Report to

THE INTERNATIONAL JOINT COMMISSION

On

THE DIVISION OF THE WATERS OF

THE ST. MARY AND MILK RIVERS

2003

Cover Photo:

St. Mary Canal Syphon, Montana, U.S.A. 2003.
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REPORT TO

THE INTERNATIONAL JOINT COMMISSION

ON

THE DIVISION OF THE WATERS OF

THE ST. MARY AND MILK RIVERS

FOR THE YEAR 2003

SUBMITTED BY

WILLIAM J. CARSWELL, JR.

REPRESENTING THE UNITED STATES

AND

TIMOTHY GOOS

REPRESENTING CANADA

March 2004

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, 2003.

Respectfully submitted,

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

Timothy Goos
Accredited Officer of Her Majesty

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SYNOPSIS

During the 2003 irrigation season the natural flows of the St. Mary River were 75 percent and of the Milk River 70 percent 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, 2003, was 534 000 cubic decametres (dam^3) (433,000 acre-feet). Under the terms of the Boundary Waters Treaty, the Canadian share was 333 000 dam^3 (270,000 acre-feet). The total flow recorded at the International Boundary during the irrigation season was 102 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, 2003, was 97 300 dam^3 (78,900 acre-feet). Under terms of the Treaty, the United States' allotment was 63 700 dam^3 (51,600 acre-feet). The United States received 147 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 68 percent of the individual long-term average for the Lodge Creek at the International Boundary, 90 percent for the Battle Creek at the International Boundary, and 83 percent for the Frenchman River at the International Boundary.

The annual meeting of the Field Representatives was held in Medicine Hat, Alberta, on February 19, 2004. Mutual problems, future plans, and changes in computational procedures were discussed and a schedule of field operations for 2004 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 2003 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 Medicine Hat, Alberta, on February 19, 2004. Mutual concerns, future plans, and changes in computational procedures were discussed and a schedule of field operations for 2004 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 7 750 dam^3 (6,280 acre-feet) on October 31, 2002. Storage increased to 27 100 dam^3 (22,000 acre-feet) on April 3, 2003, when the 2003 irrigation season releases began. Maximum storage was 73 900 dam^3 (59,900 acre-feet) on June 30, 2003 and storage decreased to 10 100 dam^3 (8,190 acre-feet) by the end of the irrigation season on October 31, 2003. The minimum storage occurred on September 17, 2003 when the contents of Lake Sherburne lowered to 8 090 dam^3 (6,560 acre-feet).

Water was diverted from the St. Mary River into the Milk River via the St. Mary Canal from April 7 through September 20, 2003. The total flow recorded at the gauging station on the St. Mary Canal at St. Mary Crossing (station 05AE029) was 207 000 dam^3 (168,000 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, 2002 to October 31, 2003 was 604 000 dam^3 (490,000 acre-feet) of which 534 000 dam^3 (433,000 acre-feet) occurred during the irrigation season, April 1 to October 31, 2003. For the irrigation season, Canada's and the United States' shares were 333 000 dam^3 (270,000 acre-feet) and 201 000 dam^3 (163,000 acre-feet), respectively. During the irrigation season, a total discharge of 341 000 dam^3 (277,000 acre-feet) was recorded at the International Boundary, which was 102 percent of the Canadian share. The computed natural flow during the irrigation season was 75 percent of the average of the previous 100 years of record.

Deficit deliveries were recorded in five (5) of the 16 division periods during the 2003 irrigation season. In accordance with the 2001 Letter of Intent respecting the St. Mary and Milk Rivers streamflow transfers (a copy is available in Annex B of this report) the United States is allowed to accumulate a deficit on the St. Mary River of up to 4,000 cfs-days (9 800 dam^3) (7,940 acre-feet) between March 1 and May 31 of each year which, at the discretion of the United States, may be reduced to no less then 2,000 cfs-days (4 900 dam^3) (3,970 acre-feet) between June 1 and July 15 of each year with surplus deliveries of St. Mary River water. The incurred deficits on the St. Mary and Milk Rivers may be offset and the outstanding deficits as of September 15 will be equalized by October 31 of each year.

For the year 2003, an outstanding deficit of 3 580 dam^3 (2,900 acre-feet) (1,460 cfs-days) remained in the St. Mary River on September 15 after the accumulated Canadian Milk River deficit of 1 720 dam^3 (1,400 acre-feet) (704 cfs-days) was offset against the 5 300 dam^3 (4,300 acre-feet) (2,170 cfs-days) United States deficit outstanding on the St. Mary River. The remaining deficit was completely refunded by end of the irrigation season on October 31.

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 2003*
Quantities in Cubic Decametres

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	CANADA'S SHARE	RECEIVED BY CANADA	RECEIVED BY CANADA	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	12,357	6,178	10,539	4,361	
MAR 16 - MAR 31	15,407	7,703	11,764	4,060	
APR 1 - APR 15	24,194	17,873	14,263		3,610
APR 16 - APR 30	41,496	26,856	27,270	414	
MAY 1 - MAY 15	38,023	25,119	23,246		1,873
MAY 16 - MAY 31	90,841	51,935	55,354	3,419	
JUNE 1 - JUNE 15	116,881	64,549	71,123	6,574	
JUNE 16 - JUNE 30	79,208	45,713	43,998		1,715
JULY 1 - JULY 15	46,736	29,478	31,155	1,677	
JULY 16 - JULY 31	31,720	22,347	22,562	215	
AUG 1 - AUG 15	18,176	13,631	13,230		401
AUG 16 - AUG 31	13,243	9,931	9,645		286
SEP 1 - SEP 15	9,640	7,229	8,618	1,389	
SEP 16 - SEP 30	9,236	6,927	7,130	203	
OCT 1 - OCT 15	6,152	4,615	4,799	184	
OCT 16 - OCT 31	8,452	6,339	9,020	2,681	
TOTAL	561,762	346,423	363,716		

* 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, 2003: 5,483 dam3 (4,445 acre-feet) (2,241 cfs-days)
as of July 15, 2003: 4,938 dam^3 (4,003 acre-feet) (2,018 cfs-days)
as of September 15, 2003: 5,301 dam^3 (4,298 acre-feet) (2,167 cfs-days)

U.S.A. share of Milk River waters outstanding as of September 15, 2003: 1 723 dam^3 (1,397 acre-feet) (704 cfs-days)

