Sixth

Annual Report

ARKANSAS RIVER COMPACT ADMINISTRATION

(1954)

For the Report-Year November 1, 1953, to October 31, 1954

LAMAR, COLORADO

December 14, 1954

THE ADMINISTRATION

HANS KRAMER, Representative of the United States and Chairman HARRY C. NEVIUS, Secretary and Treasurer

Ivan C. Crawford, Harry B. Mendenhall and Harry C. Nevius for Colorado

WILLIAM E. LEAVITT, R. V. SMRHA and ROLAND H. TATE for Kansas

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Annual Report of

ARKANSAS RIVER COMPACT ADMINISTRATION

(1954)

Report-Year November 1, 1953, to October 31, 1954

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, 1953, through October 31, 1954, as follows:

1. Members of the Administration

Representative of the United States:

Hans Kramer (Brig. General U.S.A.—Ret.)

Colorado Representatives:

Ivan C. Crawford, Denver, Colorado

Harry B. Mendenhall, Rocky Ford, Colorado

Harry C. Nevius, Lamar, Colorado

Kansas Representatives:

William E. Leavitt, Garden City, Kansas

R. V. Smrha, Topeka, Kansas

Roland H. Tate, Garden City, Kansas

2. Officers of the Administration

Chairman—Hans Kramer (Brig. General U.S.A.—Ret.)
Vice-Chairman—Roland H. Tate of Garden City, Kansas

Secretary—Harry C. Nevius of Lamar, Colorado Treasurer—Harry C. Nevius of Lamar, Colorado

3. Standing Committees

Administrative and Legal Committees:

Roland H. Tate of Kansas (Chairman) and

Harry C. Nevius of Colorado

Engineering Committee:

R. V. Smrha of Kansas (Chairman) and

Ivan C. Crawford of Colorado

Operations Committee:

Harry B. Mendenhall of Colorado (Chairman) and

William E. Leavitt of Kansas

Hans Kramer, Representative of the United States is ex-officio member of all standing committees.

4. Meetings

(a) Decmeber 22, 1953 Lamar, Colorado Annual Meeting March 23, 1954 Lamar, Colorado Regular Meeting April 10, 1954 Telephonic Meeting July 23, 1954 Telephonic Meeting July 27, 1954 Lamar, Colorado Regular Meeting August 5, 1954 Telephonic Meeting August 12, 1954 Telephonic Meeting October 26, 1954 Denver, Colorado Special Meeting

(b) The Administration at its Annual Meeting, December 22, 1953, acted to amend the By-Laws to authorize Telephonic Meetings as follows:

BE IT RESOLVED that Article IV, Meetings, Section 3, of the By-laws of the Arkansas River Compact Administration be amended to read as follows:

- 3. (a) Special Meetings etc.—
 - (b) Special telephonic meetings of the Administration may be held by telephonic communications between the several members of the Administration in respect to all matters arising under Article VF of the Compact: Provided, that such special telephonic meetings may be called by the Chairman, Vice-Chairman or any member of the Operations Committee, and in any case, at least two representatives of each State shall participate personally in such special telephonic meetings and concur in the action taken as a result of any such meeting. And provided further, that the Secretary of the Administration shall prepare minutes of any special telephonic meetings and such minutes shall be acted upon by the Administration at the next regular meeting or special meeting held under sub-section (a) hereof.
- (c) The Administration met as a Committee of the Whole on January 26, 1954, to discuss, study and report any recommended revisions of the Rules and Regulations. No revisions were recommended.

5. Fiscal

- (a) Balance on hand October 31, 1953, Auditor's Report..\$3,600.07
- (b) Receipts

00.00

\$3,600.07

(c) Disbursements by the Administration—Nov. 1, 1953 to Oct. 31, 1954:

	31, 1934	i '	
Voucher	Date	Payee and Purpose	Amount
No.	Date	Tayee and Luipose	
114	12-23-53	Treasurer of U. S., Deposit F.I.C.A	197.00
115	12-31-53	Robert W. Rollins, Audit & Service	65.00
116		Mtn. States. T. & T. Co., Nov. & Dec. Serv. & Tol	
117 118		Transport of H. S. Deposit F.I.C.A.	12.00
118	3-10-54	Secretary Salary, Jan. & Feb. (less \$4.00 F.I.C.A. Mtn. States T. & T. Co., Jan. & Feb. Serv. & Tol) 196.00
120	3,10,14	Mtn. States T. & T. Co., Jan. & Feb. Serv. & Tol	ls 22.50
121	4-10-54	Peerless Printing Co., Annual Report	476.00
122		Mtn. States T. & T. Co., March Service & Tolls	9.40
123		Secretary Salary, March (less \$2.00 F.I.C.A.)	98.00
124		Treasurer of U.S., Deposit F.I.C.A	12.00
125	6-26-54	Lamar Daily News, Supplies	7.50
126		Mtn States T. & T. Co., April & May Serv, & 101	IS \$2.00
127		Secretary Salary, April & May (less \$4.00 F.I.C.A.	.) 196.00
128	6-30-54	Secretary Salary, June (less \$2.00 F.I.C.A.)	98.00 12.00
129		Treasurer of U. S., Deposit F.I.C.A.	12.00
130		Treasurer of U. S., Deposit F.I.C.A	7.70
131	10-11-54	J. L. Wade, Agent Nat. Surety Corp.,	25.00
		Treasurers' Bond	27.00
132		Secretary Salary, July, Aug. & Sept. (less \$6.00 F.I.C.A.)	294.00
122		Treasurer of U. S., Deposit F.I.C.A.	12.00
133 134		Mtn. States T. & T. Co., July, Aug. & Sept.	
134		Service & Tolls	90.30
135		Secretary Mileage expense	55.30
136	10-31-54	Secretary Salary, Oct. (less \$2.00 F.I.C.A.)	98.00
137	10 01 71	Treasurer of U.S., Deposit F.I.C.A	4.00
138		Secretary Cash Advanced, Stamps	7.00
139		Mtn. States T. & T. Co., October Serv. & Tolls	. 11.60
		Total Disbursements	
(d)	Balance of	n hand, October 31, 1954	\$1,514.62
(e)	for the	ober 26, 1954, the Administration approved fiscal year July 1, 1955, to June 30, 1956, of the Governor of each of the States of Colon accordance with Article VIII E (2) of the vs:	for trans- lorado and
	D 1	Service	\$1.825.00
	Personai	retary Salary \$1,200.00	
	Soci	al Security 50.00	i
	Gag	e Reports 500.00	
	And	lit of Accounts 75.00	
	Capital (Outlay	300.00
	Maintena	ance and Operation	1,675.00
	Bon	d25.00	
	Prin	ting 600.00	
	Offic	cial Publication 100.00	
	Tra	vel 150.00	
	Typ	oing and Mailing 200.00	
	Inve	estigation and Inspection	
	Tele	ephone and Telegraph 300.00	
	Oth	ce Supplies	•

