Report to

THE INTERNATIONAL JOINT COMMISSION

on

THE DIVISION AND USE MADE OF THE WATERS OF

ST. MARY AND MILK RIVERS

by

G. L. PARKER
representing the United States

and

VICTOR MEEK
representing Canada

1940

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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 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 ended October 31st, 1940.

Respectfully submitted,

Accredited Officer of the United States.

Accredited Officer of His Majesty.

April 1st, 1941.

Introduction

The field work incidental to the division and administration of the waters of the St. Mary and Milk Rivers in Alberta, Saskatchewan and Montana was conducted, during the irrigation season of 1940, by the same groups of engineers as in previous years.

The Chief Hydraulic Engineer, United States Geological Survey, Mr. G. L. Parker, as accredited officer of the United States, was represented in the field by Mr. A. H. Tuttle, District Engineer, Helena, Montana. Mr. V. M. Meek, Controller, Dominion Water and Power Bureau, as accredited officer of His Majesty, was represented by Mr. O. H. Hoover, Engineer-in-Charge, Calgary, Alberta.

The water of the two rivers was divided between the two countries in accordance with the Order of the Commission dated in Ottawa, Canada, on the 4th day of October, 1921.

The hydrometric data on which this report is based, were obtained in Montana by engineers of the United States Geological Survey under the supervision of Mr. Tuttle; while those from streams and ditches in Canada were collected by engineers of the Dominion Water and Power Bureau, under the direction of Mr. Hoover. The

joint international gauging stations were visited frequently by representatives of both countries.

The annual report was compiled and assembled by Mr. S. G. Dawson, Dominion Water and Power Bureau, Ottawa, Canada.

When the natural flow of St. Mary River fell below the combined capacity of the two canals diverting therefrom, and when the demand for water in each country was equivalent to or in excess of its share of the natural flow of St. Mary River, which occurred this season towards the middle of June and continued until the closing of the season, the field engineers kept closely informed as to the natural flow of the river, the water stored or released from storage and the quantity diverted by each country. Any discrepancy in the division was therefore discovered and adjustments made to allow each country its proper share as set forth in the Order of the Commission dated October 4th, 1921. Statements showing the daily division of water were prepared and forwarded to the Superintendent, Lethbridge Section, Canadian Pacific Irrigation System; to the Project Manager, United States Bureau of Reclamation, Malta, Montana; and to the Controller, Dominion Water and Power Bureau, Ottawa, Canada.

Division of Water

The United States St. Mary Canal was in operation from May 3rd to August 29th, and from October 30th to November 13th, water being delivered to the North Branch Milk River on May 5th.

As the seepage from the canal between the intake and the crossing of the St. Mary River, which this year was 17% of the water diverted at the headgates, is assumed to return directly to the river and eventually become available to Canada, the discharge of 122,700 acre-feet passing in the canal at St. Mary Crossing, during the period May 3rd to August 29th, is considered as the actual quantity diverted from the St. Mary River by the United States. Of this quantity, 121,700 acre-feet was delivered to the North Branch Milk River and made available for irrigation in Montana. The negligible loss of about 0.8% between the St. Mary River and the Hudson Bay Divide, the end of the canal, indicated that local inflow was practically equal to any losses due to evaporation and seepage.

On November 20th, 1939, approximately 2,300 acre-feet of water remained in Sherburne reservoir, by March 30th, 1940, this was increased to 13,600 acre-feet. The maximum storage reached during the season was 50,200 acre-feet on June 24th. On October 30th, 1940, 14,400 acre-feet of water

remained in storage.

As only a small quantity of water was diverted in Canada from Milk River, the natural flow of the river, which is estimated at 48,000 acre-feet for the open water period, from March 1st to October 31st, is considered as being delivered to the United States at Eastern Crossing. The total diversion for irrigation from Milk River in Montana was 177,600 acre-feet.

The quantity delivered to the United States at the International Boundary from the Northern Tributaries of Milk River, during the open water period of 1940, was 174,500 acre-feet. This flow is 83% of that recorded in 1939 and about 130% of the average for the last 14 years.

During the open water period of 1940, Canada stored in Cypress Lake reservoir, 9,370 acre-feet of the flow of Battle Creek, while 26,000 acre-feet was delivered to Montana at the International Boundary; of this amount more than 22,000 acre-feet came during April. In the Frenchman River Basin Canada stored in Cypress Lake reservoir about 7,300 acre-feet of the flow from Davis and Belanger Creeks, and 11,600 acre-feet from the main stream in the reservoirs at East End and Val Marie. From this storage 9,300 acre-feet was released to irrigate lands in the Frenchman River valley.

while 70,560 acre-feet of the natural flow of Frenchman River was delivered to Montana. The apportionment during the open water season is shown in Table 3.

The Canadian Pacific Railway Canal at Kimball, Alberta, diverted 175,700 acre-feet from the St. Mary River during the period of operation from the 7th of April to the 30th of October. 157,600 acre-feet of this diversion was applied to lands in Southern Alberta during the irrigation season.

The Dominion Water and Power Bureau is dependent to a large extent upon the irrigators themselves for records of the diversions in Canada from the Northern Tributaries of Milk River as, in the majority of cases, the diversions are too small to justify the expense of appointing and paying gauge observers. Consequently the records are believed to be incomplete and of doubtful value. The total diversions from these tributaries in Canada as reported and shown in Table 4 were: from Lodge Creek, 425 acre-feet; from Battle Creek, 10,486 acre-feet; from Frenchman River, 8,647 acre-feet.

Any question as to the proper share of St. Mary River being delivered to either country was decided in the following manner. Record of the daily flow was kept of Swiftcurrent Creek at Many Glacier, but the flow of the other creeks entering Swiftcurrent Creek above the Sherburne dam were estimated. The total of these creeks gave the inflow

into Sherburne reservoir. The losses by evaporation in the reservoir were considered when estimating the flow from the unrecorded small streams. A record of the outflow from the reservoir was kept at the gauging station just below the dam. The difference between the inflow and the outflow showed the quantity of water being stored or released from storage. A record of the daily flow of the United States St. Mary Canal at St. Mary crossing was kept to find the water diverted by the United States and a record of the daily flow of the St. Mary River at Kimball, near the International Boundary, was kept to determine the water being delivered to Canada.

If water was being stored in Sherburne reservoir the natural flow of St. Mary River at the Boundary was obtained by adding the quantity of water stored to that diverted by the St. Mary Canal and that delivered to Canada, a two-day lag was allowed for stored water to reach the Boundary. If stored water was being released, the quantity released was deducted from the combined flow of the St. Mary Canal and that in the river at Kimball to determine the natural flow.

The natural flow having been determined, the share to which each country was entitled was calculated on the following basis:-

(1) When the natural flow of the St. Mary River was 666 cubic-feet per second or less, Canada was entitled, by the ruling of the Commission, to three-fourths of that flow and the United States to one-fourth.

(2) When the natural flow of the St. Mary River was greater than 666 cubic-feet per second, Canada was entitled to 500 cubic-feet per second plus one-half of the increase over 666 cubic-feet per second and the United States was entitled to the remainder.

No actual division was made of the waters of Milk River or its Northern tributaries except those of Frenchman River and Battle Creek.

Water Supply

The precipitation on the foothills and in the mountainous areas forming the headwaters of the St. Mary and Milk Rivers was below normal again during 1940, while that on the prairies tributary to Milk River was greater than is usual.

In the mountainous areas tributary to the St. Mary River Basin, as shown by the nineteenth annual international survey of the snow conditions on the headwaters of the Swiftcurrent Creek, an area considered typical of the headwaters of St. Mary River, the snow cover was 75% of the mean

of the previous eighteen years of record while the water content of this snow cover was 71% of the mean. The run-off of 49,400 acre-feet from the area surveyed, during May, June and July was also 74% of the average for the previous eighteen year period.

The natural flow of 364,100 acre-feet of St. Mary River at the Boundary during the irrigation season of 1940, from the first of April to the end of October, was 62% of the average for 37 years of record.

The run-off from the prairies, as indicated by the Northern tributaries of Milk River, was 23% in excess of the average for the last fourteen years.

