

Report to

THE INTERNATIONAL JOINT COMMISSION

on

THE DIVISION OF THE WATERS OF

THE ST. MARY AND MILK RIVERS

1993



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Cover photo:

Teepee Rings - Battle Creek Basin.

Photo by Jeff Woodward, Water Survey of Canada, Regina, Saskatchewan.

Report to
THE INTERNATIONAL JOINT COMMISSION
on
THE DIVISION OF THE WATERS OF
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1993

by

R.A. Halliday
representing Canada

and

Philip Cohen
representing the United States

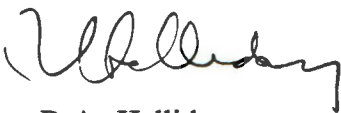
March 1994

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

Gentlemen:

In compliance with the provisions of Article VI of the Boundary Waters Treaty of 1909 and Clause VIII (c) of your order of October 4, 1921, directing the division of the waters of the 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, 1993.

Respectfully submitted,



R.A. Halliday
Accredited Officer of Her Majesty



Philip Cohen
Accredited Officer of the United States

SYNOPSIS

During the 1993 irrigation season, the natural flow of the St. Mary and Milk rivers was 88 percent and 116 percent, respectively, of the long-term average.

The natural flow of the St. Mary River at the International Boundary during the irrigation season, April 1 to October 31, 1993, was 630 000 cubic decametres (dam^3) (511,000 acre-feet). Under the terms of the Boundary Waters Treaty, the Canadian share was 395 000 dam^3 (320,000 acre-feet). The total flow recorded at the International Boundary during the irrigation season was 103 percent of the Canadian allotment.

The natural flow of the Milk River at the eastern crossing of the International Boundary from March 1 to October 31, 1993, was 160 000 dam^3 (130,000 acre-feet). Under the terms of the Treaty, the United States' allotment was 110 000 dam^3 (89,200 acre-feet). The United States received 150 percent of its allotment at Eastern Crossing, in addition to its share of St. Mary River water diverted into the Milk River by the St. Mary Canal.

The March to October natural flows of the three apportioned tributaries of the Milk River; Lodge Creek, Battle Creek, and Frenchman River; were 142 percent, 112 percent, and 97 percent respectively of the long term averages. An additional period was added to the division of Battle Creek to account for storage in Cypress Lake. As of the end of the apportionment season, no deficit remained on Battle Creek and Lodge Creek. A deficit of 142 dam^3 (115 acre-feet) developed during the last division period on the Frenchman River due to excess storage.

The annual meeting of the Field Representatives was held in Helena, Montana on February 2, 1994. Mutual problems, future plans, and changes in computational procedures were discussed and a schedule of field operations for 1994 was adopted. Streamflow records and natural flow computations collected jointly by the United States and Canada were reviewed and approved at the meeting and through correspondence after the meeting.

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INTRODUCTION

The apportionment of the waters of the St. Mary and Milk rivers is governed by Article VI of the Boundary Waters Treaty of 1909 between Great Britain and the United States. The terms of the Treaty were further clarified by the 1921 Order of the International Joint Commission. Copies of Article VI and the 1921 Order are contained in Annex A of this report.

To comply with this Treaty, Field Representatives of the United States and Canada collected and compiled hydrometric data at 41 international gauging stations on a co-operative basis. An additional 27 gauging stations were operated independently by the United States or Canada to obtain data on diversions, reservoir contents, return flows and index runoff. Most of this additional information was used to improve the accuracy of natural flow computations.

This report summarizes the 1993 natural flow computations, apportionment of the natural flow, unusual occurrences during the year and procedural modifications designed to increase the accuracy of the natural flow computations. Summary natural flow tables are included. Detailed natural flow computations are included in Appendix A. Daily discharge and other related data are included in Appendix B. Appendices A and B are submitted with this report under separate cover.

In accordance with the International System of Units (SI) conversion schedule established by the International Joint Commission, this report uses SI units first, followed by inch-pound units in parentheses. Data in tables are shown in SI units first, followed by the respective inch-pound units (for example, Tables 1 and 1A). The format for Appendices A and B of the report is SI units only. All Canadian data are collected, computed and published in SI units. The United States' data, which are collected and computed in inch-pound units, were converted to SI units using the appropriate conversions. A summary of the conversion factors is contained in Annex B.

Mr. R.A. Halliday, as Accredited Officer of Her Majesty, was represented in the field by G. H. Morton, Chief, Water Resources Branch, Calgary, Alberta and Mr. R.G. Boals, Chief, Water Resources Branch, Regina, Saskatchewan. Mr. Philip Cohen, Chief Hydrologist, United States Geological Survey, as Accredited Officer of the United States, was

represented in the field by Mr. J.A. Moreland, District Chief, United States Geological Survey, Helena, Montana. This report was prepared jointly by personnel of Environment Canada, Water Resources Branch and the United States Geological Survey, under the supervision of Messrs. Morton, Boals, and Moreland.

The annual meeting of the Field Representatives was held in Helena, Montana, on February 2, 1994. Mutual problems, future plans, and changes in computational procedures were discussed and a schedule of field operations for 1994 was adopted.

Streamflow records and natural flow computations collected jointly by the United States and Canada were reviewed and approved at the meeting and through correspondence after the meeting.

ST. MARY RIVER

During the irrigation season, April 1 to October 31, Canada's share of the natural flow of the St. Mary River at the International Boundary, as stipulated by the 1921 Order, is three-fourths of the natural flow when that flow is 666 cubic feet per second (18.86 cubic metres per second) or less. Flow in excess of that quantity is divided equally between Canada and the United States. During the non-irrigation season, November 1 to March 31, the flow is divided equally between the two countries.

To comply with the above Order, representatives of both countries make twice-monthly computations of the daily natural flow of the St. Mary River during the irrigation season. If use by the United States is in excess of its share, then a delivery of an equivalent quantity of water is normally made to Canada at the earliest opportunity. Regular interim reports of these computations are sent to all agencies involved in the water use and management of the flow of the St. Mary River. The interim reports keep these agencies informed as to the quantity of water that is available and the status of apportionment.

Tentative computations and interim reports are not made during the non-irrigation season when use by the United States is limited to storage in Lake Sherburne. The flow into Lake Sherburne is considerably less than 50 per cent of the natural flow. Occasionally, water is diverted into the St. Mary Canal during the non-irrigation season, necessitating additional computations.

Lake Sherburne, the only storage reservoir within the St. Mary River basin in the United States, is used to store part of the United States' share of flow for later diversion to the Milk River. This water, which passes through Canada, is used by the United States for irrigation in the eastern portion of the Milk River basin.

Storage in Lake Sherburne (station 05AE036) was 27 100 dam³ (22,000 acre-feet) on October 31, 1992 and increased to 39 900 dam³ (32,300 acre-feet) on March 26, 1993 when releases began. It subsequently increased to 40 000 dam³ (32,400 acre-feet) on March 31, 1993, just prior to the commencement of the irrigation season. Maximum storage was 72 000 dam³ (58,400 acre-feet) on August 1, 1993 and storage decreased to 32 100 dam³ (26,000 acre-feet) by the end of the irrigation season on October 31, 1993.

Water was diverted from the St. Mary River into the Milk River via the St. Mary Canal from March 26 to October 4, 1993. The total flow recorded at the gauging station on the St. Mary Canal at St. Mary Crossing (station 05AE029) was 232 000 dam³ (188,000 acre-feet). Any 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 computed natural flow of the St. Mary River at the International Boundary from November 1, 1992 to October 31, 1993 was 705 000 dam³ (572,000 acre-feet) of which 630 000 dam³ (511,000 acre-feet) occurred during the irrigation season, April 1 to October 31, 1993. For the irrigation season, Canada's and the United States' shares were 395 000 dam³ (320,000 acre-feet) and 235 000 dam³ (191,000 acre-feet) respectively. A total discharge of 407 000 dam³ (330,000 acre-feet) was recorded at the International Boundary, which was 103 per cent of the Canadian share. The computed natural flow during the irrigation season was 88 per cent of the average of the previous 90 years of record.

Deficit deliveries were recorded in 5 of the 14 division periods during the 1993 irrigation season. Deficits which occurred were refunded by the end of August.

The division of St. Mary River natural flow is summarized in Tables 1 and 1A and Figure 1 which follow. The detailed computation of the natural flow is given in Table 6 and the historical summary is given in Table 7 of Appendix A.

TABLE 1
SUMMARIES OF ST. MARY RIVER DIVISION FOR 1993¹
QUANTITIES IN CUBIC DECAMETRES

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	COMPUTED NATURAL FLOW	CANADA'S SHARE	RECEIVED BY CANADA	RECEIVED BY CANADA	
				ABOVE SHARE	BELOW SHARE
APR 1 - APR 15	15 142	11 356	10 885		471
APR 16 - APR 30	18 094	13 568	10 983		2 585
MAY 1 - MAY 15	39 452	25 639	24 604		1 035
MAY 16 - MAY 31	113 188	63 111	63 513	402	
JUN 1 - JUN 15	74 135	43 176	42 593		583
JUN 16 - JUN 30	68 168	40 191	41 017	826	
JUL 1 - JUL 15	76 013	44 116	45 814	1 698	
JUL 16 - JUL 31	61 166	37 098	38 071	973	
AUG 1 - AUG 15	30 592	21 326	21 208		118
AUG 16 - AUG 31	36 379	24 704	25 662	958	
SEP 1 - SEP 15	29 126	20 674	21 257	583	
SEP 16 - SEP 30	30 579	21 383	22 607	1 224	
OCT 1 - OCT 15	20 728	15 525	24 365	8 840	
OCT 16 - OCT 31	16 934	12 699	14 746	2 047	
TOTAL	629 696	394 566	407 325		

¹ This is a summary of data from Table 6, Appendix A.

