Report to

THE INTERNATIONAL JOINT COMMISSION

on

THE DIVISION AND USE MADE OF THE WATERS OF

ST. MARY AND MILK RIVERS

by

C. G. PAULSEN
representing the United States

and

VICTOR MEEK
representing Canada

1947

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

Gentlemen:-

In compliance with the Provisions of Clause VIII (c) of your Order of the 4th October, 1921, directing the division of the waters of St. Mary and Milk Rivers between Canada and the United States, we are transmitting herewith a report on the operations during the irrigation season ended October 31, 1947.

Respectfully submitted,

C.G. Paulsen,
Accredited Officer of the United States.

Victor Meek,
Accredited Officer of His Majesty.

April 6, 1948.

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 1947, by the same group of engineers as in previous years.

The Chief Hydraulic Engineer, United States Geological Survey, Mr. C.G. Paulsen, as accredited officer of the United States was represented by Mr. A.H. Tuttle, District Engineer, Helena, Montana. Mr. Victor Meek, Controller, Dominion Water and Power Bureau, as accredited officer of His Majesty, was represented in the field by Mr. O.H. Hoover, District Chief Engineer, 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 and the data obtained were jointly approved by the field engineers.

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

The run-off from the St. Mary River basin during the irrigation season of 1947 was 109.6 per cent of the average for the 44 years of record. The field engineers constantly kept themselves 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 adjusted to allow each country its proper share as set forth in the Order of the Commission dated October 4, 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 at the headgates from May 11 to October 2 and water was delivered to the North Branch Milk River from May 13 to October 15.

As seepage from the canal between the intake and the crossing of the St. Mary River is assumed to return to the river and eventually become available to Canada, the discharge of 138,900 acre-feet passing in the canal at St. Mary Crossing during the period May 11 to October 2 is considered as the quantity diverted from the St. Mary River by the United States. During the period of operation of the canal a total of 138,200 acre-feet was diverted from St. Mary River to the North Branch Milk River and made available for irrigation in Montana. The slight decrease between the St. Mary Crossing and the Hudson Bay Divide, the end of the canal, was probably due to evaporation and seepage.

On October 31st, 1946, 11,380 acre-feet of water remained in Sherburne Lake Reservoir. By March 31st, 1947, 23,117 acre-feet was in storage. This was increased to 55,204 acre-feet by July 17th. Water was released during the latter part of March and during the first half of April. After July 17th and until October 3rd water was released in varying amounts to supplement the flow of St. Mary River. On October 31st, 1947, 23,535 acre-feet remained in storage.

As only a small quantity of water was diverted from Milk River, the natural flow of the river at Eastern Crossing is considered as being delivered to the United States. The natural flow of the river at Eastern Crossing for the open water period of 1947, March 1st to October 31st, is estimated as 176,000 acre-feet. The total measured diversion for irrigation from Milk River in Montana was 233,850 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 1947, was 94,540 acre-feet. This flow is about three-fourths of the average for the previous 20 years.

During the open water period of 1947, Canada diverted to Cypress Lake reservoir, 5,078 acre-feet of the flow of Battle Creek, but later returned 2,081 acre-feet, while 6,920 acre-feet was delivered to Montana at the International Boundary. In the Frenchman River basin, Canada stored in Cypress Lake reservoir 3,184 acre-feet of the flow from Belanger Creek and 15,370 acre-feet from the main stream in reservoirs at East End and Val Marie. From this storage 8,461 acre-feet were released to irrigate land in the Frenchman River valley in Canada, while 35,014 acre-feet

of the natural flow of Frenchman River was delivered to Montana. The apportionment during the open water period is shown in Table 3.

The Canadian Pacific Railway canal at Kimball, Alberta, diverted 173,230 acre-feet from the St. Mary River during the period of operation from the 5th of May to the 30th of October and applied 130,312 acre-feet of this diversion to land 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, no report; from Battle Creek 4,345 acre-feet; from Frenchman River 21,292 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 from the other creeks entering Swiftcurrent Creek above the Sherburne

dam was estimated. The total of these creeks gave the inflow into Sherburne Lake Reservoir. The unrecorded inflow was determined by comparison with the recorded flow in Swiftcurrent Creek and with the use of the water levels of Sherburne Lake Reservoir after direct application of the losses by evaporation and seepage was made. 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 in 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 in 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 Lake 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 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 the Frenchman River and Battle Creek.

Water Supply

In the mountainous areas tributary to the St. Mary River basin, as shown by the twenty-sixth annual international survey of the snow conditions on the headwaters of the Swiftcurrent Creek, and area considered typical of

the headwaters of the St. Mary River, the snow cover of 67.2 inches was about 125 per cent of the mean for the previous 25 years, while the water content, 33.5 inches, of this snow cover was about 140 per cent of the mean. The run-off of 72,100 acre-feet from the area surveyed, during May, June and July, was 110 per cent of the average for the previous 25 years.

The natural flow of 624,970 acre-feet of the St. Mary River at the Boundary during the irrigation season of 1947, from the first of April to the end of October, was 109.6 per cent of the average for the 44 years of record.

The run-off from the prairies, as indicated by the Northern Tributaries of Milk River was about three-fourths of the average for the last 20 years.

Forty-one 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.

An appendix to this report gives the results of current meter measurements, the daily gauge heights and the discharge at all gauging stations operated in the two drainage basins during 1947.

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 1947, the water available for use and used by Canada and the United States. In this table there are four pages for each month from April to October, inclusive.

Page 1 (water stored or released from Sherburne Lake Reservoir) shows the daily inflow and the daily outflow from Sherburne Lake 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 flow in Swiftcurrent Creek and with the use of the water levels of Sherburne Lake 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 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 Lake Reservoir to influence the flow at International 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 4, 1921, the water diverted and stored and the excess or deficit in the quantity used as compared with the share 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 which is 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 pages: Page 1 shows the quantity used by Canada in Cypress Lake Reservoir and at East End; Page 2 shows the quantity used by Canada at Val Marie; and Page 3 shows the total quantity used by Canada, the natural flow of Frenchman River at the Boundary and the quantity delivered to the United States.

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 - 1947

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	47	5	52	311	---	259
2	38	8	46	309	---	263
3	44	8	52	309	---	257
4	41	46	87	309	---	222
5	35	14	49	306	---	257
6	35	19	54	306	---	252
7	30	9	39	301	---	262
8	30	21	51	299	---	248
9	30	48	78	299	---	221
10	30	37	67	297	---	230
11	27	26	53	294	---	241
12	25	35	60	290	---	230
13	30	84	114	285	---	171
14	47	76	123	283	---	160
15	57	69	126	281	---	155
16	70	61	131	276	---	145
17	85	70	155	209	---	54
18	107	147	254	127	127	---
19	157	181	338	129	209	---
20	220	129	349	129	220	---
21	199	127	326	129	197	---
22	162	97	259	130	129	---
23	135	117	252	130	122	---
24	123	111	234	130	104	---
25	130	131	261	147	114	---
26	173	137	310	166	144	---
27	265	113	378	167	211	---
28	412	214	626	201	425	---
29	481	293	774	261	513	---
30	416	206	622	265	357	---
Total sec-ft.	3681	2639	6320	7075	2872	3627
Mean	123	88	211	236	96	121
Ac-ft.	7301	5234	12536	14033	5697	7194

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER

APRIL - 1947.

