Report of

THE INTERNATIONAL JOINT COMMISSION

on

THE DIVISION AND USE MADE OF THE WATERS OF

ST. MARY AND MILK RIVERS

by

L. B. LEOPOLD
representing United States

and

J. D. McLEOD
representing Canada

1959

Report to

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International Joint Commission,

Washington, D.C., and Ottawa, Ontario.

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 the United States and Canada, we are transmitting herewith a report on the operations during the irrigation season ended October 31, 1959.

Respectfully submitted,

Luna B. Leopold

L. B. Leopold
Accredited Officer of the United States.

J. D. McLeod
Accredited Officer of Her Majesty.

MAR 25, 1960.
(date)

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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 1959 by representatives of the Water Resources Branch (Canada) and the United States Geological Survey.

Dr. L. B. Leopold, Chief Hydraulic Engineer, United States Geological Survey, as accredited officer of the United States, was represented in the field by Mr. F. Stermitz, District Engineer, Helena, Montana. Mr. J. D. McLeod, Chief Engineer, Water Resources Branch, Department of Northern Affairs and National Resources, acting in the capacity of accredited officer of Her Majesty, was represented in the field by Mr. E. P. Collier, District Engineer, Calgary, Alberta.

The waters of the two rivers were divided between the two countries in accordance with the Order of the International Joint Commission dated at Ottawa, Canada, on the 4th day of October, 1921.

The hydrometric data upon which this report is based were collected and compiled jointly for 36 international stations by engineers of the United States Geological Survey under the direction of Mr. Stermitz and of the Water Resources Branch (Canada) under the direction of Mr. Collier. Data for another 19 stations in Canada and 7 stations in the United States were collected independently by the same engineers in their respective countries. The United States Bureau of Reclamation furnished data for 8 canal and 2 reservoir stations and the United States Bureau of Indian Affairs furnished data for one other canal station in Montana.

Complete data for 51 of the stations mentioned above are contained in the appendix to this report; monthly quantities only for 12 canal stations in Montana are shown in Table 3, Page 3, and Table 7.

Data for 4 stations maintained by the United States Geological Survey in the St. Mary River basin and 4 stations maintained by Canada in the St. Mary and Milk River basins are not used for purposes of division and are not included in either this report or its appendix.

This report has been compiled jointly by Mr. F. Stermitz and Mr. E. P. Collier.

Water Supply

St. Mary River

The total natural flow of the St. Mary River at the international boundary for the year November 1, 1958, to October 31, 1959, was 808,206 acre-feet. Of this total 714,693 occurred during the irrigation season, April 1 to October 31. The natural flow during the irrigation season was 122 percent of 587,933 acre-feet, the average of the previous 56 years of record. Of the total natural flow there was delivered to Canada 598,167 acre-feet, 525,324 acre-feet during the irrigation season and 72,843 acre-feet during the balance of the year.

The thirty-eighth annual international survey of snow conditions in the St. Mary River drainage basin was conducted on April 30 and May 1, 1959. The survey provided advance information on the probable run-off during the irrigation season. The tabulated results of the forecasts and measured discharge at three locations are shown below.

Location	Period of Correlation	Forecast of 1959 Run-off		Measured Run-off	
		Acre-Feet	% of Average	Acre-feet	% of Average
Swiftcurrent Creek at Many Glacier	1923-57	82,000 (May to July)	(1923-58) 120	75,400 (May to July)	(1923-58) 110
Natural Flow Swiftcurrent Creek at Sherburne	1922-57	139,000 (May to Sept.)	(1922-58) 122	142,700 (May to Sept.)	(1922-58) 125
Natural Flow St. Mary River at International Boundary	1922-57	623,000 (May to Sept.)	(1922-58) 124	612,691 (May to Sept.)	(1922-58) 122

Milk River

The estimated natural flow of Milk River at its eastern crossing of the international boundary, during the period March 1 to October 31, 1959 was 129,000 acre-feet or 111 percent of 116,000 acre-feet, the estimated average of the previous 47 years of record.

Eastern Tributaries of Milk River

The total quantity of water delivered to the United States by the eastern tributaries of Milk River during the period, March 1 to October 31, 1959 was 73,680 acre-feet or 50 percent of 146,000 acre-feet, the average of the previous 32 years. The quantities delivered to the United States by the various tributaries are listed in Table 8.

During the season a total of 40,022 acre-feet was diverted from the eastern tributaries in Canada to irrigation canals or storage. These diversions are listed in Table 6. The consumptive use was less than the total diversions shown because of return flow from irrigation projects. Measured diversions in Montana amounted to 13,320 acre-feet. These are listed in Table 7.

The seventh annual snow survey in the basins of the eastern tributaries of Milk River was conducted by the Water Resources Branch, Canada

on March 2, 4 and 5, 1959. The correlation of snow survey data and subsequent run-off will be attempted after several more years record have been obtained. For comparison purposes the average snow cover and the average water content for the history of the survey are listed below:

Year	Average Snow Cover	Average Water Content
1953	10.3 inches	2.1 inches
1954	4.4 "	1.2 "
1955	10.4 "	2.8 "
1956	13.0 "	3.4 "
1957	7.7 "	2.1 "
1958	7.9 "	1.2 "
1959	9.8 "	3.4 "

Division of Water

St. Mary River

The division of the waters of the St. Mary River was carried out in accordance with the Order of the International Joint Commission dated October 4, 1921, which stipulates:

"(a) During the irrigation season, when the natural flow of the St. Mary River at the point where it crosses the international boundary is six hundred and sixty-six (666) cubic feet per second or less, Canada shall be entitled to three-fourths and the United States to one-fourth of such flow.

(b) During the irrigation season, when the natural flow of the St. Mary River at the point where it crosses the international boundary is more than six hundred and sixty-six (666) cubic feet per second, Canada shall be entitled to a prior appropriation of five hundred (500) cubic feet per second and the excess over six hundred and sixty-six (666) cubic feet per second shall be divided equally between the two countries."

The daily natural flow of the St. Mary River was determined in the following manner:

(1) Daily records were obtained at the following gauging and climatologic stations:

1. Lake Sherburne (formerly called Sherburne Lake Reservoir), Daily Storage or Release.

2. United States St. Mary Canal at St. Mary Crossing near Babb (United States Diversion from St. Mary River Basin).

3. St. Mary River at International Boundary (Quantity delivered to Canada).

4. Evaporation and Precipitation station near Babb, Montana.

(2a) When water was being stored in Lake Sherburne, the natural flow of the St. Mary River at the international boundary was considered to be the sum of the quantities measured at gauging stations 1, 2 and 3 above. This sum is the total of the United States storage and diversion and the quantity delivered to Canada.

(2b) When water was being released from Lake Sherburne, the natural flow of the St. Mary River at the international boundary was computed by adding the quantities measured at gauging stations 2 and 3 above, and subtracting the quantity measured at station 1; that is, the natural flow was considered to be the sum of the quantity diverted in the United States St. Mary Canal and that delivered to Canada reduced by the quantity released from Lake Sherburne.

(3) In order to synchronize Lake Sherburne operations with flow quantities at the international boundary, a two-day time lag was applied to data from station 1.

(4) The natural flow of the St. Mary River having been determined, the division of its waters was carried out in accordance with the above Order.

(5) Computed evaporation losses from Lake Sherburne were treated as storage by the United States.

During the irrigation season, April 1 to October 31, field engineers of both countries made frequent computations of the daily natural flow of the river and each country's share thereof, in order that any appropriation by the United States in excess of their share could be adjusted by a subsequent delivery to Canada of an equivalent amount at the earliest opportunity.

Regular interim reports on the progress of the division of the natural flow at the international boundary were made to interested agencies throughout the irrigation season.

During the non-irrigation season, November 1, 1958, to March 31, 1959, no interim reports were made as the only United States use during this period was storage in Lake Sherburne where the contributing drainage area is about 14 percent of the total area of the St. Mary River drainage basin in the United States.

Storage in Lake Sherburne was 16,600 acre-feet on October 31, 1958, and had increased to 36,960 by March 31, 1959, and to 62,030 acre-feet by July 26, 1959. Thereafter, water was released at varying rates of flow until the storage was reduced to 2,890 acre-feet by October 22, 1959. On October 31, 1959, the storage had been increased to 2,980 acre-feet.

The United States St. Mary Canal was operated between April 6 and October 11 and water was delivered to the North Branch of the Milk River from April 10 to October 17.

Seepage from the canal between the point of diversion and the crossing of the St. Mary River is assumed to return to the river and eventually become available to Canada. The discharge of 221,290 acre-feet which passed the gauging station on the United States St. Mary Canal at St. Mary Crossing between April 6 and October 11 was considered to be the quantity diverted from the St. Mary River by the United States. A total of

216,120 acre-feet was delivered to the North Branch of Milk River at Hudson Bay Divide during the season, from where it was conveyed to irrigation projects in Montana via the Milk River.

Canada diverted 269,193 acre-feet of water from the St. Mary River Reservoir in 1959 as measured at the Canadian St. Mary Canal and Magrath Irrigation District Canal gauging stations near Spring Coulee.

Milk River

No division of the flow of Milk River at Eastern Crossing was made in 1959. Except for a few small unmeasured diversions above the eastern crossing of the international boundary, the entire natural flow of the Milk River at that point was delivered to the United States.

Eastern Tributaries of Milk River

Minor Diversions

There are a number of small diversions from the eastern tributaries of Milk River in Saskatchewan for which only estimates of the quantities diverted are available. These estimates were provided by the Water Rights Division of the Province of Saskatchewan and are based on reports from the individual irrigators. It is considered that the quantities diverted do not justify the expense of gauging these small diversions. These estimates, being incomplete and of doubtful value, are not used in the Frenchman River and Battle Creek division computations in Tables 4 and 5, except as an adjustment to the totals for the season. The estimated quantities reported to date for 1959 are, however, shown in Table 6 and also detailed in the appendix to this report.

