Report to

THE INTERNATIONAL JOINT COMMISSION

on

THE DIVISION OF THE WATERS OF

THE ST. MARY AND MILK RIVERS

1999

Cover photo:

Verdigris Coulee near the Mouth, Alberta, March, 1993.
Photo by Norm A.Midtlyng, U.S. Geological Survey, Helena, Montana.

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1999

by

Timothy Goos
representing Canada

and

Robert M. Hirsch
representing the United States

March 2000

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

Commissioners:

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, 1999.

Respectfully submitted,

Robert M. Hirsch
Accredited Officer of the United States

Tim Goos
Accredited Officer of Her Majesty

SYNOPSIS

During the 1999 irrigation season, the natural flows of the St. Mary and Milk Rivers were 98 percent and 55 percent, respectively, of the long-term averages.

The natural flow of the St. Mary River at the International Boundary during the irrigation season, April 1 to October 31, 1999, was 698 000 cubic decametres (dam^3) (566,000 acre-feet). Under the terms of the Boundary Waters Treaty, the Canadian share was 424 000 dam^3 (344,000 acre-feet). The total flow recorded at the International Boundary during the irrigation season was 108 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, 1999, was 76 800 dam^3 (62,300 acre-feet). Under the terms of the Treaty, the United States' allotment was 54 800 dam^3 (44,400 acre-feet). The United States received 131 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 21 percent, 36 percent, and 103 percent, respectively, of the long-term averages.

The annual meeting of the Field Representatives was held in Helena, Montana, on February 9, 2000. Mutual problems, future plans, and changes in computational procedures were discussed and a schedule of field operations for 2000 was adopted.

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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. A copy of the 1921 Order, including Article VI, is 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 36 international gauging stations on a cooperative basis. An additional 30 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 1999 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 adopted 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. Tim Goos, as Accredited Officer of Her Majesty, was represented in the field by Mr. R.G. Boals, Environment Canada, Prairie and Northern Region. Mr. Robert M. Hirsch, United States Geological Survey, as Accredited Officer of the United States, was represented in the field by Mr. R.E. Davis, District Chief, United States Geological Survey, Helena, Montana. This report was

prepared jointly by personnel of Environment Canada, Hydrometric Monitoring Division, and the United States Geological Survey, under the supervision of Messrs. Boals and Davis.

The annual meeting of the Field Representatives was held in Helena, Montana, on February 9, 2000. Mutual problems, future plans, and changes in computational procedures were discussed and a schedule of field operations for 2000 was adopted.

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 percent 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 7 020 dam^3 (5,690 acre-feet) on October 31, 1998 and increased to 27 800 dam^3 (22,500 acre-feet) on April 13, 1999, when releases began. Maximum storage was 83 600 dam^3 (67,800 acre-feet) on July 31, 1999 and storage decreased to 46 300 dam^3 (37,500 acre-feet) by the end of the irrigation season on October 31, 1999.

Water was diverted from the St. Mary River into the Milk River via the St. Mary Canal from April 14 through September 24, 1999. The total flow recorded at the gauging station on the St. Mary Canal at St. Mary Crossing (station 05AE029) was 222 000 dam^3 (180,000 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, 1998 to October 31, 1999 was 759 000 dam^3 (615,000 acre-feet) of which 698 000 dam^3 (566,000 acre-feet) occurred during the irrigation season, April 1 to October 31, 1999. For the irrigation season, Canada's and the United States' shares were 424 000 dam^3 (344,000 acre-feet) and 274 000 dam^3 (222,000 acre-feet), respectively. A total discharge of 456 000 dam^3 (370,000 acre-feet) was recorded at the International Boundary, which was 108 percent of the Canadian share. The computed natural flow during the irrigation season was 98 percent of the average of the previous 96 years of record.

Deficit deliveries were recorded in 3 of the 14 division periods during the 1999 irrigation season. Deficits 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

SUMMARY OF ST. MARY RIVER DIVISION FOR 1999[1]
QUANTITIES IN CUBIC DECAMETRES

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	CANADA'S SHARE	RECEIVED BY CANADA	RECEIVED BY CANADA	
				ABOVE SHARE	BELOW SHARE
APR 1 - APR 15	8 660	6 495	7 107	612	
APR 16 - APR 30	23 108	16 161	15 145		1 016
MAY 1 - MAY 15	33 232	22 726	20 105		2 621
MAY 16 - MAY 31	82 672	47 850	51 203	3 353	
JUNE 1 - JUNE 15	106 070	59 143	64 198	5 055	
JUNE 16 - JUNE 30	128 232	70 226	78 094	7 868	
JULY 1 - JULY 15	88 279	50 249	54 340	4 091	
JULY 16 - JULY 31	70 346	41 688	46 024	4 336	
AUG 1 - AUG 15	47 906	30 062	28 941		1 121
AUG 16 - AUG 31	31 514	22 264	25 273	3 009	
SEP 1 - SEP 15	18 114	13 451	14 531	1 080	
SEP 16 - SEP 30	13 087	9 814	10 941	1 127	
OCT 1 - OCT 15	18 031	12 926	13 410	484	
OCT 16 - OCT 31	28 839	20 560	26 629	6 069	
TOTAL	698 090	423 615	455 941		

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

TABLE 1A

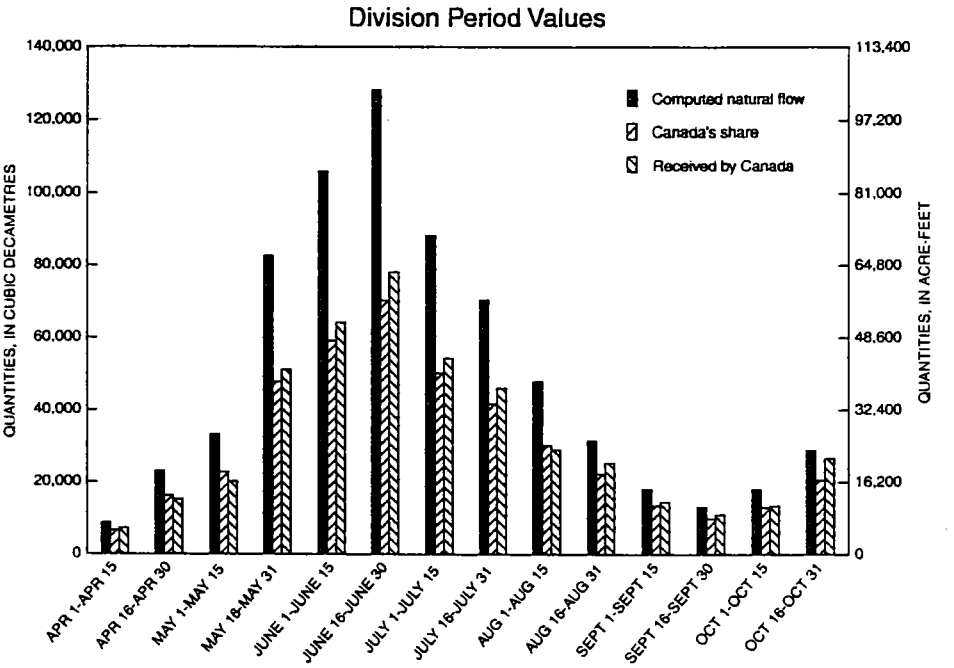
SUMMARY OF ST. MARY RIVER DIVISION FOR 1999[1]

