	5,942.84	10,350.79
Sept.	10,350.79	0.00	262.82	10,087.97	0.00
Oct. '90	0.00	0.00	0.00	0.00	0.00
Summer Subtotal		15,896.12	3,551.49	28,658.27	
Year Total		38,730.16	3,743.30	36,650.18	

NOTES

[1] Winter inflow stored at JMR per Pueblo WWSP, summer inflow per Great Plains Reservoir decree.
[2] Releases include 7,991.91 AF [March] and 5,563.63 AF [May-August] transferred to transit loss account, a total of 13,555.54 AF.
[3] Inflows and releases do not include transfers between Section III accounts.
[4] Source: Oper. Sec. 90 Report, Tables III, IV, V, and monthly accounting sheets.

Kansas called for releases from its account of 14,894.59 acre-feet during a single run from June 20 to July 14, 1990. A separate transit loss account release of 4,142.88 acre-feet was made to support deliveries of Kansas account water to the Stateline. Operations of the Kansas and transit loss accounts are summarized in Tables 9, 10, and 11. These operations are also detailed on a daily basis in Appendices B-12 and B-13.

By annual agreement between the states, the Stateline flow attributed to Kansas demands for releases from JMR is calculated using a lag/rundown period to account for the transit time between JMR and the Stateline. To determine whether the requested release has been delivered, the states further agree that no part of the daily Stateline flow exceeding 105% of Kansas' demand will be credited toward those deliveries. The total Stateline flow on days of Kansas demands, calculated pursuant to this agreement, was 18,555 acre-feet (provisional data), adjusted to 18,581 acre-feet when final USGS discharge records became available. Differences between quantities in

Table 10 of this report and Table XI in the Operations Secretary Annual Report reflect the fact that Table 10 reports final corrected USGS gaged flows, while Table XI was prepared by the Operations Secretary immediately following the end of the Compact Year when only provisional flow data was available. Of this Stateline flow, 17,845 acre-feet was calculated pursuant to the annual agreement to be a credited delivery against the releases from the Kansas account. In Compact Year 1990 USGS recalculation of Stateline flows resulted in a change of 258 acre-feet in the volume of credited delivery.

The operation of the transit loss account in Compact Year 1990 is shown in Table 11. Inflows to the transit loss account are by transfer of 35% of Section III account inflows, as required by the Operating Plan. Summer releases were made as necessary to support deliveries to the Stateline of the water requested by Kansas. The December 1989 release was the reallocation of excess transit loss account water to the other Section II accounts, and was not a physical release from the reservoir.

TABLE 9
JOHN MARTIN RESERVOIR
KANSAS ACCOUNT OPERATION [AF]
COMPACT YEAR 1990

Month	Contents Begin Month	Inflow to Storage	Evaporation	Storage Release	Contents End Month
Nov. '89	4,924.15	0.00	71.61	0.00	4,852.54
Dec.	4,852.54	1,482.76	30.30	0.00	6,305.00
Jan. '90	6,305.00	0.00	0.00	0.00	6,305.00
Feb.	6,305.00	0.00	17.87	0.00	6,287.13
Mar.	6,287.13	0.00	140.27	0.00	6,146.86
Winter Subtotal		1,482.76	260.05	0.00	
Apr.	6,146.86	10,521.95	325.47	0.00	16,343.34
May	16,343.34	0.00	601.49	0.00	15,741.85
June	15,741.85	0.00	805.41	10,016.68	4,919.76
July	4,919.76	4,410.08	91.19	4,877.91	4,360.74
Aug.	4,360.74	0.00	214.27	0.00	4,146.47
Sept.	4,146.47	0.00	208.48	0.00	3,937.99
Oct. '90	3,937.99	0.00	148.26	0.00	3,789.73
Summer Subtotal		14,932.03	2,394.57	14,894.59	
Year Total		16,414.79	2,654.62	14,894.59	

NOTES
[1] December inflow is Kansas share (11/35) of transfer of excess transit loss account water.
[2] Source: Oper. Sec. 90 Report, monthly accounting sheets.

TABLE 10
JOHN MARTIN RESERVOIR
KANSAS DEMANDS and RELEASES [AF]
COMPACT YEAR 1990

Month	Demand/ Release	Transit Loss Acct. Release	Stateline Flow	Credited Delivery
Nov. '89	0.00	0.00	0	0
Dec.	0.00	0.00	0	0
Jan. '90	0.00	0.00	0	0
Feb.	0.00	0.00	0	0
Mar.	0.00	0.00	0	0
Winter Subtotal	0.00	0.00	0	0
Apr.	0.00	0.00	0	0
May	0.00	0.00	0	0
June	10,016.68	3,533.13	8,746	8,470
July	4,877.91	609.75	9,837	9,375
Aug.	0.00	0.00	0	0
Sept.	0.00	0.00	0	0
Oct. '90	0.00	0.00	0	0
Summer Subtotal	14,894.59	4,142.88	18,583	17,845
Year Total	14,894.59	4,142.88	18,583	17,845

NOTES

[1] Stateline flow equals sum of gaged flows (as published by USGS) at Frontier Ditch and Arkansas River at Coolidge, Kansas on days of Kansas demands, adjusted for transit times and appropriate "rundown" period. Generally, deliveries begin 2 days after the release from JMR commences and continue for up to 7 days following the end of the release.

[2] The annual operating agreement for 1990 (dated Dec. 12, 1989) states in part:

"3. Credit for delivery to Kansas will stop at the Stateline 7 days after the end of the run at JMR. No credit for over delivery will be carried forward to any subsequent run.

4. When the daily average flow at the Stateline exceeds the demand, delivery will be credited at not to exceed 105% of the demand."

[3] Demands at the end of month are partially satisfied by deliveries in the following month due to rundown period and transit time between JMR and the Stateline.

[4] Source: Oper. Sec. 90 Report, Table XI, revised using final USGS published data for Stateline flows. Operation Secretary originally reported Stateline flow as 18,555 AF and credited delivery of 18,103 AF.

TABLE 11
JOHN MARTIN RESERVOIR
TRANSIT LOSS ACCOUNT SUMMARY [AF]
COMPACT YEAR 1990

Month	Contents Begin Month	Inflow to Storage	Evaporation	Storage Release	Contents End Month
Nov. '89	4,808.84	0.00	69.97	0.00	4,738.87
Dec.	4,738.87	0.00	21.00	4,717.87	0.00
Jan. '90	0.00	0.00	0.00	0.00	0.00
Feb.	0.00	0.00	0.00	0.00	0.00
Mar.	0.00	7,991.91	63.07	0.00	7,928.84
Winter Subtotal		7,991.91	154.04	4,717.87	
Apr.	7,928.84	0.00	201.32	0.00	7,727.52
May	7,727.52	787.13	298.51	0.00	8,216.14
June	8,216.14	1,190.81	475.31	3,533.13	5,398.51
July	5,398.51	3,397.16	335.80	609.75	7,850.12
Aug.	7,850.12	188.53	393.15	0.00	7,645.50
Sept.	7,645.50	0.00	384.35	0.00	7,261.15
Oct. '90	7,261.15	0.00	273.41	0.00	6,987.74
Summer Subtotal		5,563.63	2,361.85	4,142.88	
Year Total		13,555.54	2,515.89	8,860.75	

NOTES

[1] Inflows are transfers from Section III accounts.

[2] Transit loss account totals included with Section II accounts in Table 7.

[3] Dec. 1989 not a physical release to river from storage; reallocated 1,482.76 AF (11/35) to Kansas account and 3,235.11 AF (24/35) to Colorado ditch accounts pursuant to Section III of the 1980 Operating Plan and the annual operating agreement for 1990.

[4] Source: Oper. Sec. 90 Report, Table VII.

Combined operations of the Section II accounts for the ditches in Colorado Irrigation District 67 are shown in Table 12A. Combined Section III account operations were previously shown in Table 8. Total releases from Section II and III accounts to Colorado ditches during the 1990 Compact Year totaled 55,225.70 acre-feet as summarized in Table 12B.

TABLE 12A
JOHN MARTIN RESERVOIR
COLORADO DISTRICT 67 DITCHES
SECTION II ACCOUNTS OPERATION [AF]
COMPACT YEAR 1990

Month	Contents Begin Month	Inflow to Storage	Evaporation	Storage Release	Contents End Month
Nov. '89	10,557.51	0.00	153.56	0.00	10,403.95
Dec	10,403.95	3,235.11	65.04	0.00	13,574.02
Jan. '90	13,574.02	0.00	0.00	0.00	13,574.02
Feb.	13,574.02	0.00	38.43	0.00	13,535.59
Mar.	13,535.59	0.00	302.07	0.00	13,233.52
Winter Subtotal		3,235.11	559.10	0.00	
Apr.	13,233.52	15,782.95	566.78	7,910.49	20,539.20
May	20,539.20	0.00	652.44	4,961.37	14,925.39
June	14,925.39	1,428.51	792.49	5,299.89	10,261.52
July	10,261.52	6,615.13	435.98	9,231.73	7,208.94
Aug.	7,208.94	0.00	273.95	3,251.79	3,683.20
Sept.	3,683.20	0.00	126.23	1,475.79	2,081.18
Oct. '90	2,081.18	0.00	78.29	0.00	2,002.89
Summer Subtotal		23,826.59	2,926.16	32,131.06	
Year Total		27,061.70	3,485.26	32,131.06	

NOTES

[1] Includes City of Lamar temporary sub-account as follows:
Inflow at 1,428.51 AF, evaporation at 67.23 AF, release at 1,361.28 AF

[2] Dec. Inflow is Colorado share (24/35) of transfer of excess transit loss account water.

[3] Transfers between ditch accounts, if any, not included as either an inflow or release.

[4] Source: Oper. Sec. 90 Report, monthly accounting sheets.

TABLE 12B
JOHN MARTIN RESERVOIR
SUMMARY OF RELEASES TO COLORADO DITCHES [AF]
COMPACT YEAR 1990

Month	Release from Sec. II Account	Release from Sec. III Account	Total Colorado Release to River
Nov. '89	0.00	0.00	0.00
Dec.	0.00	0.00	0.00
Jan. '90	0.00	0.00	0.00
Feb.	0.00	0.00	0.00
Mar.	0.00	0.00	0.00
Winter Subtotal	0.00	0.00	0.00
Apr.	7,910.49	0.00	7,910.49
May	4,961.37	4,186.19	9,147.56
June	5299.89	427.71	5,727.60
July	9231.73	2638.46	11,870.19
Aug.	3251.79	5754.31	9,006.10
Sept.	1475.79	10087.97	11,563.76
Oct. '90	0.00	0.00	0.00
Summer Subtotal	32,131.06	23,094.64	55,225.70
Year Total	32,131.06	23,094.64	55,225.70

NOTES

[1] Total includes release of City of Lamar's transmountain Fry-Ark water at 1,361.28 AF.

[2] Source: Oper. Sec. 90 Report, Table X.

The permanent pool in John Martin Reservoir received 1,197.79 acre-feet of inflow from transmountain water sources obtained by the Colorado Division of Wildlife in Compact Year 1990. Even so, the pool contents declined over 600 acre-feet due to evaporation. At the close of Compact Year 1990 the permanent pool contained 4,808.46 acre-feet. Permanent pool operations during the year are shown in Table 13.

TABLE 13
JOHN MARTIN RESERVOIR
PERMANENT POOL OPERATION [AF]
COMPACT YEAR 1990

Month	Contents Begin Month	Inflow to Storage	Evaporation	Storage Release	Contents End Month
Nov. '89	5,452.96	0.00	79.32	0.00	5,373.64
Dec.	5,373.64	0.00	31.30	0.00	5,342.34
Jan. '90	5,342.34	0.00	0.00	0.00	5,342.34
Feb.	5,342.34	0.00	15.13	0.00	5,327.21
Mar.	5,327.21	0.00	118.85	0.00	5,208.36
Winter Subtotal		0.00	244.60	0.00	
Apr.	5,208.36	0.00	132.24	0.00	5,076.12
May	5,076.12	0.00	186.82	0.00	4,889.30
June	4,889.30	0.00	291.44	0.00	4,597.86
July	4,597.86	1,033.95	273.74	0.00	5,358.07
Aug.	5,358.07	0.00	263.29	0.00	5,094.78
Sept.	5,094.78	163.84	262.12	0.00	4,996.50
Oct. '90	4,996.50	0.00	188.04	0.00	4,808.46
Summer Subtotal		1,197.79	1,597.69	0.00	
Year Total		1,197.79	1,842.29	0.00	

NOTES
[1] Source: Oper. Sec. 90 Report, Table VIII

Compact Year 1990 ended at 2400 hours on October 31, 1990. JMR contained 17,588.82 acre-feet, as determined by the Operations Secretary accounting, which agrees closely with the 17,830 acre-feet provisionally reported by the USGS, and the 17,900 acre-feet subsequently published. An adjustment to reservoir accounting was made by the Operations Secretary on November 1, 1990 by crediting approximately 240 acre-feet of additional inflow to conservation storage. This reconciled the records of JMR contents for the start of Compact Year 1991. JMR contained approximately 10,000 acre-feet less water than at the beginning of Compact Year 1990. The final contents were allocated as shown in Table 14.

TABLE 14
JOHN MARTIN RESERVOIR
CONTENTS DISTRIBUTION [AF]
OCTOBER 31,1990

Storage Component	Subtotal	Contents
Conservation Storage		0.00
Agreement Accounts		
Section II Agreement		
Kansas Account	3,789.73	
Dist. 67 Accounts	2,002.89	
Transit Loss Account	6,987.74	
Subtotal Section II	12,780.36	
Section III Agreement		
Amity	0.00	
Ft. Lyon	0.00	
Las Animas Cons.	0.00	
Subtotal Section III	0.00	
Total All Accounts	12,780.36	12,780.36
Flood Pool		0.00
Permanent Pool		4,808.46
Total Reservoir Contents		17,588.82

NOTES
[1] Source: Oper. Sec. 90 Report, Table XIII.

The technical data for this section was compiled by the staff of the Colorado Water Conservation Board using data from the Annual Report of the Operations Secretary Concerning the Operation of John Martin, the USGS, the Colorado Division of Water Resources, the Kansas Division of Water Resources and the minutes and correspondence of the Arkansas River Compact Administration.

9. GAGING STATIONS

The USGS operates eight gaging stations, as included in Appendix B, under their "Collection of Basic Records" program and through funding agreements with the Corps of Engineers and the Administration. For federal fiscal year 1989-1990 (October 1, 1989 to September 30, 1990) the Administration approved a cooperative agreement with the USGS in the amount of $21,620. The Administration was assessed one half of this amount, or $10,810. These funds were used for supplemental measurements at seven gaging sites, the operation of one station (Arkansas River near Granada, Colorado), operation of a telemark gage at John Martin Dam, maintenance of radio equipment, and the preparation of records for this annual report.

In general, streamflow records of satisfactory accuracy were obtained at the Compact stations. Emphasis was again placed on obtaining more field data, particularly in the form of discharge measurements at various stages of flow. Several more measurements were made by the USGS at each site than are required under its agreement with the Administration. Additional measurements were made by personnel of the Colorado State Engineer which were also incorporated into the records. There were no critical problems at the stations during the year, with the exception of the continuing unstable channels and controls.

10. FINDINGS of FACT by the ADMINISTRATION

There were no findings of fact made by the Administration during Compact Year 1990.

11. INVESTIGATIONS

There were no investigations undertaken by the Administration during Compact Year 1990.