TABLE 1A
SUMMARIES OF ST. MARY RIVER DIVISION FOR 1993¹
QUANTITIES IN ACRE-FEET

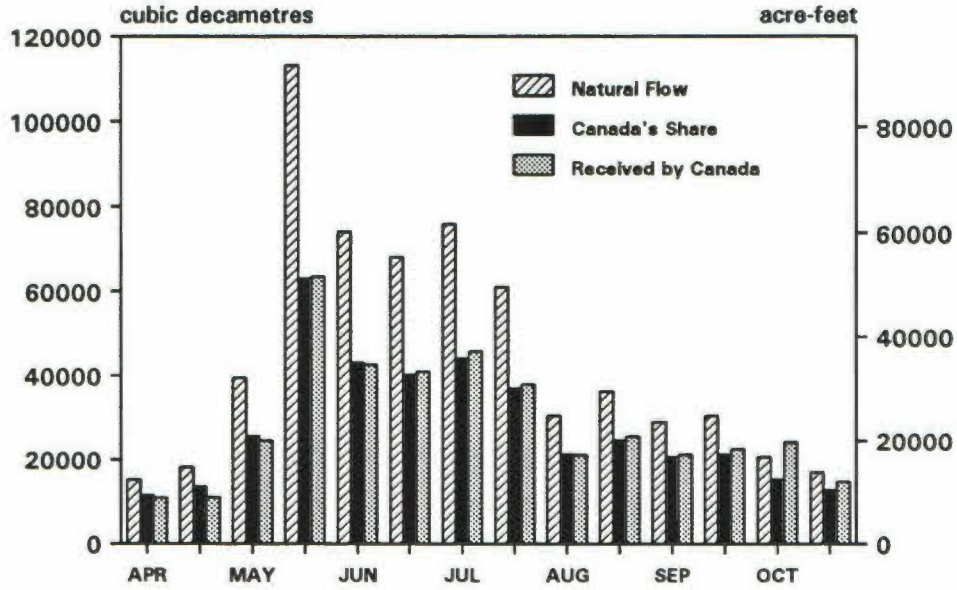
DIVISION PERIOD AT INTERNATIONAL BOUNDARY	COMPUTED NATURAL FLOW	CANADA'S SHARE	RECEIVED BY CANADA	RECEIVED BY CANADA	
				ABOVE SHARE	BELOW SHARE
APR 1 - APR 15	12,276	9,206	8,824		382
APR 16 - APR 30	14,669	11,000	8,904		2,096
MAY 1 - MAY 15	31,984	20,786	19,946		839
MAY 16 - MAY 31	91,762	51,164	51,490	326	
JUN 1 - JUN 15	60,101	35,003	34,530		473
JUN 16 - JUN 30	55,264	32,583	33,252	670	
JUL 1 - JUL 15	61,624	35,765	37,141	1,377	
JUL 16 - JUL 31	49,587	30,075	30,864	789	
AUG 1 - AUG 15	24,801	17,289	17,193		96
AUG 16 - AUG. 31	29,492	20,028	20,804	777	
SEP 1 - SEP 15	23,612	16,760	17,233	473	
SEP 16 - SEP 30	24,790	17,335	18,327	992	
OCT 1 - OCT 15	16,804	12,586	19,753	7,167	
OCT 16 - OCT 31	13,728	10,295	11,955	1,660	
TOTAL	510,495	319,875	330,218		

¹ All values are conversions of data from Table 1. Totals and shares may not add or subtract exactly as a result of rounding.

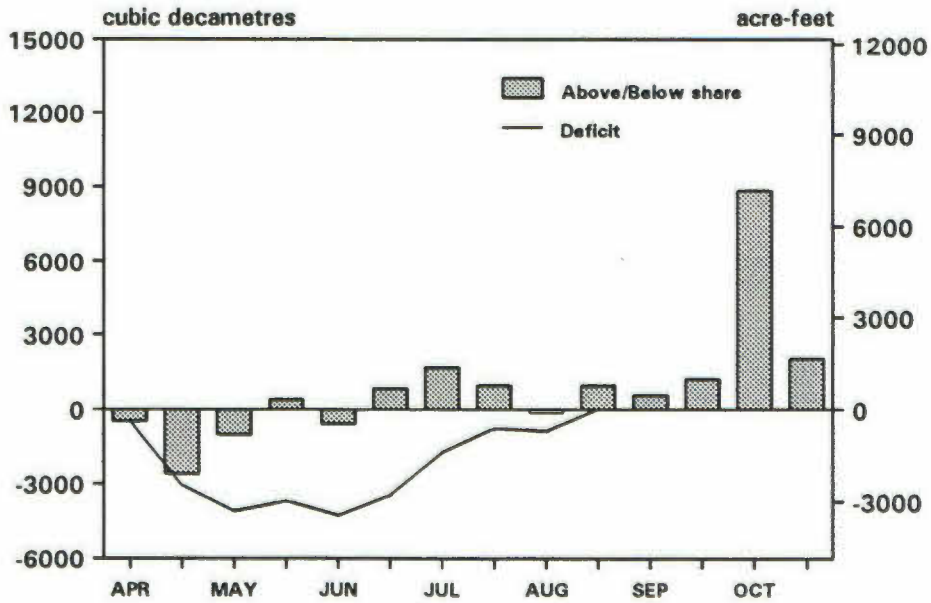
FIGURE 1

ST. MARY RIVER DIVISION, 1993

Period Values



Excess/Deficit Delivery to Canada



MILK RIVER

During the irrigation season, April 1 to October 31, the United States' share of the natural flow of the Milk River at the eastern crossing of the International Boundary, as stipulated by the 1921 Order, is three-fourths of the natural flow when that flow is 666 cubic feet per second (18.86 cubic meters per second) or less. Flows in excess of that quantity are divided equally between the United States and Canada. During the non-irrigation season, November 1 to March 31, the entire flow is divided equally between the two countries.

Prior to the mid-seventies, uses of the natural flow of the Milk River by Canada and the United States were assumed to be less than their respective shares and no formal apportionment was made. By 1977, it became apparent that the increasing numbers of sprinkler irrigation systems were capable of using all of the natural flow for long periods of time. Consequently, a more comprehensive natural flow computation and water division procedure was developed and has been used since 1985. The revised computation procedure includes an approximate accounting of irrigation consumptive uses in both countries, and the interbasin transfer of water in Canada. An additional refinement was made in 1988 when F. I. Morton's evapotranspiration model replaced the adjusted pan evaporation method in the natural flow computations. During 1993, the United States' and Canada's respective estimated consumptive uses were 5 050 dam³ (4,090 acre-feet) and 5 160 dam³ (4,180 acre-feet) respectively. An interbasin transfer of 8 820 dam³ (7,150 acre-feet) from Verdigris Coulee near the Mouth (station 11AA038) was credited to the Canadian consumptive use.

The computed natural flow of the Milk River at the Eastern Crossing of the International Boundary from March 1 to October 31, 1993 was 160 000 dam³ (130,000 acre-feet). This flow was 116 percent of the average computed natural flow of the previous 81 years of record. It is important to note, however, that natural flow computations prior to 1985 did not account for consumptive use. Consequently, natural flow values after 1985 are not directly comparable with natural flows of previous years. The respective shares of the United States and Canada were 110 000 dam³ (89,200 acre-feet) and 50 800 dam³ (41,200 acre-feet).

TABLE 2
SUMMARY OF MILK RIVER DIVISION FOR 1993¹
QUANTITIES IN CUBIC DECAMETRES

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	COMPUTED NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	21 080	10 540	21 164	10 624	
MAR 16 - MAR 31	17 149	8 574	17 159	8 585	
APR 1 - APR 15	12 655	9 491	12 891	3 400	
APR 16 - APR 30	7 340	5 505	7 942	2 437	
MAY 1 - MAY 15	3 785	2 839	4 286	1 447	
MAY 16 - MAY 31	6 555	4 916	5 965	1 049	
JUN 1 - JUN 15	8 182	6 136	7 546	1 410	
JUN 16 - JUN 30	4 119	3 089	4 091	1 002	
JUL 1 - JUL 15	12 888	8 998	12 729	3 731	
JUL 16 - JUL 31	23 444	17 110	23 413	6 303	
AUG 1 - AUG 15	5 479	4 109	5 739	1 630	
AUG 16 - AUG 31	10 538	7 904	10 958	3 054	
SEP 1 - SEP 15	8 141	6 106	8 615	2 509	
SEP 16 - SEP 30	4 767	3 575	5 607	2 032	
OCT 1 - OCT 15	8 267	6 200	9 010	2 810	
OCT 16 - OCT 31	5 912	4 434	6 728	2 294	
TOTAL	160 301	109 526	163 843		

¹ This is a summary of data from Table 8, Appendix A.