Battle Creek

The computed natural flow of Battle Creek at the international boundary for the period March 1 to October 31, 1959, was 18,119 acre-feet,

of which each country was entitled to fifty percent. The details of this division are shown in Table 4 of this report. Canada used 6,220 acre-feet, including an estimated 1,539 acre-feet in minor diversions as detailed in the appendix, and delivered 11,899 acre-feet to the United States.

Frenchman River

The computed natural flow of the Frenchman River at the international boundary for the period March 1 to October 31, 1959, was 53,210 acre-feet, of which each country was entitled to fifty percent. The details of this division are shown in Table 5 of this report. Canada used 19,787 acre-feet, including an estimated 2,126 acre-feet in minor diversions as detailed in the appendix, and delivered 33,423 acre-feet to the United States.

Lodge Creek

Canada diverted or stored a total of 5,611 acre-feet in the Lodge Creek basin during the period March 1 to October 31, 1959, and delivered 11,590 acre-feet to the United States. The Canadian use mentioned above includes 1,830 acre-feet diverted into the Spangler ditch near Govenlock, 4,170 acre-feet stored in Middle Creek Reservoir and an additional 160 acre-feet in minor diversions as detailed in the appendix.

Description of Tables

The eight tables accompanying this report show the total water available in the St. Mary and Milk River basins, the manner in which it was divided and the use made by each country of its share during the irrigation season.

Table 1 deals with the natural flow of the St. Mary River at the international boundary and its division. It comprises seven pages, one for each month of the irrigation season. The table shows the computed daily natural flow and each country's share thereof. It also shows the

recorded flow at international boundary and the quantity diverted by the United States.

Table 2 is a summary of the mean monthly natural flow of the St. Mary River at International Boundary.

Table 3, Page 1, (upper table), shows the monthly discharge of the St. Mary River at the International Boundary, the contributions by Lee and Rolph Creeks in Canada and the total available to Canada from St. Mary River at the St. Mary Reservoir near Spring Coulee.

Table 3, Page 1, (lower table), shows the monthly disposition made by Canada of its share of the natural flow of the St. Mary River at the international boundary.

Table 3, Page 2, is a summary by months of the disposition of the United States share of the natural flow of the St. Mary River at the international boundary. It shows the quantities stored in or released from Lake Sherburne, the quantity diverted to the United States St. Mary Canal for delivery to the Milk River basin and the unused portion of the United States share. The table also shows, by months, the measured discharge of the Milk River at Eastern Crossing. This discharge is the sum of the natural flow of the Milk River above its eastern crossing of the international boundary and the water diverted from the St. Mary River basin in the United States. Thus it represents the total quantity available to the United States from the two basins during the irrigation season of 1959.

Table 3, Page 3, shows the measured diversions, in acre-feet, from the Milk River to several canals in the United States. These records as well as the data for Fresno and Nelson Reservoirs were furnished by the Milk River Project of the United States Bureau of Reclamation and the United States Bureau of Indian Affairs.

Table 4 is a compilation, in ten-day periods, of the natural flow of the Battle Creek at the international boundary. This table consists of

three pages. Page 1 shows the Canadian diversion to Cypress Lake; Page 2 shows the Canadian diversion to irrigated lands; Page 3 shows the total quantity used by Canada, the natural flow of Battle Creek at the international boundary, the quantity delivered, the United States share and the excess quantity delivered to the United States.

Table 5 is a compilation, in ten-day periods, of the natural flow of the Frenchman River at the international boundary. This table consists of four pages. Page 1 shows the Canadian storage in the main stem reservoirs; Page 2 shows the Canadian diversions; Page 3 shows the summary of storage and diversion and Page 4 shows the net Canadian diversion and storage, the natural flow of the Frenchman River at international boundary, the United States share thereof and the quantity delivered to the United States.

Table 6 summarizes the available information on the diversions from the Eastern Tributaries of Milk River in Canada in 1959.

Table 7 shows the available information on quantities diverted from the Eastern Tributaries of Milk River in the United States in 1959.

Table 8 shows the measured monthly run-off, in acre-feet, of the Eastern Tributaries of Milk River at the international boundary for the period March 1 to October 31, 1959.

Following the tables is a list of the gauging stations operated jointly by Canada and the United States in the St. Mary and Milk River drainage basins in 1959 and a list of other gauging stations in these basins operated independently by either the United States or Canada. A map showing the location of all these stations is included in this report.

Appendix

An appendix, submitted with this report, under separate cover, contains the result of discharge measurements, summary of monthly discharge and the daily gauge height and discharge data for 51 gauging stations operated during 1959 in the St. Mary and Milk River drainage basins. Details of the Canadian minor diversions, as grouped in Table 6 of the report, are included.

NATURAL FLOW OF ST. MARY RIVER AT INTERNATIONAL BOUNDARY AND ITS DIVISION BETWEEN CANADA AND UNITED STATES (Cu. ft. per sec.) Table 1.

1959 Day APRIL	Computed Nat. Flow St. Mary River at Int. Bdry.	Canada's share of St. Mary River Nat. Flow	Recorded Flow of St. Mary River nr. Int. Bdry.	Canada rec'd more (+) or less (-) than share +	-	U.S. share of St. Mary River.	Storage Factors Lake Sherburne (2-day lag applied) Stored	Rlsd	Diverted by U.S. St. Mary Canal	Net Used by United States	U.S. used more (+) or less (-) than share. +	-
1	201	151	171	20		50	30		0	30		20
2	339	254	321	67		85	18		0	18		67
3	404	303	343	40		101	61		0	61		40
4	525	394	355		39	131	170		0	170	39	
5	636	477	361		116	159	275		0	275	116	
6	623	467	367		100	156	229		27	256	100	
7	559	419	305		114	140	157		97	254	114	
8	576	432	355		77	144	131		90	221	77	
9	580	435	416		19	145	111		53	164	19	
10	502	376	456	80		126	26		20	46		80
11	574	430	423		7	144	39		112	151	7	
12	553	415	416	1		138		59	196	137		1
13	646	484	390		94	162		72	328	256	94	
14	679	506	378		128	173		157	458	301	128	
15	761	547	430		117	214		210	541	331	117	
16	791	562	535		27	229		301	557	256	27	
17	761	547	588	41		214		389	562	173		41
18	791	562	602	40		229		375	564	189		40
19	713	523	580	57		190		431	564	133		57
20	698	516	580	64		182		448	566	118		64
21	731	532	572	40		199		405	564	159		40
22	784	559	550		9	225		332	566	234	9	
23	828	581	520		61	247		270	578	308	61	
24	866	600	550		50	266		265	581	316	50	
25	957	645	550		95	312		174	581	407	95	
26	942	638	572		66	304		213	583	370	66	
27	903	618	588		30	285		271	586	315	30	
28	871	602	558		44	269		273	586	313	44	
29	997	665	686	21		332		282	593	311		21
30	1,271	802	934	132		469		277	614	337		132
31												
Total Sec.-ft.	21,062	15,042	14,452	(603)	(1,193) 590	6,020	1,247	5,204	10,567	6,610	(1,193) 590	(603)
Mean	702	501	482		19.7	201	41.6	173	352	220	19.7	
Ac.-ft.	41,776	29,835	28,665		1,170	11,940	2,473	10,322	20,959	13,111	1,170	

TABULAR FLOW OF ST. MARY RIVER AT INTERNATIONAL BOUNDARY AND ITS DIVISION BETWEEN CANADA AND UNITED STATES (Cu. ft. per sec.) Table 1.

1959 Day MAY	Computed Nat. Flow St. Mary River at Int. Bdry.	Canada's share of St. Mary River Nat. Flow	Recorded Flow of St. Mary River nr. Int. Bdry.	Canada rec'd more (+) or less (-) than share +	-	U.S. share of St. Mary River.	Storage Factors Lake Sherburne (2-day lag applied) Stored	Rlsd.	Diverted by U.S. St. Mary Canal	Net Used by United States	U.S. used more (+) or less (-) than share. +	-
1	1,550	942	1,030	88		608		87	607	520		88
2	2,003	1,168	1,140		28	835	243		620	863	28	
3	2,108	1,221	1,200		21	887	284		624	908	21	
4	1,989	1,161	1,220	59		828	145		624	769		59
5	1,785	1,059	1,180	121		726		22	627	605		121
6	1,623	978	1,130	152		645		131	624	493		152
7	1,504	919	1,080	161		585		198	622	424		161
8	1,468	901	1,060	159		567		216	624	408		159
9	1,500	917	1,100	183		583		224	624	400		183
10	1,586	960	1,120	160		626		158	624	466		160
11	1,655	994	1,100	106		661		69	624	555		106
12	1,563	948	1,030	82		615		91	624	533		82
13	1,502	918	1,020	102		584		140	622	482		102
14	1,467	900	1,030	130		567		185	622	437		130
15	1,503	918	1,080	162		585		201	624	423		162
16	1,760	1,047	1,270	223		713		140	630	490		223
17	2,179	1,256	1,580	324		923		35	634	599		324
18	2,743	1,538	1,900	362		1,205	198		645	843		362
19	3,466	1,900	2,460	560		1,566	356		650	1,006		560
20	3,288	1,811	2,520	709		1,477	128		640	768		709
21	2,829	1,581	2,450	869		1,248		255	634	379		869
22	2,577	1,455	2,340	885		1,122		393	630	237		885
23	2,432	1,383	2,240	857		1,049		435	627	192		857
24	2,375	1,354	2,190	836		1,021		442	627	185		836
25	2,402	1,368	2,240	872		1,034		465	627	162		872
26	2,576	1,455	2,310	855		1,121		366	632	266		855
27	2,676	1,505	2,290	785		1,171		248	634	386		785
28	2,618	1,476	2,240	764		1,142		256	634	378		764
29	2,375	1,354	2,110	756		1,021		367	632	265		756
30	2,201	1,267	2,010	743		934		433	624	191		743
31	2,112	1,223	1,950	727		889		458	620	162		727
	65,415	37,877	50,620	(12,694) 12,743	(49)	27,538	1,354	6,015	19,456	14,795	(49)	(12,694) 12,743
	2,110	1,222	1,633	411		888	43.7	194	628	477		411
	129,749	75,128	100,403	25,275		54,621	2,686	11,931	38,590	29,345		25,275

NATURAL FLOW OF ST. MARY RIVER AT INTERNATIONAL BOUNDARY AND ITS DIVISION BETWEEN CANADA AND UNITED STATES (Cu. ft. per sec.) Table 1.