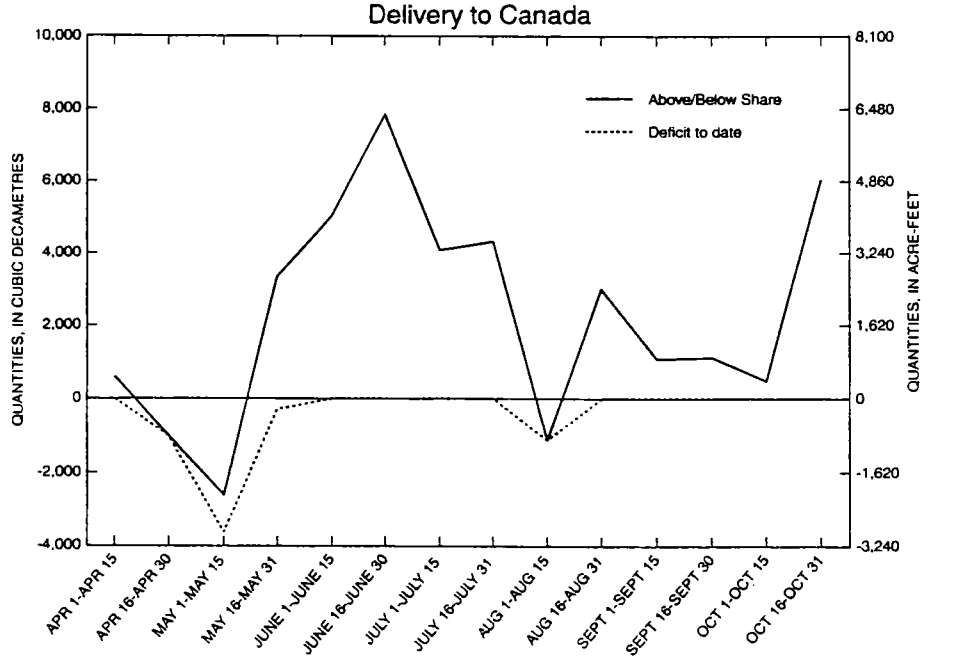
QUANTITIES IN ACRE-FEET

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	CANADA'S SHARE	RECEIVED BY CANADA	RECEIVED BY CANADA	
				ABOVE SHARE	BELOW SHARE
APR 1 - APR 15	7,021	5,266	5,762	496	
APR 16 - APR 30	18,734	13,102	12,278		824
MAY 1 - MAY 15	26,941	18,424	16,299		2,125
MAY 16 - MAY 31	67,022	38,792	41,510	2,718	
JUNE 1 - JUNE 15	85,991	47,947	52,045	4,098	
JUNE 16 - JUNE 30	103,958	56,932	63,311	6,379	
JULY 1 - JULY 15	71,568	40,737	44,054	3,317	
JULY 16 - JULY 31	57,030	33,797	37,312	3,515	
AUG 1 - AUG 15	38,837	24,371	23,463		909
AUG 16 - AUG 31	25,548	18,049	20,489	2,439	
SEP 1 - SEP 15	14,685	10,905	11,780	876	
SEP 16 - SEP 30	10,610	7,956	8,870	914	
OCT 1 - OCT 15	14,618	10,479	10,872	392	
OCT 16 - OCT 31	23,380	16,668	21,588	4,920	
TOTAL	565,942	343,425	369,632		

[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, 1999





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 metres 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 1970's, 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 1999, the United States' and Canada's respective estimated consumptive uses were 5 050 dam^3 (4,090 acre-feet) and 5 160 dam^3 (4,180 acre-feet). An interbasin transfer of 177 dam^3 (143 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, 1999 was 76 800 dam^3 (62,300 acre-feet). This flow was 55 percent of the average computed natural flow of the previous 87 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 54 800 dam^3 (44,400 acre-feet) and 22 000 dam^3 (17,800 acre-feet). The United States received 131 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.

Deficit deliveries were recorded in 3 of the 16 division periods during the season. All deficits were refunded by September 15.

The division of Milk River natural flow is summarized in Table 2 and 2A and Figure 2, which follow. The detailed computation of the natural flow is given in Table 8 and the historical summary is given in Table 9 of Appendix A.

An error was found in the April 1998 natural flow computations this year during quality assurance testing of a new natural flow computation computer program. The April computed natural flows were significantly higher because the values reported were actual flows instead of computed natural flows. The error resulted from the presence and usage of a developmental version of the MilkNat program on the computer system. The developmental version was removed from the computer system and the natural flow computations were recomputed using the correct program.

The revised computed natural flow of the Milk River at the Eastern Crossing of the International Boundary from March 1 to October 31, 1998 was 86 700 dam^3 (72,700 acre-feet). This flow was 53 percent of the average computed natural flow of the previous 86 years of record. The respective shares of the United States and Canada were 59 800 dam^3 (48,500 acre-feet) and 27 000 dam^3 (21,900 acre-feet). The United States received 130 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 revised 1998 division of Milk River natural flow is summarized in Table 2R and Table 2AR and Figure 3R which follow on pages 13-15. A revised copy of the April 1998 natural flow computations is shown on page 39 of Appendix A.

TABLE 2

SUMMARY OF MILK RIVER DIVISION FOR 1999[1]
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	3 953	1 977	3 955	1 978	
MAR 16 - MAR 31	6 234	3 118	6 236	3 118	
APR 1 - APR 15	3 735	2 798	3 729	931	
APR 16 - APR 30	4 406	3 302	4 403	1 101	
MAY 1 - MAY 15	7 768	5 825	7 778	1 953	
MAY 16 - MAY 31	8 871	6 653	7 893	1 240	
JUNE 1 - JUNE 15	14 564	10 680	13 749	3 069	
JUNE 16 - JUNE 30	8 139	6 106	7 779	1 673	
JULY 1 - JULY 15	2 344	1 758	1 683		75
JULY 16 - JULY 31	2 772	2 079	2 066		13
AUG 1 - AUG 15	2 161	1 622	1 630	8	
AUG 16 - AUG 31	1 115	835	541		294
SEP 1 - SEP 15	2 997	2 245	2 629	384	
SEP 16 - SEP 30	3 118	2 338	3 117	779	
OCT 1 - OCT 15	2 806	2 102	2 803	701	
OCT 16 - OCT 31	1 826	1 367	1 821	454	
TOTAL	76 809	54 805	71 812		