12. CHRONOLOGY of EVENTS in KANSAS v. COLORADO LITIGATION

The following is a partial list of significant events in the ongoing lawsuit during Compact Year 1990:

DATE	PARTY	ITEM
11-10-89	Kansas	First Amended Complaint
11-22-89	Colorado	Answer to First Amended Complaint and Counterclaim
1-2-90	Spec.Master	Order to Bifurcate Proceedings
1-12-90	U.S.A.	Answer to First Amended Complaint
3-7-90	Spec.Master	Orders re Trial Date and Pre-Trial Procedures
5-25-90	Spec.Master	Order Amending Pre-Trial Procedures
7-3-90	Spec.Master	Order Amending Pre-Trial Schedules
8-27-90	All Parties	Pre-Trial Statements
9-11-90	Spec.Master	Order re Motion for Ruling of Law
9-17-90	All Parties	Trial commenced, continuing intermittently for 141 days through December 16, 1992

13. RESOLUTIONS HONORING: CARL E. BENTRUP, RONALD OLOMON, and J. WILLIAM McDONALD.

The following three resolutions were adopted by the Administration at its Annual Meeting on December 10, 1990 in honor of the members who retired during Compact Year 1990. Each served with distinction in their own way, however Mr. Bentrup's service was most extraordinary in its 33 year length and his devotion to the Arkansas River Compact and spirit of interstate cooperation. This 1990 Annual Report is dedicated to all three gentleman as a way of remembering their efforts on behalf of water users throughout the Arkansas River Valley and expressing the appreciation of the Administration and the States of Colorado and Kansas for their skillful service.

RESOLUTION HONORING CARL E. BENTRUP

WHEREAS, Carl E. Bentrup served on the Arkansas River Compact Administration as a Representative of the State of Kansas from 1957 through 1990, a total of 33 years of distinguished service; and

WHEREAS, he was born in a house next to the Deerfield Bridge and his roots have been inextricably entwined with the lifeblood of the Arkansas River since that time; and

WHEREAS, he has lived at his present location near the Arkansas River since 1947 where he has been a successful irrigator under the Amazon Ditch and one of southwest Kansas' leading sheep ranchers; and

WHEREAS, Mr. Bentrup has selflessly devoted many hours of time to diligently representing the interests of the Arkansas River Valley water users and State of Kansas in the Arkansas River Compact Administration; and

WHEREAS, he has ably and fairly served as Vice-Chairman of the Arkansas River Compact Administration; and

WHEREAS, Carl Bentrup's devotion to the Compact, the Compact Administration, and the welfare of the Arkansas River were widely known and appreciated by all those who came in contact with him; and

WHEREAS, when you look in the dictionary under the term "gentlemen", it has a picture of Carl Bentrup; and

WHEREAS, Carl Bentrup's devotion and service to the Arkansas River Compact cannot be replaced and will be sorely missed by all those who know him;

NOW THEREFORE, BE IT RESOLVED by the Arkansas River Compact Administration, that it does hereby express its deepest gratitude and appreciation to Carl Bentrup for the services he has rendered to the Arkansas River Compact Administration and to the States of Kansas and Colorado during the past 33 years.

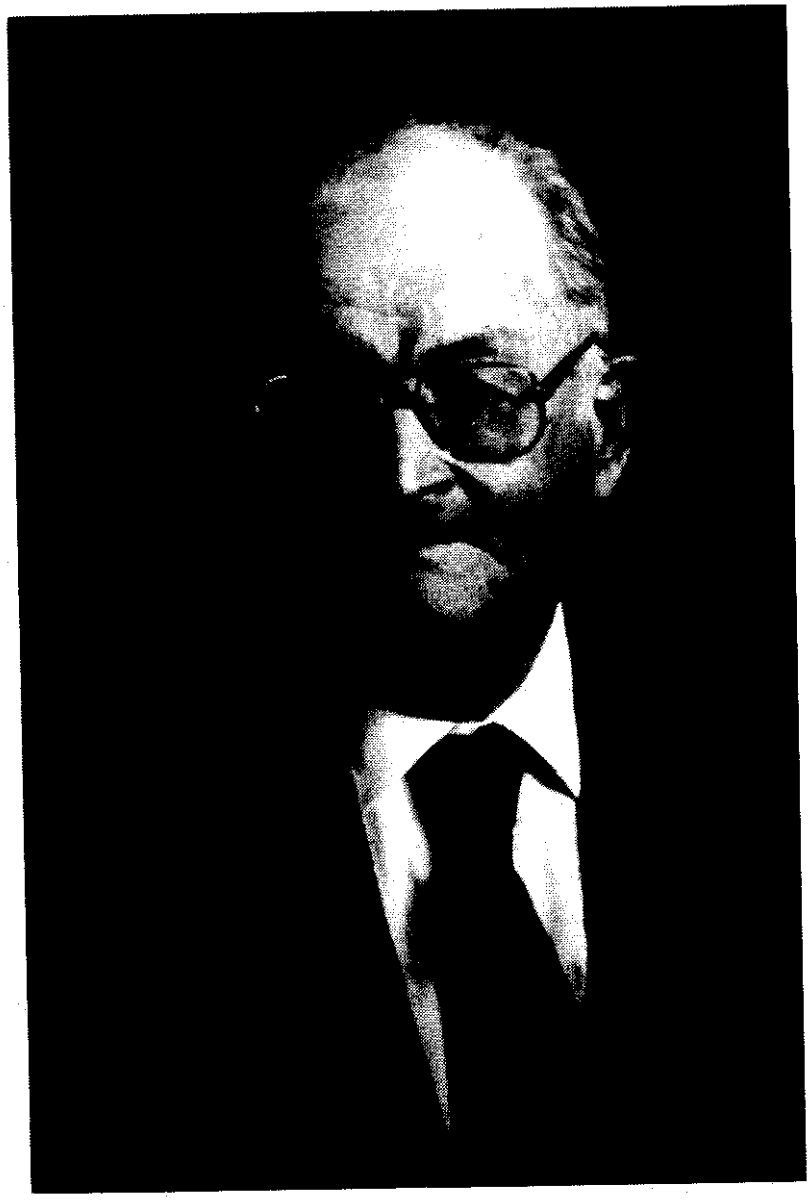
BE IT FURTHER RESOLVED that this resolution be entered into to the records of the Arkansas River Compact Administration and that the Recording Secretary be instructed to send a copy to Mr. Bentrup.

BE IT FURTHER RESOLVED that the Administration honor Mr. Bentrup for his many years of extraordinary service by including his picture and appropriate dedicatory remarks in the Administrations annual report for the Compact Year 1990.

Entered this 11th day of December, 1990, at the Annual Meeting of the Arkansas River Compact Administration held in Lamar, Colorado.

/s/
Frank G. Cooley, Chairman

/s/
Carl Genova, Vice-Chairman



CARL E. BENTRUP
Arkansas River Compact Administration
1957 - 1990

RESOLUTION HONORING RONALD OLOMON

WHEREAS, Ron Olomon, an irrigator on the Farmer's Ditch and lifelong resident of the Garden City area, served on the Arkansas River Compact Administration as a Representative of the State of Kansas and the water users of the Arkansas River Valley in Kansas from 1981 until 1990; and

WHEREAS, he faithfully performed his duties and represented the interests of the State of Kansas; and

WHEREAS, his service to the Arkansas River Compact Administration has been greatly appreciated;

NOW THEREFORE, BE IT RESOLVED by the Arkansas River Compact Administration, that it hereby acknowledges with gratitude the dedicated service of Ron Olomon to the Administration and expresses its appreciation to him for his dedication.

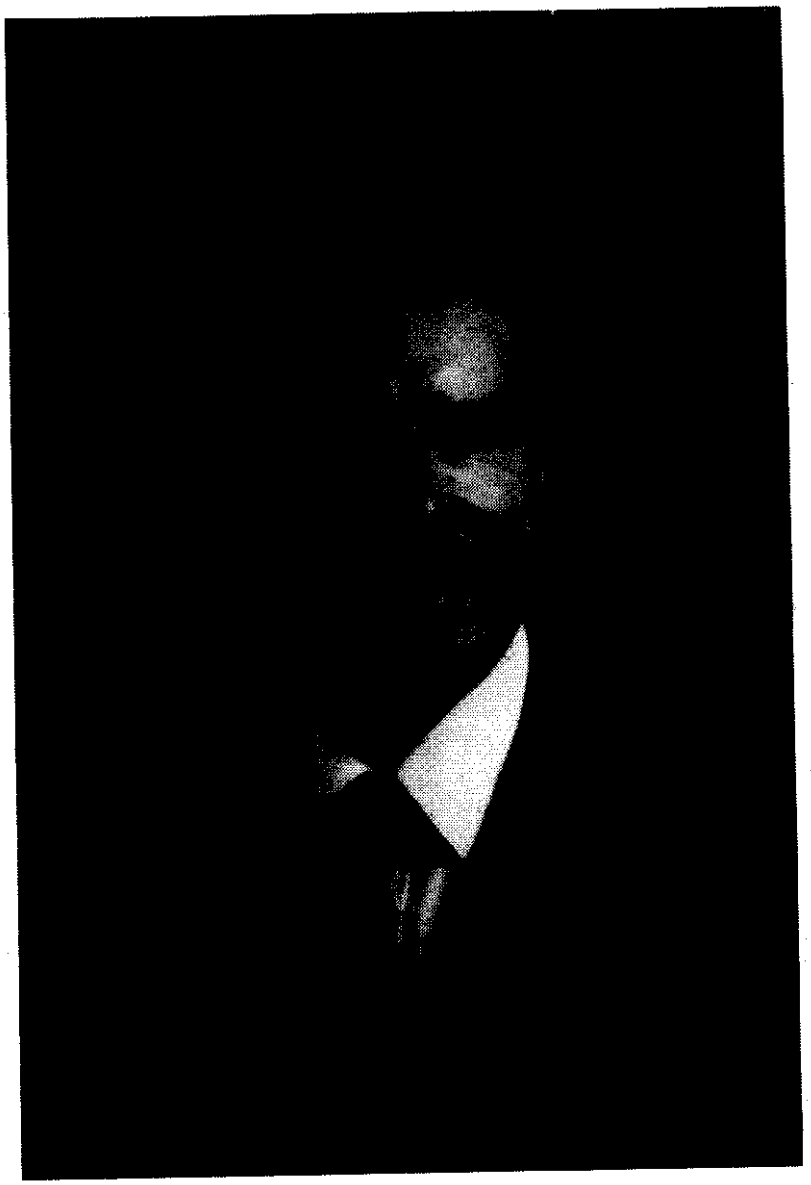
BE IT FURTHER RESOLVED that this Resolution be entered into the records of the Arkansas River Compact Administration and that the Recording Secretary be instructed to send a copy to Mr. Olomon.

BE IT FURTHER RESOLVED that the Administration honor Mr. Olomon for his may years of service by including his picture and appropriate dedicatory remarks in the Administration's annual report for the Compact Year 1990.

Entered this 11th day of December, 1990, at the Annual Meeting of the Arkansas River Compact Administration held in Lamar, Colorado.

/s/
Frank G. Cooley, Chairman

/s/
Carl Genova, Vice-Chairman



RONALD OLOMON
Arkansas River Compact Administration
1981 - 1990

RESOLUTION HONORING J. WILLIAM MCDONALD

WHEREAS, Mr. J. William McDonald, in his capacity as Director of the Colorado Water Conservation Board, served as a Representative from the State of Colorado to the Arkansas River Compact Administration during that period; and

WHEREAS, Mr. McDonald ably and steadfastly represented Colorado's interests with equanimity and fairness in a gentlemanly manner during his nearly eleven years on the Administration; and

WHEREAS, Mr. McDonald was instrumental in helping to implement the 1980 Operating Plan for John Martin Reservoir to the benefit of Kansas and Colorado.

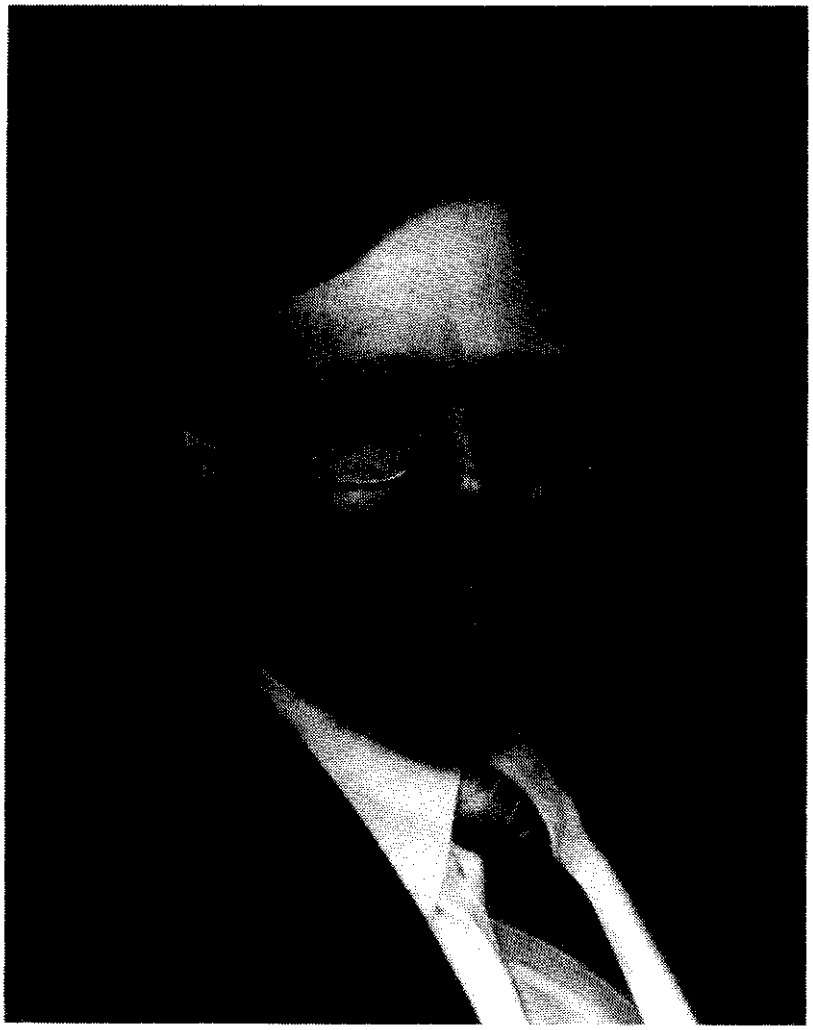
NOW, THEREFORE, BE IT RESOLVED by the Arkansas River Compact Administration that it does hereby express its gratitude and appreciation to J. William McDonald for his outstanding service, dedication, and courtesy to the Administration and to the states, and further extends to him its best wishes for health and happiness in the future.

BE IT FURTHER RESOLVED that the Administration honor Mr. McDonald for his service by including this Resolution along with his picture in the Administration's 1990 annual report and instruct the Recording Secretary to send a copy of the Resolution to Mr. McDonald.

Entered this 11th day of December, 1990, at the Annual Meeting of the Arkansas River Compact Administration held in Lamar, Colorado.