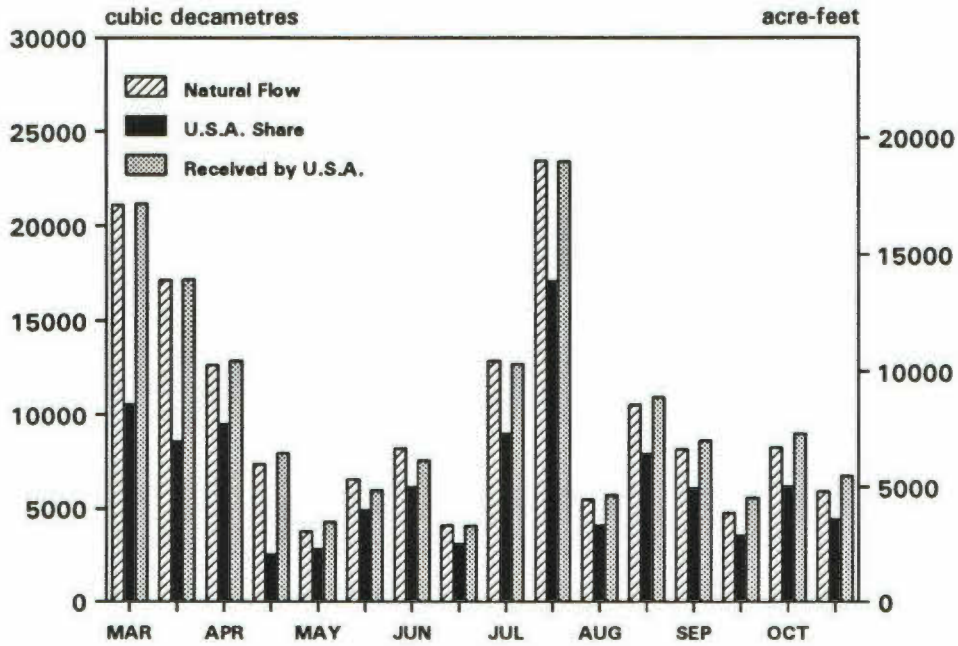
TABLE 2A
SUMMARY OF MILK RIVER DIVISION FOR 1993¹
QUANTITIES IN ACRE-FEET

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	COMPUTED NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	17,090	8,545	17,158	8,613	
MAR 16 - MAR 31	13,903	6,951	13,911	6,960	
APR 1 - APR 15	10,259	7,694	10,451	2,756	
APR 16 - APR 30	5,951	4,463	6,439	1,976	
MAY 1 - MAY 15	3,068	2,302	3,475	1,173	
MAY 16 - MAY 31	5,314	3,985	4,836	850	
JUN 1 - JUN 15	6,633	4,974	6,118	1,143	
JUN 16 - JUN 30	3,339	2,504	3,317	812	
JUL 1 - JUL 1	10,448	7,295	10,319	3,025	
JUL 16 - JUL 31	19,006	13,871	18,981	5,110	
AUG 1 - AUG 15	4,442	3,331	4,653	1,321	
AUG 16 - AUG 31	8,543	6,408	8,884	2,476	
SEP 1 - SEP 15	6,600	4,950	6,984	2,034	
SEP 16 - SEP 30	3,865	2,898	4,546	1,647	
OCT 1 - OCT 15	6,702	5,026	7,304	2,278	
OCT 16 - OCT 31	4,793	3,595	5,454	1,860	
TOTAL	129,956	88,793	132,828		

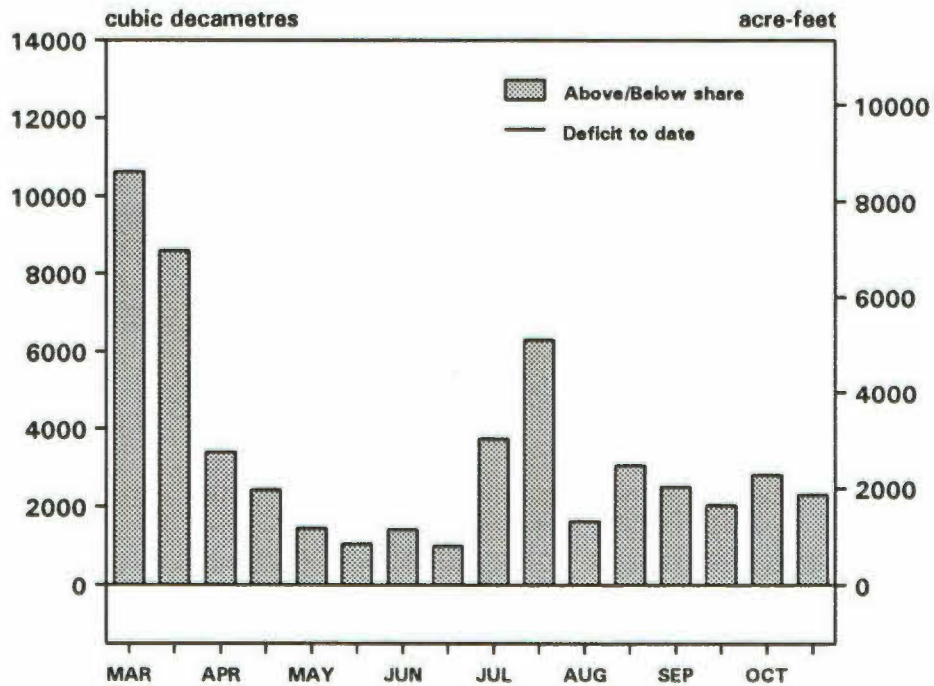
¹ all values are conversions of data from Table 2. Totals and shares may not add or subtract exactly as a result of rounding.

FIGURE 2

MILK RIVER DIVISION, 1993
Period Values



Excess/Deficit Delivery to the U.S.A.



SOUTHERN TRIBUTARIES OF THE MILK RIVER

Responding to concerns expressed by Canadian water users, the International Joint Commission at its executive session on December 8, 1986 agreed, in principle, that the issue of utilization of the southern tributaries should be addressed in an informal, pragmatic manner. The Commission instructed the Accredited Officers to proceed with discussions to resolve Canadian concerns. To assist them in implementing the Commission's instructions, the Accredited Officers established a four-member ad hoc task force comprised of officials from the State of Montana and the Province of Alberta water management agencies and the United States and Canadian Field Representatives for the St. Mary-Milk River Treaty.

The task force met with United States and Canadian water users, conducted public meetings, toured water-use projects, compiled information on water availability and use, investigated ground-water supplies, and considered various options for resolving issues. The task force determined that United States water users were reluctant to participate in options that might limit their use of water and jeopardize their water claims in future adjudication of water rights. They also determined that basic Canadian water user needs for domestic and stock-watering use were being satisfied with wells and dugouts. Solutions to water utilization problems were limited because cost of storage facilities, pumpage from the Milk River, and formal apportionment of southern tributary waters would not be cost effective.

In September, 1991, the Montana Department of Natural Resources and Conservation, in response to requests from the task force and others, issued an Order to close the southern tributaries to issuance of additional water permits.

The task force prepared a final report to the Accredited Officers in 1993 containing the following recommendations:

- 1) Use the Commission's influence to expedite adjudication of water rights in the Montana portion of the basin.

- 2) Obtain agreement with State of Montana to notify the governments of Canada and Alberta when adjudication hearings are to commence and allow them the opportunity to seek representation in the adjudication process under the jurisdiction of the Montana Water Court.
- 3) Encourage the State of Montana to recognize the requirements of Canadian water users in the Montana adjudication program.
- 4) The Southern Tributaries ad hoc task force should be terminated.

EASTERN TRIBUTARIES OF THE MILK RIVER

The waters of the eastern tributaries of the Milk River are divided in accordance with the 1921 Order of the International Joint Commission, which stipulates under Rule III that "The natural flow of the eastern (otherwise known as the Saskatchewan or northern) tributaries of the Milk River at the points where they cross the International Boundary shall be divided equally between the two countries." This order might well be interpreted as requiring that the division of water be made on a continuing basis, however, the physical limitation due to transit time in the flow system was recognized. Further analysis showed that the minimum practical time frame for compilation of the natural flows at the International Boundary was every 10 days. In 1993 the time frame was increased to bi-monthly. This change was made possible by using real-time stream flow stations in the area.

Prior to 1937, Canadian use along the eastern tributaries consisted of domestic projects, and the Canadian share of the natural flow was not fully used. In the late 1930s, the Government of Canada constructed three dams on the Frenchman River creating Eastend Reservoir (station 11AC055), Huff Lake (station 11AC063), and Newton Lake (station 11AC056) and subsequently an operational division of flow on this tributary became necessary by 1937. In 1938, dams were constructed at both ends of Cypress Lake (station 11AC037) near the Battle Creek-Frenchman River divide to allow interbasin storage and transfers of water. In the early 1950s the redevelopment of several private irrigation projects and the construction of the Vidora Irrigation Project resulted in increased use of Battle Creek water in Canada and made an operational division of flow on this tributary necessary by 1957. In 1960, construction of Altawan Reservoir (station 11AB089) and the Spangler Irrigation Project on Lodge Creek (station 11AB060) made an operational division of flow on this tributary necessary by 1961.

During the period March 1 to October 31, bi-monthly computations of the natural flow of Lodge Creek, Battle Creek and the Frenchman River are made to determine each country's share. If use by Canada is in excess of its share, then a delivery of an equivalent quantity of water is made to the United States at the earliest opportunity. When mutually agreed to, the United States or Canada may request that deficit deliveries be delayed to allow for more efficient use of the water.