Allowable deficit carryovers, as per 2001 Letter of Intent respecting St. Mary-Milk Rivers streamflow transfers, are:
as of May 31, 2003: 9,800 dam^3 (7,940 acre-feet) (4,000 cfs-days)
as of July 15, 2003: 4,900 dam^3 (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 2003*
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	10,018	5,009	8,544	3,535	0
MAR 16 - MAR 31	12,490	6,244	9,537	3,291	0
APR 1 - APR 15	19,614	14,490	11,563	0	2,927
APR 16 - APR 30	33,641	21,772	22,108	336	0
MAY 1 - MAY 15	30,825	20,364	18,846	0	1,518
MAY 16 - MAY 31	73,645	42,104	44,876	2,772	0
JUNE 1 - JUNE 15	94,755	52,330	57,659	5,330	0
JUNE 16 - JUNE 30	64,214	37,060	35,669	0	1,390
JULY 1 - JULY 15	37,889	23,898	25,257	1,360	0
JULY 16 - JULY 31	25,715	18,117	18,291	174	0
AUG 1 - AUG 15	14,735	11,051	10,726	0	325
AUG 16 - AUG 31	10,736	8,051	7,819	0	232
SEP 1 - SEP 15	7,815	5,861	6,987	1,126	0
SEP 16 - SEP 30	7,488	5,616	5,780	165	0
OCT 1 - OCT 15	4,987	3,741	3,891	149	0
OCT 16 - OCT 31	6,852	5,139	7,313	2,173	0
TOTAL	455,421	280,846	294,865		

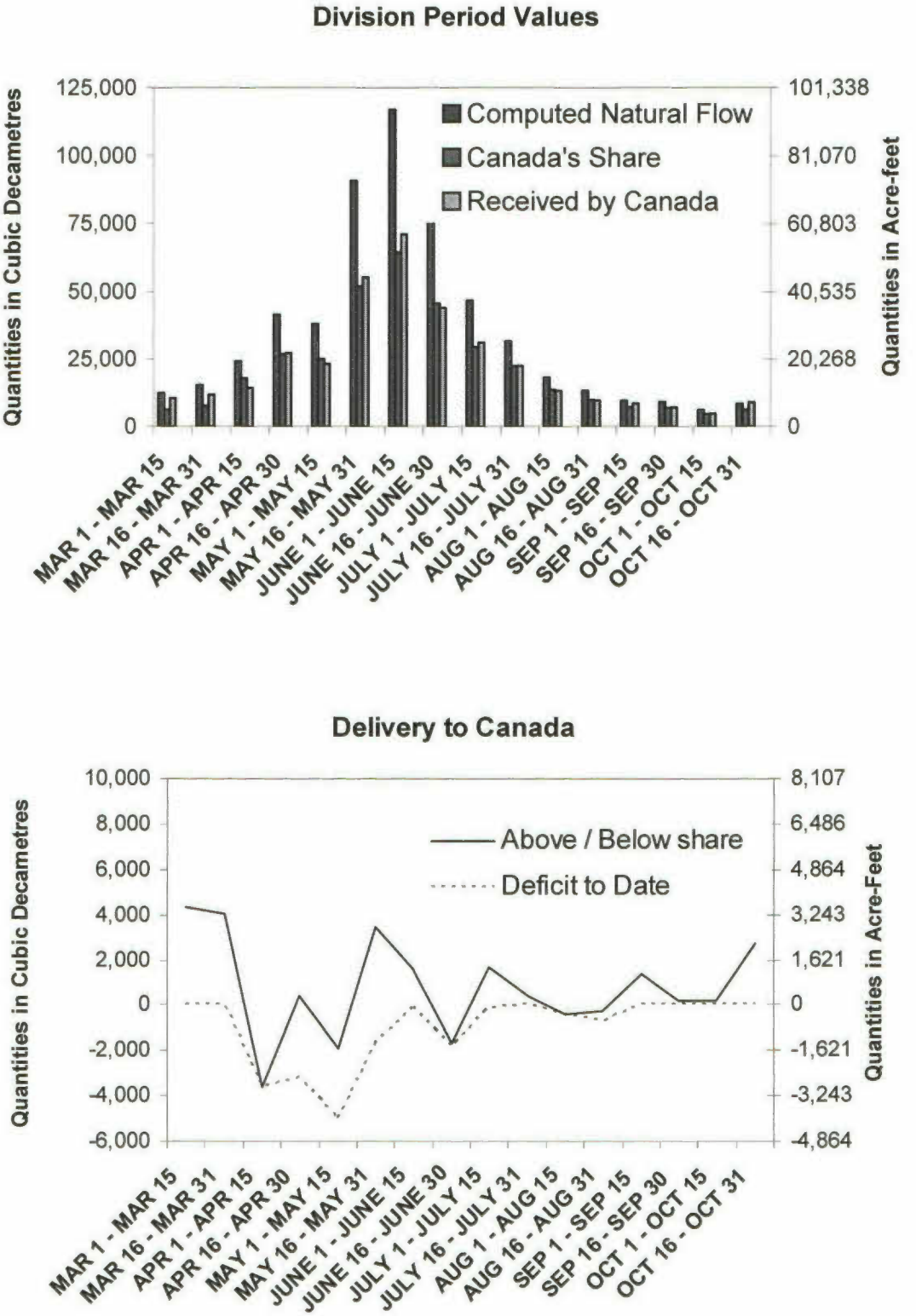
* All values are conversions of data from Table 1. Totals and shares may not add or subtract exactly as a result of rounding.

Note: Canadian share of St. Mary R. waters deficit outstanding
as of May 31, 2003: 4,445 acre-feet (5,483 dam^3) (2,241 cfs-days)
as of July 15, 2003: 4,003 acre-feet (4,938 dam^3) (2,018 cfs-days)
as of September 15, 2003: 4,298 acre-feet (5,301 dam^3) (2,167 cfs-days)

U.S.A. share of Milk River waters outstanding as of September 15, 2003:1,397 acre-feet (1 723 dam^3) (704 cfs-days)

Allowable deficit carryovers, as per 2001 Letter of Intent respecting St. Mary-Milk Rivers streamflow transfers, are:
as of May 31, 2003: 7,940 acre-feet (9,800 dam^3) (4,000 cfs-days)
as of July 15, 2003: 3,970 acre-feet (4,900 dam^3) (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, 2003



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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 2003, evapo-transpiration was estimated using the Onefour pan evaporation data as an index of Morton's model results.

During 2003, the United States' and Canada's respective estimated consumptive uses were 5 050 dam^3 (4,090 acre-feet) and 4 400 dam^3 (3,560 acre-feet). An inter-basin transfer of 760 dam^3 (616 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, 2003 was 97 300 dam^3 (78,900 acre-feet). This flow was 70 percent of the average computed natural flow of the previous 91 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 63 700 dam^3 (51,600 acre-feet) and 33 600 dam^3 (27,200 acre-feet). The United States received 147 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 five (5) of the 16 division periods during the irrigation season. 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 allowed by the 2001 Letter of Intent respecting the St. Mary and Milk Rivers streamflow transfers (a copy of which is available in Annex B of this report) where Canada is allowed to accumulate a deficit on the Milk River of up to 2,000 cfs-days (4 900 dam^3) (3,970 acre-feet) between June 1 and September 15 of each year. The incurred deficits on the St. Mary and Milk Rivers may be offset and the outstanding deficits as of September 15 will be equalized by October 31 of each year.