/s/
Frank G. Cooley, Chairman

/s/
Carl Genova, Vice-Chairman



J. WILLIAM McDONALD
Arkansas River Compact Administration
1979 - 1990

APPENDICES

Appendix A-1

REVISED FY 1989-90 BUDGET
(July 1, 1989 - June 30, 1990)

EXPENDITURES		
A. SALARIES AND CONTRACTUAL SERVICES		
1. Treasurer	$ 1,000	
2. Recording Secretary	1,000	
3. Operations Secretary	6,100	
4. Auditor's Fees	500	
5. Court Reporter's Fees	500	
		$9,100
B. GAGING STATIONS		
1. U.S. Geological Survey Cooperative Agreements for federal FY 1989	$11,375	
2. St. of Colorado Satellite System	8,000	
		$19,375
C. OPERATING EXPENSES		
1. Treasurer's Bond	$ 100	
2. 1987/88 Annual Reports (Printing)	6,500	
3. Telephone	1,000	
4. Office Supplies/Postage	400	
5. Printing/Copying	300	
6. Meetings	150	
7. Travel	0	
8. Rent	600	
		$ 9,050
D. EQUIPMENT		0
E. CONTINGENCY		1,000
F. TOTAL		$38,525
INCOME		
A. ASSESSMENTS		
1. Colorado (60%)	$12,000	
2. Kansas (40%)	8,000	
		$20,000
B. INTEREST EARNINGS		2,000
C. MISCELLANEOUS		0
		$22,000
EXPENDITURES FROM SURPLUS		$16,525

Adopted by the Arkansas River Compact Administration at its December 8, 1987 Annual Meeting and revised at its December 13, 1988 Annual Meeting.

/s/
Treasurer

Appendix A-1

REVISED FY 1990-91 BUDGET

(July 1, 1990 - June 30, 1991)

EXPENDITURES		
A. SALARIES AND CONTRACTUAL SERVICES		
1. Treasurer	$ 1,500	
2. Recording Secretary	1,500	
3. Operations Secretary	6,100	
4. Auditor's Fees	700	
5. Court Reporter's Fees	600	
		$10,400
B. GAGING STATIONS		
1. U.S. Geological Survey Cooperative Agreements for federal FY 1990	$11,830	
2. St. of Colorado Satellite System	8,000	
		$19,830
C. OPERATING EXPENSES		
1. Treasurer's Bond	$ 100	
2. 1988/89 Annual Reports (Printing)	7,000	
3. Telephone	1,000	
4. Office Supplies/Postage	400	
5. Printing/Copying	300	
6. Meetings	150	
7. Travel	0	
8. Rent	600	
		$ 9,550
D. EQUIPMENT		0
E. CONTINGENCY		1,000
F. TOTAL		$40,780
INCOME		
A. ASSESSMENTS		
1. Colorado (60%)	$15,000	
2. Kansas (40%)	10,000	
		$25,000
B. INTEREST EARNINGS		1,500
C. MISCELLANEOUS		0
		$26,500
EXPENDITURES FROM SURPLUS		$14,280

First adopted by the Arkansas River Compact Administration at its December 13, 1988 Annual Meeting and revised at its December 12, 1989 Annual Meeting.

/s/

Treasurer

Appendix A-1

FY 1991-92 BUDGET
(July 1, 1991 - June 30, 1992)

EXPENDITURES		
A. SALARIES AND CONTRACTUAL SERVICES		
1. Treasurer	$ 1,500	
2. Recording Secretary	1,500	
3. Operations Secretary	6,100	
4. Auditor's Fees	700	
5. Court Reporter's Fees	600	
		$ 10,400
B. GAGING STATIONS		
1. U.S. Geological Survey Cooperative Agreements for federal FY 1991	$12,600	
2. St. of Colorado Satellite System	8,000	
		$20,600
C. OPERATING EXPENSES		
1. Treasurer's Bond	$ 100	
2. 1990 Annual Reports (Printing)	4,000	
3. Telephone	1,000	
4. Office Supplies/Postage	400	
5. Printing/Copying	300	
6. Meetings	150	
7. Travel	0	
8. Rent	600	
		$ 6,550
D. EQUIPMENT		0
E. CONTINGENCY		1,000
F. TOTAL		$38,550
INCOME		
A. ASSESSMENTS		
1. Colorado (60%)	$15,750	
2. Kansas (40%)	10,500	
		$26,250
B. INTEREST EARNINGS		3,000
C. MISCELLANEOUS		0
		$29,250
EXPENDITURES FROM SURPLUS		$ 9,300

Adopted by the Arkansas River Compact Administration at its December 12, 1989 Annual Meeting.

/s/
Treasurer

Appendix A-2
AUDITORS REPORT

ANDERSON & COMPANY P.C.

Members AICPA CSCPA ■ Certified Public Accountants ■ Gary L. Anderson, C.P.A. Ronald D. Anderson, P.A.

October 24, 1990

We have audited the accompanying statements of assests, liabilities and equity - cash basis - of the Arkansas River Compact Administration as of June 30, 1990, and the related statements of revenue collected and expenses paid for the year then ended. These financial statements are the responsibility of the Administration's management. Our responsibility is to express an opinion on these financial statements based on our audit.

Our examination was made in accordance with generally accepted auditing standards and accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

As described in Note 1a, these financial statements were prepared on the basis of cash receipts and disbursements, which is a comprehensive basis of accounting other than generally accepted accounting principles.

In our opinion, the financial statements referred to above present fairly, in all material respects, the assets and liabilities - cash basis - of the Arkansas River Compact Administration as of June 30, 1990 and its revenue collected and expenses paid during the year then ended, on the basis of accounting described in Note 1a.

4th & Parmenter ■ P.O. Box 1077 ■ Lamar, Colorado 81052 ■ (719) 336-7785

Appendix A-2
AUDITORS REPORT

ARKANSAS RIVER COMPACT ADMINISTRATION
STATEMENT OF ASSETS AND LIABILITIES - CASH BASIS
June 30, 1990

ASSETS	
Cash	$ 34,890
Equipment	29,811
Concrete Control	8,000
TOTAL ASSETS	$ 72,701
LIABILITIES	
Liabilities	$ 0
CASH BASIS EQUITY	
Expended:	
Equipment	$ 29,811
Concrete Control	8,000
Unexpended	34,890
TOTAL LIABILITIES AND CASH BASIS EQUITY	$ 72,701

See Accountant's Audit Report.
2

Appendix A-2
AUDITORS REPORT

ARKANSAS RIVER COMPACT ADMINISTRATION
STATEMENT OF REVENUES COLLECTED AND EXPENSES PAID
and CHANGES IN CASH BALANCE
For the Year Ended June 30, 1990

CASH BALANCE - July 1, 1989		$ 46,685
REVENUES		
Revenues from Assessments		
Colorado - 60%	$ 12,000	
Kansas - 40%	8,000	
Interest	3,075	
TOTAL REVENUES		23,075
EXPENSES		
Treasurers Bond	$ 100	
Geological Survey	11,370	
Satellite Access Fee	8,000	
Operations Secretary	6,501	
Printing Annual Report - 1986	3,678	
Office Rent	600	
Auditor Fee	700	
Office Supplies and Postage	159	
Copying	321	
Meeting Expense	239	
Court Reporter Fee	453	
Telephone	749	
Recording Secretary and Treasurer	2,000	
TOTAL EXPENSES		34,870
EXCESS OF EXPENSES OVER REVENUES		(11,795)
CASH BALANCE - June 30, 1990		$ 34,890

See Accountant's Audit Report.
3

Appendix A-2
AUDITORS REPORT

ARKANSAS RIVER COMPACT ADMINISTRATION
STATEMENT OF REVENUES COLLECTED
and EXPENSES PAID WITH BUDGET COMPARISON
For the Budget Year July 1, 1989 to June 30, 1990

	ACTUAL	BUDGET	OVER(UNDER)
REVENUES			
Revenues from Assessments:			
Colorado - 60%	$ 12,000	$ 12,000 ✓	$ 0
Kansas - 40%	8,000	8,000 ✓	0
Interest	3,075	2,000 ✓	1,075
TOTAL REVENUES	23,075	22,000 ✓	1,075
EXPENSES			
U.S. Geological Survey	$ 11,370	$ 11,375 ✓	$(5)
Satellite Access Fee	8,000	8,000 ✓	0
Operation Secretary	6,501	6,100 ✓	401
Treasurers Bond	100	100 ✓	0
Telephone	749	1,000 ✓	(251)
Court Reporter Fee	453	500 ✓	(47)
Recording Secretary & Treasurer	2,000	2,000 ✓	0
Meeting Expense	239	150 ✓	89
Auditor Fee	700	500 ✓	200
Office Supplies & Postage	159	400 ✓	(241)
Printing and Copying	321	300 ✓	21
Printing Annual Reports - 1987 and 1988	0	6,500 ✓	(6,500)
Print Annual Report- 1986	3,678	0 ✓	3,678
Office Rent	600	600 ✓	0
Contingency	0	1,000 ✓	(1,000)
TOTAL EXPENSES	34,870	38,525 ✓	(3,655)
BUDGET DEFICIT	$(11,795)	$(16,525)	$ 4,730

See Accountant's Audit Report.
A

Appendix A-2
AUDITORS REPORT

ARKANSAS RIVER COMPACT ADMINISTRATION
NOTES TO CASH BASIS STATEMENTS
June 30, 1990

NOTE 1 - Summary of significant accounting policies:

a. The Administration maintains financial records using the cash basis of accounting. By using the cash basis of accounting, certain revenues are recognized when received rather than when earned, and certain expenses and purchases of assets are recognized when cash is disbursed rather than when the obligation is incurred.

Appendix A-3
CASH BALANCE STATEMENT

ARKANSAS RIVER COMPACT ADMINISTRATION
307 South Fifth Street
LAMAR, COLORADO 81052

COLORADO
J. WILLIAM McDONALD, Denver
CARL GENOVA, Pueblo
JAMES G. ROGERS, Lamar
Treasurer

FRANK G. COOLEY
Chairman and Federal Representative
P.O. Box 98
Meeker, Colorado 81641

KANSAS
DAVID L. POPE, Topeka
CARL E. BENTRUP, Deerfield
Vice Chairman
RON OLOMON, Garden City

ARKANSAS RIVER COMPACT ADMINISTRATION

STATEMENT OF CASH RECEIPTS & DISBURSEMENTS & CHANGE IN CASH BALANCE

FROM JULY 1, 1990 thru DECEMBER 10, 1990

CASH BALANCE: July, 1, 1990			$34,889.61
RECEIPTS:			
Colorado	$15,000.00		
Kanaas	10,000.00		
Interest Earned since July 1	1,187.11		
TOTAL RECEIPTS		$26,187.11	
DISBURSEMENTS:			
Treasurer's Bond	$ 100.00		
U. S. Geological Survey	15,275.00		
Salaries	1,500.00		
Telephone	495.43		
Office Rent	300.00		
Postage	40.00		
Supplies & Copies	64.57		
Audit	350.00		
Transcript-Annual Mtg.	479.68		
Operations Secretary Account	1,009.60		
TOTAL DISBURSEMENTS		$19,614.28	
EXCESS RECEIPTS OVER DISBURSEMENTS			$ 6,572.83
CASH BALANCE: December 10, 1990			$41,462.44

FUNDS ON HAND:	
Checking Account	$ 210.08
Money Market Account	41,252.36
TOTAL	$41,462.44

Attachment 4

B-1
1990

DISCHARGE: ARKANSAS RIVER ABOVE PUEBLO,COLORADO

U.S.G.S. PUBLISHED RECORDS, GAGING STATION #7099400
DAILY MEAN DISCHARGE,CUBIC FEET PER SECOND
REPORT YEAR ENDING OCTOBER 31, 1990

B-1
1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	245	106	110	184	373	345	394	811	1,090	790	294	335	1
2	259	106	110	225	406	345	395	808	1,020	766	408	431	2
3	282	107	110	222	429	345	490	894	954	718	450	569	3
4	285	105	110	222	428	345	544	934	915	486	497	504	4
5	288	105	110	222	364	311	611	1,110	1,320	436	503	427	5
6	301	105	110	216	326	273	711	1,650	1,540	419	593	411	6
7	307	107	110	212	344	265	958	2,340	1,960	370	548	411	7
8	308	107	110	207	353	264	923	2,810	1,670	362	564	411	8
9	290	107	110	205	352	238	536	3,000	1,700	424	543	443	9
10	278	107	110	206	353	253	345	3,090	1,690	440	510	391	10
11	279	107	111	208	352	272	321	3,400	1,800	448	506	388	11
12	281	107	112	207	301	273	348	3,710	1,660	469	461	395	12
13	311	107	112	209	234	273	360	3,550	1,460	547	426	395	13
14	263	106	111	237	196	287	415	2,770	1,090	906	410	396	14
15	105	106	110	285	140	295	493	2,170	928	1,230	403	458	15
16	107	107	110	298	122	260	560	1,880	1,030	1,220	380	496	16
17	107	107	111	288	118	250	559	1,670	1,350	1,120	380	529	17
18	107	107	112	288	118	288	528	1,540	1,360	1,110	399	555	18
19	107	107	112	288	118	325	565	1,370	1,360	1,040	439	461	19
20	107	107	112	288	124	364	453	1,640	1,320	978	464	415	20
21	107	107	112	315	128	383	403	1,770	1,350	964	458	415	21
22	107	107	112	341	129	383	435	1,910	1,410	929	449	553	22
23	106	107	112	351	125	366	418	1,920	1,040	855	442	572	23
24	105	107	112	354	118	308	534	1,890	719	639	400	558	24
25	105	107	112	353	118	254	755	1,700	718	592	356	570	25
26	105	107	112	375	118	298	1,040	1,520	724	457	387	569	26
27	106	107	114	371	131	364	1,370	1,370	742	338	359	569	27
28	105	108	114	373	219	384	1,410	1,260	1,210	334	299	569	28
29	105	109	114	---	285	384	1,220	1,180	1,430	326	287	498	29
30	107	109	116	—	321	390	1,160	1,160	1,410	298	299	458	30
31	---	110	116	—	343	—	1,100	—	1,060	270	—	448	31
TOTAL CFS	5,675	3,315	3,459	7,550	7,586	9,385	20,354	56,827	39,030	20,281	12,914	14,600	TOTAL CFS
TOTAL AF	11,260	6,580	6,860	14,980	15,050	18,620	40,370	112,700	77,420	40,230	25,610	28,960	TOTAL AF
TOTAL YEAR	398,640	ACRE-FEET											

B-2a
1990

DISCHARGE: ARKANSAS RIVER AT LAS ANIMAS,COLORADO

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7124000
DAILY MEAN DISCHARGE,CUBIC FEET PER SECOND
REPORT YEAR ENDING OCTOBER 31, 1990

B-2a
1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	53	126	80	103	112	36	58	462	273	175	44	385	1
2	32	125	95	105	111	30	79	523	255	121	39	318	2
3	29	123	60	103	111	28	299	382	239	83	35	266	3
4	28	123	45	101	108	25	402	352	218	71	33	226	4
5	26	117	60	100	103	25	399	425	318	68	35	299	5
6	26	119	80	99	106	25	374	378	327	69	43	418	6
7	25	115	100	104	106	28	276	365	395	788	42	318	7
8	25	110	105	107	113	28	357	373	469	132	35	261	8
9	25	109	112	105	117	29	396	394	459	139	33	259	9
10	25	109	107	105	113	27	412	467	436	154	48	264	10
11	25	106	109	107	107	25	329	548	905	114	49	321	11
12	25	91	107	107	103	24	350	672	1,000	83	54	351	12
13	25	90	109	105	103	23	331	770	560	65	42	287	13
14	26	90	111	125	95	23	302	990	431	246	33	261	14
15	54	80	111	108	87	22	303	868	455	402	32	291	15
16	61	75	108	90	97	23	238	554	483	386	30	317	16
17	60	80	106	138	100	22	148	339	491	400	27	283	17
18	170	75	105	249	113	22	108	420	461	402	28	302	18
19	220	55	109	300	130	23	117	592	454	309	33	337	19
20	190	60	111	176	69	26	124	400	480	234	42	393	20
21	191	80	104	183	62	23	91	316	1,200	396	56	403	21
22	187	50	98	202	56	25	66	415	772	398	60	390	22
23	163	45	102	184	42	25	85	539	1,080	265	86	351	23
24	158	60	106	145	38	26	96	573	621	179	96	365	24
25	157	90	99	133	36	29	86	588	823	135	110	361	25
26	157	90	101	126	32	40	61	582	240	122	105	334	26
27	155	95	109	119	30	39	63	548	347	130	93	321	27
28	145	100	103	115	30	31	268	435	454	112	75	333	28
29	139	100	98	—	30	32	383	470	383	80	75	358	29
30	130	95	102	—	33	44	423	444	399	69	197	337	30
31	—	90	100	—	38	—	924	—	233	54	—	317	31
TOTAL CFS	2,732	2,873	3,052	3,744	2,531	828	7,948	15,182	15,661	6,381	1,710	10,027	TOTAL CFS
TOTAL AF	5,420	5,700	6,050	7,430	5,020	1,640	15,760	30,110	31,060	12,660	3,390	19,890	TOTAL AF
TOTAL YEAR	144,130	ACRE FEET											