Regular interim reports on the progress of the division of the natural flows of Lodge Creek, Battle Creek, and Frenchman River at the International Boundary are distributed to interested agencies during the irrigation season. Extra division periods may be added to account for significant usages beyond the October 31 ending date. Generally, no division of flow is made during the winter as flow and use are low and streamflow records are impractical to obtain.

Lyons Creek is monitored but does not have sufficient use in Canada at this time to warrant an operational division of flow. A total of 800 dam³ was recorded on Lyons Creek in 1993.

Volumes for unmeasured diversions to private irrigation projects in the Lodge Creek, Battle Creek, and Frenchman River basins in Saskatchewan were based on year-end reports provided by the Saskatchewan Water Corporation, and for the Lodge Creek and Battle Creek basins in Alberta, by Alberta Environment. These reports are compiled from reports received from operators of irrigation projects and from on-site inspections. An additional adjustment is made for domestic projects in the Battle Creek and Frenchman River basins based on the results of studies conducted by Canada on domestic use.

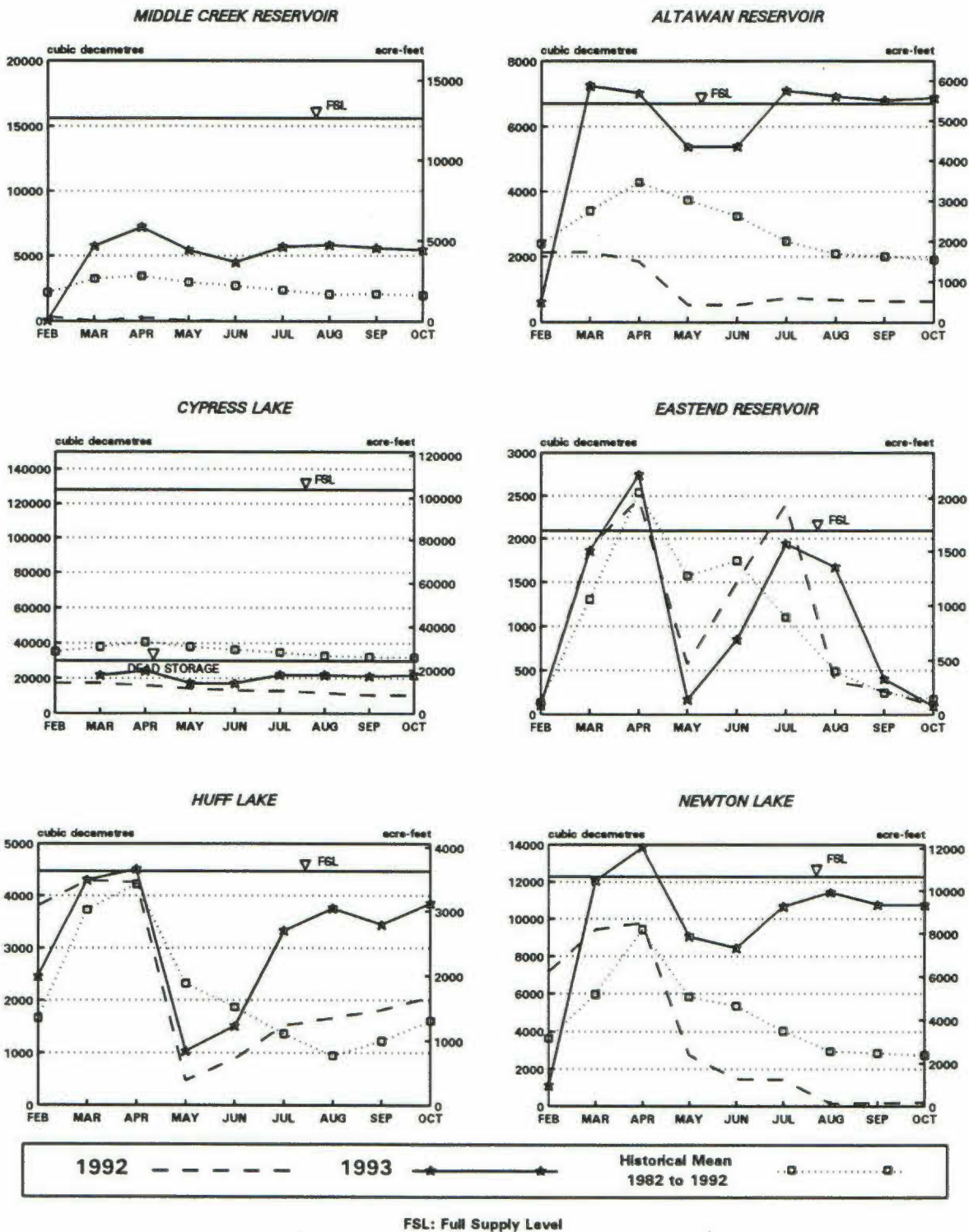
Concerning the interim reports prepared at the end of division periods, estimates of minor diversions were made based on a field conditions and historical usages. At mid-year and at year-end, estimates of minor diversions were updated based on usage reports received from Alberta Environment and the Saskatchewan Water Corporation. Consequently, some discrepancy exists between interim and final division computations. Lists of reported diversions are contained in Appendix B.

The more normal flows in 1993 as compared to the below normal flows since 1988 have substantially increased the volume of water stored in Cypress Lake. Although lake levels were still below the dead storage elevation, irrigation was possible through pumping. At the end of October the lake contained 22 000 dam³ (17,800 acre-feet) which is 8 000 dam³ (6,500 acre-feet) below the dead storage level of 30 000 dam³ (24,300 acre-feet). This is an increase of 11 800 dam³ (9,600 acre-feet) from 1992.

At the end of February, the combined usable storage of Middle Creek Reservoir, Altawan Reservoir, Eastend Reservoir, Huff Lake, and Newton Lake was 27 000 dam³ (21,900 acre-feet), or 66 percent of the total live storage of 41 100 dam³ (33,300 acre-feet). By the end of April, runoff had increased the combined usable storage to the yearly maximum of 35 300 dam³ (28,600 acre-feet) or 86 percent of the total live storage. By the end of June, irrigation usage, evaporation, and releases from the reservoirs depleted the combined usable storage to 20 600 dam³ (16,700 acre-feet) or 50 percent of the total live storage. Further details on storage in the major Canadian reservoirs are provided in Figure 3, and in Table 16 of Appendix B.

FIGURE 3

RESERVOIRS IN LODGE, BATTLE AND FRENCHMAN BASINS
MONTH END CONTENTS



LODGE CREEK

The computed natural flow of Lodge Creek at the International Boundary from March 1 to October 31, 1993, was 46 200 dam³ (37,500 acre-feet). This represents 142 percent of the average natural flow of the last 43 years of record and is the largest flow recorded since 1977. Each country is entitled to 50 percent of the natural flow or 23 100 dam³ (18,700 acre-feet). A total of 26 700 dam³ (21,600 acre-feet) was recorded at Lodge Creek below McRae Creek at the International Boundary (station 11AB083), from March 1 to October 31.

Deficit deliveries were recorded in the first 2 of the 16 division periods during the season. No deficit remained at the end of October.

The division of the Lodge Creek natural flow is summarized in Tables 3 and 3A and Figure 4 which follow. The detailed computation of the natural flow is given in Table 10 and the historical summary is given in Table 11 of Appendix A.

TABLE 3
SUMMARY OF LODGE CREEK DIVISION FOR 1993*
QUANTITIES IN CUBIC DECAMETRES

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	277	139	0		139
MAR 16 - MAR 31	27 654	13 827	13 755		72
APR 1 - APR 15	5 844	2 922	4 065	1 143	
APR 16 - APR 30	2 354	1 177	1 667	490	
MAY 1 - MAY 15	481	240	568	328	
MAY 16 - MAY 31	171	86	126	40	
JUNE 1 - JUNE 15	0	0	90	90	
JUNE 16 - JUNE 30	348	174	194	20	
JULY 1 - JULY 15	454	227	454	227	
JULY 16 - JULY 31	5 549	2 775	2 897	122	
AUG 1 - AUG 15	809	404	1 045	641	
AUG 16 - AUG 31	1 874	937	1 468	531	
SEP 1 - SEP 15	122	61	184	123	
SEP 16 - SEP 30	107	54	80	26	
OCT 1 - OCT 15	58	29	37	8	
OCT 16 - OCT 31	72	36	58	22	
TOTAL	46 175	23 088	26 688		

* This is a summary of data from Table 10, Appendix A. Totals and shares may not add or subtract exactly as a result of rounding.

