

TWELFTH ANNUAL REPORT

ARKANSAS RIVER

COMPACT

ADMINISTRATION

(1960)

For the Report-Year November 1, 1959
to October 31, 1960

LAMAR, COLORADO

December 16, 1960

Twelfth
Annual Report
**ARKANSAS RIVER COMPACT
ADMINISTRATION**
(1960)

For the Report Year November 1, 1959, to October 31, 1960

LAMAR, COLORADO

December 16, 1960

THE ADMINISTRATION

CARL G. PAULSEN, *Chairman and Representative of the United States*
HACKET SMARTT, *Secretary and Treasurer*

FELIX L. SPARKS, DAVID JENKINS AND HACKET SMARTT
for Colorado

R. V. SMRHA, LOGAN N. GREEN AND CARL E. BENTRUP
for Kansas

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Annual Report of
ARKANSAS RIVER COMPACT ADMINISTRATION
(1960)

Report-Year November 1, 1959 to October 31, 1960

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 report-year November 1, 1959 through October 31, 1960 as follows:

1. *Members of the Administration*

Representative of the United States:

Carl G. Paulsen

Colorado Representatives:

Felix L. Sparks, Denver, Colorado

David Jenkins, Las Animas, Colorado

Hacket Smartt, Lamar, Colorado

Kansas Representatives:

Carl E. Bentrup, Deerfield, Kansas

Logan N. Green, Garden City, Kansas

R. V. Smrha, Topeka, Kansas

2. *Officers of the Administration*

Chairman:

Carl G. Paulsen

Vice-Chairman:

Logan N. Green of Garden City, Kansas

Secretary:

Hacket Smartt of Lamar, Colorado

Treasurer:

Hacket Smartt of Lamar, Colorado

3. Standing Committees

Administrative and Legal Committees:

Logan N. Green of Kansas (Chairman)

David Jenkins of Colorado

Engineering Committee:

R. V. Smrha of Kansas (Chairman)

Felix L. Sparks of Colorado

Operations Committee:

Carl E. Bentrup of Kansas (Chairman)

Hacket Smartt of Colorado

Carl G. Paulsen, Representative of the United States, is ex-officio member of all standing committees.

4. Meetings

December 8, 1959	Lamar, Colorado	Annual Meeting
March 22, 1960	Lamar, Colorado	Regular Meeting
May 18, 1960		Telephonic Meeting
July 6, 1960		Telephonic Meeting
July 13, 1960		Telephonic Meeting
July 26, 1960	Lamar, Colorado	Regular Meeting
October 25, 1960	Lamar, Colorado	Special Meeting

5. Fiscal

(a) Balance on Hand October 31, 1959, Auditor's Report..\$4,610.94

(b) Receipts

State of Colorado, September 1, 1960....\$2,880.00

State of Kansas, September 13, 1960..... 1,920.00

4,800.00

\$9,410.94

(c) Disbursements by the Administration—November 1, 1959 to October 31, 1960:

<i>Voucher</i> No.	<i>Date</i>	<i>Payee and Purpose</i>	<i>Amount</i>
282	1- 4-60	R. W. Rollins, Audit and Service.....	\$ 65.00
283		Mtn. States T. & T. Co., Nov & Dec. Service....	24.95
284		Treasurer of U. S., Deposits by States.....	15.00
285		Secretary Salary, Nov. & Dec.....	195.00
286	3- 5-60	U. S. Geological Survey, Cooperative Agreement....	725.00
287		Mtn. States T. & T. Co., Jan. & Feb. Service.....	22.40
288	3-21-60	Peerless Printing Co.....	605.00
289	4- 6-60	Secretary Salary, Jan., Feb., & Mar.....	291.00
290		Treasurer of U. S., Deposits by States.....	18.00
291	5- 4-60	Mtn. States T. & T. Co., Mar. & Apr. Service.....	22.80
292		U. S. Geological Survey, Cooperative Agreement....	725.00
293	6-30-60	Secretary Salary, Apr., May & June.....	292.50
294		Treasurer of U. S., Deposits by States.....	15.00
295		Mtn. States T. & T. Co., May & June Service.....	35.75
296		Lamar Daily News, Printing.....	9.44
297	7-16-60	U. S. Geological Survey, Cooperative Agreement....	725.00
298	9- 4-60	Mtn. States T. & T. Co., July & Aug. Service.....	59.50
299	10-24-60	Valley Agency, Treasurer's Bond.....	25.00
300		Treasurer of U. S., Deposits by States.....	21.00
301		Secretary Salary, July, Aug. & Sept.....	289.50
302	10-31-60	Mtn. States T. & T. Co., Sept. & Oct. Service.....	26.10
303		Secretary Salary, Oct.....	97.00
304		Secretary Mileage, Postage, Mail & Typing.....	144.01
		Total Disbursements	<u>\$4,448.95</u>

(d) Balance on hand October 31, 1960.....\$4,961.99

(e) The Compact Administration, at a regular meeting held in Lamar, Colorado, on July 26, 1960, estimated its expenses in accordance with expenditures during the past year and approved its budget for the fiscal year July 1, 1961, to June 30, 1962, as follows:

Personal Services	\$2,975.00	
Secretary Salary	\$1,200.00	
Social Security	50.00	
Gage Reports	1,650.00	
Professional Services (Audit of Accounts)	75.00	
Capital Outlay		300.00
Maintenance and Operation.....		1,675.00
Bond, Treasurer	25.00	
Printing	600.00	
Official Publications	100.00	
Travel Expense—Secretary and Employees	150.00	
Typing and Mailing.....	200.00	
Investigation and Inspection.....	150.00	
Telephone and Telegraph.....	300.00	
Office Supplies	150.00	
Total Proposed Budget, 1961-1962.....	\$4,950.00	
Estimated Carry-over as of June 30, 1961.....		0

In accordance with Article VIII E (I), the amount of such budget payable by the State of Colorado is sixty percent thereof, or \$2,970.00, and the amount payable by the State of Kansas is forty percent thereof, or \$1,980.00.

- (f) Pursuant to provisions of the Compact, (Article VIII-E (3)) and of the By-Laws of the Administration (Article VII (5)), the receipts and disbursements of the Administration have been audited for the period commencing November 1, 1959 through October 31, 1960, the end of the Report-year. The report of such audit is hereto attached as Appendix "A".

6. *Cooperative Studies and Activities*

- (a) Article VIII G (1) of the 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 waters 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, 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 streamflow and related data. Under the By-Laws

of the Administration, these cooperative studies and activities are assigned to the Engineering Committee of the Administration.

- (b) 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 Corps of Engineers continued to operate John Martin Reservoir in accordance with the terms of the Compact. The latest capacity table of John Martin Reservoir, adopted as of June 1, 1958, was continued in use throughout the year. The United States Geological Survey has continued the operation of the Compact gaging stations and the analyses and compilation of hydrologic data presented in this report and used in the administration of the Compact. To assist that agency in defraying the costs of operating the Compact gaging stations and performing other hydrologic work required in the administration of the Compact, the Administration entered into a cooperative agreement with the Geological Survey in the total amount of \$3,000 (half to be borne by each party) for the Fiscal Year 1961 (July 1, 1960 to June 30, 1961). The Stevens Telemetering equipment at the gaging station below John Martin Dam and the bubbler recording gage at the station on the Arkansas River at Las Animas continued to function adequately and thereby greatly facilitated operations. At the July 26, 1960, meeting the Administration requested the Geological Survey to represent the Administration on an inspection trip of all gaging stations on the mainstem of the Arkansas River from Granite, Colorado to the Colorado-Kansas State line. As a result of that trip, the Geological Survey, the Colorado Water Conservation Board, the Southeastern Colorado Water Conservancy District, and the State Engineer entered into a four-way cooperative agreement amounting to \$9,000, \$7,000, \$13,000 and \$1,000 respectively, covering increased field work, the rehabilitation of three existing gaging stations, and the installation of two new stations. Bubbler gages and telemetering equipment will be installed at the two new stations and one existing station, which is to be relocated. This equipment will facilitate the administration of the waters of the Arkansas River.

7. Water Supply, Reservoir Operations and Hydrologic Data

At the beginning of the Compact year, November 1, 1959, John Martin Reservoir had only 930 acre feet of water in storage. By the end of the winter storage period on March 31, 1960, stored water in the reservoir had increased to 47,503 acre feet. This was a net gain of 46,573 acre feet, constituting the second largest winter gain since the first year of operation under the Compact. The gates remained closed through April 23, 1960, at which time there were 56,860 acre feet of water in storage.

The first release of stored water was made beginning at 1:30 p.m. on April 24, 1960, to meet demands of both states. At 8:30 a.m. on April 28, 1960, releases from the reservoir were increased to satisfy additional demands of Colorado. Releases were made for both states until the reservoir was declared empty at 6:00 a.m. on May 29, 1960.