For the year 2003, the September 15 accumulated Canadian deficit on the Milk River was 1 720 dam^3 (1,400 acre-feet) (704 cfs-days). This deficit was used to offset the 4 900 dam^3 (3,970 acre-feet) (2,000 cfs-days) deficit deliveries accumulated by the United States on the St. Mary River in accordance with the provisions of the 2001 Letter of Intent. No outstanding deficit deliveries occurred during the remainder of the irrigation season.

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 2003* 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	1,519	760	1,520	760	
MAR 16 - MAR 31	35,598	17,799	35,606	17,807	
APR 1 - APR 15	10,617	7,963	10,618	2,655	
APR 16 - APR 30	13,148	9,861	13,150	3,289	
MAY 1 - MAY 15	8,807	6,605	8,861	2,256	
MAY 16 - MAY 31	8,359	6,270	7,384	1,114	
JUNE 1 - JUNE 15	6,012	4,509	5,162	653	
JUNE 16 – JUNE 30	4,557	3,418	4,389	971	
JULY 1 - JULY 15	1,796	1,347	1,318		29
JULY 16 – JULY 31	404	303	0		467
AUG 1 - AUG 15	457	343	0		365
AUG 16 - AUG 31	127	95	0		548
SEP 1 - SEP 15	192	144	0		315
SEP 16 - SEP 30	3,228	2,421	3,228	807	
OCT 1 - OCT 15	1,512	1,134	1,512	378	
OCT 16 - OCT 31	929	697	929	232	
TOTAL	97,263	63,668	93,678		

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

Note:
U.S.A. share of Milk River waters deficit outstanding
as of September 15, 2003: 1 723 dam^3 (1,397 acre-feet) (704 cfs-days)

Canadian share of St. Mary R. waters deficit outstanding
as of May 31, 2003: 5 483 dam^3 (4,445 acre-feet) (2,241 cfs-days)

Allowable deficit carryover from June 1 and September 15 as per 2001 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 dam^3 (2,000 cfs-days) (3,970 acre-feet), whichever is less.

Table 2A: Summary of Milk River Division for 2003*
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	1,232	616	1,232	616	
MAR 16 - MAR 31	28,859	14,430	28,866	14,436	
APR 1 - APR 15	8,607	6,455	8,608	2,152	
APR 16 - APR 30	10,659	7,995	10,661	2,667	
MAY 1 - MAY 15	7,140	5,355	7,184	1,829	
MAY 16 - MAY 31	6,777	5,083	5,986	903	
JUNE 1 - JUNE 15	4,874	3,655	4,185	530	
JUNE 16 - JUNE 30	3,694	2,771	3,558	787	
JULY 1 - JULY 15	1,456	1,092	1,069		23
JULY 16 - JULY 31	328	246	0		379
AUG 1 - AUG 15	371	278	0		296
AUG 16 - AUG 31	103	77	0		444
SEP 1 - SEP 15	155	116	0		255
SEP 16 - SEP 30	2,617	1,963	2,617	654	
OCT 1 - OCT 15	1,226	919	1,226	306	
OCT 16 - OCT 31	753	565	753	188	
TOTAL	78,851	51,616	75,945		

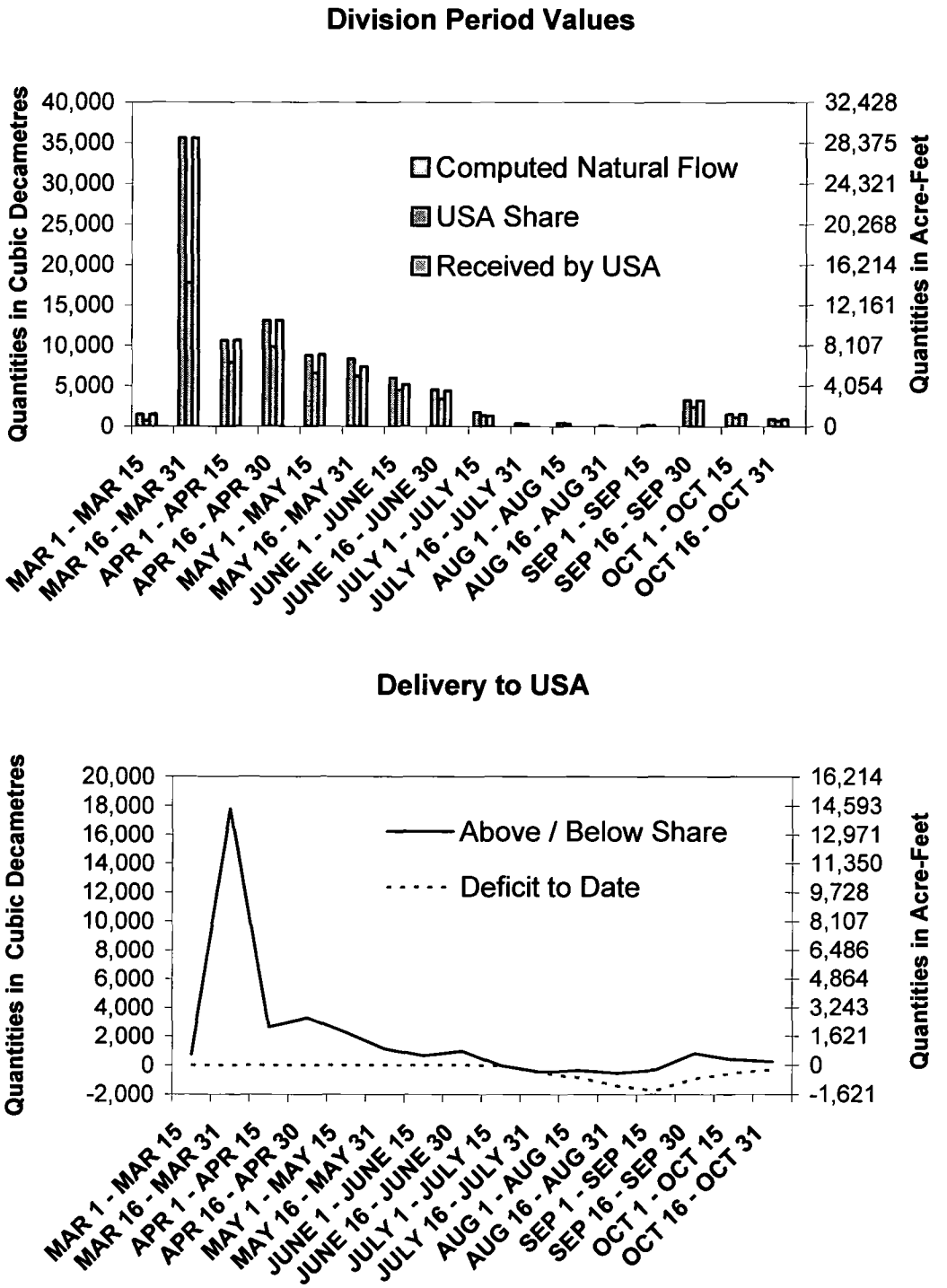
* All values are conversions of data from Table 2. Totals and shares may not add or subtract exactly as a result of rounding.

