



CANADA

DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES
WATER RESOURCES BRANCH

REPORT TO INTERNATIONAL JOINT COMMISSION

ON

DIVISION AND USE OF THE WATER

OF ST.MARY AND MILK RIVERS

WATER SURVEY OF CANADA
CALGARY DISTRICT OFFICE

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BY

E. F. DRAKE

representing Canada

and

A. P. DAVIS

representing the United States

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REPORT ON
DIVISION AND USE OF WATER
OF
ST. MARY AND MILK RIVERS.

1922

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The Honourable, the International Joint Commission,
Washington, D.C., and Ottawa, Canada.

Gentlemen:

In compliance with the provisions of Clause 10
of your Order of the 4th day of October, 1921, directing
the division of the waters of St. Mary and Milk rivers
between the United States and Canada, we are transmitting
herewith a report on the operations during the irrigation
season of 1922.

Respectfully submitted,

Accredited Reclamation Officer of His Majesty.

Accredited Reclamation Officer of the United States.

28th February, 1923.

INTRODUCTION

The field work incidental to the division and administration of the waters of St. Mary and Milk rivers in Alberta, Saskatchewan, and Montana during the irrigation season of 1922 was conducted by the same engineers as last year. Mr. A.P.Davis, the accredited officer for the United States, was represented in the field by officers of the United States Reclamation Service. Mr. E.F.Drake, accredited officer for His Majesty, was represented by Mr. S.G.Dawson, of the Canadian Reclamation Service.

The hydrometric data were obtained, in Montana, by the United States Geological Survey, under the personal supervision of Mr. W.A.Lamb, District Chief Engineer, While those from Canadian streams and ditches were collected under the supervision of Mr. A.L.Ford, District Engineer, Dominion Water Power Branch.

A table showing the use to which the waters of the St.Mary river were put was submitted weekly to the project managers of the U.S.R.S. St.Mary canal, and of the Alberta Railway and Irrigation Company, and to the Director of the Canadian Reclamation Service.

Frequent trips of inspection were made through the irrigated tracts in both countries to determine the benefit derived from the waters diverted.

DIVISION OF WATER

The U.S.R.S. St.Mary canal diverted 67,940 acre-feet of water from the St.Mary river during the period of operation, viz: from the opening of the head-gates on 21st May to their closing for the season on 2nd October.

During the irrigation season of 1922, the total natural flow of Milk river, estimated at 76,000 acre-feet crossed the boundary at Eastern Crossing, as there was no appreciable diversion from Milk river in Canada; 46,324 acre-feet fo the flow of Lodge creek; 51,376 acre-feet of the flow of Battle creek; and 113,124 acre-feet of the flow of the Frenchman river also crossed the boundary into Montana. In the Lodge creek basin Canadian irrigators diverted 305 acre-feet, in the Battle creek basin 1,658 acre-feet, and in the Frenchman river basin 2,015 acre-feet. No diversions were made in canada from Rock or Whitewater creeks.

The A.R.& I. Company's canal diverted 178,080 acre-feet from the St. Mary river during the period of operation - 18th April to 4th November.

The natural flow of the St.Mary river at the international boundary was determined by current meter measurements of the discharge of the headwaters of the

St. Mary river, by computing the inflow to, and the outflow from, the Sherburne reservoir, the amount diverted by the U.S.R.S. St. Mary canal, and the amount delivered to Canada at the international boundary.

The share to which each country was entitled during the irrigation season was computed from these measurements and calculations on the following basis:

- (a) When the natural flow was 666 cubic-feet, or less, Canada was awarded three-fourths and the United States one-fourth of such flow.
- (b) When the natural flow exceeded 666 cubic-feet per second, Canada was awarded 500 cubic-feet per second, and the excess over 666 cubic-feet was divided equally between the two countries.

As the natural flow of the St. Mary exceeded 1,000 second-feet until 25th July, which was after the peak demand for water, and as rains in July and August lessened the demand for irrigation, the requirements of both countries were supplied without difficulty.

WATER SUPPLY.

The run-off from the St. Mary basin during the irrigation season of 1922 was below the average for the years of record. The flow from the first of July to the end of October was about 66 percent of the average.

Between 21st June and 16th July the flow of Swiftcurrent, Canyon, and smaller creeks above Sherburne was impounded in Sherburne reservoir. During this period 38,600 acre-feet were stored and used to augment the

of the United States during the latter part of the season.

Lodge creek went dry on 5th August, although except for three days in July, the flow was less than one second-foot after 15th June. Battle creek and Frenchman river maintained a flow at the international boundary throughout the season.

All international gauging stations previously used in determining the daily flow of the streams in the St. Mary and Milk river basins were maintained and operated under the joint supervision of the field engineers.

Canada maintained and operated the same stations as previously on those waters in Canada.

The United States maintained and operated the same stations as previously except the following, which have been discontinued; Big Sandy creek at Laredo; Beaver creek near Fort Assiniboine; Clear creek near Bear Paw ; Box Elder creek near Bear Paw; Peoples creek near Dodson; and, late in the season, Milk river at Malta.

In an appendix to this report will be found the results of current meter measurements, daily gauge heights, and discharges at all gauging stations operated in the two drainage basins during the season of 1922.

DESCRIPTION OF TABLES

In the tables accompanying this report will be found summarized data regarding the division and use of the waters of the two rivers.

Table 1 shows the method of determining the natural flow of the St. Mary river during the irrigation season, the water available for use and diverted by the United States, and the water available for use and diverted by Canada.

Sheet No. 1 of each month shows the daily inflow and outflow of Sherburne reservoir, the difference being the amount of water stored or released from storage. On this sheet the inflow from streams other than those recorded is estimated by comparison with other streams and the use of the storage curve of Sherburne reservoir, and is shown in the column headed "other streams".

Sheet No. 2 shows the water diverted, stored, or released from storage by the United States and the natural flow of St. Mary river which would cross the boundary if undisturbed. Two days has been estimated as the time required for stored water to reach the boundary from Sherburne reservoir.

Sheet No. 3 shows the water available for use by the United States, the water used, and the excess or

deficiency of this quantity over the quantity available.

Sheet No. 4 shows the natural flow of St.Mary river at Kimball or the boundary, Canada's share, and the actual discharge of the river at Kimball (which is the quantity of water received by Canada), the amount diverted by Canada, and the excess or deficiency of the quantity received by Canada as compared with the share.

It is apparent from Table 1 that, except during a few short periods, each country received the share to which it was entitled. During the second week of August the St.Mary canal diverted in excess of the share of the United States in order to test the carrying capacity of the siphon crossing St.Mary river; during this period stored water was released from Sherburne reservoir so as to prevent any shortage of water to Canada.

Table 2 shows the quantity of water taken in each month by each country and the quantity applied to the land; also, the quantity of water diverted from St.Mary to Milk river and stored or held back by either country. This table also shows the water available, diverted, used, stored, wasted, and the losses in canals and reservoirs.

Table 3 gives the available data on diversions from the principal northern tributaries of Milk river and the flow of these streams passing the boundary.

Table 1.
DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER.

WATER STORED AND RELEASED BY UNITED STATES.

APRIL - 1922

Day	Inflow into Sherburne Res:	Outflow	Stored	Released
	Swift-Canyon:	Other:	Total:	Swift-:
	current:Creek:	Creeks:	Inflow:	current C:
1	:	:	22	22
2	:	:	22	22
3	:	:	23	23
4	:	:	24	24
5	:	:	24	24
6	:	:	27	27
7	:	:	30	30
8	:	:	35	35
9	:	:	36	36
10	:	:	35	35
11	:	:	34	34
12	:	:	33	33
13	:	:	31	31
14	:	:	30	30
15	(Records incomplete)			30
16	:	:	31	31
17	:	:	30	30
18	:	:	30	30
19	:	:	31	31
20	:	:	35	35
21	:	:	56	56
22	:	:	76	76
23	:	:	84	84
24	:	:	117	96
25	:	:	130	100
26	:	:	114	92
27	:	:	110	89
28	:	:	127	105
29	:	:	277	242
30	:	:	270	235
Total	:	1954	1768	186
Mean	:	65	59	6.2
Ac-ft	:	3870	3500	370

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER.

APRIL - 1922.