TABLE 3A
 SUMMARY OF LODGE CREEK DIVISION FOR 1993*
 QUANTITIES IN ACRE-FEET

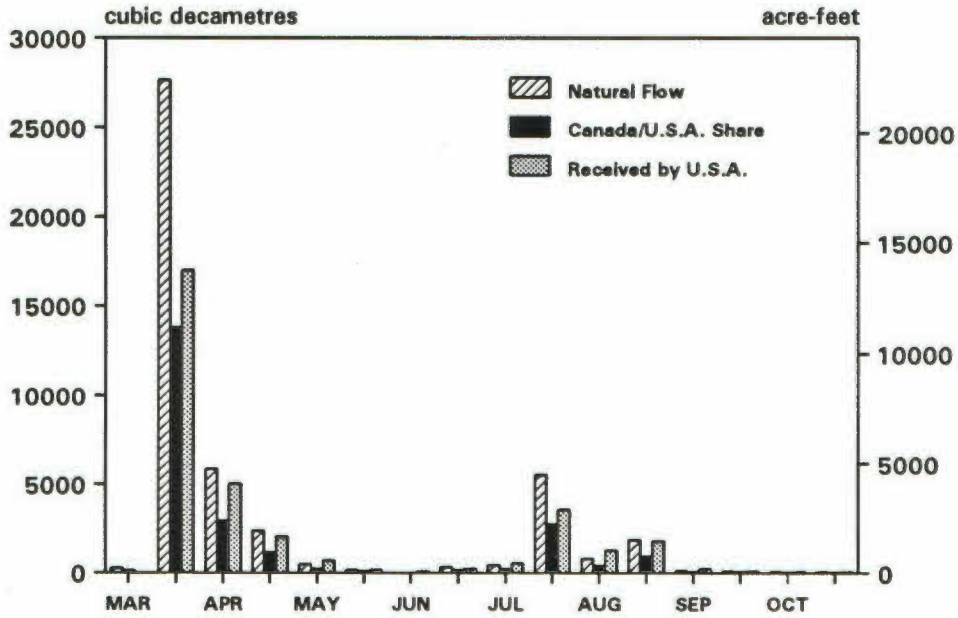
DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	225	113	0		113
MAR 16 - MAR 31	22,420	11,210	11,151		59
APR 1 - APR 15	4,738	2,369	3,296	927	
APR 16 - APR 30	1,909	954	1,352	398	
MAY 1 - MAY 15	390	195	460	266	
MAY 16 - MAY 31	139	70	102	33	
JUNE 1 - JUNE 15	0	0	73	73	
JUNE 16 - JUNE 30	282	141	157	16	
JULY 1 - JULY 15	368	184	368	184	
JULY 16 - JULY 31	4,499	2,250	2,349	99	
AUG 1 - AUG 15	656	328	847	520	
AUG 16 - AUG 31	1,519	760	1,190	431	
SEP 1 - SEP 15	99	49	149	100	
SEP 16 - SEP 30	87	44	65	21	
OCT 1 - OCT 15	47	24	30	6	
OCT 16 - OCT 31	59	29	47	18	
TOTAL	37,434	18,717	21,636		

* All values are conversions of data from Table 3. Totals and shares may not add or subtract exactly as a result of rounding.

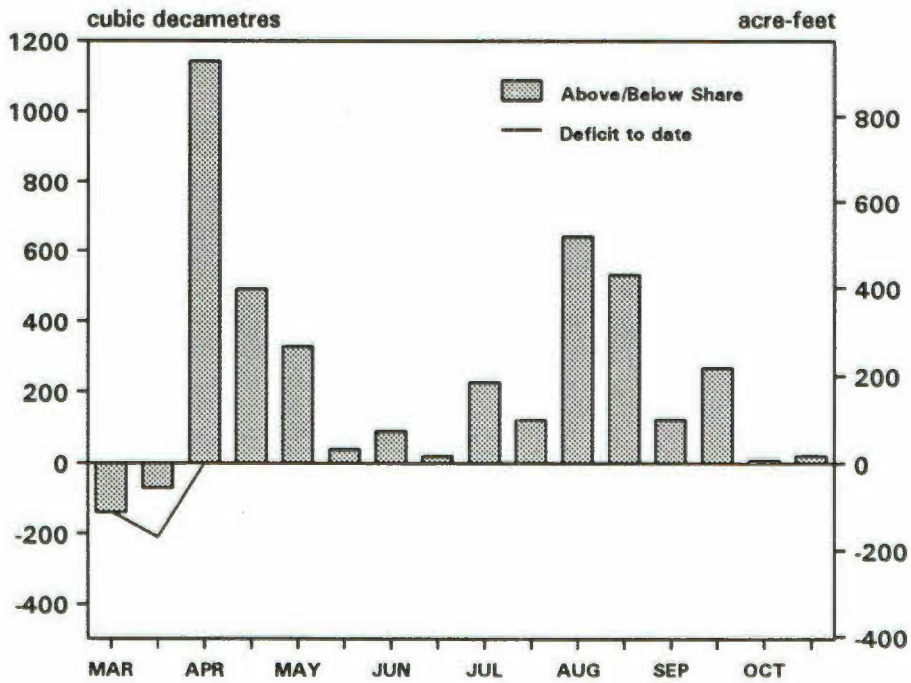
FIGURE 4

LODGE CREEK DIVISION, 1993

Period Values



Excess/Deficit Delivery to the U.S.A.



BATTLE CREEK

The computed natural flow of Battle Creek at the International Boundary from March 1 to October 31, 1993, was 34 500 dam³ (28,000 acre-feet) or 112 percent of the average natural flow of the previous 53 years of record. Each country is entitled to 50 percent of the natural flow or 17 250 dam³ (14 000 acre-feet). A total flow of 17 800 dam³ (14,400 acre-feet) was recorded at Battle Creek at International Boundary (station 11AB027) during this period.

Apportionment on Battle Creek was extended beyond October 31, 1993 to account for water stored in Cypress Lake. In addition to the 16 regular apportionment divisions, a period from November 1 to November 16 was added to the calculations. To maintain consistency, flows during this period were not included in the totals reported. No deficit arose during this period.

Deficit deliveries were recorded in 5 of the 16 division periods during the season. No deficit remained at the end of October.

The division of the Battle Creek natural flow is summarized in Tables 4 and 4A and Figure 5 which follow. The detailed computation of the natural flow is given in Table 12 and the historical summary is given in Table 13 of Appendix A.

TABLE 4
SUMMARY OF BATTLE CREEK DIVISION FOR 1993*
QUANTITIES IN CUBIC DECAMETRES

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 25	3 547	1 773	2 364	591	
MAR 26 - APR 9	10 930	5 465	3 369		2 096
APR 10 - APR 24	3 890	1 945	2 391	446	
APR 25 - MAY 9	1 857	928	1 449	521	
MAY 10 - MAY 25	1 355	677	541		136
MAY 26 - JUN 9	596	298	1 035	737	
JUNE 10 - JUNE 24	1 085	543	649	106	
JUNE 25 - JULY 9	1 297	648	259		389
JULY 10 - JULY 25	2 121	1 061	722		339
JULY 26 - AUG 9	2 328	1 164	465		699
AUG 10 - AUG 25	931	466	662	196	
AUG 26 - SEP 9	940	470	935	465	
SEP 10 - SEP 24	874	437	874	437	
SEP 25 - OCT 9	1 245	622	1 102	480	
OCT 10 - OCT 25	1 073	536	761	225	
OCT 26 - OCT 31	423	211	259	48	
** NOV 1 - NOV 16	1 243	622	694	72	
TOTAL	35 734	17 867	18 530		

* This is a summary of data from Table 12, Appendix A. Totals and shares may not add or subtract exactly as a result of rounding.

** Additional period to account for storage in Cypress Lake.

TABLE 4A
SUMMARY OF BATTLE CREEK DIVISION FOR 1993*
QUANTITIES IN ACRE-FEET

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 25	2,875	1,437	1,916	479	
MAR 26 - APR 9	8,861	4,430	2,731		1699
APR 10 - APR 24	3,153	1,577	1,938	361	
APR 25 - MAY 9	1,505	752	1,174	422	
MAY 10 - MAY 25	1,098	549	438		111
MAY 26 - JUN 9	484	242	839	598	
JUNE 10 - JUNE 24	880	440	526	86	
JUNE 25 - JULY 9	1,051	525	210		316
JULY 10 - JULY 25	1,720	860	586		274
JULY 26 - AUG 9	1,887	944	377		567
AUG 10 - AUG 25	755	378	537	159	
AUG 26 - SEP 9	762	381	758	377	
SEP 10 - SEP 24	709	354	709	355	
SEP 25 - OCT 9	1,009	504	893	389	
OCT 10 - OCT 25	870	435	617	182	
OCT 26 - OCT 31	343	171	210	39	
** NOV 1 - NOV 16	1,008	504	563	58	
TOTAL	28,970	14,485	15,022		

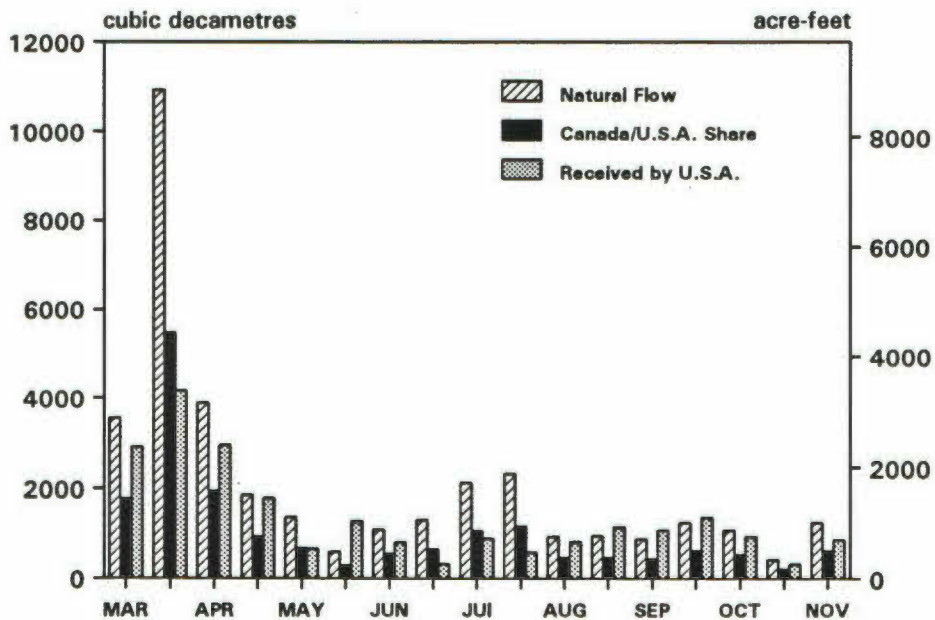
* All values are conversions of data from Table 4. Totals and shares may not add or subtract exactly as a result of rounding.