1959 JUNE	Unregulated Nat. Flow St. Mary River at Int. Bdry.	Canada's share of St. Mary River Nat. Flow	Recorded Flow of St. Mary River nr. Int.Bdry.	Canada rec'd more (+) or less (-) than share +	-	U.S. share of St. Mary River.	Storage Factors Lake Sherburne (2-day lag applied) Stored	Rlsd.	Diverted by U.S. St. Mary Canal	Net Used by United States	U.S. used more (+) or less (-) than share. +	-
	2,361	1,347	2,010	663		1,014		269	620	351		663
	2,666	1,500	2,210	710		1,166		164	620	456		710
	3,162	1,748	2,550	802		1,414		15	627	612		802
	3,848	2,091	3,010	919		1,757	204		634	838		919
	4,510	2,422	3,420	998		2,088	448		642	1,090		998
	5,104	2,719	3,930	1,211		2,385	529		645	1,174		1,211
	5,487	2,910	4,280	1,370		2,577	562		645	1,207		1,370
	5,499	2,917	4,280	1,363		2,582	572		647	1,219		1,363
	5,123	2,728	4,140	1,412		2,395	338		645	983		1,412
	4,597	2,465	3,890	1,425		2,132	65		642	707		1,425
	4,133	2,233	3,530	1,297		1,900		29	632	603		1,297
	3,727	2,030	3,180	1,150		1,697		83	630	547		1,150
	3,428	1,881	3,020	1,139		1,547		212	620	408		1,139
	3,438	1,886	3,020	1,134		1,552		199	617	418		1,134
	4,040	2,187	3,200	1,013		1,853	220		620	840		1,013
	4,378	2,356	3,240	884		2,022	506		632	1,138		884
	4,349	2,341	3,200	859		2,008	502		647	1,149		859
	4,249	2,291	3,120	829		1,958	484		645	1,129		829
	4,066	2,200	2,930	730		1,866	494		642	1,136		730
	4,045	2,189	2,820	631		1,856	588		637	1,225		631
	4,206	2,270	2,880	610		1,936	686		640	1,326		610
	4,385	2,359	2,930	571		2,026	818		637	1,455		571
	4,518	2,426	2,860	434		2,092	1,018		640	1,658		434
	4,322	2,328	2,710	382		1,994	970		642	1,612		382
	4,060	2,197	2,550	353		1,863	870		640	1,510		353
	3,906	2,120	2,480	360		1,786	781		645	1,426		360
	3,909	2,121	2,460	339		1,788	807		642	1,449		339
	3,689	2,011	2,330	319		1,678	722		637	1,359		319
	3,400	1,867	2,090	223		1,533	678		632	1,310		223
	3,080	1,707	1,840	133		1,373	613		627	1,240		133
	121,685	65,847	90,110	24,263		55,838	13,475	971	19,071	31,575		24,263
	4,056	2,195	3,004	809		1,861	449	32.4	636	1,052		809
	241,359	130,606	178,731	48,125		110,753	26,727	1,926	37,827	62,628		48,125

NATURAL FLOW OF ST. MARY RIVER AT INTERNATIONAL BOUNDARY AND ITS DIVISION BETWEEN CANADA AND UNITED STATES (C. F. S.) Table 1.

1959 Day JULY	Computed Nat. Flow St. Mary River at Int. Bdry.	Canada's share of St. Mary River Nat. Flow	Recorded Flow of St. Mary River nr. Int. Bdry.	Canada rec'd more (+) less (-) than share +	Canada rec'd more (+) less (-) than share -	U.S. share of St. Mary River.	Storage Factors Lake Sherburne (2-day lag applied) Stored	Storage Factors Lake Sherburne (2-day lag applied) Rlsd.	Diverted by U.S. St. Mary Canal	Net Used by United States	U.S. used more (+) less (-) than share. +	U.S. used more (+) less (-) than share. -
1	2,806	1,570	1,650	80		1,236	526		630	1,156		80
2	2,631	1,482	1,550	68		1,149	447		634	1,081		68
3	2,674	1,504	1,530	26		1,170	497		647	1,144		26
4	2,729	1,531	1,520		11	1,198	564		645	1,209	11	
5	2,706	1,520	1,420		100	1,186	639		647	1,286	100	
6	2,412	1,373	1,330		43	1,039	437		645	1,082	43	
7	2,384	1,359	1,270		89	1,025	487		627	1,114	89	
8	2,258	1,296	1,220		76	962	450		588	1,038	76	
9	2,083	1,208	1,220	12		875	389		474	863		12
10	1,948	1,141	1,140		1	807	344		464	808	1	
11	1,918	1,126	1,130	4		792	326		462	788		4
12	1,969	1,151	1,130		21	818	377		462	839	21	
13	2,071	1,202	1,180		22	869	429		462	891	22	
14	2,228	1,281	1,260		21	947	504		464	968	21	
15	2,280	1,307	1,320	13		973	492		468	960		13
16	2,420	1,377	1,390	13		1,043	562		468	1,030		13
17	2,313	1,323	1,380	57		990	431		502	933		57
18	2,222	1,278	1,380	102		944	276		566	842		102
19	2,158	1,246	1,380	134		912	207		571	778		134
20	2,063	1,198	1,320	122		865	145		598	743		122
21	2,041	1,187	1,240	53		854	156		645	801		53
22	2,023	1,178	1,190	12		845	159		674	833		12
23	1,956	1,145	1,160	15		811	125		671	796		15
24	1,934	1,134	1,150	16		800	116		668	784		16
25	1,909	1,121	1,140	19		788	101		668	769		19
26	1,862	1,098	1,130	32		764	64		668	732		32
27	1,802	1,068	1,100	32		734	34		668	702		32
28	1,767	1,050	1,080	30		717	21		666	687		30
29	1,640	987	981		6	653		4	663	659	6	
30	1,413	873	872		1	540		117	658	541	1	
31	1,349	841	786		55	508		90	653	563	55	
Total Sec.-ft.	65,969	38,155	38,549	(840) 394	(446)	27,814	9,305	211	18,326	27,420	(446)	(840) 394
Mean	2,128	1,231	1,244	12.7		897	300	6.81	591	885		12.7
Ac.-ft.	130,848	75,679	76,461	781		55,168	18,456	419	36,349	54,387		781

NATURAL FLOW OF ST. MARY RIVER AT INTERNATIONAL BOUNDARY AND ITS DIVISION BETWEEN CANADA AND UNITED STATES (Cu. ft. per sec.) Table 1.

1959 AUGUST Day	Computed Nat. Flow St. Mary River at Int. Bdry.	Canada's share of St. Mary River Nat. Flow	Recorded Flow of St. Mary River nr. Int. Bdry.	Canada rec'd more (+) or less (-) than share +	-	U.S. share of St. Mary River.	Storage Factors Lake Sherburne (2-day lag applied) Stored	Rlsd.	Diverted by U.S. St. Mary Canal	Net Used by United States	U.S. used more (+) or less (-) than share. +	-
1	1,266	800	750		50	466		137	653	516	50	
2	1,131	732	734	2		399		256	653	397		2
3	1,066	700	718	18		366		299	647	348		18
4	1,050	692	710	18		358		307	647	340		18
5	1,010	672	702	30		338		339	647	308		30
6	951	642	702	60		309		398	647	249		60
7	991	662	686	24		329		342	647	305		24
8	887	610	648	38		277		406	645	239		38
9	849	591	618	27		258		409	640	231		27
10	850	592	595	3		258		385	640	255		3
11	798	566	558		8	232		397	637	240	8	
12	795	564	542		22	231		381	634	253	22	
13	777	555	542		13	222		402	637	235	13	
14	735	534	550	16		201		452	637	185		16
15	704	519	535	16		185		463	632	169		16
16	646	484	506	22		162		492	632	140		22
17	617	463	477	14		154		492	632	140		14
18	553	415	463	48		138		540	630	90		48
19	599	449	470	21		150		501	630	129		21
20	643	482	492	10		161		481	632	151		10
21	566	424	477	53		142		541	630	89		53
22	586	440	470	30		146		514	630	116		30
23	609	457	463	6		152		484	630	146		6
24	689	511	484		27	178		427	632	205	27	
25	740	537	513		24	203		405	632	227	24	
26	738	536	528		8	202		424	634	210	8	
27	681	507	528	21		174		481	634	153		21
28	672	503	542	39		169		507	637	130		39
29	787	560	550		10	227		400	637	237	10	
30	904	619	550		69	285		286	640	354	69	
31	892	613	550		63	279		298	640	342	63	
Total	24,782	17,431	17,653	(516) 222	(294)	7,351		12,646	19,775	7,129	(294)	(516) 222
Mean	799	562	569	7.16		237		408	638	230		7.16
Acre-ft.	49,154	34,574	35,014	440		14,580		25,083	39,223	14,140		440

DAILY FLOW OF ST. MARY RIVER AT INTERNATIONAL BOUNDARY AND ITS DIVISION BETWEEN CANADA AND UNITED STATES (Cu. ft. per sec.) Table 1.