Day	in second - feet.						Natural flow St. Mary R.
	St. Mary R:	Diverted:	Stored by:	Total	Stored Water		
	Kimball	U.S.R.S.	U.S.R.S.	: Released			
1	130	0	0	130	0		130
2	150			150			150
3	162			162			162
4	165			165			165
5	160			160			160
6	160			160			160
7	160			160			160
8	160			160			160
9	155			155			155
10	155			155			155
11	155			155			155
12	150			150			150
13	160			160			160
14	165			165			165
15	160			160			160
16	155			155			155
17	145			145			145
18	137			137			137
19	160			160			160
20	260			260			260
21	300			300			300
22	250			250			250
23	300			300			300
24	270			270			270
25	340			340			340
26	535		21	556			556
27	595		30	625			625
28	610		22	632			632
29	675		21	696			696
30	1260		22	1282			1282
Total	8339	0	116	8455	0		8455
Mean	278	0	3.9	282	0		282
Ac-ft	16500	0	232	16780	0		16780

DIVISION OF WATER OF ST.MARY RIVER.

WATER USED BY UNITED STATES.

APRIL - 1922.

in second - feet.

Day	Natural:	Available for use :	Used by U.S.A.		Excess:	Deficit
	St. Mary River	Share U.S.	Stored Water Released	Diverted U.S.R.S.	Total Stored	Total of share used
1	130	32	--	32	0	32
2	150	38	--	38	--	38
3	162	40	--	40	--	40
4	165	41	--	41	--	41
5	160	40	--	40	--	40
6	160	40	--	40	--	40
7	160	40	--	40	--	40
8	160	40	--	40	--	40
9	155	39	--	39	--	39
10	155	39	--	39	--	39
11	155	39	--	39	--	39
12	150	38	--	38	--	38
13	160	40	--	40	--	40
14	165	41	--	41	--	41
15	160	40	--	40	--	40
16	155	39	--	39	--	39
17	145	36	--	36	--	36
18	137	34	--	34	--	34
19	160	40	--	40	--	40
20	260	65	--	65	--	65
21	300	75	--	75	--	75
22	250	62	--	62	--	62
23	300	75	--	75	--	75
24	270	67	--	67	--	67
25	340	85	--	85	--	85
26	556	139	--	139	21	21
27	625	156	--	156	30	30
28	632	158	--	158	22	22
29	696	181	--	181	21	21
30	1282	474	--	474	22	22
Total:	8455	2273	--	2273	116	116
Mean:	282	75.8	76	76	3.9	3.9
Ac-ft:	16780	4510	--	4510	226	226

Corrected
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DIVISION OF WATER OF ST. MARY RIVER.

WATER AVAILABLE FOR USE AND USED BY CANADA.

APRIL - 1922.

in second - feet.

Day	: Natural St. Mary R:	: Canada's Share	: St. Mary R: Kimball	: Diverted Canada	: Excess of share	: Deficit delivered
1	:	130	:	98	:	32
2	:	150	:	112	:	38
3	:	162	:	122	:	40
4	:	165	:	124	:	41
5	:	160	:	120	:	40
6	:	160	:	120	:	40
7	:	160	:	120	:	40
8	:	160	:	120	:	40
9	:	155	:	116	:	39
10	:	155	:	116	:	39
11	:	155	:	116	:	39
12	:	150	:	112	:	38
13	:	160	:	120	:	40
14	:	165	:	124	:	41
15	:	160	:	120	:	40
16	:	155	:	116	:	39
17	:	145	:	109	:	36
18	:	137	:	103	:	34
19	:	160	:	120	:	40
20	:	260	:	195	:	65
21	:	300	:	225	:	75
22	:	250	:	188	:	62
23	:	300	:	225	:	75
24	:	270	:	203	:	67
25	:	340	:	255	:	85
26	:	556	:	417	:	118
27	:	625	:	469	:	126
28	:	632	:	474	:	136
29	:	696	:	515	:	160
30	:	1282	:	808	:	452
Total	:	8455	:	6182	:	2157
Mean	:	282	:	206	:	143
Ac-ft	:	16780	:	12270	:	4284
				16554		--
				2140		--

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER.

WATER STORED AND RELEASED BY UNITED STATES.

MAY - 1922.

in second - feet.

Day	Inflow into Sherburne Res.	Outflow:	Released
	Swift- Canyon:Other	Total: Swift- Stored: from	
	current:Creek :Creeks:Inflow:current	Inflow:current	Storage
1		290 : 239.0 :	51 : --
2		290 : 267.0 :	23 : --
3	(Records incomplete)	300 : 254.0 :	46 : --
4		300 : 279.0 :	21 : --
5		298 : 326.0 :	-- : 28
6		254 : 267.0 :	-- : 13
7		244 : 300.0 :	-- : 56
8		229 : 279.0 :	-- : 50
9	115 : 13	224 : 239.0 :	-- : 15
10	131 : 12	224 : 237.0 :	-- : 13
11		244 : 235.0 :	9 : --
12		245 : 242.0 :	3 : --
13		245 : 248.0 :	-- : 3
14		245 : 254.0 :	-- : 9
15	202 : 50	311 : 284.0 :	27 : --
16	322 : 173	555 : 374.0 :	181 : --
17	642 : 215	917 : 378.0 :	539 : --
18	636 : 194	890 : 8.4 :	882 : --
19	760 : 224	1044 : 7.4 :	1037 : --
20	802 : 196	1058 : 255.0 :	803 : --
21	718 : 149	927 : 386.0 :	541 : --
22		885 : 7.0 :	878 : --
23		885 : 6.6 :	878 : --
24		885 : 427.0 :	458 : --
25		885 : 915.0 :	-- : 30
26		900 : 919.0 :	-- : 19
27		900 : 956.0 :	-- : 56
28		850 : 1000.0 :	-- : 150
29		700 : 1010.0 :	-- : 310
30		650 : 1020.0 :	-- : 370
31		610 : 1020.0 :	-- : 410
Total	4328 : 2253	17484 : 12639.4 :	6377 : 1532
Mean	481 : 98	564 : 408 :	202 : 49
Ac-ft	8590 : 4470	34679 : 25100 :	6377 : 3037

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER.

MAY - 1922.

in second - feet.

Day	St. Mary R. Kimbball	Diverted: U.S.R.S.	Stored: U.S.R.S.	Total	Stored Water	Natural flow	Released: St. Mary R
1	955	--	35	990	--	990	
2	1070	--	35	1105	--	1105	
3	995	--	51	1046	--	1046	
4	1000	--	23	1023	--	1023	
5	1200	--	46	1246	--	1246	
6	1200	--	21	1221	--	1221	
7	1240	--	--	1240	28	1212	
8	1260	--	--	1260	13	1247	
9	1200	--	--	1200	56	1144	
10	1130	--	--	1130	50	1080	
11	1090	--	--	1090	15	1075	
12	1070	--	--	1070	13	1057	
13	1040	--	9	1049	--	1049	
14	1050	--	3	1053	--	1053	
15	1120	--	--	1120	3	1117	
16	1290	--	--	1290	9	1281	
17	1760	--	27	1787	--	1787	
18	2100	--	181	2281	--	2281	
19	2300	--	539	2839	--	2839	
20	2570	--	882	3452	--	3452	
21	2920	4	1037	3961	--	3961	
22	3050	26	803	3879	--	3879	
23	2730	75	541	3346	--	3346	
24	2520	121	878	3519	--	3519	
25	3000	134	878	4012	--	4012	
26	3680	140	458	4278	--	4278	
27	3890	141	--	4031	30	4001	
28	4070	144	--	4214	19	4195	
29	4180	149	--	4329	56	4273	
30	3870	162	--	4032	150	3882	
31	3560	168	--	3728	310	3418	
Total	64110	1264	6447	71821	752	71069	
Mean	2070	115	208	2317	24	2293	
Ac-ft	127000	2510	12789	142730	1476	140991	

DIVISION OF WATER OF ST. MARY RIVER.

WATER USED BY UNITED STATES.

MAY - 1922.

in second - feet.