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

TABLE 2A

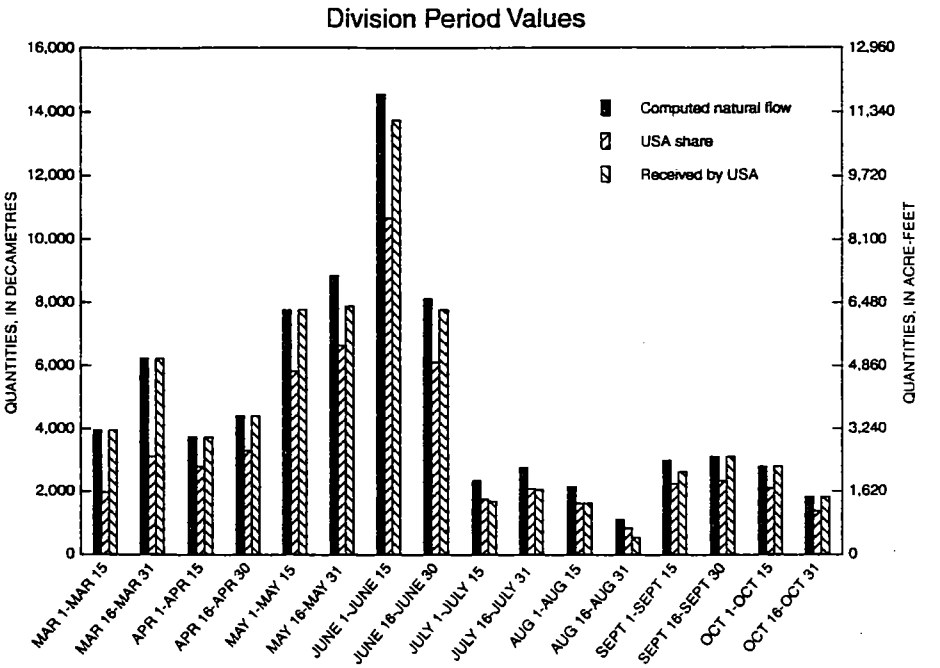
SUMMARY OF MILK RIVER DIVISION FOR 1999[1]
QUANTITIES IN ACRE-FEET

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	3,205	1,603	3,206	1,604	
MAR 16 - MAR 31	5,054	2,528	5,056	2,528	
APR 1 - APR 15	3,028	2,268	3,023	755	
APR 16 - APR 30	3,572	2,677	3,570	893	
MAY 1 - MAY 15	6,298	4,722	6,306	1,583	
MAY 16 - MAY 31	7,192	5,394	6,399	1,005	
JUNE 1 - JUNE 15	11 807	8,658	11,146	2,488	
JUNE 16 - JUNE 30	6,598	4,950	6,306	1,356	
JULY 1 - JULY 15	1,900	1,425	1,364		61
JULY 16 - JULY 31	2,247	1,685	1,675		11
AUG 1 - AUG 15	1,752	1,315	1,321	6	
AUG 16 - AUG 31	904	677	439		238
SEP 1 - SEP 15	2,430	1,820	2,131	311	
SEP 16 - SEP 30	2,528	1,895	2,527	632	
OCT 1 - OCT 15	2,275	1,704	2,272	568	
OCT 16 - OCT 31	1,480	1,108	1,476	368	
TOTAL	62,269	44,430	58,218		

[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, 1999



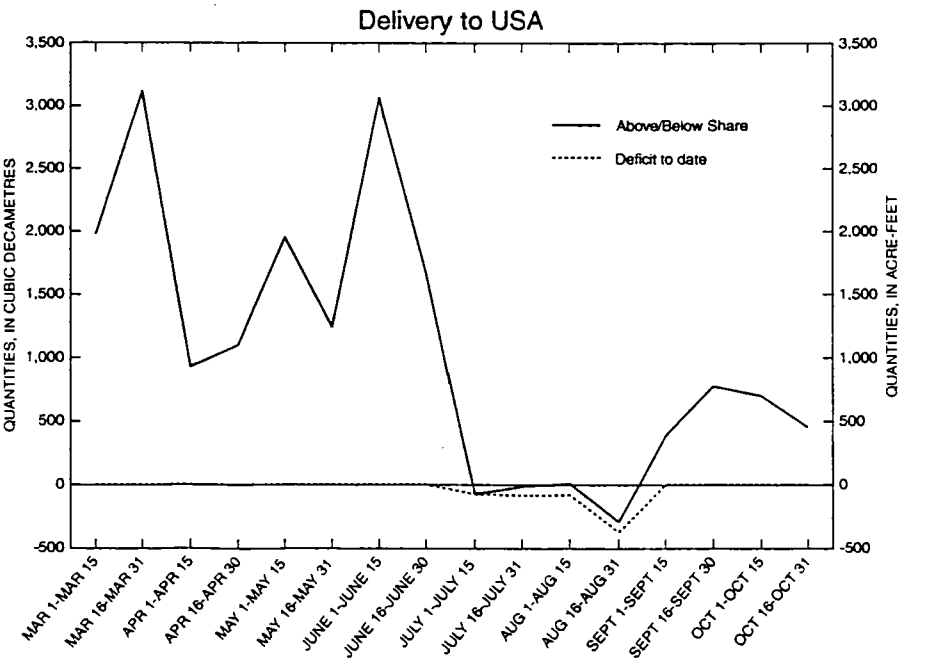


TABLE 2R

REVISED SUMMARY OF MILK RIVER DIVISION FOR 1998
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	3 031	1 519	3 038	1 519	
MAR 16 - MAR 31	2 865	1 433	2 866	1 433	
APR 1 - APR 15	6 707	5 029	6 721	1 692	
APR 16 - APR 30	8 065	6 046	8 062	2 016	
MAY 1 - MAY 15	2 045	1 531	2 039	508	
MAY 16 - MAY 31	5 203	3 902	4 222	320	
JUNE 1 - JUNE 15	6 896	5 171	5 937	766	
JUNE 16 - JUNE 30	11 058	7 991	10 737	2 746	
JULY 1 - JULY 15	18 417	13 249	17 847	4 598	
JULY 16 - JULY 31	1 797	1 346	1 095		251
AUG 1 - AUG 15	1 545	1 157	998		159
AUG 16 - AUG 31	653	491	72		419
SEP 1 - SEP 15	794	595	430		165
SEP 16 - SEP 30	762	570	788	218	
OCT 1 - OCT 15	2 211	1 659	2 260	601	
OCT 16 - OCT 31	2 977	2 232	3 012	780	
TOTAL	75 026	53 921	70 124		

TABLE 2AR

REVISED SUMMARY OF MILK RIVER DIVISION FOR 1998[1]