Twenty-two gauging stations used in the determination of the natural flow of the streams in the St. Mary and Milk River Basins were operated jointly as international gauging stations. The construction of reservoirs and the formation of two irrigation districts in the valley of the Frenchman River in Canada, has necessitated the establishment of a number of new gauging stations on this stream and on Battle Creek.

Consideration is being given to the joint operation of these gauging stations in accordance with the provisions of Articles VI and VII of the Order of the International Joint Commission of October 4th, 1921.

An appendix to this report gives the results of current meter measurements, the daily gauge heights and the discharge at all the gauging stations operated in the two drainage basins during 1940.

Description of Tables

The Tables following have been prepared to summarize the data on the division and use made of the waters in the St. Mary and Milk River Basins.

Table No. 1 shows the method used to determine the natural flow of St. Mary River during the irrigation season of 1940. the water available for use and used by United States and Canada. In this Table there are four pages for each month from April to October, inclusive.

Page 1 (water stored or released from Sherburne reservoir) shows the daily inflow into and outflow from Sherburne reservoir. The difference gives the quantity of water stored or released from storage. On this sheet the unrecorded inflow is determined by comparison with the recorded flows in Swiftcurrent Creek and with the use of the water levels of Sherburne reservoir to give the gain or loss in storage, after direct application of the evaporation and seepage losses has been made. This estimate is put in the column headed "unrecorded inflow".

Page 2, (determination of the natural flow of the St. Mary River) shows the actual flow of St. Mary River at Kimball near the International Boundary, the quantity of water diverted, stored or released from storage, by the United States and the computed natural flow of St. Mary River, or that flow which would have crossed the Boundary had there been no interference. It has been determined that two days are required for stored water released from Sherburne reservoir, to influence the flow at the Boundary, consequently a two-day lag has been applied to the stored or released water.

Page 3, (water available for use and used by the United States) shows the water available for use and used by the United States under the ruling of the Order of October 4th, 1921, the water diverted and stored and the excess or deficit in the quantity used over the quantity available.

Page 4, (water available for use and used by Canada) shows the natural flow of St. Mary River at the International Boundary, Canada's share by the ruling of the Commission, the actual discharge of St. Mary River at Kimball, which is the quantity available for use by Canada, the quantity used by Canada and the excess or deficit of the quantity received by Canada as compared with the share.

Table 2 is a statement showing the quantity in acre-feet taken each month by each country and the quantity thereof applied to the land, the quantity diverted from the St. Mary River, the loss or waste from canals and the diversions from Milk River in the United States.

Table 3 shows the determination of the natural flow of Frenchman River at the International Boundary. This Table consists of three parts: part 1 shows the quantity used by Canada at East End and the loss or gain in the river between East End and Fifty-mile; part 2 shows the quantity used by Canada at Val Marie and the loss or gain between Fifty-mile and Val Marie; part 3 shows the loss or gain between Val Marie and the International Boundary and the natural flow of Frenchman River at the Boundary.

Table 4 shows the available information on the diversions from the Northern Tributaries of Milk River in Canada.

Table 5 gives the measured diversions from the Northern Tributaries of Milk River in the United States. Smaller diversions have not been measured.

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
APRIL - 1940

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	35	27	62	0.5	61	--
2	35	27	62	0.5	61	--
3	37	25	62	0.5	61	--
4	34	28	62	0.5	61	--
5	31	31	62	0.5	61	--
6	29	31	60	0.5	60	--
7	29	27	56	0.5	56	--
8	32	22	54	0.5	53	--
9	42	10	52	0.5	51	--
10	49	5	54	0.5	54	--
11	41	8	49	1.0	48	--
12	38	9	47	1.0	46	--
13	52	152	204	1.0	203	--
14	112	92	204	1.0	203	--
15	148	59	207	1.0	206	--
16	134	73	207	1.0	206	--
17	117	90	207	1.0	206	--
18	134	73	207	1.0	206	--
19	161	31	192	1.0	191	--
20	179	74	253	1.0	252	--
21	198	33	231	1.0	230	--
22	174	20	194	1.0	193	--
23	166	15	181	1.0	180	--
24	151	52	203	1.0	202	--
25	136	30	166	1.0	165	--
26	121	20	141	1.0	140	--
27	119	80	199	149.0	50	--
28	131	68	199	149.0	50	--
29	136	65	201	149.0	52	--
30	129	20	149	97.0	52	--
Total sec-ft.	2930	1297	4227	565.0	3660	--
Mean	98	43	141	19	122	--
Ac-ft.	5810	2570	8380	1120	7260	--

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
APRIL - 1940.

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	157	--	62	219	--	219
2	135	--	62	197	--	197
3	128	--	61	189	--	189
4	122	--	61	183	--	183
5	125	--	61	186	--	186
6	129	--	61	190	--	190
7	129	--	61	190	--	190
8	125	--	60	185	--	185
9	125	--	56	181	--	181
10	125	--	53	178	--	178
11	129	--	51	180	--	180
12	132	--	54	186	--	186
13	154	--	48	202	--	202
14	175	--	46	221	--	221
15	181	--	203	384	--	384
16	170	--	203	373	--	373
17	187	--	206	393	--	393
18	201	--	206	407	--	407
19	208	--	206	414	--	414
20	227	--	206	433	--	433
21	286	--	191	477	--	477
22	339	--	252	591	--	591
23	408	--	230	638	--	638
24	435	--	193	628	--	628
25	454	--	180	634	--	634
26	468	--	202	670	--	670
27	520	--	165	685	--	685
28	583	--	140	723	--	723
29	602	--	50	652	--	652
30	595	--	50	645	--	645
Total sec-ft.	7754	--	3680	11434	--	11434
Mean	258	--	123	381	--	381
Ac-ft.	15380	--	7300	22680	--	22680

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
APRIL - 1940.

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	219	55	--	55	--	62	62	7	--
2	197	49	--	49	--	62	62	13	--
3	189	47	--	47	--	61	61	14	--
4	183	46	--	46	--	61	61	15	--
5	186	46	--	46	--	61	61	15	--
6	190	48	--	48	--	61	61	13	--
7	190	48	--	48	--	61	61	13	--
8	185	46	--	46	--	60	60	14	--
9	181	45	--	45	--	56	56	11	--
10	178	44	--	44	--	53	53	9	--
11	180	45	--	45	--	51	51	6	--
12	186	46	--	46	--	54	54	8	--
13	202	50	--	50	--	48	48	--	2
14	221	55	--	55	--	46	46	--	9
15	384	96	--	96	--	203	203	107	--
16	373	93	--	93	--	203	203	110	--
17	393	98	--	98	--	206	206	108	--
18	407	102	--	102	--	206	206	104	--
19	414	104	--	104	--	206	206	102	--
20	433	108	--	108	--	206	206	98	--
21	477	119	--	119	--	191	191	72	--
22	591	148	--	148	--	252	252	104	--
23	638	160	--	160	--	230	230	70	--
24	628	157	--	157	--	193	193	36	--
25	634	158	--	158	--	180	180	22	--
26	670	168	--	168	--	202	202	34	--
27	685	176	--	176	--	165	165	--	11
28	723	195	--	195	--	140	140	--	55
29	652	163	--	163	--	50	50	--	113
30	645	161	--	161	--	50	50	--	111
Total sec-ft.	11434	2876	--	2876	--	3680	3680	1105	301
Mean	381	~~96~~	--	96	--	123	123	37	10
Ac-ft.	22680	5700	--	5700	--	7300	7300	2190	597

