Report to

THE INTERNATIONAL JOINT COMMISSION

on

THE DIVISION AND USE MADE OF THE WATERS OF

ST. MARY AND MILK RIVERS

by

J. T. JOHNSTON
representing Canada

and

N. C. GROVER
representing the United States

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

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 of 1932.

Respectfully submitted,

Accredited Officer of His Majesty,

Accredited Officer of the United States.

April 4th, 1933.

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 1932, by the same engineers as in previous years.

Mr. N. C. Grover, Chief Hydraulic Engineer, United States Geological Survey, as accredited officer for the United States was represented in the field by Mr. W. A. Lamb, District Engineer, Helena, Montana. Mr. J. T. Johnston, Director, Dominion Water Power and Hydrometric Bureau, as accredited officer of His Majesty, was represented by Mr. S. G. Dawson, Ottawa, Canada.

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 personal supervision of Mr. Lamb; while those from streams and ditches in Canada were collected by Mr. W. T. McFarlane, Dominion Water Power and Hydrometric Bureau, Calgary, Alberta. The joint international stations were visited frequently by representatives of both countries.

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 early in July and continued until the closing of the season, the field engineers were compelled to keep constantly 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, therefor, 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 Director, Dominion Water Power and Hydrometric Bureau.

Division of Water.

The United States St. Mary canal was opened on April 8th and kept in continuous operation until September 11th, water being first delivered to the North Branch Milk River on April 14th. The canal was closed between September 11th and October 18th, when it was again opened for a small discharge until October 27th, the end of the season's operations. As

the loss in the canal by seepage between the intake and the crossing of the St. Mary river, which this year was about 15% of the water diverted at the headgates, is assumed to return directly to the river channel and eventually become available to Canada, the discharge of 157,000 acre-feet passing in the canal at the St. Mary river crossing is, therefore, considered as the actual quantity diverted from the St. Mary river by the United States. Of this quantity, 156,000 acre-feet were delivered to the Milk river and made available for irrigation in Montana. The loss in the canal between St. Mary river crossing and Hudson Bay Divide, the end of the canal, was due to evaporation and seepage.

Water from Swiftcurrent creek was stored in Sherburne Reservoir during the winter period and until April 15th, resulting in an impounding of 18,000 acre-feet which otherwise would have been wasted. When the United States St. Mary canal was opened on April 8th, it was found that the share of the St. Mary river available to the United States was not sufficient to wholly supply the demand on the canal, consequently, quantities of stored water were released reducing the water in storage to 9,000 acre-feet. By May 6th the flow in the river had increased sufficiently to satisfy the requirements and permit further storage. This conservation made available approximately 55,000 acre-feet of water which could later be used to supplement the United States' share of

St. Mary river.

The flow of the St. Mary river had so decreased by July 14th, that again the share was insufficient to fulfill the demands on the canal. Stored water was then released to make up this deficit but by the middle of October the reserve was practically exhausted. As very little water was diverted from Milk river in Canada during this season, the natural flow of the river is considered as being delivered to the United States at Eastern Crossing. The total diversion for irrigation from Milk river in Montana was 212,944 acre-feet.

The total recorded flow crossing the International Boundary from the Northern tributaries of Milk river during the year of 1932 was 72,299 acre-feet, which is about 434% of the flow recorded in 1931 and 41% of the average for the years of record.

The Canadian Pacific Railway canal at Kimball, Alberta, diverted 163,900 acre-feet from the St. Mary river during the period of operation from the 8th of April to the 29th of October, 138,000 acre-feet being used to irrigate lands in Southern Alberta.

Any question as to the proper share of the St. Mary river being delivered to either country was decided in the following manner. Current meter measurements were made of Swiftcurrent creek at Many Glacier and Canyon creek near Many Glacier, but the flow of the other creeks entering Swiftcurrent

creek above the Sherburne dam were estimated. The total flow 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 current meter measurement of the outflow from the reservoir was made 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 measurement of the United States St. Mary canal at St. Mary Crossing was made to find the water being diverted by the United States, and a measurement of the St. Mary river at Kimball, near the International Boundary, 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 St. Mary river was less than 666 cubic-feet per second, 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 and its Northern tributaries.

Water Supply.

The precipitation on the drainage basins of the St. Mary and Milk rivers during the winter of 1931-32, while about normal during the last months of 1931, was again below normal during the season as a whole.

In the mountainous areas tributary to the St. Mary river basin as shown by the eleventh annual international survey of the snow conditions on the headwaters of Swiftcurrent creek, an area considered typical of the headwaters of the St. Mary river, the snow cover was in excess of normal. The run-off from the area surveyed, during May, June and July was somewhat in excess of the average of previous years of survey. Under the influence of Chinook conditions during the latter part of

February, run-off was abnormal for that period.

The flow of the St. Mary river, as recorded at the international boundary during the irrigation season of 1932, was about normal for the 23 years of record but only 85% of the average of the last 10 years.

On the prairies, forming the major portion of the drainage basin of Milk river and its tributaries in Canada and Montana, an average snow cover existed until mid-February. During the last week in February and early March Chinook winds prevailed and swept the prairies free of snow. This condition resulted in a partial break-up of the streams causing increased run-off until the first week in March. Lower temperatures during the latter part of March delayed the usual spring break-up until early April. In late April heavy rains fell over the whole area but because of the very dry condition of the soil, a large percentage of the precipitation was absorbed by the ground and did not increase the run-off.

The total annual precipitation in Saskatchewan during 1932 was slightly above the normal for the last 13 years but during the growing season, June and July, it was much in excess of the average for these months. In Montana the total precipitation for 1932 was more than 6 inches above the total for 1931, and .73 of an inch above the normal. The average for June and July was .7 of an inch above that for the same period in 1931.

The twenty-three international gauging stations previously used in the determination of the daily natural flow of the streams in the St. Mary and Milk river basins were maintained and operated under the joint supervision of the field engineers.

Owing to lack of sufficient funds, several stations previously maintained by Canada on international streams and canals diverting therefrom were abandoned. The Dominion Water Power and Hydrometric Bureau is largely dependent 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 and do not show the total diversion.

Diversions reported from the Northern tributaries in Canada are: from Lodge creek, 380 acre-feet; from Battle creek, 1,125 acre-feet; from Frenchman river, 920 acre-feet. There were no diversions from the other tributaries.

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 1932.

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 the St. Mary river during the irrigation season of 1932, the water available for use and used by the 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 to and the 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 and Canyon creeks and with the use of the storage curve of Sherburne reservoir to give the gain or loss in storage, after allowance has been made for evaporation and seepage losses. 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 by the United States under the ruling of the Order of October 4th, 1921, the water diverted and stored and the excess or the 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 the statement showing the quantity in acre-feet taken in each month by each country and the quantity thereof applied to the land, the quantity diverted from St. Mary river, the loss or waste from the canals and the diversions from Milk river in the United States.

Table 3 shows the available information on the diversions from the northern tributaries of Milk river in Canada.

Table 4 gives the diversions from the northern tributaries of Milk river in the United States.