DISCHARGE: PURGATOIRE RIVER NEAR LAS ANIMAS,COLORADO

B-2b
1990

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7126500
DAILY MEAN DISCHARGE,CUBIC FEET PER SECOND
REPORT YEAR ENDING OCTOBER 31, 1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	9.6	16.0	25.0	22.0	33.0	16.0	6.2	15.0	3.0	87.0	4.6	33.0	1
2	13.0	15.0	25.0	22.0	35.0	11.0	8.2	14.0	3.1	238.0	4.5	51.0	2
3	8.2	14.0	24.0	23.0	35.0	9.6	32.0	12.0	3.2	64.0	4.3	19.0	3
4	4.4	16.0	25.0	25.0	33.0	10.0	47.0	11.0	4.1	23.0	4.0	15.0	4
5	6.9	20.0	25.0	25.0	34.0	12.0	43.0	7.0	6.1	13.0	3.2	13.0	5
6	7.7	24.0	25.0	25.0	32.0	26.0	30.0	7.3	4.0	499.0	3.4	18.0	6
7	4.5	18.0	24.0	27.0	29.0	28.0	50.0	7.0	3.5	297.0	4.3	16.0	7
8	4.0	22.0	24.0	24.0	27.0	24.0	34.0	7.5	3.1	170.0	4.1	25.0	8
9	3.8	25.0	25.0	21.0	27.0	22.0	20.0	16.0	5.4	81.0	5.0	28.0	9
10	4.6	20.0	26.0	20.0	26.0	35.0	20.0	21.0	5.6	43.0	4.6	24.0	10
11	5.8	19.0	26.0	26.0	34.0	20.0	11.0	9.3	44.0	28.0	3.9	18.0	11
12	4.6	15.0	27.0	25.0	33.0	19.0	11.0	17.0	21.0	21.0	3.2	15.0	12
13	5.0	17.0	28.0	24.0	29.0	11.0	8.4	20.0	22.0	17.0	3.8	15.0	13
14	4.9	17.0	33.0	25.0	26.0	10.0	25.0	19.0	8.7	56.0	3.7	16.0	14
15	4.9	15.0	30.0	19.0	23.0	9.3	30.0	10.0	5.0	92.0	4.2	20.0	15
16	4.9	14.0	30.0	20.0	30.0	11.0	10.0	5.5	4.3	35.0	3.0	18.0	16
17	4.3	15.0	25.0	26.0	69.0	7.9	8.4	6.1	3.9	63.0	3.0	23.0	17
18	4.3	14.0	25.0	30.0	65.0	6.0	7.7	4.3	2.7	22.0	3.6	27.0	18
19	4.8	12.0	24.0	25.0	51.0	7.3	8.0	3.4	2.6	57.0	4.5	23.0	19
20	5.4	11.0	21.0	20.0	39.0	6.7	10.0	6.7	3.0	35.0	2.4	21.0	20
21	5.1	10.0	20.0	20.0	35.0	6.6	8.1	6.1	1,730.0	14.0	2.6	17.0	21
22	5.1	10.0	20.0	34.0	24.0	6.3	8.5	6.0	528.0	8.6	2.3	11.0	22
23	5.8	10.0	22.0	34.0	34.0	5.8	8.7	4.9	819.0	16.0	2.9	13.0	23
24	5.8	11.0	24.0	29.0	24.0	6.2	9.8	3.5	236.0	14.0	2.6	16.0	24
25	5.8	12.0	24.0	27.0	24.0	8.0	10.0	3.6	127.0	9.7	2.7	15.0	25
26	7.1	13.0	24.0	31.0	21.0	7.9	10.0	3.6	252.0	8.8	3.4	9.5	26
27	8.5	15.0	24.0	29.0	17.0	6.8	10.0	3.8	155.0	7.2	3.8	9.0	27
28	11.0	18.0	22.0	32.0	18.0	6.2	10.0	4.0	46.0	6.9	12.0	12.0	28
29	8.9	21.0	22.0	---	15.0	6.2	18.0	5.2	42.0	6.3	18.0	13.0	29
30	13.0	24.0	24.0	---	24.0	5.9	33.0	2.9	386.0	5.2	14.0	15.0	30
31	---	25.0	24.0	---	17.0	---	25.0	---	186.0	3.4	---	23.0	31
TOTAL CFS	191.7	508.0	767.0	710.0	963.0	367.7	571.0	262.7	4,665.3	2,041.1	141.6	591.5	TOTAL CFS
TOTAL AF	380	1,010	1,520	1,410	1,910	729	1,130	521	9,250	4,050	281	1,170	TOTAL AF
TOTAL YEAR	23,361.0	ACRE-FEET											

RIVER FLOW INTO JOHN MARTIN RESERVOIR

CALCULATED USING U.S.G.S. PUBLISHED RECORDS. [1]
DAILY MEAN DISCHARGE,CUBIC FEET PER SECOND
REPORT YEAR ENDING OCTOBER 31, 1990

B-2c
1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	63	142	105	125	145	52	64	477	276	262	49	418	1
2	45	140	120	127	146	41	87	537	258	359	44	369	2
3	37	137	84	126	146	38	331	394	242	147	39	285	3
4	32	139	70	126	141	35	449	363	222	94	37	241	4
5	33	137	85	125	137	37	442	432	324	81	38	312	5
6	34	143	105	124	138	51	404	385	331	568	46	436	6
7	30	133	124	131	135	56	326	372	399	1,085	46	334	7
8	29	132	129	131	140	52	391	381	472	302	39	286	8
9	29	134	137	126	144	51	416	410	464	220	38	287	9
10	30	129	133	125	139	62	432	488	442	197	53	288	10
11	31	125	135	133	141	45	340	557	949	142	53	339	11
12	30	106	134	132	136	43	361	689	1,021	104	57	366	12
13	30	107	137	129	132	34	339	790	582	82	46	302	13
14	31	107	144	150	121	33	327	1,009	440	302	37	277	14
15	59	95	141	127	110	31	333	876	460	494	36	311	15
16	66	89	138	110	127	34	248	560	487	421	33	335	16
17	64	95	131	164	169	30	156	345	495	463	30	306	17
18	174	89	130	279	178	28	116	424	464	424	32	329	18
19	225	67	133	325	181	30	125	595	457	366	38	360	19
20	195	71	132	196	108	33	134	407	483	269	44	414	20
21	196	90	124	203	97	30	99	322	2,930	410	59	420	21
22	192	60	118	236	80	31	75	421	1,300	407	62	401	22
23	169	55	124	218	76	31	94	544	1,899	281	89	364	23
24	164	71	130	174	62	32	106	577	857	193	99	381	24
25	163	102	123	160	60	37	96	592	950	145	113	376	25
26	164	103	125	157	53	48	71	586	492	131	108	344	26
27	164	110	133	148	47	46	73	552	502	137	97	330	27
28	156	118	125	147	48	37	278	439	500	119	87	345	28
29	148	121	120	---	45	38	401	475	425	86	93	371	29
30	143	119	126	---	57	50	456	447	785	74	211	352	30
31	---	115	124	---	55	---	949	---	419	57	---	340	31
TOTAL CFS	2,924	3,381	3,819	4,454	3,494	1,196	8,519	15,445	20,326	8,422	1,852	10,619	TOTAL CFS
TOTAL AF	5,800	6,710	7,570	8,840	6,930	2,369	16,890	30,631	40,310	16,710	3,671	21,060	TOTAL AF
TOTAL YEAR	167,491	ACRE-FEET											

NOTES: [1] River flow into John Martin is the combined flow of the Arkansas at Las Animas[B-2a] and the Purgatoire near Las Animas [B-2b], rounded to the nearest CFS.

CONTENTS OF JOHN MARTIN RESERVOIR

U.S.G.S. PRIMARY DATA, GAGING STATION # 7130000 [1]
MIDNIGHT CONTENTS TO NEAREST ACRE FOOT [2]
REPORT YEAR ENDING OCTOBER 31, 1990

B-3
1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	28,500	35,230	43,877	53,749	64,219	72,577	64,421	56,830	37,150	42,823	30,361	18,677	1
2	28,582	35,510	44,218	54,047	64,582	72,747	63,736	56,640	35,292	42,451	29,658	18,584	2
3	28,773	35,885	44,595	54,308	64,946	72,832	63,857	56,754	33,760	41,913	28,993	18,353	3
4	28,883	36,199	44,903	54,533	65,230	72,875	64,259	56,527	32,090	41,075	28,337	18,148	4
5	28,965	36,420	45,144	54,944	65,514	73,045	64,501	56,451	30,502	40,111	27,744	18,125	5
6	29,048	36,800	45,420	55,207	66,043	73,173	64,825	56,300	29,020	39,747	27,396	18,285	6
7	29,158	37,150	45,696	55,470	66,370	73,344	64,663	56,111	28,310	40,276	26,707	18,376	7
8	29,269	37,502	46,076	55,809	66,697	73,430	64,744	55,809	28,175	40,144	26,260	18,538	8
9	29,324	37,856	46,354	56,111	67,107	73,601	64,542	55,696	28,067	39,747	25,789	18,468	9
10	29,463	38,114	46,703	56,375	67,354	73,644	64,501	55,546	28,609	39,353	25,322	18,262	10
11	29,547	38,406	47,087	56,678	67,641	73,773	64,501	55,358	29,241	38,731	24,908	18,102	11
12	29,658	38,503	47,438	56,982	67,970	73,902	64,179	55,395	30,304	38,211	24,393	18,079	12
13	29,714	38,764	47,791	57,285	68,342	74,031	64,058	55,508	30,987	37,470	23,906	18,057	13
14	29,854	38,992	48,109	57,590	68,508	74,074	64,018	56,111	31,074	36,832	23,369	17,943	14
15	29,938	39,287	48,428	57,781	68,756	74,160	63,978	56,640	31,016	37,023	22,784	17,875	15
16	30,079	39,583	48,749	58,164	69,005	74,160	63,696	56,678	30,959	36,927	22,228	17,853	16
17	30,248	39,714	48,999	58,625	69,296	74,117	63,175	56,073	30,844	36,991	21,750	17,762	17
18	30,502	39,945	49,392	58,933	69,670	74,117	62,577	54,944	30,816	36,895	21,326	17,785	18
19	30,959	40,177	49,896	59,513	70,088	74,203	61,863	53,674	30,276	36,737	21,177	17,921	19
20	31,448	40,376	50,185	60,252	70,297	74,117	61,350	52,451	30,079	36,452	20,806	18,102	20
21	31,796	40,575	50,439	60,682	70,507	74,160	60,721	50,692	33,247	36,199	20,415	18,285	21
22	32,149	40,808	50,692	61,192	70,674	74,203	59,901	48,999	36,011	35,854	20,027	18,422	22
23	32,532	41,006	50,983	61,666	70,842	73,516	59,203	47,579	38,764	35,448	19,714	18,399	23
24	32,918	41,276	51,349	62,061	71,010	72,577	58,471	46,250	40,508	35,014	19,404	18,331	24
25	33,247	41,543	51,642	62,457	71,137	71,474	57,743	45,144	41,644	34,582	19,003	18,285	25
26	33,639	41,846	51,899	62,816	71,263	70,339	57,019	43,741	42,081	34,032	18,793	18,171	26
27	33,941	42,182	52,266	63,295	71,474	69,171	56,224	42,755	42,148	33,458	18,770	18,011	27
28	34,245	42,519	52,561	63,656	71,686	68,053	55,508	41,476	42,316	32,858	18,956	17,898	28
29	34,582	42,925	52,820	—	71,982	66,697	55,998	40,078	42,316	32,296	18,840	17,853	29
30	34,859	43,264	53,154	—	72,279	65,514	55,922	38,699	42,823	31,623	18,723	17,785	30
31	—	43,570	53,451	—	72,449	—	56,375	—	43,128	31,016	—	17,830	31
USGS PUBLISHED END OF MONTH CONTENTS [1]:													
	34,900	43,600	53,400	63,700	72,400	65,500	56,300	38,500	43,100	31,000	18,700	17,900	

NOTES: [1] Final published record uses this data rounded per USGS procedures.

[2] Determined with elevation-capacity table provided by U.S. Army Corps of Engineers and placed in use Feb. 1, 1988.