Day	St. Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R. Gross	Total in sec-ft.	Stored water released Net	Natural flow St.Mary River at Boundary
1	842	---	---	842	220	622
2	700	---	---	700	238	462
3	715	---	---	715	259	456
4	700	---	---	700	263	437
5	707	---	---	707	257	450
6	707	---	---	707	222	485
7	722	---	---	722	257	465
8	746	---	---	746	252	494
9	761	---	---	761	262	499
10	801	---	---	801	248	553
11	809	---	---	809	221	588
12	826	---	---	826	230	596
13	893	---	---	893	241	652
14	964	---	---	964	230	734
15	937	---	---	937	171	766
16	937	---	---	937	160	777
17	992	---	---	992	155	837
18	1040	---	---	1040	145	895
19	1060	---	---	1060	54	1006
20	1080	---	127	1207	---	1207
21	1020	---	209	1229	---	1229
22	1040	---	220	1260	---	1260
23	1040	---	197	1237	---	1237
24	1060	---	129	1189	---	1189
25	1080	---	122	1202	---	1202
26	1160	---	104	1264	---	1264
27	1270	---	114	1384	---	1384
28	1400	---	144	1544	---	1544
29	1650	---	211	1861	---	1861
30	1800	---	425	2225	---	2225
Total sec-ft.	29459	---	2002	31461	4085	27376
Mean	982	---	67	1049	136	913
Ac-ft.	58432	---	3970	62402	8102	54300

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

APRIL - 1947

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	622	156	220	376	--	--	--	--	376
2	462	116	238	354	--	--	--	--	354
3	456	114	259	373	--	--	--	--	373
4	437	109	263	372	--	--	--	--	372
5	450	112	257	369	--	--	--	--	369
6	485	121	222	343	--	--	--	--	343
7	465	116	257	373	--	--	--	--	373
8	494	124	252	376	--	--	--	--	376
9	499	125	262	387	--	--	--	--	387
10	553	138	248	386	--	--	--	--	386
11	588	147	221	368	--	--	--	--	368
12	596	149	230	379	--	--	--	--	379
13	652	163	241	404	--	--	--	--	404
14	734	200	230	430	--	--	--	--	430
15	766	216	171	387	--	--	--	--	387
16	777	222	160	382	--	--	--	--	382
17	837	252	155	407	--	--	--	--	407
18	895	281	145	426	--	--	--	--	426
19	1006	336	54	390	--	--	--	--	390
20	1207	437	---	437	--	127	127	--	310
21	1229	448	---	448	--	209	209	--	239
22	1260	463	---	463	--	220	220	--	243
23	1237	452	---	452	--	197	197	--	255
24	1189	428	---	428	--	129	129	--	299
25	1202	434	---	434	--	122	122	--	312
26	1264	465	---	465	--	104	104	--	361
27	1384	525	---	525	--	114	114	--	411
28	1544	605	---	605	--	144	144	--	461
29	1861	764	---	764	--	211	211	--	553
30	2225	946	---	946	--	425	425	--	521
Total sec-ft.	27376	9164	4085	13249	--	2002	2002	--	11247
Mean	913	305	136	441	--	67	67	--	375
Ac-ft.	54300	18177	8102	26279	--	3970	3970	--	22309

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

APRIL - 1947

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	622	466	842	--	376	--
2	462	346	700	--	354	--
3	456	342	715	--	373	--
4	437	328	700	--	372	--
5	450	338	707	--	369	--
6	485	364	707	--	343	--
7	465	349	722	--	373	--
8	494	370	746	--	376	--
9	499	374	761	--	387	--
10	553	415	801	--	386	--
11	588	441	809	--	368	--
12	596	447	826	--	379	--
13	652	489	893	--	404	--
14	734	534	964	--	430	--
15	766	550	937	--	387	--
16	777	555	937	--	382	--
17	837	585	992	--	407	--
18	895	614	1040	--	426	--
19	1006	670	1060	--	390	--
20	1207	770	1080	--	310	--
21	1229	781	1020	--	239	--
22	1260	797	1040	--	243	--
23	1237	785	1040	--	255	--
24	1189	761	1060	--	299	--
25	1202	768	1080	--	312	--
26	1264	799	1160	--	361	--
27	1384	859	1270	--	411	--
28	1544	939	1400	--	461	--
29	1861	1097	1650	--	553	--
30	2225	1279	1800	--	521	--
Total sec-ft.	27376	18212	29459	--	11247	--
Mean	913	607	982	--	375	--
Ac-ft.	54300	36123	58432	--	22309	--

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

MAY - 1947

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	308	202	510	269	241	---
2	382	267	649	224	425	---
3	658	427	1085	183	902	---
4	650	276	926	185	741	---
5	621	249	870	167	703	---
6	477	273	750	153	597	---
7	458	230	688	158	530	---
8	557	240	797	159	638	---
9	695	267	962	287	675	---
10	679	226	905	418	487	---
11	658	177	835	421	414	---
12	581	317	898	423	475	---
13	545	229	774	541	233	---
14	497	247	744	740	4	---
15	408	159	567	740	---	173
16	368	175	543	699	---	156
17	350	157	507	473	34	---
18	336	134	470	369	101	---
19	328	168	496	328	168	---
20	308	142	450	328	122	---
21	322	179	501	386	115	---
22	343	155	498	435	63	---
23	350	141	491	435	56	---
24	361	192	553	435	118	---
25	416	144	560	438	122	---
26	493	146	639	438	201	---
27	477	120	597	441	156	---
28	397	81	478	438	40	---
29	346	177	523	441	82	---
30	364	182	546	441	105	---
31	462	141	603	444	159	---
Total sec-ft.	14195	6220	20415	12037	8707	329
Mean	458	201	659	388	281	11
Ac-ft.	28156	12337	40493	23875	17270	652

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER

MAY - 1947

Day	St. Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R. Gross	Total in sec-ft.	Stored water released Net	Natural flow St.Mary River at Boundary
1	1830	---	513	2343	---	2343
2	2050	---	357	2407	---	2407
3	2230	---	241	2471	---	2471
4	2190	---	425	2615	---	2615
5	2290	---	902	3192	---	3192
6	2400	---	741	3141	---	3141
7	2480	---	703	3183	---	3183
8	2540	---	597	3137	---	3137
9	2680	---	530	3210	---	3210
10	2870	---	638	3508	---	3508
11	3050	5	675	3730	---	3730
12	3040	25	487	3552	---	3552
13	2940	111	414	3465	---	3465
14	2940	116	475	3531	---	3531
15	2880	118	233	3231	---	3231
16	2800	116	4	2920	---	2920
17	2540	176	---	2716	173	2543
18	2200	375	---	2575	156	2419
19	1950	383	34	2367	---	2367
20	1840	383	101	2324	---	2324
21	1760	380	168	2308	---	2308
22	1740	380	122	2242	---	2242
23	1690	402	115	2207	---	2207
24	1660	405	63	2128	---	2128
25	1690	405	56	2151	---	2151
26	1760	405	118	2283	---	2283
27	1840	410	122	2372	---	2372
28	1900	412	201	2513	---	2513
29	1880	412	156	2448	---	2448
30	1860	412	40	2312	---	2312
31	1870	408	82	2360	---	2360
Total sec-ft.	69390	6239	9313	84942	329	84613
Mean	2238	(11-31) 297	300	2740	11	2729
Ac-ft.	137635	12375	18472	168482	652	167830