Day	Natural St. Mary River	Available for use U.S. Share	Stored Release	Total for use	Used by U. S. A. Diverted	Stored Total Used	Excess of share used	Deficit
1	990	328	--	328	--	35	35	-- 293
2	1105	386	--	386	--	35	35	-- 351
3	1046	356	--	356	--	51	51	-- 305
4	1023	344	--	344	--	23	23	-- 321
5	1246	456	--	456	--	46	46	-- 410
6	1221	444	--	444	--	21	21	-- 423
7	1212	439	28	467	--	--	--	-- 467
8	1247	456	13	469	--	--	--	-- 469
9	1144	405	56	461	--	--	--	-- 461
10	1080	373	50	423	--	--	--	-- 423
11	1075	371	15	386	--	--	--	-- 386
12	1057	362	13	375	--	--	--	-- 375
13	1049	358	--	358	--	9	9	-- 349
14	1053	359	--	359	--	3	3	-- 356
15	1117	392	3	395	--	--	--	-- 395
16	1281	474	9	483	--	--	--	-- 483
17	1787	726	--	726	--	27	27	-- 699
18	2281	974	--	974	--	181	181	-- 793
19	2839	1252	--	1252	--	539	539	-- 713
20	3452	1559	--	1559	--	882	882	-- 677
21	3961	1814	--	1814	4	1037	1041	-- 773
22	3879	1773	--	1773	26	803	829	-- 944
23	3346	1506	--	1506	75	541	616	-- 890
24	3519	1592	--	1592	121	878	999	-- 593
25	4012	1839	--	1839	134	878	1012	-- 827
26	4278	1972	--	1972	140	458	598	-- 1374
27	4001	1834	30	1864	141	--	141	-- 1723
28	4195	1930	19	1949	144	--	144	-- 1805
29	4273	1970	56	2026	149	--	149	-- 1877
30	3882	1774	150	1924	162	--	162	-- 1762
31	3418	1542	310	1852	168	--	168	-- 1684
	Total	71069	30360	752	31112	1264	6447	7711 -- 23401
	Mean	2293	980	24	1003	115	208	249 -- 755
	Ac-:		979					
	ft:	140991	60257	1476	61613	2510	12789	15299 -- 46324

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30367
980

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA.

MAY - 1922

Day	in second - feet						Deficit of share delivered
	Natural St. Mary R.	Canada's Share	St. Mary R. Kimball	Diverted Canada	Excess of share	Deficit of share delivered	
1	990	662	955	241	293		--
2	1105	719	1070	249	351		--
3	1046	690	995	299	305		--
4	1023	679	1000	339	321		--
5	1246	790	1200	343	410		--
6	1221	777	1200	331	423		--
7	1212	773	1240	343	467		--
8	1247	791	1260	339	469		--
9	1144	739	1200	336	461		--
10	1080	707	1130	394	423		--
11	1075	704	1090	436	386		--
12	1057	695	1070	445	375		--
13	1049	691	1040	455	349		--
14	1053	694	1050	465	356		--
15	1117	725	1120	461	395		--
16	1281	807	1290	455	483		--
17	1787	1061	1760	451	699		--
18	2281	1307	2100	443	793		--
19	2839	1587	2300	453	713		--
20	3452	1893	2570	451	677		--
21	3961	2147	2920	451	773		--
22	3879	2106	3050	439	944		--
23	3346	1840	2730	447	890		--
24	3519	1927	2520	443	593		--
25	4012	2173	3000	479	827		--
26	4278	2306	3680	434	1374		--
27	4001	2167	3890	417	1723		--
28	4195	2265	4070	426	1805		--
29	4273	2303	4180	474	1877		--
30	3882	2108	3870	495	1762		--
31	3418	1876	3560	485	1684		--
Total	71069	40709	64110	12719	23401		--
Mean	2293	1319	2070	410	755		--
Ac-ft	140991	80734	127000	25210	46324		--

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER.

WATER STORED AND RELEASED BY UNITED STATES.

JUNE - 1922

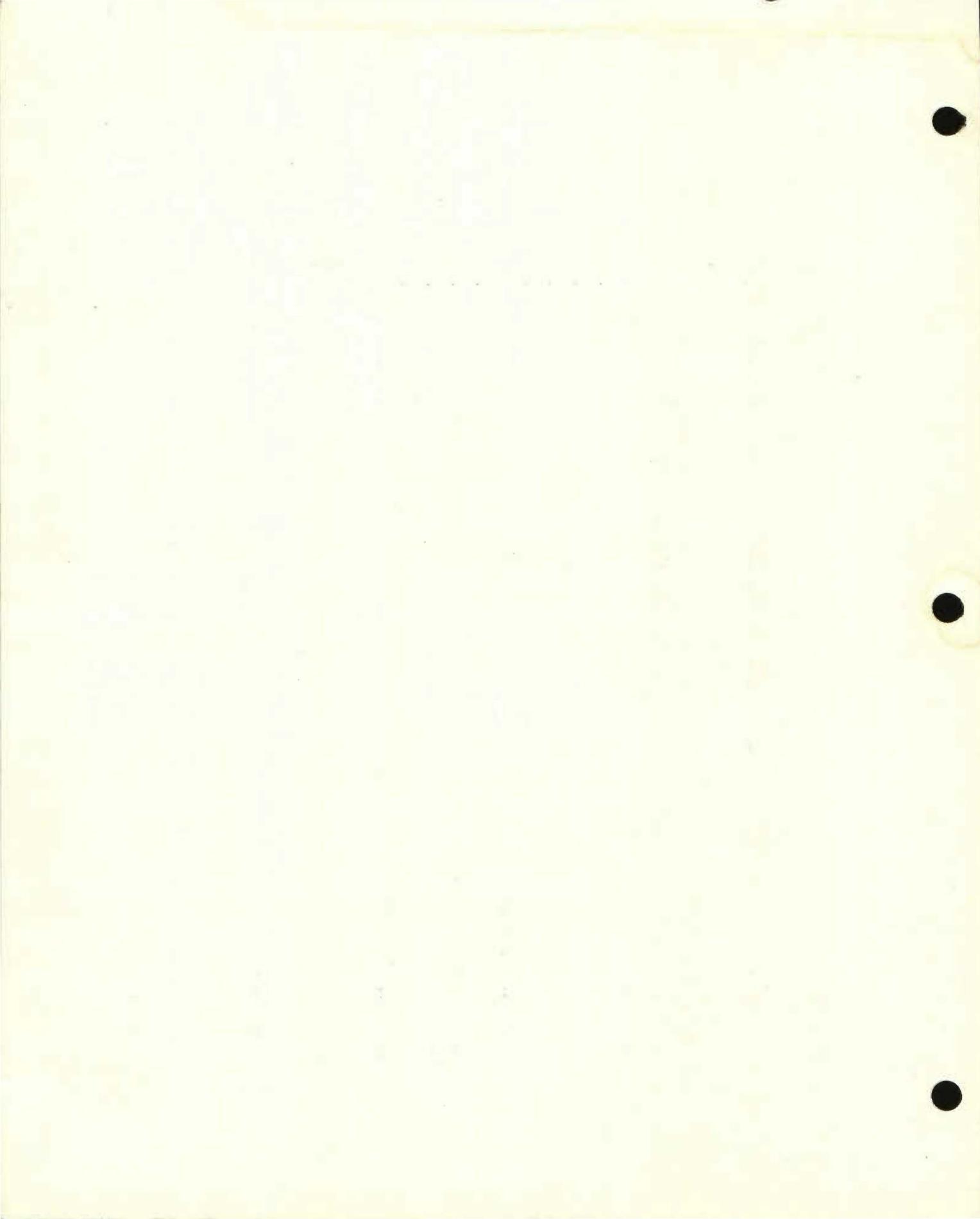
in second - feet

in second - feet							
	Inflow into Sherburne Res.	Swift-current	Stored	Released			
	: Swift-current	: Canyon Creek	: Other Creeks	: Total Inflow	: current	: outflow	: from Storage
1		112		700e	1020.0	--	320
2		140		800	1020.0	--	220
3		171		1000	1050.0	--	50
4		178		1200	1070.0	130	--
5		153		1341	1100.0	241	--
6		146		1300	1150.0	150	--
7		140		1145	1170.0	--	25
8		134		900	1140.0	--	240
9		128		800e	1120.0	--	320
10	434	122	18	574	1070.0	--	496
11	455	116	18	589	1030.0	--	441
12	619	110	27	756	989.0	--	233
13	736	104	28	868	989.0	--	121
14	760	98	33	891	993.0	--	102
15	700	92	28	820	989.0	--	169
16	683	86	28	797	977.0	--	180
17	631	79	28	738	960.0	--	222
18	602	72	26	700	932.0	--	232
19	546	65	26	637	895.0	--	258
20	466	72	53	591	438.0	153	--
21	445	77	10	632	3.2	629	--
22	424	75	18	617	4.2	613	--
23	403	65	110	578	0.6	577	--
24	382	50	110	542	0.6	541	--
25	361	50	110	521	0.6	520	--
26	340	52	110	502	0.1	502	--
27	364	53	110	527	0.4	527	--
28	384	52	110	546	0.4	546	--
29	384	52	110	546	0.4	546	--
30	379	52	110	541	0.6	540	--
Total	10498	2896		22699	20113.	6215	3629
Mean	500	96		757	670	207	121
Ac-ft	20800	5740		45000	39900	12300	7200

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER.