River flow was passed through the reservoir until noon on July 6, 1960, when the gates were closed to store runoff from heavy rains that occurred on July 5. The accumulated amount of water in storage reached a maximum of 4,688 acre feet at midnight on July 7, 1960. Releases were begun at 10:30 p.m. on July 6, 1960, upon demand of Colorado and continued until the reservoir was declared empty at 6:00 a. m. on July 12, 1960.

River flow was again passed through the reservoir until 10:30 a.m. on July 14, 1960. At 9:00 p.m. on July 13, 1960, the gates were adjusted to limit outflow from the reservoir to 600 c.f.s. so that runoff from a small freshet could be partially stored. Storage of flood flows and release of stored water on demand of Colorado were begun simultaneously at 10:30 a.m. on July 14, 1960. Releases were increased at 2:30 p.m. on July 15, 1960, to meet Kansas demands and continued until the reservoir was declared empty at 3:00 a.m. on July 17, 1960. Maximum storage during this second flood period was 3,666 acre-feet.

The reservoir remained empty the remainder of the year. With the exception of four hours on October 31, 1960, river flow was passed through the reservoir from 3:00 a.m. on July 17, 1960, to midnight on October 31, 1960.

Inflow into John Martin Reservoir during the irrigation season totalled 66,320 acre feet. While this was more than three times the 1959 irrigation-season inflow, it was the second lowest summer inflow since 1949-1950 and only 41 per cent of the eleven-year average.

Diversions downstream from John Martin Reservoir during the irrigation season were less than any year since 1954 and were 31 per cent less than the eleven-year average. Total diversions April 1, 1960, to October 31, 1960, by the ditches in Colorado W. D. No. 67 were 108,343 acre feet. Ditch diversions in Kansas for the same period amounted to 56,365 acre feet or 85 per cent of the water crossing the stateline in that time.

Total reservoir releases April 1 to October 31 were 116,700 acre feet which were 48,008 acre feet less than total diversions. Local runoff from areas below the reservoir and return flows provided 29 per cent of the water diverted during the irrigation season.

River flow was passed through the reservoir averaging:

3.4 c.f.s. from November 1, 1959, to April 23, 1960
362 c.f.s. from May 30, 1960, to July 5, 1960
79 c.f.s. from July 17, 1960, to October 31, 1960.

Stateline flow for corresponding periods averaged 193 c.f.s., 193 c.f.s., and 42 c.f.s. respectively.

The total discharge for the year at Garden City was 93,190 acre feet of which winter flows made up 70,240 acre feet. Rains during two periods in April and June accounted for an additional 9,335 acre feet. The remaining discharge past Garden City was 13,615 acre feet or an average of 36 c.f.s.

8. *Gaging Stations*

Stream-flow records were collected at all of the Compact gaging stations. During the year emphasis was placed on performing additional field work and providing provisional discharge data on a current basis to Administration and State officials. The measuring cableways at the stations on the Arkansas River near Coolidge, Kansas and the Purgatoire River at Las Animas, Colorado were completed in January and March 1960, respectively.

At the regular meeting on July 26, 1960, the Administration authorized the Secretary-Treasurer to enter into an agreement with the U. S. Geological Survey as follows:

1. Partial support of Compact gaging stations \$1,500
2. Relocation of gaging stations, not to exceed \$1,100
 - a. Purgatoire River near Las Animas
 - b. Arkansas River at Las Animas

Later, however, it was decided not to relocate the Arkansas River gage. The cost of a temporary gage installation on the Purgatoire River, and rental of a dozer to place a temporary check across the head of the flood channel of the Arkansas River at Las Animas were paid out of the operating funds included in the regular cooperative agreement.

The final cooperative agreement for Fiscal Year 1961 (July 1, 1960 to June 30, 1961) is as follows:

	<u>ARCA</u>	<u>USGS</u>	<u>Total</u>
1. Partial support of following			
Compact gaging stations	\$1,000	\$1,000	\$2,000
a. Arkansas River at Las Animas			
b. Purgatoire River near Las Animas			
c. Arkansas River below John Martin Reservoir			
d. Arkansas River near Coolidge, Kansas			
e. Frontier Ditch near Coolidge, Kansas			
2. Operation of Compact gaging station,			
Arkansas River at Lamar	500	500	1,000
Total	\$1,500	\$1,500	\$3,000

9. Findings of fact by the Administration

(a) A special Telephonic Meeting of the Administration was held on May 18th, 1960, in accordance with Article IV, Section 3B, of the By-Laws for the purpose of declaring the Reservoir empty and giving notice to the State Engineer of Colorado that priority administration would commence on May 28th, 1960, unless a change of condition justified cancellation or modification of that notice. Priority administration should commence, and decreed rights of water users in Colorado would be administered by the Colorado State Engineer. The Reservoir was empty at 6 A. M., May 29, 1960.

(b) On Tuesday night, July 5th, some heavy rains occurred in the vicinity south of the John Martin Reservoir causing Caddoa Creek and Rule Creek to flood. About 7 A. M. July 6th Mr. McGrath notified the Secretary that there was considerable flood water at the Fort Bent headgate. Under closer investigation it was found that most of the flood water was coming from Caddoa Creek and Rule Creek. It was also discovered that the discharge from John Martin Reservoir had reached 2300 cu. ft. per second at approximately 11 A. M.

A special telephonic meeting of the administration was held at 11:30 A. M. July 6th, 1960, in accordance with Article IV, Sec. 3B, of the By-Laws of the Administration.

As a result of this meeting the administration found that stored water was available for a 24-hour period to District 67 and Kansas, and the State Engineer of Colorado was notified to that effect. On July 7th this notice was modified to extend the supply to 12 Noon, July 9th, and again extended to Tuesday, July 12th, 1960. The Reservoir was empty Tuesday A. M., July 12th, 1960, sometime before 8 A. M.

(c) Wednesday morning, July 13, 1960, the secretary was informed that a considerable amount of water was passing the Fort Lyon Canal dam in the Arkansas River. Also about 2000 cfs was in the Purgatoire at the Nine Mile south of Las Animas. With this information at hand, a telephonic meeting was held at 12:30 P. M., July 13th, 1960, in accordance with Article IV, Section 3B of the By-Laws of the Administration.

As a result of this meeting and upon further investigation the administration found that water was available for Colorado District 67 and Kansas. The gates were adjusted at 9 P. M. on July 13th to limit the discharge to 600 cfs. Storage began at 10:30 A. M. July 14th, and the State Engineer of Colorado was notified to that effect. The reservoir was emptied at 3:00 A. M. on July 17, 1960.

There being no water available for storage during the remainder of the water year, the river was administered by the State Engineer. Colorado continued to call for 100 cfs. up to December 1st, 1960, as provided in Article V, paragraph A of the Compact Administration. The gates were closed at 11 A. M. December 1, 1960.

The above Findings and Notifications were in form similar to those published in the Fifth Annual Arkansas River Compact Administration Report of 1953, Appendix C.

Respectfully submitted,

ARKANSAS RIVER COMPACT ADMINISTRATION
BY:

CARL G. PAULSEN,
Representative of the United States and
Chairman of the Administration

FELIX L. SPARKS
DAVID JENKINS
HACKET SMARTT
Colorado Members of the Administration

R. V. SMRHA
LOGAN N. GREEN
CARL E. BENTRUP
Kansas Members of the Administration

Lamar, Colorado
December 16, 1960

APPENDICES
for
Annual Report of the
Arkansas River Compact Administration

For the Report-Year November 1, 1959 to October 31, 1960

- APPENDIX "A" —Auditor's Report.
- APPENDIX "B-1" —Daily Discharges, Arkansas River near Pueblo, Colorado.
- APPENDIX "B-2" —Daily Discharges, Arkansas River at Las Animas, Colorado.
- APPENDIX "B-3" —Daily Discharges, Purgatoire River near Las Animas, Colorado.
- APPENDIX "B-4" —Inflow into John Martin Reservoir.
- APPENDIX "B-5" —Daily Contents, John Martin Reservoir.
- APPENDIX "B-6" —Outflow from John Martin Reservoir.
- APPENDIX "B-7" —Daily Discharges; Arkansas River at Lamar, Colorado.
- APPENDIX "B-8" —Daily Discharges, Arkansas River at Colorado-Kansas Stateline.
- APPENDIX "B-9" —Daily Discharges, Arkansas River at Garden City, Kansas.
- APPENDIX "B-10"—Demands by Colorado for Water.
- APPENDIX "B-11"—Demands by Kansas for Water.
- APPENDIX "B-12"—Stateline Flow on Days of Kansas Demand.
- APPENDIX "B-13"—Diversions by Ditches in Colorado Water Districts 14 and 17.
- APPENDIX "B-14"—Diversions by Ditches in Colorado Water District 67.
- APPENDIX "B-15"—Diversions by Ditches in Kansas, Stateline to Garden City.
- APPENDIX "B-16"—Summary Tabulation.
- PLATE I —Graphs showing inflow, outflow and contents of John Martin Reservoir and Stateline Flow for Report-Year.

