

Report to

THE INTERNATIONAL JOINT COMMISSION

On

THE DIVISION OF THE WATERS OF

THE ST. MARY AND MILK RIVERS

2002



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Cover Photo:

Mt. Gould in the Headwaters of the St. Mary River Basin, Montana, U.S.A. May, 2002.
Photo by Don Bischoff, United States Geological Survey, Helena, Montana.

REPORT TO
THE INTERNATIONAL JOINT COMMISSION
ON
THE DIVISION OF THE WATERS OF
THE ST. MARY AND MILK RIVERS
FOR THE YEAR 2002

SUBMITTED BY

TIMOTHY GOOS

REPRESENTING CANADA

AND

WILLIAM J. CARSWELL, JR.

REPRESENTING THE UNITED STATES

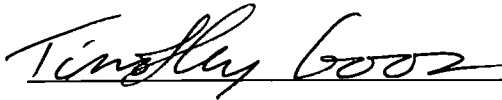
March 2003

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

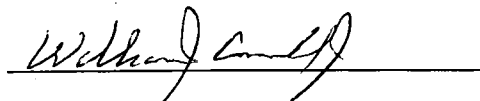
Commissioners:

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, 2002.

Respectfully submitted,

A handwritten signature in cursive script, reading "Timothy Goos", written over a horizontal line.

Timothy Goos
Accredited Officer of Her Majesty

A handwritten signature in cursive script, reading "William J. Carswell, Jr.", written over a horizontal line.

William J. Carswell, Jr., for the
Accredited Officer of the United States

SYNOPSIS

During the 2002 irrigation season the natural flows of the St. Mary and Milk Rivers were 138 percent and 171 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, 2002, was 981 000 cubic decametres (dam^3) (795,000 acre-feet). Under the terms of the Boundary Waters Treaty, the Canadian share was 562 000 dam^3 (456,000 acre-feet). The total flow recorded at the International Boundary during the irrigation season was 145 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, 2002, was 235 000 dam^3 (190,500 acre-feet). Under terms of the Treaty, the United States' allotment was 146 000 dam^3 (118,000 acre-feet). The United States received 159 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 were 41 percent of the individual long-term average for the Lodge Creek, 77 percent for the Battle Creek, and 75 percent for the Frenchman River.

The annual meeting of the Field Representatives was held in Helena, Montana, on February 14, 2003. Mutual problems, future plans, and changes in computational procedures were discussed and a schedule of field operations for 2003 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 year 2002 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 C.

Mr. Timothy 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. In February 2002, Mr. Hirsch designated Mr. William J. Carswell, Jr., United States Geological Survey, as his alternate as Accredited Officer of the United States. 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 14, 2003. Mutual concerns, future plans, and changes in computational procedures were discussed and a schedule of field operations for 2003 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 8 340 dam³ (6,760 acre-feet) on October 31, 2001. Storage increased to 28 100 dam³ (22,800 acre-feet) on March 23, 2002, when the 2002 irrigation season releases began. Maximum storage was 82 850 dam³ (67,200 acre-feet) on July 28, 2002 and storage decreased to 7 750 dam³ (6,280 acre-feet) by the end of the irrigation season on October 31, 2002. The minimum storage occurred on October 15, 2002 when the contents of Lake Sherburne lowered to 4 880 dam³ (3,960 acre-feet).

Water was diverted from the St. Mary River into the Milk River via the St. Mary Canal from March 23 through June 22, 2002 and again from July 25 through October 17, 2002. The canal was closed for the month, June 23 to July 24, 2002, for repairs required after damage caused by a high water event of June 10-13, 2002. The total flow recorded at the gauging station on the St. Mary Canal at St. Mary Crossing (station 05AE029) was 188 000 dam³ (153,000 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, 2001 to October 31, 2002 was 1 060 000 dam³ (858,000 acre-feet) of which 981 000 dam³ (795,000 acre-feet) occurred during the irrigation season, April 1 to October 31, 2002. For the irrigation season, Canada's and the United States' shares were 562 000 dam³ (455,000 acre-feet) and 420 000 dam³ (342,000 acre-feet), respectively. During the irrigation season, a total discharge of 812 000 dam³ (659,000 acre-feet) was recorded at the International Boundary, which was 145 percent of the Canadian share. The computed natural flow during the irrigation season was 138 percent of the average of the previous 99 years of record.

Deficit deliveries were recorded in 4 of the 16 division periods during the 2002 irrigation season. Deficits early in the season were refunded by May 15. A later deficit was refunded during the subsequent August 16 to 31 period.

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 2002*
Quantities in Cubic Decametres

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	CANADA* SHARE	RECEIVED BY CANADA	RECEIVED BY CANADA	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	8,094	4,047	6,065	2,018	
MAR 16 - MAR 31	2,932	1,466	5,516	4,050	
APR 1 - APR 15	8,775	6,411	5,529		882
APR 16 - APR 30	24,650	18,147	10,157		7,990
MAY 1 - MAY 15	27,875	19,998	12,012		7,986
MAY 16 - MAY 31	120,478	66,755	84,063	17,308	
JUNE 1 - JUNE 15	204,582	108,401	152,935	44,534	
JUNE 16 - JUNE 30	248,117	130,169	229,415	99,246	
JULY 1 - JULY 15	151,833	82,026	150,196	68,170	
JULY 16 - JULY 31	84,624	48,829	79,781	30,952	
AUG 1 - AUG 15	31,022	21,485	18,997		2,488
AUG 16 - AUG 31	21,477	16,066	18,697	2,631	
SEP 1 - SEP 15	20,213	15,159	15,375	216	
SEP 16 - SEP 30	13,771	10,327	11,469	1,142	
OCT 1 - OCT 15	11,702	8,779	14,461	5,682	
OCT 16 - OCT 31	11,980	8,985	9,267	282	
TOTAL	992,125	567,050	823,935		

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

Note:

Canadian share of St. Mary R. waters deficit outstanding

as of May 31, 2002: 0 dam³ (0 acre-feet) (0 cfs-days)
as of July 15, 2002: 0 dam³ (0 acre-feet) (0 cfs-days)
as of September 15, 2002: 0 dam³ (0 acre-feet) (0 cfs-days).

USA share of Milk River waters outstanding as of September 15, 2002: 0 dam³ (0 acre-feet) (0 cfs-days)

Allowable deficit carryovers, as per Letter of Intent respecting St. Mary-Milk Rivers Streamflow Transfers, are:

as of May 31, 2002: 9,800 dam³ (7,940 acre-feet) (4,000 cfs-days)
as of July 15, 2002: 4,900 dam³ (3,970 acre-feet) (2,000 cfs-days).

Any deficits outstanding as of September 15 are to be equalized by October 31 of each year.

Table 1A Summary of St. Mary River Division for 2002*
Quantities in Acre-Feet

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	CANADA'S SHARE	RECEIVED BY CANADA	RECEIVED BY CANADA	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	6,562	3,281	4,917	1,636	0
MAR 16 - MAR 31	2,377	1,188	4,472	3,283	0
APR 1 - APR 15	7,114	5,197	4,482	0	715
APR 16 - APR 30	19,984	14,712	8,234	0	6,478
MAY 1 - MAY 15	22,598	16,212	9,738	0	6,474
MAY 16 - MAY 31	97,672	54,118	68,150	14,032	0
JUNE 1 - JUNE 15	165,855	42,888	123,985	1,263	0
JUNE 16 - JUNE 30	201,149	105,528	185,987	80,459	0
JULY 1 - JULY 15	123,091	66,499	121,764	55,266	0
JULY 16 - JULY 31	68,605	39,586	64,679	301	0
AUG 1 - AUG 15	25,150	17,418	15,401	0	2,017
AUG 16 - AUG 31	17,411	13,025	15,158	2,133	0
SEP 1 - SEP 15	16,387	12,289	12,465	175	0
SEP 16 - SEP 30	11,164	8,372	9,298	926	0
OCT 1 - OCT 15	9,487	7,117	11,724	4,606	0
OCT 16 - OCT 31	9,712	7,284	7,513	229	0
TOTAL	804,317	459,708	667,965		

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

Note:

Canadian share of St. Mary R. waters deficit outstanding

as of May 31, 2002: 0 acre-feet (0 dam³) (0 cfs-days)

as of July 15, 2002: 0 acre-feet (0 dam³) (0 cfs-days)

as of September 15, 2002: 0 acre-feet (0 dam³) (0 cfs-days).