OUTFLOW: ARKANSAS RIVER BELOW JOHN MARTIN RESERVOIR

B-4
1990

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7130500
DAILY MEAN DISCHARGE,CUBIC FEET PER SECOND
REPORT YEAR ENDING OCTOBER 31, 1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	2.3	2.5	1.5	1.9	3.1	1.6	582.0	434.0	1,030.0	460.0	332.0	325.0	1
2	2.2	2.5	1.6	1.9	2.8	1.6	574.0	434.0	1,020.0	489.0	331.0	399.0	2
3	2.2	2.5	1.7	1.9	2.8	1.6	420.0	443.0	1,030.0	485.0	332.0	396.0	3
4	2.2	2.5	1.4	2.0	2.8	1.6	298.0	430.0	1,020.0	472.0	321.0	316.0	4
5	2.2	2.5	1.4	2.3	2.8	1.8	290.0	412.0	1,020.0	469.0	312.0	265.0	5
6	2.2	2.5	1.4	2.2	2.7	1.9	290.0	412.0	1,010.0	536.0	311.0	265.0	6
7	2.2	2.5	1.5	2.2	2.5	1.9	352.0	459.0	551.0	613.0	311.0	265.0	7
8	2.4	2.5	1.7	2.2	2.5	1.9	393.0	517.0	446.0	531.0	240.0	265.0	8
9	2.2	2.5	1.9	2.2	2.2	1.9	397.0	530.0	434.0	447.0	220.0	325.0	9
10	2.2	2.5	1.8	2.2	2.2	1.9	404.0	530.0	430.0	428.0	234.0	375.0	10
11	2.2	2.5	1.6	2.2	2.2	1.8	403.0	543.0	393.0	425.0	257.0	370.0	11
12	2.2	2.0	1.6	2.6	2.1	1.6	402.0	570.0	384.0	419.0	275.0	339.0	12
13	2.4	1.9	1.6	2.5	2.1	1.7	404.0	573.0	406.0	407.0	288.0	324.0	13
14	2.5	1.8	1.6	2.5	2.0	1.8	405.0	587.0	421.0	410.0	281.0	323.0	14
15	2.6	1.7	1.6	2.5	2.1	1.9	405.0	606.0	425.0	413.0	276.0	313.0	15
16	2.5	1.6	1.6	2.5	2.0	1.8	403.0	608.0	445.0	406.0	273.0	313.0	16
17	2.6	1.6	1.4	2.6	1.7	14.0	402.0	602.0	457.0	401.0	254.0	305.0	17
18	2.5	1.6	1.4	2.6	1.6	23.0	406.0	908.0	496.0	401.0	218.0	255.0	18
19	2.5	1.6	1.6	2.5	1.6	29.0	406.0	1,100.0	541.0	403.0	209.0	276.0	19
20	2.5	1.6	1.4	3.1	1.8	34.0	402.0	1,110.0	524.0	403.0	205.0	307.0	20
21	2.5	1.6	1.4	2.7	1.9	34.0	410.0	1,100.0	504.0	404.0	214.0	308.0	21
22	2.5	1.4	1.6	2.5	1.6	35.0	420.0	1,120.0	510.0	493.0	222.0	341.0	22
23	2.5	1.4	1.7	2.5	1.6	310.0	419.0	1,130.0	459.0	480.0	224.0	377.0	23
24	2.5	1.4	1.7	2.5	1.6	523.0	420.0	1,130.0	412.0	393.0	250.0	386.0	24
25	2.5	1.5	1.6	2.5	1.6	595.0	428.0	1,100.0	403.0	364.0	295.0	387.0	25
26	2.6	1.6	1.7	2.5	1.6	603.0	421.0	1,080.0	403.0	361.0	142.0	387.0	26
27	2.8	1.7	1.6	3.5	1.6	628.0	420.0	1,060.0	404.0	374.0	118.0	387.0	27
28	2.6	1.7	1.6	3.7	1.6	625.0	420.0	1,040.0	407.0	366.0	119.0	387.0	28
29	2.5	1.7	1.7	—	1.6	610.0	425.0	1,030.0	405.0	359.0	178.0	386.0	29
30	2.5	1.5	1.9	—	1.6	598.0	439.0	1,030.0	422.0	359.0	218.0	386.0	30
31	—	1.5	2.0	—	1.6	—	439.0	—	433.0	346.0	—	302.0	31
TOTAL CFS	72.3	59.9	49.8	69.0	63.5	4,689.3	12,699.0	22,628.0	17,245.0	13,317.0	7,460.0	10,357.0	TOTAL CFS
TOTAL AF	143	119	99	137	126	9,300	25,190	44,880	34,210	26,410	14,800	20,540	TOTAL AF
TOTAL YEAR	175,954	ACRE-FEET											

DISCHARGE: ARKANSAS RIVER AT LAMAR,COLORADO

B-5
1990

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7133000
DAILY MEAN DISCHARGE,CUBIC FEET PER SECOND
REPORT YEAR ENDING OCTOBER 31, 1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	7.0	26.0	24.0	13.0	24.0	4.0	86.0	9.0	531.0	26.0	19.0	5.1	1
2	6.4	26.0	25.0	12.0	23.0	4.2	82.0	8.6	533.0	29.0	15.0	4.7	2
3	6.2	27.0	25.0	13.0	24.0	4.7	151.0	7.2	532.0	45.0	6.9	3.5	3
4	5.9	26.0	24.0	15.0	27.0	4.5	29.0	7.0	539.0	34.0	4.6	3.4	4
5	5.9	26.0	23.0	17.0	27.0	4.9	9.6	5.8	541.0	31.0	3.2	3.4	5
6	6.2	26.0	27.0	18.0	29.0	4.3	8.0	5.4	544.0	33.0	2.8	3.4	6
7	6.4	27.0	24.0	19.0	28.0	4.9	7.4	7.6	355.0	34.0	2.3	3.7	7
8	20.0	27.0	24.0	21.0	24.0	5.0	6.9	66.0	41.0	48.0	2.0	3.7	8
9	32.0	26.0	23.0	21.0	23.0	5.5	6.7	70.0	15.0	46.0	2.2	3.7	9
10	30.0	27.0	22.0	22.0	22.0	8.8	7.7	133.0	11.0	11.0	2.9	3.7	10
11	31.0	26.0	22.0	22.0	22.0	9.5	6.5	88.0	439.0	8.3	3.9	3.7	11
12	32.0	25.0	22.0	22.0	21.0	7.0	5.7	44.0	26.0	7.7	3.5	3.7	12
13	31.0	26.0	23.0	23.0	21.0	6.4	5.4	47.0	10.0	8.0	2.6	3.9	13
14	32.0	27.0	23.0	22.0	21.0	6.5	5.9	45.0	8.9	6.3	3.2	5.1	14
15	31.0	29.0	22.0	21.0	20.0	7.3	4.9	53.0	7.8	7.0	3.2	5.1	15
16	30.0	27.0	21.0	20.0	19.0	6.6	4.5	63.0	6.7	7.7	2.8	4.8	16
17	29.0	26.0	12.0	21.0	19.0	6.2	4.6	63.0	6.7	7.2	2.7	4.4	17
18	28.0	24.0	13.0	22.0	19.0	5.9	4.6	156.0	6.9	6.3	2.0	4.0	18
19	28.0	22.0	20.0	21.0	18.0	5.9	5.7	625.0	34.0	6.5	5.8	4.0	19
20	27.0	20.0	20.0	21.0	18.0	5.1	5.6	665.0	41.0	7.0	4.1	4.8	20
21	25.0	20.0	17.0	25.0	18.0	5.5	5.4	665.0	33.0	6.1	3.6	4.8	21
22	25.0	20.0	15.0	23.0	19.0	5.2	7.8	670.0	74.0	9.7	3.4	4.7	22
23	26.0	22.0	16.0	24.0	18.0	4.2	8.7	686.0	45.0	69.0	3.4	4.9	23
24	26.0	27.0	17.0	28.0	18.0	41.0	7.9	645.0	7.7	39.0	3.8	5.1	24
25	25.0	28.0	17.0	28.0	20.0	60.0	8.2	591.0	6.2	40.0	4.0	5.1	25
26	25.0	28.0	16.0	26.0	20.0	77.0	8.2	601.0	5.2	38.0	5.3	5.3	26
27	27.0	29.0	15.0	24.0	12.0	98.0	7.9	592.0	4.7	33.0	8.7	5.5	27
28	26.0	29.0	15.0	27.0	5.3	116.0	7.9	568.0	6.1	33.0	6.3	6.2	28
29	27.0	28.0	16.0	—	4.8	100.0	14.0	547.0	6.7	14.0	15.0	6.6	29
30	27.0	27.0	15.0	—	4.3	93.0	25.0	532.0	7.8	17.0	4.9	4.8	30
31	—	25.0	14.0	—	4.0	—	14.0	—	21.0	19.0	—	4.4	31
TOTAL CFS	684.0	799.0	612.0	591.0	592.4	717.1	562.7	8,265.6	4,446.4	726.8	153.1	139.2	TOTAL CFS
TOTAL AF	1,360	1,580	1,210	1,170	1,180	1,420	1,120	16,390	8,820	1,440	304	276	TOTAL AF
TOTAL YEAR	36,270	ACRE-FEET											

DISCHARGE: ARKANSAS RIVER NEAR GRANADA, COLORADO

U.S.G.S. PUBLISHED RECORDS, GAGING STATION #7134180
DAILY MEAN DISCHARGE,CUBIC FEET PER SECOND
REPORT YEAR ENDING OCTOBER 31, 1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	45.0	86.0	93.0	92.0	100.0	76.0	27.0	33.0	417.0	5.2	4.2	9.5	1
2	46.0	83.0	93.0	88.0	102.0	75.0	25.0	26.0	407.0	4.8	4.7	15.0	2
3	48.0	84.0	90.0	80.0	104.0	73.0	106.0	23.0	403.0	5.1	4.1	16.0	3
4	49.0	89.0	91.0	77.0	109.0	72.0	161.0	7.2	402.0	6.7	5.2	16.0	4
5	47.0	95.0	92.0	80.0	108.0	66.0	92.0	5.6	406.0	8.1	5.7	18.0	5
6	44.0	96.0	89.0	82.0	108.0	59.0	60.0	5.5	414.0	7.2	4.0	20.0	6
7	42.0	97.0	87.0	83.0	106.0	52.0	13.0	6.4	400.0	5.7	4.9	9.4	7
8	34.0	101.0	87.0	84.0	105.0	51.0	4.6	5.6	190.0	5.5	4.8	2.9	8
9	48.0	103.0	87.0	84.0	102.0	52.0	4.1	8.2	92.0	7.2	5.5	2.8	9
10	52.0	102.0	87.0	85.0	103.0	47.0	3.9	20.0	48.0	5.2	5.3	2.9	10
11	49.0	100.0	86.0	85.0	107.0	37.0	4.0	33.0	261.0	3.8	5.2	3.1	11
12	49.0	96.0	85.0	86.0	106.0	38.0	4.1	20.0	226.0	3.5	5.0	3.1	12
13	51.0	94.0	85.0	85.0	102.0	35.0	4.1	8.5	64.0	3.6	4.6	3.2	13
14	50.0	96.0	83.0	82.0	100.0	33.0	4.3	11.0	65.0	3.4	3.5	3.3	14
15	49.0	91.0	82.0	80.0	95.0	33.0	5.7	7.0	54.0	2.8	3.4	3.4	15
16	54.0	90.0	83.0	76.0	95.0	19.0	5.7	7.7	18.0	2.9	3.4	12.0	16
17	62.0	93.0	84.0	80.0	93.0	12.0	6.0	11.0	12.0	2.7	3.9	22.0	17
18	54.0	89.0	84.0	81.0	90.0	11.0	4.8	14.0	9.2	2.7	4.1	24.0	18
19	63.0	74.0	88.0	82.0	90.0	9.1	5.0	150.0	5.3	2.7	5.1	24.0	19
20	79.0	83.0	83.0	89.0	90.0	6.8	4.9	379.0	7.4	3.5	4.3	26.0	20
21	89.0	74.0	85.0	87.0	90.0	6.9	14.0	419.0	16.0	3.9	3.2	29.0	21
22	87.0	58.0	84.0	90.0	88.0	7.1	24.0	436.0	22.0	3.0	3.1	27.0	22
23	82.0	64.0	92.0	92.0	84.0	5.5	26.0	473.0	26.0	3.1	3.1	26.0	23
24	83.0	90.0	93.0	93.0	86.0	5.2	9.8	456.0	20.0	4.6	3.2	25.0	24
25	85.0	100.0	88.0	96.0	87.0	6.0	4.0	430.0	9.5	4.2	3.3	26.0	25
26	87.0	101.0	89.0	95.0	88.0	8.9	4.0	420.0	8.0	4.1	3.4	22.0	26
27	87.0	96.0	90.0	95.0	88.0	16.0	4.0	466.0	7.8	4.1	3.3	20.0	27
28	82.0	94.0	85.0	97.0	86.0	22.0	3.9	447.0	7.4	4.1	3.4	21.0	28
29	79.0	93.0	86.0	—	82.0	26.0	4.2	428.0	7.2	4.6	3.5	20.0	29
30	83.0	96.0	90.0	—	83.0	24.0	12.0	417.0	6.6	4.1	3.5	22.0	30
31	—	96.0	91.0	—	81.0	—	38.0	—	5.5	4.0	—	20.0	31
TOTAL CFS	1,859.0	2,804.0	2,712.0	2,406.0	2,958.0	984.5	689.1	5,173.7	4,036.9	136.1	123.9	494.6	TOTAL CFS
TOTAL AF	3,690	5,560	5,380	4,770	5,870	1,950	1,370	10,260	8,010	270	246	981	TOTAL AF
TOTAL YEAR	48,357	ACRE-FEET											

B-7a
1990

DISCHARGE: ARKANSAS RIVER NEAR COOLIDGE, KANSAS

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7137500
DAILY MEAN DISCHARGE,CUBIC FEET PER SECOND
REPORT YEAR ENDING OCTOBER 31, 1990

B-7a
1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	113	116	156	141	137	126	113	87	397	44	19	61	1
2	111	104	156	139	138	122	115	80	385	43	17	56	2
3	110	104	154	131	144	118	162	65	378	203	16	56	3
4	107	108	151	128	150	118	243	49	385	201	17	67	4
5	105	109	152	130	146	118	185	45	405	144	17	73	5
6	108	110	149	128	147	114	148	33	408	120	18	66	6
7	102	110	150	130	146	112	118	26	407	111	19	52	7
8	103	120	151	134	147	109	82	24	341	80	18	52	8
9	102	120	147	132	146	106	78	24	221	65	16	56	9
10	102	120	145	130	144	104	78	52	156	61	23	44	10
11	106	120	143	129	146	97	71	67	146	49	17	39	11
12	102	120	144	129	143	98	71	94	384	43	15	60	12
13	104	115	151	127	138	96	69	78	220	54	15	68	13
14	107	115	148	123	137	96	65	56	135	61	15	82	14
15	105	115	146	124	136	93	67	42	124	65	16	74	15
16	107	115	141	120	133	92	60	29	112	70	15	76	16
17	110	120	139	120	132	98	62	31	91	42	20	56	17
18	117	120	140	122	130	94	49	33	81	39	26	69	18
19	116	120	150	122	129	82	29	57	64	45	32	85	19
20	118	123	147	126	131	80	29	190	63	45	56	80	20
21	119	128	139	130	134	78	35	322	94	40	46	84	21
22	120	130	138	133	131	76	42	332	89	29	41	96	22
23	117	130	141	132	127	81	46	377	124	25	38	76	23
24	121	135	145	135	124	80	45	392	157	36	39	55	24
25	121	140	141	136	126	80	38	396	83	40	40	55	25
26	120	165	142	134	127	97	34	378	53	34	32	86	26
27	122	168	140	135	128	104	29	461	43	30	33	86	27
28	118	168	135	138	130	98	30	436	40	26	29	77	28
29	119	162	136	—	130	102	43	411	45	22	32	81	29
30	127	161	141	—	132	113	91	396	50	22	63	76	30
31	—	158	142	—	133	—	86	—	45	20	—	78	31
TOTAL CFS	3,359	3,949	4,500	3,638	4,222	2,982	2,413	5,063	5,726	1,929	800	2,122	TOTAL CFS
TOTAL AF	6,660	7,830	8,930	7,220	8,370	5,910	4,790	10,040	11,360	3,830	1,590	4,210	TOTAL AF
TOTAL YEAR	80,740	ACRE FEET											

B-7b
1990

DISCHARGE: FRONTIER DITCH NEAR COOLIDGE, KANSAS

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7137000
DAILY MEAN DISCHARGE,CUBIC FEET PER SECOND
REPORT YEAR ENDING OCTOBER 31, 1990