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
APRIL - 1932

Day	INFLOW TO SHERBURNE RESERVOIR: Recorded Inflow: Swift-current Creek	Canyon Creek	Un-recorded Inflow Estimated	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec.ft.	Released from Reservoir Sec.ft.
1						71	--
2						68	--
3						63	--
4						60	--
5						57	--
6						54	--
7						51	--
8						48	--
9						45	--
10						42	--
11						39	--
12						36	--
13						32	--
14	No record available	No record available	No record available	No record available	No record available	--	--
15						--	36
16						--	85
17						--	166
18						--	246
19						--	303
20						--	176
21						--	217
22						--	212
23						--	154
24						--	150
25						--	227
26						--	616
27						--	400
28						--	246
29						--	246
30						--	258
Total Sec.Ft.						666	3738
Mean						22.2	125
Ac.Ft.						1320	7440

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
APRIL - 1932

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	347	--	76	423	--	423
2	404	--	73	477	--	477
3	460	--	71	531	--	531
4	430	--	68	498	--	498
5	401	--	63	464	--	464
6	350	--	60	410	--	410
7	299	--	57	356	--	356
8	327	--	54	381	--	381
9	323	--	51	374	--	374
10	327	--	48	375	--	375
11	331	--	45	376	--	376
12	339	--	42	381	--	381
13	300	74	39	413	--	413
14	272	144	36	452	--	452
15	249	220	32	501	--	501
16	216	295	--	511	--	511
17	219	374	--	593	36	557
18	263	438	--	701	85	616
19	370	452	--	822	166	656
20	443	459	--	902	246	656
21	501	454	--	955	303	652
22	580	459	--	1039	176	863
23	600	462	--	1062	217	845
24	638	465	--	1103	212	891
25	638	464	--	1102	154	948
26	629	467	--	1096	150	946
27	559	472	--	1031	227	804
28	535	468	--	1003	616	387
29	501	470	--	971	400	571
30	485	470	--	955	246	709
Total Sec.Ft.	12336	7107	815	20258	3234	17024
Mean	411	395 (13-30)	27	675	108	567
Ac.Ft.	24400	14100	1610 1617	40200	6430 6415 1617 4798	33700

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
APRIL - 1932

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage	Total Available	USED BY U.S.A. Divert-ed	Stored	Total Used	Excess or Deficit	of Share Used
1	423	106	--	106	--	76	76	--	30
2	477	119	--	119	--	73	73	--	46
3	531	133	--	133	--	71	71	--	62
4	498	124	--	124	--	68	68	--	56
5	464	116	--	116	--	63	63	--	53
6	410	102	--	102	--	60	60	--	42
7	356	89	--	89	--	57	57	--	32
8	381	95	--	95	--	54	54	--	41
9	374	94	--	94	--	51	51	--	43
10	375	94	--	94	--	48	48	--	46
11	376	94	--	94	--	45	45	--	49
12	381	95	--	95	--	42	42	--	53
13	413	103	--	103	74	39	113	10	--
14	452	113	--	113	144	36	180	67	--
15	501	125	--	125	220	32	252	127	--
16	511	128	--	128	295	--	295	167	--
17	557	139	36	175	374	--	374	199	--
18	616	154	85	239	438	--	438	199	--
19	656	164	166	330	452	--	452	122	--
20	656	164	246	410	459	--	459	49	--
21	652	163	303	466	454	--	454	--	12
22	863	264	176	440	459	--	459	19	--
23	845	256	217	473	462	--	462	--	11
24	891	278	212	490	465	--	465	--	25
25	948	307	154	461	464	--	464	3	--
26	946	306	150	456	467	--	467	11	--
27	804	235	227	462	472	--	472	10	--
28	387	97	616	713	468	--	468	--	245
29	571	143	400	543	470	--	470	--	73
30	709	188	246	434	470	--	470	36	--
Total Sec.Ft.	17024	4588	3234	7822	7107	815	7922	1019	919
Mean	567	153	108	261	395 (13-30)	27	264	34	30
Ac.Ft.	33700	9100	6430 6415	15530	14100	1610 1617	15710	2020	1780

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
APRIL - 1932

Day	Natural flow 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	423	317	347	--	30	--
2	477	358	404	--	46	--
3	531	398	460	--	62	--
4	498	374	430	--	56	--
5	464	348	401	--	53	--
6	410	308	350	--	42	--
7	356	267	299	--	32	--
8	381	286	327	74	41	--
9	374	280	323	85	43	--
10	375	281	327	137	46	--
11	376	282	331	116	49	--
12	381	286	339	96	53	--
13	413	310	300	106	--	10
14	452	339	272	130	--	67
15	501	376	249	142	--	127
16	511	383	216	116	--	167
17	557	418	219	136	--	199
18	616	462	263	185	--	199
19	656	492	370	272	--	122
20	656	492	443	299	--	49
21	652	489	501	304	12	--
22	863	599	580	290	--	19
23	845	589	600	288	11	--
24	891	613	638	295	25	--
25	948	641	638	295	--	3
26	946	640	629	283	--	11
27	804	569	559	271	--	10
28	387	290	535	295	245	--
29	571	428	501	281	73	--
30	709	521	485	269	--	36
Total Sec.Ft.	17024	12436	12336	4765	919	1019
Mean	567	414 5	411	207 (8-30)	30	34
Ac.Ft.	33700	24600	24500	9440	1780	2020

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
MAY - 1932

Day	INFLOW TO SHERBURNE RESERVOIR: Recorded Inflow: Swift-current Creek	Canyon Creek	Un-recorded Inflow Estimated	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec.ft.	Released from Reservoir Sec.ft.
1						--	304
2						--	278
3						--	256
4						--	159
5						--	4
6						80	--
7				421	423	98	--
8				795	331	464	--
9				856	196	660	--
10	662			905	117	788	--
11	657			906	122	784	--
12	647			921	125	796	--
13	839			1104	126	978	--
14	891			1086	128	958	--
15	611			817	131	686	--
16	432			580	131	449	--
17	380			575	131	444	--
18	452			584	129	455	--
19	487			666	132	534	--
20	589			743	135	608	--
21	819)		175	1133	142	991	--
22	1250)		254	1643	145	1498	--
23	865)	139	183	1187	139	1048	--
24	516)		120	775	142	633	--
25	355)		90	584	143	441	--
26	270)		59	381	142	239	--
27	221)		50	323	147	176	--
28	193)	52	45	290	146	144	--
29	179)		42	273	145	128	--
30	221)		50	323	139	184	--
31	362)		76	490	179	311	--
Total Sec.Ft.	11898 (10-31)				3966 (7-31)	~~13574~~ 14575	1001
Mean	541				159	438	32
Ac.Ft.	23600				7880	26900	1970

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DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
MAY - 1932