Total Budget proposed for 1955-56. Estimated Carry-over as of June 30, 1955	3,800.00 1,400.00
Total to be appropriated by Colorado and Kansas To be appropriated by Colorado (60%) To be appropriated by Kansas (40%)	\$2,400.00 1,440.00 960.00
	\$2,400.00

(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, 1953 through October 31, 1954, 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 and with the Federal agencies in a systematic determination and correlation of the facts as to the flow and diversion of the waters of the Arkansas River and as 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 Reclamation, and the Chief of Engineers, United States Army, to collaborate with the Administration and with appropriate State officials in such determination and correlation of stream flow and related data. The carrying out of these cooperative studies and activities is assigned, under the By-Laws of the Administration, to the Engineering Committee.
- (b) During the period covered by this report, the Administration has had the benefit of excellent cooperation from all agencies and officials referred to in the above provisions of the Compact. The United States Geological Survey has proceeded with the establishment and operation of Compact gaging stations, an activity which is covered in detail in Paragraph 8 of this report. The United States Geological Survey has also continued the compilation of hydrologic data which are presented in this report and which have been utilized in the administration of the Compact. The Corps of Engineers has continued to operate John Martin Reservoir in accordance with the provisions of the Compact.

7. Water Supply, Reservoir Operation and Hydrologic Data

Repeating the previous year's experience, John Martin Reservoir was empty at the beginning of the Compact year on November 1, 1953. The storage of winter flows started on November 23, 1953 and continued to the opening of the irrigation season on April 1, 1954, at

which time the reservoir contained 15,853 acre-feet of water. This is about 25% less than was accumulated during the same period in the preceding year and constitutes a new low in winter water supply by that margin. The accumulation of water in storage was continued through April 6, 1954, reaching a total volume of 16,066 acre-feet before releases were commenced.

Inflow to John Martin Reservoir during the irrigation season April 1, 1954 to October 31, 1954, as measured by discharge of the Arkansas and Purgatoire Rivers near Las Animas was 113,075 acre-feet. This is comparable to the summer water supplies that have been available each year since 1949. This year, the largest part of it occurred in July and August.

Releases from the reservoir commenced on April 7, 1954, based upon the concurrent demands of both states and continued until the reservoir was empty on April 15, 1954. Water rights on the river in Colorado then were administered by the State Engineer of Colorado according to their decreed priorities until July 23, 1954 when water began to be accumulated in the reservoir. Upon due notice then being given to the State Engineer of Colorado, releases were begun at once in accordance with provisions of the Compact. Water accumulated in storage to the extent of 33,314 acre-feet on July 27, 1954 and then declined steadily to 19,649 acre-feet on August 6, 1954. At that time another freshet occurred bringing additional water which accumulated in the reservoir to a peak of 38,343 acre-feet on August 9, 1954. Continuing demands soon exhausted the supply, and the reservoir was empty again on September 8, 1954. It remained empty to the end of the Compact year on October 31, 1954. During this time, water rights on the river in Colorado were administered by the State Engineer of Colorado pursuant to due notice given him in accordance with provisions of the Compact.

Releases from the reservoir during the periods April 7 to 15 and July 23 to September 8 amounted to a total of 89,550 acre-feet. Stateline flows during the corresponding periods, allowing three days for water from the reservoir to reach the stateline, amounted to 59,970 acre-feet.

During the periods April 1 to 6, inclusive, April 16 to July 22, inclusive, and September 9 to October 31, inclusive, discharge of the Arkansas River reported as outflow from John Martin Reservoir was 23,590 acre-feet. Stateline flow for the corresponding period was 13,660 acre-feet.

The inflow, outflow and storage at the John Martin Reservoir and Stateline flow for the report-year are shown in graphs on Plate I.

Hydrologic data as listed below are presented in Appendix B:

- B-1. Daily discharges, Arkansas River near Pueblo, Colorado, monthly totals corrected for transmountain water.
- B-2. Daily discharges, Arkansas River at Las Animas, Colorado.
- B-3. Daily discharges, Purgatoire River near Las Animas, Colorado.

B-4. Inflow into John Martin Reservoir.

B-5. Daily contents, John Martin Reservoir.

B-6. Outflow from John Martin Reservoir.

- B-7. Daily discharges, Arkansas River at the Colorado-Kansas Stateline.
- B-8. Daily discharges, Arkansas River at Garden City, Kansas.

B-9. Demands by Colorado for water.

B-10. Demands by Kansas for water.

B-11. Stateline flows on days of Kansas demand.

B-12. Diversions by ditches in Colorado Water Districts 14 and 17.

B-13. Diversions by ditches in Colorado Water District 67.

B-14. Diversions by ditches in Kansas, Stateline to Garden City.

B-15. Summary tabulation.

8. Gaging Stations

Heavy rains in July in the vicinity of John Martin Reservoir caused severe damage to the Compact Gaging Station below the Reservoir and for several weeks, the safety of the structure was endangered. With the cooperation of the Corps of Engineers, repairs were completed before further damage occurred.

The July floods on the Purgatoire River also caused severe scouring of the channel at the Compact station on this stream. When the high water receded, the channel had moved from the right bank to the left bank of the stream and the gaging station was left surrounded by large deposits of sand and debris. As a temporary expedient to obtain streamflow records, a wire-weight gage was installed over the new channel and daily gage readings were obtained. Since occasional channel shifts can be expected in the future, plans have been made to construct a new station on the left bank, leaving the right bank station in place. The recording instrument will be moved from one structure to the other as channel shifts may require.

The need still exists for radio stage-reporting equipment at the stations measuring inflow into John Martin Reservoir.