APPENDIX "A"

* * * *

AUDITOR'S REPORT

ROBERT W. ROLLINS

* * * *

Certified Public Accountant
La Junta, Colorado

December 9, 1960

To the Representatives
Arkansas River Compact Administration
Lamar, Colorado

Gentlemen:

In accordance with your request, an examination has been made of the financial transactions of the Arkansas River Compact Administration for its "Report-Year" November 1, 1959 to October 31, 1960. The results of the audit are expressed in the attached statement of cash receipts and disbursements, Schedule I, Page No. 18. The remarks which follow are offered as additional information and tend to describe the extent of the audit work performed.

General Comments

Schedule I, reflects the beginning balance of cash in bank, revenue assessments received from the States of Colorado and Kansas, expenditures by classification and the ending balance of cash in bank.

As provided for in the budget of the Administration's meeting of July 28, 1959 and to comply with action taken by the Board at its July 26, 1960 meeting, funds due from Colorado (60% share) of \$2,880.00 and Kansas (40% share) of \$1,920.00 were received for the budget year ending June 30, 1961 and placed on deposit with the First National Bank in Lamar, Colorado on the respective dates of September 1, 1960 and September 13, 1960.

All disbursements were made by checks drawn on the Administration's account at the First National Bank in Lamar, Colorado. The individual checks were examined for amount, signature, and endorsement. Amounts so expended were substantiated by verification to payees' statements, authorization of payment as evidenced in minutes of the Compact's meetings, or other supporting documents.

Consistent with prior years' practices, the Secretary's salary for the current year of \$1,200.00 has been reduced by the Old-Age and Survivor's Insurance deductions amounting to \$35.00. It will be noticed on Schedule I, that \$34.50 of this amount together with the Administration's related contribution are shown under the classification of taxes.

The rate of tax increased from 5% to 6% effective January 1, 1960, consequently the October 1960 payroll deduction is shown as \$3.00. Schedule I also reflects the \$1.00 due the Secretary caused by the understatement of the amount on check No. 304.

Travel expense of the Secretary for the fiscal year ending October 31, 1960 amounted to \$101.92 or 1274 miles at \$0.08 per mile.

Payments made to the U. S. Treasurer totaling \$69.00 during the year were accompanied by related returns reflecting the Old-Age and Survivor's Insurance information on the Secretary. During the phase of the examination, it was noticed the old rate of 5% was used for the second quarter of 1960, but the additional \$3.00 liability was remitted along with the regular third quarter payment.

Expenditures to the U. S. Geological Survey for the year under review totaled \$2,175.00 and consisted of:

March 5, 1960 (Period 10/1/59-12/31/59—2nd Qtr.)	
Agreement based on \$2,900.00 per annum)	\$ 725.00
May 5, 1960 (Period 1/1/60-3/31/60—3rd Qtr.)	
Agreement based on \$2,900.00 per annum)	725.00
July 16, 1960 (Period 4/1/60-6/30/60—4th Qtr.)	
Agreement based on \$2,900.00 per annum)	725.00
TOTAL	<u>\$2,175.00</u>

Cash in bank at October 31, 1960, per Schedule I, amounting to \$4,961.99 was reconciled to the amount directly confirmed by the First National Bank in Lamar, Colorado. Funds available for general use of the next year amount to \$4,957.99.

The following summary compares the Administration's financial position at October 31, 1960 with that of a year ago.

COMPARATIVE BALANCE SHEET

<u>ASSETS</u>	Oct. 31, 1960	Oct. 31, 1959	Increase (Decrease)
Cash in bank	\$4,961.99	\$4,610.94	\$351.05
Equipment (Portable typewriter)	92.50	92.50	—0—
Total Assets	<u>\$5,054.49</u>	<u>\$4,703.44</u>	<u>\$351.05</u>
CAPITAL			
Unexpanded fund balance	\$4,961.99	\$4,610.94	\$351.05
Expanded fund balance for equipment	92.50	92.50	—0—
Total Capital	<u>\$5,054.49</u>	<u>\$4,703.44</u>	<u>\$351.05</u>

Because the "Budget Year" covers the period July 1, 1959 to June 30, 1960, it has been necessary to combine related months of the last two "Report Years," in order to compare actual expenditures with the related budgeted items. Such a comparison is set forth for your review in the following schedule.

COMPARISON OF DISBURSEMENTS WITH BUDGET

Budget Year July 1, 1959 to June 30, 1960

<i>Classification</i>	<i>Disbursements</i>	<i>Budget</i>
PERSONAL SERVICES		
Secretary's salary	\$1,200.00	\$1,200.00
Taxes—O.A. and S.I.—Administration's share	31.50	50.00
Gage reports	2,425.00	2,500.00
Professional services (Audit of accounts) ..	65.00	75.00
CAPITAL OUTLAY	\$ —0—	\$ 300.00
MAINTENANCE AND OPERATION		
Bond—Treasurer	25.00	25.00
Printing	605.00	600.00
Official publications	—0—	100.00
Travel expense—Secretary	101.52	150.00
Typing and mailing	25.00	200.00
Investigation and inspection	—0—	150.00
Telephone and telegraph	190.90	300.00
Office supplies	28.11	150.00
TOTALS	<u>\$4,697.03</u>	<u>\$5,800.00</u>

As of June 30, 1960, the cash in bank balance was \$1,549.10, thus allowing some funds to be carried over to the "Budget Year"—July 1, 1960 to June 30, 1961. The Compact in its Meeting of July 28, 1959 approved the Budget for the year ending June 30, 1961 reflecting estimated expenditures of \$4,800.00. Appropriations from the States of Colorado and Kansas (previously mentioned on page no. 1 of this report) for the related period set at the respective amounts of \$2,880.00 and \$1,920.00 were received in September of 1960.

Respectfully submitted,
ROBERT W. ROLLINS
Certified Public Accountant

SCHEDULE I

ARKANSAS RIVER COMPACT ADMINISTRATION Lamar, Colorado

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS

November 9, 1959 to October 31, 1960

(Refer to comments in text of audit)

CASH IN BANK AT NOVEMBER 1, 1959 (per audit).....\$4,610.94
RECEIPTS

Revenue from assessments	
Colorado portion 60%	\$2,880.00
Kansas portion 40%	1,920.00
	<hr/>
TOTAL RECEIPTS	4,800.00
	<hr/>
TOTAL AVAILABLE FUNDS	\$9,410.94

DISBURSEMENTS

Salary of secretary	\$1,200.00
Less: O.A. and S.I. deductions	35.00(1)
	<hr/>
Sub-total	\$1,165.00
Printing—Annual report	605.00
Telephone and telegraph	191.50
Travel expense of secretary	101.92
Audit fee (Fiscal year ended 10/31/59) ..	65.00
Premium on treasurer's bond	25.00
Typing and mailing	25.00
Office supplies, stationary, etc.	26.53(2)
Taxes—O.A. and S.I. payments	
Deductions from	
employee	\$34.50(1)
Administration's portion 34.50	69.00
	<hr/>

Surface water investigations by the U. S. Geological Survey	2,175.00
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TOTAL DISBURSEMENTS	4,448.95
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CASH IN BANK AT OCTOBER 31, 1960	<u>\$4,961.99</u>
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Consisting of:

Amount held in trust—Payroll de- duction on secretary's salary for month of October, 1960.....\$	3.00(1)
Check No. 304 to secretary was un- derstated by \$1.00, accordingly	

(continued on next page)

(continued from preceding page)

—office supplies have been re-
duced by the same amount 1.00(2)

Sub-total\$ 4.00

Cash available for expending in
subsequent period 4,957.99

TOTAL\$4,961.99

CASH ON DEPOSIT AT FIRST NATIONAL BANK, LAMAR, COLORADO

Per direct confirmation at October 31,
1960\$5,229.10

Less: Outstanding checks of:

No. 302 Mountain States
Tel. and Tel. Co...\$ 26.10

303 Hacket Smartt—
Salary 97.00

304 Hacket Smartt—
Mileage, etc. ..(2) 144.01 267.11

ADJUSTED CASH ON DEPOSIT WITH BANK \$4,961.99

ARKANSAS RIVER NEAR PUEBLO, COLORADO

Report-Year Ending October 31, 1960

U S G S Records—Provisional, subject to revision

DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
1	614	395	356	364	317	438	804	1220	1300	1000	253	103
2	615	395	331	304	317	402	763	1480	1290	1130	185	114
3	616	394	239	307	325	359	667	1920	1670	1150	199	96
4	589	387	242	298	327	338	594	2220	1230	1160	172	92
5	535	381	263	273	337	302	373	2940	1440	1060	164	84
6	519	359	357	266	332	365	330	3090	1340	1110	183	78
7	526	380	365	272	337	468	266	3110	1290	1100	175	87
8	569	423	378	272	341	500	237	3270	1280	868	216	105
9	614	394	349	290	349	468	238	2880	1180	808	706	110
10	565	380	356	284	328	473	202	2760	1040	767	336	99
11	530	443	369	266	308	482	188	2860	1080	699	353	88
12	490	467	391	259	292	487	229	2220	1270	680	233	93
13	531	443	370	260	273	494	341	2000	1280	635	173	92
14	527	436	335	265	296	489	654	1620	1150	598	154	102
15	500	442	307	253	316	359	1270	1460	955	588	151	168
16	508	414	264	236	312	344	1260	1590	1190	633	158	233
17	523	421	235	225	271	378	1150	1600	1230	724	370	274
18	497	420	185	208	263	308	1050	1980	1200	714	509	861
19	422	407	146	210	301	283	1030	2570	1060	724	470	487
20	401	357	197	233	307	292	851	2410	965	713	461	420
21	387	314	250	250	385	274	701	2460	906	704	468	345
22	394	296	241	245	441	224	741	2500	875	680	466	318
23	401	302	251	261	545	262	634	1980	876	637	506	318
24	401	295	258	250	533	324	646	1650	1060	656	492	324
25	401	305	279	242	594	387	793	1450	997	565	323	295
26	394	332	306	246	597	371	666	1460	897	555	172	285
27	379	332	326	261	676	349	639	1710	817	529	191	287
28	338	313	314	304	821	333	677	1620	757	488	139	270
29	338	302	314	308	739	634	853	1460	747	456	113	271
30	372	366	324		511	835	1000	1320	791	391	100	258
31		371	399		454		1080		792	298		258
TOTAL												
sec. ft.	14496	11666	9297	7712	12545	12022	20927	62810	33955	22820	8591	7015
ac. ft.	28750	23140	18440	15300	24880	23850	41510	124600	67350	45260	17040	13910
(a)ac. ft.	0	0	0	0	0	1010	3840	0	10240	26630	5850	0
(b)ac. ft.	28750	23140	18440	15300	24880	22840	37670	124600	57110	18630	11190	13910

(a) Less upstream reservoir and transmountain water.

(b) Corrected total Ac. Ft.

THE YEAR 444,000 Acre Feet
CORRECTED 396,500 Acre Feet

ARKANSAS RIVER NEAR PUEBLO, COLORADO

APPENDIX "B-1"

* * * *

ARKANSAS RIVER AT LAS ANIMAS, COLORADO
 Report-Year Ending October 31, 1960
 U S G S Records—Provisional, subject to revision

DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
1	68	29	19	38	74	58	18	157	492	9.2	8.0	6.4
2	44	24	17	38	86	60	18	345	437	10	7.2	5.8
3	21	22	16	38	95	54	16	365	471	11	7.5	5.8
4	22	18	16	38	100	52	14	312	537	8.6	8.0	5.8
5	30	17	29	37	108	54	15	350	662	8.6	8.0	4.7
6	22	17	38	40	153	56	15	513	800	10	7.2	4.0
7	17	17	32	58	268	52	12	350	245	18	6.4	4.0
8	18	17	29	58	280	51	12	238	104	9.7	6.1	4.0
9	17	17	24	52	192	40	12	263	62	9.7	22	4.4
10	15	18	25	54	125	34	10	350	38	10	102	5.4
11	15	18	25	45	118	27	9.7	340	31	8.0	10	6.1
12	14	18	22	35	118	30	9.7	614	56	7.5	11	7.2
13	14	18	20	35	93	414	9.7	596	1550	7.5	5.8	7.2
14	15	18	19	35	84	154	7.5	322	340	7.5	6.1	7.2
15	29	18	18	35	76	47	8.6	437	89	7.5	5.8	11
16	18	19	18	35	68	32	8.6	299	61	7.5	5.8	11
17	15	19	17	33	64	35	9.7	281	406	7.2	5.8	11
18	18	19	24	34	62	34	11	424	558	6.8	5.8	23
19	19	24	24	33	64	37	12	370	606	6.8	6.1	133
20	21	37	26	31	62	37	11	370	528	6.8	6.1	196
21	22	40	30	30	58	35	10	340	378	7.5	6.4	89
22	25	25	28	28	60	24	10	231	250	7.2	6.8	49
23	24	18	32	27	60	18	12	520	170	6.4	8.0	51
24	24	16	38	26	56	18	12	471	111	6.4	9.2	82
25	24	33	47	25	52	18	10	370	103	7.5	8.6	97
26	25	44	50	28	45	14	10	370	71	9.2	8.6	97
27	25	49	49	33	43	13	9.7	355	73	10	8.0	97
28	27	47	48	38	43	13	8.6	537	69	9.7	7.5	99
29	29	52	46	44	45	18	9.7	672	24	8.6	7.2	97
30	33	38	43		47	27	15	580	17	8.6	6.8	115
31		29	39		52		86		12	10		104
TOTAL												
sec. ft.	710	795	908	1081	2851	1556	432.5	11742	9351	269.0	327.8	1440.0
ac. ft.	1410	1580	1800	2140	5650	3090	858	23290	18550	534	650	2860

THE YEAR 62.410 Acre Feet

ARKANSAS RIVER AT LAS ANIMAS, COLORADO

APPENDIX "B-2"

* * *

PURGATOIRE RIVER NEAR LAS ANIMAS, COLORADO
 Report-Year Ending October 31, 1960
 U S G S Records—Provisional, subject to revision

DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
1	18	24	28	20	9.5	182	13	2.8	2.2	1.5	1.5	1.3
2	13	28	26	32	10	158	8.2	2.5	1.6	1.7	1.5	1.3
3	18	30	25	34	10	138	8.2	2.5	1.9	1.7	1.4	1.4
4	16	26	28	37	11	88	11	2.5	2.2	1.5	1.4	1.4
5	27	21	31	37	11	86	11	2.5	3.1	1.5	1.4	1.4
6	24	22	35	40	14	83	36	4.0	432	1.5	1.5	1.4
7	12	25	40	42	21	78	18	3.4	244	1.8	1.4	1.4
8	6.9	19	43	50	184	82	13	3.4	56	2.2	1.5	1.4
9	7.4	16	46	83	1980	115	11	6.4	25	2.6	2.0	1.4
10	11	21	49	95	2450	132	17	26	28	180	400	1.4
11	15	34	52	76	1000	94	13	32	14	10	150	1.4
12	15	27	66	65	530	76	12	16	101	130	50	1.3
13	19	21	64	68	319	1140	12	27	423	10	30	1.1
14	15	23	60	58	319	244	16	27	235	1.6	25	1.5
15	17	28	45	45	199	141	32	20	114	1.4	20	7.3
16	19	29	31	37	144	114	22	7.6	86	1.4	15	2.2
17	22	28	15	36	123	135	28	5.8	38	1.4	50	2.2
18	25	29	8.2	34	94	106	16	5.2	26	1.4	6.0	18
19	28	28	6.8	34	82	73	16	5.8	13	1.4	4.5	690
20	12	11	6.6	33	70	42	16	2.8	7.0	1.4	4.2	171
21	5.9	10	6.4	31	62	21	13	2.5	1.6	1.4	3.7	83
22	7.4	22	6.2	23	59	10	7.6	2.5	1.6	1.5	3.0	61
23	8.5	23	6.1	15	62	8.8	5.2	2.5	3.5	1.5	2.1	47
24	7.4	35	6.0	10	92	7.6	4.6	2.8	3.5	1.5	1.6	39
25	3.5	56	5.9	8.0	126	7.0	1.9	2.5	3.5	1.4	1.4	25
26	8.5	47	5.8	8.8	123	7.0	1.3	2.5	3.0	1.4	1.3	24
27	10	44	5.7	9.0	115	8.8	1.6	2.5	1.3	1.4	1.3	17
28	28	37	5.7	7.2	120	7.6	5.2	2.5	2.9	1.3	1.3	7.3
29	22	31	6.0	9.3	208	14	16	2.8	1.8	1.3	1.3	5.0
30	30	28	8.0		222	31	2.2	1.9	2.0	1.4	1.3	3.6
31		30	13		194		2.5		1.5	1.6		4.3
TOTAL												
sec. ft.	471.5	853	780.4	1077.3	8963.5	3429.8	390.5	230.2	1879.2	371.7	786.6	1226.0
ac. ft.	935	1690	1550	2140	17780	6800	775	457	3730	737	1560	2430
THE YEAR 40,580 Acre Feet												