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	459	472	--	931	246	685
2	438	470	--	908	258	650
3	433	472	--	905	304	601
4	600	477	--	1077	278	799
5	806	464	--	1270	256	1014
6	738	460	--	1198	159	1039
7	782	467	--	1249	4	1245
8	948	470	80	1498	--	1498
9	1130	474	98	1702	--	1702
10	1250	479	464	2193	--	2193
11	1420	483	660	2563	--	2563
12	1610	484	788	2882	--	2882
13	1790	488	784	3062	--	3062
14	2000	495	796	3291	--	3291
15	2170	511	978	3659	--	3659
16	2120	524	958	3602	--	3602
17	2000	528	686	3214	--	3214
18	1960	454	449	2863	--	2863
19	1870	510	444	2824	--	2824
20	1870	540	455	2865	--	2865
21	2040	559	534	3133	--	3133
22	2580	567	608	3755	--	3755
23	2840	567	991	4398	--	4398
24	2800	573	1498	4871	--	4871
25	2560	582	1048	4190	--	4190
26	2220	582	633	3435	--	3435
27	1890	563	441	2894	--	2894
28	1730	497	239	2466	--	2466
29	1480	488	176	2144	--	2144
30	1340	488	144	1972	--	1972
31	1230	528	128	1886	--	1886
Total Sec.Ft.	49104	15716	14080	78900	1505	77395
Mean	1584	507	454	2545	48	2497
Ac.Ft.	97400	31200	27900	156500	2950	153500

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
MAY - 1932

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage	Total Available	USED BY U.S.A. Diverted	Stored	Total Used	Excess or Deficit of Share Used	
1	685	176	246	422	472	--	472	50	--
2	650	162	258	420	470	--	470	50	--
3	601	150	304	454	472	--	472	18	--
4	799	232	278	510	477	--	477	--	33
5	1014	340	256	596	464	--	464	--	132
6	1039	352	159	511	460	--	460	--	51
7	1245	456	4	460	467	--	467	7	--
8	1498	582	--	582	470	80	550	--	32
9	1702	684	--	684	474	98	572	--	112
10	2193	930	--	930	479	464	943	13	--
11	2563	1114	--	1114	483	660	1143	29	--
12	2882	1274	--	1274	484	788	1272	--	2
13	3062	1364	--	1364	488	784	1272	--	92
14	3291	1478	--	1478	495	796	1291	--	187
15	3659	1662	--	1662	511	978	1489	--	173
16	3602	1634	--	1634	524	958	1482	--	152
17	3214	1440	--	1440	528	686	1214	--	226
18	2863	1264	--	1264	454	449	903	--	361
19	2824	1245	--	1245	510	444	954	--	291
20	2865	1266	--	1266	540	455	995	--	271
21	3133	1400	--	1400	559	534	1093	--	307
22	3755	1710	--	1710	567	608	1175	--	535
23	4398	2032	--	2032	567	991	1558	--	474
24	4871	2268	--	2268	573	1498	2071	--	197
25	4190	1928	--	1928	582	1048	1630	--	298
26	3435	1550	--	1550	582	633	1215	--	335
27	2894	1280	--	1280	563	441	1004	--	276
28	2466	1066	--	1066	497	239	736	--	330
29	2144	905	--	905	488	176	664	--	241
30	1972	819	--	819	488	144	632	--	187
31	1886	776	--	776	528	128	656	--	120
Total Sec.Ft.	77395	33539	1505	35044	15716	14080	29796	167	5415
Mean	2497	1082	48.6	1130	507	454	961	6	175
Ac.Ft.	154000	66500	2990	69500	31200	27900	59100	370	10800

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
MAY - 1932

Day	Natural flow 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	685	509	459	284	--	50
2	650	488	438	293	--	50
3	601	451	433	311	--	18
4	799	567	600	397	33	--
5	1014	674	806	379	132	--
6	1039	687	738	353	51	--
7	1245	789	782	379	--	7
8	1498	916	948	422	32	--
9	1702	1018	1130	397	112	--
10	2193	1263	1250	409	--	13
11	2563	1449	1420	409	--	29
12	2882	1608	1610	441	2	--
13	3062	1698	1790	461	92	--
14	3291	1813	2000	450	187	--
15	3659	1997	2170	450	173	--
16	3602	1968	2120	412	152	--
17	3214	1774	2000	422	226	--
18	2863	1599	1960	467	361	--
19	2824	1579	1870	483	291	--
20	2865	1599	1870	491	271	--
21	3133	1733	2040	429	307	--
22	3755	2045	2580	282	535	--
23	4398	2366	2840	369	474	--
24	4871	2603	2800	349	197	--
25	4190	2262	2560	355	298	--
26	3435	1885	2220	351	335	--
27	2894	1614	1890	405	276	--
28	2466	1400	1730	452	330	--
29	2144	1239	1480	407	241	--
30	1972	1153	1340	403	187	--
31	1886	1110	1230	445	120	--
Total Sec.Ft.	77395	43856	49104	12357	5415	167
Mean	2497	1415	1584	399	175	6
Ac.Ft.	154000	87000	97400	24500	10800	370

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
JUNE - 1932

Day	INFLOW TO SHERBURNE RESERVOIR: Recorded Inflow: Swift-current Creek	Canyon Creek	Un-recorded Inflow Estimated;	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec.ft.	Released from Reservoir Sec.ft.
1	537	--	57	675	191	484	--
2	740	)	76	897	160	737	--
3	624	) 81	66	771	160	611	--
4	558	)	60	699	160	539	--
5	504	)	54	639	162	477	--
6	406	--	40	489	164	325	--
7	330	)	33	406	164	242	--
8	355	)	35	433	165	268	--
9	413	) 43	42	498	166	332	--
10	452	)	46	541	166	375	--
11	440	)	45	528	168	360	--
12	537	57	56	650	168	482	--
13	657	49	67	773	171	602	--
14	740	45	75	860	212	648	--
15	765	47	78	890	478	412	--
16	667	57	69	793	739	54	--
17	634	62	66	762	798	--	36
18	524	72	56	652	789	--	137
19	448	81	49	578	663	--	85
20	376	87	43	506	599	--	93
21	409	--	45	532	560	--	28
22	533	)	58	669	531	138	--
23	576	) 78	62	716	528	188	--
24	558	)	60	696	528	168	--
25	475	--	52	605	487	118	--
26	428	--	44	525	379	146	--
27	391	)	41	485	354	131	--
28	366	) 53	38	457	349	108	--
29	376	)	39	468	363	105	--
30	398	)	41	492	365	127	--
Total Sec.Ft.	15217	1874	1593	18684	10887	8177	379
Mean	507	62	53	622	363	273	13
Ac.Ft.	30200	3690	3150	37000	21600	16200	770