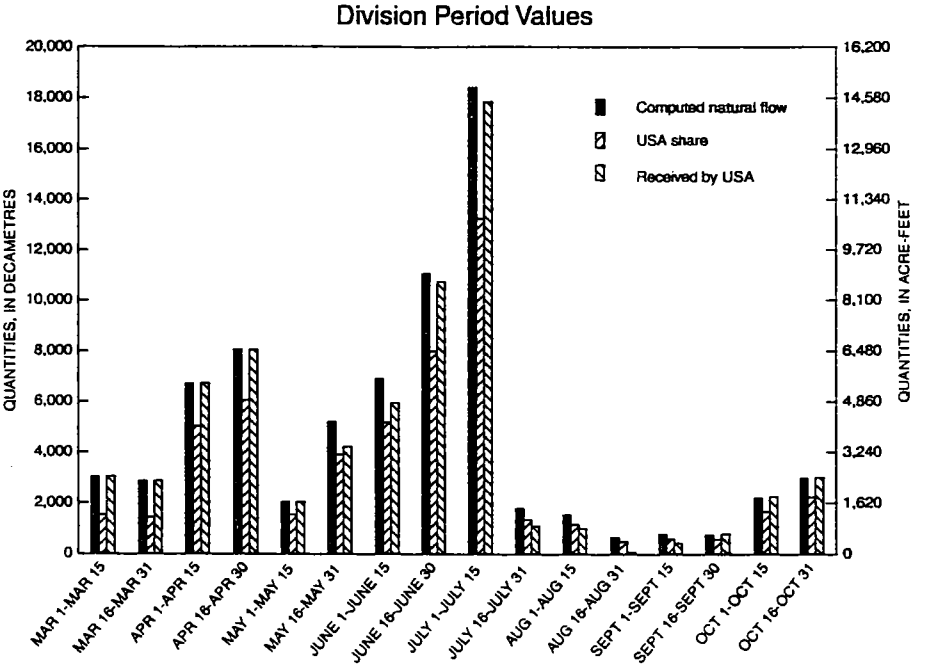
QUANTITIES IN ACRE-FEET

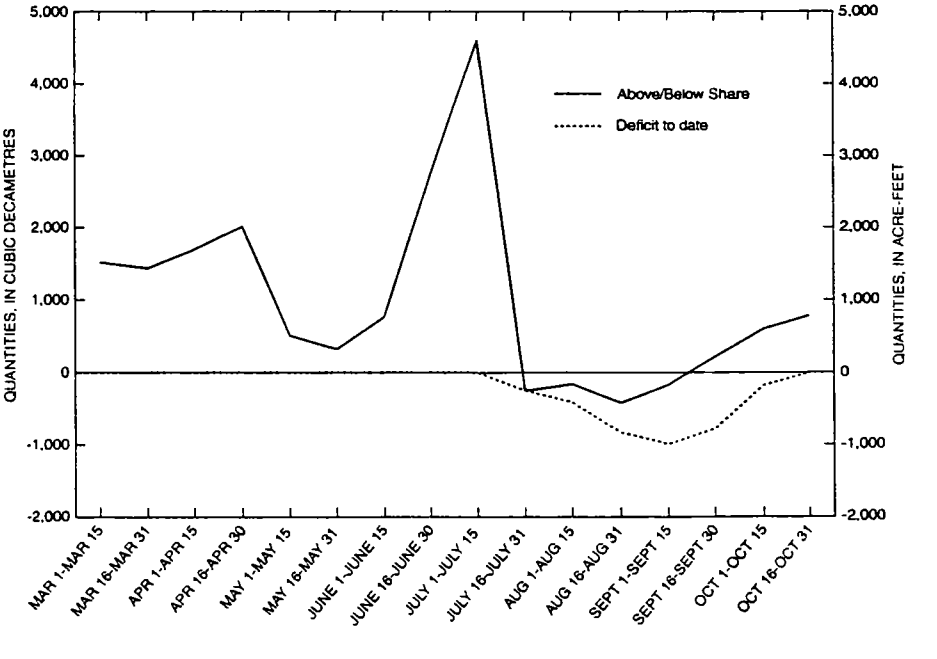
DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	2,457	1,231	2,463	1,231	
MAR 16 - MAR 31	2,323	1,162	2,323	1,162	
APR 1 - APR 15	5,437	4,077	5,449	1,372	
APR 16 - APR 30	6,538	4,901	6,536	1,634	
MAY 1 - MAY 15	1,658	1,241	1,653	412	
MAY 16 - MAY 31	4,218	3,163	3,423	259	
JUNE 1 - JUNE 15	5,591	4,192	4,813	621	
JUNE 16 - JUNE 30	8,965	6,478	8,704	2,226	
JULY 1 - JULY 15	14,931	10,741	14,469	3,728	
JULY 16 - JULY 31	1,457	1,091	888		203
AUG 1 - AUG 15	1,253	938	809		129
AUG 16 - AUG 31	529	398	58		340
SEP 1 - SEP 15	644	482	349		134
SEP 16 - SEP 30	618	462	639	177	
OCT 1 - OCT 15	1,792	1,345	1,832	487	
OCT 16 - OCT 31	2,413	1,809	2,442	632	
TOTAL	60,824	43,714	56,850		

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

FIGURE 2R

REVISED MILK RIVER DIVISION, 1998





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 discussion 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-water 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 final report was forwarded to the International Joint Commission in May 1994. At its Executive session on September 21, 1994, the Commission agreed that the task force should be terminated as recommended. The Commission also agreed not to act at that time on the three recommendations related to the adjudication process, but requested that the Accredited Officers continue to monitor the situation and report annually, or more frequently if appropriate, on such matters as complaints by Canadian ranchers and changes in the status of basin adjudication.

Communication with officials from Alberta Environment and the Montana Department of Natural Resources and Conservation in January 2000 indicated no Canadian complaints or changes in the Montana adjudication process in 1999.

Flows for March through October 1999 for the southern tributaries were as follows:

- Bear Creek near International Boundary - 666 dam^3 (540 acre-feet).
- Miners Coulee near International Boundary - 139 dam^3 (113 acre-feet)

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 ten days. In 1994 the time frame was increased to twice monthly to reduce lag-time anomalies, reduce costs, and conform to St. Mary and Milk Rivers computation periods.

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 1930's, the Government of Canada constructed three dams on the Frenchman River creating Eastend Reservoir (station 11AC055), Huff Lake (11AC063), and Newton Lake (station 11AC056) and necessitated an operational division of flow on this tributary 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 1950's 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 the flow on this tributary necessary by 1957. In 1960, construction of Altawan reservoir (station 11AB089) and Spangler Irrigation Project (station 11AB060) on Lodge Creek made an operational division of flow on this tributary necessary by 1961.

During the period March 1 to October 31, twice-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. Additional computations may be made to account for significant usages before October 31. Generally, no division of flow is made during winter as flow and use are low and streamflow records are impractical to obtain.

Lyons Creek is monitored by Canada, but does not have sufficient use in Canada at this time to warrant an operational division of flow. A total flow of 186 dam^3 (151 acre-feet) was recorded on Lyons Creek in 1999.

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 Environmental Protection. 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.

For Interim reports prepared at the end of each division period, estimates of minor diversions were made based on 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 Environmental Protection and the Saskatchewan Water Corporation. Consequently, some discrepancy exists between interim and the final division computations. Lists of reported diversions are contained in Appendix B.