9. Findings of Fact by the Administration

(a) On April 10, 1954, the Administration in accordance with Article IV, Section 3 (b) of the By-laws considered by telephonic meeting the question of finding the Reservoir empty of winter stored water April 16, 1954 and giving notice to the State Engineer of Colorado that priority administration would commence April 13, 1954. As a result of affirmative action taken, the State Engineer of Colorado was notified that on April 13, 1954, priority administration should commence, and decreed rights of water users on the river would be administered by Colorado under Article V-F of the Compact.

The Reservoir was emptied at 11:50 P.M., April 15, 1954.

(b) On July 23, 1954, the Administration gave Notice to the Acting State Engineer of Colorado that water was in John Martin Reservoir and in the Purgatoire River as recorded at Purgatoire Com-

pact Gaging Station, which would be available at 8:00 A.M., July 24, 1954 for release to water users in Kansas and in Colorado Water Dis-

trict No. 67 as provided in the Compact.

(c) On August 5, 1954, the Administration again made Findings and gave notice to the Acting State Engineer of Colorado that the Conservation Pool would be exhausted by August 18, 1954, and that on August 15, 1954, unless a change of conditions justified cancellation or modification of this notice he should administer the decreed rights of water users in Colorado under the terms of the Compact.

On August 12, 1954, the Administration modified the above Findings and extended the date of Priority Administration for twelve (12)

days from August 15, 1954 to August 27, 1954.

Again on August 25, 1954, it was found that water had accumulated in the Reservoir in quantity sufficient to justify another modification as to date of priority administration. The time was extended for twelve (12) days from August 27, 1954 to September 8, 1954.

The Reservoir was emptied at 6:30 A.M., September 8, 1954.
The above Findings and Notifications were in form similar to those published in the 5th Annual Arkansas River Compact Administration Report of 1953, Appendix C.

Respectfully submitted,

ARKANSAS RIVER COMPACT ADMINISTRATION

By:

HANS KRAMER, Representative of the United States and Chairman

IVAN C. CRAWFORD,
HARRY B. MENDENHALL,
HARRY C. NEVIUS,
Colorado Members of the Administration

WILLIAM E. LEAVITT, R. V. SMRHA, ROLAND H. TATE, Kansas Members of the Administration.

Lamar, Colorado December 14, 1954.

APPENDICES

for

Annual Report of the Arkansas River Compact Administration

For the Report-Year Nov. 1, 1953, to Oct. 31, 1954

APPENDIX "A" —Auditors 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 Colorado-Kansas Stateline.

APPENDIX "B-8" —Daily Discharges, Arkansas River at Garden City, Kansas.

APPENDIX "B-9" —Demands by Colorado for Water.

APPENDIX "B-10"-Demands by Kansas for Water.

APPENDIX "B-11"-Stateline Flows on Days of Kansas Demand.

APPENDIX "B-12"—Diversions by Ditches in Colorado Water Districts 14 and 17.

APPENDIX "B-13"—Diversions by Ditches in Colorado Water District 67.

APPENDIX "B-14"—Diversions by Ditches in Kansas, Stateline to Garden City.

APPENDIX "B-15"—Summary Tabulation.

PLATE 1—Graphs showing inflow, outflow and storage at John Martin Reservoir and Stateline Flow for Report-Year.

APPENDIX "A"

AUDITOR'S REPORT

ROBERT W. ROLLINS Certified Public Accountant La Junta, Colorado

December 10, 1954

To the Representatives Arkansas River Compact Administration Lamar, Colorado

Gentlemen:

In reply to your request, an examination has been made of the financial transactions of the Arkansas River Compact Administration for its fifth "Report year," November 1, 1953 to October 31, 1954. The results of this audit are expressed in the attached Statement of Cash Receipts and Disbursements—Schedule I, page No. 4. The following remarks are offered as additional information and also tend to describe the extent of the auditing work performed.

General Comments

Schedule I, page No. 4 reflects the beginning balance of cash in bank, expenditures by classification and the ending balance of cash in bank.

As noted on the a fore mentioned Schedule no funds were received from the States of Colorado and Kansas during the year under review. Calls for funds were authorized, however, in the minutes of the Administration's meeting of October 26, 1954. The amounts due from Colorado (60% share) of \$1,440.00 and Kansas (40% share) of \$960.00 will then be shown in the subsequent year.

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 of each payment to the payee's statement, authorization by the Administration as evidenced in minutes of the representatives' meetings or other supporting evidence. All minutes of the Administration's meetings for the year under review were examined for information relating to accounting matters.

The Secretary's salary for the current year of \$1,200.00 has been

reduced by Old-Age and Survivors Insurance deductions amounting to \$23.00. A similar amount contributed by the Administration is shown under the classification of taxes.

Travel expense of the Secretary for the fiscal year ended October 31, 1954 amounted to \$55.30 or 790 miles of business travel at \$.07 per mile.

Payments made to the U. S. Treasury totaling \$58.00 are shown in detail on Schedule I.

Cash in bank at October 31, 1954 per Schedule I amounting to \$1,514.62 was reconciled to the amount confirmed by the First National Bank in Lamar. A review of the Administration's bank statement at November 22, 1954 shows that all outstanding checks listed on Schedule I, with the exception of check No. 137 for \$4.00 to the Treasurer of the U. S. had cleared the bank at that date.

The financial position of the Administration at October 31, 1954 is compared with that of a year ago, in the following summary:

ARKANSAS RIVER COMPACT ADMINISTRATION Lamar, Colorado

Comparative Balance Sheet

	ober 31, 954	October 31, 1953	Increase (Decrease)
Assets:			(Decrease)
Cash in bank \$1,5	14.62	\$3,600.07	\$(2,085.45)
Equipment (Portable typewriter)	92.50	92.50	
Total Assets\$1,6	507.12	\$3,692.57	\$(2,085.45)
Liabilities:			
Employee's deductions (Held in trust)\$		\$ 6.00	\$ (6.00)
Capital:		•	
Unexpended fund balance\$1,5 Expended fund balance for equip't	92.50	\$3,594.07 92.50	\$(2,079.45)
Total Capital\$1,6	507.12	\$3,686.57	\$(2,079.45)
Total Liabilities and Capital \$1,6	507.12	\$3,692.57	\$(2,085.45)

As the "Budget year" covers the period July 1, 1953 to June 30, 1954, it has been necessary to combine the related months of the last two "Report years," in order to compare actual expenditures with related budgeted amounts. The following summary reflects such a comparison in detail.