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

MAY - 1947

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 used	Deficit
1	2343	1005	---	1005	---	513	513	--	492
2	2407	1037	---	1037	---	357	357	--	680
3	2471	1069	---	1069	---	241	241	--	828
4	2615	1141	---	1141	---	425	425	--	716
5	3192	1429	---	1429	---	902	902	--	527
6	3141	1404	---	1404	---	741	741	--	663
7	3183	1425	---	1425	---	703	703	--	722
8	3137	1402	---	1402	---	597	597	--	805
9	3210	1438	---	1438	---	530	530	--	908
10	3508	1587	---	1587	---	638	638	--	949
11	3730	1698	---	1698	5	675	680	--	1018
12	3552	1609	---	1609	25	487	512	--	1097
13	3465	1566	---	1566	111	414	525	--	1041
14	3531	1599	---	1599	116	475	591	--	1008
15	3231	1449	---	1449	118	233	351	--	1098
16	2920	1293	---	1293	116	4	120	--	1173
17	2543	1105	173	1278	176	---	176	--	1102
18	2419	1043	156	1199	375	---	375	--	824
19	2367	1017	---	1017	383	34	417	--	600
20	2324	995	---	995	383	101	484	--	511
21	2308	987	---	987	380	168	548	--	439
22	2242	954	---	954	380	122	502	--	452
23	2207	937	---	937	402	115	517	--	420
24	2128	897	---	897	405	63	468	--	429
25	2151	909	---	909	405	56	461	--	448
26	2283	975	---	975	405	118	523	--	452
27	2372	1019	---	1019	410	122	532	--	487
28	2513	1090	---	1090	412	201	613	--	477
29	2448	1057	---	1057	412	156	568	--	489
30	2312	989	---	989	412	40	452	--	537
31	2360	1013	---	1013	408	82	490	--	523
Total sec-ft.	84613	37138	329	37467	6239	9313	15552	--	21915
Mean	2729	1198	11	1209	(1131) 297	300	502	--	707
Ac-ft.	167830	73663	652	74315	12375	18472	30847	--	43468

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

MAY - 1947

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	2343	1338	1830	---	492	--
2	2407	1370	2050	---	680	--
3	2471	1402	2230	---	828	--
4	2615	1474	2190	---	716	--
5	3192	1763	2290	143	527	--
6	3141	1737	2400	180	663	--
7	3183	1758	2480	191	722	--
8	3137	1735	2540	198	805	--
9	3210	1772	2680	216	908	--
10	3508	1921	2870	233	949	--
11	3730	2032	3050	261	1018	--
12	3552	1943	3040	261	1097	--
13	3465	1899	2940	255	1041	--
14	3531	1932	2940	286	1008	--
15	3231	1782	2880	284	1098	--
16	2920	1627	2800	274	1173	--
17	2543	1438	2540	249	1102	--
18	2419	1376	2200	248	824	--
19	2367	1350	1950	260	600	--
20	2324	1329	1840	274	511	--
21	2308	1321	1760	285	439	--
22	2242	1288	1740	337	452	--
23	2207	1270	1690	335	420	--
24	2128	1231	1660	335	429	--
25	2151	1242	1690	340	448	--
26	2283	1308	1760	384	452	--
27	2372	1353	1840	413	487	--
28	2513	1423	1900	458	477	--
29	2448	1391	1880	514	489	--
30	2312	1323	1860	530	537	--
31	2360	1347	1870	526	523	--
Total sec-ft.	84613	47475	69390	8270	21915	--
Mean	2729	1531	2238 (5-31)	306	707	--
Ac-ft.	167830	94167	137635	16400	43468	--

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

JUNE - 1947

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	450	167	617	444	173	---
2	473	160	633	444	189	---
3	485	151	636	444	192	---
4	454	192	646	446	200	---
5	462	121	583	444	139	---
6	501	147	648	472	176	---
7	497	154	651	606	45	---
8	477	148	625	635	---	10
9	462	187	649	635	14	---
10	497	170	667	652	15	---
11	473	162	635	658	---	23
12	454	129	583	622	---	39
13	497	158	655	598	57	---
14	533	136	669	602	67	---
15	470	150	620	634	---	14
16	397	122	519	666	---	147
17	401	113	514	560	---	46
18	470	130	600	297	303	---
19	537	119	656	299	357	---
20	509	151	660	220	440	---
21	412	103	515	141	374	---
22	357	100	457	133	324	---
23	336	115	451	134	317	---
24	375	142	517	136	381	---
25	408	190	598	136	462	---
26	533	171	704	136	568	---
27	545	146	691	136	555	---
28	489	160	649	138	511	---
29	394	121	515	138	377	---
30	357	99	456	138	318	---
Total sec-ft.	13705	4314	18019	11744	6554	279
Mean	457	144	601	391	218	9
Ac-ft.	27184	8557	35741	23294	13002	554

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER

JUNE - 1947

Day	St. Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R. Gross	Total in sec-ft	Stored water released Net	Natural flow St.Mary River at Boundary
1	1920	410	105	2435	---	2435
2	1960	408	159	2527	---	2527
3	2030	410	173	2613	---	2613
4	2050	414	189	2653	---	2653
5	2050	414	192	2656	---	2656
6	2030	412	200	2642	---	2642
7	2060	412	139	2611	---	2611
8	2090	415	176	2681	---	2681
9	2290	428	45	2763	---	2763
10	2510	424	---	2934	10	2924
11	2440	408	14	2862	---	2862
12	2370	407	15	2792	---	2792
13	2300	407	---	2707	23	2684
14	2270	405	---	2675	39	2636
15	2230	403	57	2690	---	2690
16	2170	402	67	2639	---	2639
17	2120	400	---	2520	14	2506
18	1970	446	---	2416	147	2269
19	1810	536	---	2346	46	2300
20	1790	538	303	2631	---	2631
21	1710	540	357	2607	---	2607
22	1590	542	440	2572	---	2572
23	1480	559	374	2413	---	2413
24	1430	571	324	2325	---	2325
25	1400	569	317	2286	---	2286
26	1430	569	381	2380	---	2380
27	1500	571	462	2533	---	2533
28	1580	572	568	2720	---	2720
29	1540	572	555	2667	---	2667
30	1460	567	511	2538	---	2538
Total sec-ft.	57580	14131	6123	77834	279	77555
Mean	1919	471	204	2594	9	2585
Ac-ft.	114210	28029	12145	154384	554	153830

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

JUNE - 1947

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	2435	1051	--	1051	410	105	515	--	536
2	2527	1097	--	1097	408	159	567	--	530
3	2613	1140	--	1140	410	173	583	--	557
4	2653	1160	--	1160	414	189	603	--	557
5	2656	1161	--	1161	414	192	606	--	555
6	2642	1154	--	1154	412	200	612	--	542
7	2611	1139	--	1139	412	139	551	--	588
8	2681	1174	--	1174	415	176	591	--	583
9	2763	1215	--	1215	428	45	473	--	742
10	2924	1295	10	1305	424	--	424	--	881
11	2862	1264	--	1264	408	14	422	--	842
12	2792	1229	--	1229	407	15	422	--	807
13	2684	1175	23	1198	407	--	407	--	791
14	2636	1151	39	1190	405	--	405	--	785
15	2690	1178	--	1178	403	57	460	--	718
16	2639	1153	--	1153	402	67	469	--	684
17	2506	1086	14	1100	400	--	400	--	700
18	2269	968	147	1115	446	--	446	--	669
19	2300	983	46	1029	536	--	536	--	493
20	2631	1149	--	1149	538	303	841	--	308
21	2607	1137	--	1137	540	357	897	--	240
22	2572	1119	--	1119	542	440	982	--	137
23	2413	1040	--	1040	559	374	933	--	107
24	2325	996	--	996	571	324	895	--	101
25	2286	976	--	976	569	317	886	--	90
26	2380	1023	--	1023	569	381	950	--	73
27	2533	1100	--	1100	571	462	1033	--	67
28	2720	1193	--	1193	572	568	1140	--	53
29	2667	1167	--	1167	572	555	1127	--	40
30	2538	1102	--	1102	567	511	1078	--	24
Total sc-ft.	77555	33775	279	34054	14131	6123	20254	--	13800
Mean	2585	1126	9	1135	471	204	675	--	460
Ac-ft.	153830	66992	554	67546	28029	12145	40174	--	27372