1959 Day SEPTEMBER	Computed Nat. Flow St. Mary River at Int. Bdry.	Canada's share of St. Mary River Nat. Flow	Recorded Flow of St. Mary River nr. Int. Bdry.	Canada rec'd more (+) or less (-) than share +	-	U.S. share of St. Mary River.	Storage Factors Lake Sherburne (2-day lag applied) Stored	Rlsd.	Diverted by U.S. St. Mary Canal	Net Used by United States	U.S. used more (+) less (-) or than share. +	-
1	809	571	565		6	238		396	640	244	6	
2	732	533	558	25		199		466	640	174		25
3	722	528	550	22		194		468	640	172		22
4	684	509	513	4		175		466	637	171		4
5	605	454	506	52		151		538	637	99		52
6	749	541	506		35	208		394	637	243	35	
7	651	488	565	77		163		554	640	86		77
8	1,295	814	726		88	481		81	650	569	88	
9	1,723	1,028	934		94	695	131		658	789	94	
10	1,864	1,099	1,050		49	765	146		668	814	49	
11	1,733	1,033	1,100	67		700		38	671	633		67
12	1,481	907	1,090	183		574		280	671	391		183
13	1,341	837	1,040	203		504		370	671	301		203
14	1,236	785	981	196		451		413	668	255		196
15	1,139	736	945	209		403		474	668	194		209
16	1,154	744	957	213		410		474	671	197		213
17	1,191	762	957	195		429		434	668	234		195
18	1,063	698	892	194		365		497	668	171		194
19	1,004	669	840	171		335		499	663	164		171
20	951	642	795	153		309		507	663	156		153
21	944	639	759	120		305		473	658	185		120
22	915	624	734	110		291		477	658	181		110
23	914	624	710	86		290		451	655	204		86
24	894	614	678	64		280		439	655	216		64
25	886	610	648	38		276		412	650	238		38
26	803	568	632	64		235		479	650	171		64
27	805	569	632	63		236		474	647	173		63
28	872	603	602		1	269		377	647	270	1	
29	973	653	678	25		320		358	653	295		25
30	914	624	702	78		290		443	655	212		78
31												
Total	31,047	20,506	22,845	(2,617) 2,339	(268)	10,541	277	11,732	19,657	8,202	(268)	(2,617) 2,339
Mean	1,035	684	762	78.0		351	9.23	391	655	273		78.0
Ac.-Ft.	61,581	40,673	45,312	4,639		20,908	549	23,270	38,989	16,268		4,639

NATURAL FLOW OF ST. MARY RIVER AT INTERNATIONAL BOUNDARY AND ITS DIVISION BETWEEN CANADA AND UNITED STATES (Cu. ft. per sec.) Table 1.

1959 OCTOBER	Computed Nat. Flow St. Mary River at Int. Bdry.	Canada's share of St. Mary River Nat. Flow	Recorded Flow of St. Mary River nr. Int. Bdry.	Canada rec'd more (+) or less (-) than share +	-	U.S. share of St. Mary River.	Storage Factors Lake Sherburne (2-day lag applied) Stored	Rlsd.	Diverted by U.S. St. Mary Canal	Net Used by United States	U.S. used more (+) or less (-) than share. +	-
1	845	589	804	215		256		622	663	41		215
2	624	468	813	345		156		852	663	-189		345
3	541	406	718	312		135		837	660	-177		312
4	640	480	580	100		160		593	653	60		100
5	692	513	442		71	179		390	640	250	71	
6	736	535	410		125	201		286	612	326	125	
7	726	530	513		17	196		245	458	213	17	
8	695	514	632	118		181		207	270	63		118
9	715	524	768	244		191		137	84	- 53		244
10	695	514	786	272		181		101	10	- 91		272
11	646	484	742	258		162		100	4	- 96		258
12	642	482	726	244		160		84	0	- 84		244
13	659	494	726	232		165		67	0	- 67		232
14	676	505	742	237		171		66	0	- 66		237
15	751	542	822	280		209		71	0	- 71		280
16	864	599	1,020	421		265		156	0	-156		421
17	1,140	737	1,220	483		403		80	0	- 80		483
18	1,342	838	1,310	472		504	32		0	32		472
19	1,197	765	1,240	475		432		43	0	- 43		475
20	1,112	723	1,180	457		389		68	0	- 68		457
21	1,065	699	1,130	431		366		65	0	- 65		431
22	1,008	671	1,060	389		337		52	0	- 52		389
23	954	644	993	349		310		39	0	- 39		349
24	939	636	945	309		303		6	0	- 6		309
25	1,119	726	1,090	364		393	29		0	29		364
26	1,530	932	1,420	488		598	110		0	110		488
27	1,897	1,115	1,640	525		782	257		0	257		525
28	1,750	1,042	1,700	658		708	50		0	50		658
29	1,529	931	1,600	669		598		71	0	- 71		669
30	1,348	841	1,470	629		507		122	0	-122		629
31	1,287	810	1,380	570		477		93	0	- 93		570
Total	30,364	20,289	30,622	(10,546) 10,333	(213)	10,075	478	5,453	4,717	-258	(213)	(10,546) 10,333
Mean	979	654	988	333		325	15.4	176	152	- 8.32		333
Acre-ft.	60,226	40,243	60,738	20,495		19,983	948	10,816	9,356	-512		20,495

Historical Summary

of

Natural Flow of St. Mary River at International Boundary

TABLE 2

Year	Mean Monthly Discharge In Second-feet During Irrigation Season April - October							Run-off in Acre-feet		
	April	May	June	July	August	September	October	Non Irrigation Season Nov.-Mar.	Irrigation Season Apr.-Oct.	For Year Nov.-Oct.
1901-02	-	-	-	-	-	618 d	477 d	-	66,111 z	66,111 z
1902-03	568	1726	5300	2324	1404	1109	917	57,965	837,816	895,781
1903-04	724	2082	2738	1903	933	429	221	96,361	555,162	651,523
1904-05	304	1215	2461	1642	847	371	772	39,128	461,855	500,983
1905-06	481	1504	2265	1825	946	528	754	51,592	511,307	562,899
1906-07	489	1931	4259	3117	1335	1214	632	124,082	785,988	910,070
1907-08	844	2485	7500	2485	634	452	451	62,436	910,711	973,147
1908-09	350	1904	5169	3030	1460	540	450	65,276	785,464	850,740
1909-10	1188	2315	2243	1175	580	553	1036	87,729	551,042	638,771
1910-11	520	2035	3470	1679	1053	1300	621	97,349	650,860	748,209
1911-12	542	2031	2347	1582	887	524	423	59,092	505,795	564,887
1912-13	749	1913	4519	2024	1162	574	448	69,604	688,735	758,339
1913-14	637	2230	2298	1430	719	584	841	58,564	530,307	588,871
1914-15	575	1644	2351	1722	969	842	739	83,970	530,287	614,257
1915-16	664	1707	4634	3463	1228	947	391	109,773	789,058	898,831
1916-17	453	2215	4104	2427	759	470	378	58,828	654,520	713,348
1917-18	661	1875	3093	1185	763	489	394	91,256	511,779	603,035
1918-19	340	1979	2116	919	498	336	189	49,684	386,479	436,163
1919-20	429	1720	3133	2355	800	572	557	61,025	579,977	641,002
1920-21	646	2664	3713	1809	755	416	499	72,117	636,167	708,284
1921-22	282	2293	3835	1578	642	420	301	64,657	565,880	630,537
1922-23	422	2286	3359	1726	788	482	560	47,191	583,224	630,415
1923-24	393	2680	2152	1534	728	397	302	51,406	520,145	571,551
1924-25	1272	3461	3512	1893	807	542	406	78,619	720,710	799,329
1925-26	670	1264	1078	818	405	751	1141	49,198	371,837	421,035
1926-27	600	2885	5434	2812	1274	1509	1143	74,838	935,423	1,010,261
1927-28	546	3695	2940	2594	921	511	863	112,116	734,376	846,492
1928-29	314	1837	2558	1272	493	291	288	66,040	427,377	493,417
1929-30	1477	2425	2489	1264	511	370	314	52,374	535,575	587,949
1930-31	224	1357	1838	796	592	464	291	38,856	373,888	412,744
1931-32	567	2497	2898	1409	595	307	240	83,750	515,819	599,569
1932-33	416	1764	4339	2169	766	492	685	67,488	643,242	710,730
1933-34	1734	3461	2929	1155	592	343	269	168,272	629,044	797,316
1934-35	392	1541	2716	1516	630	387	235	136,576	467,568	604,144
1935-36	517	2417	2153	823	420	352	162	30,004	414,845	444,849
1936-37	267	1797	3752	1409	475	298	285	34,013	500,701	534,714
1937-38	696	2611	3323	1622	510	360	322	65,262	571,983	637,245
1938-39	840	2271	1771	1259	459	202	188	59,359	402,996	462,355
1939-40	381	1860	1808	737	382	407	415	37,815	364,056	401,871
1940-41	364	1335	1439	879	359	510	635	32,842	334,846	367,688
1941-42	676	1390	3777	1824	754	526	397	94,304	535,668	629,972
1942-43	1240	1996	3922	2591	810	776	325	63,366	675,767	739,133
1943-44	193	1273	1634	809	536	424	374	36,343	318,121	354,464
1944-45	355	2090	3342	1455	457	486	421	46,471	505,676	552,147
1945-46	658	2361	2731	1500	571	475	521	76,816	535,571	612,387
1946-47	913	2729	2585	1634	657	526	1251	86,866	624,962	711,828
1947-48	621	2967	3486	1576	758	379	266	71,379	725,024	796,403
1948-49	526	2317	2272	991	472	358	404	35,419	456,637	492,056
1949-50	468	1569	4537	3157	1100	402	329	96,111	766,778	862,889
1950-51	813	3365	3931	3230	1135	1309	1390	141,366	885,233	1,026,599
1951-52	967	2463	2204	1631	819	609	284	82,842	517,093	599,935
1952-53	635	2716	5534	3519	817	438	281	62,545	786,960	849,505
1953-54	435	3037	3637	3189	1100	971	736	62,518	795,974	858,492
1954-55	257	1491	3755	2248	729	360	416	79,260	589,738	668,998
1955-56	525	2793	3631	2027	830	441	513	89,020	652,395	741,415
1956-57	375	3563	2897	1277	491	303	332	59,363	545,264	604,627
1957-58	401	2764	3347	1382	358	489	524	58,514	530,643	589,157
1958-59	722	2110	6038	2128	753	1035	973	93,513	714,693	808,206
Average	**595**	**2226**	**3266**	**1797**	**768**	**554**	**535**	**71,625**	**590,157**	**661,782**

This table contains revisions to formerly reported data.