** Additional period to account for storage in Cypress Lake.

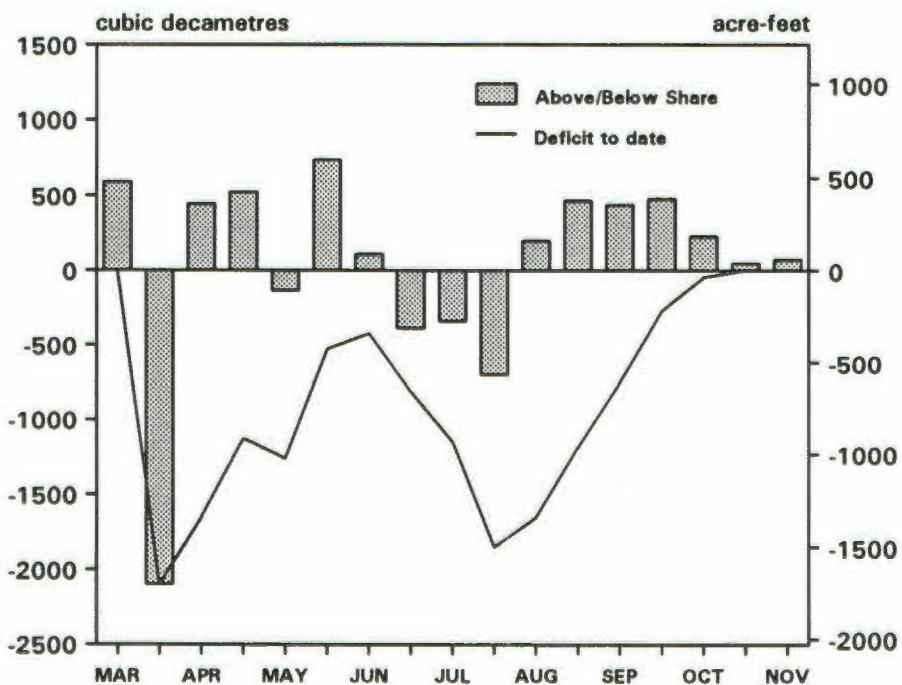
FIGURE 5

BATTLE CREEK DIVISION, 1993

Period Values



Excess/Deficit Delivery to the U.S.A.



FRENCHMAN RIVER

The computed natural flow of the Frenchman River at the International Boundary from March 1 to October 31, 1993, was 77 300 dam³ (62,700 acre-feet) or 97 percent of the average natural flow of the previous 53 years of record. Each country is entitled to 50 percent of the natural flow or 38 650 dam³ (31,300 acre-feet). A total flow of 49 200 dam³ (39 900 acre-feet) was recorded at Frenchman River at International Boundary (station 11AC041) from March 1 to October 31.

Deficit deliveries were recorded in 4 of the 16 division periods during the season. A small deficit of 142 dam³ (115 acre feet) remained at the end of October. This deficit was due to storage in Huff and Newton Lakes in the last division period.

The division of the Frenchman River natural flow is summarized in Tables 5 and 5A and Figure 6 which follow. The detailed computation of the natural flow is given in Table 14 and the historical summary is given in Table 15 of Appendix A.

TABLE 5
SUMMARY OF FRENCHMAN RIVER DIVISION FOR 1993*
QUANTITIES IN CUBIC DECAMETRES

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	7 041	3 520	4 700	1 180	
MAR 16 - MAR 31	15 705	7 852	7 593		259
APR 1 - APR 15	17 486	8 743	7 867		876
APR 16 - APR 30	3 152	1 576	2 208	632	
MAY 1 - MAY 15	2 332	1 166	943		223
MAY 16 - MAY 31	1 024	512	1 028	516	
JUNE 1 - JUNE 15	529	265	317	52	
JUNE 16 - JUNE 30	452	226	144		82
JULY 1 - JULY 15	1 263	631	716	85	
JULY 16 - JULY 31	15 842	7 921	12 862	4 941	
AUG 1 - AUG 15	982	491	607	116	
AUG 16 - AUG 31	7 029	3 514	5 303	1 789	
SEP 1 - SEP 15	1 206	603	1 448	845	
SEP 16 - SEP 30	1 366	683	1 670	987	
OCT 1 - OCT 15	1 079	540	1 545	1 005	
OCT 16 - OCT 31	821	411	269		142
TOTAL	77 311	38 655	49 221		

* This is a summary of data from Table 14, Appendix A. Totals and shares may not add or subtract exactly as a result of rounding.

TABLE 5A
SUMMARY OF FRENCHMAN RIVER DIVISION FOR 1993*
QUANTITIES IN ACRE-FEET

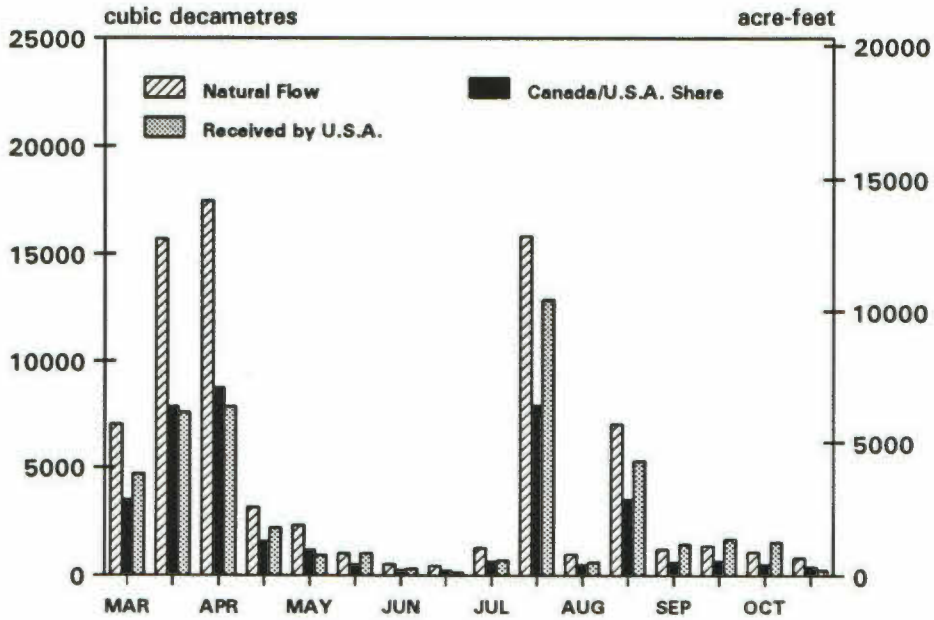
DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	5,708	2,854	3,811	957	
MAR 16 - MAR 31	12,732	6,366	6,156		210
APR 1 - APR 15	14,176	7,088	6,378		710
APR 16 - APR 30	2,556	1,278	1,790	513	
MAY 1 - MAY 15	1,890	945	764		181
MAY 16 - MAY 31	831	415	834	418	
JUNE 1 - JUNE 15	429	215	257	43	
JUNE 16 - JUNE 30	367	183	116		67
JULY 1 - JULY 15	1,024	512	581	69	
JULY 16 - JULY 31	12,844	6,422	10,427	4,005	
AUG 1 - AUG 15	796	398	492	94	
AUG 16 - AUG 31	5,698	2,849	4,299	1,450	
SEP 1 - SEP 15	978	489	1,174	685	
SEP 16 - SEP 30	1,108	554	1,354	800	
OCT 1 - OCT 15	875	438	1,253	815	
OCT 16 - OCT 31	666	333	218		115
TOTAL	62,676	31,338	39,903		

* All values are conversions of data from Table 5. Totals and shares may not add or subtract exactly as a result of rounding.