JUNE - 1922

Day	in second - feet						Natural flow St. Mary R.
	St. Mary R:	Diverted	Stored by	Total	Stored Water		
	Kimball	U.S.R.S.	U.S.R.S.		Released		
1	3430	178	--	3608	370		3238
2	3450	180	--	3630	410		3220
3	3740	186	--	3926	320		3606
4	4220	189	--	4409	220		4189
5	4750	192	--	4942	50		4892
6	5040	196	130	5366	--		5366
7	5250	201	241	5692	--		5692
8	5140	203	150	5493	--		5493
9	4820	202	--	5022	25		4997
10	4560	197	--	4757	240		4517
11	4220	194	--	4414	320		4094
12	4080	205	--	4274	496		3778
13	4100	200	--	4305	441		3864
14	4160	200	--	4360	233		4127
15	4220	200	--	4420	121		4299
16	4240	200	--	4440	102		4338
17	4140	200	--	4340	169		4171
18	4100	203	--	4303	180		4123
19	4000	210	--	4210	222		3988
20	3800	235	--	4035	232		3803
21	3470	237	--	3707	258		3449
22	2890	259	153	3302	--		3302
23	2630	288	629	3547	--		3547
24	2400	295	613	3308	--		3308
25	2090	306	577	2973	--		2973
26	1820	337	541	2698	--		2698
27	1650	352	520	2522	--		2522
28	1620	354	502	2476	--		2476
29	1570	370	527	2467	--		2467
30	1580	375	546	2501	--		2501
Total	107180	7138	5129	119447	4409		115038
Mean	3570	239	171	3982	147		3835
Ac-ft	212000	14200	10175	236945	8747		228198



DIVISION OF WATER OF ST.MARY RIVER.

WATER USED BY UNITED STATES.

JUNE - 1922

in second -feet.

Day	Available for use			Used by U.S.A.			Excess:Deficit		
	Natural	U.S.	Stored	Total	Divert	Stored	Total	of share used	
	St. Mary	Share	Water		-ed				
Kimball			Released						
1	3238	1452	370	1822	178	--	178	--	1644
2	3220	1443	410	1853	180	--	180	--	1673
3	3606	1636	320	1956	186	--	186	--	1770
4	4189	1928	220	2148	189	--	189	--	1959
5	4892	2279	50	2329	192	--	192	--	2137
6	5366	2516	--	2516	196	130	326	--	2190
7	5692	2679	--	2679	201	241	442	--	2237
8	5493	2580	--	2580	203	150	353	--	2227
9	4997	2332	25	2357	202	--	202	--	2155
10	4517	2091	240	2331	197	--	197	--	2134
11	4094	1880	320	2200	194	--	194	--	2006
12	3778	1722	496	2218	194	--	194	--	2024
13	3864	1765	441	2206	205	--	205	--	2001
14	4127	1897	233	2130	200	--	200	--	1930
15	4299	1982	121	2103	200	--	200	--	1903
16	4338	2002	102	2104	200	--	200	--	1904
17	4171	1919	169	2088	200	--	200	--	1888
18	4123	1894	180	2074	203	--	203	--	1871
19	3988	1827	222	2049	210	--	210	--	1839
20	3803	1735	232	1967	235	--	235	--	1732
21	3449	1558	258	1816	237	--	237	--	1579
22	3302	1484	--	1484	259	153	412	--	1072
23	3547	1606	--	1606	288	629	917	--	689
24	3308	1487	--	1487	295	613	908	--	579
25	2973	1320	--	1320	306	577	883	--	437
26	2598	1182	--	1182	337	541	878	--	304
27	2522	1094	--	1094	352	520	872	--	222
28	2476	1071	--	1071	354	502	856	--	215
29	2467	1066	--	1066	370	527	897	--	169
30	2501	1084	--	1084	375	546	921	--	163
Total	115038	52511	4409	56920	7138	5129	12267	--	44653
Mean	3835	1750	147	1897	238	171	409	--	1488
Ac-ft	228198	104130	8747	112877	14162	10175	24337	--	88540

DIVISION OF WATER OF ST. MARY RIVER.

WATER AVAILABLE FOR USE AND USED BY CANADA.

JUNE - 1922.

in second - feet.

Day	: Natural St. Mary R:	Canada's Share	: St. Mary R: Kimball	Diverted: Canada	Excess of share	Deficit delivered
1	3238	1786	3430	509	1644	--
2	3220	1777	3450	550	1673	
3	3606	1970	3740	568	1770	
4	4189	2261	4220	561	1959	
5	4892	2613	4750	531	2137	
6	5366	2850	5040	589	2190	
7	5692	3013	5250	641	2237	
8	5493	2913	5140	631	2227	
9	4997	2665	4820	642	2155	
10	4517	2426	4560	637	2134	
11	4094	2214	4220	655	2006	
12	3778	2056	4080	644	2024	
13	3864	2099	4100	691	2001	
14	4127	2230	4160	708	1930	
15	4299	2317	4220	699	1903	
16	4388	2336	4240	708	1904	
17	4171	2252	4140	711	1888	
18	4123	2229	4100	761	1871	
19	3988	2161	4000	773	1839	
20	3803	2068	3800	761	1732	
21	3449	1891	3470	790	1579	
22	3302	1818	2890	790	1072	
23	3547	1941	2630	791	689	
24	3308	1821	2400	807	579	
25	2973	1653	2090	735	437	
26	2698	1516	1820	812	304	
27	2522	1428	1650	809	222	
28	2476	1405	1620	812	215	
29	2467	1401	1570	800	169	
30	2501	1417	1580	802	163	--
Total	115038	62527	107180	20918	44653	--
Mean	3835	2085	3570	697	1488	--
Ac-ft	228198	124068	212608	41474	88540	--

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER.

WATER STORED AND RELEASED BY UNITED STATES.

JULY - 1922

in second - feet.

Day	Inflow into Sherburne Res.	Outflow	Stored	Released		
	Swift- current	Canyon Creek	Other Inflow	Total	Swift- current	from Storage
1	355	52	100	507	0.6	506
2	322	50	95	467	0.4	467
3	326	56	90	472	0.4	472
4	345	64	80	489	0.4	489
5	331	56	70	457	0.4	457
6	315	41	70	426	0.4	426
7	299	54	64	417	0.6	416
8	284	60	62	406	0.6	405
9	269	75	61	405	2.6	402
10	254	68	60	382	1.0	381
11	239	54	60	353	0.8	352
12	224	45	60	329	0.6	328
13	243	42	60	345	0.5	344
14	220	45	58	323	0.4	323
15	252	41	57	350	0.4	350
16	228	37	54	319	0.5	318
17	195	30	50	275	52.0	223
18	179	29	45	253	120.0	133
19	182	30	40	252	258.0	--
20	186	30	36	252	299.0	--
21	179	28	32	239	410.0	--
22	166	26	30	222	405.0	--
23	157	25	22	204	406.0	--
24	157	23	15	195	455.0	--
25	154	24	15	193	450.0	--
26	148	20	14	182	447.0	--
27	131	20	14	165	442.0	--
28	131	20	13	164	436.0	--
29	136	24	10	170	302.0	--
30	136	24	9	169	218.0	--
31	142	24	7	173	222.0	--
Total	6885	1217	1453	9555	4932.6	6792
Mean	222	39	47	308	159.0	219
Ac-ft	13650	2420	2868	18938	9800	13434
						4304

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER.