Natural flow records computed on basis of Lake Sherburne storage and release records as published in the original reports to the International Joint Commission.

d - 1902 data not used.

z - Partial record not included in average.

Table 2

DIVISION OF FLOW OF ST. MARY RIVER
1959

Water Available to Canada at Spring Coulee from St. Mary River
(Acre-feet)

Month	St. Mary River Int. Boundary	Kolph Creek Kimball	Lee Creek Cardston	Total Available at Spring Coulee
April	28,665	2,540	6,150	37,355
May	100,403	1,170	15,120	116,693
June	178,731	291	9,280	188,302
July	76,461	128	2,630	79,219
August	35,014	232	901	36,147
September	45,312	258	973	46,543
October	60,738	267	1,320	62,325
Total	525,324	4,886	36,374	566,584

DISPOSITION OF CANADIAN SHARE

Water Used in St. Mary and Milk Rivers Development
(Acre-feet)

Month	Canada's Share Natural Flow: Int. Boundary	Canadian St. Mary Canal: Spring Coulee	Magrath I.D. Canal: Spring Coulee	Total Diverted to S.M.R.D.	Available Storage from Canada's Share
April	29,835	14	2.6	16.6	29,818.4
May	75,128	857	146	1,003	74,125
June	130,606	37,600	2,360	39,960	90,646
July	75,679	55,350	3,080	58,430	17,249
August	34,574	75,070	2,300	77,370	-42,796
September	40,673	39,500	718	40,218	455
October	40,243	51,590	605	52,195	-11,952
Total	426,738	259,981	9,211.6	269,192.6	157,545.4

Storage in St. Mary Reservoir March 31, Elev. 3599.02 = 173,900 acre-feet
October 31, Elev. 3610.87 = 245,500 acre-feet

DIVISION OF FLOWS OF ST. MARY AND MILK RIVERS
1959

Water Available to the United States in Milk River at Eastern Crossing
Including Diversion from St. Mary River
(Acre-feet)

Month	St. Mary River Basin						Milk River Basin
	United States Share Nat. Flow	Lake Sherburne Stored	Lake Sherburne Rled.	Total Available for Diversion	Diverted to Milk River Basin	Unused	Measured Flow at Eastern Crossing*
April	11,940	2,473	10,322	19,789	20,959	-1,170	45,480
May	54,621	2,686	11,931	63,866	38,590	25,276	63,450
June	110,753	26,727	1,926	85,952	37,827	48,125	49,800
July	55,168	18,456	419	37,131	36,349	782	38,840
Aug.	14,580	0	25,083	39,663	39,223	440	37,770
Sept.	20,908	549	23,270	43,629	38,989	4,640	39,380
Oct.	19,983	948	10,816	29,851	9,356	20,495	20,330
Total	287,953	51,839	83,767	319,881	221,293	98,588	295,050

* Represents natural flow of Milk River and diversion from St. Mary River Basin.

Lake Sherburne quantities are corrected for evaporation.

Storage in Lake Sherburne on March 31 = 36,960 acre-feet
October 31 = 2,980 acre-feet

Storage in Fresno Reservoir on March 31 = 86,770 acre-feet
October 31 = 86,340 acre-feet

MAJOR DIVERSIONS FROM MILK RIVER
IN THE UNITED STATES
1959

(Acre-feet)

DIVERSION	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Total
Fort Belknap Canal	0	2,980	15,580	17,710	13,200	17,690	10,920	0	0	78,080
Paradise Canal	0	0	5,280	8,110	5,670	6,730	3,420	0	0	29,210
Harlem Canal	0	0	2,660	4,480	3,450	4,090	1,150	0	0	15,830
Harlem No. 2	0	38	980	1,170	1,090	1,170	716	0	0	5,164
Agency Canal	0	159	3,620	4,490	1,580	2,060	724	0	0	12,633
Dodson North	0	0	4,260	7,530	10,200	9,560	5,210	565	0	37,325
Dodson South	1,980	14,080	16,860	18,640	18,450	18,450	16,760	19,490	1,690	126,400
Vandalia Canal	0	0	3,350	11,600	11,740	9,740	7,440	4,730	595	49,195
Wiota Pumping Plant	0	0	0	1,720	1,150	1,070	0	303	155	4,398
Totals	1,980	17,257	52,590	75,450	66,530	70,560	46,340	25,088	2,440	358,235

Storage in Nelson Reservoir on March 31, 42,510 acre-feet
on October 31, 53,860 acre-feet

Table 3
Page 3

DETERMINATION OF NATURAL FLOW OF BATTLE CREEK AT INTERNATIONAL BOUNDARY
1959

Diversion to Cypress Lake
Quantities in Second-foot Days

Period at International Boundary	West Inflow Canal	West Inflow Canal Drain	Diversion to Cypress Lake	West Outflow Canal	Net Diversion to Cypress Lake
Feb.23 - Mar. 4	0.0	0.0	0.0	0.0	0.0
Mar. 5 - Mar.14	0.0	0.0	0.0	0.0	0.0
Mar.15 - Mar.25	5.0	0.0	+ 5.0	0.0	+ 5.0
Mar.26 - Apr. 4	527.0	36.0	+ 491.0	0.0	+ 491.0
Apr. 5 - Apr.14	1,303.0	11.4	+ 1,291.6	0.0	+ 1,291.6
Apr.15 - Apr.24	1,198.8	1.3	+ 1,197.5	0.0	+ 1,197.5
Apr.25 - May 4	246.8	56.3	+ 190.5	66.9	+ 123.6
May 5 - May 14	206.9	144.7	+ 62.2	88.6	- 26.4
May 15 - May 25	210.1	205.0	+ 5.1	551.8	- 546.7
May 26 - June 4	172.8	170.5	+ 2.3	611.1	- 608.8
June 5 -June 14	141.8	136.5	+ 5.3	517.5	- 512.2
June 15-June 24	117.4	118.3	- 0.9	477.5	- 478.4
June 25-July 4	126.4	131.2	- 4.8	270.9	- 275.7
July 5-July 14	163.4	193.8	- 30.4	4.4	- 34.8
July 15-July 25	90.5	91.1	- 0.6	242.2	- 242.8
July 26-Aug. 4	11.9	11.4	+ 0.5	448.9	- 448.4
Aug. 5 - Aug.14	0.0	0.0	0.0	452.4	- 452.4
Aug.15 - Aug.25	0.0	0.0	0.0	171.6	- 171.6
Aug.26 - Sept.4	0.0	0.0	0.0	9.2	- 9.2
Sept. 5-Sept.14	0.0	0.0	0.0	3.0	- 3.0
Sept.15-Sept.24	0.0	0.0	0.0	73.7	- 73.7
Sept.25- Oct. 4	0.0	0.0	0.0	164.6	- 164.6
Oct. 5 - Oct.14	0.0	0.0	0.0	0.0	0.0
Oct.15 - Oct.25	0.0	0.0	0.0	0.0	0.0
Oct.26 - Oct.31	0.0	0.0	0.0	0.0	0.0
Total	4,521.8	1,307.5	3,214.3	4,154.3	- 940.0
Acre-feet	8,969	2,593	6,375	8,240	- 1,864

DETERMINATION OF NATURAL FLOW OF BATTLE CREEK AT INTERNATIONAL BOUNDARY 1959

Diversion to Irrigated Lands
Quantities in Second-foot Days

Period at International Boundary	Stirling & Nash Ditch	McKinnon Ditch	Richardson Ditch	Vidora Ditch	Total Diverted	Return Flow	Net Diversion to Irrigated Land
Feb.23 - Mar. 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mar. 5 - Mar.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mar.15 - Mar.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mar.26 - Apr. 4	12.2	0.0	0.0	0.0	12.2	3.7	8.5
Apr. 5 - Apr.14	77.0	0.0	0.0	0.0	77.0	23.1	53.9
Apr.15 - Apr.24	206.0	5.6	0.0	0.0	211.6	63.5	148.1
Apr.25 - May 4	257.7	42.1	0.0	16.2	316.0	94.8	221.2
May 5 - May 14	307.0	0.0	0.0	5.8	312.8	93.8	219.0
May 15 - May 25	39.1	20.0	222.7	0.0	281.8	84.5	197.3
May 26 - June 4	3.6	186.5	206.9	145.0	542.0	162.6	379.4
June 5 -June 14	124.0	251.2	52.5	204.7	632.4	189.7	442.7
June 15-June 24	163.8	162.8	0.0	234.0	560.6	168.2	392.4
June 25-July 4	147.0	49.2	0.2	210.1	406.5	122.0	284.5
July 5-July 14	2.3	0.5	0.0	2.6	5.4	1.6	3.8
July 15-July 25	0.0	18.9	134.5	0.0	153.4	46.0	107.4
July 26-Aug. 4	0.0	161.0	223.2	21.7	405.9	121.8	284.1
Aug. 5 - Aug.14	0.0	207.0	194.8	14.8	416.6	125.0	291.6
Aug.15 - Aug.25	0.0	134.1	10.8	0.0	144.9	43.5	101.4
Aug.26 - Sept.4	0.0	0.9	0.0	1.2	2.1	0.6	1.5
Sept. 5-Sept.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sept.15-Sept.24	0.0	0.0	0.0	51.0	51.0	15.3	35.7
Sept.25- Oct. 4	0.0	0.0	0.0	175.8	175.8	52.7	123.1
Oct. 5 - Oct.14	0.0	0.0	0.0	0.1	0.1	0.0	0.1
Oct.15 - Oct.25	0.0	6.0	0.0	0.0	6.0	1.8	4.2
Oct.26 - Oct.31	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	1,339.7	1,245.8	1,045.6	1,083.0	4,714.1	1,414.2	3,299.9
Acre-feet	2,657	2,471	2,074	2,148	9,350	2,805	6,545

Return flow assumed to be 30 percent of diverted quantities.