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

JUNE - 1947

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	or Deficit delivered
1	2435	1384	1920	520	536	--
2	2527	1430	1960	532	530	--
3	2613	1473	2030	487	557	--
4	2653	1493	2050	432	557	--
5	2656	1495	2050	416	555	--
6	2642	1488	2030	416	542	--
7	2611	1472	2060	422	588	--
8	2681	1507	2090	418	583	--
9	2763	1548	2290	382	742	--
10	2924	1629	2510	341	881	--
11	2862	1598	2440	333	842	--
12	2792	1563	2370	413	807	--
13	2684	1509	2300	345	791	--
14	2636	1485	2270	252	785	--
15	2690	1512	2230	534	718	--
16	2639	1486	2170	528	684	--
17	2506	1420	2120	526	700	--
18	2269	1301	1970	560	669	--
19	2300	1317	1810	580	493	--
20	2631	1482	1790	576	308	--
21	2607	1470	1710	570	240	--
22	2572	1453	1590	574	137	--
23	2413	1373	1480	574	107	--
24	2325	1329	1430	583	101	--
25	2286	1310	1400	603	90	--
26	2380	1357	1430	686	73	--
27	2533	1433	1500	726	67	--
28	2720	1527	1580	704	53	--
29	2667	1500	1540	672	40	--
30	2538	1436	1460	684	24	--
Total sec-ft.	77555	43780	57580	15389	13800	--
Mean	2585	1459	1919	513	460	--
Ac-ft.	153830	86838	114210	30520	27372	--

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

JULY - 1947

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	382	117	499	139	360	---
2	405	124	529	192	337	---
3	423	116	539	226	313	---
4	397	98	495	228	267	---
5	375	112	487	228	259	---
6	353	97	450	288	162	---
7	364	94	458	346	112	---
8	371	106	477	346	131	---
9	375	82	457	338	119	---
10	375	114	489	304	185	---
11	357	88	445	304	141	---
12	308	29	337	304	33	---
13	274	89	363	297	66	---
14	274	80	354	265	89	---
15	284	91	375	265	110	---
16	265	59	324	265	59	---
17	242	69	311	309	2	---
18	227	69	296	328	---	32
19	217	58	275	328	---	53
20	217	68	285	328	---	43
21	214	57	271	348	---	77
22	211	49	260	358	---	98
23	199	62	261	356	---	95
24	194	35	229	385	---	156
25	191	58	249	452	---	203
26	179	56	235	452	---	217
27	168	25	193	455	---	262
28	165	30	195	452	---	257
29	159	20	179	476	---	297
30	141	50	191	500	---	309
31	133	40	173	529	---	356
Total sec-ft.	8439	2242	10681	10391	2745	2455
Mean	272	72	344	335	89	79
Ac-ft.	16739	4447	21186	20610	5445	4869

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER

JULY - 1947

Day	St. Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R. Gross	Total in sec-ft.	Stored water released Net	Natural flow St.Mary River at Boundary
1	1340	561	377	2278	---	2278
2	1260	563	318	2141	---	2141
3	1250	572	360	2182	---	2182
4	1280	572	337	2189	---	2189
5	1260	572	313	2145	---	2145
6	1240	574	267	2081	---	2081
7	1250	582	259	2091	---	2091
8	1290	582	162	2034	---	2034
9	1300	584	112	1996	---	1996
10	1280	593	131	2004	---	2004
11	1270	595	119	1984	---	1984
12	1250	593	185	2028	---	2028
13	1190	590	141	1921	---	1921
14	1120	586	33	1739	---	1739
15	1050	590	66	1706	---	1706
16	983	590	89	1662	---	1662
17	929	586	110	1625	---	1625
18	893	586	59	1538	---	1538
19	859	586	2	1447	---	1447
20	826	586	---	1412	32	1380
21	801	584	---	1385	53	1332
22	784	584	---	1368	43	1325
23	769	586	---	1355	77	1278
24	746	584	---	1330	98	1232
25	722	582	---	1304	95	1209
26	730	584	---	1314	156	1158
27	700	586	---	1286	203	1083
28	685	592	---	1277	217	1060
29	657	584	---	1241	262	979
30	608	584	---	1192	257	935
31	595	584	---	1179	297	882
Total sec-ft.	30917	18077	3440	52434	1790	50644
Mean	997	583	111	1691	58	1634
Ac-ft.	61324	35856	6822	104003	3550	100452

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

JULY - 1947

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	2278	972	--	972	561	377	938	--	34
2	2141	904	--	904	563	318	881	--	23
3	2182	924	--	924	572	360	932	8	--
4	2189	928	--	928	572	337	909	--	19
5	2145	906	--	906	572	313	885	--	21
6	2081	874	--	874	574	267	841	--	33
7	2091	879	--	879	582	259	841	--	38
8	2034	850	--	850	582	162	744	--	106
9	1996	831	--	831	584	112	696	--	135
10	2004	835	--	835	593	131	724	--	111
11	1984	825	--	825	595	119	714	--	111
12	2038	847	--	847	593	185	778	--	69
13	1921	794	--	794	590	141	731	--	63
14	1739	703	--	703	586	33	619	--	84
15	1706	686	--	686	590	66	656	--	30
16	1662	664	--	664	590	89	679	15	--
17	1625	646	--	646	586	110	696	50	--
18	1538	602	--	602	586	59	645	43	--
19	1447	557	--	557	586	2	588	31	--
20	1380	523	32	555	586	--	586	31	--
21	1332	499	53	552	584	--	584	32	--
22	1325	496	43	539	584	--	584	45	--
23	1278	472	77	549	586	--	586	37	--
24	1232	449	98	547	584	--	584	37	--
25	1209	438	95	533	582	--	582	49	--
26	1158	412	156	568	584	--	584	16	--
27	1083	375	203	578	586	--	586	8	--
28	1060	363	217	580	592	--	592	12	--
29	979	323	262	585	584	--	584	--	1
30	935	301	257	558	584	--	584	26	--
31	882	274	297	571	584	--	584	13	--
Total sc-ft.	50644	20152	1790	21942	18077	3440	21517	453	878
Mean	1634	650	58	708	583	111	694	15	28
Ac-ft.	100452	39971	3550	43521	35856	6822	42678	899	1742

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

JULY - 1947

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	or Deficit delivered
1	2278	1306	1340	679	34	--
2	2141	1237	1260	707	23	--
3	2182	1258	1250	721	--	8
4	2189	1261	1280	719	19	--
5	2145	1239	1260	724	21	--
6	2081	1207	1240	724	33	--
7	2091	1212	1250	765	38	--
8	2034	1184	1290	834	106	--
9	1996	1165	1300	892	135	--
10	2004	1169	1280	944	111	--
11	1984	1159	1270	941	111	--
12	2028	1181	1250	938	69	--
13	1921	1127	1190	935	63	--
14	1739	1036	1120	941	84	--
15	1706	1020	1050	935	30	--
16	1662	998	983	905	--	15
17	1625	979	929	912	--	50
18	1538	936	893	901	--	43
19	1447	890	859	861	--	31
20	1380	857	826	818	--	31
21	1332	833	801	790	--	32
22	1325	829	784	770	--	45
23	1278	806	769	740	--	37
24	1232	783	746	707	--	37
25	1209	771	722	697	--	49
26	1158	746	730	704	--	16
27	1083	708	700	682	--	8
28	1060	697	685	664	--	12
29	979	656	657	625	1	--
30	935	634	608	589	--	26
31	882	608	595	572	--	13
Total sec-ft.	50644	30492	30917	24346	878	453
Mean	1634	984	997	785	28	15
Ac-ft.	100452	60481	61324	48290	1742	899