USA share of Milk River waters outstanding as of September 15, 2002: 0 dam³ (0 acre-feet) (0 cfs-days)

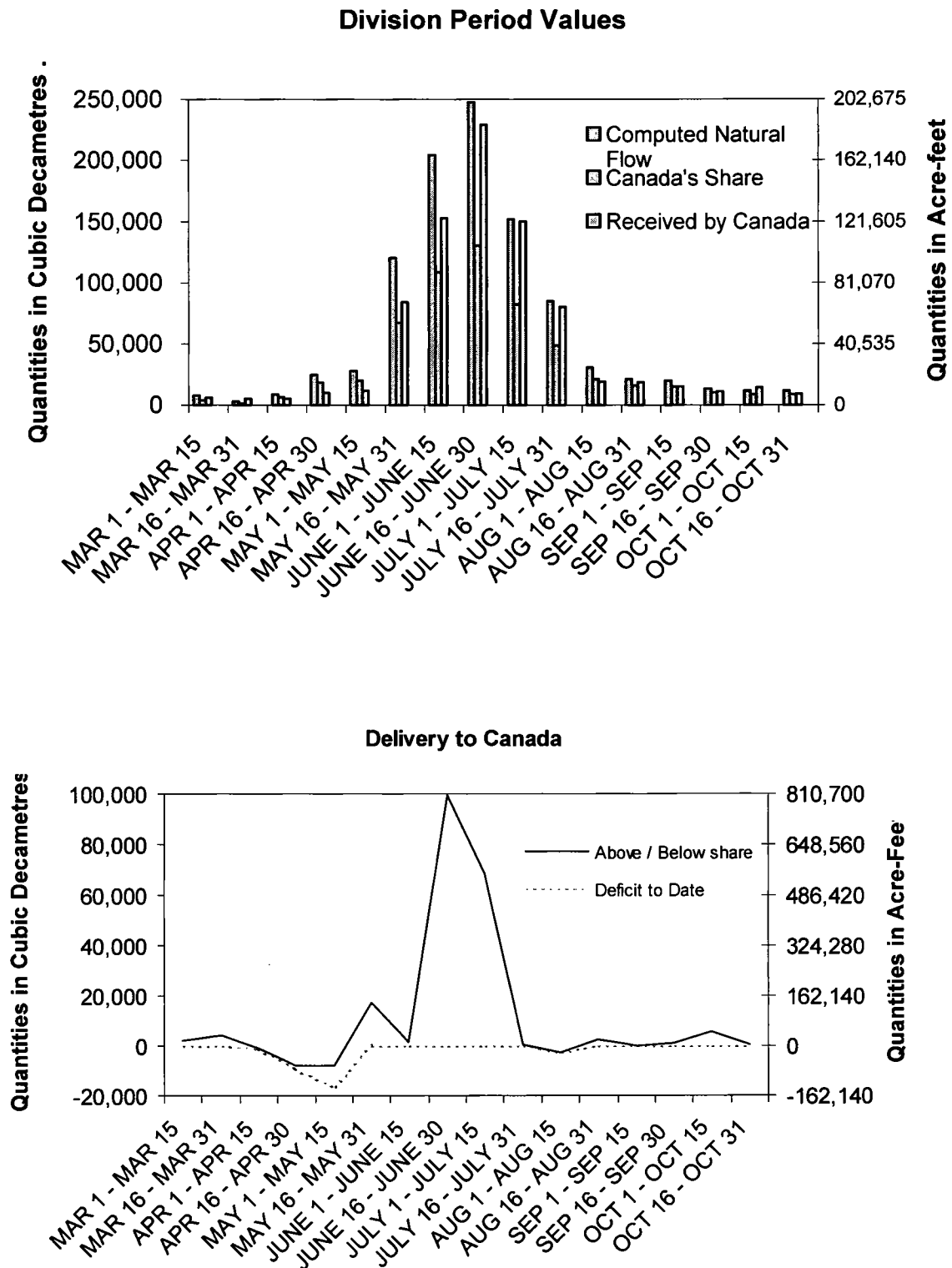
Allowable deficit carryovers, as per Letter of Intent respecting St. Mary-Milk Rivers Streamflow Transfers, are:

as of May 31, 2002: 7,940 acre-feet (9,800 dam³) (4,000 cfs-days)

as of July 15, 2002: 3,970 acre-feet (4,900 dam³) (2,000 cfs-days).

Any deficits outstanding as of September 15 are to be equalized by October 31 of each year.

Figure 1. St. Mary River Division, 2002



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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 inter-basin transfer of water in Canada. An additional refinement was made in 1988 when F.I. Morton's evapo-transpiration model replaced the adjusted pan evaporation method in the natural-flow computations.

Data required for Morton's model is resource intensive. The equipment used to collect the data is highly specialized, less than robust, and located in a remote area. Data collected at the evapo-transpiration monitoring site near Milk River, Alberta needed frequent supplementation from the Onefour, Alberta pan evaporation site due to equipment malfunction. This coupled with the fact that the analysis program required extensive re-writing to port it from the obsolete DEC-VMS computer operating system suggested that an alternative should be investigated.

Data from the results of Morton's model were found to have a strong linear correlation with the Onefour, Alberta, Class - A evaporation pan results. Therefore, again for the year 2002, evapo-transpiration was estimated using the Onefour pan evaporation data as an index of Morton's model results.

During 2002, the United States' and Canada's respective estimated consumptive uses were 5 130 dam³ (4,160 acre-feet) and 4 170 dam³ (3,380 acre-feet). An inter-basin transfer of 989 dam³ (802 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, 2002 was 235 000 dam³ (191,000 acre-feet). This flow was 171 percent of the average computed natural flow of the previous 90 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 146 000 dam³ (118,000 acre-feet) and 90 000 dam³ (72,800 acre-feet). The United States received 159 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 1 of the 16 division periods during the irrigation season. This deficit was refunded by the next period. By September 15, the deficit outstanding for the United States share of the waters of the Milk River was 0 dam³ (0 acre-feet). At present Canada does not have the facility to store and release water into the Milk River Basin. Deficits are made up by transfer of Canada's share of St. Mary River water if excess capacity exists both in the stream and in the American St. Mary Canal, or as provisioned for in the 1991 Procedures for the Division of the Waters of the St. Mary and Milk River: September 30 deficits on the Milk River can be equalized against May 31 deficits outstanding on the St. Mary River, up to 2,000 cfs-days (4 900 dam³).

For the year 2002, the Canadian share of St. Mary River waters deficit outstanding as of May 31, 2002 was 0 dam³ (0 acre-ft) (0 cfs-days). Since there was no outstanding deficit on either the St. Mary or the Milk Rivers, no balance of deficits was applied.

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.

Table 2: Summary of Milk River Division for 2002*
Quantities in Cubic Decametres

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	USA SHARE	RECEIVED BY USA	RECEIVED BY USA	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	0	0	0	0	
MAR 16 - MAR 31	760	380	760	380	
APR 1 - APR 15	5,030	3,772	5,032	1,259	
APR 16 - APR 30	3,535	2,651	3,537	886	
MAY 1 - MAY 15	705	529	715	185	
MAY 16 - MAY 31	28,089	17,973	27,345	9,372	
JUNE 1 - JUNE 15	113,432	62,099	113,106	51,008	
JUNE 16 - JUNE 30	43,395	27,826	43,053	15,227	
JULY 1 - JULY 15	15,670	11,752	15,009	3,256	
JULY 16 - JULY 31	5,702	4,276	5,083	807	
AUG 1 - AUG 15	3,424	2,568	2,879	312	
AUG 16 - AUG 31	1,916	1,437	1,335		102
SEP 1 - SEP 15	2,525	1,894	2,162	268	
SEP 16 - SEP 30	776	582	776	194	
OCT 1 - OCT 15	5,019	3,764	5,019	1,255	
OCT 16 - OCT 31	5,398	4,049	5,398	1,350	
TOTAL	235,376	145,552	231,209		

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

Note:

USA share of Milk River waters deficit outstanding

as of September 15, 2002: 0 dam³ (0 acre-feet) (0 cfs-days)

Canadian share of St. Mary R. waters deficit outstanding

as of May 31, 2002: 0 dam³ (0 acre-feet) (0 cfs-days)

Allowable deficit carryover from June 1 and September 15 as per 2002 Letter of Intent respecting St. Mary - Milk River Streamflow Transfers can not be less than the outstanding deficit to Canada on St. Mary River Division as of May 31st, nor exceeding 4,900 dam³ (2,000 cfs-days) (3,970 acre-feet), whichever is less.

Table 2A: Summary of Milk River Division for 2002*
Quantities in Acre-Feet

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	USA SHARE	RECEIVED BY USA	RECEIVED BY USA	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	0	0	0	0	
MAR 16 - MAR 31	616	308	616	308	
APR 1 - APR 15	4,078	3,058	4,079	1,021	
APR 16 - APR 30	2,865	2,149	2,867	718	
MAY 1 - MAY 15	572	429	579	150	
MAY 16 - MAY 31	22,772	14,571	22,169	7,598	
JUNE 1 - JUNE 15	91,960	50,343	91,695	41,352	
JUNE 16 - JUNE 30	35,181	22,559	34,903	12,344	
JULY 1 - JULY 15	12,703	9,527	12,167	2,640	
JULY 16 - JULY 31	4,622	3,467	4,121	654	
AUG 1 - AUG 15	2,776	2,082	2,334	253	
AUG 16 - AUG 31	1,553	1,165	1,082		82
SEP 1 - SEP 15	2,047	1,535	1,753	218	
SEP 16 - SEP 30	629	472	629	157	
OCT 1 - OCT 15	4,069	3,052	4,069	1,017	
OCT 16 - OCT 31	4,376	3,282	4,376	1,094	
TOTAL	190,819	117,999	187,441		

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

Note:

USA share of Milk River waters deficit outstanding

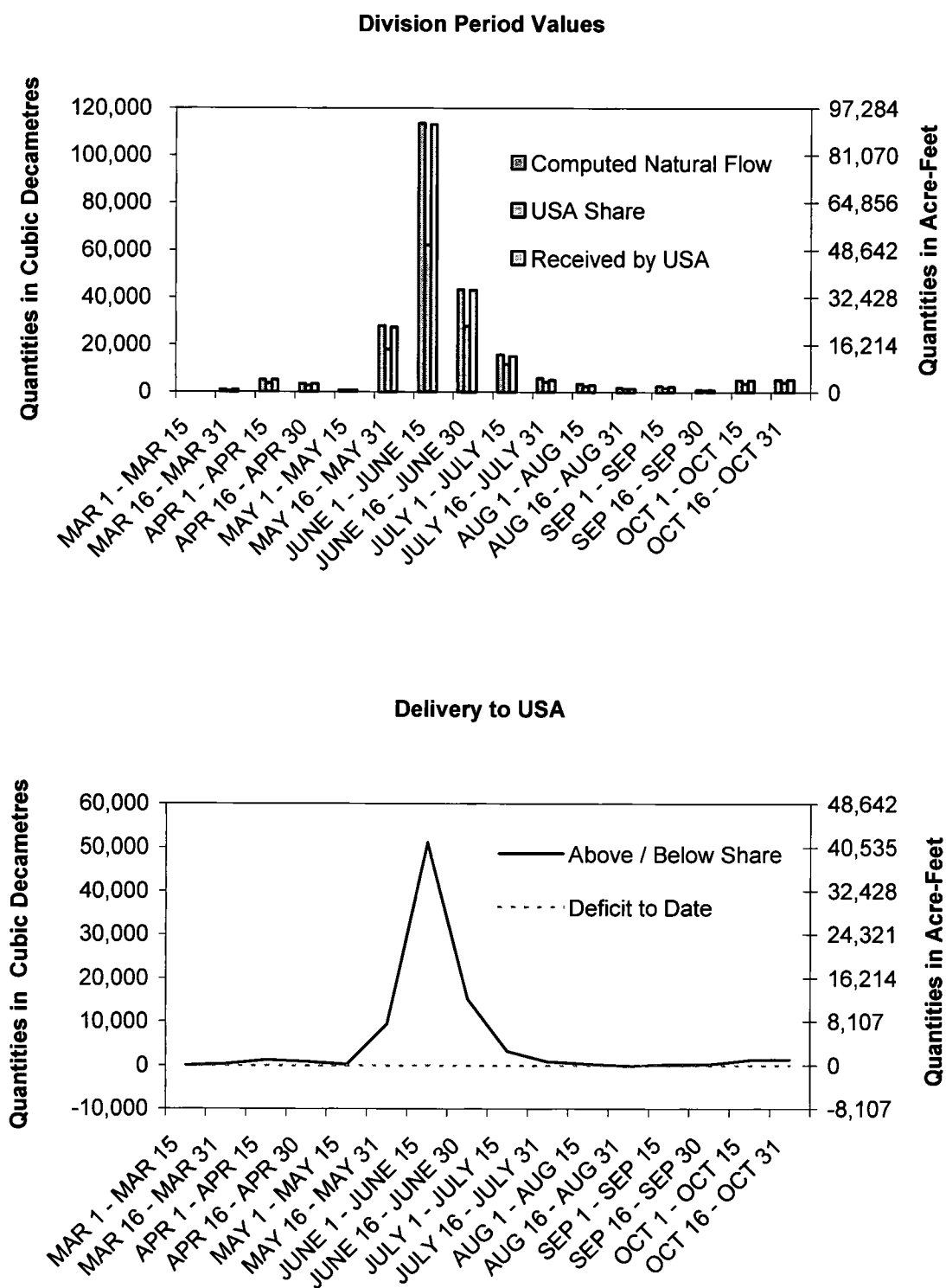
as of September 15, 2002: 0 acre-feet (0 dam³) (0 cfs-days)

Canadian share of St. Mary R. waters deficit outstanding

as of May 31, 2002: 0 acre-feet (0 dam³) (0 cfs-days)

Allowable deficit carryover from June 1 and September 15 as per 2002 Letter of Intent respecting St. Mary - Milk River Streamflow Transfers can not be less than the outstanding deficit to Canada on St. Mary River Division as of May 31st, nor exceeding 4,900 dam³ (2,000 cfs-days) (3,970 acre-feet), whichever is less.

Figure 2. Milk River Division, 2002



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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.

No Canadian complaints or changes in the Montana adjudication process were noted in 2002.

Flows for March through October 2002 for the southern tributaries were as follows:

- o Bear Creek near International Boundary – 4 314 dam³ (3,497 acre-feet).
- o Miners Coulee near International Boundary – 3 058 dam³ (2,479 acre-feet).

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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 inter-basin 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 (station 11AB075) is monitored by Canada, but does not have sufficient use in Canada at this time to warrant an operational division of flow. Total flows from March to October of 47.58 dam³ (38.75 ac-ft) were recorded on Lyons Creek for the year 2002.

The spring of 2002 began much the same as the spring of 2001, with low soil moisture and shallow snow cover. Many of the Lodge and Middle Creek basin reservoirs were very low with Massy, Cressday, Bare Creek and Altawan reservoirs in a dry state. This was also the case in the Frenchman River basin with both Huff and Newton lakes being initially dry. Flow in the Frenchman River channel was essentially zero in the lower portion of the basin.

Warm temperatures coupled with high winds in mid April generated a moderate amount of runoff from the snow pack existing in the Cypress Hills. The Cypress Lake West Inflow Canal diverted 1 200 dam³ (973 ac-ft) into Cypress Lake. Eastend Reservoir and Huff Lake recharged enough to initiate a small irrigation. All of the upper Lodge Creek Reservoirs attained a degree of live storage.

Irrigation in both the Battle and Frenchman River basins began in April under dry conditions. Two diesel pumps operated at Cypress Lake, as the lake was too low for gravity operation. The Spangler irrigation project in the Lodge Creek basin did not operate.

A complete reversal of the three basins outlook took place in early June with a series of significant rain events, which significantly diminished the demand for irrigation water. A total of 342 mm (13.5 inches) of precipitation was recorded at the Altawan rain gauge and during the season, two releases from Altawan Reservoir were required to meet apportionment demands from the resulting storage of the Lodge Creek Basin. Heavy rains occurred in the Cypress Hills in June, when 260 mm (10.2 inches) were recorded which allowed for another 3 700 dam³ (3000 ac-ft) to be diverted into Cypress Lake. The Val Marie area recorded some of the highest precipitation amounts, accumulating 410 mm (16.1 inches) when total annual normals are usually in the 250 to 300 mm range. A short irrigation took place at Eastend in late July, but it was too wet for a second irrigation at Val Marie. Further rains in July, August and September allowed an additional 2 000 dam³ (1621 ac-ft) of water to be diverted into Cypress Lake, bringing the season total to over 7 000 dam³ (5675 ac-ft). Efficiencies in delivering water to the United States were enhanced by the wet conditions of the basins.

The season ended quite differently from the way it began; the basins moved from poor soil moisture conditions and empty reservoirs to good soil moisture conditions and full reservoirs. Both Huff and Newton lakes were spilling and Cypress Lake ended at approximately the same elevation as it started even though it was utilized for irrigation.

Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins

Month-End Contents: 2001, 2002, and 1992-2001 Mean

Figure 3a. Altawan Reservoir

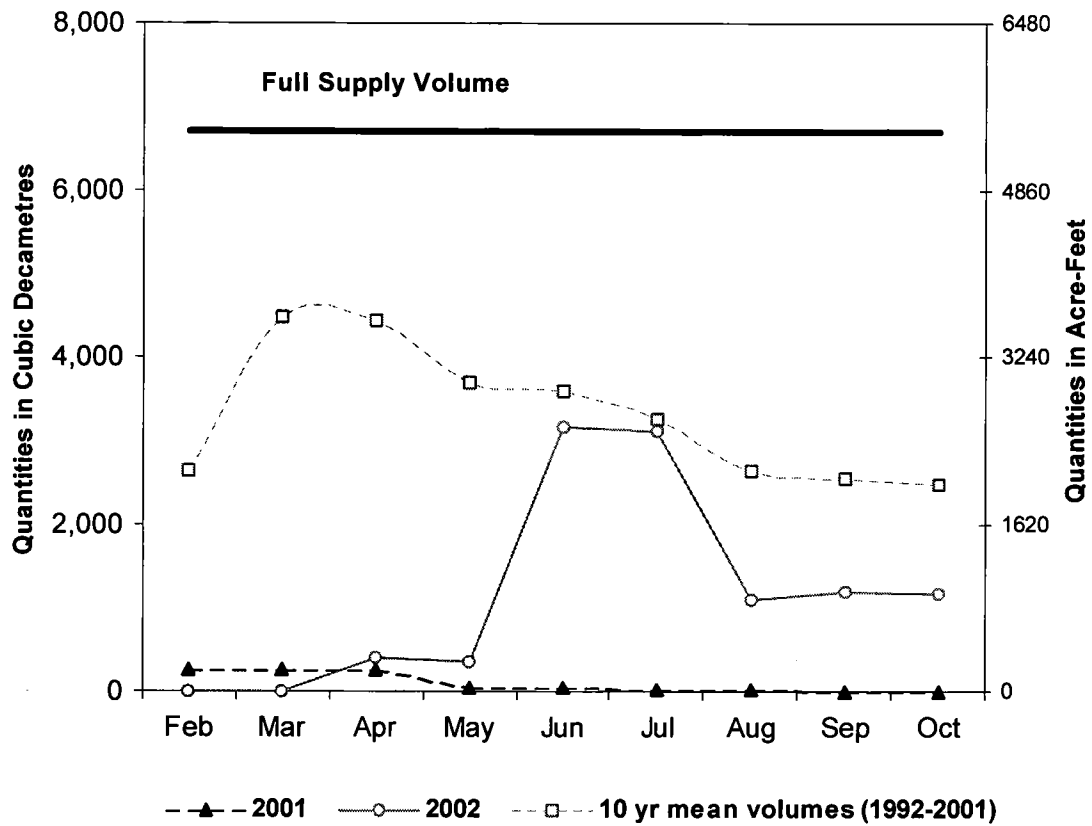
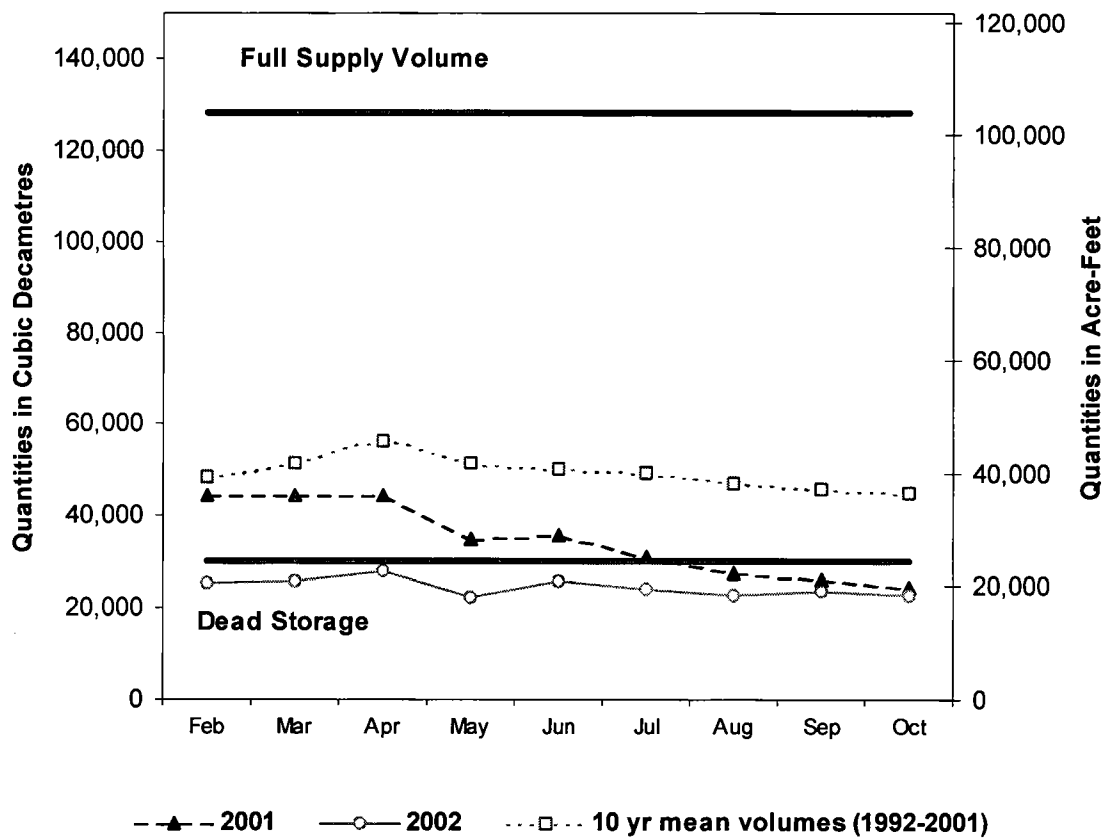


Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins

Month-End Contents: 2001, 2002, and 1992-2001 Mean

Figure 3b. Cypress Lake



**Figure 3. Reservoirs in Lodge Creek, Battle Creek,
and Frenchman River Basins**

**Month-End Contents: 2001, 2002,
and 1992-2001 Mean**

Figure 3c. Eastend Reservoir

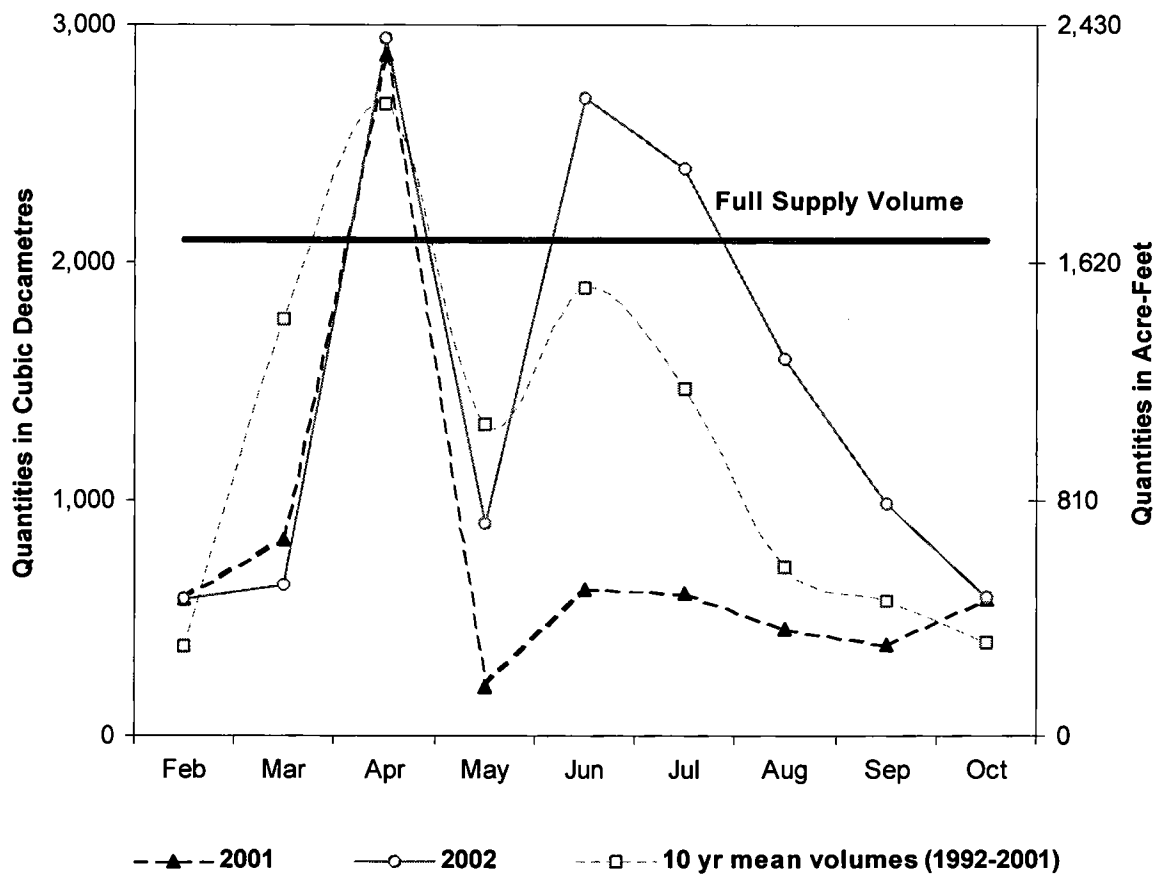


Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins

Month-End Contents: 2001, 2002, and 1992-2001 Mean

Figure 3d. Huff Lake

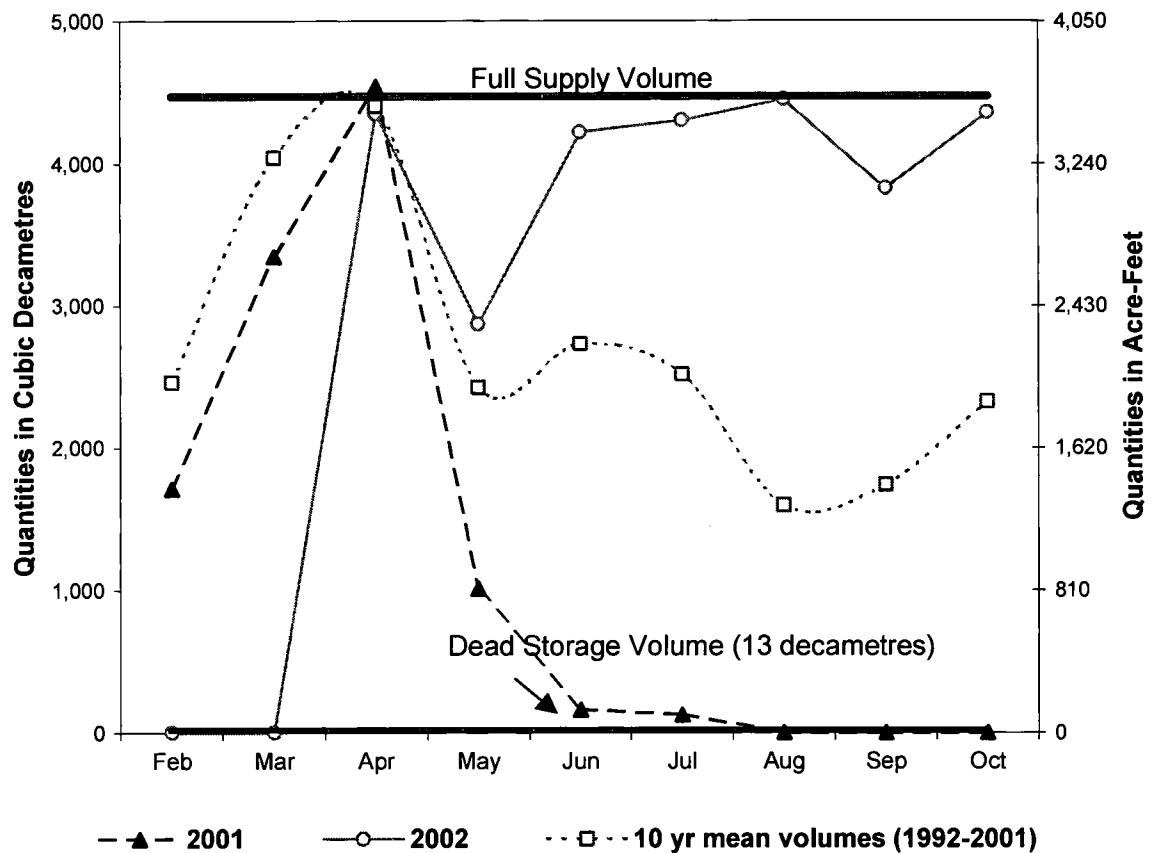
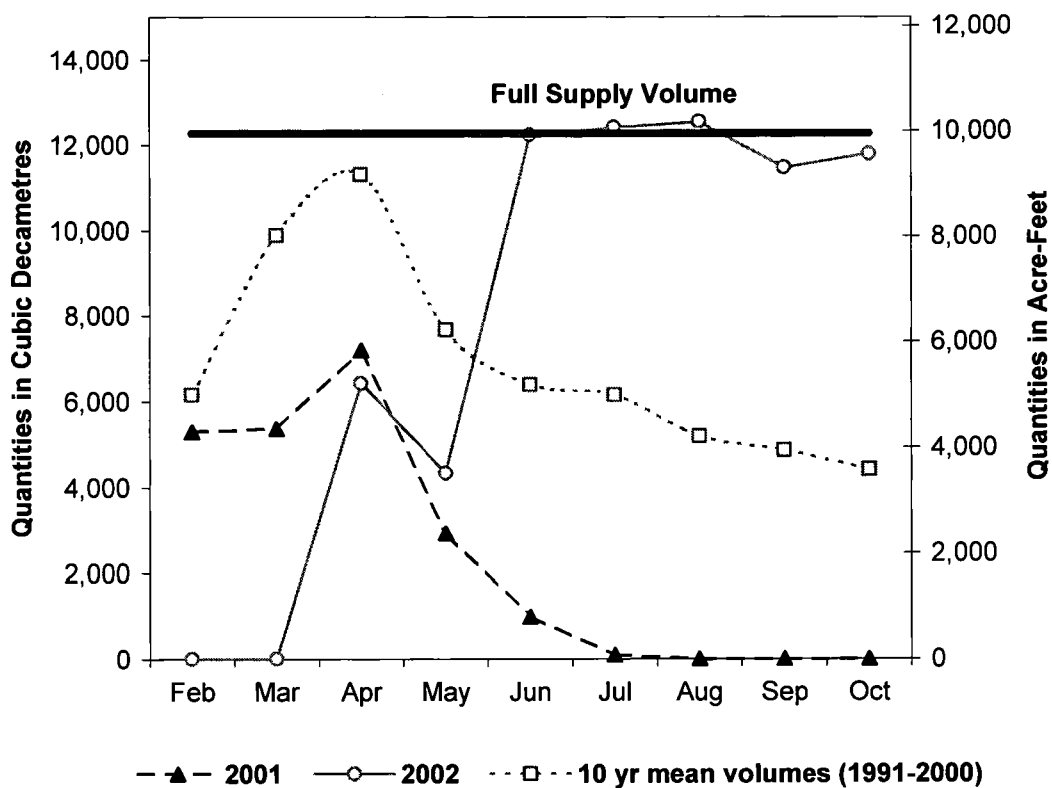


Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins

**Month-End Contents: 2001, 2002,
and 1992-2001 Mean**

Figure 3e. Newton Lake



LODGE CREEK

The computed natural flow of Lodge Creek at the International Boundary from March 1 to October 31, 2002 was 12 600 dam³ (10,200 acre-feet). This volume is 41 percent of the average natural flow of the previous 52 years of record. Each country is entitled to 50 percent of the natural flow or 6 300 dam³ (5,100 acre-feet) for the irrigation season.

Total flows from March to October of 6 096 dam³ (4942 ac-ft) were recorded at Lodge Creek below McRae Creek at the International Boundary (station 11AB083), consequently; a deficit delivery was computed for 8 of the 16 division periods for which natural flow values were determined, totaling 198 dam³ (161 acre-feet).

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, both in Appendix A.

Table 3: Summary of Lodge Creek Division for 2002*
Quantities in Cubic Decametres

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	USA SHARE	RECEIVED BY USA	RECEIVED BY USA	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	0	0	0	0	0
MAR 16 - MAR 31	0	0	0	0	0
APR 1 - APR 15	295	148	0		148
APR 16 - APR 30	1,260	630	0		630
MAY 1 - MAY 15	58	29	0		29
MAY 16 - MAY 31	53	26	0		26
JUNE 1 - JUNE 15	8,282	4,141	146		3,995
JUNE 16 - JUNE 30	2,231	1,115	3,495	2,380	
JULY 1 - JULY 15	0	0	329	329	
JULY 16 - JULY 31	53	26	7		19
AUG 1 - AUG 15	87	44	2		42
AUG 16 - AUG 31	94	47	2,042	1,995	
SEP 1 - SEP 15	167	84	68		16
SEP 16 - SEP 30	4	2	4	2	
OCT 1 - OCT 15	2	1	2	1	
OCT 16 - OCT 31	1	1	1	0	0
TOTAL	12,587	6,294	6,096		

* 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.

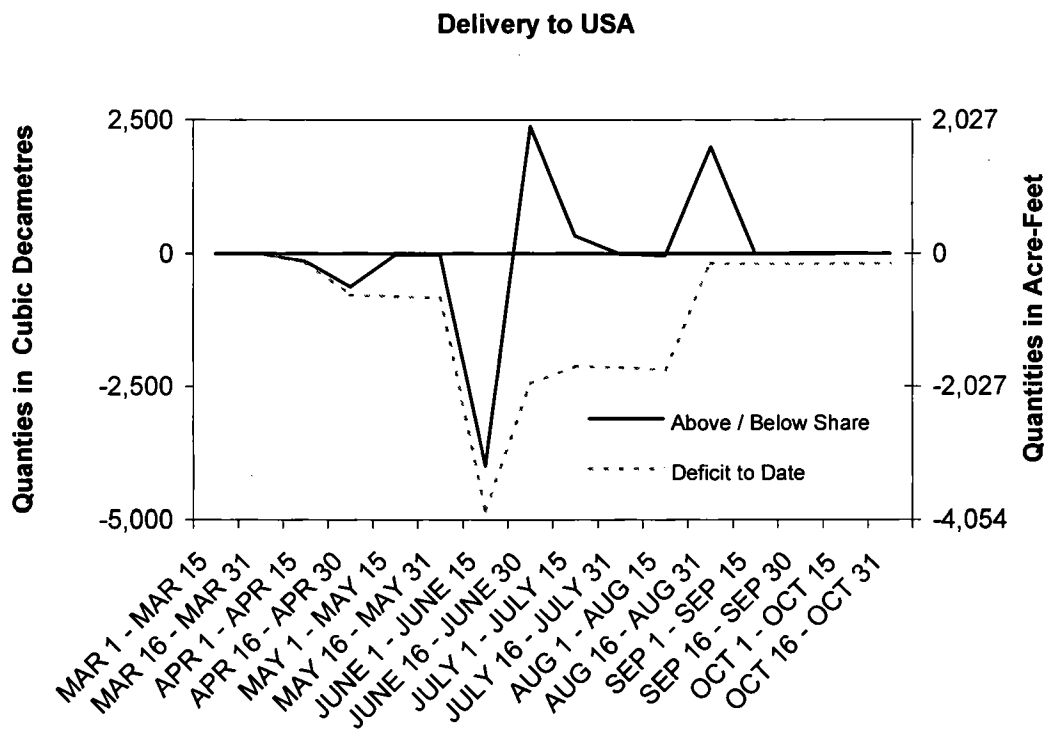
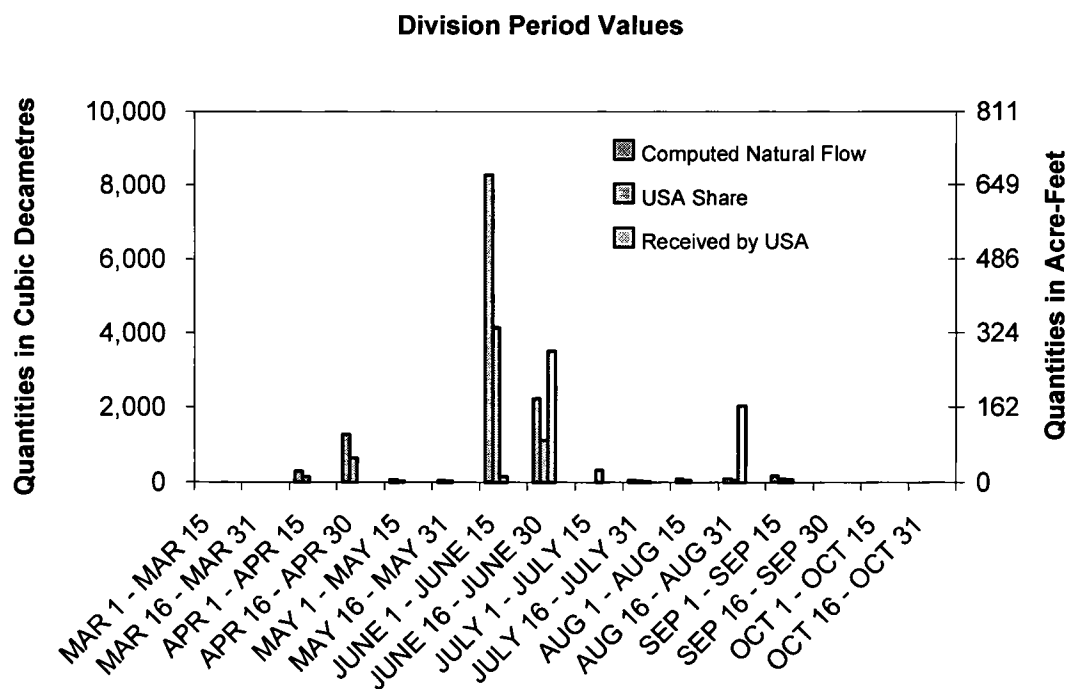
Table 3A: Summary of Lodge Creek Division for 2002*
Quantities in Acre-Feet