Note:
U.S.A. share of Milk River waters deficit outstanding
as of September 15, 2003: 1,397 acre-feet (1 723 dam³) (704 cfs-days)

Canadian share of St. Mary R. waters deficit outstanding
as of May 31, 2003: 4,445 acre-feet (5 483 dam³) (2,241 cfs-days)

Allowable deficit carryover from June 1 and September 15 as per 2001 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 dam^3 (2,000 cfs-days) (3,970 acre-feet), whichever is less.

Figure 2. Milk River Division, 2003



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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 2003.

Flows for March through October 2003 for the southern tributaries were as follows:

- Bear Creek near International Boundary – 1 460 dam^3 (1,180 acre-feet).
- Miners Coulee near International Boundary – 582 dam^3 (472 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 (station 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 1320 dam^3 (1,070 ac-ft) were recorded on Lyons Creek for the year 2003.

The 2003 season began with light to moderate snow cover and excellent soil moisture conditions due to above average rainfall in 2002. The Lodge and Middle Creek Reservoirs varied from low to moderate water levels. Huff and Newton lakes were still spilling although Cypress Lake was below dead storage elevation.

Warm weather in mid March brought on a fairly quick thaw. Good stream flows were recorded in all three drainage basins. The capacities of the Lodge and Middle Creek reservoirs increased and Cypress Lake filled to slightly above the dead storage elevation. Eastend Reservoir filled and all water spilled down the Frenchman River was passed through Huff and Newton lakes. A decision to leave the gate open at Jaydot Reservoir was made early in the season, causing the reservoir to drain. It remained open throughout the calendar year.

Average to above average rainfall occurred through spring into early summer. Rainfall ceased by mid June and the summer period through to September was very hot and dry, significantly reducing all stream flows. Conditions remained dry right into the winter period. Average to above average snow fell over all three basins from October to December.

A major rebuild of Bare Creek Reservoir dam began in the summer of 2003. The reservoir was drawn down to facilitate construction, which will likely also impact 2004 operations, as cold temperatures during the fall and winter prevented completion of the work.

Irrigations took place in all three basins. The Frenchman River and Lodge Creek basins had two irrigations each and there was a single irrigation in the Battle Creek basin again assisted by pumping from Cypress Lake. Reservoir capacities still remained fair following irrigation except for Cypress Lake which was back to below dead storage level.

Small deficits occurred in all three basins during the summer. A small deficit remained at season end in the Lodge Creek basin. The Battle Creek deficit was refunded in late summer from natural flow in the basin. The deficit in the Frenchman River basin was refunded in the first week of November by a late October release from Newton Lake.

Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins
Month-End Contents: 2002, 2003, and 1993-2002 Mean

Figure 3a. Altawan Reservoir

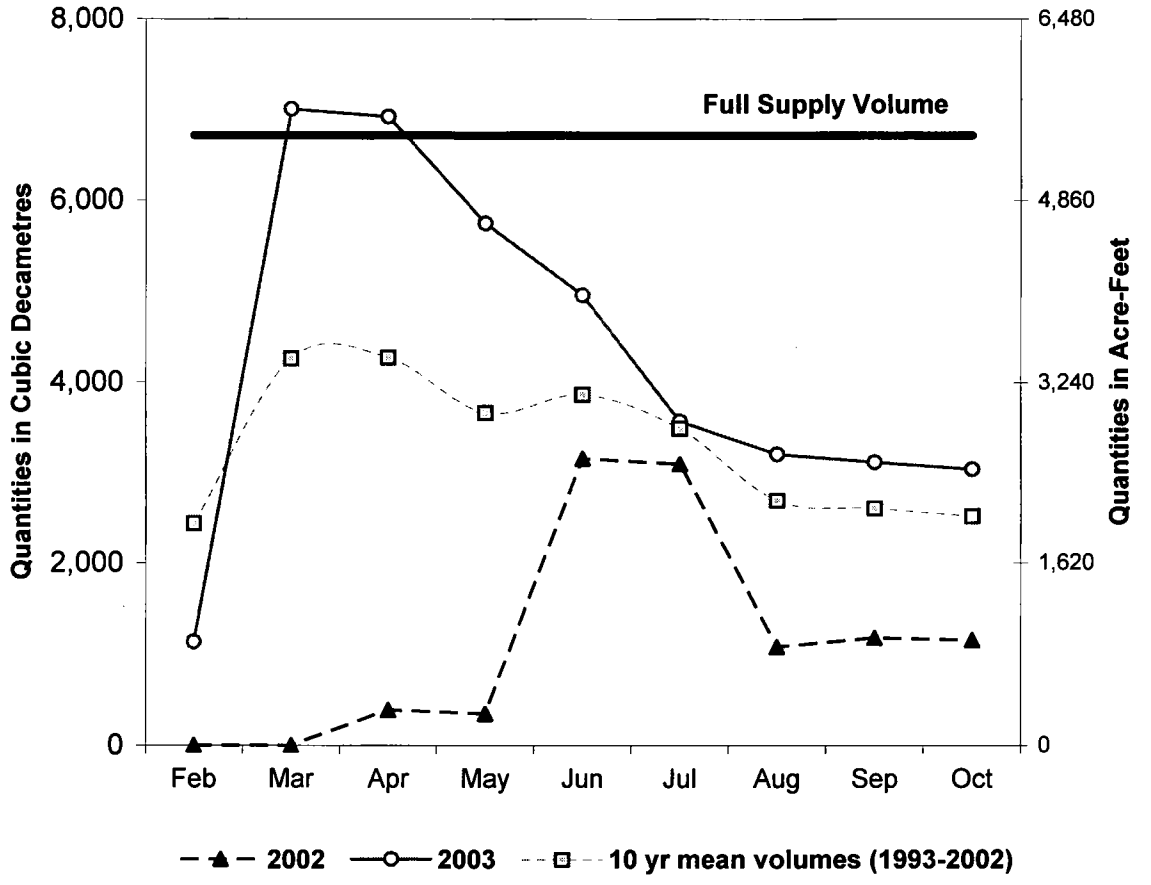


Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins
Month-End Contents: 2002, 2003, and 1993-2002 Mean