DETERMINATION OF NATURAL FLOW OF BATTLE CREEK AT INTERNATIONAL BOUNDARY 1959

Quantities in Second-foot Days

Period at International Boundary	Net Diversion to Cypress Lake	Net Diversion to Irrigated Land	Total Used by Canada	Battle Creek Flow at Int'l Boundary	Battle Creek Natural Flow	United States Share	United States Received in Excess of Share
Feb.23 - Mar. 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mar. 5 - Mar.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mar.15 - Mar.25	+5.0	0.0	+5.0	478.0	+483.0	+241.5	+236.5
Mar.26 - Apr. 4	+491.0	8.5	+499.5	1,659.2	+2,158.7	+1,079.4	+579.8
Apr. 5 - Apr.14	+1,291.6	53.9	+1,345.5	307.2	+1,652.7	+826.4	-519.2
Apr.15 - Apr.24	+1,197.5	148.1	+1,345.6	179.7	+1,525.3	+762.6	-582.9
Apr.25 - May 4	+123.6	221.2	+344.8	135.5	+480.3	+240.2	-104.7
May 5 - May 14	-26.4	219.0	+192.6	356.1	+548.7	+274.4	+81.7
May 15 - May 25	-546.7	197.3	-349.4	669.0	+319.6	+159.8	+509.2
May 26 - June 4	-608.8	379.4	-229.4	375.1	+145.7	+72.8	+302.3
June 5 -June 14	-512.2	442.7	-69.5	120.1	+50.6	+25.3	+94.8
June 15-June 24	-478.4	392.4	-86.0	74.7	-11.3	-5.6	+80.3
June 25-July 4	-275.7	284.5	+8.8	648.6	+657.4	+328.7	+319.9
July 5-July 14	-34.8	3.8	-31.0	297.6	+266.6	+133.3	+164.3
July 15-July 25	-242.8	107.4	-135.4	113.7	-21.7	-10.8	+124.5
July 26-Aug. 4	-448.4	284.1	-164.3	62.4	-101.9	-51.0	+113.4
Aug. 5 - Aug.14	-452.4	291.6	-160.8	17.7	-143.1	-71.6	+89.3
Aug.15 - Aug.25	-171.6	101.4	-70.2	38.1	-32.1	-16.0	+54.1
Aug.26 - Sept.4	-9.2	1.5	-7.7	24.3	+16.6	+8.3	+16.0
Sept. 5-Sept.14	-3.0	0.0	-3.0	1.6	-1.4	-0.7	+2.3
Sept.15-Sept.24	-73.7	35.7	-38.0	0.0	-38.0	-19.0	+19.0
Sept.25- Oct. 4	-164.6	123.1	-41.5	43.9	+2.4	+1.2	+42.7
Oct. 5 - Oct.14	0.0	0.1	+0.1	152.6	+152.7	+76.4	+76.2
Oct.15 - Oct.25	0.0	4.2	+4.2	159.8	+164.0	+82.0	+77.8
Oct.26 - Oct.31	0.0	0.0	0.0	84.2	+84.2	+42.1	+42.1
Total	-940.0	3,299.9	+2,359.9	5,999.1	+8,359.0	+4,179.7	+1,819.4
Acre-feet	-1,864	6,545	+4,681	11,899	+16,580	+8,290	+3,609
Estimated acre-feet total of minor diversions detailed in appendix to this report.			1,539		1,539		
			6,220		18,119		

DETERMINATION OF NATURAL FLOW OF FRENCHMAN RIVER AT INTERNATIONAL BOUNDARY 1959

Storage in Frenchman River Main Stem Reservoirs
Quantities in Second-Foot Days

Period at International Boundary	Eastend Reservoir		Val Marie West Reservoir		Val Marie Reservoir		Total Storage on Frenchman River
	Stored	Released	Stored	Released	Stored	Released	
March							
1 - 10	0		31		0		+ 31
11 - 20	23		281		0		+ 304
21 - 31	11		130		2,150		+ 2,291
April							
1 - 10	83		94		2,063		+ 2,240
11 - 20	498		472		848		+ 1,818
21 - 30	244		81		8		+ 333
May							
1 - 10	93		22		19		+ 134
11 - 20		52		78		31	- 161
21 - 31		59		162		516	- 737
June							
1 - 10		155		196		581	- 932
11 - 20		303		146		552	- 1,001
21 - 30		135	49			180	- 266
July							
1 - 10	768		353		331		+ 1,452
11 - 20		108		795	550		- 353
21 - 31		56	1			842	- 897
Aug.							
1 - 10		185		3		686	- 874
11 - 20		305		4		463	- 772
21 - 31	42		0			112	- 70
Sept.							
1 - 10		41	1			92	- 132
11 - 20		50	3			64	- 111
21 - 30	13		4			46	- 29
Oct.							
1 - 10	66		13		53		+ 132
11 - 20		64	19		81		+ 36
21 - 31		99		16	229		+ 114
Total	1,841	1,612	1,554	1,400	6,332	4,165	+ 2,550
Acre-feet	3,652	3,197	3,082	2,777	12,559	8,261	+ 5,058

DETERMINATION OF NATURAL FLOW OF
FRENCHMAN RIVER AT INTERNATIONAL BOUNDARY
1959

Diversion to Irrigated Lands
Quantities in Second-foot Days

Period at International Boundary	Eastend Canal	Val Marie West Pumping Canal	Val Marie West Gravity Canal	Val Marie Main Canal	Total Diverted to Val Marie Districts	Total Diverted to Irrigated Lands
March						
1 - 10	Nil	Nil	Nil	Nil	Nil	Nil
11 - 20	Nil	Nil	Nil	Nil	Nil	Nil
21 - 31	Nil	Nil	Nil	Nil	Nil	Nil
April						
1 - 10	Nil	Nil	Nil	Nil	Nil	Nil
11 - 20	Nil	Nil	Nil	Nil	Nil	Nil
21 - 30	35.5	Nil	Nil	Nil	Nil	35.5
May						
1 - 10	113.3	0.1	Nil	161.9	162.0	275.3
11 - 20	114.1	39.5	241.8	365.4	646.7	760.8
21 - 31	211.1	199.2	200.6	406.6	806.4	1,017.5
June						
1 - 10	334.9	186.8	108.9	439.6	735.3	1,070.2
11 - 20	478.5	97.5	67.6	365.6	530.7	1,009.2
21 - 30	442.3	163.9	36.4	466.1	666.4	1,108.7
July						
1 - 10	72.6	0.1	26.9	1.2	28.2	100.8
11 - 20	0.8	83.8	0.1	128.1	212.0	212.8
21 - 31	44.7	44.0	Nil	454.9	498.9	543.6
Aug.						
1 - 10	233.6	Nil	Nil	577.0	577.0	810.6
11 - 20	414.0	Nil	Nil	343.6	343.6	757.6
21 - 31	351.6	Nil	Nil	102.6	102.6	454.2
Sept.						
1 - 10	260.2	Nil	Nil	4.1	4.1	264.3
11 - 20	64.5	Nil	Nil	0.0	0.0	64.5
21 - 30	1.6	Nil	Nil	0.0	0.0	1.6
Oct.						
1 - 10	0.0	Nil	Nil	Nil	Nil	0.0
11 - 20	Nil	Nil	Nil	Nil	Nil	Nil
21 - 31	Nil	Nil	Nil	Nil	Nil	Nil
Total	3,173.3	814.9	682.3	3,816.7	5,313.9	8,487.2
Acre-feet	6,294	1,616	1,353	7,570	10,540	16,834