B-7b
1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	16.0	15.0	0.0	0.0	0.0	0.0	0.0	5.3	39.0	33.0	30.0	0.2	1
2	16.0	23.0	0.0	0.0	0.0	0.0	0.0	0.0	36.0	33.0	32.0	0.0	2
3	15.0	23.0	0.0	0.0	0.0	0.0	0.0	16.0	47.0	26.0	28.0	0.0	3
4	14.0	24.0	0.0	0.0	0.0	0.0	0.0	37.0	53.0	16.0	29.0	0.0	4
5	13.0	24.0	0.0	0.0	0.0	0.0	0.0	37.0	45.0	2.6	26.0	0.0	5
6	14.0	24.0	0.0	0.0	0.0	0.0	0.0	28.0	35.0	0.2	30.0	0.0	6
7	12.0	25.0	0.0	0.0	0.0	0.0	0.0	25.0	42.0	0.0	37.0	0.0	7
8	12.0	18.0	0.0	0.0	0.0	0.0	0.0	24.0	42.0	21.0	31.0	0.0	8
9	12.0	0.4	0.0	0.0	0.0	0.0	0.0	24.0	49.0	38.0	33.0	0.0	9
10	12.0	0.2	0.0	0.0	0.0	0.0	0.0	36.0	53.0	34.0	38.0	17.0	10
11	13.0	0.0	0.0	0.0	0.0	0.0	0.0	43.0	46.0	37.0	47.0	35.0	11
12	11.0	0.0	0.0	0.0	0.0	0.0	0.0	28.0	35.0	37.0	38.0	30.0	12
13	12.0	0.0	0.0	0.0	0.0	0.0	0.0	23.0	31.0	36.0	35.0	27.0	13
14	13.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0	37.0	38.0	29.0	14.0	14
15	13.0	0.0	0.0	0.0	0.0	0.0	0.0	26.0	27.0	21.0	24.0	17.0	15
16	13.0	0.0	0.0	0.0	0.0	0.0	0.0	34.0	26.0	24.0	24.0	31.0	16
17	15.0	0.0	0.0	0.0	0.0	0.0	0.0	34.0	26.0	37.0	25.0	22.0	17
18	9.6	0.0	0.0	0.0	0.0	0.0	21.0	33.0	26.0	29.0	30.0	11.0	18
19	11.0	0.0	0.0	0.0	0.0	0.0	39.0	20.0	35.0	26.0	39.0	0.0	19
20	11.0	0.0	0.0	0.0	0.0	0.0	46.0	37.0	35.0	23.0	35.0	0.0	20
21	12.0	0.0	0.0	0.0	0.0	0.0	49.0	29.0	35.0	26.0	13.0	0.0	21
22	12.0	0.0	0.0	0.0	0.0	0.0	43.0	31.0	37.0	30.0	13.0	3.1	22
23	11.0	0.0	0.0	0.0	0.0	0.0	27.0	36.0	35.0	32.0	12.0	12.0	23
24	12.0	0.0	0.0	0.0	0.0	0.0	26.0	31.0	33.0	38.0	15.0	16.0	24
25	12.0	0.0	0.0	0.0	0.0	0.0	26.0	23.0	33.0	40.0	14.0	18.0	25
26	12.0	0.0	0.0	0.0	0.0	0.0	25.0	20.0	40.0	40.0	11.0	19.0	26
27	12.0	0.0	0.0	0.0	0.0	0.0	27.0	28.0	39.0	37.0	10.0	15.0	27
28	11.0	0.0	0.0	0.0	0.0	0.0	31.0	23.0	40.0	37.0	14.0	26.0	28
29	9.1	0.0	0.0	—	0.0	0.0	30.0	26.0	35.0	36.0	16.0	31.0	29
30	3.6	0.0	0.0	—	0.0	0.0	18.0	35.0	29.0	37.0	0.7	28.0	30
31	—	0.0	0.0	—	0.0	—	12.0	—	29.0	32.0	—	24.0	31
TOTAL CFS	364.3	176.6	0.0	0.0	0.0	0.0	420.0	810.3	1,150.0	896.8	758.7	396.3	TOTAL CFS
TOTAL AF	723	350	0	0	0	0	833	1,610	2,280	1,780	1,500	786	TOTAL AF
TOTAL YEAR	9,862	ACRE-FEET											

NOTES: [1] USGS data rounded to nearest 0.1 CFS.

STATELINE FLOW

CALCULATED USING U.S.G.S. PUBLISHED RECORDS [1]
DAILY MEAN DISCHARGE,CUBIC FEET PER SECOND
REPORT YEAR ENDING OCTOBER 31, 1990

B-7c
1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	129	131	156	141	137	126	113	92	436	77	49	61	1
2	127	127	156	139	138	122	115	80	421	76	49	56	2
3	125	127	154	131	144	118	162	81	425	229	44	56	3
4	121	132	151	128	150	118	243	86	438	217	46	67	4
5	118	133	152	130	146	118	185	82	450	147	43	73	5
6	122	134	149	128	147	114	148	61	443	120	48	66	6
7	114	135	150	130	146	112	118	51	449	111	56	52	7
8	115	138	151	134	147	109	82	48	383	101	49	52	8
9	114	120	147	132	146	106	78	48	270	103	49	56	9
10	114	120	145	130	144	104	78	88	209	95	61	61	10
11	119	120	143	129	146	97	71	110	192	86	64	74	11
12	113	120	144	129	143	98	71	122	419	80	53	90	12
13	116	115	151	127	138	96	69	101	251	90	50	95	13
14	120	115	148	123	137	96	65	74	172	99	44	96	14
15	118	115	146	124	136	93	67	68	151	106	40	91	15
16	120	115	141	120	133	92	60	63	138	94	39	107	16
17	125	120	139	120	132	96	62	65	117	79	45	78	17
18	127	120	140	122	130	94	70	66	107	68	56	80	18
19	127	120	150	122	129	82	68	77	99	71	71	85	19
20	129	123	147	126	131	80	75	227	98	68	91	80	20
21	131	128	139	130	134	78	84	351	129	66	59	84	21
22	132	130	138	133	131	76	85	363	126	59	54	99	22
23	128	130	141	132	127	81	73	413	159	57	50	88	23
24	133	135	145	135	124	80	71	423	190	74	54	71	24
25	133	140	141	136	126	80	64	419	116	80	54	73	25
26	132	165	142	134	127	97	59	398	93	74	43	105	26
27	134	168	140	135	128	104	56	489	82	67	43	101	27
28	129	168	135	138	130	98	61	459	80	63	43	103	28
29	128	162	136	—	130	102	73	437	80	58	48	112	29
30	131	161	141	—	132	113	109	431	79	59	64	104	30
31	—	158	142	—	133	0	98	—	74	52	—	102	31
TOTAL CFS	3,723	4,126	4,500	3,638	4,222	2,982	2,833	5,873	6,876	2,826	1,559	2,518	TOTAL CFS
TOTAL AF	7,383	8,180	8,930	7,220	8,370	5,910	5,623	11,650	13,640	5,610	3,090	4,996	TOTAL AF
TOTAL YEAR	90,602	ACRE-FEET											

NOTES: [1] The daily stateline flow is the sum of the flow of the Arkansas near Coolidge [B-7a] and the Frontier Ditch near Coolidge [B-7b], rounded to the nearest CFS.

DISCHARGE: ARKANSAS RIVER AT GARDEN CITY, KANSAS

B-8
1990

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7139000
DAILY MEAN DISCHARGE,CUBIC FEET PER SECOND [1], [2]
REPORT YEAR ENDING OCTOBER 31, 1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	0.0	24.0	11.0	100.0	45.0	7.0	0.0	8.7	0.0	0.0	0.0	0.0	1
2	0.0	24.0	36.0	100.0	50.0	8.0	0.0	5.8	0.0	0.0	0.0	0.0	2
3	0.0	2.6	41.0	110.0	50.0	9.0	3.5	4.2	0.0	0.0	0.0	0.0	3
4	0.0	0.0	51.0	110.0	53.0	9.0	3.7	4.1	0.0	0.0	0.0	0.0	4
5	0.0	0.0	59.0	110.0	55.0	10.0	6.1	3.5	0.0	0.0	0.0	0.0	5
6	0.0	0.0	50.0	110.0	46.0	10.0	12.0	1.9	0.0	0.0	0.0	0.0	6
7	0.0	0.0	60.0	110.0	16.0	10.0	25.0	0.0	0.0	0.0	0.0	0.0	7
8	0.0	0.1	77.0	102.0	11.0	11.0	18.0	0.0	0.0	0.0	0.0	0.0	8
9	0.0	3.1	74.0	88.0	9.8	12.0	14.0	0.0	0.0	0.0	0.0	0.0	9
10	0.0	8.0	93.0	81.0	8.7	14.0	8.5	0.0	0.0	0.0	0.0	0.0	10
11	0.0	6.0	100.0	79.0	8.2	15.0	7.5	0.0	0.0	0.0	0.0	0.0	11
12	0.0	0.0	98.0	83.0	6.6	18.0	6.0	0.0	0.0	0.0	0.0	0.0	12
13	0.0	0.0	106.0	74.0	6.0	15.0	1.7	0.0	0.0	0.0	0.0	0.0	13
14	0.0	0.0	133.0	50.0	5.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	14
15	0.0	0.0	136.0	48.0	5.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	15
16	0.0	0.0	130.0	44.0	4.0	8.6	0.0	0.0	0.0	0.0	0.0	0.0	16
17	0.0	0.0	112.0	40.0	4.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	17
18	0.0	0.0	101.0	40.0	3.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	18
19	0.0	0.0	90.0	40.0	3.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	19
20	0.0	0.0	100.0	40.0	2.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	20
21	0.0	0.0	100.0	40.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	21
22	0.0	0.0	90.0	40.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22
23	0.0	0.0	90.0	40.0	2.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	23
24	0.0	0.0	100.0	40.0	3.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	90.0	40.0	3.0	8.9	0.0	0.0	0.4	0.0	0.0	0.0	25
26	0.0	0.0	80.0	45.0	3.0	4.9	1.3	0.0	5.3	0.0	0.0	0.0	26
27	0.0	0.0	80.0	45.0	4.0	5.4	4.5	0.0	0.6	0.0	0.0	0.0	27
28	1.6	0.0	90.0	45.0	4.0	1.4	1.6	0.0	0.4	0.0	0.0	0.0	28
29	10.0	0.0	90.0	—	5.0	0.0	7.8	0.0	0.0	0.0	0.0	0.0	29
30	30.0	0.0	90.0	—	5.0	0.0	13.0	0.0	0.0	0.0	0.0	0.0	30
31	—	0.0	90.0	—	6.0	—	12.0	—	0.0	0.0	—	0.0	31
TOTAL CFS	41.6	67.8	2,648.0	1,894.0	430.3	221.7	146.2	28.2	6.6	0.0	0.0	0.0	TOTAL CFS
TOTAL AF	83	134	5,250	3,760	853	440	290	56	13	0	0	0	TOTAL AF
TOTAL YEAR	10,879	ACRE-FEET											

NOTE: [1] Many dates are estimated values per U.S.G.S.
[2] Rounded to nearest 0.1 CFS.

CONTENTS JOHN MARTIN RESERVOIR CONSERVATION STORAGE

B-9
1990

OPERATIONS SECRETARY, ARCA MONTHLY ACCOUNTING SHEETS
MIDNIGHT CONTENTS [2400 HOURS], ACRE FEET [1]
REPORT YEAR ENDING OCTOBER 31, 1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	1,107	4,548	7,887	12,353	16,922	23,790	0	0	0	0	0	0	1
2	1,203	4,664	8,008	12,494	17,180	24,003	0	0	0	0	0	0	2
3	1,408	4,784	8,141	12,594	17,399	24,127	0	0	0	0	0	0	3
4	1,530	4,903	8,252	12,699	17,578	24,217	0	0	0	0	0	0	4
5	1,627	4,994	8,339	12,919	17,807	24,395	0	0	0	0	0	0	5
6	1,722	5,159	8,437	13,028	18,084	24,548	0	0	0	0	0	0	6
7	1,845	5,322	8,536	13,177	18,276	22,284	0	0	0	0	0	0	7
8	1,941	5,497	8,659	13,321	18,469	20,000	0	0	0	0	0	0	8
9	2,037	5,648	8,775	13,462	18,694	18,220	0	0	0	0	0	0	9
10	2,189	5,768	8,929	13,569	18,830	16,325	0	0	0	0	0	0	10
11	2,286	5,885	9,130	13,711	18,973	14,533	0	0	0	0	0	0	11
12	2,412	5,989	9,310	13,851	19,166	12,694	0	0	0	0	0	0	12
13	2,510	6,019	9,493	13,988	19,365	10,891	0	0	0	0	0	0	13
14	2,635	6,103	9,640	14,126	19,482	9,003	0	0	0	0	0	0	14
15	2,733	6,210	9,785	14,191	19,578	7,160	0	0	0	0	0	0	15
16	2,838	6,293	9,932	14,369	19,731	5,267	0	0	0	0	0	0	16
17	2,985	6,364	10,047	14,596	20,058	3,337	0	0	0	0	0	0	17
18	3,179	6,447	10,277	14,712	20,435	1,453	0	0	0	0	0	0	18
19	3,359	6,530	10,581	14,797	20,832	0	0	0	0	0	0	0	19
20	3,465	6,601	10,700	15,056	21,161	0	0	0	0	0	0	0	20
21	3,552	6,672	10,779	15,239	21,365	0	0	0	943	0	0	0	21
22	3,608	6,755	10,872	15,427	21,527	0	0	0	1,079	0	0	0	22
23	3,701	6,827	11,010	15,592	21,729	0	0	0	1,790	0	0	0	23
24	3,837	6,922	11,181	15,717	21,933	0	0	0	1,320	0	0	0	24
25	3,928	7,017	11,347	15,899	22,095	0	0	0	282	0	0	0	25
26	4,021	7,125	11,449	16,063	22,256	0	0	0	0	0	0	0	26
27	4,143	7,246	11,624	16,319	22,460	0	0	0	0	0	0	0	27
28	4,237	7,367	11,789	16,550	22,749	0	0	0	0	0	0	0	28
29	4,318	7,552	11,923	—	23,080	0	0	0	0	0	0	0	29
30	4,412	7,671	12,069	—	23,413	0	0	0	0	0	0	0	30
31	—	7,779	12,209	—	23,618	—	0	—	0	0	—	0	31

NOTES: [1] Values are the volume of winter and/or summer compact water remaining in conservation storage prior to release to storage accounts, as reported by the Operations Secretary, and rounded to the nearest AF.

B-10
1990

TRANSFER OF COMPACT WATER FROM CONSERVATION STORAGE

TRANSFERRED INTO JOHN MARTIN RESERVOIR AGREEMENT ACCOUNTS
OPERATIONS SECRETARY, ARCA ; IN ACRE FEET
REPORT YEAR ENDING OCTOBER 31, 1990

B-10
1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6
7	0.0	0.0	0.0	0.0	0.0	2,479.4	0.0	0.0	0.0	0.0	0.0	0.0	7
8	0.0	0.0	0.0	0.0	0.0	2,404.6	0.0	0.0	0.0	0.0	0.0	0.0	8
9	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	0.0	0.0	0.0	9
10	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	0.0	0.0	0.0	10
11	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	0.0	0.0	0.0	11
12	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	0.0	0.0	0.0	12
13	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	0.0	0.0	0.0	13
14	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	0.0	0.0	0.0	14
15	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	0.0	0.0	0.0	15
16	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	0.0	0.0	0.0	16
17	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	0.0	0.0	0.0	17
18	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	0.0	0.0	0.0	18
19	0.0	0.0	0.0	0.0	0.0	1,585.9	0.0	0.0	0.0	0.0	0.0	0.0	19
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	21
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	22
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	23
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,983.5	0.0	0.0	0.0	25
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,107.7	0.0	0.0	0.0	26
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28
29	0.0	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29
30	0.0	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30
31	—	0.0	0.0	---	0.0	—	0.0	—	0.0	0.0	—	0.0	31
TOTAL AF	0.0	0.0	0.0	0.0	0.0	26,304.9	0.0	0.0	11,025.2	0.0	0.0	0.0	TOTAL AF
TOTAL YEAR	37,330	ACRE FEET											

NOTES: [1] All conservation storage water was apportioned into Colorado and Kansas accounts as follows: 40% to Kansas and 60% to Colorado, as described in the 1980 Colorado-Kansas Operating Plan Resolution.