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	USA SHARE	RECEIVED BY USA	RECEIVED BY USA	
				ABOVE SHARE	BELOW
MAR 1 - MAR 15	0	0	0		0
MAR 16 - MAR 31	0	0	0		0
APR 1 - APR 15	239	120	0		120
APR 16 - APR 30	1,021	511	0		511
MAY 1 - MAY 15	47	24	0		24
MAY 16 - MAY 31	43	21	0		21
JUNE 1 - JUNE 15	6,714	3,357	118		3,239
JUNE 16 - JUNE 30	1,809	904	2,833	1,929	
JULY 1 - JULY 15	0	0	267	267	
JULY 16 - JULY 31	43	21	6		15
AUG 1 - AUG 15	71	36	2		34
AUG 16 - AUG 31	76	38	1,655	1,617	
SEP 1 - SEP 15	135	68	55		13
SEP 16 - SEP 30	3	2	3	2	
OCT 1 - OCT 15	2	1	2	1	
OCT 16 - OCT 31	1	1	1		0
TOTAL	10,204	5,103	4,942		

* 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, 2002



BATTLE CREEK

The computed natural flow of Battle Creek at the International Boundary from March 1 to October 31, 2002, was 23 700 dam³ (19,200 acre-feet). This volume is 77 percent of the average natural flow of the previous 62 years of record. Each country is entitled to 50 percent of the natural flow i.e., 11 800 dam³ (9,590 acre-feet). A total of 12 600 dam³ (10,200 acre-feet) was recorded at Battle Creek at International Boundary (station 11AB027) from March 1 to October 31.

Deficit deliveries were recorded in 6 of the 16 division periods during the irrigation season. A deficit of 2 460 dam³ (1,995 acre-feet) had accumulated by June 9, 2002 due to irrigation usage in Canada. Releases to refund the deficit from Cypress Lake occurred over the next six periods. A later smaller deficit in October 2002 was refunded in the next period, leaving no outstanding deficits for 2002.

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, both in Appendix A.

Table 4: Summary of Battle Creek Division for 2002*
Quantities in Cubic Decametres

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	USA SHARE	RECEIVED BY USA	RECEIVED BY USA	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 25	0	0	0	0	0
MAR 26 - APR 9	3	2	0		2
APR 10 - APR 24	3,308	1,654	482		1,172
APR 25 - MAY 9	1,127	564	92		472
MAY 10 - MAY 25	738	369	57		312
MAY 26 - JUNE 9	1,360	680	177		503
JUNE 10 - JUNE 24	9,132	4,566	5,073	507	
JUNE 25 - JULY 9	1,755	878	1,359	481	
JULY 10 - JULY 25	1,149	575	853	278	
JULY 26 - AUG 9	463	232	447	215	
AUG 10 - AUG 25	818	409	817	408	
AUG 26 - SEP 9	996	498	995	497	
SEP 10 - SEP 24	1,577	789	1,298	509	
SEP 25 - OCT 9	421	211	156		55
OCT 10 - OCT 25	586	293	585	292	
OCT 26 - OCT 31	228	114	227	113	
TOTAL	23,661	11,834	12,618		

* 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.

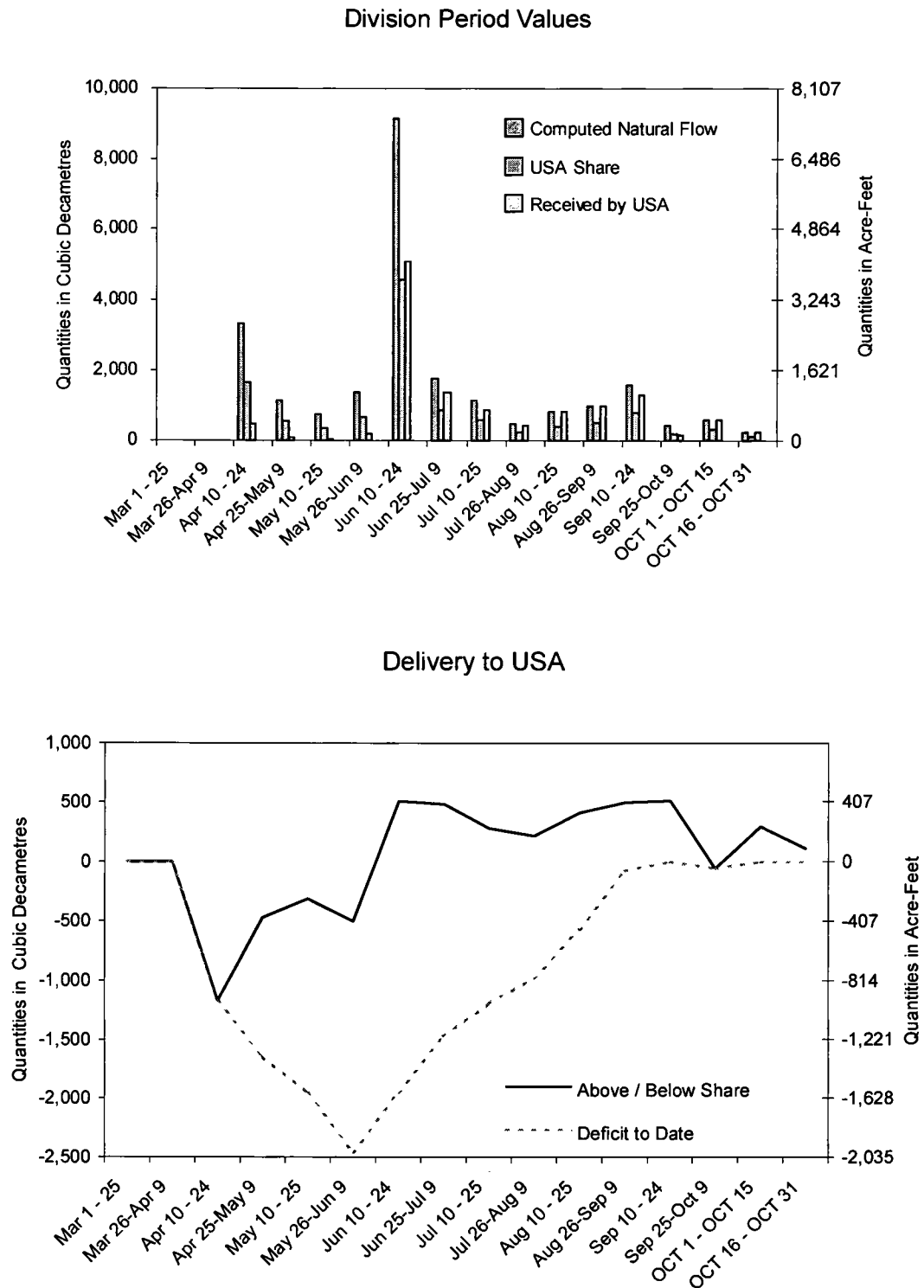
Table 4A: Summary of Battle Creek Division for 2002*
Quantities in Acre-Feet

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	USA SHARE	RECEIVED BY USA	RECEIVED BY USA	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 25	0	0	0		0
MAR 26 - APR 9	2	2	0		2
APR 10 - APR 24	2,682	1,341	391		950
APR 25 - MAY 9	914	457	75		383
MAY 10 - MAY 25	598	299	46		253
MAY 26 - JUNE 9	1,103	551	143		408
JUNE 10 - JUNE 24	7,403	3,702	4,113	411	
JUNE 25 - JULY 9	1,423	712	1,102	390	
JULY 10 - JULY 25	931	466	692	225	
JULY 26 - AUG 9	375	188	362	174	
AUG 10 - AUG 25	663	332	662	331	
AUG 26 - SEP 9	807	404	807	403	
SEP 10 - SEP 24	1,278	640	1,052	413	
SEP 25 - OCT 9	341	171	126		45
OCT 10 - OCT 25	475	238	474	237	
OCT 26 - OCT 31	185	92	184	92	
TOTAL	19,182	9,594	10,229		

* 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, 2002



FRENCHMAN RIVER

The computed natural flow of the Frenchman River at the International Boundary from March 1 to October 31, 2002, was 59 700 dam³ (48,400 acre-feet). This volume is 75 percent of the average natural flow of the previous 62 years of record. Each country is entitled to 50 percent of the natural flow, i.e., 29 900 dam³ (24,200 acre-feet). A total flow of 37 900 dam³ (30,800 acre-feet) was recorded at Frenchman River at International Boundary (station 11AC041) from March 1 to October 31.