Figure 3b. Cypress Lake

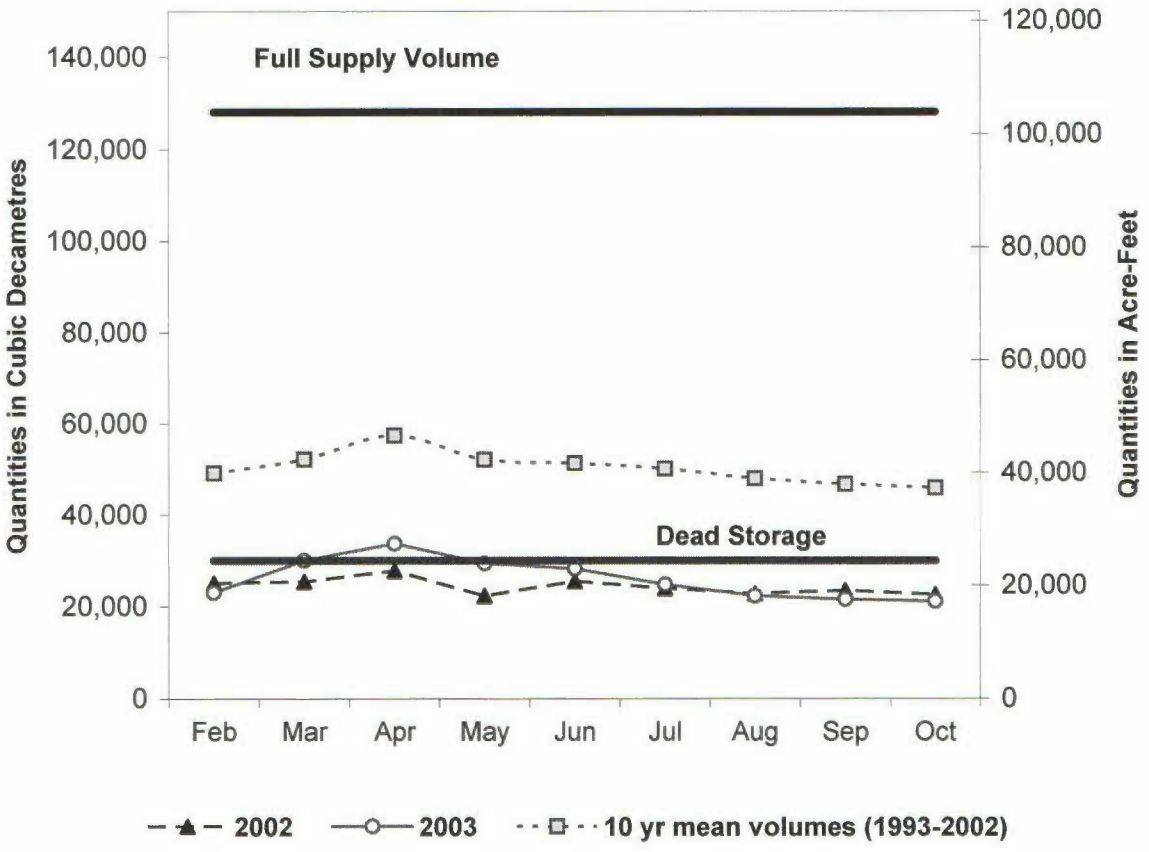


Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins
Month-End Contents: 2002, 2003, and 1993-2002 Mean

Figure 3c. Eastend Reservoir

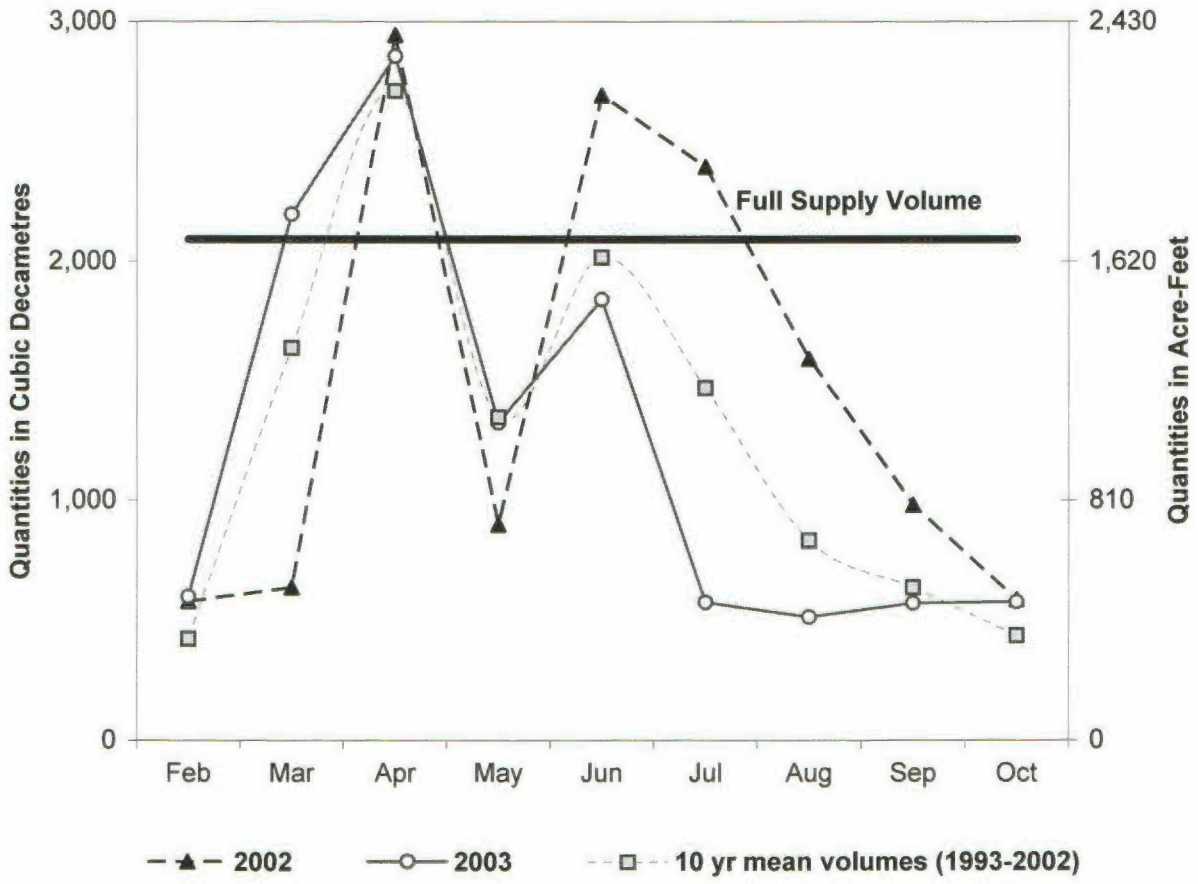


Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins
Month-End Contents: 2002, 2003, and 1993-2002 Mean