[2] Values reported are "winter compact water" and "summer compact water" releases from monthly accounting sheets, to nearest 0.1 AF.

B-11
1990

DEMANDS BY COLORADO FOR AGREEMENT ACCOUNT WATER

RELEASES TO COLORADO WATER USERS FROM JOHN MARTIN RESERVOIR
OPERATIONS SECRETARY, ARCA ; IN ACRE FEET [1]
REPORT YEAR ENDING OCTOBER 31, 1990

B-11
1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	0.0	0.0	0.0	0.0	0.0	0.0	1,090.8	0.0	590.8	0.0	590.6	0.0	1
2	0.0	0.0	0.0	0.0	0.0	0.0	654.1	0.0	847.4	0.0	590.6	0.0	2
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	881.8	65.5	590.6	0.0	3
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	881.0	104.8	595.5	0.0	4
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	516.0	621.8	594.7	0.0	5
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	484.3	185.9	594.7	0.0	6
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	103.4	220.2	104.8	594.7	0.0	7
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	170.8	173.0	106.4	452.7	0.0	8
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	164.7	133.2	177.5	423.1	0.0	9
10	0.0	0.0	0.0	0.0	0.0	0.0	6.2	161.0	109.3	455.8	412.6	0.0	10
11	0.0	0.0	0.0	0.0	0.0	0.0	10.0	161.0	59.7	568.9	412.6	0.0	11
12	0.0	0.0	0.0	0.0	0.0	0.0	10.0	161.0	59.7	582.9	412.6	0.0	12
13	0.0	0.0	0.0	0.0	0.0	0.0	211.3	161.0	22.4	609.2	412.6	0.0	13
14	0.0	0.0	0.0	0.0	0.0	0.0	110.7	188.8	0.0	640.6	412.6	0.0	14
15	0.0	0.0	0.0	0.0	0.0	0.0	110.7	205.5	0.0	130.0	412.6	0.0	15
16	0.0	0.0	0.0	0.0	0.0	0.0	110.4	205.5	68.9	125.3	412.6	0.0	16
17	0.0	0.0	0.0	0.0	0.0	25.8	277.8	205.5	110.2	131.5	405.3	0.0	17
18	0.0	0.0	0.0	0.0	0.0	41.3	512.8	239.8	295.7	135.3	402.6	0.0	18
19	0.0	0.0	0.0	0.0	0.0	45.0	479.1	260.3	396.5	118.5	402.6	0.0	19
20	0.0	0.0	0.0	0.0	0.0	0.0	479.1	254.3	269.6	69.6	402.6	0.0	20
21	0.0	0.0	0.0	0.0	0.0	0.0	484.1	250.7	954.6	71.8	402.6	0.0	21
22	0.0	0.0	0.0	0.0	0.0	0.0	704.1	281.6	954.6	119.1	402.6	0.0	22
23	0.0	0.0	0.0	0.0	0.0	522.1	594.0	300.2	907.6	147.4	402.6	0.0	23
24	0.0	0.0	0.0	0.0	0.0	974.3	615.1	300.2	879.3	273.2	402.6	0.0	24
25	0.0	0.0	0.0	0.0	0.0	979.3	623.8	300.2	879.3	348.6	402.6	0.0	25
26	0.0	0.0	0.0	0.0	0.0	974.7	675.5	352.0	614.2	380.2	22.2	0.0	26
27	0.0	0.0	0.0	0.0	0.0	1,029.6	675.5	383.1	279.0	565.6	0.0	0.0	27
28	0.0	0.0	0.0	0.0	0.0	1,135.2	675.5	310.7	154.7	531.0	0.0	0.0	28
29	0.0	0.0	0.0	—	0.0	1,092.4	29.8	303.1	59.8	505.8	0.0	0.0	29
30	0.0	0.0	0.0	—	0.0	1,090.8	7.4	303.1	59.8	536.6	0.0	0.0	30
31	—	0.0	0.0	—	0.0	—	0.0	—	7.6	590.6	—	—	31
TOTAL AF	0.0	0.0	0.0	0.0	0.0	7,910.5	9,147.6	5,727.8	11,870.2	9,006.1	11,563.8	0.0	TOTAL AF
TOTAL YEAR	55,226 ACRE FEET												

NOTES: [1] Operations Secretary data rounded to the nearest 0.1 AF.

B-12
1990

DEMANDS BY KANSAS FOR AGREEMENT ACCOUNT WATER

RELEASES TO KANSAS WATER USERS FROM JOHN MARTIN RESERVOIR [1]
OPERATIONS SECRETARY, ARCA ; IN ACRE FEET [2]
REPORT YEAR ENDING OCTOBER 31, 1990

B-12
1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	1
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	2
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	3
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	4
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	5
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	6
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	117.5	0.0	0.0	0.0	7
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	495.9	0.0	0.0	0.0	0.0	18
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	0.0	19
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	0.0	20
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	0.0	21
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	0.0	22
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	0.0	23
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	0.0	25
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	0.0	26
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	0.0	27
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.4	0.0	0.0	0.0	0.0	28
29	0.0	0.0	0.0	—	0.0	0.0	0.0	793.4	0.0	0.0	0.0	0.0	29
30	0.0	0.0	0.0	—	0.0	0.0	0.0	793.4	0.0	0.0	0.0	0.0	30
31	—	0.0	0.0	—	0.0	—	0.0	—	0.0	0.0	—	0.0	31
TOTAL AF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10,016.7	4,877.9	0.0	0.0	0.0	TOTAL AF
TOTAL YEAR	14,895 ACRE FEET												

NOTES: [1] Does not include releases from transit loss account.
[2] Operations Secretary data rounded to the nearest 0.1 AF.

B-13
1990

STATELINE FLOWS ON DAYS OF KANSAS DEMANDS

FRONTIER DITCH PLUS ARKANSAS RIVER AT THE STATELINE
OPERATIONS SECRETARY, ARCA ; IN ACRE FEET [1], [2]
REPORT YEAR ENDING OCTOBER 31, 1990

B-13
1990

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	DAY
1	0	0	0	0	0	0	0	0	865	0	0	0	1
2	0	0	0	0	0	0	0	0	835	0	0	0	2
3	0	0	0	0	0	0	0	0	843	0	0	0	3
4	0	0	0	0	0	0	0	0	869	0	0	0	4
5	0	0	0	0	0	0	0	0	893	0	0	0	5
6	0	0	0	0	0	0	0	0	879	0	0	0	6
7	0	0	0	0	0	0	0	0	891	0	0	0	7
8	0	0	0	0	0	0	0	0	760	0	0	0	8
9	0	0	0	0	0	0	0	0	536	0	0	0	9
10	0	0	0	0	0	0	0	0	415	0	0	0	10
11	0	0	0	0	0	0	0	0	381	0	0	0	11
12	0	0	0	0	0	0	0	0	831	0	0	0	12
13	0	0	0	0	0	0	0	0	498	0	0	0	13
14	0	0	0	0	0	0	0	0	341	0	0	0	14
15	0	0	0	0	0	0	0	0	0	0	0	0	15
16	0	0	0	0	0	0	0	0	0	0	0	0	16
17	0	0	0	0	0	0	0	0	0	0	0	0	17
18	0	0	0	0	0	0	0	0	0	0	0	0	18
19	0	0	0	0	0	0	0	0	0	0	0	0	19
20	0	0	0	0	0	0	0	450	0	0	0	0	20
21	0	0	0	0	0	0	0	696	0	0	0	0	21
22	0	0	0	0	0	0	0	720	0	0	0	0	22
23	0	0	0	0	0	0	0	819	0	0	0	0	23
24	0	0	0	0	0	0	0	839	0	0	0	0	24
25	0	0	0	0	0	0	0	831	0	0	0	0	25
26	0	0	0	0	0	0	0	789	0	0	0	0	26
27	0	0	0	0	0	0	0	970	0	0	0	0	27
28	0	0	0	0	0	0	0	910	0	0	0	0	28
29	0	0	0	—	0	0	0	867	0	0	0	0	29
30	0	0	0	—	0	0	0	855	0	0	0	0	30
31	—	0	0	—	0	—	0	—	0	0	—	0	31
TOTAL AF	0	0	0	0	0	0	0	8,746	9,837	0	0	0	TOTAL AF
TOTAL YEAR	18,583 ACRE FEET												

NOTES: [1]Flow revised from that presented in Oper. Sec. 90 Report to reflect USGS published data.
[2] Stateline flow is sum of Arkansas River at Coolidge, Kansas and Frontier Ditch near Coolidge, on days of Kansas demand, including applicable rundown period.

B-14a
1990

DIVERSIONS BY DITCHES, COLORADO WATER DISTRICT 14

SOURCE: COLO. DWR, WATER COMMISSIONER MONTHLY REPORTS, ACRE-FEET [1]
REPORT-YEAR ENDING OCTOBER 31,1990

B-14a
1990

DITCH OR CANAL	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	YEAR
BESSEMER													
RIVER	1,988.6	0.0	0.0	0.0	2,320.7	4,267.6	5,427.2	10,761.9	6,752.4	5,028.4	4,397.2	4,491.3	45,435.3
RES. / IMP.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,207.0	3,043.6	5,179.6	1,134.9	0.0	10,565.1
TOTAL	1,988.6	0.0	0.0	0.0	2,320.7	4,267.6	5,427.2	11,968.8	9,796.1	10,208.0	5,532.1	4,491.3	56,000.4
MINNEQUA/UNION	7,113.0	4,461.2	5,869.9	3,211.4	5,866.1	1,780.9	7,009.6	5,147.0	7,473.8	7,474.1	7,063.2	5,852.5	68,342.7
WEST PUEBLO	0.0	0.0	0.0	0.0	0.0	0.0	107.5	195.6	93.2	0.0	0.0	0.0	396.3
EXCELSIOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COLLIER	0.0	0.0	0.0	0.0	0.0	0.0	127.4	553.2	0.0	0.0	0.0	0.0	680.6
COLORADO													
RIVER	0.0	3,680.7	7,917.7	4,355.6	1,638.0	0.0	2,221.6	8,969.6	1,363.2	712.2	0.0	0.0	30,858.5
RES. / IMP.	0.0	963.9	2,514.1	2,250.7	816.7	0.0	1,919.1	4,372.8	5,559.0	7,245.6	0.0	0.0	25,641.9
TOTAL	0.0	4,644.6	10,431.8	6,606.3	2,454.6	0.0	4,140.7	13,342.4	6,922.2	7,957.9	0.0	0.0	56,500.4
HIGHLINE													
RIVER	3,350.5	0.0	0.0	0.0	3,586.5	5,986.9	8,469.4	13,373.7	10,582.3	8,099.3	6,107.0	7,560.2	67,115.8
RES. / IMP.	0.0	0.0	0.0	0.0	0.0	1,206.0	190.4	1,190.1	3,733.6	1,982.1	1,475.7	0.0	9,777.9
TOTAL	3,350.5	0.0	0.0	0.0	3,586.5	7,192.9	8,659.8	14,563.8	14,315.9	10,081.4	7,582.7	7,560.2	76,893.7
OXFORD-FARMER													
RIVER	1,608.9	0.0	0.0	0.0	640.4	1,955.9	2,258.5	6,881.2	4,065.7	3,751.8	1,141.7	2,131.2	24,435.2
RES. / IMP.	0.0	0.0	0.0	0.0	0.0	137.7	150.5	0.0	891.1	586.4	583.7	31.0	2,380.4
TOTAL	1,608.9	0.0	0.0	0.0	640.4	2,093.6	2,409.0	6,881.2	4,956.7	4,338.2	1,725.4	2,162.2	26,815.6
TOTAL DISTRICT # 14													
RIVER	14,060.9	8,141.9	13,787.6	7,566.9	14,051.7	13,991.3	25,621.2	45,882.1	30,330.6	25,065.7	18,729.2	20,035.3	237,264.4
RES./ IMP.	0.0	963.9	2,514.1	2,250.7	816.7	1,343.6	2,260.0	6,769.8	13,227.3	14,993.8	3,194.3	31.0	48,365.2
TOTAL	14,060.9	9,105.8	16,301.7	9,817.6	14,868.3	15,335.0	27,881.2	52,652.0	43,557.9	40,059.5	21,923.5	20,066.3	285,629.6

NOTES:
[1] Colorado DWR monthly report data rounded to nearest 0.1 AF.
[2] "River" refers to direct flow diversions of native Arkansas River flows.
[3] "Res." refers to diversion of stored water released to river from reservoirs for rediversion.
[4] "Imported" refers to diversions of non-native (trans-mountain) water brought into the Arkansas Basin for use by the canal.

B-14b
1990

DIVERSIONS BY DITCHES, COLORADO WATER DISTRICT 17

SOURCE: COLO. DWR, WATER COMMISSIONER MONTHLY REPORTS, ACRE-FEET [1]
REPORT-YEAR ENDING OCTOBER 31,1990

B-14b
1990

DITCH OR CANAL	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	YEAR
OTERO													
RIVER	2,842.9	709.6	0.0	0.0	1,203.5	0.0	1,038.8	2,007.0	1,533.8	0.0	11.0	0.0	9,346.6
RES. / IMP.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	134.0	0.0	567.3	0.0	701.3
TOTAL	2,842.9	709.6	0.0	0.0	1,203.5	0.0	1,038.8	2,007.0	1,667.9	0.0	578.3	0.0	10,047.8
CATLIN													
RIVER	3,854.6	0.0	0.0	0.0	3,668.8	10,176.9	10,563.4	15,668.4	14,460.9	14,012.7	2,779.6	8,301.2	83,486.3
RES. / IMP.	0.0	0.0	0.0	0.0	0.0	3,790.8	303.9	0.0	0.0	1,380.3	8,527.2	0.0	14,002.1
TOTAL	3,854.6	0.0	0.0	0.0	3,668.8	13,967.7	10,867.3	15,668.4	14,460.9	15,392.9	11,306.8	8,301.2	97,488.4
HOLBROOK													
RIVER	0.0	0.0	0.0	6,099.1	2,233.5	0.0	3,600.7	14,218.5	7,175.9	2,732.3	0.0	0.0	36,060.1
RES. / IMP.	0.0	0.0	0.0	0.0	0.0	503.7	3,423.7	0.0	922.4	2,646.0	0.0	0.0	7,495.8
TOTAL	0.0	0.0	0.0	6,099.1	2,233.5	503.7	7,024.4	14,218.5	8,098.3	5,378.3	0.0	0.0	43,555.9
ROCKY FORD	1,007.0	0.0	0.0	0.0	924.2	2,771.5	2,816.2	4,851.9	5,490.8	4,994.1	4,368.3	1,579.6	28,803.5
FT. LYON STORE													
RIVER	4,281.6	12,286.6	9,228.2	7,636.5	11,839.5	0.0	192.4	0.0	1,246.7	301.5	0.0	0.0	47,013.0
RES. / IMP.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3,409.4	642.7	0.0	0.0	4,052.1
TOTAL	4,281.6	12,286.6	9,228.2	7,636.5	11,839.5	0.0	192.4	0.0	4,656.1	944.1	0.0	0.0	51,065.0
FT. LYON													
RIVER	10,471.8	0.0	0.0	0.0	5,250.9	11,885.4	21,779.8	42,577.9	30,784.4	20,108.0	9,775.7	14,309.4	166,943.2
RES. / IMP.	0.0	0.0	0.0	0.0	0.0	0.0	2,124.2	0.0	6,055.7	347.5	0.0	0.0	8,527.3
TOTAL	10,471.8	0.0	0.0	0.0	5,250.9	11,885.4	23,904.0	42,577.9	36,840.1	20,455.4	9,775.7	14,309.4	175,470.5
LAS ANIMAS CON.	1,331.9	0.0	0.0	0.0	1,463.4	2,604.4	3,499.5	4,633.0	5,101.2	4,506.5	2,752.7	2,361.7	28,254.1
TOTAL DISTRICT # 17													
RIVER	22,457.9	12,996.2	9,228.2	13,735.6	25,120.4	24,833.8	39,991.3	79,323.6	60,692.5	42,148.5	16,934.5	24,190.1	371,652.6
RES. / IMP.	0.0	0.0	0.0	0.0	0.0	4,294.5	5,851.7	0.0	10,521.6	5,016.4	9,094.5	0.0	34,778.6
TOTAL	22,457.9	12,996.2	9,228.2	13,735.6	25,120.4	29,128.3	45,843.0	79,323.6	71,214.1	47,164.9	26,029.0	24,190.1	406,431.2
TOTAL DISTRICTS # 14 + # 17													
RIVER	36,518.8	21,138.1	23,015.8	21,302.6	39,172.1	38,825.1	65,612.5	125,205.8	91,023.1	67,214.3	35,663.7	44,225.4	608,917.0
RES. / IMP.	0.0	963.9	2,514.1	2,250.7	816.7	5,638.1	8,111.7	6,769.8	23,748.9	20,010.1	12,288.8	31.0	83,143.8
TOTAL	36,518.8	22,102.0	25,529.9	23,553.2	39,988.7	44,463.2	73,724.1	131,975.6	114,772.0	87,224.4	47,952.5	44,256.4	692,060.9

NOTES:
[1] Colorado DWR monthly report data rounded to nearest 0.1 AF.
[2] "River" refers to direct flow diversions of native Arkansas River flows.
[3] "Res." refers to diversion of stored water released to river from reservoirs for rediversion.
[4] "Imported" refers to diversions of non-native (trans-mountain) water brought into the Arkansas Basin for use by the canal.