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

AUGUST - 1947

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	133	43	176	545	---	369
2	141	38	179	545	---	366
3	143	28	171	539	---	368
4	141	59	200	539	---	339
5	135	37	172	559	---	387
6	128	72	200	573	---	373
7	118	41	159	566	---	407
8	116	9	125	562	---	437
9	114	27	141	580	---	439
10	107	37	144	594	---	450
11	98	49	147	591	---	444
12	89	53	142	587	---	445
13	85	49	134	580	---	446
14	81	7	88	591	---	503
15	79	20	99	594	---	495
16	83	26	109	591	---	482
17	92	20	112	584	---	472
18	81	23	104	576	---	472
19	77	38	115	573	---	458
20	79	49	128	570	---	442
21	77	9	86	562	---	476
22	98	134	232	556	---	324
23	224	93	317	549	---	232
24	239	75	314	545	---	231
25	188	32	220	542	---	322
26	146	27	173	539	---	366
27	120	59	179	536	---	357
28	104	42	146	545	---	399
29	94	28	122	566	---	444
30	96	48	144	598	---	454
31	96	92	188	594	---	406
Total sec-ft.	3602	1364	4966	17571	---	12605
Mean	116	44	160	567	---	407
Ac-ft.	7144	2705	9849	34852	---	25002

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER

AUGUST - 1947

Day	St. Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R. Gross	Total in sec-ft.	Stored water released Net	Natural flow St.Mary River at Boundary
1	595	586	--	1181	309	872
2	588	586	--	1174	356	818
3	581	586	--	1167	369	798
4	575	584	--	1159	366	793
5	556	584	--	1140	368	772
6	538	586	--	1124	339	785
7	544	587	--	1131	387	744
8	525	588	--	1113	373	740
9	496	588	--	1084	407	677
10	490	588	--	1078	437	641
11	473	588	--	1061	439	622
12	467	588	--	1055	450	605
13	467	588	--	1055	444	611
14	440	586	--	1026	445	581
15	424	586	--	1010	446	564
16	414	590	--	1004	503	501
17	424	584	--	1008	495	513
18	484	523	--	1007	482	525
19	424	540	--	964	472	492
20	398	548	--	946	472	474
21	398	548	--	946	458	488
22	445	555	--	1000	442	558
23	538	559	--	1097	476	621
24	513	555	--	1068	324	744
25	501	555	--	1056	232	824
26	496	555	--	1051	231	820
27	484	554	--	1038	322	716
28	461	554	--	1015	366	649
29	445	552	--	997	357	640
30	450	554	--	1004	399	605
31	461	557	--	1018	444	574
Total sec-ft.	15095	17682	--	32777	12410	20367
Mean	487	570	--	1057	400	657
Ac-ft.	29941	35072	--	65013	24615	40398

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

AUGUST - 1947

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	872	269	309	578	586	--	586	8	--
2	818	242	356	598	586	--	586	--	12
3	798	232	369	601	586	--	586	--	15
4	793	230	366	596	584	--	584	--	12
5	772	219	368	587	584	--	584	--	3
6	785	226	339	565	586	--	586	21	--
7	744	205	387	592	587	--	587	--	5
8	740	203	373	576	588	--	588	12	--
9	677	172	407	579	588	--	588	9	--
10	641	160	437	597	588	--	588	--	9
11	622	156	439	595	588	--	588	--	7
12	605	151	450	601	588	--	588	--	13
13	611	153	444	597	588	--	588	--	9
14	581	145	445	590	586	--	586	--	4
15	564	141	446	587	586	--	586	--	1
16	501	125	503	628	590	--	590	--	38
17	513	128	495	623	584	--	584	--	39
18	525	131	482	613	523	--	523	--	90
19	492	123	472	595	540	--	540	--	55
20	474	118	472	590	548	--	548	--	42
21	488	122	458	580	548	--	548	--	32
22	558	140	442	582	555	--	555	--	27
23	621	155	476	631	559	--	559	--	72
24	744	205	324	529	555	--	555	26	--
25	824	245	232	477	555	--	555	78	--
26	820	243	231	474	555	--	555	81	--
27	716	191	322	513	554	--	554	41	--
28	649	162	366	528	554	--	554	26	--
29	640	160	357	517	552	--	552	35	--
30	605	151	399	550	554	--	554	4	--
31	574	144	444	588	557	--	557	--	31
Total sec-ft.	20367	5447	12410	17857	17682	--	17682	341	516
Mean	657	176	400	576	570	--	570	11	17
Ac-ft.	40398	10804	24615	35419	35072	--	35072	676	1023

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

AUGUST - 1947

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	or Deficit delivered
1	872	603	595	572	--	8
2	818	576	588	566	12	--
3	798	566	581	556	15	--
4	793	563	575	542	12	--
5	772	553	556	524	3	--
6	785	559	538	512	--	21
7	744	539	544	516	-5	--
8	740	537	525	497	--	12
9	677	505	496	468	--	9
10	641	481	490	458	9	--
11	622	466	473	441	7	--
12	605	454	467	431	13	--
13	611	458	467	432	9	--
14	581	436	440	404	4	--
15	564	423	424	391	1	--
16	501	376	414	384	38	--
17	513	385	424	401	39	--
18	525	394	484	456	90	--
19	492	369	424	408	55	--
20	474	356	398	384	42	--
21	488	366	398	382	32	--
22	558	418	445	417	27	--
23	621	466	538	508	72	--
24	744	539	513	482	--	26
25	824	579	501	482	--	78
26	820	577	496	468	--	81
27	716	525	484	463	--	41
28	649	487	461	445	--	26
29	640	480	445	432	--	35
30	605	454	450	431	--	4
31	574	430	461	438	31	--
Total sec-ft.	20367	14920	15095	14291	516	341
Mean	657	481	487	461	17	11
Ac-ft.	40398	29594	29941	28350	1023	676

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

SEPTEMBER - 1947

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	92	6	98	580	--	492
2	85	13	98	573	--	475
3	83	49	132	566	--	434
4	79	42	121	559	--	438
5	79	17	96	549	--	453
6	77	72	149	539	--	390
7	77	63	140	529	--	389
8	81	20	101	522	--	421
9	74	23	97	513	--	416
10	74	19	93	504	--	411
11	74	15	89	519	--	430
12	77	20	97	522	--	425
13	72	29	101	529	--	428
14	72	20	92	526	--	434
15	67	20	87	526	--	439
16	60	48	108	606	--	498
17	60	68	128	613	--	485
18	57	88	145	587	--	442
19	55	66	121	545	--	424
20	52	11	63	363	--	300
21	63	13	76	299	--	223
22	116	50	166	374	--	208
23	202	139	341	578	--	237
24	220	140	360	465	--	105
25	196	90	286	373	--	87
26	162	70	232	316	--	84
27	143	60	203	286	--	83
28	128	50	178	259	--	81
29	114	40	154	239	--	85
30	100	35	135	220	--	85
Total sec-ft.	2891	1396	4287	14179	--	9892
Mean	96	47	143	473	--	330
Ac-ft.	5734	2768	8502	28124	--	19622

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER

SEPTEMBER - 1947

Day	St. Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R. Gross	Total in sec-ft.	Stored water released Net	Natural flow St.Mary River at Boundary
1	445	555	--	1000	454	546
2	429	555	--	984	406	578
3	419	555	--	974	482	492
4	398	555	--	953	475	478
5	379	550	--	929	434	495
6	351	552	--	903	438	465
7	342	554	--	896	453	443
8	325	555	--	880	390	490
9	308	559	--	867	389	478
10	297	557	--	854	421	433
11	285	557	--	842	416	426
12	281	559	--	840	411	429
13	278	550	--	828	430	398
14	270	550	--	820	425	395
15	263	552	--	815	428	387
16	278	556	--	834	434	400
17	334	562	--	896	439	457
18	351	572	--	923	498	425
19	365	575	--	940	485	455
20	414	505	--	919	442	477
21	356	480	--	836	424	412
22	478	302	--	780	300	480
23	556	227	--	783	223	560
24	635	227	--	862	208	654
25	678	228	--	906	237	669
26	685	228	--	913	105	808
27	671	227	--	898	87	811
28	642	227	--	869	84	785
29	608	224	--	832	83	749
30	575	223	--	798	81	717
Total sec-ft.	12696	13678	--	26374	10582	15792
Mean	423	456	--	879	353	526
Ac-ft.	25183	27130	--	52312	20989	31323