ARKANSAS RIVER COMPACT ADMINISTRATION Lamar, Colorado

Comparison of Disbursements With Budget Budget Year July 1, 1953 to June 30, 1954

Classification	Disbursements	Budget
Personal Services		
Secretary's salary (\$1,300.00 -22.50) Taxes—O. A. and S. I. (Combined)		\$1,200.00
Gage reports		500.00
Professional services (Audit of accounts)	65.00	100.00
Capital Outlay		300.00
Maintenance and Operation		
Bond, Treasurer	25.00	50.00
Printing	476.00	600.00
Official publications	•••••	100.00
Travel expense—Secretary and employees	37.80	150.00
Typing and mailing	 7.50	200.00
Investigation and inspection		150.00
Telephone and telegraph	280.45	300.00
Office supplies	12.30	150.00
Totals	\$2,238.55	\$3,800.00

Consistent with prior year's practice, the Administration's Budget for the year July 1, 1954 to June 30, 1955 amounting to \$3,800.00, as approved in the Minutes of the October 27, 1953 Meeting, provides for the application of the unexpended funds at June 30, 1954 to the future year, thus reducing the assessments from the States accordingly.

Respectfully submitted,

ROBERT W. ROLLINS, Certified Public Accountant.

^{*} You will recall that the Secretary's June salary for 1953 was paid in July of 1953, consequently thirteen salary payments are shown in the year ending June 30, 1954.

ARKANSAS RIVER COMPACT ADMINISTRATION Lamar, Colorado

Statement of Receipts and Disbursements

November 1, 1953 to October 31, 1954 (Refer to comments in text of audit)

Cash in bank at November 1, 1953 (Per Au	ıdit)	\$3,600.07
Receipts		
Revenues from assessments*		
Colorado portion 60%	. \$	
Kansas portion 40%		,
Total Available Funds		\$3,600.07
Disbursements		
Salary of secretary \$1,20	0.00	
Less: O. A. and S. I. deductions 2	3.00 1,177	.00
Printing—Annual report	476	. 00
Telephone and telegraph	214	,-
Travel expense	55	
Audit fee-Fiscal year ended	33	.50
October 31, 1953	65	.00
Taxes—O. A. and S. I. payments	00	.00
Deductions from employee	• *	
Current year\$23.00		
	9.00	
Administration's portion 2	9.00 58	.00
Premium on secretary treasurer's		
bond Typing and mailing		.00
Typing and mannig	14	.00
Total Disbursements		2,085.45
Cash in bank at October 31, 1954		\$1,514.62
Cash on deposit at First National Bank in L	mor	
Per direct confirmation at October 31, 19: Less: Outstanding checks of:		.22
37 444 77 50 47 4	8.00	,
	4.00	
	7.00 7.00	
	. 15.5	.60 \$1,514.62
1.0. 207 1.0. 0. 0. 1. 0 1. 00 1	1.00 120	.00 pi,J17.02

^{*}Funds amounting to \$2,400.00 for the Budget Year July 1, 1954 to June 30, 1955 were not authorized for call from the States of Colorado and Kansss until the meeting of October 26, 1954.

APPENDIX "B-1"

ARKANSAS RIVER NEAR PUEBLO, COLORADO

21	VON	DEC	TAN	FEB.	MAR.	APR.	MAR. APR. MAY	JUNE	JULY	AUG.	SEPT.	SCT.
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ب	289	317	299	000	0 1	77	271	441	207	37.4	160	172
9	348	291	287	219	7 (1	4. 5	61	404	407	210	191	182
1	349	266	293	202	171	6	110	404	Y.	200	187	182
∞	348	266	303	4 9	011	2 2	1.7	8	90	44.	140	141
6	327	293	303	201	, c	V ć	200	110	387	1.4	127	120
9	305	268	299	121	10	44	500	102	4 6	119	115	120
<u> </u>	305	280	4.7	0 1	- 6	3 3	300	314	5.5	199	103	128
12	348	298	727	147	12	. 0	740	er def	244	200	103	137
13	348	286	200) i	- 5	70	404	12.2	182	367	136	144
4	371	304	767	171	3 6	4.7	404	080	913	146	111	149
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× 0	976	te	17.	120	70	et	1510	1060	096	408	70	137
610	170	200	210	130	61	32	1230	1090	939	434	63	129
2.2	000	315	267	101	4.7	27	1120	734	1050	408	51	124
17	707	224	273	116	. \$c	30	1290	629	923	426	35	11
77	007	714	, k	11	5.4	69	1490	618	443	462	4	4
0 7 0	214	28.5	260	106	63	73	1600	641	111	3%6	4	66 <u>;</u>
† ¥	* 60 * 60 * 60 * 60 * 60 * 60 * 60 * 60	310	261	87	63	94	1650	989	123	318	111	119
, Y) Im) ef	324	262	91	51	144	1330	742	483	137	135	149
10	4	340	268	86	32	131	1050	729	453	61	172	123
200	20%	360	262	46	32	110	845	697	597	4 4	141	
000	286	336	274		58	94	819	687	337	42	151	10)
, c	084	7.6	280		60	94	869	3040	307	59	176	90
3.5	Š	367	287		34	٠.	607		. 631	96		}
TOTAL					•		0100	610	103.00	74.00	2260	4454
Sec. Ft.	9654	10180	8993	4374	2404	1830	00017	7/017	16200	14030	0777	- C
Ac. Ft.	19150	20190	17840	8680	4770	3630	45510	41900	06706	0000		
(a) ac. ft.	230	0	0	0	0	0	7460	7150	2000	0000	0,44	8830
(b) ac. ft.	18920	20190	17840	8680	4770	3630		34030	061/7	0006	2.5	
	Less upst	61	and transi	mountain	water.			THE YEAR	٠٠٠	225,830 Ac	ĭ.t	
9	Corrected Total,	_	acre feet.				•				;	

APPENDIX "B-2"