Figure 3d. Huff Lake

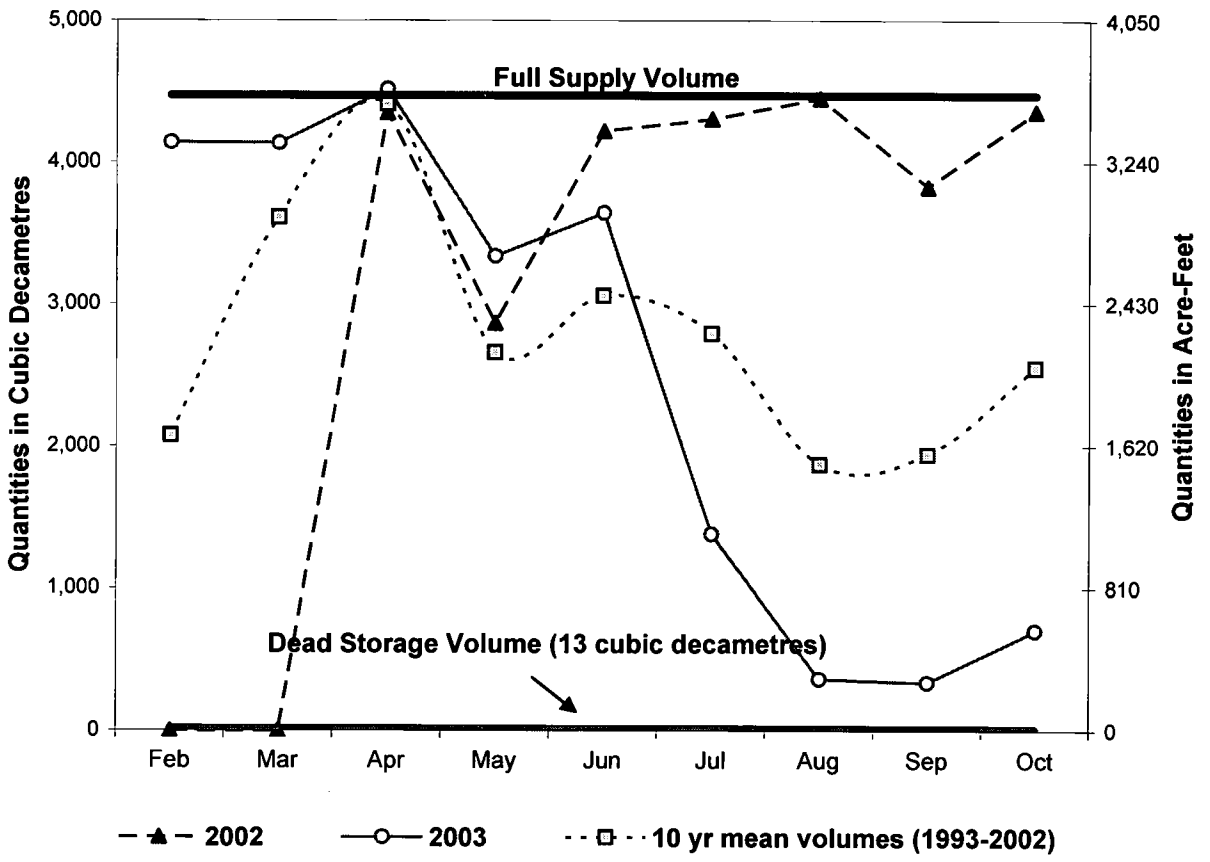
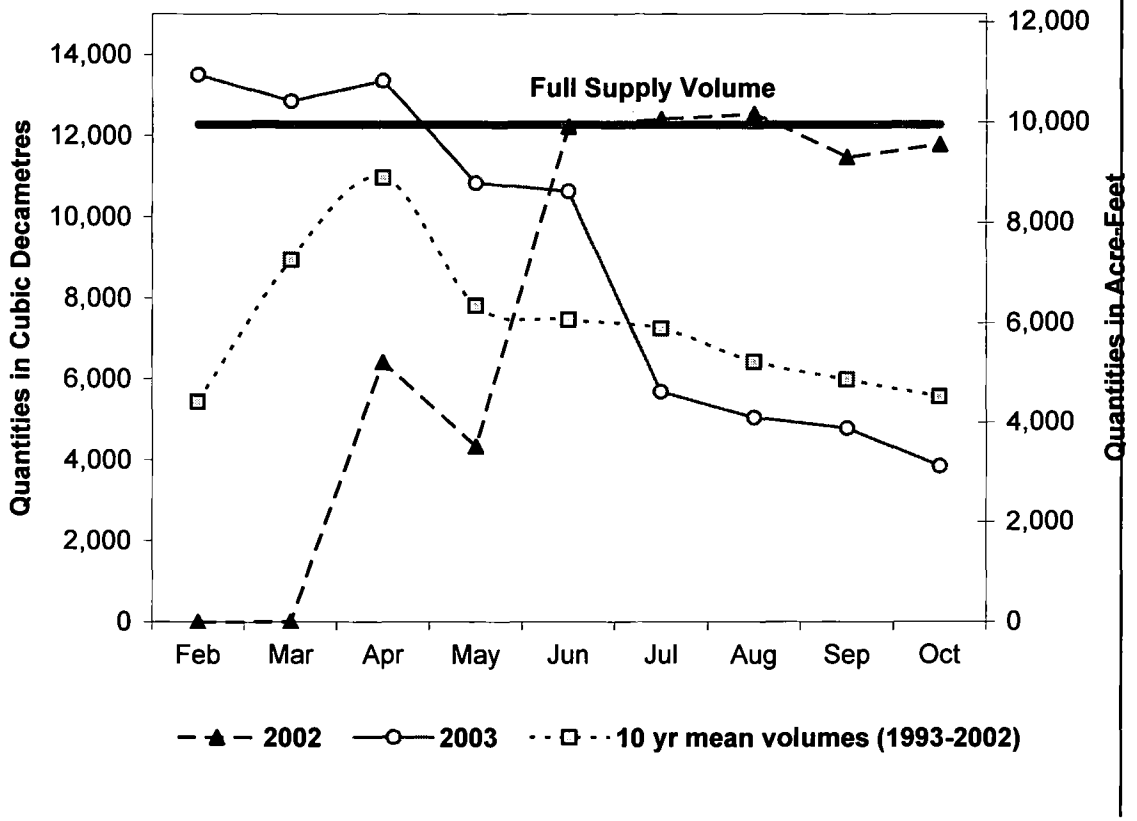


Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins
Month-End Contents: 2002, 2003, and 1993-2002 Mean

Figure 3e. Newton Lake



LODGE CREEK

The computed natural flow of Lodge Creek at the International Boundary from March 1 to October 31, 2003 was 21 300 dam^3 (17,300 acre-feet). This volume is 68 percent of the average natural flow of the previous 53 years of record. Each country is entitled to 50 percent of the natural flow or 10 650 dam^3 (8,650 acre-feet) for the irrigation season. A total of 12 700 dam^3 (10,300 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 for three (3) of the 16 division periods during the irrigation season. An outstanding deficit of 69 dam^3 (56 acre-feet) remained at the end of October 2003.

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 2003*
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	1	1	0	
MAR 16 – MAR 31	15,394	7,697	7,473		224
APR 1 - APR 15	1,858	929	1,414	485	
APR 16 - APR 30	1,782	891	1,821	930	
MAY 1 - MAY 15	1,201	600	1,091	491	
MAY 16 – MAY 31	810	405	769	364	
JUNE 1 - JUNE 15	61	30	48	18	
JUNE 16 - JUNE 30	173	87	28		59
JULY 1 - JULY 15	41	20	4		16
JULY 16 – JULY 31	0	0	1	1	
AUG 1 - AUG 15	0	0	1	1	
AUG 16 - AUG 31	2	1	2	1	
SEP 1 - SEP 15	1	1	1	0	
SEP 16 - SEP 30	2	1	2	1	
OCT 1 - OCT 15	0	0	2	2	
OCT 16 - OCT 31	3	1	3	2	
TOTAL	21,329	10,664	12,661		

* 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.