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
JUNE - 1932

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	1310	552	184	2046	--	2046
2	1500	526	311	2337	--	2337
3	1590	530	484	2604	--	2604
4	1710	399	737	2846	--	2846
5	2250	22	611	2883	--	2883
6	2400	2	539	2941	--	2941
7	2250	4	477	2731	--	2731
8	1950	352	325	2627	--	2627
9	1660	465	242	2367	--	2367
10	1720	511	268	2499	--	2499
11	1790	515	332	2637	--	2637
12	1820	515	375	2710	--	2710
13	1850	517	360	2727	--	2727
14	2040	520	482	3042	--	3042
15	2220	526	602	3348	--	3348
16	2470	524	648	3642	--	3642
17	2740	515	412	3667	--	3667
18	3040	515	54	3609	--	3609
19	2910	511	--	3421	36	3385
20	2780	508	--	3288	137	3151
21	2640	502	--	3142	85	3057
22	2500	499	--	2999	93	2906
23	2500	497	--	2997	28	2969
24	2500	504	138	3142	--	3142
25	2420	528	188	3136	--	3136
26	2380	540	168	3088	--	3088
27	2220	550	118	2888	--	2888
28	2050	557	146	2753	--	2753
29	1930	569	131	2630	--	2630
30	1830	582	108	2520	--	2520
Total Sec.Ft.	64970	13857	8440	87267	379	86888
Mean	2166	462	281	2909	13	2896
Ac.Ft.	128900	27500	16700	173100	770	172300

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
JUNE - 1932

Day	Natural Flow St,Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage	Total Available	USED BY U.S.A. Diverted	Stored	Total Used	Excess or Deficit of Share Used	
1	2046	856	--	856	552	184	736	--	120
2	2337	1002	--	1002	526	311	837	--	165
3	2604	1135	--	1135	530	484	1014	--	121
4	2846	1256	--	1256	399	737	1136	--	120
5	2883	1274	--	1274	22	611	633	--	641
6	2941	1304	--	1304	2	539	541	--	763
7	2731	1198	--	1198	4	477	481	--	717
8	2627	1146	--	1146	352	325	677	--	469
9	2367	1016	--	1016	465	242	707	--	309
10	2499	1082	--	1082	511	268	779	--	303
11	2637	1152	--	1152	515	332	847	--	305
12	2710	1188	--	1188	515	375	890	--	298
13	2727	1196	--	1196	517	360	877	--	319
14	3042	1354	--	1354	520	482	1002	--	352
15	3348	1506	--	1506	526	602	1128	--	378
16	3642	1654	--	1654	524	648	1172	--	482
17	3667	1666	--	1666	515	412	927	--	739
18	3609	1638	--	1638	515	54	569	--	1069
19	3385	1526	36	1562	511	--	511	--	1051
20	3151	1408	137	1545	508	--	508	--	1037
21	3057	1362	85	1447	502	--	502	--	945
22	2906	1286	93	1379	499	--	499	--	880
23	2969	1318	28	1346	497	--	497	--	849
24	3142	1404	--	1404	504	138	642	--	762
25	3136	1401	--	1401	528	188	716	--	685
26	3088	1377	--	1377	540	168	708	--	669
27	2888	1277	--	1277	550	118	668	--	609
28	2753	1210	--	1210	557	146	703	--	507
29	2630	1148	--	1148	569	131	700	--	448
30	2520	1093	--	1093	582	108	690	--	403
Total Sec.Ft.	86888	38433	379	38812	13857	8440	22297	--	16515
Mean	2896	1281	12	1294	462	281	743	--	550
Ac.Ft.	172000	76200	750	77000	27500	16700	44200	--	32700

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
JUNE - 1932

Day	Natural flow 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	2046	1190	1310	478	120	--
2	2337	1335	1500	485	165	--
3	2604	1469	1590	487	121	--
4	2846	1590	1710	472	120	--
5	2883	1609	2250	469	641	--
6	2941	1637	2400	467	763	--
7	2731	1533	2250	437	717	--
8	2627	1481	1950	414	469	--
9	2367	1351	1660	452	309	--
10	2499	1417	1720	476	303	--
11	2637	1485	1790	480	305	--
12	2710	1522	1820	469	298	--
13	2727	1531	1850	491	319	--
14	3042	1688	2040	584	352	--
15	3348	1842	2220	867	378	--
16	3642	1988	2470	523	482	--
17	3667	2001	2740	493	739	--
18	3609	1971	3040	480	1069	--
19	3385	1859	2910	446	1051	--
20	3151	1743	2780	446	1037	--
21	3057	1695	2640	452	945	--
22	2906	1620	2500	478	880	--
23	2969	1651	2500	471	849	--
24	3142	1738	2500	463	762	--
25	3136	1735	2420	438	685	--
26	3088	1711	2380	465	669	--
27	2888	1611	2220	521	609	--
28	2753	1543	2050	578	507	--
29	2638	1482	1930	600	448	--
30	2520	1427	1830	615	403	--
Total Sec.Ft.	86888	48455	64970	14997	16515	--
Mean	2896	1615	2166	500	550	--
Ac.Ft.	172000	96100	129000	29800	32700	--

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
JULY - 1932

Day	INFLOW TO SHERBURNE RESERVOIR: Recorded Inflow: Swift-current Creek	Canyon Creek	Un-recorded Inflow Estimated	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec.ft.	Released from Reservoir Sec.ft.
1	362	55	55	472	365	109	--
2	351	50	53	454	347	107	--
3	333	42	50	425	340	85	--
4	366	43	55	464	340	124	--
5	391	50	58	499	340	159	--
6	326	46	49	421	338	83	--
7	273	40	42	355	335	20	--
8	251	33	38	322	312	10	--
9	236	33	36	305	305	--	--
10	221	30	33	284	278	6	--
11	204	28	31	263	250	13	--
12	193	27	29	249	284	--	35
13	187	27	29	243	370	--	127
14	181	24	27	232	423	--	191
15	170	24	25	219	443	--	224
16	168	25	25	218	478	--	260
17	187	26	28	241	459	--	218
18	201	26	30	257	452	--	195
19	190	24	29	243	455	--	212
20	170	21	25	216	464	--	248
21	160	20	24	204	498	--	294
22	160	20	24	204	533	--	329
23	165	20	24	209	533	--	324
24	173	20	25	218	535	--	317
25	170	19	25	214	538	--	324
26	160	18	24	202	550	--	348
27	157	17	23	197	571	--	374
28	147	16	22	185	571	--	386
29	157	18	23	198	574	--	376
30	163	20	24	207	605	--	398
31	150	18	22	190	610	--	420
Total Sec.Ft.	6723	880	1007	8610	13494	716	5600
Mean	217	28.4	32.5	278	435	23.1	181
Ac.Ft.	13300	1750	2050	17100	26700	1410	11100