Deficit deliveries were recorded in 7 of 16 division periods during the irrigation season. A deficit of 6 220 dam³ (5,040 acre-feet) had accumulated by the end of May. The deficit was refunded by the end of the August 1-15 division period. An outstanding deficit of 90 dam³ (73 acre-feet) occurred in the last division period of the irrigation season.

The division of the Frenchman River natural flow is summarized in Tables 5 and 5A and in 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, both of Appendix A.

Table 5: Summary of Frenchman River Division for 2002*
Quantities in Cubic Decametres

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	USA SHARE	RECEIVED BY USA	RECEIVED BY USA	
				ABOVE SHARE	BELOW SHARE
Mar 1 - 15	0	0	0	0	
Mar 16 - 31	0	0	0	0	
Apr 1 - 15	1,344	672	648		24
Apr 16 - 30	13,160	6,580	1,361		5,219
May 1 - 15	1,674	837	46		791
May 16 - 31	662	331	145		186
Jun 1 - 15	10,606	5,303	7,869	2,566	
Jun 16 - 30	8,959	4,480	2,475		2,005
Jul 1 - 15	3,516	1,758	1,734		24
Jul 16 - 31	2,994	1,497	3,010	1,513	
Aug 1 - 15	11,715	5,858	10,519	4,661	
Aug 16 - 31	0	0	4,566	4,566	
Sep 1 - 15	2,888	1,444	2,041	597	
Sep 16 - 30	966	483	2,717	2,234	
Oct 1 - 15	471	236	504	268	
Oct 16 - 31	780	390	300		90
TOTAL	59,736	29,869	37,935		

* 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.

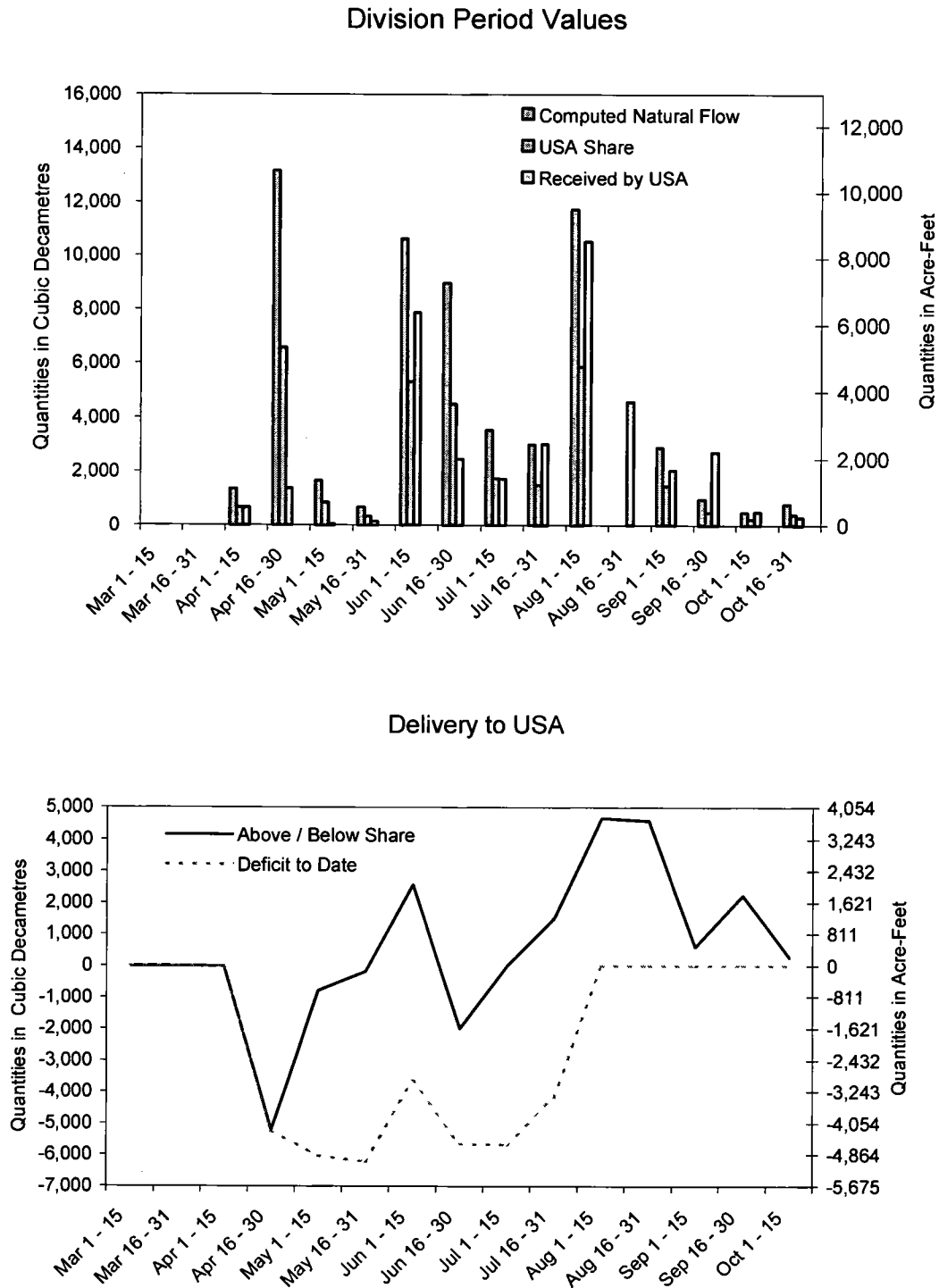
Table 5A: Summary of Frenchman River Division for 2002*
Quantities in Acre-Feet

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	USA SHARE	RECEIVED BY USA	RECEIVED BY USA	
				ABOVE SHARE	BELOW SHARE
Mar 1 - 15	0	0	0	0	
Mar 16 - 31	0	0	0	0	
Apr 1 - 15	1,090	545	525		19
Apr 16 - 30	10,669	5,334	1,103		4,231
May 1 - 15	1,357	679	37		641
May 16 - 31	536	268	118		151
Jun 1 - 15	8,598	4,299	6,379	2,080	
Jun 16 - 30	7,263	3,632	2,006		1,625
Jul 1 - 15	2,851	1,425	1,406		19
Jul 16 - 31	2,427	1,214	2,440	1,227	
Aug 1 - 15	9,498	4,749	8,528	3,779	
Aug 16 - 31	0	0	3,702	3,702	
Sep 1 - 15	2,341	1,171	1,655	484	
Sep 16 - 30	783	392	2,203	1,811	
Oct 1 - 15	382	191	409	217	
Oct 16 - 31	632	316	243		73
TOTAL	48,428	24,2	30,75		

* 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 Divisin, 2002



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ANNEX A

1921 Order Of The International Joint Commission

Respecting The St. Mary-Milk Rivers

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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.

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ANNEX B

Letter of Intent Respecting

The St. Mary - Milk Rivers Streamflow Transfers

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**LETTER OF INTENT
TO BETTER UTILIZE THE WATERS OF THE ST. MARY AND MILK RIVERS**

Whereas Article VI of the Boundary Waters Treaty of 1909 states that the St. Mary and Milk Rivers and their tributaries are to be treated as one for the purposes of irrigation and power;

And whereas, the Boundary Waters Treaty of 1909 and the International Joint Commission Order of 1921 authorizes the Reclamation and Irrigation Officers of the United States and Canada (currently designated as the Accredited Officers of the United States and Canada) to make the greatest beneficial use of the waters of the St. Mary and Milk Rivers;

And whereas, Canada finds it beneficial to use more than its share of the Milk River in the June-September period each year to supply water to Canadian Milk River irrigators;

And whereas, the United States finds it beneficial to use more than its share of the St. Mary River in the March-May period each year to supply water to United States Milk River irrigators;

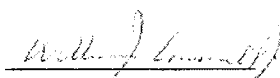
It is therefore ordered and directed by said Accredited Officers or their designates that the United States be allowed to accumulate a deficit on the St. Mary River of up to 4,000 cfs-days (9 800 dam³) between March 1 and May 31 of each year which, at the discretion of the United States, may be reduced to no less than 2,000 cfs-days (4 900 dam³) between June 1 and July 15 of each year with surplus deliveries of St. Mary River water, and that Canada be allowed to accumulate a deficit on the Milk River of up to 2,000 cfs-days (4 900 dam³) between June 1 and September 15 of each year. The incurred deficits on the St. Mary and Milk Rivers can be offsetting and the outstanding deficits as of September 15 will be equalized by October 31 of each year under administration by Field Representatives of the Accredited Officers. Detailed accounting procedures for the computation of deficit and surplus deliveries under this Letter Of Intent are outlined in Appendix A, "Procedures for the Computation of Deficit and Surplus Deliveries to Better Utilize Waters of the St. Mary and Milk Rivers".

In signing this letter, the parties recognize this agreement is within the 1921 Order of the International Joint Commission. Additionally, the parties recognize that this Letter of Intent and Appendix A will form part of the St. Mary - Milk River Procedural Manual.

Termination of this Letter Of Intent will be allowed upon request by either the United States or Canada notifying the other party in writing two months prior to the commencement of the irrigation season (April 1st as specified by the 1921 Order).