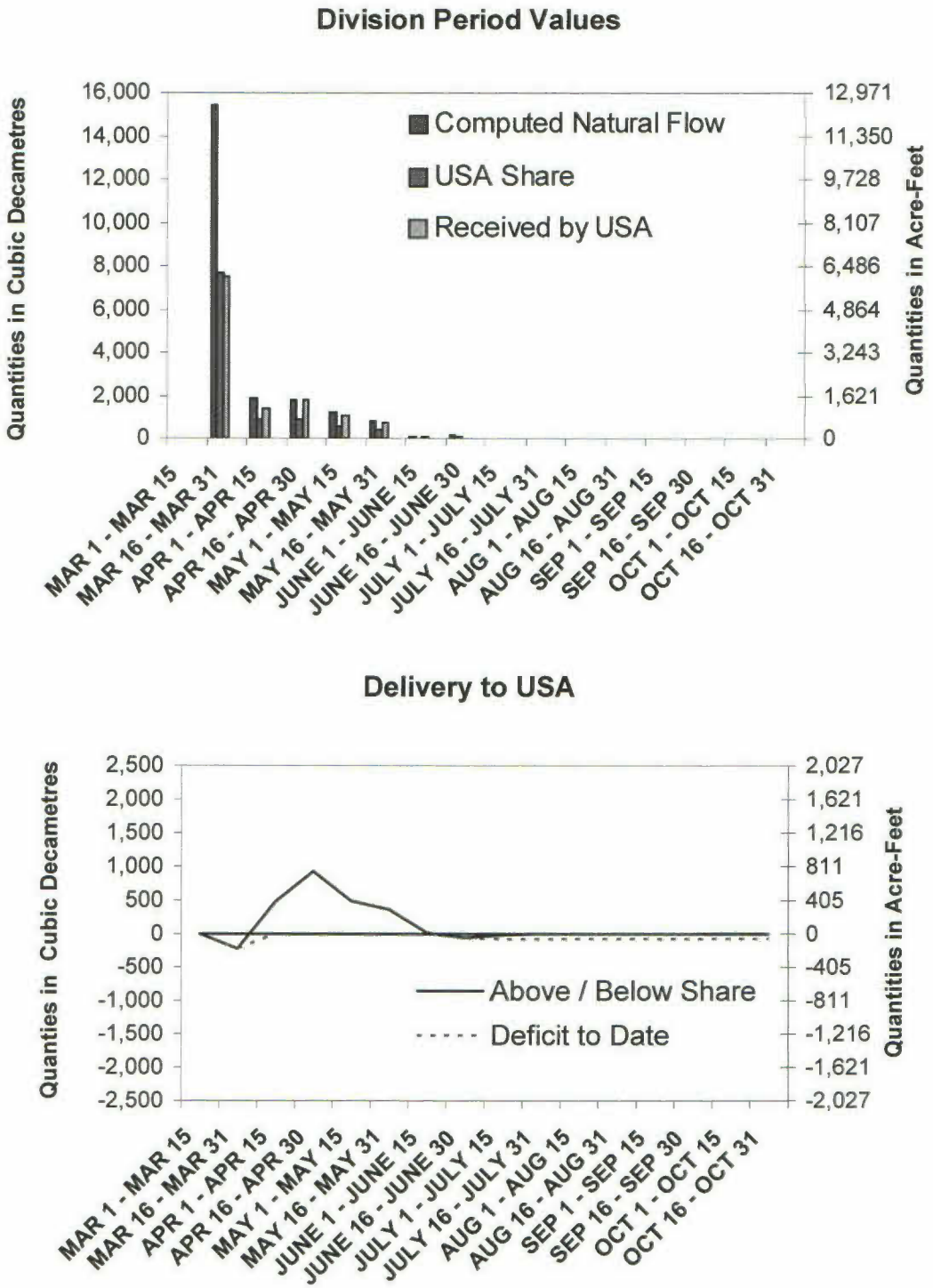
Table 3A: Summary of Lodge Creek Division for 2003* Quantities in Acre-Feet

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	1	1	0	
MAR 16 - MAR 31	12,480	6,240	6,058		182
APR 1 - APR 15	1,506	753	1,146	393	
APR 16 - APR 30	1,445	722	1,476	754	
MAY 1 - MAY 15	973	486	884	398	
MAY 16 - MAY 31	657	328	624	295	
JUNE 1 - JUNE 15	49	24	39	14	
JUNE 16 - JUNE 30	140	71	22		48
JULY 1 - JULY 15	33	16	3		13
JULY 16 - JULY 31	0	0	1	1	
AUG 1 - AUG 15	0	0	1	1	
AUG 16 - AUG 31	1	1	1	1	
SEP 1 - SEP 15	1	1	1	0	
SEP 16 - SEP 30	2	1	2	1	
OCT 1 - OCT 15	0	0	2	2	
OCT 16 - OCT 31	2	1	2	2	
TOTAL	17,292	8,645	10,264		

* 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, 2003



BATTLE CREEK

The computed natural flow of Battle Creek at the International Boundary from March 1 to October 31, 2003, was 27 300 dam^3 (22,100 acre-feet). This volume is 90 percent of the average natural flow of the previous 63 years of record. Each country is entitled to 50 percent of the natural flow i.e., 13 650 dam^3 (11,100 acre-feet). A total of 15 600 dam^3 (12,700 acre-feet) was recorded at Battle Creek at International Boundary (station 11AB027) from March 1 to October 31.

Deficit deliveries were recorded in three (3) of the 16 division periods during the irrigation season. All deficit deliveries were refunded by the end 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, both in Appendix A.

Table 4: Summary of Battle Creek Division for 2003* 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	8,111	4,056	4,943	887	
MAR 26 - APR 9	5,510	2,755	2,133		622
APR 10 - APR 24	4,132	2,066	2,442	376	
APR 25 – MAY 9	1,889	944	951	7	
MAY 10 - MAY 25	3,022	1,511	2,044	533	
MAY 26 - JUNE 9	1,631	815	1,158	343	
JUNE 10 - JUNE 24	1,425	712	558		154
JUNE 25 - JULY 9	394	197	344	147	
JULY 10 - JULY 25	269	135	232	97	
JULY 26 – AUG 9	27	13	19	6	
AUG 10 - AUG 25	20	10	12	2	
AUG 26 - SEP 9	12	6	2		4
SEP 10 - SEP 24	40	20	31	11	
SEP 25 - OCT 9	334	167	325	158	
OCT 10 - OCT 25	333	166	321	155	
OCT 26 - OCT 31	126	63	123	60	
TOTAL	27,276	13,636	15,639		

* 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.