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
JULY - 1932

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	1770	590	105	2465	--	2465
2	1670	590	127	2387	--	2387
3	1630	590	109	2329	--	2329
4	1580	588	107	2275	--	2275
5	1500	590	85	2175	--	2175
6	1390	590	124	2104	--	2104
7	1280	588	159	2027	--	2027
8	1180	586	83	1849	--	1849
9	1060	580	20	1660	--	1660
10	987	578	10	1575	--	1575
11	904	582	--	1486	--	1486
12	831	578	6	1415	--	1415
13	798	578	13	1389	--	1389
14	814	582	--	1396	35	1361
15	798	578	--	1376	127	1249
16	798	582	--	1380	191	1189
17	798	584	--	1382	224	1158
18	782	586	--	1368	260	1108
19	782	592	--	1374	218	1156
20	747	592	--	1339	195	1144
21	695	596	--	1291	212	1079
22	687	601	--	1288	248	1040
23	687	603	--	1290	294	996
24	662	603	--	1265	329	936
25	646	603	--	1249	324	925
26	629	603	--	1232	317	915
27	621	605	--	1226	324	902
28	621	605	--	1226	348	878
29	613	605	--	1218	374	844
30	600	605	--	1205	386	819
31	613	607	--	1220	376	844
Total Sec.Ft.	29173	18340	948	48461	4782	43679
Mean	941	592	31	1563	154	1409
Ac.Ft.	57900	36400	1900	96200	9470	86600

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
JULY - 1932

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage	Total Available	USED BY U.S.A. Diverted	Stored	Total Used	Excess or Deficit	of Share Used
1	2465	1066	--	1066	590	105	695	--	371
2	2387	1026	--	1026	590	127	717	--	309
3	2329	998	--	998	590	109	699	--	299
4	2275	970	--	970	588	107	695	--	275
5	2175	920	--	920	590	85	675	--	245
6	2104	885	--	885	590	124	714	--	171
7	2027	846	--	846	588	159	747	--	99
8	1849	758	--	758	586	83	669	--	89
9	1660	663	--	663	580	20	600	--	63
10	1575	620	--	620	578	10	588	--	32
11	1486	576	--	576	582	--	582	6	--
12	1415	540	--	540	578	6	584	44	--
13	1389	528	--	528	578	13	591	63	--
14	1361	514	35	549	582	--	582	33	--
15	1249	458	127	585	578	--	578	--	7
16	1189	428	191	619	582	--	582	--	37
17	1158	412	224	636	584	--	584	--	52
18	1108	387	260	647	586	--	586	--	61
19	1156	411	218	629	592	--	592	--	37
20	1144	405	195	600	592	--	592	--	8
21	1079	372	212	584	596	--	596	12	--
22	1040	353	248	601	601	--	601	--	--
23	996	331	294	625	603	--	603	--	22
24	936	301	329	630	603	--	603	--	27
25	925	296	324	620	603	--	603	--	17
26	915	290	317	607	603	--	603	--	4
27	902	284	324	608	605	--	605	--	3
28	878	272	348	620	605	--	605	--	15
29	844	255	374	629	605	--	605	--	24
30	819	242	386	628	605	--	605	--	23
31	844	255	376	631	607	--	607	--	24
Total Sec.Ft.	43679	16662	4782	21444	18340	948	19288	158	2314
Mean	1409	537	154	691	592	31	622	5	75
Ac.Ft.	86600	33000	9160	41100	36400	1900	38200	310	4610

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
JULY - 1932

Day	Natural flow 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	2465	1399	1770	623	371	--
2	2387	1361	1670	692	309	--
3	2329	1331	1630	717	299	--
4	2275	1305	1580	706	275	--
5	2175	1255	1500	708	245	--
6	2104	1219	1390	728	171	--
7	2027	1181	1280	728	99	--
8	1849	1091	1180	728	89	--
9	1660	997	1060	734	63	--
10	1575	955	987	734	32	--
11	1486	910	904	700	--	6
12	1415	875	831	678	--	44
13	1389	861	798	680	--	63
14	1361	847	814	692	--	33
15	1249	791	798	706	7	--
16	1189	761	798	700	37	--
17	1158	746	798	700	52	--
18	1108	721	782	686	61	--
19	1156	745	782	694	37	--
20	1144	739	747	678	8	--
21	1079	707	695	658	--	12
22	1040	687	687	655	--	--
23	996	665	687	664	22	--
24	936	635	662	636	27	--
25	925	629	646	636	17	--
26	915	625	629	621	4	--
27	902	618	621	618	3	--
28	878	606	621	615	15	--
29	844	589	613	600	24	--
30	819	577	600	598	23	--
31	844	589	613	605	24	--
Total Sec.Ft.	43679	27017	29173	20918	2314	158
Mean	1409	872	941	675	75	5
Ac.Ft.	86600	53600	57900	41500	4610	310

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
AUGUST - 1932

Day	INFLOW TO SHERBURNE RESERVOIR: Recorded Inflow: Swift-current Creek	Canyon Creek	Un-recorded Inflow Estimated	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec.ft.	Released from Reservoir Sec.ft.
1	122	17	44	183	593	No water stored during August	410
2	110	16	39	165	588		423
3	106	16	38	160	616		456
4	110	16	39	165	639		474
5	117	17	42	176	628		452
6	117	17	42	176	651		475
7	113	16	41	170	660		490
8	106	16	38	160	663		503
9	106	16	38	160	663		503
10	108	17	39	164	642		478
11	122	18	44	184	584		400
12	127	18	45	190	577		387
13	101	18	37	156	546		390
14	89	18	34	141	536		395
15	87	18	33	138	584		446
16	95	17	35	147	601		454
17	106	17	39	162	604		442
18	115	17	42	174	608		434
19	116	17	42	174	611		437
20	120	17	43	180	611		431
21	127	17	45	189	608		419
22	127	17	45	189	608		419
23	115	17	42	174	553		379
24	106	17	39	162	493		331
25	95	17	35	147	500		353
26	85	17	32	134	516		382
27	83	17	31	131	546		415
28	83	16	31	130	553		423
29	87	15	32	134	553		419
30	79	14	29	122	550		428
31	70	13	26	109	543		434
Total Sec.Ft.	3249	518	1181	4946	18228		13282
Mean	105	17	38	160	588		428
Ac.Ft.	6460	1030	2350	9840	36200		26300

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
AUGUST 1932

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	600	609	No water stored during August	1209	398	811
2	566	607		1173	420	753
3	529	603		1132	410	722
4	507	603		1110	423	687
5	507	603		1110	456	654
6	507	603		1110	474	636
7	507	603		1110	452	658
8	501	603		1104	475	629
9	490	603		1093	490	603
10	485	603		1088	503	585
11	485	609		1094	503	591
12	438	611		1049	478	571
13	406	605		1011	400	611
14	370	601		971	387	584
15	347	599		946	390	556
16	347	599		946	395	551
17	356	599		955	446	509
18	360	601		961	454	507
19	356	601		957	442	515
20	370	603		973	434	539
21	415	609		1024	437	587
22	438	607		1045	431	614
23	454	594		1048	419	629
24	490	557		1047	419	628
25	429	550		979	379	600
26	392	546		938	331	607
27	370	544		914	353	561
28	365	544		909	382	527
29	352	544		896	415	481
30	343	544		887	423	464
31	343	544		887	419	468
Total Sec.Ft.	13425	18251		31676	13238	18438
Mean	433	589		1022	427	595
Ac.Ft.	26600	36200		62800	26200	36600