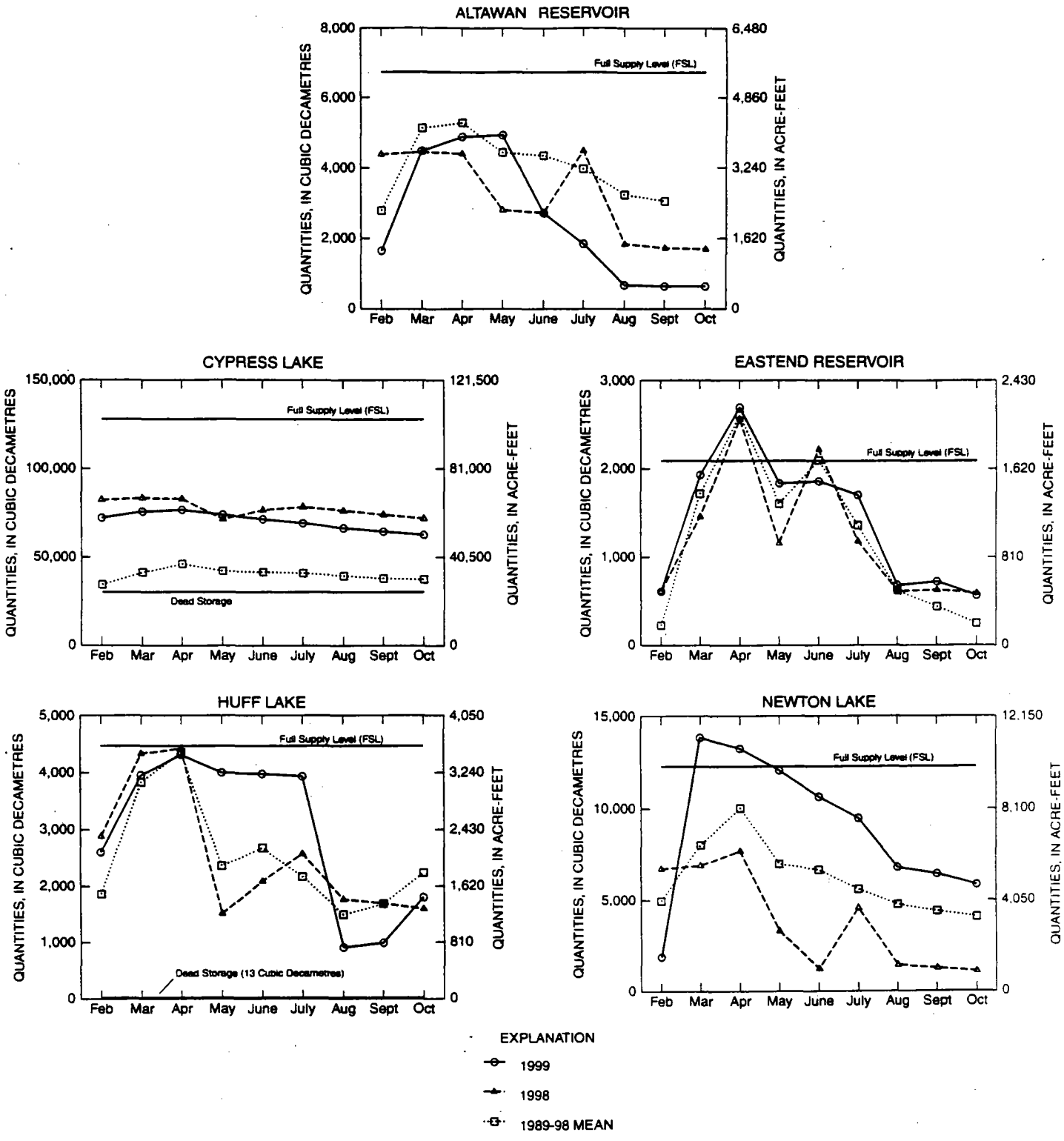
Below average runoff and normal water use by local irrigators occurred in 1999. A rainstorm in early June reduced the stress on the water resource for a short period of time but generally dry conditions prevailed for the remainder of the summer. Month-end reservoir contents for most of the reservoirs in Lodge Creek, Battle Creek, and Frenchman River basins were average to the end of July and below average for the remainder of the year. Year-end levels for Altawan and Eastend reservoirs were well below average. Cypress Lake, however, remained average throughout the year as a result of the previous year's inflow.

On the Frenchman River system, construction to increase the holding capacity of Eastend Reservoir was completed.

At the end of February, the combined usable storage of Altawan Reservoir, Cypress Lake, Eastend Reservoir, Huff Lake, and Newton Lake was 48 900 dam^3 (39,600 acre-feet), or 40 percent of the total usable storage of 124 000 dam^3 (101,000 acre-feet). By the end of April, runoff had increased the combined storage to the yearly maximum of 71 800 dam^3 (58,200 acre-feet), or 58 percent of the total usable storage. By the end of October, irrigation usage, evaporation, and releases from the reservoirs depleted the combined usable storage to 41 500 dam^3 (33,600 acre-feet) or 34 percent of the total usable 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, 1998, 1999, AND 1989-98 MEAN



LODGE CREEK

The computed natural flow of Lodge Creek at the International Boundary from March 1 to October 31, 1999, was 6 910 dam^3 (5,600 acre-feet). This volume is 21 percent of the average natural flow of the previous 49 years of record. Each country is entitled to 50 percent of the natural flow -- 3 460 dam^3 (2,810 acre-feet). A total flow of 3 720 dam^3 (3,020 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 6 of the 16 division periods during the season. By the end of May the accumulated deficit was 2 450 dam^3 (1,990 acre-feet) due to irrigation usage. This deficit was refunded by the end of July through releases from Altawan Reservoir.

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 1999[1]
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	3	2	0		2
MAR 16 - MAR 31	4 262	2 131	312		1 819
APR 1 - APR 15	342	171	28		143
APR 16 - APR 30	195	97	2		95
MAY 1 - MAY 15	318	159	13		146
MAY 16 - MAY 31	527	264	15		249
JUNE 1 - JUNE 15	1 043	521	1 129	608	
JUNE 16 - JUNE 30	192	96	1 116	1 020	
JULY 1 - JULY 15	32	16	683	667	
JULY 16 - JULY 31	0	0	414	414	
AUG 1 - AUG 15	0	0	4	4	
AUG 16 - AUG 31	0	0	0	0	
SEP 1 - SEP 15	0	0	0	0	
SEP 16 - SEP 30	0	0	0	0	
OCT 1 - OCT 15	0	0	0	0	
OCT 16 - OCT 31	0	0	0	0	
TOTAL	6 914	3 457	3 716		

[1]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.