JULY - 1922

Day	in second - feet						Natural flow St. Mary R.
	St. Mary R:	Diverted Kimball	Stored by: U.S.R.S.	Total	Stored Water		
						: Released	
1	1520	:	377	546	2443	:	-- : 2443
2	1390	:	402	540	2332	:	-- : 2332
3	1320	:	408	506	2234	:	-- : 2234
4	1250	:	406	467	2123	:	-- : 2123
5	1250	:	408	472	2130	:	-- : 2130
6	1220	:	410	489	2119	:	-- : 2119
7	1100	:	412	457	1969	:	-- : 1969
8	1210	:	414	426	2050	:	-- : 2050
9	1410	:	416	416	2242	:	-- : 2242
10	1450	:	392	405	2247	:	-- : 2247
11	1270	:	400	402	2072	:	-- : 2072
12	1070	:	400	381	1851	:	-- : 1851
13	1060	:	402	352	1814	:	-- : 1814
14	937	:	398	328	1663	:	-- : 1663
15	682	:	396	344	1622	:	-- : 1622
16	875	:	396	323	1594	:	-- : 1594
17	762	:	396	350	1508	:	-- : 1508
18	702	:	396	318	1416	:	-- : 1416
19	702	:	394	223	1319	:	-- : 1319
20	755	:	372	133	1260	:	-- : 1260
21	868	:	351	--	1219	:	6 : 1213
22	1030	:	228	--	1258	:	47 : 1211
23	1040	:	216	--	1256	:	171 : 1085
24	1040	:	217	--	1257	:	183 : 1074
25	1040	:	218	--	1258	:	202 : 1056
26	1040	:	218	--	1258	:	260 : 998
27	1010	:	214	--	1224	:	257 : 967
28	969	:	212	--	1181	:	265 : 916
29	921	:	211	--	1132	:	277 : 855
30	808	:	210	--	1018	:	272 : 746
31	718	:	208	--	926	:	132 : 794
Total	32619	:	10498	7878	50995	:	2072 : 48923
Mean	1050	:	337	254	1645	:	67 : 1578
Ac-ft	64600	:	20800	15618	101148	:	4120 : 97028

DIVISION OF WATER OF ST. MARY RIVER.

WATER USED BY UNITED STATES.

JULY - 1922.

Day	Natural:		Available for use:		Used by U.S.A.		Excess:		Deficit of share used			
	St. Mary:	U.S.:	Stored:	Divert:	Total:	-ed	Stored:	Total:				
1	:	2443	:	1054	:	--	1054	377	546	923	--	131
2	:	2332	:	999	:	--	999	402	540	942	--	57
3	:	2234	:	950	:	--	950	408	506	914	--	36
4	:	2123	:	894	:	--	894	406	467	873	--	21
5	:	2130	:	898	:	--	898	408	472	880	--	18
6	:	2119	:	892	:	--	892	410	489	899	7	--
7	:	1969	:	818	:	--	818	412	457	869	51	--
8	:	2050	:	858	:	--	858	414	426	840	--	18
9	:	2242	:	954	:	--	954	416	416	832	--	122
10	:	2247	:	956	:	--	956	392	405	797	--	159
11	:	2072	:	869	:	--	869	400	402	802	--	67
12	:	1851	:	758	:	--	758	400	381	781	23	--
13	:	1814	:	740	:	--	740	402	352	754	14	--
14	:	1663	:	665	:	--	665	398	328	726	61	--
15	:	1622	:	644	:	--	644	396	344	740	96	--
16	:	1594	:	630	:	--	630	396	323	719	89	--
17	:	1508	:	587	:	--	587	396	350	746	159	--
18	:	1416	:	541	:	--	541	396	318	714	173	--
19	:	1319	:	492	:	--	492	394	223	617	125	--
20	:	1260	:	463	:	--	463	372	133	505	42	--
21	:	1213	:	440	:	6	446	351	--	351	--	95
22	:	1211	:	439	:	47	486	228	--	228	--	258
23	:	1085	:	376	:	171	547	216	--	216	--	331
24	:	1074	:	370	:	183	553	217	--	217	--	336
25	:	1056	:	361	:	202	563	218	--	218	--	345
26	:	998	:	332	:	260	592	218	--	218	--	374
27	:	967	:	316	:	257	573	214	--	214	--	359
28	:	916	:	291	:	265	556	212	--	212	--	344
29	:	855	:	260	:	277	537	211	--	211	--	326
30	:	746	:	206	:	272	478	210	--	210	--	268
31	:	794	:	230	:	132	362	208	--	208	--	154
Total	:	48923	:	19283	:	2072	21355	10498	7878	18376	840	3819
Mean	:	1578	:	622	:	67	689	339	254	593	27	123
Ac-ft	:	97028	:	38246	:	4120	42366	20844	15618	36462	1660	7564

DIVISION OF WATER OF ST. MARY RIVER.

WATER AVAILABLE FOR USE AND USED BY CANADA.

JULY - 1922

Day	: Natural St. Mary R:	Canada's Share	: St. Mary R: Kimball	Diverted: by Canada:	Excess of share	: Deficit delivered
1	2443	1389	1520	800	131	--
2	2332	1333	1390	790	57	--
3	2234	1284	1320	773	36	--
4	2123	1229	1250	800	21	--
5	2130	1232	1250	872	18	--
6	2119	1227	1220	865	--	7
7	1969	1151	1100	845	--	51
8	2050	1192	1210	824	18	--
9	2242	1288	1410	776	122	--
10	2247	1291	1450	761	159	--
11	2072	1203	1270	725	67	--
12	1851	1093	1070	678	--	23
13	1814	1074	1060	635	--	14
14	1663	998	937	595	--	61
15	1622	978	882	590	--	96
16	1594	964	875	580	--	89
17	1508	921	762	623	--	159
18	1416	875	702	601	--	173
19	1319	827	702	646	--	125
20	1260	797	755	676	--	42
21	1213	773	868	699	95	--
22	1211	772	1030	678	258	--
23	1085	709	1040	632	331	--
24	1074	704	1040	632	336	--
25	1056	695	1040	636	345	--
26	998	666	1040	619	374	--
27	967	651	1010	614	359	--
28	916	625	969	592	344	--
29	855	595	921	618	326	--
30	746	540	808	595	268	--
31	794	564	718	588	154	--
Total	48923	29640	32619	21358	3819	840
Mean	1578	956	1050	689	123	27
Ac-ft	97028	58782	64686	42365	7564	1660

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER.

WATER STORED AND RELEASED BY UNITED STATES.

AUGUST - 1922.

in second - feet

Day	Inflow into Sherburne Res.		Outflow	Stored	Released
	Swift- Current	Canyon: Creek	Total:	Swift- current	: from Storage
	Current	Creeks:			
1	145	26	5	176	218
2	151	28	5	184	218
3	160	28	4	192	229
4	163	28	4	195	256
5	157	28	3	188	243
6	151	26	3	180	282
7	139	24	2	165	309
8	134	23	2	159	374
9	134	23	1	158	395
10	136	24	1	161	413
11	134	23	1	158	418
12	139	24	1	164	431
13	126	19	1	146	444
14	107	16	1	124	497
15	103	15	0	118	523
16	110	15	0	125	566
17	103	14	0	117	576
18	100	14	0	114	566
19	110	18	0	128	550
20	120	19	0	139	541
21	107	15	0	122	529
22	100	14	0	114	520
23	96	15	0	111	508
24	105	16	0	121	421
25	105	14	0	119	302
26	103	13	0	116	298
27	103	14	0	117	294
28	98	14	0	112	290
29	103	14	0	117	286
30	100	15	0	115	279
31	108	16	0	124	277
Total	3750	595	34	4379	12053
Mean	121	19	1	141	389
Ac-ft	7440	1180	56	8620	23919
					15243

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER.

AUGUST - 1922;

in second - feet

Day	St. Mary R. Kimball	Diverted :U.S.R.S.	Stored by: :U.S.R.S.	Total	Stored : water	Natural flow	Released: St. Mary R.
1	667	206	0	873	49	824	
2	641	204		845	49	796	
3	622	204		826	42	784	
4	641	214		855	34	821	
5	579	284		863	37	826	
6	511	337		848	61	787	
7	480	366		846	55	791	
8	490	382		872	102	770	
9	485	392		877	144	733	
10	495	406		901	215	686	
11	490	430		920	237	683	
12	490	446		936	252	684	
13	480	454		934	260	674	
14	465	462		927	267	660	
15	465	473		938	298	640	
16	460	480		940	373	567	
17	572	388		960	405	555	
18	762	278		1040	441	599	
19	800	253		1053	459	594	
20	800	253		1053	452	601	
21	792	250		1042	422	620	
22	778	238		1016	402	614	
23	762	222		984	407	577	
24	732	214		946	406	540	
25	667	205		872	397	475	
26	579	205		784	300	484	
27	516	202		718	183	535	
28	490	205		695	182	513	
29	465	205		670	177	493	
30	450	211		661	178	483	
31	455	214	0	669	169	500	
Total	18081	9283	0	27364	7455	19909	
Mean	583	299	0	883	240	642	
Ac-ft	35800	18400	0	54294	14757	39472	

Table 1

DIVISION OF WATER OF ST. MARY RIVER.