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
AUGUST - 1932

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage	Total Available	USED BY U.S.A. Diverted	Stored	Total Used	Excess or Deficit of Share Used	
1	811	238	398	636	609	No water stored during August	609	--	27
2	753	210	420	630	607		607	--	23
3	722	194	410	604	603		603	--	1
4	687	176	423	599	603		603	4	--
5	654	164	456	620	603		603	--	17
6	636	159	474	633	603		603	--	30
7	658	164	452	616	603		603	--	13
8	629	157	475	632	603		603	--	29
9	603	151	490	641	603		603	--	38
10	585	146	503	649	603		603	--	46
11	591	148	503	651	609		609	--	42
12	571	143	478	621	611		611	--	10
13	611	153	400	553	605		605	52	--
14	584	146	387	533	601		601	68	--
15	556	139	390	529	599		599	70	--
16	551	138	395	533	599		599	66	--
17	509	127	446	573	599		599	26	--
18	507	127	454	581	601		601	20	--
19	515	129	442	571	601		601	30	--
20	539	135	434	569	603		603	34	--
21	587	147	437	584	609		609	25	--
22	614	154	431	585	607		607	22	--
23	629	157	419	576	594		594	18	--
24	628	157	419	576	557		557	--	19
25	600	150	379	529	550		550	21	--
26	607	152	331	483	546		546	63	--
27	561	140	353	493	544		544	51	--
28	527	132	382	514	544		544	30	--
29	481	120	415	535	544		544	9	--
30	464	116	423	539	544		544	5	--
31	468	117	419	536	544		544	8	--
Total Sec.Ft.	18438	4686	13238	17924	18251		18251	622	295
Mean	595	151	427	578	589		589	20	9.5
Ac.Ft.	36600	9220	26200	35500	36200		36200	1230	580

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
AUGUST - 1932

Day	Natural flow 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	811	573	600	585	27	--
2	753	543	566	550	23	--
3	722	528	529	504	1	--
4	687	511	507	497	--	4
5	654	490	507	497	17	--
6	636	477	507	504	30	--
7	658	494	507	497	13	--
8	629	472	501	490	29	--
9	603	452	490	482	38	--
10	585	439	485	476	46	--
11	591	443	485	476	42	--
12	571	428	438	431	10	--
13	611	458	406	393	--	52
14	584	438	370	359	--	68
15	556	417	347	340	--	70
16	551	413	347	330	--	66
17	509	382	356	344	--	26
18	507	380	360	357	--	20
19	515	386	356	350	--	30
20	539	404	370	357	--	34
21	587	440	415	399	--	25
22	614	460	438	436	--	22
23	629	472	454	446	--	18
24	628	471	490	478	19	--
25	600	450	429	419	--	21
26	607	455	392	381	--	63
27	561	421	370	361	--	51
28	527	395	365	357	--	30
29	481	361	352	339	--	9
30	464	348	343	330	--	5
31	468	351	343	331	--	8
Total Sec.Ft.	18438	13752	13425	13096	295	622
Mean	595	444	433	422	9.5	20
Ac.Ft.	36600	27300	26600	25900	580	1230

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
SEPTEMBER - 1932

Day	INFLOW TO SHERBURNE RESERVOIR: Recorded Inflow: Swift-current Creek	Canyon Creek	Un-recorded Inflow Estimated	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec.ft.	Released from Reservoir Sec.ft.
1	64	12	18	94	546	No water stored during September	452
2	66	11	18	95	543		448
3	59	11	17	87	533		446
4	55	12	16	83	526		443
5	55	12	16	83	546		463
6	56	12	16	84	563		479
7	60	12	17	89	553		464
8	64	12	18	94	447		353
9	60	11	17	88	349		261
10	57	11	16	84	264		180
11	56	10	16	82	223		141
12	54	10	15	79	217		138
13	54	9	15	78	204		126
14	51	10	15	76	191		115
15	51	9	15	75	185		110
16	51	9	15	75	183		108
17	51	8	14	73	173		100
18	50	8	14	72	170		98
19	47	7	13	67	162		95
20	44	7	12	63	156		93
21	43	7	12	62	153		91
22	38	6	11	55	147		92
23	33	6	9	48	143		95
24	31	5	9	45	140		95
25	32	5	9	46	142		96
26	31	6	9	46	139		93
27	31	6	9	46	138		92
28	31	5	9	45	135		90
29	31	5	9	45	129		84
30	31	6	9	46	125		79
Total Sec.Ft.	1437	260	408	2105	8125		6020
Mean	47.9	8.6	13.6	70	271		201
Ac.Ft.	2850	512	809	4170	16100		11900

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
SEPTEMBER - 1932

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	311	544	No water stored during September	855	428	427
2	300	540		840	434	406
3	282	540		822	452	370
4	276	538		814	448	366
5	266	536		802	446	356
6	263	536		799	443	356
7	260	534		794	463	331
8	266	517		783	479	304
9	378	382		760	464	296
10	388	300		688	353	335
11	507	122		629	261	368
12	501	5		506	180	326
13	524	--		524	141	383
14	490	--		490	138	352
15	459	--		459	126	333
16	448	--		448	115	333
17	438	--		438	110	328
18	433	--		433	108	325
19	403	--		403	100	303
20	392	--		392	98	294
21	374	--		374	95	279
22	356	--		356	93	263
23	343	--		343	91	252
24	335	--		335	92	243
25	327	--		327	95	232
26	319	--		319	95	224
27	307	--		307	96	211
28	300	--		300	93	207
29	296	--		296	92	204
30	286	--		286	90	196
Total Sec.Ft.	10828	5094		15922	6719	9203
Mean	361	392 (1-13)		531	224	307
Ac.Ft.	21500	10100		31600	13300	18300

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
SEPTEMBER - 1932

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage	Total Available	USED BY U.S.A. Diverted	Stored	Total Used	Excess or Deficit of Share Used	
1	427	107	428	535	544	No water stored during September	544	9	--
2	406	102	434	536	540		540	4	--
3	370	92	452	544	540		540	--	4
4	366	92	448	540	538		538	--	2
5	356	89	446	535	536		536	1	--
6	356	89	443	532	536		536	4	--
7	331	83	463	546	534		534	--	12
8	304	76	479	555	517		517	--	38
9	296	74	464	538	382		382	--	156
10	335	84	353	437	300		300	--	137
11	368	92	261	353	122		122	--	231
12	326	82	180	262	5		5	--	257
13	383	96	141	237	--		--	--	237
14	352	88	138	226	--		--	--	226
15	333	83	126	209	--		--	--	209
16	333	83	115	198	--		--	--	198
17	328	82	110	192	--		--	--	192
18	325	81	108	189	--		--	--	189
19	303	76	100	176	--		--	--	176
20	294	74	98	172	--		--	--	172
21	279	70	95	165	--		--	--	165
22	263	66	93	159	--		--	--	159
23	252	63	91	154	--		--	--	154
24	243	61	92	153	--		--	--	153
25	232	58	95	153	--		--	--	153
26	224	56	95	151	--		--	--	151
27	211	53	96	149	--		--	--	149
28	207	52	93	145	--		--	--	145
29	204	51	92	143	--		--	--	143
30	196	49	90	139	--		--	--	139
Total Sec.Ft.	9203	2304	6719	9023	5094		5094	18	3947
Mean	307	77 76.8	224	301	392 (1-12)		392 (1-12)	0.6	132
Ac.Ft.	18300	4580	13300	17900	10100		10100	36	7860