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

SEPTEMBER - 1947

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	546	136	454	590	555	--	555	--	35
2	578	144	406	550	555	--	555	5	--
3	492	123	482	605	555	--	555	--	50
4	478	120	475	595	555	--	555	--	40
5	495	124	434	558	550	--	550	--	8
6	465	116	438	554	552	--	552	--	2
7	443	111	453	564	554	--	554	--	10
8	490	122	390	512	555	--	555	43	--
9	478	120	389	509	559	--	559	50	--
10	433	108	421	529	557	--	557	28	--
11	426	106	416	522	557	--	557	35	--
12	429	107	411	518	559	--	559	41	--
13	398	100	430	530	550	--	550	20	--
14	395	99	425	524	550	--	550	26	--
15	387	97	428	525	552	--	552	27	--
16	400	100	434	534	556	--	556	22	--
17	457	114	439	553	562	--	562	9	--
18	425	106	498	604	572	--	572	--	32
19	455	114	485	599	575	--	575	--	24
20	477	119	442	561	505	--	505	--	56
21	412	103	424	527	480	--	480	--	47
22	480	120	300	420	302	--	302	--	118
23	560	140	223	363	227	--	227	--	136
24	654	164	208	372	227	--	227	--	145
25	669	168	237	405	228	--	228	--	177
26	808	237	105	342	228	--	228	--	114
27	811	239	87	326	227	--	227	--	99
28	785	226	84	310	227	--	227	--	83
29	749	208	83	291	224	--	224	--	67
30	717	192	81	273	223	--	223	--	50
Total sec-ft.	15792	4083	10582	14665	13678	--	13678	306	1293
Mean	526	136	353	489	456	--	456	10	43
Ac-ft.	31323	8099	20989	29088	27130	--	27130	607	2565

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

SEPTEMBER - 1947

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	or Deficit delivered
1	546	410	445	423	35	--
2	578	434	429	406	--	5
3	492	369	419	396	50	--
4	478	358	398	379	40	--
5	495	371	379	362	8	--
6	465	349	351	340	2	--
7	443	332	342	332	10	--
8	490	368	325	322	--	43
9	478	358	308	300	--	50
10	433	325	297	288	--	28
11	426	320	285	278	--	35
12	429	322	281	273	--	41
13	398	298	278	270	--	20
14	395	296	270	264	--	26
15	387	290	263	260	--	27
16	400	300	278	268	--	22
17	457	343	334	325	--	9
18	425	319	351	351	32	--
19	455	341	365	359	24	--
20	477	358	414	401	56	--
21	412	309	356	348	47	--
22	480	360	478	442	118	--
23	560	420	556	516	136	--
24	654	490	635	574	145	--
25	669	501	678	481	177	--
26	808	571	685	392	114	--
27	811	572	671	386	99	--
28	785	559	642	370	83	--
29	749	541	608	374	67	--
30	717	525	575	404	50	--
Total sec-ft.	15792	11709	12696	10884	1293	306
Mean	526	390	423	363	43	10
Ac-ft.	31323	23225	25183	21590	2565	607

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

OCTOBER - 1948

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	89	32	121	200	--	79
2	96	34	130	183	--	53
3	133	44	177	192	--	15
4	211	54	265	142	123	--
5	227	62	289	1	288	--
6	199	60	259	1	258	--
7	168	52	220	118	102	--
8	148	47	195	1	194	--
9	133	38	171	1	170	--
10	128	32	160	1	159	--
11	128	32	160	0	160	--
12	125	31	156	0	156	--
13	120	30	150	0	150	--
14	114	29	143	0	143	--
15	114	29	143	0	143	--
16	269	110	379	0	379	--
17	481	205	686	0	686	--
18	458	203	661	0	661	--
19	882	421	1303	1	1302	--
20	874	416	1290	0	1290	--
21	529	290	819	0	819	--
22	350	140	490	0	490	--
23	258	106	364	0	364	--
24	202	95	297	0	297	--
25	173	73	246	0	246	--
26	157	68	225	0	225	--
27	148	51	199	0	199	--
28	151	45	196	0	196	--
29	159	47	206	0	206	--
30	159	47	206	0	206	--
31	148	44	192	0	192	--
Total sec-ft.	7531	2967	10498	841	9804	147
Mean	243	96	339	27	316	5
Ac-ft.	14940	5885	20825	1668	19446	292

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER

OCTOBER - 1947

Day	St. Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R. Gross	Total in sec-ft.	Stored water released Net	Natural flow St.Mary River at Boundary
1	568	211	--	779	85	694
2	746	30	--	776	85	691
3	738	--	--	738	79	659
4	761	--	--	761	53	708
5	776	--	--	776	15	761
6	761	--	123	884	--	884
7	753	--	288	1041	--	1041
8	776	--	258	1034	--	1034
9	746	--	102	848	--	848
10	715	--	194	909	--	909
11	685	--	170	855	--	855
12	693	--	159	852	--	852
13	649	--	160	809	--	809
14	615	--	156	771	--	771
15	588	--	150	738	--	738
16	606	--	143	745	--	745
17	642	--	143	785	--	785
18	769	--	379	1148	--	1148
19	1020	--	686	1706	--	1706
20	1460	--	661	2121	--	2121
21	1610	--	1302	2912	--	2912
22	1650	--	1290	2940	--	2940
23	1600	--	819	2419	--	2419
24	1510	--	490	2000	--	2000
25	1420	--	364	1784	--	1784
26	1310	--	297	1607	--	1607
27	1220	--	246	1466	--	1466
28	1130	--	225	1355	--	1355
29	1020	--	199	1219	--	1219
30	964	--	196	1160	--	1160
31	911	--	206	1117	--	1117
Total sec-ft.	29408	241	9406	39055	317	38738
Mean	949 (1-2)	120	303	1260	10	1250
Ac-ft.	58331	478	18657	77466	629	76837

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

OCTOBER - 1947

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. Divert-ed	Stored Gross	Total Used	Excess of share	Deficit used
1	694	180	85	265	211	--	211	--	54
2	691	179	85	264	30	--	30	--	234
3	659	165	79	244	--	--	--	--	244
4	708	187	53	240	--	--	--	--	240
5	761	214	15	229	--	--	--	--	229
6	884	275	--	275	--	123	123	--	152
7	1041	354	--	354	--	288	288	--	66
8	1034	350	--	350	--	258	258	--	92
9	848	257	--	257	--	102	102	--	155
10	909	288	--	288	--	194	194	--	94
11	855	261	--	261	--	170	170	--	91
12	852	259	--	259	--	159	159	--	100
13	809	238	--	238	--	160	160	--	78
14	771	219	--	219	--	156	156	--	63
15	738	202	--	202	--	150	150	--	52
16	745	206	--	206	--	143	143	--	63
17	785	226	--	226	--	143	143	--	83
18	1148	407	--	407	--	379	379	--	28
19	1706	686	--	686	--	686	686	--	--
20	2121	894	--	894	--	661	661	--	233
21	2912	1289	--	1289	--	1302	1302	13	--
22	2940	1303	--	1303	--	1290	1290	--	13
23	2419	1043	--	1043	--	819	819	--	224
24	2000	833	--	833	--	490	490	--	343
25	1784	725	--	725	--	364	364	--	361
26	1607	637	--	637	--	297	297	--	340
27	1466	566	--	566	--	246	246	--	320
28	1355	511	--	511	--	225	225	--	286
29	1219	443	--	443	--	199	199	--	244
30	1160	413	--	413	--	196	196	--	217
31	1117	392	--	392	--	206	206	--	186
Total sec-ft.	38738	14202	317	14519	241	9406	9647	13	4885
Mean	1250	458	10	468(1-2)	120	303	311	--	157
Ac-ft.	76837	28170	629	28799	478	18657	19135	25	9689