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
APRIL - 1940

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess or Deficit of Share Delivered	
1	219	164	157	--	--	7
2	197	148	135	--	--	13
3	189	142	128	--	--	14
4	183	137	122	--	--	15
5	186	140	125	--	--	15
6	190	142	129	--	--	13
7	190	142	129	55	--	13
8	185	139	125	82	--	14
9	181	136	125	112	--	11
10	178	134	125	107	--	9
11	180	135	129	110	--	6
12	186	140	132	120	--	8
13	202	152	154	140	2	--
14	221	166	175	157	9	--
15	384	288	181	164	--	107
16	373	280	170	150	--	110
17	393	295	187	160	--	108
18	407	305	201	179	--	104
19	414	310	208	189	--	102
20	433	325	227	203	--	98
21	477	358	286	255	--	72
22	591	443	339	297	--	104
23	638	478	408	366	--	70
24	628	471	435	327	--	36
25	634	476	454	334	--	22
26	670	502	468	339	--	34
27	685	509	520	348	11	--
28	723	528	583	348	55	--
29	652	489	602	327	113	--
30	645	484	595	320	111	--
Total sec-ft.	11434	8558	7754	5189 (7-30)	301	1105
Mean	381	285	258	216	10	37
Ac-ft.	22680	16970	15380	10290	597	2190

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
MAY - 1940

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	124	126	250	97	153	--
2	161	143	304	146	158	--
3	328	168	496	238	258	--
4	400	159	559	298	261	--
5	325	168	493	380	113	--
6	253	166	419	419	--	--
7	209	250	459	451	8	--
8	201	254	455	446	9	--
9	238	50	288	443	--	155
10	372	27	399	443	--	44
11	617	240	857	307	550	--
12	641	90	731	96	635	--
13	519	150	669	2	667	--
14	436	197	633	2	631	--
15	393	128	521	1	520	--
16	362	139	501	1	500	--
17	325	145	470	1	469	--
18	296	86	382	1	381	--
19	355	110	465	1	464	--
20	429	112	541	1	540	--
21	407	78	485	118	367	--
22	425	165	590	315	275	--
23	466	148	614	252	362	--
24	507	185	692	125	567	--
25	557	151	708	83	625	--
26	549	166	715	2	713	--
27	447	149	596	2	594	--
28	362	100	462	2	460	--
29	312	132	444	151	293	--
30	331	120	451	324	127	--
31	418	126	544	324	220	--
Total sec-ft.	11765	4428	16193	5472	10920	199
Mean	380	143	522	177	352	6
Ac-ft.	23340	8780	32120	10850	21660	395

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
MAY - 1940.

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	583	--	52	635	--	635
2	608	--	52	660	--	660
3	652	80	153	885	--	885
4	520	296	158	974	--	974
5	686	320	258	1264	--	1264
6	764	330	261	1355	--	1355
7	802	350	113	1265	--	1265
8	787	403	--	1190	--	1190
9	779	441	8	1228	--	1228
10	844	449	9	1302	--	1302
11	1040	454	--	1494	155	1339
12	1290	459	--	1749	44	1705
13	1320	461	550	2331	--	2331
14	1350	467	635	2452	--	2452
15	1340	468	667	2475	--	2475
16	1290	468	631	2389	--	2389
17	1240	468	520	2228	--	2228
18	1160	468	500	2128	--	2128
19	1090	467	469	2026	--	2026
20	1190	427	381	1998	--	1998
21	1590	75	464	2129	--	2129
22	1230	445	540	2215	--	2215
23	1320	495	367	2182	--	2182
24	1320	579	275	2174	--	2174
25	1380	596	362	2338	--	2338
26	1450	600	567	2617	--	2617
27	1420	598	625	2643	--	2643
28	1310	598	713	2621	--	2621
29	1210	594	594	2398	--	2398
30	1230	594	460	2284	--	2284
31	1340	596	293	2229	--	2229
Total sec-ft.	34135	13046 (3-31)	10677	57858	199	57659
Mean	1100	450	344	1866	6	1860
Ac-ft.	67710	25880	21180	114800	395	114400

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
MAY - 1940.

Day	Natural Flow St.Mary River	AVAILABLE FOR US BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	635	159	--	159	--	52	52	--	107
2	660	165	--	165	--	52	52	--	113
3	885	276	--	276	80	153	233	--	43
4	974	320	--	320	296	158	454	134	--
5	1264	465	--	465	320	258	578	113	--
6	1355	511	--	511	330	261	591	80	--
7	1265	466	--	466	350	113	463	--	3
8	1190	428	--	428	403	--	403	--	25
9	1228	447	--	447	441	8	449	2	--
10	1302	484	--	484	449	9	458	--	26
11	1339	503	155	658	454	--	454	--	204
12	1705	686	44	730	459	--	459	--	271
13	2331	999	--	999	461	550	1011	12	--
14	2452	1059	--	1059	467	635	1102	43	--
15	2475	1071	--	1071	468	667	1135	64	--
16	2389	1028	--	1028	468	631	1099	71	--
17	2228	947	--	947	468	520	988	41	--
18	2128	897	--	897	468	500	968	71	--
19	2026	846	--	846	467	469	936	90	--
20	1998	832	--	832	427	381	808	--	24
21	2129	898	--	898	75	464	539	--	359
22	2215	941	--	941	445	540	985	44	--
23	2182	924	--	924	495	367	862	--	62
24	2174	920	--	920	579	275	854	--	66
25	2338	1002	--	1002	596	362	958	--	44
26	2617	1142	--	1142	600	567	1167	25	--
27	2643	1155	--	1152	598	625	1223	68	--
28	2621	1144	--	1144	598	713	1311	167	--
29	2398	1032	--	1032	594	594	1188	156	--
30	2284	975	--	975	594	460	1054	79	--
31	2229	948	--	948	596	293	889	--	59
Total sec-ft.	57659	23670	199	23869	13046 (3-31)	10677	23723	1260	1406
Mean	1860	764	6	770	450	344	765	41	45
Ac-ft.	114400	46950	395	47340	25880	21180	47050	2500	2790

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
MAY - 1940

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess or Deficit of Share Delivered	
1	635	476	583	332	107	--
2	660	495	608	402	113	--
3	885	609	652	415	43	--
4	974	654	520	395	--	134
5	1264	799	686	415	--	113
6	1355	844	764	424	--	80
7	1265	799	802	420	3	--
8	1190	762	787	409	25	--
9	1228	781	779	409	--	2
10	1302	818	844	449	26	--
11	1339	836	1040	514	204	--
12	1705	1019	1290	495	271	--
13	2331	1332	1320	493	--	12
14	2452	1393	1350	495	--	43
15	2475	1404	1340	495	--	64
16	2389	1361	1290	487	--	71
17	2228	1281	1240	480	--	41
18	2128	1231	1160	478	--	71
19	2026	1180	1090	476	--	90
20	1998	1166	1190	495	24	--
21	2129	1231	1590	507	359	--
22	2215	1274	1230	518	--	44
23	2182	1258	1320	594	62	--
24	2174	1254	1320	596	66	--
25	2338	1336	1380	596	44	--
26	2617	1475	1450	596	--	25
27	2643	1488	1420	591	--	68
28	2621	1477	1310	584	--	167
29	2398	1366	1210	584	--	156
30	2284	1309	1230	598	--	79
31	2229	1281	1340	598	59	--
Total sec-ft.	57659	33989	34135	15340	1406	1260
Mean	1860	1100	1100	495	45	41
Ac-ft.	114400	67420	67710	30430	2790	2500

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
JUNE - 1940

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	443	115	558	270	288	--
2	400	135	535	143	392	--
3	418	139	557	3	554	--
4	396	129	525	78	447	--
5	368	150	518	186	332	--
6	321	108	429	217	212	--
7	277	107	384	217	167	--
8	280	134	414	217	197	--
9	271	98	369	217	152	--
10	287	98	385	270	115	--
11	358	113	471	312	159	--
12	400	168	568	315	253	--
13	418	114	532	317	215	--
14	429	104	533	315	218	--
15	358	113	471	317	154	--
16	302	86	388	317	71	--
17	277	89	366	317	49	--
18	265	85	350	317	33	--
19	274	61	335	319	16	--
20	293	83	376	319	57	--
21	302	80	382	319	63	--
22	287	158	445	319	126	--
23	232	92	324	326	--	2
24	193	65	258	362	--	104
25	193	59	252	390	--	138
26	212	58	270	408	--	138
27	204	45	249	439	--	190
28	179	35	214	471	--	257
29	164	43	207	516	--	309
30	161	45	206	569	--	363
Total sec-ft.	8962	2909	11871	9102	4270	1501
Mean	299	97	396	303	142	50
Ac-ft.	17780	5770	23550	18050	8470	2980