DETERMINATION OF NATURAL FLOW OF FRENCHMAN RIVER AT INTERNATIONAL BOUNDARY 1959

Total Canadian Storage and Diversion Quantities in Second-foot Days

Period at International Boundary	Total Storage on Frenchman River	Belanger Creek Diversion to Cypress Lake	Cypress Lake East Outflow Canal	Net Belanger Creek Diversion to Cypress Lake	Cypress Lake Natural Overflow	Total Diverted to Irrigated Lands	Total Stored or Diverted by Canada
March							
1 - 10	+ 31	Nil	10.0	- 10.0	Nil	Nil	+ 21.0
11 - 20	+ 304	Nil	13.0	- 13.0	Nil	Nil	+ 291.0
21 - 31	+ 2,291	Nil	22.0	- 22.0	Nil	Nil	+ 2,269.0
April							
1 - 10	+ 2,240	916.0	43.0	+ 873.0	Nil	Nil	+ 3,113.0
11 - 20	+ 1,818	749.6	88.0	+ 661.6	Nil	Nil	+ 2,479.6
21 - 30	+ 333	179.4	78.3	+ 101.1	Nil	35.5	+ 469.6
May							
1 - 10	+ 134	141.2	164.3	- 23.1	Nil	275.3	+ 386.2
11 - 20	- 161	8.3	80.3	- 72.0	Nil	760.8	+ 527.8
21 - 31	- 737	91.6	26.0	+ 65.6	Nil	1,017.5	+ 346.1
June							
1 - 10	- 932	20.1	15.0	+ 5.1	Nil	1,070.2	+ 143.3
11 - 20	- 1,001	18.7	44.5	- 25.8	Nil	1,009.2	- 17.6
21 - 30	- 266	21.8	200.4	- 178.6	Nil	1,108.7	+ 664.1
July							
1 - 10	+ 1,452	265.4	787.0	- 521.6	Nil	100.8	+ 1,031.2
11 - 20	- 353	48.6	105.9	- 57.3	Nil	212.8	- 197.5
21 - 31	- 897	Nil	18.1	- 18.1	Nil	543.6	- 371.5
Aug.							
1 - 10	- 874	Nil	3.2	- 3.2	Nil	810.6	- 66.6
11 - 20	- 772	Nil	3.9	- 3.9	Nil	757.6	- 18.3
21 - 31	- 70	Nil	247.4	- 247.4	Nil	454.2	+ 136.8
Sept.							
1 - 10	- 132	Nil	85.4	- 85.4	Nil	264.3	+ 46.9
11 - 20	- 111	Nil	1.0	- 1.0	Nil	64.5	- 47.5
21 - 30	- 29	Nil	0.2	- 0.2	Nil	1.6	- 27.6
Oct.							
1 - 10	+ 132	Nil	0.0	0.0	Nil	0.0	+ 132.0
11 - 20	+ 36	Nil	1.6	- 1.6	Nil	Nil	+ 34.4
21 - 31	+ 114	Nil	8.9	- 8.9	Nil	Nil	+ 105.1
Total	+ 2,550	2,460.7	2,047.4	+ 413.3	Nil	8,487.2	+11,450.5
Acre-feet	+ 5,058	4,881	4,061	+ 820	Nil	16,834	+22,712

DETERMINATION OF NATURAL FLOW OF FRENCHMAN RIVER AT INTERNATIONAL BOUNDARY 1959

Quantities in Second-foot Days

Period at International Boundary	Total Stored or Diverted by Canada	Return Flow	Net Stored or Diverted by Canada	Frenchman River at International Boundary			
				Measured Flow	Natural Flow	United States Share	Received in Excess of Share by U.S.A.
March							
1 - 10	+ 21.0	Nil	+ 21.0	70.0	+ 91.0	+ 45.5	+ 24.5
11 - 20	+ 291.0	Nil	+ 291.0	136.0	+ 427.0	+ 213.5	- 77.5
21 - 31	+ 2,269.0	Nil	+ 2,269.0	8,767.0	+11,036.0	+5,518.0	+3,249.0
April							
1 - 10	+ 3,113.0	Nil	+ 3,113.0	3,048.0	+6,161.0	+3,080.5	- 32.5
11 - 20	+ 2,479.6	Nil	+ 2,479.6	245.5	+2,725.1	+1,362.6	-1,117.1
21 - 30	+ 469.6	10.6	+ 459.0	558.1	+1,017.1	+ 508.6	+ 49.5
May							
1 - 10	+ 386.2	82.6	+ 303.6	530.4	+ 834.0	+ 417.0	+ 113.4
11 - 20	+ 527.8	228.2	+ 299.6	354.0	+ 653.6	+ 326.8	+ 27.2
21 - 31	+ 346.1	305.2	+ 40.9	362.9	+ 403.8	+ 201.9	+ 161.0
June							
1 - 10	+ 143.3	321.1	- 177.8	267.8	+ 90.0	+ 45.0	+ 222.8
11 - 20	- 17.6	302.8	- 320.4	196.1	- 124.3	- 62.2	+ 258.3
21 - 30	+ 664.1	332.6	+ 331.5	1,268.0	+1,599.5	+ 799.8	+ 468.2
July							
1 - 10	+ 1,031.2	30.2	+ 1,001.0	186.2	+1,187.2	+ 593.6	- 407.4
11 - 20	- 197.5	63.8	- 261.3	141.7	- 119.6	- 59.8	+ 201.5
21 - 31	- 371.5	163.1	- 534.6	336.5	- 198.1	- 99.0	+ 435.5
Aug.							
1 - 10	- 66.6	243.2	- 309.8	139.8	- 170.0	- 85.0	+ 224.8
11 - 20	- 18.3	227.3	- 245.6	132.0	- 113.6	- 56.8	+ 188.8
21 - 31	+ 136.8	136.3	+ 0.5	63.8	+ 64.3	+ 32.2	+ 31.6
Sept.							
1 - 10	+ 46.9	79.3	- 32.4	1.4	- 31.0	- 15.5	+ 16.9
11 - 20	- 47.5	19.4	- 66.9	0.0	- 66.9	- 33.4	+ 33.4
21 - 30	- 27.6	0.5	- 28.1	Nil	- 28.1	- 14.0	+ 14.0
Oct.							
1 - 10	+ 132.0	0.0	+ 132.0	Nil	+ 132.0	+ 66.0	- 66.0
11 - 20	+ 34.4	Nil	+ 34.4	5.8	+ 40.2	+ 20.1	- 14.3
21 - 31	+ 105.1	Nil	+ 105.1	39.8	+ 144.9	+ 72.4	- 32.6
Total	+11,450.5	2,546.2	+8,904.3	16,850.8	+25,755.1	+12,877.8	+3,973.0
Acre-feet	+22,712	5,050	+17,661	33,423	+51,084	+25,543	+7,880
Estimated Acre-feet Total of Minor Diversions detailed in appendix to this report.			2,126		2,126		
			19,787		53,210		

Return flow assumed to be 30 percent of diverted quantities.

Table 6

DIVERSIONS FROM THE EASTERN TRIBUTARIES OF MILK RIVER IN CANADA
1959

Quantities in Acre-feet

Lodge Creek Tributary Basin

Middle Creek near Alberta Boundary	4,170[a]	
Released to Lodge Creek from Middle Creek Reservoir	0[b]	4,170
Spangler Ditch near Govenlock	1,830	
Estimated return flow from Spangler Ditch	549	1,281
Total of 12 Minor Diversions Detailed in Appendix		160[c]
Total Diverted by Canada		5,611

a - Total flow of this station stored in Middle Creek Reservoir.

b - Released from Middle Creek Reservoir via Bedford Slough.

c - 450 acre-feet diverted by Mitchell Ranching Co. and listed as a Minor Diversion in Appendix is included in Middle Creek near Alberta Boundary.

(Lodge Creek at International Boundary = 11,590 acre-feet)

Battle Creek Tributary Basin

Diverted by Cypress Lake West Inflow Canal		8,969	
Returned by Cypress Lake West Inflow Canal Drain	2,593		
Returned by Cypress Lake West Outflow Canal	8,240	10,833	- 1,864
Vidora Ditch near Consul	2,148		
Richardson Ditch near Consul	2,074		
McKinnon Ditch near Consul	- 2,471	1681 -	
Stirling and Nash Ditch near Consul	2,657	9,350	
Estimated Return Flow from Irrigated Lands		2,805	6,545
Total of 67 Minor Diversions Detailed in Appendix			1,539
Total Diverted by Canada			6,220

(Battle Creek at International Boundary = 11,899 acre-feet)

Frenchman River Tributary Basin

Belanger Creek Diversion to Cypress Lake	4,881		
Returned by Cypress Lake East Outflow Canal	4,061	820	
Cypress Lake Natural Overflow		0	820
Stored in Eastend Reservoir		3,652	
Released from Eastend Reservoir		3,197	455
Stored in Val Marie Reservoirs		15,641	
Released from Val Marie Reservoirs		11,038	4,603
Eastend Irrigation District Canal	6,294		
Val Marie Irrigation District West Canals	2,969		
Val Marie Main Canal	7,570	16,833	
Estimated Return Flow from Irrigated Lands		5,050	11,783
Total of 70 Minor Diversions Detailed in Appendix			2,126
Total Diverted by Canada			19,787

(Frenchman River at International Boundary = 33,423 acre-feet)

MEASURED DIVERSIONS FROM THE EASTERN TRIBUTARIES

OF MILK RIVER IN THE UNITED STATES

1959

(Quantities in Acre-Feet)

Irrigator	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
				Lodge Creek					
North Chinook Canal	2,140	2,150	142	89	108	0	0	0	4,990
				Battle Creek					
Matheson Canal	-	-	-	-	-	-	-	-	0
Pumping	-	-	-	-	-	-	-	-	a690
				Frenchman River					
Frenchman Canal	413	242	1,500	2,300	1,520	1,440	226	0	7,640
Total	-	-	-	-	-	-	-	-	13,320

a - Estimated use by pumping from Battle Creek to land under the Matheson Canal.