WATER USED BY UNITED STATES

AUGUST - 1922

in second - feet										
	Natural flow	Available for use	Used by U.S.A.	Excess	Deficit					
Day	St. Mary River	U.S. Share	Stored Water Released	Total	Diverted	Stored	Total	of share used		
1	824	245	49	294	206	--	206	--	88	
2	796	231	49	280	204	--	204	--	76	
3	784	225	42	267	204	--	204	--	63	
4	821	244	34	278	214	--	214	--	64	
5	826	246	37	283	284	--	284	1	--	
6	787	227	61	288	337	--	337	49	--	
7	791	228	55	283	366	--	366	83	--	
8	770	218	102	320	382	--	382	62	--	
9	733	200	144	344	392	--	392	48	--	
10	686	176	215	391	406	--	406	15	--	
11	683	175	237	412	430	--	430	18	--	
12	684	175	252	427	446	--	446	19	--	
13	674	170	260	430	454	--	454	24	--	
14	660	165	267	432	462	--	462	30	--	
15	640	160	298	458	473	--	473	15	--	
16	567	142	373	515	480	--	480	--	35	
17	555	139	405	544	388	--	388	--	156	
18	599	150	441	591	278	--	278	--	313	
19	594	148	459	607	253	--	253	--	354	
20	601	150	452	602	253	--	253	--	349	
21	620	155	422	577	250	--	250	--	327	
22	614	153	402	555	238	--	238	--	317	
23	577	144	407	551	222	--	222	--	329	
24	540	135	406	541	214	--	214	--	327	
25	475	119	397	516	205	--	205	--	311	
26	484	121	300	421	205	--	205	--	216	
27	535	134	183	317	202	--	202	--	115	
28	513	128	182	310	205	--	205	--	105	
29	493	123	177	300	205	--	205	--	95	
30	483	121	178	299	211	--	211	--	88	
31	500	125	169	294	214	--	214	--	80	
Total	19909	5272	7455	12727	9283	--	9283	364	3808	
Mean	642	170	240	410	299	--	299	12	123	
Ac-ft	39475	10452	14757	25209	18385	--	18385	737	7561	

DIVISION OF WATER OF ST. MARY RIVER.

WATER AVAILABLE FOR USE AND USED BY CANADA.

AUGUST - 1922

in second - feet

Day	Natural St. Mary R:	Canada's Share	St. Mary R: Kimball	Diverted: by Canada	Excess of share	Deficit delivered
1	824	579	667	601	88	—
2	796	565	641	592	76	—
3	784	559	622	590	63	—
4	821	577	641	605	64	—
5	826	580	579	550	—	1
6	787	560	511	491	—	49
7	791	563	480	457	—	83
8	770	552	490	445	—	62
9	733	533	485	463	—	48
10	686	510	495	461	—	15
11	683	508	490	445	—	18
12	684	509	490	441	—	19
13	674	504	480	434	—	24
14	660	495	465	422	—	30
15	640	480	465	424	—	15
16	567	425	460	424	35	—
17	555	416	572	515	156	—
18	599	449	762	628	313	—
19	594	446	800	609	354	—
20	601	451	800	609	349	—
21	620	465	792	599	327	—
22	614	461	778	623	317	—
23	577	433	762	621	329	—
24	540	405	732	637	327	—
25	475	356	667	605	311	—
26	484	363	579	544	216	—
27	535	401	516	505	115	—
28	513	385	490	469	105	—
29	493	370	465	455	95	—
30	483	362	450	441	88	—
31	500	375	455	436	80	—
Total	19909	14637	18081	16141	3808	364
Mean	642	472	583	521	123	12
Ac-ft	39475	29023	35800	32035	7561	737

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER.

WATER STORED OR RELEASED BY UNITED STATES.

SEPTEMBER - 1922

Day	in second - feet					Released from Storage	
	Inflow into Sherburne Res.			Outflow			
	Swift- current:	Canyon Creek	Other Greeks	Total			
1	110	16.0	0	126	273	0 : 147	
2	110	16.0	0	126	269	0 : 143	
3	96	13.0	0	109	267	0 : 158	
4	94	13.0	0	107	263	0 : 156	
5	92	13.0	0	105	288	0 : 183	
6	88	12.0	0	100	298	0 : 198	
7	79	12.0	0	91	292	0 : 201	
8	73	12.0	0	85	286	0 : 201	
9	64	11.0	0	75	279	0 : 204	
10	61	12.0	0	73	271	0 : 198	
11	68	14.0	0	82	265	0 : 183	
12	77	15.0	0	92	258	0 : 166	
13	83	16.0	0	99	248	0 : 149	
14	85	15.0	0	100	242	0 : 142	
15	83	14.0	0	97	237	0 : 140	
16	79	14.0	0	93	233	0 : 140	
17	79	13.0	0	92	229	0 : 137	
18	73	12.0	0	85	224	0 : 139	
19	66	11.0	0	77	218	0 : 141	
20	47	10.0	0	57	215	0 : 158	
21	59	10.0	0	69	208	0 : 139	
22	58	10.0	0	68	200	0 : 132	
23	50	8.7	0	59	188	0 : 129	
24	50	8.3	0	58	179	0 : 121	
25	48	8.7	0	57	171	0 : 114	
26	47	8.7	0	56	188	0 : 132	
27	52	9.0	0	61	206	0 : 145	
28	50	10.0	0	60	209	0 : 149	
29	46	8.3	0	54	167	0 : 113	
30	44	7.7	0	51	94	0 : 43	
Total	2111	353.4	0	2464	6965	0 : 4501	
Mean	70	11.8	0	82	232	0 : 150	
Ac-ft	4190	702	0	4892	13805	0 : 8913	

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER.

SEPTEMBER - 1922

Day	in second - feet						Natural flow St. Mary R.
	St. Mary R. Kimbball	Diverted U.S.R.S.	Stored by: U.S.R.S.	Total	Stored Water		
						Released	
1	460	214	0	674	164		510
2	455	216		671	153		518
3	438	214		652	147		505
4	430	216		646	143		503
5	426	214		640	158		482
6	430	216		646	156		490
7	442	217		659	183		476
8	450	218		668	198		470
9	426	217		643	201		442
10	406	217		623	201		422
11	392	216		608	204		404
12	378	214		592	198		394
13	378	204		582	183		399
14	369	205		574	166		408
15	369	201		570	149		421
16	360	199		559	142		417
17	357	198		555	140		415
18	357	198		555	140		415
19	351	199		550	137		413
20	345	198		543	139		404
21	335	201		536	141		395
22	338	204		542	158		384
23	322	202		524	139		385
24	316	202		518	132		386
25	314	201		515	129		386
26	308	202		510	121		389
27	304	202		506	114		392
28	312	194		506	132		374
29	314	135		449	145		304
30	342	91		433	149		284
Total	11224	6035	0	17249	4662		12587
Mean	374	201	0	575	155		420
Ac-ft	22267	11948	0	34215	9223		24992

DIVISION OF WATER OF ST. MARY RIVER.

WATER USED BY UNITED STATES.

SEPTEMBER - 1922

in second - feet

Day:	Natural flow	Available for use U.S. Share	Stored Water Released	Total	Diverted -ed	Stored	Total	Excess of share used	Deficit	
1	510	128	:	164	292	214	0	214	0	78
2	518	129	:	153	282	216	:	216	:	66
3	505	126	:	147	273	214	:	214	:	59
4	503	126	:	143	269	216	:	216	:	53
5	482	120	:	158	278	214	:	214	:	64
6	490	122	:	156	278	216	:	216	:	62
7	476	119	:	183	302	217	:	217	:	85
8	470	118	:	198	316	218	:	218	:	98
9	442	110	:	201	311	217	:	217	:	94
10	422	105	:	201	306	217	:	217	:	89
11	404	101	:	204	305	216	:	216	:	89
12	394	98	:	198	296	214	:	214	:	82
13	399	100	:	183	283	204	:	204	:	79
14	408	102	:	165	268	205	:	205	:	63
15	421	105	:	149	254	201	:	201	:	53
16	417	104	:	142	246	199	:	199	:	47
17	415	104	:	140	244	198	:	198	:	46
18	415	104	:	140	244	198	:	198	:	46
19	413	103	:	137	240	199	:	199	:	41
20	404	101	:	139	240	198	:	198	:	42
21	395	99	:	141	240	201	:	201	:	39
22	384	96	:	158	254	204	:	204	:	50
23	385	96	:	139	235	202	:	202	:	33
24	386	97	:	132	229	202	:	202	:	27
25	386	97	:	129	226	201	:	201	:	25
26	389	97	:	121	218	202	:	202	:	16
27	392	98	:	114	212	202	:	202	:	10
28	374	93	:	132	225	194	:	194	:	31
29	304	76	:	145	221	135	:	135	:	86
30	284	71	:	149	220	91	:	91	:	129
Total	12587	3145	:	4662	7807	6025	0	6025	0	1782
Mean:	420	105	:	155	260	201	0	201	0	59
Ac-ft	24992	6247	:	9223	15470	11948	0	11948	0	3522

DIVISION OF WATER OF ST. MARY RIVER.