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
JUNE - 1940

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	1440	598	127	2165	--	2165
2	1490	600	220	2310	--	2310
3	1380	598	288	2266	--	2266
4	1220	594	392	2206	--	2206
5	1200	592	554	2346	--	2346
6	1210	594	447	2251	--	2251
7	1200	594	332	2126	--	2126
8	1210	594	212	2016	--	2016
9	1160	590	167	1917	--	1917
10	1070	590	197	1857	--	1857
11	1110	601	152	1863	--	1863
12	1160	601	115	1876	--	1876
13	1200	605	159	1964	--	1964
14	1230	605	253	2088	--	2088
15	1240	609	215	2064	--	2064
16	1210	609	218	2037	--	2037
17	1140	605	154	1899	--	1899
18	1080	603	71	1754	--	1754
19	1030	600	49	1679	--	1679
20	979	600	33	1612	--	1612
21	951	598	16	1565	--	1565
22	999	601	57	1657	--	1657
23	969	600	63	1632	--	1632
24	860	603	126	1589	--	1589
25	802	600	--	1402	2	1400
26	779	600	--	1379	104	1275
27	764	598	--	1362	138	1224
28	757	596	--	1353	138	1215
29	735	594	--	1329	190	1139
30	727	592	--	1319	257	1062
Total sec-ft.	32302	17964	4617	54883	829	54054
Mean	1080	599	154	1830	28	1800
Ac-ft.	64070	35630	9160	108900	1640	107200

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
JUNE - 1940

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	2165	916	--	916	598	127	725	--	191
2	2310	988	--	988	600	220	820	--	168
3	2266	966	--	966	598	288	886	--	80
4	2206	936	--	936	594	392	986	50	--
5	2346	1006	--	1006	592	554	1146	140	--
6	2251	959	--	959	594	447	1041	82	--
7	2126	896	--	896	594	332	926	30	--
8	2016	841	--	841	594	212	806	--	35
9	1917	792	--	792	590	167	757	--	35
10	1857	762	--	762	590	197	787	25	--
11	1863	765	--	765	601	152	753	--	12
12	1876	771	--	771	601	115	716	--	55
13	1964	815	--	815	605	159	764	--	51
14	2088	877	--	877	605	253	858	--	19
15	2064	865	--	865	609	215	824	--	41
16	2037	852	--	852	609	218	827	--	25
17	1899	783	--	783	605	154	759	--	24
18	1754	710	--	710	603	71	674	--	36
19	1679	673	--	673	600	49	649	--	24
20	1612	639	--	639	600	33	633	--	6
21	1565	616	--	616	598	16	614	--	2
22	1657	662	--	662	601	57	658	--	4
23	1632	649	--	649	600	63	663	14	--
24	1589	628	--	628	603	126	729	101	--
25	1400	533	2	535	600	--	600	65	--
26	1275	471	104	575	600	--	600	25	--
27	1224	445	138	583	598	--	598	15	--
28	1215	441	138	579	596	--	596	17	--
29	1139	403	190	593	594	--	594	1	--
30	1062	364	257	621	592	--	592	--	29
Total sec-ft.	54054	22024	829	22853	17964	4617	22581	565	837
Mean	1800	734	28	762	599	154	753	19	28
Ac-ft.	107200	43680	1640	45330	35630	9160	44790	1120	1660

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
JUNE - 1940

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess of Share	Deficit Delivered
1	2165	1249	1440	618	191	--
2	2310	1322	1490	683	168	--
3	2266	1300	1380	734	80	--
4	2206	1270	1220	838	--	50
5	2346	1340	1200	945	--	140
6	2251	1292	1210	1010	--	82
7	2126	1230	1200	1000	--	30
8	2016	1175	1210	960	35	--
9	1917	1125	1160	983	35	--
10	1857	1095	1070	983	--	25
11	1863	1098	1110	994	12	--
12	1876	1105	1160	1000	55	--
13	1964	1149	1200	1070	51	--
14	2088	1211	1230	1070	19	--
15	2064	1199	1240	1070	41	--
16	2037	1185	1210	1070	25	--
17	1899	1116	1140	1060	24	--
18	1754	1044	1080	1030	36	--
19	1679	1006	1030	988	24	--
20	1612	973	979	948	6	--
21	1565	949	951	925	2	--
22	1657	995	999	960	4	--
23	1632	983	969	930	--	14
24	1589	961	860	840	--	101
25	1400	867	802	777	--	65
26	1275	804	779	736	--	25
27	1224	779	764	710	--	15
28	1215	774	757	701	--	17
29	1139	736	735	680	--	1
30	1062	698	727	670	29	--
Total sec-ft.	54054	32030	32302	26983	837	565
Mean	1800	1070	1080	899	28	19
Ac-ft.	107200	63530	64070	53520	1660	1120

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
JULY - 1940

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	159	52	211	569	--	358
2	156	56	212	569	--	357
3	172	54	226	576	--	350
4	179	76	255	595	--	340
5	198	65	263	622	--	359
6	177	41	218	668	--	450
7	154	85	239	668	--	429
8	141	42	183	685	--	502
9	136	20	156	703	--	547
10	129	12	141	712	--	571
11	129	7	136	726	--	590
12	136	25	161	731	--	570
13	148	20	168	741	--	573
14	148	30	178	745	--	567
15	138	38	176	731	--	555
16	136	41	177	712	--	535
17	138	65	203	703	--	500
18	136	36	172	694	--	522
19	129	35	164	690	--	526
20	126	40	166	681	--	515
21	119	48	167	668	--	501
22	117	55	172	687	--	515
23	114	55	169	726	--	557
24	112	19	131	717	--	586
25	105	41	146	708	--	562
26	98	64	162	731	--	569
27	109	113	222	736	--	514
28	121	92	213	722	--	509
29	114	36	150	717	--	567
30	100	48	148	708	--	560
31	96	38	134	665	--	529
Total sec-ft.	4170	1449	5619	21304	--	15685
Mean	135	47	181	687	--	506
Ac-ft.	8270	2870	11140	42260	--	31110

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
JULY - 1940

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	735	594	--	1329	309	1020
2	706	590	--	1296	363	933
3	686	590	--	1276	358	918
4	679	592	--	1271	357	914
5	700	596	--	1296	350	946
6	693	609	--	1302	340	962
7	686	628	--	1314	359	955
8	672	634	--	1306	450	856
9	652	651	--	1303	429	874
10	652	655	--	1307	502	805
11	633	664	--	1297	547	750
12	620	664	--	1284	571	713
13	602	672	--	1274	590	684
14	583	668	--	1251	570	681
15	572	672	--	1244	573	671
16	548	679	--	1227	567	660
17	526	677	--	1203	555	648
18	515	676	--	1191	535	656
19	489	677	--	1166	500	666
20	473	676	--	1149	522	627
21	468	674	--	1142	526	616
22	440	674	--	1114	515	599
23	421	674	--	1095	501	594
24	408	679	--	1087	515	572
25	398	679	--	1077	557	520
26	412	679	--	1091	586	505
27	560	691	--	1251	562	689
28	633	693	--	1326	569	757
29	572	693	--	1265	514	751
30	526	693	--	1219	509	710
31	489	683	--	1172	567	605
Total sec-ft.	17749	20376	--	38125	15268	22857
Mean	573	657	--	1230	493	737
Ac-ft.	35200	40420	--	75620	30280	45340