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DIVERSIONS BY DITCHES, COLORADO WATER DISTRICT 67

SOURCE: COLO. DWR, WATER COMMISSIONER MONTHLY REPORTS, ACRE-FEET [1]
REPORT-YEAR ENDING OCTOBER 31,1990

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1990

DITCH OR CANAL	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	YEAR
FORT BENT	29.8	0.0	0.0	0.0	0.0	848.9	2,054.9	3,526.7	2,991.1	2,419.9	1,148.5	1,481.7	14,499.4
KESSEE DITCH	65.5	0.0	0.0	0.0	0.0	289.6	880.7	841.0	991.8	1,061.2	1,011.6	247.9	5,389.2
AMITY	0.0	0.0	0.0	0.0	0.0	4,411.3	17,448.9	16,978.8	18,256.1	16,877.6	10,113.9	14,590.6	98,677.1
LAMAR	749.8	0.0	0.0	0.0	261.8	2,364.3	5,248.3	6,747.9	6,537.6	6,759.8	3,657.6	5,992.2	38,319.2
HYDE	277.7	51.6	0.0	0.0	0.0	125.0	384.8	464.1	383.0	394.7	325.3	309.4	2,695.6
MANVEL	0.0	0.0	0.0	0.0	0.0	107.1	59.5	0.0	0.0	412.6	0.0	0.0	579.2
X.Y. & GRAHAM	0.0	0.0	0.0	0.0	0.0	1,251.6	1,565.0	1,721.7	1,902.2	1,644.3	569.3	1,372.6	10,026.6
BUFFALO	1,077.0	0.0	0.0	0.0	0.0	1,231.8	2,415.9	3,800.4	3,776.8	3,145.8	2,261.2	692.2	18,400.9
TOTAL NATIVE	2,199.7	51.6	0.0	0.0	261.8	10,629.6	30,058.0	34,080.5	34,818.4	32,715.9	19,085.2	24,686.6	188,587.2
TRANSMOUNTAIN DELIVERY [2]								97.2	662.5				759.7
TOTAL DIST. 67	2,199.7	51.6	0.0	0.0	261.8	10,629.6	30,058.0	34,177.7	35,480.9	32,715.9	19,085.2	24,686.6	189,346.9

NOTES: [1] Colorado DWR monthly report data rounded to nearest 0.1 AF.
[2] City of Lamar's receipt of Fry-Ark water via Ft. Bent Canal.

DIVERSIONS BY DITCHES, KANSAS STATELINE TO GARDEN CITY

COMPILED BY KANSAS DIV. OF WATER RESOURCES, ACRE-FEET [1]
REPORT-YEAR ENDING OCTOBER 31, 1990

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1990

DITCH OR CANAL	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	YEAR
DIVERSIONS STATELINE TO SYRACUSE													
FRONTIER [2]	724	349	0	0	0	0	833	1,607	2,281	1,771	1,500	787	9,852
SUBTOTAL STATELINE TO SYRACUSE [2]	724	349	0	0	0	0	833	1,607	2,281	1,771	1,500	787	9,852
DIVERSIONS SYRACUSE TO GARDEN CITY													
AMAZON	0	0	0	0	0	1,543	0	732	2,291	0	0	0	4,566
GREAT EASTERN	2,208	1,240	0	0	1,740	1,240	0	1,617	3,606	1,440	0	0	13,091
SOUTH SIDE	692	0	0	0	0	649	1,377	1,252	2,662	0	0	0	6,632
FARMERS	345	0	0	0	0	738	3,418	2,049	1,976	1,295	0	540	10,361
GARDEN CITY	4	0	0	0	0	0	79	347	284	266	292	436	1,708
SUBTOTAL SYRACUSE TO GARDEN CITY	3,249	1,240	0	0	1,740	4,170	4,874	5,997	10,819	3,001	292	976	36,358
TOTAL DIVERSIONS STATELINE TO GARDEN CITY													
TOTAL DIVERSIONS [2]	3,973	1,589	0	0	1,740	4,170	5,707	7,604	13,100	4,772	1,792	1,763	46,210

NOTES: [1] Frontier Ditch is USGS record, other ditches are Kansas DWR records.

[2] Frontier Ditch total diversion includes 2,528 AF returned directly to the River.

TRANSMOUNTAIN DIVERSIONS INTO THE ARKANSAS BASIN

SOURCE: DIVISION ENGINEER, COLORADO WATER DIV. 2, ACRE-FEET [1]
REPORT-YEAR ENDING OCTOBER 31, 1990

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STRUCTURE/OWNER	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	YEAR
TWIN LAKES TUNNEL [2]	75.0	81.0	69.0	55.0	49.0	47.0	6,400.0	26,970.0	7,200.0	280.0	81.0	223.0	41,530.0
HOMESTAKE TUNNEL [3]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5,550.0	5,615.3	15,078.6	200.3	26,444.3
WURTZ DITCH [PUEBLO]	0.0	0.0	0.0	0.0	0.0	0.0	460.0	1,000.0	107.0	3.2	0.0	0.0	1,570.2
LARKSPUR DITCH [CATLIN]	0.0	0.0	0.0	0.0	0.0	0.0	8.1	0.0	0.0	0.0	0.0	0.0	8.1
EWING DITCH [PUEBLO]	0.0	0.0	0.0	0.0	0.0	11.0	184.0	384.0	122.0	60.0	45.0	21.8	807.8
COLUMBINE DITCH [PUEBLO]	0.0	0.0	0.0	0.0	0.0	0.0	172.8	1,145.5	151.3	11.0	0.0	0.0	1,480.6
BOUSTED TUNNEL [SECWCD]	0.0	0.0	0.0	0.0	0.0	60.0	7,840.0	33,880.0	5,230.0	123.0	134.0	141.0	47,408.0
BUSK-IVANHOE TUNNEL [4]	0.0	0.0	0.0	0.0	0.0	0.0	613.0	3,840.0	522.0	68.0	35.0	83.0	5,161.0
BLUE RIVER PROJECT [5]	299.0	467.0	703.0	558.0	599.0	377.0	61.0	346.0	316.0	148.0	351.0	0.0	4,225.0
TRANSMOUNTAIN TOTAL	374.0	548.0	772.0	613.0	648.0	495.0	15,718.8	67,565.5	19,196.3	6,308.5	15,724.6	669.2	128,634.9

NOTES:

[1] Transmountain water diverted into the Arkansas Basin through a facility is generally delivered to some type of storage prior to use. The values reported reflect water diverted into the basin, generally to storage, and are not necessarily measured as flow below Pueblo.
[2] Twin Lakes ownership: Colorado Spgs. 54.65%, Pueblo 23.14%, Pueblo West 11.56%, Aurora 4.9%, others 5.75%; (also known as Independence Pass Tunnel).
[3] Homestake ownership: Colorado Spgs. 50%, Aurora 50%.
[4] Busk-Ivanhoe ownership: Pueblo 50%, Aurora 49%, others 1%; (also known as Carlton Tunnel).
[5] Values show amount of transmountain water "delivered into the Colorado Springs potable water system" from the Blue and South Platte Rivers via Hoosier Tunnel and Montgomery Pipeline, as shown in Table 2 of City's Blue River letter report for water year 1990 (October data from subsequent report).
[6] Aurora owned transmountain water is generally rediverted into and used in the South Platte River Basin via the Otero Pump Station and Spinney Mountain Reservoir. Total imports for 1990 should be reduced by 19,114 AF to reflect water used by Aurora outside the Arkansas Basin.

SUMMARY TABULATION

COMPILED BY COLORADO WATER CONSERVATION BOARD, ACRE-FEET
REPORT YEAR ENDING OCTOBER 31, 1990

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1990

STATION/DATA	SOURCE	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	YEAR
Arkansas River at Las Animas	App B-2a	5,420	5,700	6,050	7,430	5,020	1,640	15,760	30,110	31,060	12,660	3,390	19,890	144,130
Purgatoire River near Las Animas	App B-2b	380	1,010	1,520	1,410	1,910	729	1,130	521	9,250	4,050	281	1,170	23,361
River Flow into John Martin Res.	App B-2c	5,800	6,710	7,570	8,840	6,930	2,369	16,890	30,631	40,310	16,710	3,671	21,060	167,491
End Month JMR contents [1]	App B-3	34,900	43,600	53,400	63,700	72,400	65,500	56,300	38,500	43,100	31,000	18,700	17,900	N/A
Net Change in JMR Contents	calc-ulated	7,493	8,700	9,800	10,300	8,700	(6,900)	(9,200)	(17,800)	4,600	(12,100)	(12,300)	(800)	(9,507)
Evaporation from John Martin Res.	Table 1	448	216	0	176	1,546	1,871	2,312	3,194	1,915	1,847	1,244	688	15,457
Outflow from John Martin Res.	App B-4	143	119	99	137	126	9,300	25,190	44,880	34,210	26,410	14,800	20,540	175,954
Diversions in District 67	App B-14c	2,200	52	0	0	262	10,630	30,058	34,178	35,481	32,716	19,085	24,687	189,347
Arkansas River at Stateline	App B-7c	7,383	8,180	8,930	7,220	8,370	5,910	5,623	11,650	13,640	5,610	3,090	4,996	90,602
Diversions by ditches in Kansas [2]	App B-15	3,973	1,589	0	0	1,740	4,170	5,707	7,604	13,100	4,772	1,662	1,763	46,080

NOTES: [1] Beginning contents of JMR at 0001 hours, Nov. 1, 1989 was 27,406.78 AF.

[2] Diversions by ditches in Kansas includes 2,528 AF diverted by Frontier and returned directly to the River, see Appendix B-15 and note 2 thereof.

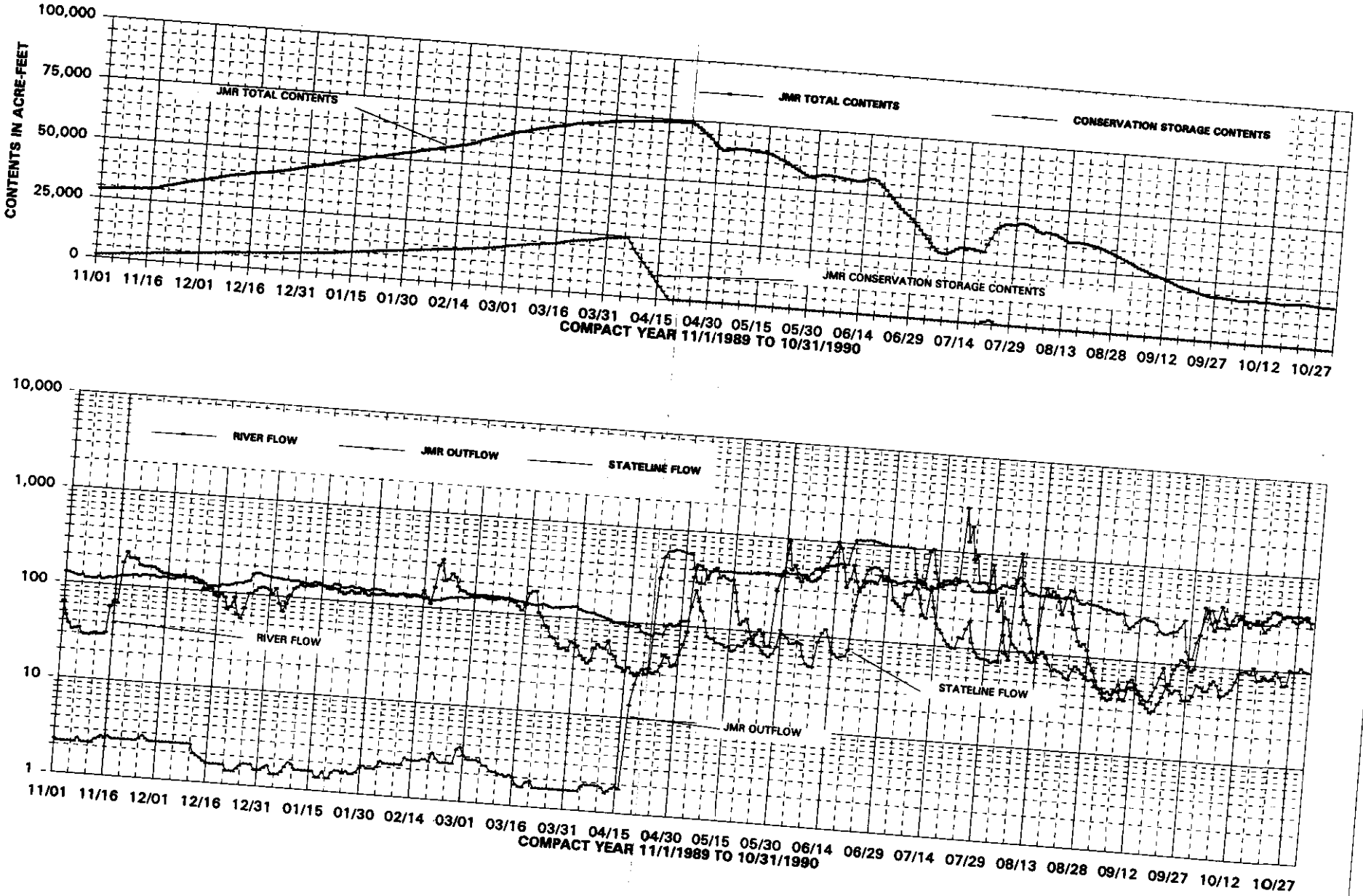

PLATE I: INFLOW, OUTFLOW, STATELINE FLOW, AND CONTENTS OF JMR