ARKANSAS RIVER AT LAS ANIMAS, COLORADO

		OCT.	8 9	2	2.5	o o	0 00	o or	0.0	, o	10	. 4	7	7.7	00	∞ ∞	0.8	8.0	1	4	7.1	£ 9	6.2	6.2	6.5	6.2	6.2	6.2	6.5	8.9	80	-	1.	!	225.9 448	
		SEPT.	17	17	. 00	2	10) <u>0</u>	20	200	16	19	19	18	18	17	16	15	14	13	11	6.5	6.2	5.6	5.6	5.6	5.6	7.4	10	4.8	8.9	90			402.5 798	
		AUG.	10	: ::::	8.0	7.6	000	260	3060	370	5	30	23	23	22	22	22	22	22	21	21	20	92	20	19	13	19	18	18	18	17	17	17		4265.4 8460	38,790
ORADO		JULY	838	320	117	4	71	oc er	2,7	20	15	21	13	16	21	27	36	37	51	27	47	38	35	56	46	81	11	465	145	36	25	16	53		2735 5420	
S, COLO	, 1954 t to Revision	JUNE	187	106	67	100	50.	1.5	13	12	13	15	30	26	56	59	5 4	126	50	23	17	15	31	56	22	12	11	10	38	78	108	62			1318 2610	THE
LAS ANIMAS, COLORADO	Report Year Ending October 31, G S Records—Provisional, Subject	MAY	20	22	15	12	12	12	12	18	15	15	15	14	12	12	56	47	8	290	155	208	300	276	573	1110	196	248	340	324	396	320	304		5418 10750	
AT LAS	Inding Oc Provísiona	APR.	12	12	12	13	4	12	, ,	13	12	13	15	18	8	15	15	<u>د</u> :	15	15	15	17	21	4:	en :	12	12	15	12	12	12	12			416 825	
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ARKANSAS RIVER	Rep USGS	FEB.	51	9	62	57	63	57	50	50	31	27	56	25	70	25	77	22	20	19	25	20 (20 a	52	77.	21	19 5	22	27	21					942 1870	
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		NOV.	53	۲. وز	4 ;	15	æ ;	21	∞ ;	5	77	2 .		1 -	~ 0	0.1	7 +	1 -	+ 2	17	10	000	000	N 5	7 0	0 0	9 6	9.5	3 5	À ;	7 0	97		_	844 1670	
		DAY	⟨	7 6	· 0 ·	4. 1	<i>د</i> ،	ره.		0 0	ס כֿ	3,5	I	7 -	C -	r <u>v</u>	17	2 12	101	0 0	ر د د	9.5	1, 5	4 C	. 40	10) t) c	- 0	9 6	N C	9.		TOTAL	Sec. Ft. Ac. Ft.	

APPENDIX "B-3"

PURGATOIRE RIVER NEAR LAS ANIMAS, COLORADO

		Я	JRGATÖ 11	OIRE RI	VER Nort Year B	PURGATOIRE RIVER NEAR LAS ANIMAS, COI Report Year Ending October 31, 1954 11 S. G. S. Records—Provisional. Subject to Revision	S ANIM ober 31, 1 Subject t	- >	COLORADO	0		
DAY	NOV.	DEC.	JAN.	. [_	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
-	, 10-	3.7	14	24	5.7	2.7	3.2	1.7	0.4	49	3.7	1.8
÷ 6		3.	·	70	8.2	2.4	2.7	1.6	4.	31	3.7	1.8
i er	2	ar er	12	18	6.6	2.2	2.3	1.6	4.	18	ъ. 4	1.8
· 4		3.0	12	16	7.0	2.2	1.8	1.4	,.	22	3.2	1.8
+ 2 -		4.	. 	12	6.5	2.7	1.7	1.1	ş	22	3.2	.: :
· v	. 4	10	12	:11	4.9	2.3	80.	oʻ	ş.	88	2.9	1.9
10		. r	: -	66	5.0	2.3	2.0	1.0	به	6330	2.7	3.4
~ oc	4	0.0	11	12	4.0	2.2	2.0	1.0	4.	2990	2.4	7.
9	i c'	5.5	0.6	23	3.7	2.2	2.2	œί	4.	1440	4.4	7.9
0.01		90	8.0	19	3.4	2.2	2.9	.,	щ.	427	4.7	11
		25.9	7.0	19	4.4	2.2	2.9	به	ų	177	2.3	13
17	; c	10	7.0	18	2.6	4.4	11	9	તં	168	2.5	₹ .
4 6	; c	<u> </u>	7.5	18	8.2	2.4	13	* ;	∹	3650	2.5	
2 -	,	2.2	3/ 00	17	3.2	2.0	12	۲,	5.	191	2.2	4.0
- *-		. C.	0.6	16	3.6	1.9	9.8	Γ.	e.j.	268	2.2	4. 4.
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1.	2.2	22	6.5	17	3.4	1.8	9.5	۲.	٠.	164	1.9	4.
200	2.2	24	6.5	10	4.7	1.8	3.7	۲.	ę.	219	∞	2.3
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20	1.5	34	6.0	7.5	4.5	1.7	2.2	r:	.i	981	4	2.5
21	1.7	78	5.0	6.4	5.7	1.8	1.8	. ب	ا قب	121	4.	æ: ,
22	2.0	70	5.0	8.6	4.7	1.8	2.3	2.7		67	1.4	æ
23	7	16	9.0	3.7	5.0	1.8	2.4	٠	19200	36	4 ,	æ, ,
24	6.8	18	11	2.9	5.0	1.8	2.2	4	1870	56	9,1	
25	3.7	21	14	2.9	4 5	1.8	6.1	4	1100	21	1.7	
3,6	4.0	18	17	5.9	4.2	. 8.	7.5	4.	1090	16	1.8	-
7.	L.	15	56	3.4	4.2	1.8	13	4.	328	13	1.8	1.
86	2.5	16	27	3.0	3.4	1.9	7.9	4	237	9. %	•• ••	1.7
20	2	15	29		2.9	2.0	4.7	4	154	4.7	1.8	1.
30	6	14	56		2.9	2.0	2.9	4.	87	4. 5	1.8	-
31	:	16	25		2.7		2.0		62	7.9		1.7
TOTAL	•	3	0		0 7 6 7		171 %	0 7 0	041250		4 4 4	8
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770. 17.	777	7	-	>	! !			Y			Ft.	