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
JULY - 1940

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	1020	343	309	652	594	--	594	--	58
2	933	300	363	663	590	--	590	--	73
3	918	292	358	650	590	--	590	--	60
4	914	290	357	647	592	--	592	--	55
5	946	306	350	656	596	--	596	--	60
6	962	314	340	654	609	--	609	--	45
7	955	211	359	670	628	--	628	--	42
8	856	261	450	711	634	--	634	--	77
9	874	270	429	699	651	--	651	--	48
10	805	236	502	738	655	--	655	--	83
11	750	208	547	755	664	--	664	--	91
12	713	190	571	761	664	--	664	--	97
13	684	175	590	765	672	--	672	--	93
14	681	174	570	744	668	--	668	--	76
15	671	169	573	742	672	--	672	--	70
16	660	165	567	732	679	--	679	--	53
17	648	162	555	717	677	--	677	--	40
18	656	164	535	699	676	--	676	--	23
19	666	166	500	666	677	--	677	11	--
20	627	157	522	679	676	--	676	--	3
21	616	154	526	680	674	--	674	--	6
22	599	150	515	665	674	--	674	9	--
23	594	148	501	649	674	--	674	25	--
24	572	143	515	658	679	--	679	21	--
25	520	130	557	687	679	--	679	--	8
26	505	126	586	712	679	--	679	--	38
27	689	178	562	740	691	--	691	--	49
28	757	212	569	781	693	--	693	--	88
29	751	209	514	723	693	--	693	--	30
30	710	188	509	697	693	--	693	--	4
31	605	151	567	718	683	--	683	--	35
Total sec-ft.	22857	6442	15268	21710	20376	--	20376	66	1400
Mean	737	208	493	700	657	--	657	2	45
Ac-ft.	45340	12780	30280	43060	40420	--	40420	131	2780

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
JULY - 1940

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess of Share	Deficit of Share Delivered
1	1020	677	735	675	58	--
2	933	633	706	655	73	--
3	918	626	686	632	60	--
4	914	624	679	625	55	--
5	946	640	700	645	60	--
6	962	648	693	635	45	--
7	955	644	686	638	42	--
8	856	595	672	615	77	--
9	874	604	652	596	48	--
10	805	569	652	601	83	--
11	750	542	633	577	91	--
12	713	523	620	565	97	--
13	684	509	602	541	93	--
14	681	507	583	520	76	--
15	671	502	572	509	70	--
16	660	495	548	487	53	--
17	648	486	526	474	40	--
18	656	492	515	457	23	--
19	666	500	489	437	--	11
20	627	470	473	422	3	--
21	616	462	463	407	6	--
22	599	449	440	384	--	9
23	594	446	421	379	--	25
24	572	426	408	370	--	21
25	520	390	398	362	8	--
26	505	379	412	373	33	--
27	689	511	560	504	49	--
28	757	545	633	584	88	--
29	751	542	572	520	30	--
30	710	522	562	480	4	--
31	605	454	489	443	35	--
Total sec-ft.	22857	16415	17749	16112	1400	66
Mean	737	530	573	520	45	2
Ac-ft.	45340	32560	35200	31960	2780	131

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
AUGUST - 1940

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	98	30	128	621	--	493
2	91	23	114	514	--	400
3	89	18	107	502	--	395
4	82	10	92	489	--	397
5	80	14	94	474	--	380
6	78	17	95	474	--	379
7	78	18	96	489	--	393
8	80	20	100	486	--	386
9	80	24	104	471	--	367
10	78	26	104	468	--	364
11	78	22	100	474	--	374
12	80	18	98	454	--	356
13	78	13	91	401	--	310
14	71	10	81	356	--	275
15	69	6	75	306	--	231
16	63	16	79	248	--	169
17	59	20	79	223	--	144
18	58	15	73	184	--	111
19	56	9	65	186	--	121
20	58	5	63	180	--	117
21	61	5	66	146	--	80
22	61	6	67	125	--	58
23	63	15	78	106	--	28
24	61	9	70	97	--	27
25	59	9	68	90	--	22
26	58	10	68	84	--	16
27	58	12	70	70	--	--
28	65	14	79	92	--	13
29	59	21	80	76	-4	--
30	59	5	64	72	--	8
31	59	12	71	70	1	--
Total sec-ft.	2167	452	2619	9028	5	6414
Mean	70	15	84	291	--	207
Ac-ft.	4300	897	5190	17910	10	12720

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
AUGUST - 1940

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	473	660	--	1133	560	573
2	454	628	--	1082	529	553
3	408	596	--	1004	493	511
4	403	558	--	961	400	561
5	390	530	--	920	395	525
6	364	519	--	883	397	486
7	339	517	--	856	380	476
8	327	517	--	844	379	465
9	314	515	--	829	393	436
10	298	503	--	801	386	415
11	327	463	--	790	367	423
12	327	461	--	788	364	424
13	302	452	--	754	374	380
14	298	417	--	715	356	359
15	306	365	--	671	310	361
16	256	358	--	614	275	339
17	217	349	--	566	231	335
18	231	292	--	523	169	354
19	201	264	--	465	144	321
20	256	201	--	457	111	346
21	234	199	--	433	121	312
22	208	198	--	406	117	289
23	178	190	--	368	80	288
24	201	155	--	356	58	298
25	187	153	--	340	28	312
26	170	152	--	322	27	295
27	154	152	--	306	22	284
28	184	84	--	268	16	252
29	298	7	--	305	--	305
30	294	--	--	294	13	281
31	282	--	4	286	--	286
Total sec-ft.	8881	10455 (1-29)	4	19340	7495	11845
Mean	286	361	--	624	242	382
Ac-ft.	17620	20740	--	38360	14870	23490

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
AUGUST - 1940

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	573	143	560	703	660	--	660	--	43
2	553	138	529	667	628	--	628	--	39
3	511	128	493	621	596	--	596	--	25
4	561	140	400	540	558	--	558	18	--
5	525	131	395	526	530	--	530	4	--
6	486	122	397	519	519	--	519	--	--
7	476	119	380	499	517	--	517	18	--
8	465	116	379	495	517	--	517	22	--
9	436	109	393	502	515	--	515	13	--
10	415	104	386	490	503	--	503	13	--
11	423	106	367	473	463	--	463	--	10
12	424	106	364	470	461	--	461	--	9
13	380	95	374	469	452	--	452	--	17
14	359	90	356	446	417	--	417	--	29
15	361	90	310	400	365	--	365	--	35
16	339	85	275	360	358	--	358	--	2
17	335	84	231	315	349	--	349	34	--
18	354	88	169	257	292	--	292	35	--
19	321	80	144	224	264	--	264	40	--
20	346	86	111	197	201	--	201	4	--
21	312	78	121	199	199	--	199	--	--
22	289	72	117	189	198	--	198	9	--
23	288	72	80	152	190	--	190	38	--
24	298	74	58	132	155	--	155	23	--
25	312	78	28	106	153	--	153	47	--
26	295	74	27	101	152	--	152	51	--
27	284	71	22	93	152	--	152	59	--
28	252	63	16	79	84	--	84	5	--
29	305	76	--	76	7	--	7	--	69
30	281	70	13	83	--	--	--	--	83
31	286	72	--	72	--	4	4	--	68
Total sec-ft.	11845	2960	7495	10455	10455 (1-29)	4	10459	433	429
Mean	382	95	242	337	361	--	337	14	14
Ac-ft.	23490	5870	14870	20740	20740	--	20750	859	851

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
AUGUST - 1940

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess of Share Delivered	Deficit of Share Delivered
1	573	430	473	473	43	--
2	553	415	454	424	39	--
3	511	383	408	379	25	--
4	561	421	403	371	--	18
5	525	394	390	364	--	4
6	486	364	364	337	--	--
7	476	357	339	311	--	18
8	465	349	327	292	--	22
9	436	327	314	281	--	13
10	415	311	298	265	--	13
11	423	317	327	295	10	--
12	424	318	327	287	9	--
13	380	285	302	270	17	--
14	359	269	298	268	29	--
15	361	271	306	275	35	--
16	339	254	256	235	2	--
17	335	251	217	201	--	34
18	354	266	231	211	--	35
19	321	241	201	190	--	40
20	346	260	256	234	--	4
21	312	234	234	213	--	--
22	289	217	208	196	--	9
23	288	216	178	174	--	38
24	298	224	201	194	--	23
25	312	234	187	178	--	47
26	295	221	170	163	--	51
27	284	213	154	150	--	59
28	252	189	184	175	--	5
29	305	229	298	266	69	--
30	281	211	294	260	83	--
31	286	214	282	251	68	--
Total sec-ft.	11845	8885	8881	8147	429	433
Mean	382	287	286	263	14	14
Ac-ft.	23490	17620	17620	16160	851	859