PURGATOIRE RIVER NEAR LAS ANIMAS, COLORADO

APPENDIX "B-3"

* * *

INFLOW INTO JOHN MARTIN RESERVOIR

Report-Year Ending October 31, 1960

U S G S Records—Provisional, subject to revision

DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
1	86	53	47	58	84	240	31	160	494	11	9.5	7.7
2	57	52	43	70	96	218	26	348	439	12	8.7	7.1
3	39	52	41	72	105	192	24	368	473	13	8.9	7.2
4	38	44	44	75	111	140	25	314	539	10	9.4	7.2
5	57	38	60	74	119	140	26	352	665	10	9.4	6.1
6	46	39	73	80	167	139	51	517	1230	12	8.7	5.4
7	29	42	72	100	289	130	30	353	489	20	7.8	5.4
8	25	36	72	108	464	133	25	241	160	12	7.6	5.4
9	24	33	70	135	2170	155	23	269	87	12	24	5.8
10	26	39	74	149	2580	166	27	376	66	190	502	6.8
11	30	52	77	121	1120	121	23	372	45	18	160	7.5
12	29	45	88	100	648	106	22	630	157	138	61	8.5
13	33	39	84	103	412	1550	22	623	1970	18	36	8.3
14	30	41	79	93	403	398	24	349	575	9.1	31	8.7
15	46	46	63	80	275	188	41	457	203	8.9	26	18
16	37	48	49	72	212	146	31	307	147	8.9	21	13
17	37	47	32	69	187	170	38	287	444	8.6	56	13
18	43	48	32	68	156	140	27	429	584	8.2	12	41
19	47	52	31	67	146	110	28	376	619	8.2	11	823
20	33	48	33	64	132	79	27	373	535	8.2	10	367
21	28	50	36	61	120	56	23	342	380	8.9	10	172
22	32	47	34	51	119	34	18	234	252	8.7	9.8	110
23	32	41	38	42	122	27	17	522	174	7.9	10	98
24	31	51	44	36	148	26	17	474	114	7.9	11	121
25	28	89	53	33	178	25	12	372	106	8.9	10	122
26	34	91	56	37	168	21	11	372	74	11	9.9	121
27	35	93	55	42	158	22	11	358	74	11	9.3	114
28	55	84	54	45	163	21	14	540	72	11	8.8	106
29	51	83	52	53	253	32	26	675	26	9.9	8.5	102
30	63	66	51		269	58	17	582	19	10	8.1	119
31		59	52		246		88		14	12		108
TOTAL												
sec. ft.	1181	1648	1689	2158	11820	4983	825	11972	11226	643.3	1115.4	2665.1
ac. ft.	2340	3270	3350	4280	23440	9880	1640	23750	22270	1280	2210	5290
THE YEAR 103,000 Acre Feet												

INFLOW INTO JOHN MARTIN RESERVOIR

APPENDIX "B-4"
* * *

CONTENTS OF JOHN MARTIN RESERVOIR

Report-Year Ending October 31, 1960

Corps of Engineers records—Provisional, subject to revision

Midnight contents in Acre Feet from capacity table dated June 1, 1958

DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
1	1304	5624	9986	13870	22762	47761	48727	0	0	0	0	0
2	1530	5788	9986	14120	22991	48180	47600	0	0	0	0	0
3	1756	5976	10061	14360	23242	48502	46159	0	0	0	0	0
4	1964	6141	10137	14544	23493	48856	44783	0	0	0	0	0
5	1999	6258	10257	14822	23699	49114	43344	0	0	0	0	0
6	2173	6328	10332	15098	23974	49372	41678	0	3788	0	0	0
7	2615	6497	10408	15374	24316	49630	39875	0	4688	0	0	0
8	2697	6613	10558	15836	25082	49827	37970	0	4275	0	0	0
9	2779	6729	10715	16383	26520	50027	35970	0	3365	0	0	0
10	2976	6806	10877	16931	31831	50360	34283	0	2277	0	0	0
11	3074	6960	10991	17400	35121	50692	32376	0	263	0	0	0
12	3156	7114	11396	17832	37299	50992	30393	0	0	0	0	0
13	3205	7269	11737	18307	38702	52356	28339	0	0	0	0	0
14	3255	7372	11932	18824	39874	54400	26352	0	3666	0	0	0
15	3327	7474	12029	19092	40768	54951	24556	0	2437	0	0	0
16	3440	7602	12175	19443	41526	55365	22716	0	1017	0	0	0
17	3534	7731	12256	19856	42132	55778	20944	0	0	0	0	0
18	3741	7926	12343	20291	42647	56122	19236	0	0	0	0	0
19	4070	8066	12430	20770	43041	56467	17791	0	0	0	0	0
20	4285	8206	12516	20857	43344	56681	16149	0	0	0	0	0
21	4487	8345	12603	21031	43845	56717	14544	0	0	0	0	0
22	4603	8484	12724	21248	44064	56824	12811	0	0	0	0	0
23	4720	8568	12811	21378	44407	56860	11202	0	0	0	0	0
24	4847	8736	12898	21596	44720	56122	9398	0	0	0	0	0
25	4953	8916	12985	21749	45002	54917	7551	0	0	0	0	0
26	5059	9126	13089	21879	45378	53642	5683	0	0	0	0	0
27	5059	9277	13210	22031	45690	52356	3797	0	0	0	0	0
28	5112	9428	13297	22260	46003	50958	1122	0	0	0	0	0
29	5165	9488	13401	22488	46316	50360	0	0	0	0	0	0
30	5388	9578	13540		46826	49694	0	0	0	0	0	0
31		9835	13679		47503		0		0	0		0

CONTENTS OF JOHN MARTIN RESERVOIR

APPENDIX "B-5"
* * *

OUTFLOW FROM JOHN MARTIN RESERVOIR

Report-Year Ending October 31, 1960

U S G S Records—Provisional, subject to revision

DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
1	5.2	3.3	2.6	3.0	3.8	16	562	90	475	24	9.0	17
2	4.3	3.6	2.8	3.0	3.6	5.2	592	185	435	20	8.5	17
3	4.0	3.6	3.0	3.0	3.3	4.3	742	322	425	18	8.1	16
4	4.0	3.6	3.0	3.0	3.6	4.3	787	327	475	20	8.1	14
5	4.0	3.0	2.8	2.8	3.3	4.3	845	296	779	17	8.5	14
6	4.0	3.0	2.6	2.8	3.0	4.0	905	470	1230	16	9.0	14
7	3.6	2.6	2.6	2.6	3.0	4.3	974	460	520	16	9.0	14
8	3.3	2.6	2.6	3.0	3.6	4.3	998	363	586	16	8.5	14
9	3.3	2.6	2.6	3.0	3.3	4.0	990	284	574	18	8.5	9.9
10	3.3	2.6	2.6	3.3	3.3	4.0	982	350	550	143	34	8.1
11	3.3	2.6	2.6	3.3	3.3	4.0	990	340	568	67	264	7.1
12	3.0	2.8	2.6	3.3	3.3	4.3	998	420	310	43	128	7.6
13	3.0	2.8	3.0	3.3	3.6	4.3	1040	514	292	65	85	9.9
14	3.0	2.8	3.6	4.0	3.3	4.3	1050	496	490	34	45	12
15	3.0	3.0	3.0	3.6	3.3	4.0	1050	363	735	20	30	20
16	3.3	3.0	3.0	3.6	3.3	4.0	1050	400	966	16	22	40
17	3.3	3.0	3.0	3.3	3.3	4.0	1050	280	415	13	19	38
18	3.3	3.0	3.0	3.3	3.3	4.0	966	314	508	12	36	81
19	3.3	3.0	2.8	3.3	3.3	4.0	912	381	544	12	56	199
20	3.3	3.0	2.8	3.8	3.3	4.0	912	340	508	12	33	616
21	3.6	3.0	2.8	3.6	3.3	4.0	898	336	415	9.9	22	480
22	3.6	3.0	2.8	3.8	3.6	4.0	905	300	332	8.5	16	244
23	3.3	3.0	2.8	3.6	3.6	4.0	898	260	240	7.6	16	152
24	3.6	3.0	2.8	3.6	3.6	240	942	440	172	7.1	19	130
25	3.8	2.8	2.8	3.6	3.6	646	942	400	125	8.1	22	141
26	3.8	2.6	2.8	3.8	3.6	628	935	354	115	9.0	19	144
27	3.3	2.8	2.8	3.8	3.6	628	920	358	87	8.5	18	133
28	3.6	2.6	2.8	3.6	3.6	735	912	345	94	8.1	19	125
29	3.6	2.8	2.8	3.6	3.8	702	349	455	61	11	18	110
30	3.3	2.8	2.8		4.0	400	38	490	38	12	17	112
31		2.8	2.8		4.0		34		30	9.9		100