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

OCTOBER - 1947

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	or Deficit delivered
1	694	514	568	508	54	--
2	691	512	746	540	234	--
3	659	494	738	469	244	--
4	708	521	761	484	240	--
5	761	547	776	485	229	--
6	884	609	761	474	152	--
7	1041	687	753	468	66	--
8	1034	684	776	485	92	--
9	848	591	746	463	155	--
10	909	621	715	463	94	--
11	855	594	685	467	91	--
12	852	593	693	482	100	--
13	809	571	649	468	78	--
14	771	552	615	478	63	--
15	738	536	588	474	52	--
16	745	539	602	495	63	--
17	785	559	642	506	83	--
18	1148	741	769	516	28	--
19	1706	1020	1020	527	--	--
20	2121	1227	1460	445	233	--
21	2912	1623	1610	429	--	13
22	2940	1637	1650	441	13	--
23	2419	1376	1600	415	224	--
24	2000	1167	1510	445	343	--
25	1784	1059	1420	459	361	--
26	1607	970	1310	461	340	--
27	1466	900	1220	450	320	--
28	1355	844	1130	472	286	--
29	1219	776	1020	454	244	--
30	1160	747	964	433	217	--
31	1117	725	911	---	186	--
Total sec-ft.	38738	24536	29408	14156	4885	13
Mean	1250	792	949 (1-30)	472	157	--
Ac-ft.	76837	48667	58331	28080	9689	25

DIVISION OF ST. MARY RIVER
CANADA
1947

Water available in acre-feet

Month	St.Mary R. at Kimball	Rolph Creek at Kimball	Lee Creek at Cardston	Pothole Creek at Magrath	Combined flow
April	58432	1370	12110	2300	74212
May	137635	544	15120	154	153453
June	114210	350	8200	230	122990
July	61324	172	2050	16	63562
August	29941	199	864	--	31004
September	25183	321	1660	--	27164
October	58331	206	897	--	59434
Total	485056	3162	40901	2700	531819[a]

DISPOSITION

Month	Canada's share	Diverted by Canada	Unused by Canada	Gain or loss in Canal	Wasted from Canal	Applied to Land
April	36123	--	36123	2430	2430	--
May	94167	16400	77767	- 1787	2148	12465
June	86838	30520	56318	- 996	8117	21407
July	60481	48290	12191	2285	3285	47290
August	29594	28350	1244	2138	6148	24340
September	23225	21590	1635	2054	12450	11194
October	48667	28080	20587	1505	15969	13616
Total	379095	173230[b]	205865[c]	7629[d]	50547[e]	130312[f]

a - Computed. b - Diverted by A.R.&I. Co. at Kimball.
c - Difference between Canada's share and quantity of share diverted.
d - Gain or Loss in canal between Kimball and Magrath.
e - Wasted in Pinepound and Pothole Creeks.
f - Flow in canal at Magrath plus diversion by laterals.

DIVISION OF ST. MARY RIVER
UNITED STATES
1947

Water available in acre-feet.

Month	St. Mary River						Total flow Milk River Eastern Crossing
	U. S. Share	Sherburne Res. Stored	Sherburne Res. Released	Total Available for Diversion	Diverted	Unused	
April	18177	3970	8102	22309	--	22309	41190
May	73663	18472	652	55843	12375	43468	29130
June	66992	12145	554	55401	28029	27372	38150
July	39971	6822	3550	36699	35856	843	37160
August	10804	---	24615	35419	35072	347	37000
September	8099	---	20989	29088	27130	1958	33740
October	28170	18657	629	10142	478	9664	8230
Total	245876	60066	59091	244901	138940	105961	224600

Storage in Sherburne Lake Reservoir on March 31, 23,117 acre-feet.
on October 31, 23,535 acre-feet.
Storage in Fresno Reservoir on March 31, 136,684 acre-feet.
on October 31, 80,450 acre-feet.
The water stored in Sherburne Lake Reservoir includes the amount lost by evaporation.

DIVERSIONS FROM MILK RIVER
UNITED STATES
1947

Quantities in acre-feet

Month	Fort Belknap Canal	Paradise Canal	Harlem Canal	Harlem No.2	Agency Canal	Dodson North	Dodson South	Vandalia Canal	Total
April	---	---	---	---	---	528	8940	---	9740
May	6040	2450	3170	641	2440	4390	14080	4130	37330
June	11920	6780	4280	1130	6180	3640	13810	2500	50240
July	12880	6450	2940	1730	4500	6530	13080	6430	54540
August	12620	6520	3330	791	2710	4200	14130	4110	48410
September	6150	2830	1190	---	893	1980	6630	2280	21950
October	2150	615	1590	---	496	526	3330	2080	10790
November	---	---	---	---	198	---	149	774	1120
Total	51760	25640	16500	4290	17420	21790	74150	22700	233850

Storage in Nelson Reservoir on March 31, 27,033 acre-feet.
on October 31, 40,096 acre-feet.

DETERMINATION OF NATURAL FLOW OF FRENCHMAN RIVER AT INTERNATIONAL BOUNDARY 1947

Water used by Canada at Cypress Lake and East End.
Quantities in second-feet.

Date at Intern'l Boundary	Used at Cypress		Used at East End				Total used
	Stored	Released	Stored	Released	Diverted	Return flow	
March							
1 - 10	0.0	0.0	1.0	0.0	0.0	0.0	1.0
11 - 20	0.0	0.0	2.0	0.0	0.0	0.0	2.0
21 - 31	18.0	0.0	2.0	0.0	0.0	0.0	20.0
April							
1 - 10	343.0	0.0	69.0	0.0	0.0	0.0	412.0
11 - 20	455.0	0.0	591.0	0.0	0.0	0.0	1046.0
21 - 30	410.3	0.0	15.0	0.0	0.0	0.0	425.3
May							
1 - 10	140.8	0.0	79.0	0.0	12.0	3.6	228.2
11 - 20	99.1	0.0	78.0	0.0	103.0	30.9	249.2
21 - 31	53.5	94.2	149.0	0.0	261.5	78.4	291.4
June							
1 - 10	19.6	64.9	16.0	0.0	239.9	72.0	138.6
11 - 20	5.1	53.4	75.0	0.0	140.4	42.1	125.0
21 - 30	12.9	37.0	15.0	0.0	107.0	32.1	65.8
July							
1 - 10	18.7	31.3	0.0	9.0	154.5	46.4	86.5
11 - 20	13.7	17.8	0.0	225.0	337.7	101.3	7.3
21 - 31	12.8	7.1	0.0	281.0	363.3	109.0	- 21.0
August							
1 - 10	0.0	53.6	0.0	137.0	303.7	91.1	22.0
11 - 20	1.6	157.6	119.0	0.0	196.7	59.0	100.7
21 - 31	0.0	9.1	0.0	70.0	97.6	29.3	- 10.8
September							
1 - 10	0.0	0.0	2.0	0.0	8.5	2.6	7.9
11 - 20	0.0	0.0	0.0	28.0	0.0	0.0	- 28.0
21 - 30	1.1	0.0	33.0	0.0	0.0	0.0	34.1
October							
1 - 10	0.0	3.5	6.0	0.0	0.0	0.0	2.5
11 - 20	0.0	3.0	12.0	0.0	0.0	0.0	9.0
21 - 31	0.0	0.5	17.0	0.0	0.0	0.0	16.5
Total sec-ft.	1605.2	533.0	1281.0	750.0	2325.8	697.8	3231.2
Mean	6.6	2.2	5.2	3.1	9.5	2.8	13.2
Ac-ft.	3184	1057	2541	1488	4613	1384	6409

DETERMINATION OF NATURAL FLOW OF FRENCHMAN RIVER AT INTERNATIONAL BOUNDARY 1947

Water used by Canada at Val Marie
Quantities in second-feet.