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR SEPTEMBER - 1940

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	58	12	70	69	1	--
2	56	13	69	68	1	--
3	54	13	67	44	23	--
4	58	23	81	3	78	--
5	74	51	125	3	122	--
6	76	37	113	3	110	--
7	69	12	81	2	79	--
8	61	5	66	2	64	--
9	59	41	100	2	98	--
10	56	13	69	2	67	--
11	52	50	102	2	100	--
12	52	50	102	2	100	--
13	54	86	140	2	138	--
14	107	10	117	2	115	--
15	138	3	141	2	139	--
16	114	16	130	1	129	--
17	98	10	108	1	107	--
18	84	14	98	1	97	--
19	82	20	102	1	101	--
20	76	32	108	1	107	--
21	93	161	254	1	253	--
22	179	41	220	1	219	--
23	182	78	260	1	259	--
24	156	37	193	1	192	--
25	131	61	192	1	191	--
26	114	41	155	1	154	--
27	98	19	117	1	116	--
28	84	32	116	1	115	--
29	82	37	119	1	118	--
30	74	7	81	1	80	--
Total sec-ft.	2671	1025	3696	223	3473	--
Mean	89	34	123	7	116	--
Ac-ft.	5300	2030	7330	442	6890	--

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
SEPTEMBER - 1940

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	279	--	--	279	8	271
2	275	--	1	276	--	276
3	279	--	1	280	--	280
4	310	--	1	311	--	311
5	298	--	23	321	--	321
6	263	--	78	341	--	341
7	241	--	122	363	--	363
8	234	--	110	344	--	344
9	231	--	79	310	--	310
10	221	--	64	285	--	285
11	214	--	98	312	--	312
12	205	--	67	272	--	272
13	205	--	100	305	--	305
14	259	--	100	359	--	359
15	249	--	138	387	--	387
16	249	--	115	364	--	364
17	256	--	139	395	--	395
18	259	--	129	388	--	388
19	271	--	107	378	--	378
20	267	--	97	364	--	364
21	294	--	101	395	--	395
22	364	--	107	471	--	471
23	430	--	253	683	--	683
24	499	--	219	718	--	718
25	510	--	259	769	--	769
26	499	--	192	691	--	691
27	489	--	191	680	--	680
28	478	--	154	632	--	632
29	468	--	116	584	--	584
30	459	--	115	574	--	574
Total sec-ft.	9555	--	3276	12831	8	12823
Mean	318	--	109	428	--	427
Ac-ft.	18950	--	6500	25450	16	25430

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
SEPTEMBER - 1940

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	271	68	8	76	--	--	--	--	76
2	276	69	--	69	--	1	1	--	68
3	280	70	--	70	--	1	1	--	69
4	311	78	--	78	--	1	1	--	77
5	321	80	--	80	--	23	23	--	57
6	341	85	--	85	--	78	78	--	7
7	363	91	--	91	--	122	122	31	--
8	344	86	--	86	--	110	110	24	--
9	310	78	--	78	--	79	79	1	--
10	285	71	--	71	--	64	64	--	7
11	312	78	--	78	--	98	98	20	--
12	272	68	--	68	--	67	67	--	1
13	305	76	--	76	--	100	100	24	--
14	359	90	--	90	--	100	100	10	--
15	387	97	--	97	--	138	138	41	--
16	364	91	--	91	--	115	115	24	--
17	395	99	--	99	--	139	139	40	--
18	388	97	--	97	--	129	129	32	--
19	378	94	--	94	--	107	107	13	--
20	364	91	--	91	--	97	97	6	--
21	395	99	--	99	--	101	101	2	--
22	471	118	--	118	--	107	107	--	11
23	683	175	--	175	--	253	253	78	--
24	718	192	--	192	--	219	219	27	--
25	769	218	--	218	--	259	259	41	--
26	691	179	--	179	--	192	192	13	--
27	680	173	--	173	--	191	191	18	--
28	632	158	--	158	--	154	154	--	4
29	584	146	--	146	--	116	116	--	30
30	574	144	--	144	--	115	115	--	29
Total sec-ft.	12823	3259	8	3267	--	3276	3276	445	436
Mean	427	109	--	109	--	109	109	15	15
Ac-ft.	25430	6460	16	6480	--	6500	6500	883	865

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
SEPTEMBER - 1940

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess of Share	Deficit Delivered
1	271	203	279	242	76	--
2	276	207	275	239	68	--
3	280	210	279	241	69	--
4	311	233	310	274	77	--
5	321	241	298	263	57	--
6	341	256	263	234	7	--
7	363	272	241	215	--	31
8	344	258	234	207	--	24
9	310	232	231	206	--	1
10	285	214	221	200	7	--
11	312	234	214	196	--	20
12	272	204	205	189	1	--
13	305	229	205	189	--	24
14	359	269	259	233	--	10
15	387	290	249	223	--	41
16	364	273	249	224	--	24
17	395	296	256	223	--	40
18	388	291	259	226	--	32
19	378	284	271	234	--	13
20	364	273	267	234	--	6
21	395	296	294	252	--	2
22	471	353	364	310	11	--
23	683	508	430	373	--	78
24	718	526	499	449	--	27
25	769	551	510	455	--	41
26	691	512	499	449	--	13
27	680	507	489	441	--	18
28	632	474	478	433	4	--
29	584	438	468	420	30	--
30	574	430	459	411	29	--
Total sec-ft.	12823	9564	9555	8485	436	445
Mean	427	319	318	283	15	15
Ac-ft.	25430	18970	18950	16830	865	883

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
OCTOBER - 1940

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	74	7	81	1	80	--
2	71	30	101	--	101	--
3	67	30	97	--	97	--
4	58	25	83	--	83	--
5	56	25	81	--	81	--
6	49	19	68	--	68	--
7	42	21	63	--	63	--
8	39	45	84	--	84	--
9	39	43	82	--	82	--
10	37	45	82	--	82	--
11	47	35	82	--	82	--
12	80	42	122	--	122	--
13	91	31	122	--	122	--
14	89	73	162	--	162	--
15	78	4	82	--	82	--
16	74	8	82	--	82	--
17	67	25	92	--	92	--
18	59	33	92	--	92	--
19	59	33	92	--	92	--
20	65	27	92	--	92	--
21	65	27	92	--	92	--
22	61	21	82	--	82	--
23	58	24	82	--	82	--
24	49	33	82	--	82	--
25	50	32	82	--	82	--
26	54	30	84	--	84	--
27	58	31	89	--	89	--
28	50	42	92	--	92	--
29	45	1	46	--	46	--
30	45	1	46	--	46	--
31	49	2	51	117	--	66
Total sec-ft.	1825	845	2670	118	2618	66
Mean	59	27	86	4	84	2
Ac-ft.	3620	1680	5300	230	5190	130

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
OCTOBER - 1940

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	449	--	118	567	--	567
2	440	--	80	520	--	520
3	426	--	80	506	--	506
4	416	--	101	517	--	517
5	398	--	97	495	--	495
6	381	--	83	464	--	464
7	368	--	81	449	--	449
8	351	--	68	419	--	419
9	335	--	63	398	--	398
10	314	--	84	398	--	398
11	314	--	82	396	--	396
12	306	--	82	388	--	388
13	310	--	82	392	--	392
14	318	--	122	440	--	440
15	322	--	122	444	--	444
16	318	--	162	480	--	480
17	310	--	82	392	--	392
18	298	--	82	380	--	380
19	318	--	92	410	--	410
20	314	--	92	406	--	406
21	302	--	92	394	--	394
22	298	--	92	390	--	390
23	294	--	92	386	--	386
24	290	--	82	372	--	372
25	279	--	82	361	--	361
26	286	--	82	368	--	368
27	286	--	82	368	--	368
28	279	--	84	363	--	363
29	271	--	89	360	--	360
30	259	5	92	356	--	356
31	221	27	46	294	--	294
Total sec-ft.	10071	32 (30-31)	2770	12873	--	12873
Mean	325	16	89	415	--	415
Ac-ft.	19980	63	5490	25530	--	25530