TOTAL

sec. ft.	106.3	90.7	87.4	97.3	107.4	4086.6	26168	10733	13094	701.7	1015.2	3039.6
ac. ft.	211	180	173	193	213	8110	51900	21290	25970	1390	2010	6030

THE YEAR 117,700 Acre Feet

OUTFLOW FROM JOHN MARTIN RESERVOIR

APPENDIX "B-6"

* * *

ARKANSAS RIVER AT LAMAR, COLORADO
Report Year Ending October 31, 1960
U S G S Records—Provisional, subject to revision

DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
1	46	27	16	25	25	38	217	12	5.0	3.9	3.9	3.9
2	22	32	8.0	25	24	44	192	18	5.0	3.9	3.6	3.6
3	20	33	8.0	26	24	40	197	11	5.0	3.6	3.6	3.6
4	19	37	8.5	26	24	38	302	8.5	10	3.6	3.4	3.6
5	25	28	8.5	27	26	38	270	8.5	6.5	3.1	3.4	3.6
6	27	25	9.0	28	28	36	321	11	996	2.8	3.4	3.9
7	28	26	10	30	32	36	302	25	80	3.1	3.4	3.9
8	28	20	13	31	41	36	360	14	66	3.1	3.6	3.9
9	27	11	13	30	46	36	370	7.5	53	166	4.5	4.2
10	28	13	12	27	219	36	430	7.5	32	71	3.9	4.2
11	28	7.5	12	23	328	32	440	8.5	24	5.5	3.6	4.2
12	31	7.0	11	23	204	33	451	14	38	4.7	4.2	4.2
13	26	7.0	11	23	137	41	456	82	11	4.7	4.2	4.2
14	25	9.0	10	14	98	38	493	117	11	4.5	4.2	3.9
15	32	7.5	10	16	82	34	490	37	14	4.2	4.5	3.6
16	23	9.0	9.0	16	71	34	467	14	334	4.5	4.5	3.6
17	24	11	8.0	15	60	33	467	7.5	242	4.5	4.5	3.4
18	28	9.5	7.0	15	55	36	427	7.5	19	4.5	4.5	4.2
19	26	11	6.0	14	55	34	357	7.5	14	4.7	4.7	4.5
20	27	14	6.5	14	53	33	357	6.5	11	4.2	5.0	66
21	28	16	8.0	15	52	22	357	6.0	9.0	4.2	5.0	127
22	26	16	7.5	15	53	11	339	6.5	6.5	3.9	5.5	16
23	25	13	9.0	14	55	9.0	341	6.5	6.0	3.6	6.0	10
24	25	11	13	13	53	8.5	328	8.0	6.0	3.6	5.0	8.5
25	25	11	17	13	50	293	365	8.0	6.0	3.6	5.0	7.0
26	26	15	20	17	46	396	344	8.0	6.0	3.6	5.5	5.5
27	22	15	21	19	44	409	349	7.0	6.5	3.6	5.5	5.5
28	25	16	23	17	42	362	378	7.0	6.5	4.2	4.7	5.0
29	30	14	24	21	40	328	411	5.0	4.7	4.5	4.5	4.7
30	26	14	25		41	230	22	5.0	4.5	4.5	4.2	4.5
31		16	25		38		14		4.2	4.7		4.5
TOTAL												
sec. ft.	798	501.5	389.0	592	2146	2794.5	10614	491.5	2042.4	354.1	131.5	338.4
ac. ft.	1580	995	772	1170	4260	5540	21050	975	4050	702	261	671
THE YEAR 42,030 Acre Feet												

ARKANSAS RIVER AT LAMAR, COLORADO

* * * * *

ARKANSAS RIVER AT THE COLORADO-KANSAS STATELINE

Report-Year Ending October 31, 1960

U S G S Records—Provisional, subject to revision

DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
1	265	175	140	205	148	215	379	212	48	40	19	26
2	260	161	130	195	160	195	304	163	52	38	18	27
3	245	151	127	215	130	195	270	162	56	37	19	27
4	215	166	123	225	140	200	245	163	170	33	18	27
5	190	156	115	215	165	195	310	154	118	31	18	24
6	166	156	120	215	180	180	353	175	122	29	17	22
7	185	170	135	200	213	180	424	188	511	41	19	22
8	190	161	170	200	300	185	444	242	249	38	27	25
9	185	146	180	220	500	185	470	418	200	49	36	25
10	180	161	180	215	750	170	470	557	175	48	29	23
11	166	170	170	215	829	170	470	340	151	70	24	23
12	170	170	175	200	622	180	457	366	220	37	24	27
13	170	151	161	200	491	190	478	386	276	25	22	27
14	130	137	170	185	405	190	499	380	188	21	28	30
15	150	161	161	175	366	190	517	477	127	23	28	30
16	155	156	160	156	316	166	532	424	134	29	23	30
17	135	166	100	151	316	166	506	334	259	30	22	36
18	142	156	46	156	322	166	520	298	280	27	23	46
19	151	156	42	161	310	146	488	161	124	29	24	54
20	156	156	40	170	280	156	466	118	97	26	24	54
21	156	156	48	160	260	156	452	114	108	25	23	68
22	166	166	50	150	265	142	439	104	82	24	23	133
23	166	170	100	140	270	146	427	86	70	23	28	109
24	175	185	150	132	270	142	420	79	57	25	26	72
25	175	180	164	127	328	123	420	72	55	22	25	65
26	175	180	160	135	386	220	449	67	52	21	24	58
27	175	170	156	150	366	386	407	66	56	19	25	58
28	180	160	153	140	340	424	415	59	54	19	25	47
29	166	140	152	145	304	386	525	55	52	21	27	47
30	180	125	190		265	431	570	49	48	20	25	54
31		130	205		255		293		43	20		62
TOTAL												
sec. ft.	5320	4944	4173	5153	10252	6176	13419	6469	4234	940	713	1378
ac. ft.	10550	9810	8280	10220	20330	12250	26620	12830	8400	1860	1410	2730

THE YEAR 125,300 Acre Feet

The daily discharges shown are the sum of the flows of the Arkansas River near Coolidge, Kansas, and the Frontier Ditch.

ARKANSAS RIVER AT THE COLORADO-KANSAS
STATELINE

APPENDIX "B-8"
* * *

ARKANSAS RIVER AT GARDEN CITY, KANSAS

Report Year Ending October 31, 1960

U S G S Records—Provisional, subject to revision

DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
1	247	223	202	307	157	328	32	14	44	6.8	1.6	12
2	253	223	205	337	154	313	25	12	34	3.8	0	9.8
3	268	235	160	349	142	301	24	13	27	4.4	2.3	12
4	274	235	139	352	154	289	27	20	22	5.0	2.9	12
5	250	229	115	316	166	283	27	18	21	7.4	4.4	11
6	238	226	107	301	193	277	30	42	18	7.7	2.6	11
7	229	220	112	190	239	217	27	66	18	6.5	5.0	12
8	229	217	127	118	287	142	23	96	17	6.5	6.2	12
9	232	217	166	104	368	118	24	190	21	6.2	4.7	10
10	241	214	199	118	488	110	22	220	15	5.3	4.1	13
11	247	214	232	226	653	96	20	292	14	4.4	3.2	13
12	250	211	178	235	625	91	17	367	13	4.7	2.0	13
13	250	217	93	181	630	121	17	343	10	6.2	4.4	13
14	223	217	81	93	562	211	22	331	9.8	5.3	6.8	13
15	169	226	145	110	524	229	21	337	6.8	3.2	6.8	13
16	178	223	211	199	482	232	22	343	12	4.7	7.1	11
17	136	232	55	247	446	232	24	376	9.8	4.7	5.3	12
18	139	226	28	256	443	235	28	349	13	4.4	6.8	13
19	187	226	34	253	454	226	28	316	13	5.0	7.7	12
20	241	220	44	250	429	124	27	304	13	5.0	11	10
21	250	223	66	172	432	55	23	262	13	3.8	12	8.6
22	247	217	88	145	412	46	18	199	13	2.1	13	10
23	235	214	99	93	406	39	21	127	13	3.8	12	9.8
24	223	214	104	81	391	35	18	91	9.8	2.6	10	12
25	220	217	115	99	382	32	12	62	12	2.7	10	12
26	208	220	127	107	379	34	27	76	11	0	10	13
27	217	223	142	112	397	32	22	74	10	1.0	12	13
28	214	232	169	118	436	32	23	71	9.8	3.8	10	13
29	196	217	190	139	415	46	17	66	8.0	2.3	10	13
30	223	208	220		391	51	12	51	8.0	1.4	11	11
31		214	292		358		14		6.8	2.0		13
TOTAL												
sec. ft.	6714	6850	4245	5608	11995	4577	694	5128	465.8	132.7	204.9	366.2
ac. ft.	13320	13590	8420	11120	23790	9080	1380	10170	924	263	406	726