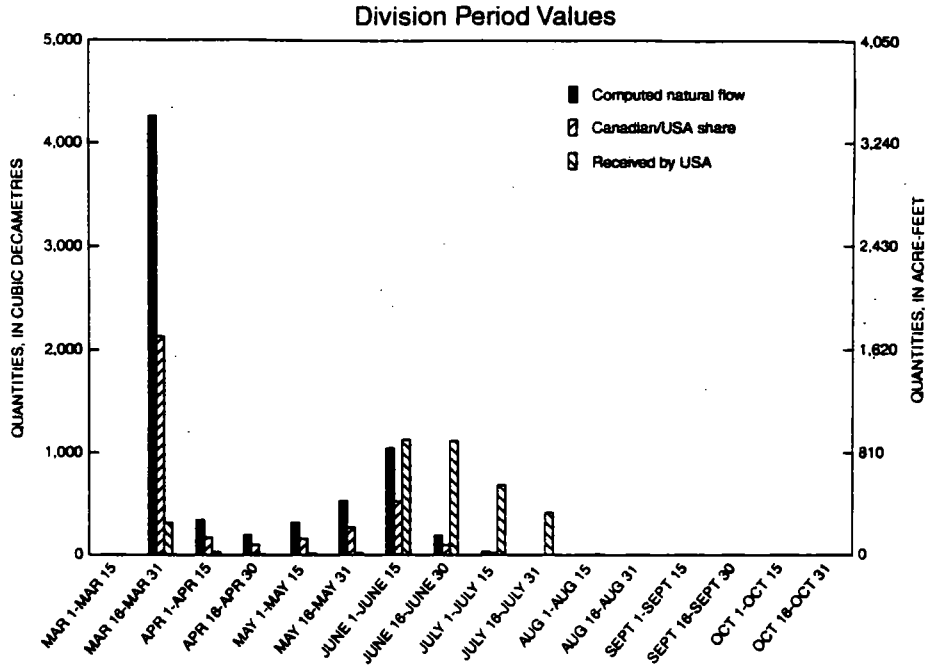
TABLE 3A

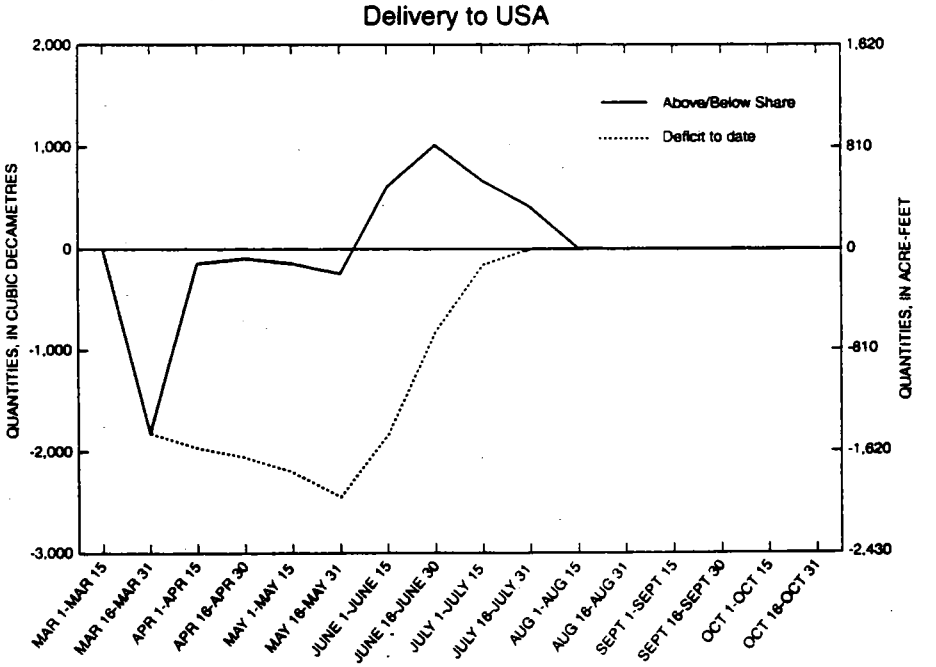
SUMMARY OF LODGE CREEK DIVISION FOR 1999[1]
QUANTITIES IN ACRE-FEET

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	2	2	0		2
MAR 16 - MAR 31	3,455	1,728	253		1475
APR 1 - APR 15	277	139	23		116
APR 16 - APR 30	158	79	2		77
MAY 1 - MAY 15	258	129	11		118
MAY 16 - MAY 31	427	214	12		202
JUNE 1 - JUNE 15	846	422	915	493	
JUNE 16 - JUNE 30	156	78	905	827	
JULY 1 - JULY 15	26	13	554	541	
JULY 16 - JULY 31	0	0	336	336	
AUG 1 - AUG 15	0	0	3	3	
AUG 16 - AUG 31	0	0	0	0	
SEP 1 - SEP 15	0	0	0	0	
SEP 16 - SEP 30	0	0	0	0	
OCT 1 - OCT 15	0	0	0	0	
OCT 16 - OCT 31	0	0	0	0	
TOTAL	5,605	2,803	3,013		

[1]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, 1999





BATTLE CREEK

The computed natural flow of Battle Creek at the International Boundary from March 1 to October 31, 1999, was 11 400 dam^3 (9,240 acre-feet). This volume is 36 percent of the average natural flow of the previous 59 years of record. Each country is entitled to 50 percent of the natural flow -- 5 700 dam^3 (4,620 acre-feet). A total flow of 6 890 dam^3 (5,590 acre-feet) was recorded at Battle Creek at International Boundary (station 11AB027) from March 1 to October 31.

Deficit deliveries were recorded in 4 of the 16 division periods during the season. A deficit of 2 380 dam^3 (1,930 acre-feet) had accumulated by the end of May due to irrigation usage in Canada. Release to refund the deficit from Cypress Lake began in late May and by the first of July the deficit had been refunded. No deficits occurred during the remainder of the irrigation season.

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 1999[1]
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	1 533	767	1 442	675	
MAR 26 - APR 9	2 144	1 072	301		771
APR 10 - APR 24	1 142	571	114		457
APR 25 - MAY 9	1 298	649	283		366
MAY 10 - MAY 25	1 807	903	118		785
MAY 26 - JUN 9	229	114	1 775	1 661	
JUNE 10 - JUNE 24	1 092	546	795	249	
JUNE 25 - JULY 9	635	317	572	255	
JULY 10 - JULY 25	486	243	485	242	
JULY 26 - AUG 9	198	99	197	98	
AUG 10 - AUG 25	138	69	137	68	
AUG 26 - SEP 9	75	37	74	37	
SEP 10 - SEP 24	64	32	64	32	
SEP 25 - OCT 9	93	47	93	46	
OCT 10 - OCT 25	303	152	303	151	
OCT 26 - OCT 31	141	71	141	70	
TOTAL	11 377	5 689	6 893		

[1]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.