Table 7 ⑧

Measured Run-off of Eastern Tributaries of Milk River
at International Boundary for period March to October, 1959
(Quantities in Acre-feet)

STREAM	March	April	May	June	July	Aug.	Sept.	Oct.	Total
Lodge Creek	6,180	4,910	179	264	55	0	0	0	11,590
Woodpile Coulee	1,790	91	0	4.0	0	0	0	0	1,880
Battle Creek	3,780	1,470	2,760	1,120	1,700	176	41	845	11,890
Lyons Coulee	441	98	0	309	7.1	0	0	0	855
East Br. Battle Cr.	525	141	0	639	24	0	0	0	1,330
Whitewater Creek	2,100	52	9.5	4.6	2.4	0	0	5.2	2,170
Frenchman River	17,800	7,640	2,470	3,440	1,320	666	2.8	90	33,430
McEachern Creek	2,780	824	2.6	0	0	0	0	0	3,610
Horse Creek	1,130	179	0	175	12	0	0	0	1,500
Rock Creek	2,730	1,080	306	791	230	0	12	281	5,430
Totals	39,256	16,485	5,727.1	6,746.6	3,350.5	842	55.8	1,221.2	73,680

Table 9

GAUGING STATIONS OPERATED JOINTLY BY
CANADA AND UNITED STATES
IN ST. MARY AND MILK RIVER DRAINAGE BASINS

- 1959 -

Map Index	Stream and Location	Remarks
	St. Mary River Basin	
$5AE_{27}$	St. Mary River at International Boundary	Int.[a]
$5AE_{0.5}$	Swiftcurrent Creek at Many Glacier, Montana	Int.[a]
$5AE_{0.9}$	Lake Sherburne at Sherburne, Montana	Int.R[a]
$5AE_{0.6}$	Swiftcurrent Creek at Sherburne, Montana	Int.[a]
$5AE_{0.2}$	United States St. Mary Canal at St. Mary Crossing, near Babb, Montana	Int.[a]
$5AE_{0.3}$	United States St. Mary Canal at Hudson Bay Divide near Browning, Montana	Int.[a]
	Milk River Basin	
$11AA_{5}$	Milk River at Milk River, Alberta	Int.[a]
$11AA_{0.2}$	Milk River at Eastern Crossing of International Boundary	Int.[a]
$11AA_{0.3}$	North Branch of Milk River above St. Mary Canal, near Browning, Montana	Int.[a]
$11AA_{1}$	North Branch of Milk River near International Boundary	Int.[a]
$11AA_{25}$	South Branch of Milk River near International Boundary	Int.[a]
$11AD_{0.1}$	Whitewater Creek near International Boundary	Int.[a]
	Lodge Creek Tributary Basin	
$11AB_{83}$	Lodge Creek below McRae Coulee at International Boundary	Int.[a]
	Battle Creek Tributary Basin	
$11AB_{76}$	Battle Creek above Cypress Lake West Inflow Canal near West Plains, Saskatchewan	Int.[a]
$11AB_{27}$	Battle Creek at International Boundary	Int.[a]

Map Index	Stream and Location	Remarks
	Battle Creek Tributary Basin	
$11AB_{0.1}$	Woodpile Coulee near International Boundary	Int.[a]
$11AB_{0.3}$	East Branch of Battle Creek near International Boundary	Int.[a]
$11AB_{75}$	Lyons Coulee at International Boundary	Int.[a]
$11AB_{78}$	Cypress Lake West Inflow Canal	Int.[a]
$11AB_{77}$	Cypress Lake West Outflow Canal	Int.[a]
	Frenchman River Tributary Basin	
$11AC_{37}$	Cypress Lake Reservoir near Vidora, Saskatchewan	Int.R[a]
$11AC_{64}$	Belanger Creek Diversion to Cypress Lake	Int.[a]
$11AC_{60}$	Cypress Lake East Outflow Canal	Int.[a]
$11AC_{18}$	Frenchman River above East End Reservoir	Int.[a]
$11AC_{55}$	East End Reservoir at East End, Saskatchewan	Int.R[a]
$11AC_{52}$	East End Canal at East End, Saskatchewan	Int.[a]
$11AC_{1}$	Frenchman River below East End Reservoir	Int.[a]
$11AC_{63}$	Val Marie West Reservoir, near Val Marie, Saskatchewan	Int.R[a]
$11AC_{65}$	Val Marie West Gravity Canal	Int.[a]
$11AC_{56}$	Val Marie Reservoir near Val Marie, Saskatchewan	Int.R[a]
$11AC_{54}$	Val Marie Main Canal	Int.[a]
$11AC_{41}$	Frenchman River at International Boundary	Int.[a]
	Rock Creek Tributary Basin	
$11AE_{0.2}$	Rock Creek at International Boundary	Int.[a]
$11AE_{0.6}$	Rock Creek below Horse Creek near International Boundary	Int.[a]
$11AE_{0.3}$	Horse Creek near International Boundary	Int.[a]
$11AE_{0.4}$	McEachern Creek near International Boundary	Int.[a]

GAUGING STATIONS OPERATED INDEPENDENTLY
BY CANADA OR UNITED STATES

IN ST. MARY AND MILK RIVER DRAINAGE BASINS

- 1959 -

Map Index	Stream and Location	Remarks
	St. Mary River Basin	
	Grinnell Creek at Grinnell Glacier near Many Glacier, Montana	U.S.[c]
	Grinnell Creek near Mary Glacier, Montana	U.S.[c]
	St. Mary River near Babb, Montana	U.S.[c]
	St. Mary Lake near St. Mary, Montana	U.S.[c]
$5AE_6$	St. Mary River near Lethbridge	Canada[c]
$5AE_5$	Rolph Creek near Kimball, Alberta	Canada[a]
$5AE_2$	Lee Creek at Cardston, Alberta	Canada[a]
$5AE_{25}$	St. Mary Reservoir near Spring Coulee, Alberta	Canada R[a]
$5AE_{26}$	Canadian St. Mary Canal near Spring Coulee, Alberta	Canada[a]
$5AF_{28}$	Canadian St. Mary Canal at Drop 1	Canada[c]
$5AE_{21}$	Magrath Irrigation District Canal near Spring Coulee, Alberta	Canada[a]
	Milk River Basin	
	Lodge Creek Tributary Basin	
$11AB_{82}$	Lodge Creek near Alberta Boundary	Canada[a]
$11AB_9$	Middle Creek near Alberta Boundary	Canada[a]
$11AB_{80}$	Middle Creek Reservoir	Canada R[a]
$11AB_{60}$	Spangler Ditch near Govenlock, Saskatchewan	Canada[a]
2	North Chinook Canal near Havre, Montana	U.S.[b]

Map Index	Stream and Location	Remarks
	Battle Creek Tributary Basin	
$11AB_{81}$	Battle Creek at Ranger Station	Canada[c]
$11AB_{85}$	Cypress Lake West Inflow Canal Drain	Canada[a]
$11AB_{84}$	Vidora Ditch near Consul, Saskatchewan	Canada[a]
$11AB_{58}$	Richardson Ditch near Consul, Saskatchewan	Canada[a]
$11AB_{44}$	McKinnon Ditch near Consul, Saskatchewan	Canada[a]
$11AB_{18}$	Stirling and Nash Ditch near Consul, Saskatchewan	Canada[a]
3	Matheson Canal near Chinook, Montana	U.S.[b]
	Frenchman River Tributary Basin	
$11AC_{51}$	Frenchman River below Val Marie, Saskatchewan	Canada[c]
$11AC_{66}$	Val Marie West Pumping Canal near Val Marie, Saskatchewan	Canada[a]
4	Frenchman Canal near Saco, Montana	U.S.[b]

Int. - International Gauging Station

Int.R - International Station on Reservoir

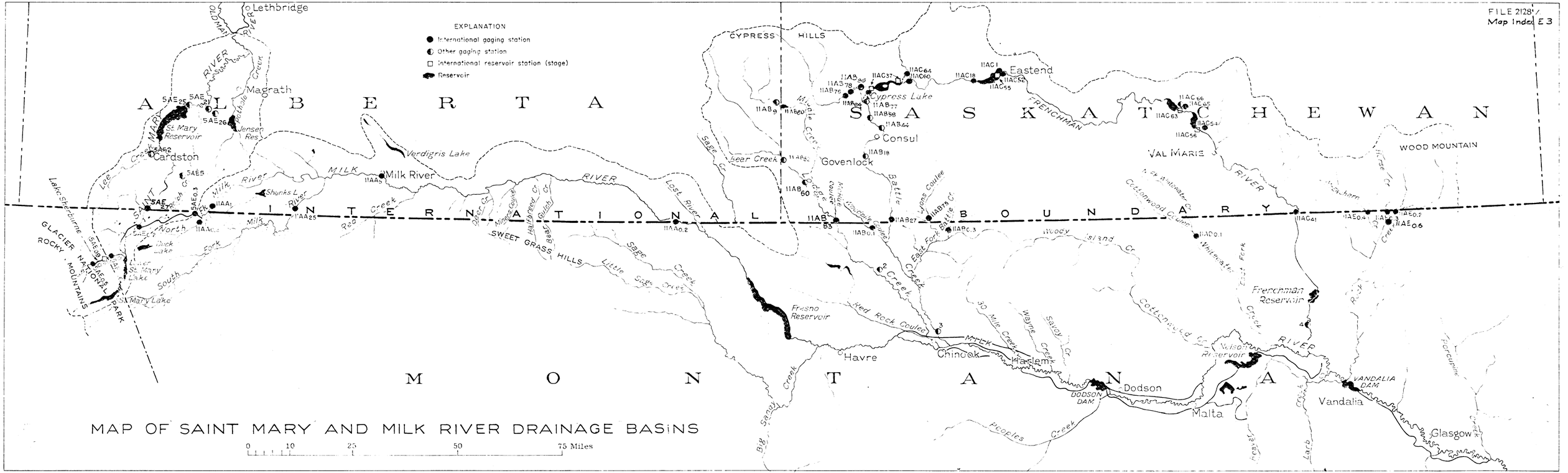
U.S. - Denotes operation by United States Geological Survey.

Canada - Denotes operation by Water Resources Branch, Canada.

a - Monthly and daily discharge data and stream measurements contained in Appendix.

b - Monthly Discharge data only tabulated in this report.

c - Data not included in this report or appendix.



MAP OF SAINT MARY AND MILK RIVER DRAINAGE BASINS

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