Tim Goos
Accredited Officer of Her Majesty
Dated this 8th day of February, 2001



William J. Carswell, Jr. for the
Accredited Officer of the United States
Dated this 8th day of February, 2001

**PROCEDURES FOR THE COMPUTATION OF DEFICIT AND SURPLUS DELIVERIES
TO BETTER UTILIZE WATERS OF THE ST. MARY AND MILK RIVERS**

ST. MARY RIVER

As of January 2001, the accounting procedures for the computation of deficit and surplus deliveries during March 1 through September 15 of each year on the St. Mary River are:

1. During March 1 through May 31 of each year, deficit deliveries from the United States to Canada at the end of each division period will carry over from one division period to another for the year, are cumulative for the year, and are allowed up to a cumulative total of 4,000 cfs-days (9 800 dam³). Deficit deliveries greater than the allowed cumulative total of 4,000 cfs-days (9 800 dam³) are to be refunded in the subsequent division period. Surplus deliveries at the end of a division period are not cumulative, cannot be used to reduce the accumulated deficit from previous division periods to below the allowed total deficit of 4,000 cfs-days (9 800 dam³), and cannot be used as a credit to make up future deficits. Exceptions to these procedures for this period are allowed only if agreed upon in writing by the Field Representative for Canada.
2. During June 1 through July 15 of each year, the United States, at its discretion, may reduce the deficit accumulated in the March 1 through May 31 period to 2,000 cfs-days (4 900 dam³) by making surplus deliveries of St. Mary River water. The remaining deficit is not refundable until after September 15 of that year unless agreed upon in writing by the Field Representative for Canada.
3. During June 1 through September 15 of each year, deficit deliveries from the United States to Canada at the end of each division are not to be incurred. However, if deficits are incurred, they are to be refunded by surplus deliveries in the subsequent division period or at a time agreed upon by both parties. Surplus deliveries do not carry over from one division period to another, are not cumulative, and cannot be used as a credit to make up future deficits.
4. On September 15 of each year, outstanding deficits are to be determined using the best available data, even though those data may be provisional. Any outstanding deficits as of September 15 are to be equalized by October 31 of each year. Deficit deliveries accumulated by Canada on the Milk River can be used to offset deficit deliveries accumulated by the United States on the St. Mary River.
5. The United States Bureau of Reclamation shall contact Canada (Environment Canada), the United States (U.S. Geological Survey), Montana (Montana Department of Natural Resources and Conservation), and Alberta (Alberta Environment) when they plan to begin deficit deliveries during the March 1 through May 31 period and when they plan to make surplus deliveries to reduce the accumulated deficits to 2,000 cfs-days (4 900 dam³) during June 1 through July 15. On or about July 1, and again by September 15 of each year, the parties shall participate in a conference call or meeting to discuss refund of remaining deficit deliveries.

MILK RIVER

As of January 2001, the accounting procedures for the computation of deficit and surplus deliveries during March 1 through September 15 of each year on the Milk River are:

1. During March 1 through May 31 of each year, deficit deliveries from Canada to the United States at the end of each division period are not to be incurred. However, if deficits are incurred, they are to be refunded by surplus deliveries in the subsequent division period or at a time agreed upon by both parties. Surplus deliveries do not carry over from one division period to another, are not cumulative, and cannot be used as a credit to make up future deficits.
2. During June 1 through September 15 of each year, deficit deliveries from Canada to the United States at the end of each division period will carry over from one division period to another for the year, are cumulative for the year, and are allowed up to a cumulative total of 2,000 cfs-days (4 900 dam³). Deficit deliveries greater than the allowed total of 2,000 cfs-days (4 900 dam³) are to be refunded in the subsequent division period. Surplus deliveries at the end of a division period cannot be used to reduce the deficit accumulated during the June 1 through September 15 period to below the lesser of the allowed total deficit of 2,000 cfs-days (4 900 dam³) or the outstanding United States' deficit accumulated on the St. Mary River in the March 1 through May 31 period, and cannot be used as credits to make up future deficits. The remaining deficit is not refundable until after September 15 of that year unless agreed upon in writing by the Field Representative for the United States.
3. On September 15 of each year, outstanding deficits are to be determined using the best available data, even though those data may be provisional. Any outstanding deficits as of September 15 are to be equalized by October 31 of each year. Deficit deliveries accumulated by Canada on the Milk River can be used to offset deficit deliveries accumulated by the United States on the St. Mary River.
4. Canada (Environment Canada), the United States (U.S. Bureau of Reclamation and U.S. Geological Survey), Alberta (Alberta Environment) and Montana (Montana Department of Natural Resources and Conservation) shall participate in a conference call or meeting on or about July 1, and again by September 15 of each year to decide on the approach to be used to reconcile outstanding deficit deliveries.

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ANNEX C

Conversion Factors

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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

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ANNEX D

List of Gauging Stations

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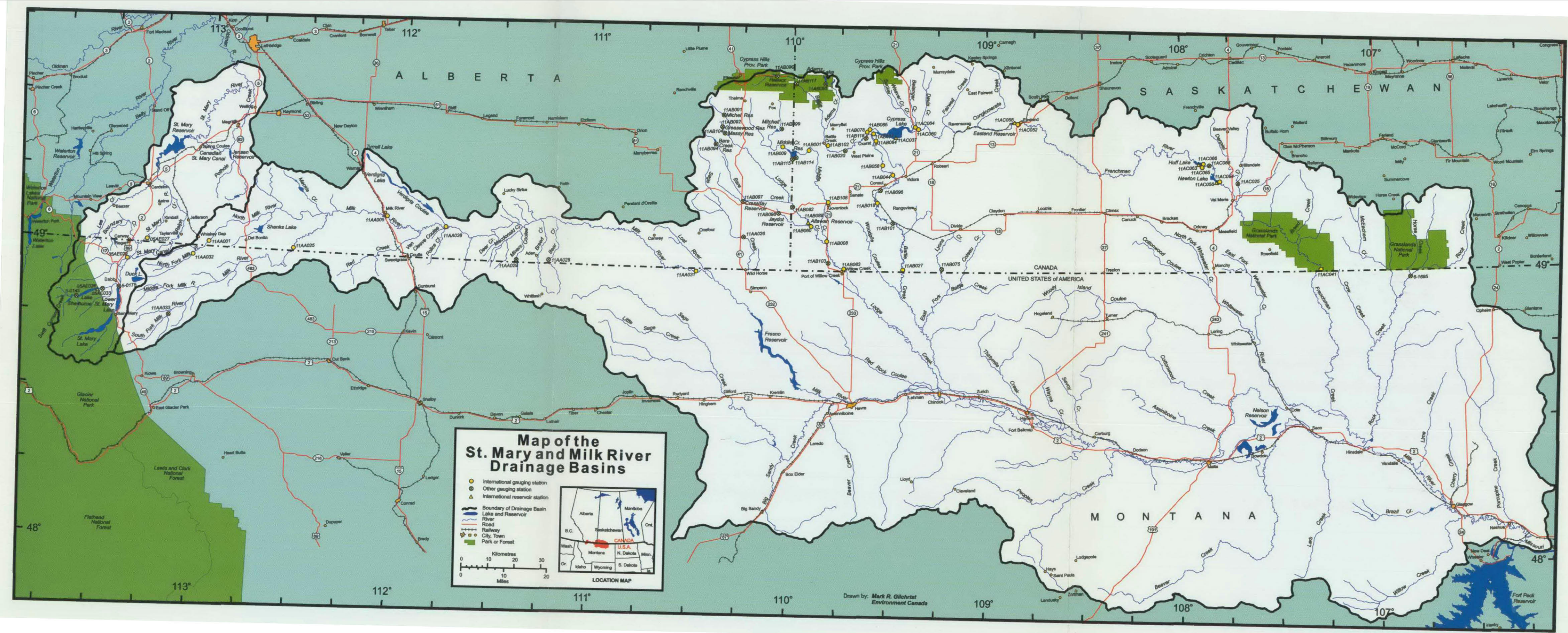
INTERNATIONAL GAUGING STATIONS OPERATED JOINTLY
BY
THE UNITED STATES AND CANADA
ST. MARY AND MILK RIVER BASINS
2002

Map Index	Station Name
<u>ST. MARY RIVER BASIN</u>	
05AE027	St. Mary River at International Boundary
05AE029	St. Mary Canal at St. Mary Crossing near Babb, Montana
05AE036	Lake Sherburne at Sherburne, Montana
<u>MILK RIVER BASIN</u>	
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
<u>LODGE CREEK TRIBUTARY BASIN</u>	
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
<u>BATTLE CREEK TRIBUTARY BASIN</u>	
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
<u>FRENCHMAN RIVER TRIBUTARY BASIN</u>	
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
2002

*Data for 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.
5-0160*	Swiftcurrent Creek at Sherburne, Montana	U.S.A.
5-0175*	St. Mary River near Babb, Montana	U.S.A.
<u>MILK RIVER BASIN</u>		
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
<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
<u>BATTLE CREEK TRIBUTARY BASIN</u>		
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
<u>FRENCHMAN RIVER TRIBUTARY BASIN</u>		
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
<u>ROCK CREEK TRIBUTARY BASIN</u>		
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

The location map shows the drainage basins within the context of the Canadian provinces of Alberta, Saskatchewan, and Manitoba, and the U.S. states of Montana, Wyoming, Idaho, and Washington. The map also shows the international boundary between Canada and the United States.

Drawn by: Mark R. Gilchrist
Environment Canada

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Commission on the division and use
of the waters of the St. Mary and
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