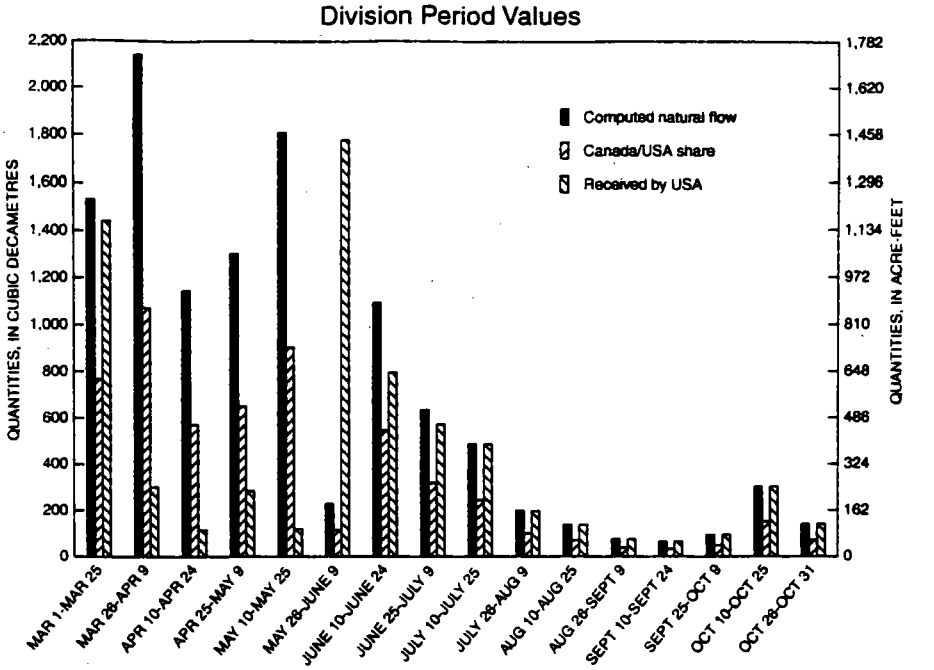
TABLE 4A

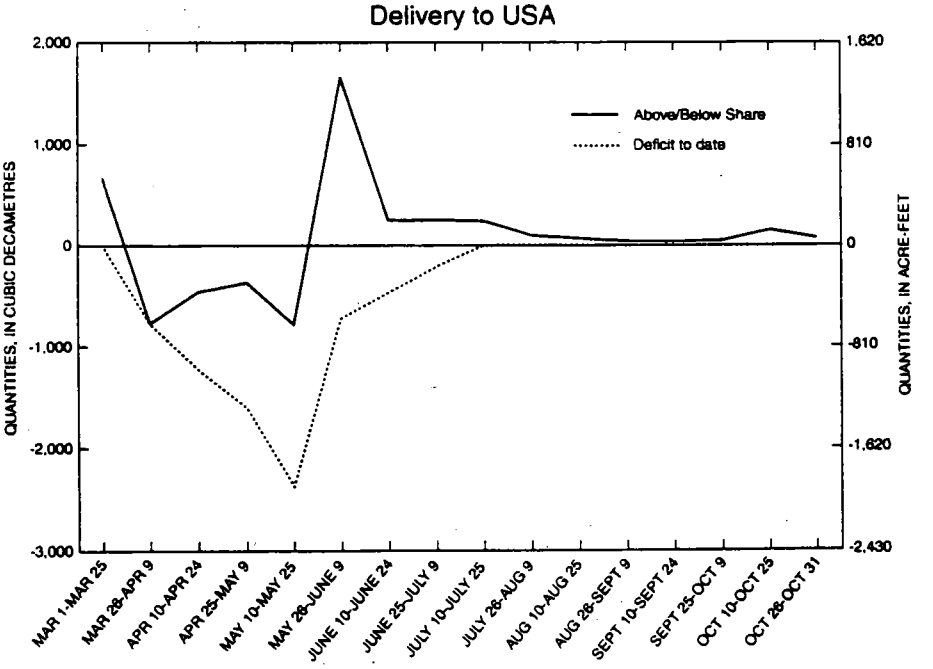
SUMMARY OF BATTLE CREEK DIVISION FOR 1999[1]
QUANTITIES IN ACRE-FEET

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	1,243	622	1,169	547	
MAR 26 - APR 9	1,738	869	244		625
APR 10 - APR 24	926	463	92		370
APR 25 - MAY 9	1,052	526	229		297
MAY 10 - MAY 25	1,465	732	96		636
MAY 26 - JUN 9	186	92	1,439	1,347	
JUNE 10 - JUNE 24	885	443	645	202	
JUNE 25 - JULY 9	515	257	464	207	
JULY 10 - JULY 25	394	197	393	196	
JULY 26 - AUG 9	161	80	160	79	
AUG 10 - AUG 25	112	56	111	55	
AUG 26 - SEP 9	61	30	60	30	
SEP 10 - SEP 24	52	26	52	26	
SEP 25 - OCT 9	75	38	75	37	
OCT 10 - OCT 25	246	123	246	122	
OCT 26 - OCT 31	114	58	114	57	
TOTAL	9,223	4,612	5,588		

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

FIGURE 5
BATTLE CREEK DIVISION, 1999





FRENCHMAN RIVER

The computed natural flow of the Frenchman River at the International Boundary from March 1 to October 31, 1999, was 83 600 dam^3 (67,800 acre-feet). This volume is 103 percent of the average natural flow of the previous 59 years of record. Each country is entitled to 50 percent of the natural flow -- 41 800 dam^3 (33,900 acre-feet). A total flow of 59 300 dam^3 (48,100 acre-feet) was recorded at Frenchman River at International Boundary (station 11AC041) from March 1 to October 31.

Deficit deliveries were recorded in 6 of the 15 division periods during the season. A deficit of 1 387 dam^3 (1,124 acre-feet) had accumulated by the end of April due to storage of spring runoff in Cypress Lake. The total volume of this deficit was refunded by the end of the next division period on May 15. Other minor deficits were also recorded in July and October, which were refunded in a timely manner.

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 1999[1]
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	1 398	699	581		118
MAR 16 - MAR 31	49 526	24 763	39 621	14 858	
APR 1 - APR 15	8 377	4 189	4 713	524	
APR 16 - APR 30	4 057	2 028	641		1 387
MAY 1 - MAY 15	5 824	2 912	4 694	1 782	
MAY 16 - MAY 31	6 632	3 316	4 116	800	
JUNE 1 - JUNE 15	2 524	1 262	1 473	211	
JUNE 16 - JUNE 30	1 946	973	809		164
JULY 1 - JULY 15	575	287	169		118
JULY 16 - JULY 31	1 658	829	1 207	378	
AUG 1 - AUG 15	183	92	672	580	
AUG 16 - AUG 31	418	209	287	78	
SEP 1 - SEP 15	61	31	18		13
SEP 16 - SEP 30	6	3	6	3	
OCT 1 - OCT 15	92	46	2		44
OCT 16 - OCT 31	286	143	253	110	
TOTAL	83 563	41 782	59 262		

[1]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.