APPENDIX "B-4"

INFLOW INTO JOHN MARTIN RESERVOR

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16 112 36 80 43 14 17 69 117 26 21 86 75 30 14 14 38 84 30 21 86 75 30 15 14 14 18 31 22 21 67 75 60 22 15 14 14 16 38 37 37 22 37 30 37 30 37 30 37 30 37 30 37 30 37 30 37 30 30 37 30 37 30 </td <td></td> <td>50</td> <td>56</td> <td>36</td> <td>8</td> <td>29</td> <td>14</td> <td>25</td> <td>108</td> <td>320</td> <td>42</td> <td>21</td> <td></td>		50	56	36	8	29	14	25	108	320	42	21	
17 148 85 73 30 15 14 38 84 30 25 74 61 68 26 16 14 121 72 29 21 67 54 60 22 15 14 16 38 357 21 67 54 60 22 15 14 16 33 357 21 60 53 64 66 19 14 14 16 33 357 <t< td=""><td>· O ·</td><td>16</td><td>112</td><td>36</td><td>08</td><td>43</td><td>14</td><td>17</td><td>69</td><td>117</td><td>5.5</td><td>21</td><td>) oc</td></t<>	· O ·	16	112	36	08	43	14	17	69	117	5.5	21) oc
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APPENDIX "B-5"

DAILY CONTENTS JOHN MARTIN RESERVOIR

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		AUG.	28074	25874	24490	22577	20758	19649	32024	37487	38343	37754	36589	35575	35988	35549	34270	33389	31680	31338	30705	29477	27885	26548	25134	23804	22577	21138	19384	18047	16493	14880	13220
VOIR	rision	JULY	0	0	0	0	0	0	0	0	0	Ö	0	0	0	0	0	0	0	0	0	0	0	0	12104	25365	26735	33314	33314	32866	32370	30972	29405
RESERVOIR	11, 1954 Subject to Revision	JUNE	0	0	0	0	0	0	0	o	0	0	0	0	0	0	0	o	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
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٠,	Report Year Engineers Record	MAR.	13962	14003	14086	14211	14315	14399	14461	14545	14629	14754	14838	14838	14838	14859	14922	15027	15133	15133	15133	15175	15238	15302	15471	15513	15534	15598	15662	15704	15725	15746	15853
CONTENTS	(A. Report Year Enc Corps of Engineers Records	FEB.	10454	10705	10919	11114	11329	11487	11665	11844	12004	12164	12285	12406	12528	12670	12771	12893	12995	13179	13179	13199	13302	13425	13466	13507	13589	. 13754	13817	13920			
DAILY	Corps	JAN.	6526	6667	6797	6969	7170	7362	7544	7715	7888	8048	8107	8211	8301	8422	8545	8684	8793	8935	9110	9190	9319	9466	9597	9764	9932	9983	10291	10497	10671	10987	11163
		DEC.	1566	1746	2029	2361	2581	2816	3060	3226	3368	3531	3687	3816	3947	4088	4222	4348	4612	4872	5026	5182	5294	5363	5454	5546	5686	5874	5969	6054	6126	6236	6386
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APPENDIX "B-6"

OUTFLOW FROM JOHN MARTIN RESERVOIR

			S D	Report Year G S Records—	Year En	Report Year Ending October 31, G S Records—Provisional, Subject	ber 31, 1 Subject to	Report Year Ending October 31, 1954 U S G S Records—Provisional, Subject to Revision				
DAY	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
-	50	1.8	2.3	1.7	1.7	1.7	36	252	\$71	1010	754	16
~	43	2.0	2.3		1.7	1.6	52	164	556	1020	768	16
m.	30	2.3	2.3	9.1	1.7	1.6	4	110	215	1020	782	16
4 :	36	2.0	2.3	1.6	1.7	1.6	4	47	107	1020	782	16
ا ر	43	2.0	2.3	1.6	1.7	1.6	35	54	80	466	789	22
91	99	2.0	2.9	1.6	1.7	1.4	32	38	99	714	789	60
t °	62	2.0	2.9	9:	1.7	385	28	28	52	239	782	92
9 0 (44	2.0	2.9	1.6	1,8	675	29	28	53	610	280	40
э. <u>(</u>	4 8	2.0	2.9	1.6	1.8	754	33	24	25	775	36	58
01;	4	1.8	2.9	1.6	1.7	890	38	20	22	922	46	25
11	4	2.0	2.9	1.6	1.6	1010	46	22	22	954	35	46
12	4 :	1.8	2.9	1.6	1.2	466	52	32	15	166	33	30
13	4 ;	8:-	2.0	1 .	1.4	466	62	28	16	988	30	23
4 ;	94 9	90	1.7	1 .	1.7	970	62	28	20	766	29	20
15	4.	8.1.	1.6	1,6	1.7	946	99	56	30	466	28	19
ō :	46	2.0	1.7	9:	1.6	159	76	49	30	890	26	20
~ [9 9	2.0	1.6	1.6	1.6	95	141	122	30	890	24	20
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67 6		5.3	1.7	∞ :	5 3	36	305	40	326	850	17	18
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07	0.4	5.3	9.	1.7	90,0	35	392	36	474	734	20	17
N C	o :	o. 4	o ;		90	78	472	76	922	734	17	17
ء د د	¥.1	2.3	1.6		 	32	380	82	1010	734	16	17
TOTAT		2.3	J.6		1.8		358		1020	740		17
Sec. Ft.	1237.8	63.6	63.3	45.7	3.3	8406.5	6135	1550	2	2,608.8	7469	
Ac. Ft.	2460	126	126	91	110	16670	12170	3090 155	2	51740	12450	1440
Daily dis	Daily discharges are	from gag	from gaging station officially designated. Arkansas River	officially	designa	ted. Arka	nsas River	THE YE	AR hn Marti	116,040 A	THE YEAR 116,040 Ac. Ft. below John Martin Reservoir Colorado	
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APPENDIX "B-7"

ARKANSAS RIVER AT THE COLORADO-KANSAS STATELINE

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ARKANSAS RIVER AT THE COLORADO-KANSAS STATELINE Report Year Ending October 31, 1954 U S G S Records—Provisional, Subject to Revision

ARKANSAS RIVER AT GARDEN CITY, KANSAS	
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APPENDIX "B-9"

DEMANDS BY COLORADO FOR WATER

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APPENDIX "B-10"