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
OCTOBER - 1940

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	567	142	--	142	--	118	118	--	24
2	520	130	--	130	--	80	80	--	50
3	506	126	--	126	--	80	80	--	46
4	517	129	--	129	--	101	101	--	28
5	495	124	--	124	--	97	97	--	27
6	464	116	--	116	--	83	83	--	33
7	449	112	--	112	--	81	81	--	31
8	419	105	--	105	--	68	68	--	37
9	398	100	--	100	--	63	63	--	37
10	398	100	--	100	--	84	84	--	16
11	396	99	--	99	--	82	82	--	17
12	388	97	--	97	--	82	82	--	15
13	392	98	--	98	--	82	82	--	16
14	440	110	--	110	--	122	122	12	--
15	444	111	--	111	--	122	122	11	--
16	480	120	--	120	--	162	162	42	--
17	392	98	--	98	--	82	82	--	16
18	380	95	--	95	--	82	82	--	13
19	410	102	--	102	--	92	92	--	10
20	406	102	--	102	--	92	92	--	10
21	394	98	--	98	--	92	92	--	6
22	390	98	--	98	--	92	92	--	6
23	386	96	--	96	--	92	92	--	4
24	372	93	--	93	--	82	82	--	11
25	361	90	--	90	--	82	82	--	8
26	368	92	--	92	--	82	82	--	10
27	368	92	--	92	--	82	82	--	10
28	363	91	--	91	--	84	84	--	7
29	360	90	--	90	--	89	89	--	1
30	356	89	--	89	-5	92	97	8	--
31	294	74	--	74	27	46	73	--	1
Total sec-ft.	12873	3219	--	3219	32 (30-31)	2770	2802	73	490
Mean	415	104	--	104	16	89	90	2	16
Ac-ft.	25530	6380	--	6380	63	5490	5560	145	972

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
OCTOBER - 1940

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess of Share Delivered	Deficit of Share Delivered
1	567	425	449	400	24	--
2	520	390	440	389	50	--
3	506	380	426	377	46	--
4	517	388	416	370	28	--
5	495	371	398	352	27	--
6	464	348	381	335	33	--
7	449	337	368	325	31	--
8	419	314	351	310	37	--
9	398	298	335	294	37	--
10	398	298	314	276	16	--
11	396	297	314	275	17	--
12	388	291	306	266	15	--
13	392	294	310	268	16	--
14	440	330	318	274	--	12
15	444	333	322	276	--	11
16	480	360	318	274	--	42
17	392	294	310	269	16	--
18	380	285	298	260	13	--
19	410	308	318	272	10	--
20	406	304	314	276	10	--
21	394	296	302	263	6	--
22	390	292	298	260	6	--
23	386	290	294	256	4	--
24	372	279	290	252	11	--
25	361	271	279	245	8	--
26	368	276	286	248	10	--
27	368	276	286	251	10	--
28	363	272	279	248	7	--
29	360	270	271	154	1	--
30	356	267	259	12	--	8
31	294	220	221	--	1	--
Total sec-ft.	12873	9654	10071	8327 (1-30)	490	73
Mean	415	311	325	278	16	2
Ac-ft.	25530	19150	19980	16520	980	145

DIVISION OF ST. MARY RIVER
CANADA
1940

Water Available in Acre-Feet

Month	St.Mary R. at Kimball	Rolph Creek	Lee Creek	Pothole Creek	Combined Flow
April	15,380	519	2,300	1,420	19,619
May	67,710	257	8,140	191	76,298
June	64,070	122	1,700	--	65,892
July	35,200	108	968	--	36,276
August	17,620	57	247	--	17,924
September	18,950	53	1,020	--	20,023
October	19,980	60	1,000[e]	--	21,040
Total	238,910	1,176	15,375	1,611	257,072[a]

DISPOSITION

Month	Diverted by A.R. & I. Co.	Gain or Loss	Wasted by A.R. & I. Co.	Applied to Land	St.Mary R. Lethbridge
April	10,290	- 6,530	2,810	950	14,720
May	30,430	1,985	6,206	26,209	47,960
June	53,520	- 2,471	2,879	48,170	14,960
July	31,960	1,450	100	33,310	2,960
August	16,160	- 594	50	15,516	1,510
September	16,730	- 203	130	16,497	2,390
October	16,520	1,741	1,319	16,942	3,500[e]
Total	175,610[b]	- 4,622[c]	13,494[d]	157,594[f]	88,050[x]

a - Computed. b - Diverted by A.R. & I.Co. at Kimball.
c - Loss or gain between Kimball and Magrath.
d - Wasted in Pinepound and Pothole Creeks.
e - Estimated.
f - Flow in canals at Magrath plus diversions by laterals.
x - Below all points of diversion.

DIVISION OF ST. MARY RIVER
UNITED STATES
1940

Water Available in Acre-Feet

Month	St. Mary River: U. S. Share	St. Mary River: Sherburne Res. Stored	St. Mary River: Sherburne Res. Released	St. Mary River: Total Available for Diversion	Diverted	Unused	Total Flow Milk River Eastern Crossing
April	5,700	7,300	--	5,700	--	5,700	16,270
May	46,950	21,180	395	47,345	25,880	21,465	26,290
June	43,680	9,160	1,640	45,320	35,630	9,690	35,400
July	12,780	--	30,280	43,060	40,420	2,640	41,230
August	5,870	--	14,870	20,740	20,740	--	24,900
September	6,460	6,500	16	6,476	--	6,476	2,880
October	6,380	5,490	--	6,380	63	6,317	1,740
Total	127,820	49,630	47,201	175,021	122,733	52,288	148,710

DIVERSIONS FROM MILK RIVER IN UNITED STATES
1940

Quantities in Acre-Feet

Month	Belknap Canal	Paradise Canal	Harlem Canal	Harlem No.2	Agency Canal	Dodson North	Dodson South	Vandalia Canal	Total
March	--	--	--	--	--	--	712	--	712
April	--	--	591	--	--	--	10423	--	11014
May	3291	2198	2160	95	3545	1355	18083	1339	32066
June	7313	3322	1672	381	1466	1728	12178	4155	32215
July	11159	5141	3669	1142	2071	4203	10375	5653	43413
Aug.	7275	3037	2029	952	1843	3092	8670	4344	31242
Sept.	3753	799	654	190	1140	2342	5423	3531	17832
Oct.	2063	--	--	--	--	--	3213	2122	7398
Nov.	1190	--	--	--	--	--	--	476	1666
Total	36044	14497	10775	2760	10065	12720	69077	21620	177558

DETERMINATION OF NATURAL FLOW OF FRENCHMAN RIVER AT THE INTERNATIONAL BOUNDARY 1940

Quantities in Second-Feet

Date at Intern'l Boundary	Frenchman River below Belanger Creek	Used by Canada at East End: Corrected for Evaporation: Store	Release	Diverted	Return Flow	Total Used	Frenchman River at 50 Mile
1	2	3	4	5	6	7	8
March							
1 - 10	5.0	0	0	0	0.0	0.0	50.0
11 - 20	5.0	0	0	0	0.0	0.0	65.0
21 - 31	5.5	0	0	0	0.0	0.0	245.0
April							
1 - 10	5.0	8	0	0	0.0	8.0	235.0
11 - 20	5.0	30	0	0	0.0	30.0	2644.0
21 - 30	11.3	154	0	0	0.0	154.0	9959.0
May							
1 - 10	0.1	342	0	0	0.0	342.0	2952.0
11 - 20	1.0	0	121	0	0.0	-121.0	1360.0
21 - 31	4.5	9	0	35.0	0.0	44.0	697.9
June							
1 - 10	9.6	42	0	134.6	73.8	102.8	329.7
11 - 20	22.9	404	0	102.5	40.0	466.5	1314.8
21 - 30	25.4	0	336	68.9	30.0	-297.1	590.8
July							
1 - 10	35.5	0	142	234.4	49.9	42.5	218.1
11 - 20	45.7	0	180	304.6	31.0	93.6	215.2
21 - 31	57.2	0	153	265.9	43.8	69.1	168.4
August							
1 - 10	73.8	335	0	89.4	5.1	419.3	110.9
11 - 20	38.6	0	250	95.5	12.9	-167.4	55.9
21 - 31	26.9	0	91	54.4	33.3	- 69.9	12.4
September							
1 - 10	14.7	0	32	8.5	6.4	- 29.9	6.3
11 - 20	11.9	2	0	2.5	7.1	- 2.6	2.0
21 - 30	14.4	49	0	3.4	5.0	47.4	2.8
October							
1 - 10	17.4	50	0	0.0	0.0	50.0	2.1
11 - 20	21.7	0	28	0.0	0.0	- 28.0	55.7
21 - 31	32.1	4	0	0.0	7.0	- 3.0	79.5
Total sec-ft.	490.2	1429	1333	1399.6	345.3	1150.3	21372.5
Daily Mean	2.0	5.8	5.4	5.7	1.4	4.7	87.2
Ac-ft.	972	2834	2644	2776	685	2282	42389