THE YEAR 93,190 Acre Feet

ARKANSAS RIVER AT GARDEN CITY, KANSAS

APPENDIX "B-g"

* * *

DEMANDS BY COLORADO FOR WATER
Report Year Ending October 31, 1960
(Arkansas River Compact Administration Records)

DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
1							400\					
2							400					
3							400					
4							400					
5							400					
6							500		60	8:30 P.M.		
7							600		530	8:30 A.M.		
8							600		600			
9							600		600			
10							500		600			
11							500		600			
12							500		210	8:30 A.M.		
13							550		100	8:00 P.M.		
14							550		600			
15							550		600\			
16							550		600			
17							550		600			
18							550		210\	8:30 A.M.		
19							550			Empty		
20							550					
21							550					
22							550					
23							550					
24							550					
25							550					
26							550					
27							550					
28					8:30 A.M.	260\	550					
29						400	140\	6:00 A.M.				
30						400		Empty				
31												
TOTAL												
sec. ft.						1060	14740		5910			
ac. ft.						2100	29240		11720			

THE YEAR 43,060 Acre Feet

DEMANDS BY COLORADO FOR WATER

APPENDIX "B-10"
* * * *

DEMANDS BY KANSAS FOR WATER
Report-Year Ending October 31, 1960
(Arkansas River Compact Administration Records)

DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
1							400					
2							400					
3							400					
4							400					
5							400					
6							400					
7							460	9:00 A.M.				
8							500					
9							500					
10							500					
11							500					
12							500					
13							500					
14							500					
15							500		120	2:30 P.M.		
16							500		300			
17							500		300			
18							500		110	8:30 A.M.		
19							500			Empty		
20							500					
21							500					
22							500					
23							500					
24							500					
25						1:30 P.M.	175					
26							400					
27							400					
28							400					
29							400					
30							400					
31							400					
TOTAL												
sec. ft.							2575	13480	830			
ac. ft.							5110	26740	1650			
								12,360				
								24,520				
									THE YEAR	33,500	Acre Feet	
										31,300		

DEMANDS BY KANSAS FOR WATER

* * * * *

APPENDIX "B-11"

STATELINE FLOW ON DAYS OF KANSAS DEMAND*

Report Year Ending October 31, 1960

U S G S Records—Provisional, subject to revision

DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
1							379	212				
2							304					
3							270					
4							245					
5							310					
6							353					
7							424					
8							444					
9							470					
10							470					
11							470					
12							457					
13							478					
14							499					
15							517					
16							532					
17							506					
18							520		280			
19							488		124			
20							466		97			
21							452		108			
22							439					
23							427					
24							420					
25							420					
26							449					
27						386	407					
28						424	415					
29						386	525					
30						431	570					
31							293					
TOTAL												
sec. ft.						1627	13419	212	609			
ac. ft.						3230	26620	420	1210			

THE YEAR 31,480 Acre Feet

*Three days' time is allowed for water released from John Martin Reservoir to reach State line.

STATELINE FLOW ON DAYS OF KANSAS DEMAND

APPENDIX "B-12"

* * *

APPENDIX "B-13"

* * * *

DIVERSIONS BY DITCHES IN COLORADO WATER DISTRICTS 14 AND 17

Report-Year Ending October 31, 1960

Source of Information, A.V.D.A. Reports and Report from the Fort Lyon Canal Co.

Reservoir Water is that from Upstream Reservoirs above Pueblo

(Acre Feet)

	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	THE YEAR
Bessemer (River)	4,900	1,164	0	0	1,097	4,959	4,770	12,226	7,908	4,366	4,038	4,366	49,794
Res. or Imported	0	0	0	0	0	0	0	0	140	2,290	149	0	2,579
Total	4,900	1,164	0	0	1,097	4,959	4,770	12,226	8,048	6,656	4,187	4,366	52,373
West Pueblo (River)	0	0	0	0	0	111	184	387	184	184	179	177	1,406
Booth Orchard Gr. (Riv.)	335	0	0	0	341	1,071	1,107	1,337	1,107	1,107	1,049	1,107	8,561
Excelsior (River)	1,170	0	0	0	99	726	38	1,478	561	0	0	0	4,072
Collier (River)	0	0	0	0	0	0	0	438	0	0	0	0	438
Colorado Canal (River) ..	2,420	0	13,299	19,226	17,804	853	0	9,729	3,380	0	0	0	66,711
Res. or Imported	0	0	0	0	0	993	3,770	0	9,465	20,480	4,933	0	39,641
Total	2,420	0	13,299	19,226	17,804	1,846	3,770	9,729	12,845	20,480	4,933	0	106,352
Highline (River)	5,580	5,449	2,580	978	1,940	6,730	4,585	16,346	8,093	3,505	3,455	4,266	63,507
Res. or Imported	0	0	0	0	0	0	0	0	575	3,060	0	0	3,635
Total	5,580	5,449	2,580	978	1,940	6,730	4,585	16,346	8,668	6,565	3,455	4,266	67,142
Oxford Canal (River)	1,020	1,164	157	99	303	2,152	3,725	5,724	2,781	783	1,069	1,260	20,237
Otero Canal (River)	0	105	93	0	1,855	1,012	0	2,216	565	0	0	0	5,846
Catlin Canal (River)	3,930	3,909	1,811	1,684	2,533	8,789	11,572	16,546	13,567	4,465	1,172	1,299	71,277
Res. or Imported	0	0	0	0	0	0	0	0	0	2,590	805	0	3,395
Total	3,930	3,909	1,811	1,684	2,533	8,789	11,572	16,546	13,567	7,055	1,977	1,299	74,672
Holbrook (River)	6,870	1,220	5,572	5,359	8,684	4,268	0	5,808	2,866	0	793	0	41,440
Rocky Ford (River)	2,765	2,654	1,884	1,210	456	4,475	5,395	6,024	5,655	5,100	4,223	3,985	43,826
Ft. Lyon Storage (River) ..	0	0	0	0	4,690	460	0	0	3,200	0	0	0	8,350
Ft. Lyon Canal (River) ..	26,878	28,906	10,368	4,860	8,686	14,136	18,634	40,358	26,116	6,172	8,736	11,328	205,178
Las Animas Cons. (River) ..	1,805	1,805	567	0	0	2,081	3,152	5,566	4,177	1,160	762	879	21,954
Las Animas Town (River) ..	0	0	0	0	0	625	1,125	1,676	1,523	1,745	1,100	476	8,270
TOTAL													
River	57,673	46,376	36,331	33,416	49,692	52,448	54,287	125,859	80,479	28,587	26,576	29,143	620,867
Res. or Imported	0	0	0	0	0	993	3,770	0	10,180	28,420	5,887	0	49,250
	57,673	46,376	36,331	33,416	49,692	53,441	58,057	125,859	90,659	57,007	32,463	29,143	670,117

APPENDIX "B-14"

* * * *

DIVERSIONS BY DITCHES IN COLORADO WATER DISTRICT 67

Report Year Ending October 31, 1960

Source of Information A.V.D.A. Reports

(Acre Feet)

	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	THE YEAR
Ft. Bent Canal.....	28	0	0	0	0	258	3,104	1,656	2,985	528	426	1,047	10,032
Keesee Ditch	0	0	0	0	0	107	468	206	732	561	367	0	2,441
Amity Canal	0	0	0	0	0	1,357	21,038	14,858	14,508	601	363	3,102	55,827
Lamar Canal	756	492	436	0	0	776	6,107	5,048	5,430	1,256	829	1,404	22,534
Hyde Ditch	0	0	0	0	0	50	468	395	341	117	83	188	1,642
Manvel Canal	0	0	0	0	0	0	902	0	147	40	0	0	1,089
X. Y. & Graham Canals..	0	0	0	0	0	163	1,600	1,332	1,307	97	0	0	4,499
Buffalo Canal	0	0	0	0	0	1,035	2,186	1,918	2,124	1,535	968	1,515	11,281
Sisson Canal	0	0	0	0	0	0	107	357	246	0	0	0	710
TOTAL	784	492	436	0	0	3,746	35,980	25,770	27,820	4,735	3,036	7,256	110,055

APPENDIX "B-15"

* * * *

DIVERSIONS BY DITCHES IN KANSAS

Report-Year Ending October 31, 1960

(Acre-Feet)

Frontier Ditch, U.S.G.S. Records

Other Ditches, Kansas Division of Water Resources Records

	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	THE YEAR
Frontier Ditch	0	0	0	0	0	0	1,630	403	1,790	1,660	1,360	860	7,703*
Alamo Canal	0	0	0	0	0	0	492	57	335	305	65	249	1,503
Ft. Aubrey Canal.....	0	0	0	0	0	0	1,510	1,050	730	316	18	930	4,554†
Total Stateline to Syracuse	0	0	0	0	0	0	3,632	1,510	2,855	2,281	1,443	2,039	13,760
Amazon Canal	0	0	0	0	0	1,700	3,270	1,240	2,140	0	0	381	8,731
Great Eastern Canal.....	0	0	1,220	2,280	0	2,760	8,350	1,590	595	0	0	0	16,795
South Side Ditch.....	650	0	0	0	0	716	4,640	435	68	0	0	0	6,509
Farmers Ditch	0	0	0	0	0	2,580	4,510	1,020	2,970	448	434	18	11,980
Garden City Canal.....	0	0	0	0	0	0	687	365	872	310	20	486	2,740
Total Syracuse to Garden City.....	650	0	1,220	2,280	0	7,756	21,457	4,650	6,645	758	454	885	46,755
Total Stateline to Garden City.....	650	0	1,220	2,280	0	7,756	25,089	6,160	9,500	3,039	1,897	2,924	60,515

* 2,720 acre-feet returned directly to river.