DEMANDS BY KANSAS FOR WATER

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٠.		SEPT.	300	308	300	300	200	2													٠				2190	. 43.40 Ft.
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DEMANDS BY KANSAS FOR WATER	Report Year Ending October 31, 1954 (Arkansas River Compact Administration records)	APR. 1	RESERVOIR EMPTY AT TIMES WHEN NO DEMAND IS SHOWN DURING	APRIL TO OCTOBER INCLUSIVE		001	267	267	360	50	400	004	}				* .								3074	0016
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APPENDIX "B-11"

STATELINE FLOWS ON DAYS OF KANSAS DEMAND*

173 189 304 376 401 444 470 318 143 143	DAY	NOV.	DEC.	IAN.	FEB.	MAR.	APR.	MAY	JUNE	IOLY	AUG.	SEPT.	OCT.
281 276 343 363 376 401 401 401 404 404 404 404 404				•							177	253	
276 276 276 277 2710											28.	242	
173 173 173 189 304 304 401 401 401 401 401 401 401 4										-	276	246	
2310 4310 4310 4310 4310 4310 4311 173 189 189 180 476 444 444 440 441 440 440											343	263	
2310 4310 396 1173 1189 1304 1304 1307 1305 1307 1307 1307 1307 1407 1407 1407 1407 1407 1407 1407 14											383	249	
4310 4310 1189 304 304 304 304 304 306 401 401 401 401 401 401 401 401											2310	248	
173 189 304 376 401 444 449 440 440 440 440 440 440											4310	253	
173 189 304 305 401 444 444 450 411 444 450 318 318 318 318 318 476 476 476 476 476 476 476 476	٠.							-			396	783	
189 376 401 440 444 444 440 440 440 440							173				3 2	146	
304 376 401 444 444 440 444 444 440 411 411							2				33.7	86	
376 401 444 440 444 450 318 318 318 318 450 475 475 475 475 475 476 471 476 471 476 471 476 471 476 471 476 471 476 471 476 471 476 471 476 471 476 471 476 471 476 471 476 471 476 471 476 471 476 471 476 471 477 477 477 477 477 477 477 477 477							Š				415	·	
401 444 450 318 143 143 143 143 475 475 475 476 476 476 476 476 476 476 476						-	376				449		
444 450 318 143 143 143 454 476 476 476 476 476 476 476 47				•			4 0				450		
318 143 143 143 454 474 475 437 437 437 437 431 431 431 431 431 431 431 431							444 450	٠			823 823		
143 144 145 147 147 147 147 147 147 147 147 147 147							318				, 10,		
723 435 435 505 816 724 476 476 476 477 478 478 579 579 579 579 579 579 579 579							C 4 1				454 454		
433 435 437 431 431 431 431 431 431 431 431											723		
2740 421 421 421 433 300 203 242 242 242 242 242 243 245 619 230 245 619 230 245 619 230 245 245 245 247 247 248 248 248 248 248 248 248 248											435		
2740 476 476 476 476 421 533 300 203 203 274 242 242 245 619 230 619 230 619 230											816		
2740 421 533 300 203 274 242 242 243 619 230											524 476		
2789 4337 18789											421		
2789 2789 2789 2789 2789										2740	342		
242 245 619 230 2789 4337 18589							-			203	25.4		
2789 4337 18589										242	245		
2789 4337 18789	į								-	619			
	1. T.						2789			4337	18589		

APPENDIX "B-12"

DIVERSIONS BY DITCHES IN COLORADO WATER DISTRICTS 14 AND 17

Report Year Ending October 31, 1954
(Acre Peet)
Source of Information, A.V.D.A. Reports—Reservoir Water is that from upstream reservoirs above Pueblo

	NOV.	DEC.	JAN.	FEB.	MAR.	APR.		JUNE	JULY	AUG.	SEPT.	OCT.	THE
Bessemer (River)Res. or Imported	4,225	2,206	00	3,207	4,358	3,299 0	4,451	4,610 0	4,608	5,476	2,559	3,814	42,813
Total	4,225	2,206	0,		4,358	3,299		4,610	4,608	5,476	2,559	3,814	42,813
West Pueblo (River)		0	0		63	131	_	179	184	190	119	123	1,181
Booth Orchard Gr. (Riv.)		292	0		1,023	930	_	1,071	1,107	1,099	952	896	9,467
Excelsior (River)	00	375	553		٥٥	00		, 0	₩,0	167	00	00	1,227
Total	0	375	553		0	0		50	84	167	0	0	1,227
Colorado Canal (River) Res. or Imported	224	2,830	8,257	. 00	00	00		595 6,942	0,956	1,386	00	00	13,163 26,183
Total	224	2,830	8,257		0	0		7.837	6,956	6,128	0	0	39,346
Highline (River)	3,749	5,845	4,030	3,761	3,277	3,392	4,725	3,948	4,052 1,942	4,462 284	3,392	2,989	47,622 2,291
Total	3,749	5,845	4,030		3,277	3,392		4,013	5,994		3,392	2,989	49,913

APPENDIX "B-12" (Continued)

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DIVERSIONS BY DITCHES IN COLORADO WATER DISTRICTS 14 AND 17

NOV.		DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	THE
Oxford Canal (River) 1.3		١.	38	1.244	781	811	1.765	902	1.561	1.783	762	601	12,100
\$00			2,102	0	0	0	61	147	24	355	Q	0	4,962
Res. or Imported	_ '		٥	0	0	0	0	0	0	0	0	0	0
Total5		1,767	2,102	0	0	0	. 19	147	24	355	0	0	4,962
Catlin (River) 7,940 Res. or Imported 0			2,095	4,235 0	1,267	00	8,654	6,920	7,236	4,056	0	706 0	46,981
•	•		2,095	4,235	1,267	0	8,654	6,920	7,236	4,056	0	706	46,981
1			5,264	0	0	0	462	397	474	2,485	0	0	17,434
4,6			903	2,783	3,961	5,185	5,393	6,426	5,921	3,915	2,218	5,000	48,081
er)			0	0		0	0	0	0	1,805	0	0	1,805
Ft. Lyon Canal (River) 13,1			8,372	11,131	6,907	3,033	12,335	9,562	12,781	10,846	0	5,845	107,634
iv.) 2,3			7.1	760	1,357	341	2,406	1,585	2,616	1,862	298	613	15,134
Las Animas Town (Riv.) 2			0	٥	264	1,488	1,466	1,680	1,632	1,577	486	430	9,227
'AL River 39,787 Res. or Imported 224	~		31,684 0	27,329 0	26,258 0	18,610 0	43,134 7,319	38,072 7,007	42,244 8,898	41,464 5,026	10,786 0	21,089	378,831 28,474
40,01		•	31,684	27,329	26,258	18,610	50,453	45,079	51,142	46,490	10,786	21,089	407,305

&*Part Highline and Oxford Canal's water diverted by Catlin for Holly Sugar Company.