WATER AVAILABLE FOR USE AND USED BY CANADA.

SEPTEMBER - 1922

in second - feet.

Day	Natural St. Mary R:	Canada's Share	St. Mary R: Kimball	Diverted: by Canada	Excess of share	Deficit delivered
1	510	382	460	432	78	--
2	518	389	455	417	66	
3	505	379	438	407	59	
4	503	377	430	403	53	
5	482	362	426	398	64	
6	490	368	430	401	62	
7	476	357	442	403	85	
8	470	352	450	407	98	
9	442	332	426	396	94	
10	422	317	406	381	89	
11	404	303	392	365	89	
12	394	296	378	347	82	
13	399	299	378	350	79	
14	408	306	369	343	63	
15	421	316	369	341	53	
16	417	313	360	332	47	
17	415	311	357	322	46	
18	415	311	357	317	46	
19	413	310	351	309	41	
20	404	303	345	296	42	
21	395	296	335	280	39	
22	384	288	338	268	50	
23	385	289	322	245	33	
24	386	289	316	232	27	
25	386	289	314	220	25	
26	389	292	308	207	16	
27	392	294	304	203	10	
28	374	281	312	208	31	
29	304	228	314	267	86	
30	284	213	342	310	129	--
Total	12587	9442	11224	9807	1782	--
Mean	420	315	374	327	59	--
Ac-ft	24992	18745	22267	19458	3522	--

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER.

OCTOBER - 1922

Day	in second -feet						Natural Flow St. Mary R.
	St. Mary R:	Diverted	Stored by:	Total	Stored	Natural	
	Kimball	U.S.R.S.	U.S.R.S.	Water	Flow	Flow	
1	375	460	14	--	389	113	276
2	392	357	1	--	358	43	361
3	330		--	--	330	--	330
4	345				345		345
5	342				342		342
6	330				330		330
7	318				318		318
8	316				316		316
9	312				312		312
10	308				308		308
11	298				298		298
12	295				295		295
13	289				289		289
14	287				287		287
15	284				284		284
16	268				268		268
17	284				284		284
18	282				282		282
19	266				266		266
20	238				238		238
21	277				277		277
22	273				273		273
23	266				266		266
24	271				271		271
25	278				278		278
26	289				289		289
27	277				277		277
28	302				302		302
29	335				335		335
30	366				366		366
31	400		--	--	400	--	400
Total	9458	9578	15	--	9473	--	9387
Mean	308	309		--	309	--	309
Ac-ft :	19000		30	--	19000	--	18480
	18760						

corrected 1/1
Feb 27/57..

DIVISION OF WATER OF ST. MARY RIVER.

WATER USED BY UNITED STATES.

OCTOBER - 1922

in second - feet

Day:	Natural Flow	Available for use : U.S.:	Used by U.S.A.	Excess:	Deficit
	: St. Mary	Stored water	Diverted: Stored: Total:		
	:	Released:	:	of share used	
1	276	969	113 : 203: 14	-- : 14 : --	189
2	315	350	8879 43 : 131: 1	-- : 1 : --	130
3	330	82	-- : 82: --	-- : -- : --	82
4	345	86	-- : 86: --	-- : -- : --	86
5	342	85	-- : 85: --	-- : -- : --	85
6	330	82	-- : 82: --	-- : -- : --	82
7	318	79	-- : 79: --	-- : -- : --	79
8	316	79	-- : 79: --	-- : -- : --	79
9	312	78	-- : 78: --	-- : -- : --	78
10	308	77	-- : 77: --	-- : -- : --	77
11	298	75	-- : 75: --	-- : -- : --	75
12	295	74	-- : 74: --	-- : -- : --	74
13	289	72	-- : 72: --	-- : -- : --	72
14	287	72	-- : 72: --	-- : -- : --	72
15	284	71	-- : 71: --	-- : -- : --	71
16	288	67	-- : 67: --	-- : -- : --	67
17	284	71	-- : 71: --	-- : -- : --	71
18	282	70	-- : 70: --	-- : -- : --	70
19	266	66	-- : 66: --	-- : -- : --	66
20	238	59	-- : 59: --	-- : -- : --	59
21	277	69	-- : 69: --	-- : -- : --	69
22	273	68	-- : 68: --	-- : -- : --	68
23	266	66	-- : 66: --	-- : -- : --	66
24	271	68	-- : 68: --	-- : -- : --	68
25	278	69	-- : 69: --	-- : -- : --	69
26	289	72	-- : 72: --	-- : -- : --	72
27	277	69	-- : 69: --	-- : -- : --	69
28	302	76	-- : 76: --	-- : -- : --	76
29	335	84	-- : 84: --	-- : -- : --	84
30	366	91	-- : 91: --	-- : -- : --	91
31	400	100	-- : 100: --	-- : -- : --	100
	9317	30	-- : -- : --	-- : -- : --	
Total	19437	2355	156 : 2355: 15	-- : 15: --	2355
	301	2325	-- : -- : --	-- : -- : --	
Mean	304	76	-- : 76: --	-- : -- : --	76
Ac-		75.0	-- : -- : --	-- : -- : --	
ft:	18692	4673	307 : 4673: 30	-- : 30: --	4673

see Corrections on
previous page do

DIVISION OF WATER OF ST. MARY RIVER.

WATER AVAILABLE FOR USE AND USED BY CANADA.

OCTOBER - 1922

Day	in second - feet					
	Natural St. Mary R.	Canada's Share	St. Mary R. Kimball	Diverted by Canada	Excess of share	Deficit delivered
1	276 361	271 207	460	358	189	--
2	315 350	262 236	392	326	130	
3	330	248	330	301	82	
4	345	259	345	309	86	
5	342	257	342	304	85	
6	330	248	330	290	82	
7	318	239	318	280	79	
8	316	237	316	270	79	
9	312	234	312	261	78	
10	308	231	308	249	77	
11	298	223	298	242	75	
12	295	221	295	233	74	
13	289	217	289	223	72	
14	287	215	287	220	72	
15	284	213	284	218	71	
16	268	201	268	215	67	
17	284	213	284	210	71	
18	282	212	282	165	70	
19	266	200	266	98	66	
20	238	179	238	88	59	
21	277	208	277	129	69	
22	273	205	273	127	68	
23	266	200	266	154	66	
24	271	203	271	179	68	
25	278	209	278	191	69	
26	289	217	289	215	72	
27	277	208	277	196	69	
28	302	226	302	237	76	
29	335	251	335	276	84	
30	366	275	366	270	91	
31	400	300	400	262	100	--
Total	9437	7082	9437	7096	2496	--
Mean	304	229	309	229	80	--
Ac-ft	18692	14019	19000	14081	4950	--

DIVISION OF ST.MARY RIVER - 1922.

CANADA.

WATER AVAILABLE, IN ACRE-FEET.