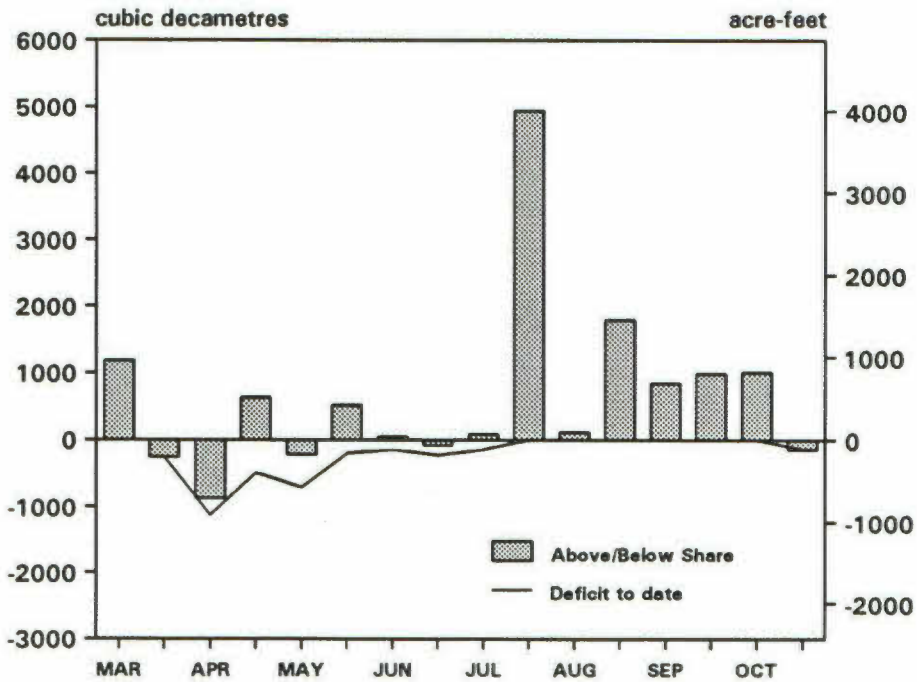
FIGURE 6

FRENCHMAN RIVER DIVISION, 1993

Period Values



Excess/Deficit Delivery to the U.S.A.



ANNEX A

TREATY BETWEEN THE UNITED STATES AND GREAT BRITAIN
RELATING TO BOUNDARY WATERS, AND QUESTIONS ARISING
BETWEEN THE UNITED STATES AND CANADA - ARTICLE VI

INTERNATIONAL JOINT COMMISSION
1921 ORDER

TREATY
BETWEEN THE UNITED STATES AND GREAT BRITAIN
RELATING TO BOUNDARY WATERS,
AND QUESTIONS ARISING BETWEEN THE
UNITED STATES AND CANADA

ARTICLE VI

The High Contracting Parties agree that the St. Mary and Milk rivers and their tributaries (in the State of Montana and the Provinces of Alberta and Saskatchewan) are to be treated as one stream for the purposes of irrigation and power, and the waters thereof shall be apportioned equally between the two countries, but in making such equal apportionment more than half may be taken from one river and less than half from the other by either country so as to afford a more beneficial use to each. It is further agreed that in the division of such waters during the irrigation season, between the 1st of April and 31st of October, inclusive, annually, the United States is entitled to a prior appropriation of 500 cubic feet per second of the waters of the Milk River, or so much of such amount as constitutes three-fourths of its natural flow, and that Canada is entitled to a prior appropriation of 500 cubic feet per second of the flow of St. Mary River, or so much of such amount as constitutes three-fourths of its natural flow.

The Channel of the Milk River in Canada may be used at the convenience of the United States for the conveyance, while passing through Canadian territory, of waters diverted from the St. Mary River. The provisions of Article II of this treaty shall apply to any injury resulting to property in Canada from the conveyance of such waters through the Milk River.

The measurement and apportionment of the water to be used by each country shall from time to time be made jointly by the properly constituted reclamation officers of the United States and the properly constituted irrigation officers of His Majesty under the direction of the International Joint Commission.

INTERNATIONAL JOINT COMMISSION

ORDER

IN THE MATTER OF THE MEASUREMENT AND APPORTIONMENT OF THE WATERS OF THE ST. MARY AND MILK RIVERS AND THEIR TRIBUTARIES IN THE STATE OF MONTANA AND THE PROVINCES OF ALBERTA AND SASKATCHEWAN.

Whereas by Article VI of the Treaty entered into between the United States of America and His Majesty, the King of the United Kingdom Great Britain and Ireland and of the British Dominions beyond the Seas, Emperor of India, signed at Washington on the 11th of January, 1909;

And whereas, the said Reclamation and Irrigation Officers have been unable to agree as to the manner in which the waters mentioned in the said Article VI should be measured and apportioned;

And whereas, before giving directions as to the measurement and apportionment of the said waters, the International Joint Commission deemed it proper to hear such representations and suggestions thereon as the Governments of the United States and Canada, the Provinces of Alberta and Saskatchewan, and the State of Montana, and as corporations and persons interested might see fit to make, and for such purposes sittings of the Commission were held at the following times and places: At the city of St. Paul, in the State of Minnesota, on the 24th, 25th, 26th, 27th, and 28th days of May, 1915; at the city of Detroit, in the State of Michigan, on the 15th, 16th, and 17th days of May, 1917; at the city of Ottawa, in the Province of Ontario, on the 3rd, 4th, and 5th days of May, 1920; at the village of Chinook, in the State of Montana, on the 15th day of September, 1921; and at the city of Lethbridge, in the Province of Alberta, on the 17th day of September, 1921, when counsel and representatives of the said Governments, corporations, and persons appeared and presented their views;

And whereas, pending final decision as to the proper method of measuring and apportioning said waters, interim orders with reference thereto have been made by the

International Joint Commission from time to time, the last of such orders bearing the date of 5th day of April, 1921;

And whereas the members of the International Joint Commission have unanimously determined that the said Reclamation and Irrigation Officers should be guided in the measurement and apportionment of said waters by the directions and instructions hereinafter set forth;

IT IS THEREFORE ORDERED AND DIRECTED by the Commission in pursuance of the powers conferred by the said Article VI of the said Treaty that the Reclamation and Irrigation Officers of the United States and Canada shall, until this order is varied, modified, or withdrawn by the Commission, make jointly the measurement and apportionment of the water to be used by the United States and Canada in accordance with the following rules:

St. Mary River

I. (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.

(c) During the non-irrigation season the natural flow of the St. Mary River at the point where it crosses the international boundary shall be divided equally between the two countries.

Milk River

II. (a) During the irrigation season when the natural flow of the Milk River at the point where it crosses the international boundary for the last time (commonly and hereafter called the Eastern Crossing) is six hundred and sixty-six (666) cubic feet per second or less, the United States shall be entitled to three-fourths and Canada to one-fourth of such natural flow.

(b) During the irrigation season when the natural flow of the Milk River at the Eastern Crossing is more than six hundred and sixty-six (666) cubic feet per second the United States 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.

(c) During the non-irrigation season the natural flow of the Milk River at the Eastern Crossing shall be divided equally between the two countries.

Eastern Tributaries of Milk River

III. The natural flow of the eastern (otherwise known as the Saskatchewan or northern) tributaries of the Milk River at the points where they cross the international boundary shall be divided equally between the two countries.

Waters not naturally crossing the boundary

IV. Each country shall be apportioned such waters of the said rivers and of any tributaries thereof as rise in that country but do not naturally flow across the international boundary.

V. For the purpose of carrying out the apportionment directed in Paragraphs I, II, and III hereof the said Reclamation and Irrigation Officers shall jointly take steps:

(a) To ascertain and keep daily record of the natural flow of the St. Mary River at the international boundary, of the Milk River at the Eastern Crossing, and of the eastern tributaries of the Milk River at the international boundary by measurement in each case:

- (1) At the gauging station at the international boundary;
- (2) At all places where any of the waters which would naturally flow across the international boundary at that particular point are diverted in either country prior to such crossing;
- (3) At all places where any of the waters which would naturally flow across the international boundary at that particular point are stored, or the natural flow thereof increased or decreased prior to such crossing.

(b) To fix the amount of water to which each country is entitled in each case by applying the directions contained in paragraphs 1, 2, and 3 hereof to the total amount of the natural flow so ascertained in each case.

(c) To communicate the amount so fixed to all parties interested, so that the apportionment of the said waters may be fully carried out by both countries in accordance with the said directions.

VI. Each country may receive its share of the said waters as so fixed at such point or points as it may desire. A gauging station shall be established and maintained by the Reclamation or Irrigation Officers of the country in which any diversion, storage, increase or decrease of the natural flow shall be made at every point where such diversion, storage, increase, or decrease takes place.

VII. International gauging stations shall be maintained at the following points:

St. Mary River near international boundary; the north branch of Milk River near international boundary; the south branch of Milk River near international boundary; Milk River at Eastern Crossing; Lodge Creek, Battle Creek, and Frenchman River, near international boundary; and gauging stations shall be established and maintained at such other points as the Commission may from time to time approve.

VIII. The said Reclamation and Irrigation Officers are hereby further authorized and directed:

(a) To make such additional measurements and to take such further and other steps as may be necessary or advisable in order to insure the apportionment of the said waters in accordance with the directions herein set forth.

(b) To operate the irrigation works of either country in such a manner as to facilitate the use by the other country of its share of the said waters and subject hereto to secure to the two countries the greatest beneficial use thereof.

(c) To report to the Commission the measurements made at all international and other gauging stations established pursuant to this order.

IX. In the event of any disagreement in respect to any matter or thing to be done under this order the said Reclamation and Irrigation Officers shall report to the Commission, setting forth fully the points of difference and the facts relating thereto.

X. The said order of the Commission, dated the 6th day of April 1921, is hereby withdrawn, except with respect to the report to be furnished to the Commission thereunder.

Dated at Ottawa, Canada, this 4th day of October, 1921.

O. GARDNER,
C.A. MACGRATH,
C.D. CLARK,
HENRY A. POWELL,
W.H. HEARST,
MARK A. SMITH.

ANNEX B

International System of Units

(SI) Conversions

WRB - USGS

INCH-POUND TO INTERNATIONAL SYSTEM OF UNITS
(SI) CONVERSION

Since 1975, the Report to the International Joint Commission on the Division of the Waters of the St. Mary and Milk rivers has used dual units (SI and inch-pound).

The two inch-pound units that were used in previous reports were cfs-days and acre-feet.