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APPENDIX "B-13"

DIVERSIONS BY DITCHES IN COLORADO WATER DISTRICT 67

Report Year Ending October 31, 1954 (Acre Feet) Source of Information A.V.D.A. Reports

	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	THE
Ft. Bent Canal	984	0	0	0	0	1,325	1,505	\$00	964	3.892	994	555*	10.719
Keesee Ditch	204	0	0	0	0	361	276	585	621	774	766	270	3.857
Amity Canal	327	0	0	0	0	4,502	5,310	450	7,553	19,119	3,838	0	41.099
Lamar Canal	1,146	674	603	16	0	2,761	3,174	1,140	2,231	6,274	2,440	1,029	21,488
Hyde Ditch	0	0	0	0	0	149	224	42	149	603	129	83	1,381
Manvel Canal	0	0	0	0	643	375	78	0	9	871	190	0	2,167
X. Y. & Graham Canal	20	0	0	0	0	305	885	30	204	1,761	428	0	3,633
Buffalo Canal	1,605	0	0	0	0	1,331	2,467	1,660	1,706	2,719	2,194	1,636	15,318
TOTAL	4,286	674	603	191	643	11,109	13,869	4,407	13,488	36,015	10,979	3,573	99,662
*Includes 171 Ac. Pt. for	Keesee I	Sitch.			-					1			

APPENDIX "B-14"

DIVERSIONS BY DITCHES IN KANSAS

Report Year Ending October 31, 1954
(Acre Feet)
Frontier Ditch, U S G S Records
Other Ditches, Kansas Division of Water Resources Records

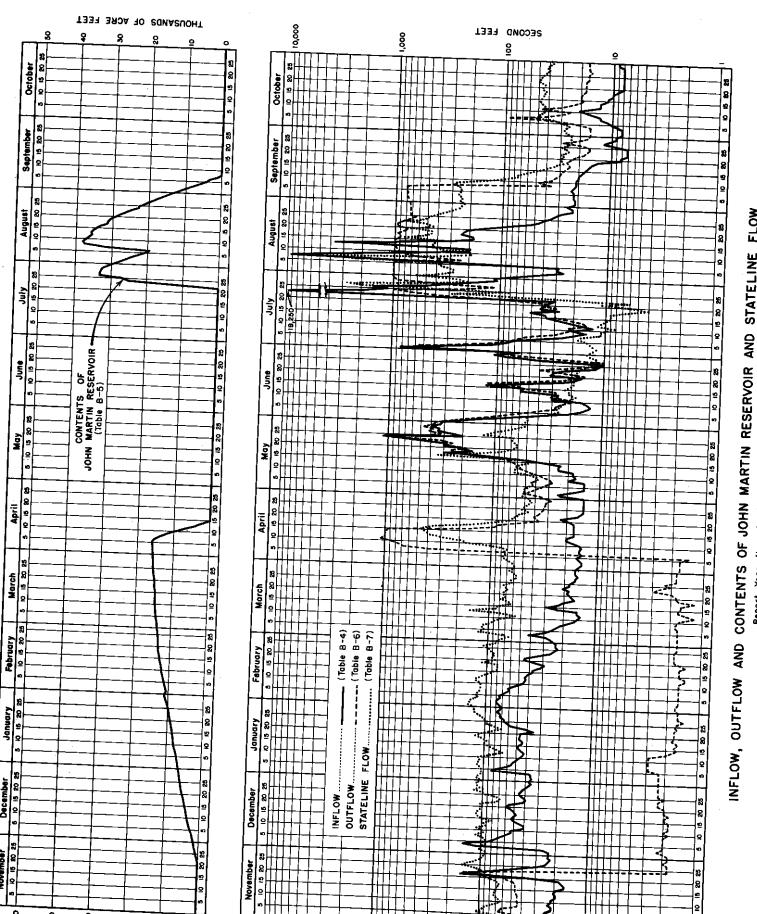
	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULX	AUG.	SEPT.	OCT.	THE
Broatier Ditch		2~	C	0	0	950	1.720	1.120	1,150	1,280	1,000	1,100	9,316
Alamo Canal		· c	c	0	0	345	532	353	Ş	87	355	482	2,387
Ft. Aubrey Canal	514	0	0	0	0	438	1,220	353	228	692	678	1,310	5,433
Total Stateline to Syracuse	1,678	an.		0	0	1,733	3,472	1,826	1,438	2,059	2,033	2,892	17,136
A manage Canal			C	0	238	1.460	1.640	0	1,660	4,600	0	0	9,598
Court Side Direk		· C	c	0	0		34	242	912	3,920	2,630	0	7,738
Court Bortown Canal		762	2.660	4.220	3.490	8033	0	0	303	6,360	1,860	0	24,808
Great Lasteil Canal		24	C	0	52	3.100	954	272	85.5	5,780	928	151	12,689
Garden City Canal	22	0	0	0	0	0	0	0	0	0	0	0	22
Total Syracuse to Garden City	4,897	804	2,660	4,220	3,780	5,393	2,628	-\$14	3,730	20,660	5,418	151	54,855
Total Stateline to Garden City	6,575	808	2,660	4,220	3,780	7.126	6,100	2,340	5,168	22,719	7,451	3,043	71,991

APPENDIX "B-15"

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SUMMARY TABULATION

DEC.
912 754
270 3360
386 11163 1
126 126
674 603
160 6360
809 2660 4220
740
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December

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THOUSANDS OF ACRE FEET

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November

10,000

1,000

8

SECOND LEET

STATELINE FLOW Report Year, November I, 1953 - October 31, 1954

23 23

8 01 8

PLATE