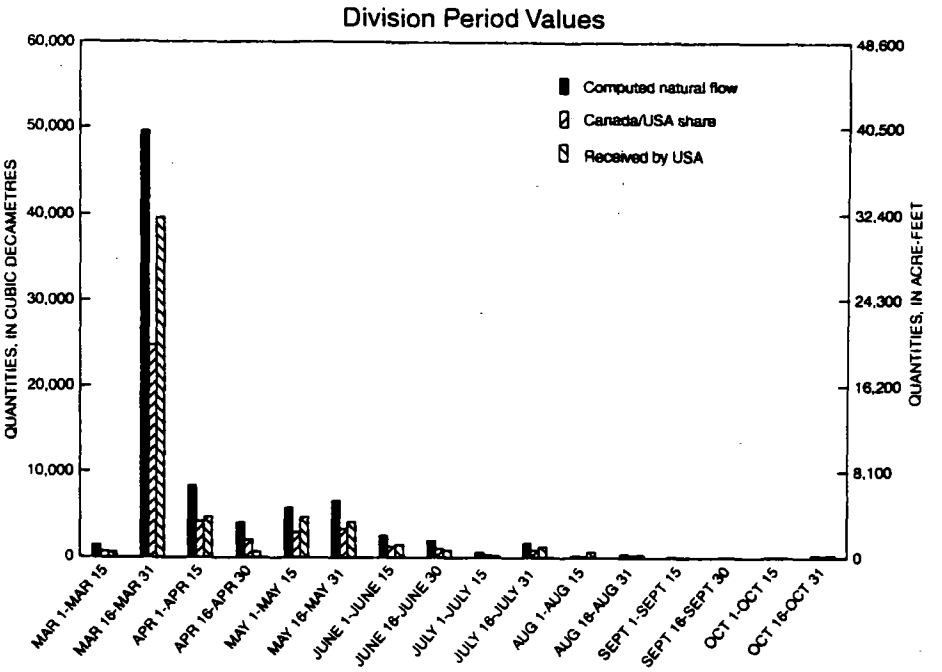
TABLE 5A

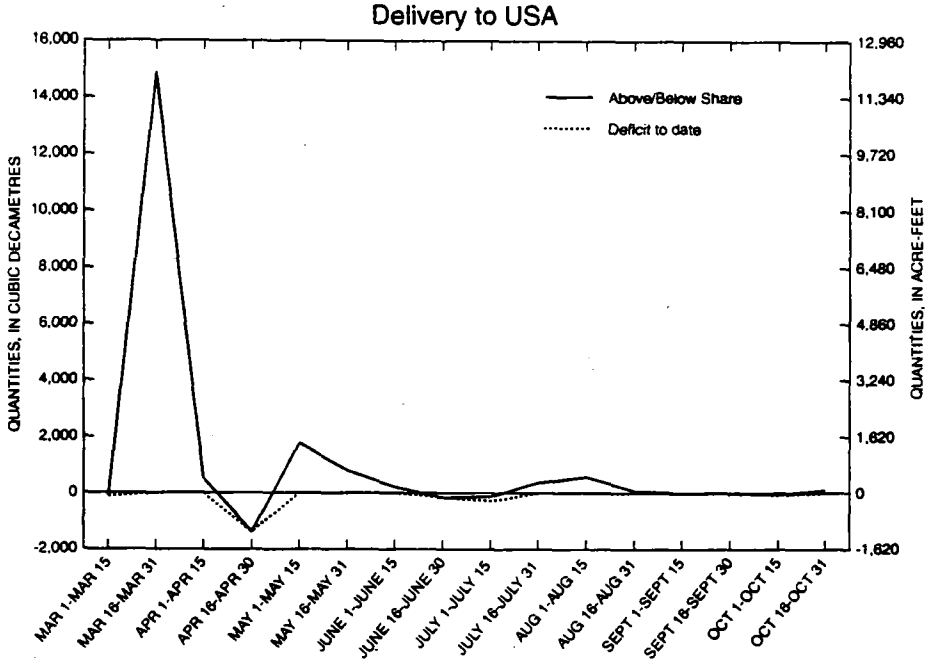
SUMMARY OF FRENCHMAN RIVER DIVISION FOR 1999[1]
QUANTITIES IN ACRE-FEET

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	1,133	567	471		96
MAR 16 - MAR 31	40,151	20,075	32,121	12,045	
APR 1 - APR 15	6,791	3,396	3,821	425	
APR 16 - APR 30	3,289	1,644	520		1,124
MAY 1 - MAY 15	4,722	2,361	3,805	1,445	
MAY 16 - MAY 31	5,377	2,688	3,337	649	
JUNE 1 - JUNE 15	2,046	1,023	1,194	171	
JUNE 16 - JUNE 30	1,578	789	656		133
JULY 1 - JULY 15	466	233	137		96
JULY 16 - JULY 31	1,344	672	979	306	
AUG 1 - AUG 15	148	75	545	470	
AUG 16 - AUG 31	339	169	233	63	
SEP 1 - SEP 15	49	25	15		11
SEP 16 - SEP 30	5	2	5	2	
OCT 1 - OCT 15	75	37	2		36
OCT 16 - OCT 31	232	116	205	89	
TOTAL	67,745	33,872	48,044		

[1]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, 1999





ANNEX A

1921 ORDER OF THE INTERNATIONAL JOINT COMMISSION RESPECTING THE ST. MARY-MILK RIVERS

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 of Great Britain and Ireland and of the British Dominions beyond the Seas, Emperor of India, signed at Washington on the 11th of January 1909, it is provided as follows:

> 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.

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 a 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. MAGRATH,
C.D. CLARK,
HENRY A. POWELL,
W.H. HEARST,
MARK A. SMITH.

ANNEX B

Conversion Factors

FACTORS FOR CONVERSION BETWEEN INCH-POUND UNITS AND INTERNATIONAL SYSTEM (SI) UNITS

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 (dam^3).

1 dam^3 = 1 000 cubic metres

1 cubic metre = 35.315 cubic feet

1 dam^3 = 35,315 cubic feet

1 acre-foot = 1.2335 dam^3

1 cfs-day = 2.4466 dam^3

1 dam^3 = 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 BASINS 1999

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
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
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
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
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
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 ST. MARY AND MILK RIVER BASINS 1999

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

Map Index	Station Name	Operated by
	ST. MARY RIVER BASIN	
5-0145*	Swiftcurrent Creek at Many Glacier, Montana	U.S.A.
5-0160*	Swiftcurrent Creek at Sherburne, Montana	U.S.A.
5-0175*	St. Mary River near Babb, Montana	U.S.A.
	MILK RIVER BASIN	
6-1322*	South Fork Milk River near Babb, Montana	U.S.A.
11AA028*	Bear Creek near International Boundary	Canada
11AA029*	Miners Coulee near International Boundary	Canada
	LODGE CREEK TRIBUTARY BASIN	
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

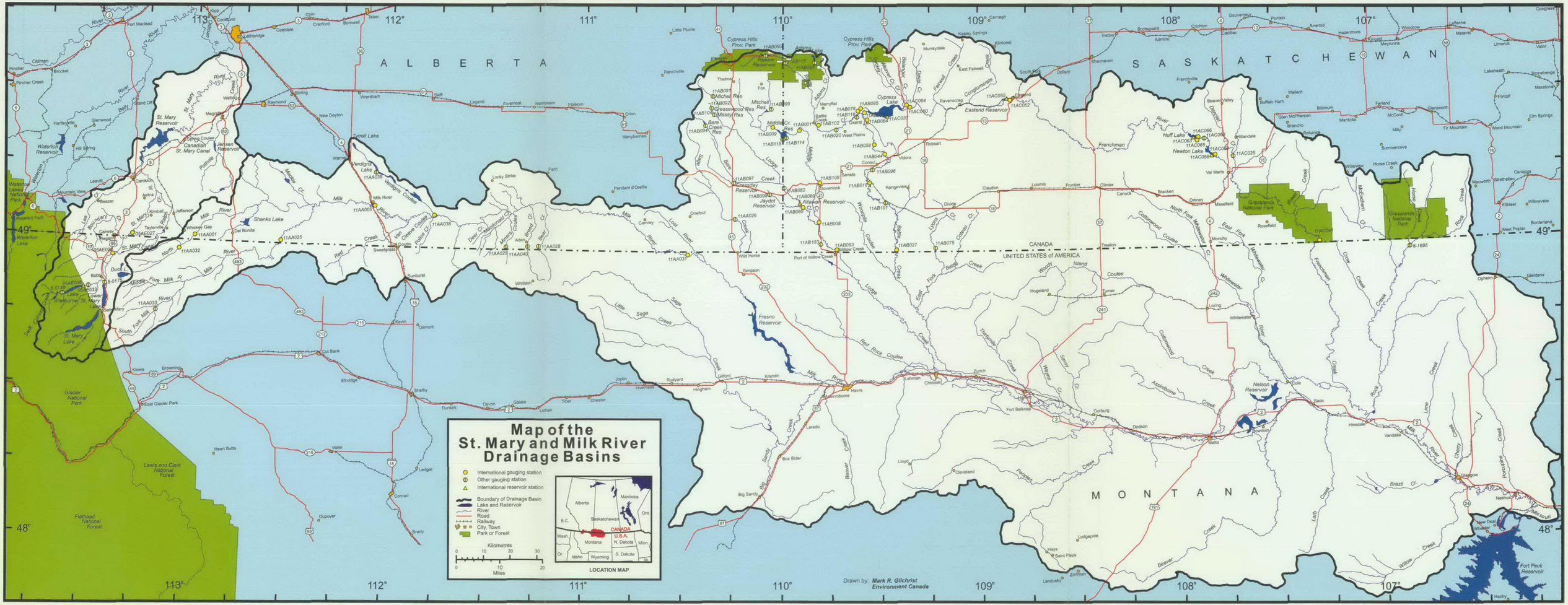
11AB020*	Shepherd Ditch near Consul	Canada
11AB075	Lyons Creek at International Boundary	Canada
11AB090	Reesor Reservoir near Elkwater	Canada
11AB095*	Adams Lake	Canada
11AB096*	Battle Creek near Consul	Canada
11AB101*	Battle Creek below Nashlyn Project	Canada
11AB117*	Battle Creek at Alberta Boundary	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
11AC062*	Frenchman River below Newton Lake	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.


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
Kilometres
0 10 20 30
Miles
0 10 20
LOCATION MAP
Alberta
Saskatchewan
Manitoba
B.C.
Ont.
CANADA
U.S.A.
Montana
N. Dakota
Minn.
Wash.
Idaho
Wyoming
S. Dakota
Or.
Drawn by: Mark R. Gilchrist
Environment Canada
ALBERTA
SASKATCHEWAN
MONTANA
CANADA
UNITED STATES of AMERICA
49°
48°
113°
112°
111°
110°
109°
108°
107°

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1999

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