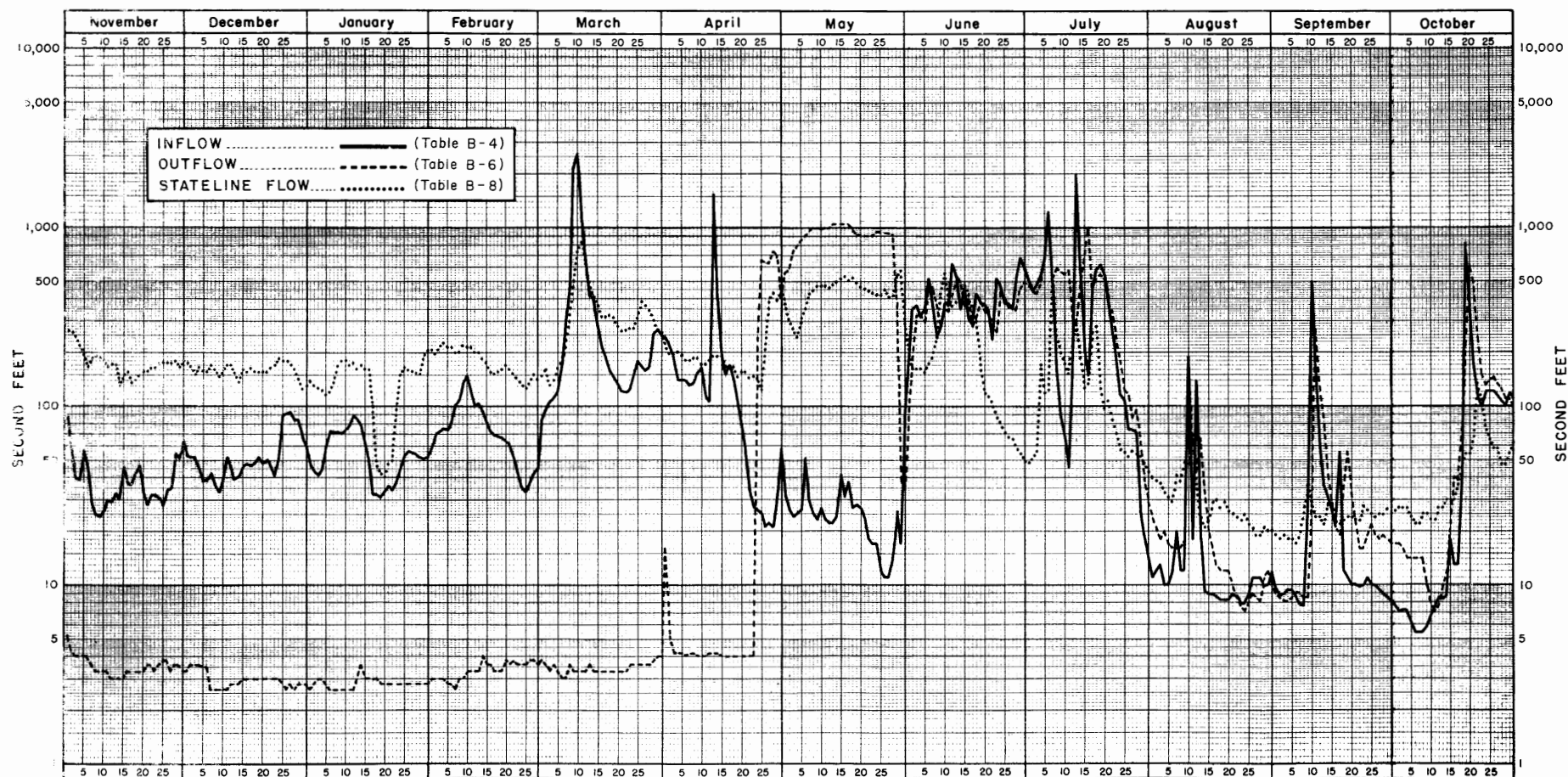
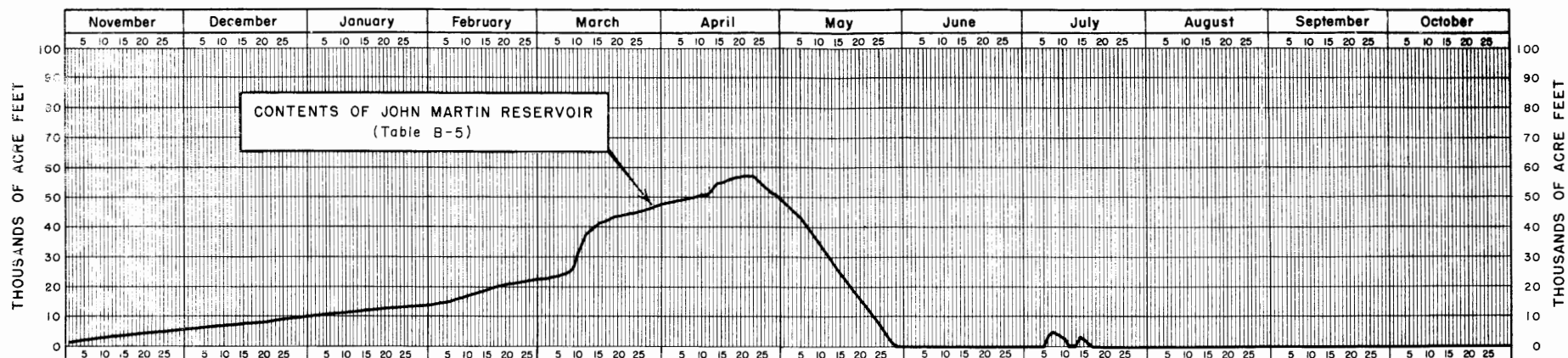
† 1,130 acre-feet returned directly to river.

APPENDIX "B-16" **SUMMARY TABULATION**

* * * *
(Acre-Feet)

	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	YEAR	FROM APP. NO.
Arkansas River at Las Animas, Colo.....	1410	1580	1800	2140	5650	3090	858	23290	18550	534	650	2860	62410	B- 2
Purgatoire River near Las Animas, Colo.....	935	1690	1550	2140	17780	6800	775	457	3730	737	1560	2430	40580	B- 3
Inflow to John Martin Reservoir	2340	3270	3350	4280	23440	9880	1640	23750	22270	1280	2210	5290	103000	B- 4*
Reservoir contents at end of month.....	5388	9835	13679	22488	47503	49694	0	0	0	0	0	0	0	B- 5
Net change in reservoir storage	+4460	+4450	+3840	+8810	+25010	+2190	-49690	0	0	0	0	0	0	B- 5
Outflow from John Martin Reservoir	211	180	173	193	213	8110	51900	21290	25970	1390	2010	6030	117700	B- 6
Diversion in District 67, Colo.	784	492	436	0	0	3746	35980	25770	27820	4735	3036	7256	110055	B-14
Flow at Colorado-Kansas Stateline	10550	9810	8280	10220	20330	12250	26620	12830	8400	1860	1410	2730	125300	B- 8
Diversions in Kansas.....	650	0	1220	2280	0	7756	25089	6160	9500	3039	1897	2924	60515	B-15
Arkansas River at Garden City, Kansas.....	13320	13590	8420	11120	23790	9080	1380	10170	924	263	406	726	93190	B- 9

*Because of computation rules, figures in B-4 are not necessarily the exact sum of B-2 and B-3.



INFLOW, OUTFLOW AND CONTENTS OF JOHN MARTIN RESERVOIR AND STATELINE FLOW

Report Year, November 1, 1959 - October 31, 1960