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
SEPTEMBER - 1932

Day	Natural flow 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	427	320	311	303	--	9
2	406	304	300	296	--	4
3	370	278	282	277	4	--
4	366	274	276	255	2	--
5	356	267	266	250	--	1
6	356	267	263	244	--	4
7	331	248	260	239	12	--
8	304	228	266	232	38	--
9	296	222	378	350	156	--
10	335	251	388	321	137	--
11	368	276	507	486	231	--
12	326	244	501	486	257	--
13	383	287	524	486	237	--
14	352	264	490	448	226	--
15	333	250	459	419	209	--
16	333	250	448	399	198	--
17	328	246	438	385	192	--
18	325	244	433	377	189	--
19	303	227	403	350	176	--
20	294	220	392	340	172	--
21	279	209	374	330	165	--
22	263	197	356	313	159	--
23	252	189	343	305	154	--
24	243	182	335	294	153	--
25	232	174	327	286	153	--
26	224	168	319	277	151	--
27	211	158	307	272	149	--
28	207	155	300	269	145	--
29	204	153	296	263	143	--
30	196	147	286	255	139	--
Total Sec.Ft.	9203	6899	10828	9807	3947	18
Mean	307	230	361	327	132	0.6
Ac.Ft.	18300	13700	21500	19500	7860	36

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
OCTOBER - 1932

Day	INFLOW TO SHERBURNE RESERVOIR: Recorded Inflow: Swift-current Creek	Canyon Creek	Un-recorded Inflow Estimated	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec.ft.	Released from Reservoir Sec.ft.
1	32	5	7	44	124	--	80
2	33	5	7	45	122	--	77
3	34	6	7	47	125	--	78
4	34	6	7	47	333	--	286
5	32	4	6	42	577	--	535
6	34	5	7	46	450	--	404
7	34	5	7	46	324	--	278
8	34	5	7	46	248	--	202
9	30	6	6	42	210	--	168
10	24	1	4	29	160	--	131
11	25	4	5	34	108	--	74
12	22	5	5	32	37	--	5
13	27	7	6	40	1	39	--
14	46	16	11	73	1	72	--
15	89	24	20	133	1	132	--
16	113	22	25	160	1	159	--
17	110	18	23	151	1	150	--
18	99	16	20	135	49	86	--
19	77	14	16	107	89	18	--
20	64	13	14	91	109	--	18
21	60	16	14	90	136	--	46
22	70	16	15	101	160	--	59
23	79	16	17	112	99	13	--
24	75	15	16	106	65	41	--
25	66	13	14	93	134	--	41
26	59	12	13	84	154	--	70
27	62	16	14	92	153	--	61
28	65	15	20	100	87	13	--
29	68	14	27	109	61	48	--
30	71	13	32	116	62	54	--
31	70	12	35	117	60	57	--
Total Sec.Ft.	1738	345	427	2510	4241	882	2613
Mean	56	11.1	13.8	81	137	28.4	84
Ac.Ft.	3440	682	848	4980	8420	1750	5160

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
OCTOBER - 1932

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	84	195
2	272	--	--	272	79	193
3	266	--	--	266	80	186
4	258	--	--	258	77	181
5	315	--	--	315	78	237
6	424	--	--	424	286	138
7	474	--	--	474	535	- 00 x
8	464	--	--	464	404	60 x
9	432	--	--	432	278	154
10	392	--	--	392	202	190
11	370	--	--	370	168	202
12	323	--	--	323	131	192
13	282	--	--	282	74	208
14	243	--	--	243	5	238
15	224	--	39	263	--	263
16	209	--	72	281	--	281
17	202	--	132	334	--	334
18	188	29	159	376	--	376
19	140	105	150	395	--	395
20	125	105	86	316	--	316
21	125	104	18	247	--	247
22	138	111	--	249	18	231
23	221	37	--	258	46	212
24	290	20	--	310	59	251
25	246	15	13	274	--	274
26	197	95	41	333	--	333
27	227	92	--	319	41	278
28	356	30	--	386	70	316
29	323	10	--	333	61	272
30	311	--	13	324	--	324
31	307	--	48	355	--	355
Total Sec.Ft.	8623	753 (18-29)	771	10147	2776	7432
Mean	278	63	24.9	327	90	240
Ac.Ft.	17100	1500	1530	20100	5530	14760

x - Outflow from St.Mary Lake held back by prevailing north wind causing natural flow to be stored in lake.

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
OCTOBER - 1932

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage	Total Available	USED BY U.S.A. Diverted	Stored	Total Used	Excess or Deficit of Share Used	
1	195	49	84	133	--	--	--	--	133
2	193	48	79	127	--	--	--	--	127
3	186	46	80	126	--	--	--	--	126
4	181	45	77	122	--	--	--	--	122
5	237	59	78	137	--	--	--	--	137
6	138	34	286	320	--	--	--	--	320
7	- 00		535	535	--	--	--	--	535
8	60	15	404	419	--	--	--	--	419
9	154	38	278	316	--	--	--	--	316
10	190	48	202	250	--	--	--	--	250
11	202	50	168	218	--	--	--	--	218
12	192	48	131	179	--	--	--	--	179
13	208	52	74	126	--	--	--	--	126
14	238	60	5	65	--	--	--	--	65
15	263	66	--	66	--	39	39	--	27
16	281	70	--	70	--	72	72	2	--
17	334	84	--	84	--	132	132	48	--
18	376	94	--	94	29	159	188	94	--
19	395	99	--	99	105	150	255	156	--
20	316	79	--	79	105	86	191	112	--
21	247	62	--	62	104	18	122	60	--
22	231	58	18	76	111	--	111	35	--
23	212	53	46	99	37	--	37	--	62
24	251	63	59	122	20	--	20	--	102
25	274	68	--	68	15	13	28	--	40
26	333	83	--	83	95	41	136	53	--
27	278	70	41	111	92	--	92	--	19
28	316	~~88~~ 79	70	159	30	--	30	--	129
29	272	68	61	129	10	--	10	--	119
30	324	81	--	81	--	13	13	--	68
31	355	89	--	89	--	48	48	--	41
Total Sec.Ft.	7432	18~~68~~ 58	2776	4644	753	771	1524	560	3680
Mean	240	60 599	90	150	63 (18-29)	24.9	49.2	18.1	119
Ac.Ft.	14760	3690	5530 5506	9220	1500	1530 1529	3030	1110	7320