DETERMINATION OF NATURAL FLOW OF FRENCHMAN RIVER AT THE INTERNATIONAL BOUNDARY 1940

Quantities in Second-Feet

Gain or Loss Belanger to 50 Mile	Used by Canada at Val Marie: Corrected for: Evaporation Store	Release	Diverted	Return Flow	Total Used	Frenchman River below Val Marie	Gain or Loss 50 Mile to Val Marie
9	10	11	12	13	14	15	16
45.0	0	0	0.0	0.0	0.0	10.0	- 40.0
60.0	0	0	0.0	0.0	0.0	10.0	- 55.0
239.5	210	0	0.0	0.0	210.0	11.0	- 24.0
238.0	0	0	0.0	0.0	0.0	37.0	- 198.0
2669.0	702	0	0.0	0.0	702.0	830.0	-1112.0
10101.7	901	0	0.0	0.0	901.0	16040.0	6982.0
3293.9	948	163	0.0	0.0	785.0	5250.4	3083.4
1238.0	1284	0	20.1	0.0	1304.1	217.0	161.1
737.4	347	0	58.2	0.0	405.2	342.9	50.2
422.9	17	0	36.6	0.0	53.6	269.6	- 6.5
1758.4	12	443	20.7	0.0	- 410.3	5186.9	3461.8
268.3	0	30	49.7	0.0	19.7	595.0	23.9
225.1	16	80	168.3	50.0	54.3	266.5	102.7
263.1	0	631	524.4	120.1	- 226.7	225.1	- 216.8
180.3	0	453	591.1	223.7	- 85.6	279.2	25.2
456.4	0	63	110.2	54.1	- 6.9	109.1	- 8.7
- 150.1	0	97	112.1	50.6	- 35.5	80.6	- 10.8
- 84.4	0	164	110.7	48.4	- 101.7	78.9	- 35.2
- 38.3	0	114	62.2	18.6	- 70.4	43.6	- 33.1
- 12.5	0	90	35.4	29.6	- 84.2	54.6	- 31.6
35.8	0	131	94.6	35.5	- 71.9	80.5	5.8
34.7	0	130	138.8	20.3	- 11.5	92.3	78.7
6.0	6	309	275.2	275.2	- 303.0	335.8	- 22.9
44.4	6	254	268.9	268.9	- 248.0	306.2	- 21.3
22032.6	4449	3152	2677.2	1195.0	2779.2	30752.2	12158.9
89.9	18.1	12.9	10.9	4.9	11.3	125.5	49.6
43701	8824	6252	5310	2370	5510	60996	24117

DETERMINATION OF NATURAL FLOW OF FRENCHMAN RIVER AT THE INTERNATIONAL BOUNDARY
1940

Quantities in Second-Feet

Frenchman River at Belanger Creek	Gain or Loss Belanger to 50 Mile	Gain or Loss 50 Mile to Val Marie	Gain or Loss Val Marie to Boundary	Natural Flow at Intern'l Boundary	United States Share	Frenchman River at Intern'l Boundary
17	18	19	20	21	22	23
7.0	45.0	- 40.0	- 4.2	7.8	3.9	5.8
7.0	60.0	- 55.0	- 1.9	10.1	5.0	8.1
7.7	239.5	- 24.0	21.5	244.7	122.3	32.5
7.0	238.0	- 198.0	116.7	163.7	81.8	153.7
7.0	2669.0	-1112.0	4121.0	5685.0	2842.5	4951.0
1032.4	10101.7	6982.0	1630.0	19746.1	9873.0	17670.0
1089.3	3293.9	3083.4	- 481.5	6985.1	3492.6	4768.9
667.4	1238.0	161.1	161.2	2227.7	1113.8	378.2
257.5	737.4	50.2	70.9	1116.0	558.0	413.8
117.0	422.9	- 6.5	1285.7	1819.1	909.6	1555.3
299.1	1758.4	3461.8	-1710.9	3808.4	1904.2	3476.0
101.8	268.3	23.9	93.0	487.0	243.5	688.0
74.3	225.1	102.7	- 27.0	375.1	187.5	239.5
65.8	263.1	- 216.8	- 42.2	69.9	34.9	182.9
67.2	180.3	25.2	- 18.9	253.8	126.9	260.3
67.6	456.4	- 8.7	19.7	535.0	267.5	128.8
40.7	- 150.1	- 10.8	- 44.7	- 164.9	0.0	35.9
23.4	- 84.4	- 35.2	- 44.2	- 140.4	0.0	34.7
18.2	- 38.3	- 33.1	- 40.8	- 94.0	0.0	2.8
18.1	- 12.5	- 31.6	- 54.3	- 80.3	0.0	0.3
24.1	35.8	5.8	- 71.5	- 5.8	0.0	9.0
35.0	34.7	78.7	- 16.9	131.5	65.8	75.4
33.7	6.0	- 22.9	- 86.7	- 69.9	0.0	249.1
32.1	44.4	- 21.3	- 45.5	9.7	4.8	260.7
4100.4	22032.6	12158.9	4828.5	43120.4	21837.6	35580.7
16.7	89.9	49.6	19.7	176.0	89.1	145.2
8133	43701	24117	9577	85528	43314	70573

Table 4

ESTIMATED DIVERSION FROM THE NORTHERN TRIBUTARIES OF MILK RIVER IN CANADA 1940

Quantities in Acre-Feet

Irrigator	Source of Supply	Estimated Diversion
Lodge Creek Basin		
Jahn, B. A.	Middle Creek	25
Hillman, W.	Thelma Creek	150
Spangler, J. M.	Lodge Creek	250
Total diverted from Lodge Creek		425
Flow of Lodge Creek at Boundary		44,620
Battle Creek Basin		
Wilkes Bros.	Battle Creek	25
Shepherd Bros.	Halfway Coulee	50
Spangler, J. M.	Sixmile Coulee	100
Stirling & Nash	Battle Creek	600
McKinnon, J.	Battle Creek	200
Fondrick, G.	Battle Creek	35
Marshall & Gaff	Battle Creek	50
Lindner Bros.	Battle Creek	60
Battle Creek diversion to Cypress Lake		9,366
Total diverted from Battle Creek		10,486
Flow of Battle Creek at Boundary		26,020
Frenchman River Basin		
Caton, W. E.	Fairwell Creek	100
Armstrong	Clarence Coulee	50
Hensman, S. A.	N. B. Frenchman River	150
Kokott, T.	Calf Creek	20
Pearse, S.	Concrete Coulee	100
Bolingbroke, J. E.	Bolingbroke Creek	5
Bate, A. E.	Garden Creek	22
East End Irrigation	Frenchman River	2,740
Val Marie Irrigation	Frenchman River	5,460
Total diverted from Frenchman River		8,647
Flow of Frenchman River at Boundary		70,560

Table 5

MEASURED DIVERSIONS FROM THE NORTHERN TRIBUTARIES

OF MILK RIVER IN THE UNITED STATES

1940

Quantities in Acre-Feet

Irrigator	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
				Lodge Creek				
North Chinook Canal	1530	1660	455	0	147	6.3	42	3840.3
				Battle Creek				
Matheson Canal	0	63	208	21	5.2	0.0	0	297.2
				Frenchman River				
Frenchman Canal	269	96	722	751	139	6.7	0	1983.7
Total	1799	1819	1385	772	291.2	13.0	42	6121.2