- 1 cfs-day = 86,400 cubic feet
- 1 acre-foot = 43,560 cubic feet
- 1 cfs-day = 1.9835 acre-feet

The SI unit replacing the inch-pound units is the cubic decametre (dam³).

- 1 dam³ = 1 000 cubic metres
- 1 cubic metre = 35.315 cubic feet
- 1 dam³ = 35,315 cubic feet
- 1 acre-foot = 1.2335 dam³
- 1 cfs-day = 2.4466 dam³
- 1 dam³ = 0.8107 acre-feet

ANNEX C

List of Gauging Stations

INTERNATIONAL GAUGING STATIONS OPERATED JOINTLY
BY
THE UNITED STATES AND CANADA
ST. MARY AND MILK RIVER DRAINAGE BASINS
1993

Map Index

Station Name

ST. MARY RIVER BASIN

05AE027	St. Mary River at International Boundary
05AE029	St. Mary Canal at St. Mary Crossing near Babb, Montana
05AE033	Swiftcurrent Creek at Sherburne, Montana
05AE036	Lake Sherburne at Sherburne, Montana

MILK RIVER BASIN

11AA001	North Milk River near International Boundary
11AA005	Milk River at Milk River Alberta
11AA025	Milk River at Western Crossing of International Boundary
11AA031	Milk River at Eastern Crossing of International Boundary
11AA032	N. Fork Milk River above St. Mary Canal near Browning, Montana.
11AA033	South Fork Milk River near Babb, Montana
11AA038	Verdigris Coulee near the Mouth

LODGE CREEK TRIBUTARY BASIN

11AB008	Middle Creek above Lodge Creek
11AB001	Middle Creek below Middle Creek Reservoir
11AB108	Middle Creek near Govenlock
11AB009	Middle Creek near Saskatchewan Boundary
11AB060	Spangler Ditch near Govenlock
11AB080	Middle Creek Reservoir
11AB083	Lodge Creek below McRae Creek at International Boundary
11AB089	Altawan Reservoir near Govenlock

BATTLE CREEK TRIBUTARY BASIN

11AB018	Nashlyn Canal near Consul
11AB027	Battle Creek at International Boundary
11AB044	McKinnon Ditch near Consul
11AB058	Richardson Ditch near Consul
11AB075	Lyons Creek at International Boundary
11AB077	Cypress Lake West Outflow Canal
11AB078	Cypress Lake West Inflow Canal
11AB084	Vidora Ditch near Consul
11AB085	Cypress Lake West Inflow Canal Drain
11AB102	Gaff Ditch near Merryflat

FRENCHMAN RIVER TRIBUTARY BASIN

11AC037	Cypress Lake
11AC041	Frenchman River at International Boundary
11AC052	Eastend Canal near Eastend
11AC054	Newton Lake Main Canal
11AC055	Eastend Reservoir
11AC056	Newton Lake
11AC060	Cypress Lake East Outflow Canal
11AC062	Frenchman River below Newton Lake
11AC063	Huff Lake
11AC064	Belanger Creek Diversion to Cypress Lake
11AC065	Huff Lake Gravity Canal
11AC066	Huff Lake Pumping Canal

GAUGING STATIONS OPERATED INDEPENDENTLY
BY EITHER
THE UNITED STATES OR CANADA
IN THE
ST. MARY AND MILK RIVER DRAINAGE BASINS
1993

* Data of these stations are not included in this report or appendices

Map Index	Station Name	Operated by
<u>ST. MARY RIVER BASIN</u>		
5-0145*	Swiftcurrent Creek at Many Glacier, Montana	U.S.A.
5-0175*	St. Mary River near Babb, Montana	U.S.A.
<u>MILK RIVER BASIN</u>		
11AA028*	Bear Creek near International Boundary	Canada
11AA029*	Miners Coulee near International Boundary	Canada
11AA040*	Breed Creek near International Boundary	Canada
<u>LODGE CREEK TRIBUTARY BASIN</u>		
11AB082*	Lodge Creek at Alberta Boundary	Canada
11AB091	Michel Reservoir near Elkwater	Canada
11AB092	Greasewood Reservoir near Elkwater	Canada
11AB094	Bare Creek Reservoir near Elkwater	Canada
11AB097	Cressday Reservoir near Cressday	Canada
11AB098	Jaydot Reservoir near Jaydot	Canada
11AB099	Mitchell Reservoir near Elkwater	Canada
11AB103	Squaw Coulee near Willow Creek	Canada
11AB104	Massy Reservoir near Elkwater	Canada
11AB114	Middle Creek Reservoir Bedford Outlet	Canada
11AB115	Middle Creek Reservoir Flood Spillway	Canada

BATTLE CREEK TRIBUTARY BASIN

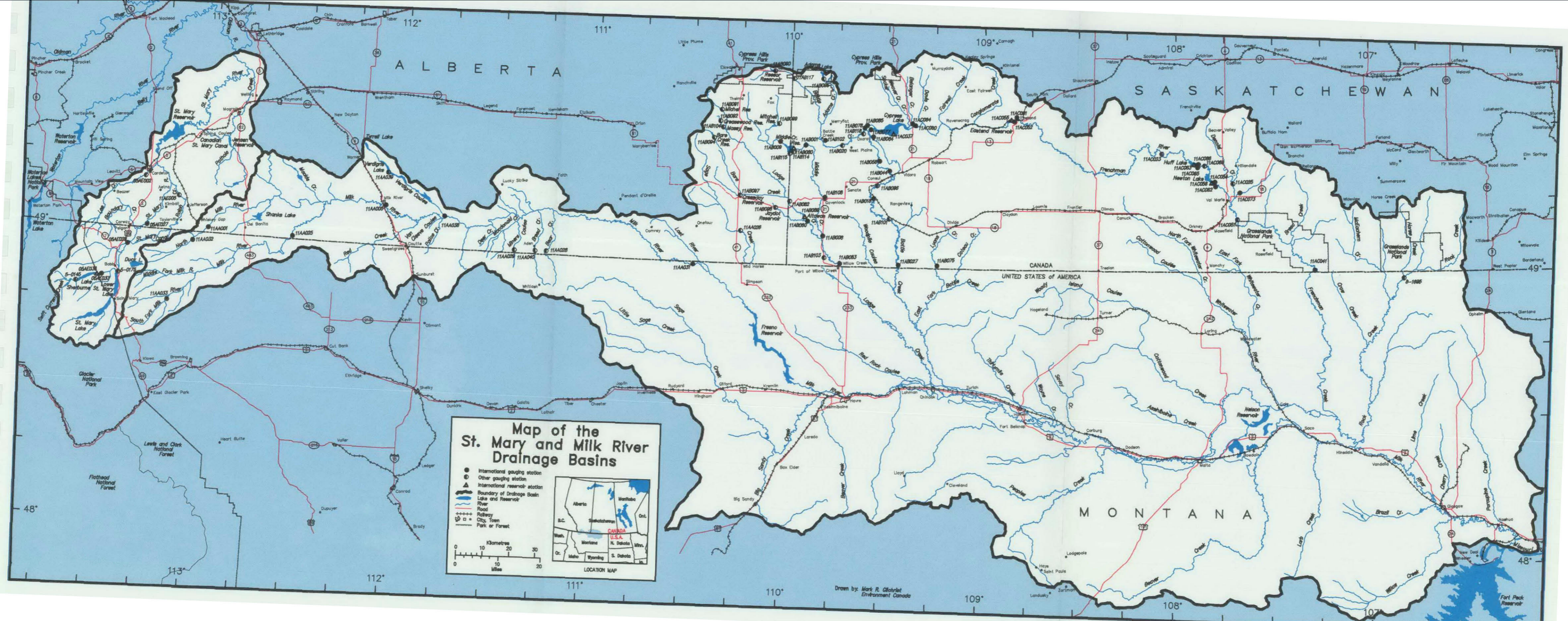
11AB020*	Shepherd Ditch near Consul	Canada
11AB090	Reesor Reservoir near Elkwater	Canada
11AB095*	Adams Lake	Canada
11AB096*	Battle Creek near Consul	Canada
11AB101*	Battle Creek below Nashlyn Project	Canada
11AB117*	Battle Creek at Alberta Boundary	Canada
11AB118*	Battle Creek below Wilson's Weir	Canada

FRENCHMAN RIVER TRIBUTARY BASIN

11AC001*	Frenchman River Below Eastend Reservoir	Canada
11AC025*	Denniel Creek near Val Marie	Canada
11AC068*	Val Marie Pump No. 1	Canada

ROCK CREEK TRIBUTARY BASIN

6-1695*	Rock Creek below Horse Creek near International Boundary	U.S.A.
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Map of the St. Mary and Milk River Drainage Basins

- International gauging station
- Other gauging station
- ▲ International reservoir station
- ▭ Boundary of Drainage Basin
- Lake and Reservoir
- River
- Road
- Railway
- City, Town
- ▭ Park or Forest

0 10 20 30
Kilometres

0 10 20
Miles

LOCATION MAP

The location map shows the drainage basins in the western part of Canada, specifically in Alberta and Saskatchewan, and their proximity to the United States border. It labels the provinces of Alberta, Saskatchewan, and Manitoba, and the states of Montana, Wyoming, Idaho, and Utah. The St. Mary and Milk River basins are highlighted in blue.

Drawn by: Mark R. Gilchrist
Environment Canada

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1993

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

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