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
OCTOBER - 1932

Day	Natural flow 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	195	146	279	250	133	--
2	193	145	272	244	127	--
3	186	140	266	237	126	--
4	181	136	258	232	122	--
5	237	178	315	274	137	--
6	138	104	424	377	320	--
7	00	00	474	423	474	--
8	60	45	464	420	419	--
9	154	116	432	385	316	--
10	190	142	392	361	250	--
11	202	152	370	337	218	--
12	192	144	323	294	179	--
13	208	156	282	258	126	--
14	238	178	243	216	65	--
15	263	197	224	200	27	--
16	281	211	209	184	--	2
17	334	250	202	171	--	48
18	376	282	188	162	--	94
19	395	296	140	106	--	156
20	316	237	125	89	--	112
21	247	185	125	92	--	60
22	231	173	138	116	--	35
23	212	159	221	151	62	--
24	251	188	290	250	102	--
25	274	206	246	208	40	--
26	333	250	197	166	--	53
27	278	208	227	151	19	--
28	316	~~227~~ 237	356	80	129	--
29	272	204	323	76	119	--
30	324	243	311	--	68	--
31	355	266	307	--	41	--
Total Sec.Ft.	7432	55~~64~~ 74	8623	6515	3619	560
Mean	240	180	278	213	117	18.1
Ac.Ft.	14760	11070	17100	13100	7190	1110

DIVISION OF ST.MARY RIVER

Table 2

CANADA

Water Available in Acre-Feet

1932

Month	St.Mary R. at Kimball	Rolph Creek	Lee Creek	Pothole Creek	Combined Flow
April	24,500		5,300	720	30,520
May	97,200		8,610	461	106,271
June	129,000	No record	5,360	42	134,402
July	57,900		1,300	--	59,200
August	26,600		430	--	27,030
September	21,500		244	--	21,744
October	17,100		No record	--	No record
Total	373,800			1,223	

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	9,440	- 2,169	5,650	2,341	28,400
May	24,500	+ 2,548	8,060	19,449	95,900
June	29,800	- 955	6,590	24,207	108,000
July	41,500	- 1,446	2,799	37,255	22,600
August	25,900	- 326	517	25,057	1,830
September	19,500	+ 1,071	2,039	18,532	3,990
October	13,100	+ 1,455	3,520	11,035	No record
Total	164,000[d]	+ 2,088[f]	29,200[g]	137,876[h]	x

b - Natural flow only.
c - Computed.
d - Diverted by A.R. & I. Co. at Kimball.
e - Estimated.
f - Gain between Kimball and Magrath.
g - Wasted in Pinepound and Pothole Creeks.
h - Flow in Canal at Magrath plus diversion by Laterals.
x - Below all points of diversion.

Table 2

DIVISION OF ST.MARY RIVER

UNITED STATES

Water Available in Acre-Feet

1932

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	9,100		4,820	13,920	14,100	000	25,800
May	66,500	24,910		41,590	31,200	10,390	43,500
June	76,200	15,950		60,250	27,500	32,750	47,700
July	33,000		7,260	40,260	36,400	3,860	36,900
Aug.	9,220		26,200	35,420	36,200	000	35,000
Sept.	4,580		13,300	17,880	10,100	7,780	16,900
Oct.	3,690		4,000	7,690	1,500	6,190	2,420
Total	202,290	40,860	55,580	217,010	157,000	60,970	208,220

Note: Water stored in Sherburne Reservoir April 13 = 18,300 Acre-Feet.
" " " " " Oct. 31 = 1,530 " "

DIVERSIONS FROM MILK RIVER IN THE UNITED STATES

(Quantities in Acre-Feet)

Month	Ft. Belknap Canal	Paradise Canal	Harlem Canal	Agency Canal	Dodson North Canal	Dodson South Canal	Vandalia Canal	Total
March			246			3,993		4,239
April	4,241	321	2,138	466	855	14,664	575	23,260
May	7,117	3,390	1,950	4,300	2,078	26,000	2,410	47,245
June	2,089	976	498	2,490	932	27,411	1,868	36,264
July	6,128	1,963	1,144	1,859	3,725	21,814	5,271	41,904
Aug.	7,835	3,796	2,265	1,098	3,505	11,819	3,163	33,481
Sept.	3,037	1,371	734	833	2,136	13,174		21,285
Oct.	2,727		75	218			540	3,560
Nov.	833						873	1,706
Total	34,007	11,817	9,050	11,264	13,231	118,875	14,700	212,944

Table 3

DISPOSITION OF THE WATERS OF THE NORTHERN TRIBUTARIES OF MILK RIVER IN CANADA

1932

Quantities in Acre-feet

Lodge Creek

Irrigator	Location	Estimated seasonal diversion
R.L.Roth	near Eagle Butte	30
J.M.Spangler	near Altawan	150
J. English	near Thelma	200
W. Mitchell	near Thelma	no data available
J.B.Spangler	near Altawan	no water diverted
H.A.Mudie	near Eagle Butte	no data available
T.S.Clark	near Eagle Butte	no data available
J. Read	near Thelma	no data available
J. Hartt	near Thelma	no data available
A. Sturm	near Thelma	no data available
Mitchell Bros.	near Fox	no data available
G. Legge	near Fox	no data available
B. Jahn	near Govenlock	no data available
Total estimated as diverted in Canada		380
Flow at the Boundary delivered to United States		4,920

Battle Creek

Lindner Bros.	near Battle Creek	150
W. Patterson	near Battle Creek	40
Marshall & Gaff	near Battle Creek	75
J.A.Gaff	near Battle Creek	150
Stirling & Nash	near Consul	450
J.M.Spangler	near Coulee	200
Shephard Bros.	near Battle Creek	60
W. Wilson	near Battle Creek	no water diverted
Wilkes Bros.	near Oxarart	no water diverted
J. Richardson	near Consul	no water diverted
J. McKi on	near Consul	no data available
Wood & Anderson	near Coulee	no water diverted
E. Parsonage	near Battle Creek	no water diverted
J. Leslie	near Coulee	no data available
Total estimated as diverted in Canada		1,125
Flow at the Boundary delivered to United States		9,540

Table 3

DISPOSITION OF THE WATERS OF THE NORTHERN TRIBUTARIES

OF MILK RIVER IN CANADA

1932

Quantities in Acre-feet

Frenchman River

Irrigator	Location	Estimated seasonal diversion
A.A.Morrison	near East End	no data available
G.N.Morrison	near East End	no water diverted
W.E.Caton	near Ravenscrag	no data available
T. Kokott	near East End	no data available
Gilchrist Bros.	near Vidora	580
D.J.Wylie	near Oxarart	150
Armstrong	near Murraydale	100
S. Pearse	near Ravenscrag	30
J.E.Bolingbroke	near East End	15
A.E.Bate	near Nummola	45
Total estimated as diverted in Canada		920
Flow at the Boundary delivered to United States		32,900

Table 4

DIVERSIONS FROM THE NORTHERN TRIBUTARIES

1932

Irrigator	March	April	May	June	July	Aug.	Sept.	Total
			Lodge Creek					
N. Chinook Canal	2,570	1,690	336	414				5,010
			Battle Creek					
Matheson Canal		643	149	31				823
			Frenchman River					
Frenchman Canal		316	1,300	1,040	787	163	40	3,646
Total	2,570	2,649	1,785	1,485	787	163	40	9,479