Month	: St Mary R.	: Ralph Cr.	: Pothole creek	: Lee Cr.	: Combined flow
April	: 16500	: 964	: 2797	: 4046	: 24307
May	: 127000	: 566	: 1070	: 14327	: 142963
June	: 212000	: 274	: 77	: 9818	: 222169
July	: 64600	: 314	: --	: 4181	: 69095
August	: 35800	: 197	: --	: 812	: 36809
September	: 22300	: 125	: --	: 494	: 22919
October	: 19000	: 111	: --	: --	: 19111
Total	: 497200	: 2551 a:	b 3944	c 33678	: 537373

DISPOSITION

Month	: Diverted by: A.R.& L.Co.	: Wasted by : A.R.& I.Co.	: Losses A.R.& I.Co.	: Stored in: Chin Res.	: St. Mary R. Lethbridge
April	: 2140	: 860	: 1060	: 9507	: 20648
May	: 25210	: 7536	: 4552	: 5380	: 120700
June	: 41474	: 6897	: 5057	: 7692	: 185474
July	: 42365	: 11411	: 11118	: 5900	: 50789
Aug.	: 32035	: 1770	: 2234	: 4719	: 7809
Sept.	: 19458	: 100	: 328	: 589	: 4522
Oct.	: 14081	: 3075	: 1740		
Total	: 176763	: 31649	d 26089	e 33950	x : 389942

a - includes seepage losses from U.S.R.S. St. Mary canal.

b - Natural flow only

c - Computed

d - Wasted in Pinepound & Pothole wasteways

e - Evaporation and seepage between headgates and Magrath

x - Below all points od division.

ST. MARY AND MILK RIVERS
USE OF WATER FOR IRRIGATION.

APRIL TO OCTOBER - 1922

UNITED STATES.

WATER AVAILABLE

Month	Actual flow:		Diverted	Total Natural:		
	St. Mary R. Kimball	St. Mary R. to Milk R.	flow North & South Milk R.	Milk River East Xing	Milk River Havre	
April	16500	:	Ac-ft	Ac-ft	Ac-ft	Ac-ft
May	127000	:	2510	12230	31000	49900
June	212000	:	14200	16390	30700	43300
July	64600	:	20800	8530	22400	25100
Aug.	35800	:	18400	8280	27100	36600
Sept.	22300	:	12000	3880	17500	21900
Oct.	19000	:	30	970	11800	12000
				1380	4300	5870
Total	497200	:	67940	51660	144800	194670

DISPOSITION

Month	Diverted by		Applied to	Stored or	In Nelson
	Milk River	Canals	the land	Released	Reservoir at
April	23490	:	3920	Plus 18350	17840
May	12350	:	5800	" 4270	35640
June	15640	:	12500	Minus 1030	35640
July	20350	:	16910	" 2040	27000
August	15760	:	9540	Plus 1640	25810
September	9590	:	900	" 7670	29360
October	11240	:	2340	" 3780	29930
November	110	:	0	" 10	28480
	b		c	d	
Total	108530	:	51910	:	:

ST. MARY AND MILK RIVERS
USE OF WATER FOR IRRIGATION
APRIL TO OCTOBER - 1922

Month	UNITED STATES				WASTED
	LOSSES		:		
:	Carriage	: Nelson Res:	Total	Milk River:	Milk River
:	lossed in	Seepage &	losses	Canals	at
St. Mary Canal	Evaporation:				
and Milk R.:	losses				
March	:	1210	:	1210	:
April	:	550	:	550	:
May	410	4270	4680	2910	215000
June	2250	3320	5570	3140	44700
July	4270	2250	6520	2890	27100
Aug.	2890	2830	5720	4180	18400
Sept.	2000	4120	6120	900	9700
Oct.	:	3210	3210	4450	5900
Nov.	:	1460	1460	300	
Total :	11820	23220	35040	18770	762200

- (aa) The natural flow can be found in Table 1
- (a) This total was obtained by adding the natural flow of the South Fork of the Milk River near the International Boundary to the natural flow of the North Fork of Milk River at the International Boundary. The rating station on the North Fork $\frac{1}{2}$ mile above the outlet of St. Mary Canal was used while St. Mary Canal was delivering water.
- (b) Fort Belknap Canal, Paradise Canal near Chinook; Harlem Canal, Agency Ditch near Harlem; Dodson North and South Canals near Dodson; Vandalia Canal near Vandalia.
- (c) Water diverted by the Milk River Canals less that which was wasted or stored. It does not include losses of St. Mary water in passing down Milk River, or in the distribution systems

- (d) Water turned into the reservoir was assumed to include rainfall and tributary run-off. The column headed "stored or released" shows the difference between the inflow and outflow, including waste back to Milk River for the month. This difference when combined with the losses, gives the change in amount in the reservoir at the end of each month, as shown in the next column.
- (e) These losses occurred between the point of measurement of the St. Mary Canal at St. Mary Crossing and the diversion of water for irrigating purposes in the Upper Milk River Valley. The first important diversion is the Fort Belknap Canal at Lohman. The results given are based on stream flow records of the St. Mary Canal at St. Mary Crossing, at Hudson Bay Divide. North and South Forks of the Milk River near the International Boundary, North Fork Milk River above the mouth of the St. Mary Canal, Milk River at Harlem, and the estimated inflow not otherwise measured.
- (f) Wasted from Dodson North, Dodson South, Bowdoin, Nelson Reservoir, Vandalia and Fort Belknap Canals, 2780 acre-feet turned from Nelson Reservoir into Milk River and 6040 acre-feet turned into Bowdoin Lake. Waste from other private canals not available. All waste except from Vandalia canal and Bowdoin Lake could be re-diverted at Vandalia Dam if needed.
- (g) This column shows the flow below Vandalia Dam, which is the only water wasted in Milk River Valley, except water to Bowdoin Lake without chance of further use.

Table 3.

DISPOSITION OF THE WATERS ON LODGE CREEK.

1922

in acre-feet.

Irrigator	: April	: May	: June	: July	: Aug.	: Sept	: Oct.	: Total
English	: --:	20:	62:	4:	--:	--:	--:	86
Spangler	: --:	113:	23:	--:	--:	--:	--:	136
Hammond	: --:	83:	--:	--:	--:	--:	--:	83
Total used by Canada	: --:	216:	85:	4:	--:	--:	--:	305
Flow at Boundary	: 39900:	6210:	179:	34:	1:	--:	--:	46324

No flow at the International Boundary after August 5th.

UNITED STATES.

Chinook North Assocation	: 1470:	2540:	380:	90:	--:	--:	--:	4480
-----------------------------	---------	-------	------	-----	-----	-----	-----	------

DISPOSITION OF THE WATERS OF BATTLE CREEK.

1922

CANADA	in acre-feet							
Irrigator	April	May	June	July	Aug.	Sept.	Oct.	Total
Leslie	:	--	--	12	--	--	--	12
Spangler	:	--	9	48	10	--	--	67
Harmon & Henderson	:	--	--	189	45	4	--	238
Patterson	:	52	34	--	--	--	--	86
Marshall & Gaff	:	--	142	220	215	--	--	577
Shephard	:	65	13	145	--	--	30	253
Wilson	:	--	--	--	--	--	--	--
Wilkes	:	--	--	48	--	--	--	48
Stirling & Nash	:	--	30	327	20	--	--	377
Badger	:	--	--	--	--	--	--	--
Total used by Canada	:	117	228	989	290	4	--	30: 1658
Flow at the Boundary	:	30347	16971	2440	806	296	221	295: 51376

UNITED STATES.

Matheson : 250: 85: --: 15: 70: --: --: 420

DISPOSITION OF THE WATERS OF FRENCHMAN RIVER.

1922.

CANADA

in acre-feet

Irrigator	:April:	May	:June:	July	:Aug.:	Sept	:Oct.:	Total
Wylie	:	--:	192:	98:	32:	--:	--:	322
Bull	:	--:	253:	280:	29:	--:	--:	562
Pearse	:	--:	2:	42:	30:	--:	--:	74
Armstrong	:	--:	23:	5:	--:	--:	--:	28
A.Cross	:	--:	--:	59:	23:	--:	--:	82
F.Cross	:	--:	--:	219:	44:	--:	--:	263
Bolingbroke	:	--:	--:	12:	1:	--:	--:	13
Strong	:	226:	82:	103:	125:	19:	--:	555
Morrison	:	--:	--:	116:	--:	--:	--:	116
Total used by Canada	226:	552:	934:	284:	19:	--:	--:	2015
:	:	:	:	:	:	:	:	:

Flow at the Boundary

66600:32800:6250: 4380:1840: 904: 664:113438

UNITED STATES.

Frenchman	:	--:	--:	260:	880:	800:	60:	--:	2000	
Rock Creek	:	--:	--:	105:	830:	170:	175:	40:	0--:	1320

HD
1694
.A2
R424
1922

Report to the International Joint
Commission on the division and use
of the waters of the St. Mary and
Milk Rivers...

DATE DUE

BORROWER'S NAME

HD
1694
.A2
R424
1922

Report to the International Joint
Commission on the division and use
of the waters of the St. Mary and
Milk Rivers...

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