Upper Val Marie			Lower Val Marie				Total used
Stored	Released	Diverted	Stored	Released	Diverted	Return flow	
March							
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
117.0	0.0	0.0	420.0	0.0	0.0	0.0	537.0
April							
201.0	0.0	0.0	643.0	0.0	0.0	0.0	844.0
212.0	0.0	0.0	3309.0	0.0	0.4	0.1	3521.3
247.0	0.0	0.0	0.0	224.0	1.3	0.4	23.9
May							
0.0	25.0	0.0	167.0	0.0	0.0	0.0	142.0
196.0	0.0	0.0	39.0	0.0	93.0	27.9	300.1
80.0	0.0	0.1	0.0	408.0	581.3	174.4	79.0
June							
0.0	13.0	61.9	0.0	81.0	341.4	121.0	188.3
88.0	0.0	40.8	406.0	0.0	44.6	25.6	553.8
10.0	0.0	44.2	80.0	0.0	38.5	24.8	147.9
July							
28.0	0.0	13.1	86.0	0.0	181.6	58.4	250.3
5.0	0.0	0.0	0.0	315.0	365.3	109.6	- 54.3
21.0	0.0	6.5	0.0	563.0	606.2	183.8	- 113.1
August							
14.0	0.0	40.8	0.0	508.0	460.3	150.3	- 143.2
5.0	0.0	35.5	73.0	0.0	91.5	38.1	166.9
0.0	0.0	6.3	21.0	0.0	0.0	1.9	25.4
September							
0.0	7.0	0.0	0.0	4.0	0.0	0.0	- 11.0
0.0	4.0	0.0	0.0	40.0	0.0	0.0	- 44.0
0.0	6.0	0.0	0.0	275.0	0.0	0.0	- 281.0
October							
0.0	15.0	0.0	0.0	260.0	0.0	0.0	- 275.0
0.0	14.0	0.0	0.0	171.0	0.0	0.0	- 185.0
0.0	18.0	0.0	0.0	32.0	0.0	0.0	- 50.0
1224.0	102.0	249.2	5244.0	2881.0	2805.4	916.3	5623.3
5.0	0.4	1.0	21.4	11.8	11.4	3.7	23.0
2428	202	494	10401	5714	5564	1817	11154

DETERMINATION OF NATURAL FLOW OF FRENCHMAN RIVER AT INTERNATIONAL BOUNDARY 1947

Quantities in second-feet.

Date at Intern'l Boundary	Used by Canada: Cypress Lake and East End	Used by Canada: Val Marie	Used by Canada: Total Used	Frenchman River: Flow Boundary	Frenchman River: Natural flow	United States: Share	United States: Received + or -
March							
1 - 10	1.0	0.0	1.0	20.0	21.0	10.5	9.5
11 - 20	2.0	0.0	2.0	10.0	12.0	6.0	4.0
21 - 31	20.0	537.0	557.0	2800.0	3357.0	1678.5	1121.5
April							
1 - 10	412.0	844.0	1256.0	3165.0	4421.0	2210.5	954.5
11 - 20	1046.0	3521.3	4567.3	4877.0	9444.3	4722.2	154.8
21 - 30	425.3	23.9	449.2	2901.0	3350.2	1675.1	1225.9
May							
1 - 10	228.2	142.0	370.2	1045.0	1415.2	707.6	357.4
11 - 20	249.2	300.1	549.3	433.3	982.6	491.3	- 58.0
21 - 31	291.4	79.0	370.4	232.2	602.5	301.2	- 69.0
June							
1 - 10	138.6	188.3	326.9	299.1	626.0	313.0	- 13.9
11 - 20	125.0	553.8	678.8	120.7	799.5	399.8	- 279.1
21 - 30	65.8	147.9	213.7	17.2	230.9	115.4	- 98.2
July							
1 - 10	86.5	250.3	336.8	41.3	378.1	189.0	- 147.7
11 - 20	7.3	- 54.3	- 47.0	159.9	112.9	56.4	103.5
21 - 31	- 21.0	-113.1	-134.1	107.7	- 26.4	- 13.2	120.9
August							
1 - 10	22.0	-143.2	-121.2	191.2	70.0	35.0	156.2
11 - 20	100.7	166.9	267.6	62.5	330.1	165.0	- 102.5
21 - 31	- 10.8	25.4	14.6	16.1	30.7	15.4	0.7
September							
1 - 10	7.9	- 11.0	- 3.1	0.0	- 3.1	- 1.6	1.6
11 - 20	- 28.0	- 44.0	- 72.0	0.0	- 72.0	- 36.0	36.0
21 - 30	34.1	-281.0	-246.9	392.9	146.0	73.0	319.9
October							
1 - 10	2.5	-275.0	-272.5	336.3	63.8	31.9	304.4
11 - 20	9.0	-185.0	-176.0	241.1	65.1	32.6	208.5
21 - 31	16.5	- 50.0	- 33.5	183.3	149.8	74.9	108.4
Total sec-ft.	3231.2	5623.3	8854.5	17652.8	26507.2	13253.5	4399.3
Mean	13.2	23.0	36.1	72.1	108.2	54.1	18.0
Ac-ft.	6409	11154	17563	35014	52576	26288	8726

Table 4

ESTIMATED DIVERSION FROM THE NORTHERN TRIBUTARIES OF MILK RIVER IN CANADA 1947

Quantities in acre-feet

Irrigator	Source of Supply		Estimated Diversion
Lodge Creek Basin			
No report			
Total diverted from Lodge Creek			No report
Flow of Lodge Creek at Boundary			19,290
Battle Creek Basin			
Shepherd Bros.	Battle Creek		25
Shepherd Bros.	Battle Creek		20
Mitchell Ranching Co.	Battle Creek		100
Stirling & Nash	Battle Creek		1,200
Battle Creek Diversion to Cypress Lake		5,080	
less return of		2,080	3,000
Total diverted from Battle Creek			4,345
Flow of Battle Creek at Boundary			6,920
Frenchman River Basin			
Cypress Cattle Co. Ltd.	Davis Creek		50
Armstrong	Clarence Coulee		60
Bolingbroke	Bolingbroke Creek		10
Howard	Concrete Coulee		200
Diversion to Cypress Lake Reservoir		3,184	
Released from Cypress Lake Reservoir		1,057	2,127
East End Irrigation District			4,620
Diversion to East End Reservoir		2,541	
Released from East End Reservoir		1,488	1,053
Diverted to Val Marie Reservoirs		12,829	
Released from Val Marie Reservoirs		5,916	6,913
Val Marie Irrigation District			6,059
P.F.R.A. above Val Marie			200
Total diverted from Frenchman River			21,292
Flow of Frenchman River at Boundary			35,014

Table 5

MEASURED DIVERSIONS FROM THE NORTHERN TRIBUTARIES

OF MILK RIVER IN THE UNITED STATES

1947

(Quantities in acre-feet)

Irrigator	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
				Lodge Creek					
North Chinook Canal	1,270	3,230	336	0	0	0	0	0	4,866
				Battle Creek					
Matheson Canal	0	31	190	132	4	79	3	0	439
				Frenchman River					
Frenchman Canal	181	3	1,570	1,250	452	698	290	1,280	*5,724
Total	1,451	3,264	2,126	1,382	456	777	293	1,280	*11,029

*Does not include 123 acre-feet measured November 1-11.