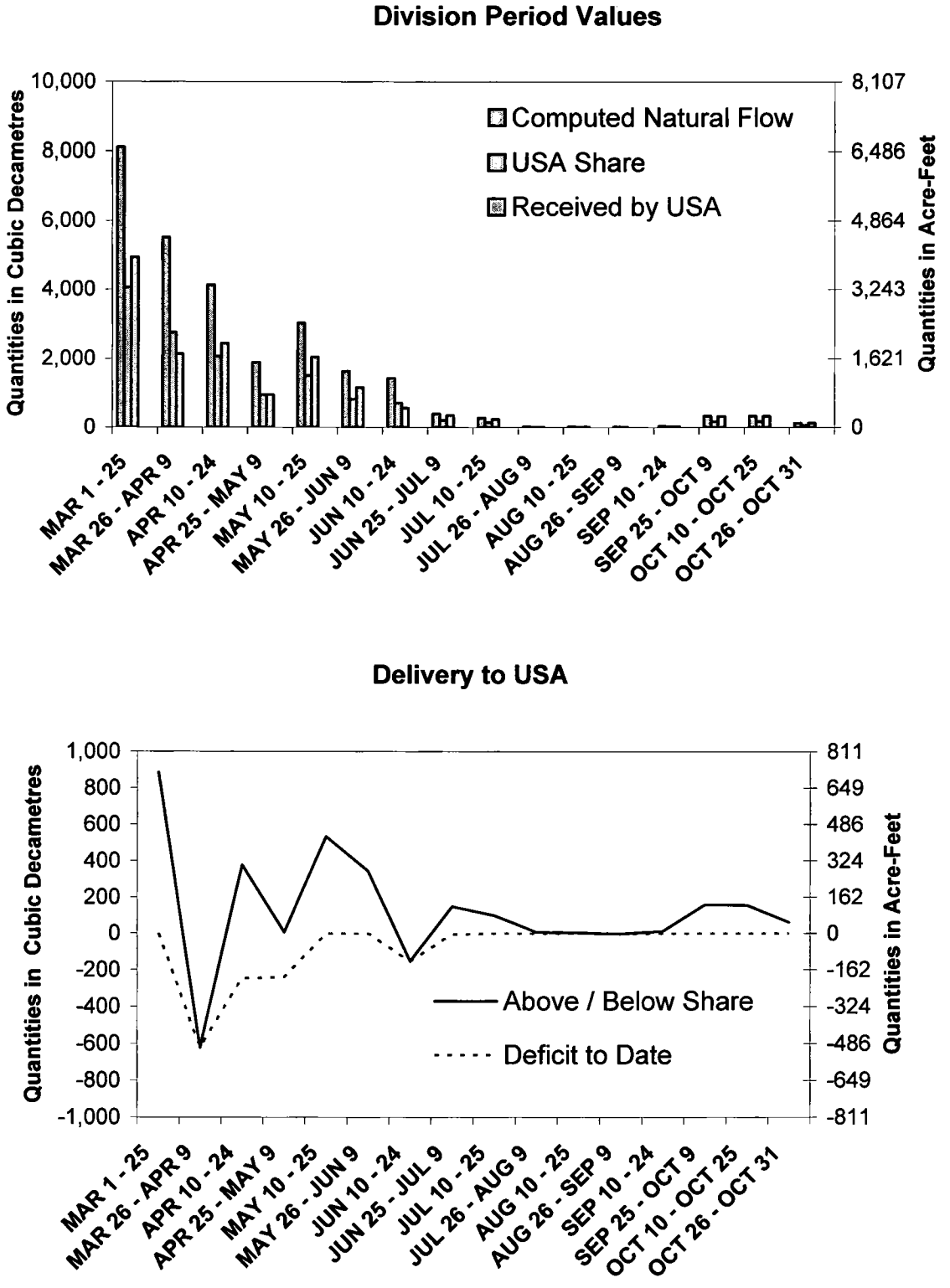
Table 4A: Summary of Battle Creek Division for 2003* Quantities in Acre-Feet

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	6,576	3,288	4,007	719	
MAR 26 - APR 9	4,467	2,233	1,729		504
APR 10 - APR 24	3,350	1,675	1,980	305	
APR 25 - MAY 9	1,531	765	771	5	
MAY 10 - MAY 25	2,450	1,225	1,657	432	
MAY 26 - JUNE 9	1,322	661	939	278	
JUNE 10 - JUNE 24	1,155	577	452		125
JUNE 25 - JULY 9	320	160	279	119	
JULY 10 - JULY 25	218	109	188	79	
JULY 26 - AUG 9	22	11	15	5	
AUG 10 - AUG 25	16	8	10	2	
AUG 26 - SEP 9	10	5	2		3
SEP 10 - SEP 24	33	16	25	9	
SEP 25 - OCT 9	271	135	263	128	
OCT 10 - OCT 25	270	135	261	126	
OCT 26 - OCT 31	102	51	100	49	
TOTAL	22,112	11,055	12,678		

* 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, 2003



FRENCHMAN RIVER

The computed natural flow of the Frenchman River at the International Boundary from March 1 to November 5, 2003[1], was 65 500 dam^3 (53,100 acre-feet). This volume of natural flow is 83 percent of the average natural flow of the previous 63 years of record. Each country is entitled to 50 percent of the natural flow, i.e., 32 800 dam^3 (26,600 acre-feet). A total flow of 56 200 dam^3 (45,600 acre-feet) was recorded at Frenchman River at International Boundary (station 11AC041) from March 1 to November 5.

Deficit deliveries were recorded in three (3) of 16 division periods during the irrigation season. All deficit deliveries were refunded by November 5, 2003.

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.

[1]The normal season ending date is October 31 but was extended to November 5 for 2003, to allow for refunding of deficit deliveries, by agreement of the Field Representatives.

Table 5: Summary of Frenchman River Division for 2003* 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	171	85	251	166	
MAR 16 - MAR 31	38,874	19,437	35,735	16,298	
APR 1 - APR 15	8,237	4,119	6,612	2,493	
APR 16 - APR 30	6,433	3,217	4,585	1,368	
MAY 1 - MAY 15	4,783	2,392	4,218	1,826	
MAY 16 - MAY 31	3,232	1,616	1,771	155	
JUNE 1 - JUNE 15	2,074	1,037	1,007		30
JUNE 16 - JUNE 30	962	481	137		344
JULY 1 - JULY 15	357	179	328	149	
JULY 16 - JULY 31	111	56	799	743	
AUG 1 - AUG 15	165	82	381	299	
AUG 16 - AUG 31	2	1	2	1	
SEP 1 - SEP 15	0	0	0	0	
SEP 16 - SEP 30	0	0	0	0	
OCT 1 - OCT 15	73	37	0		37
OCT 16 – NOV 5[1]	68	34	379	345	
TOTAL	65,542	32,773	56,205		

* 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.

[1]The normal season ending date is October 31 but was extended to November 5 for 2003, to allow for refunding of deficit deliveries, by agreement of the Field Representatives.

Table 5A: Summary of Frenchman River Division for 2003* Quantities in Acre-Feet

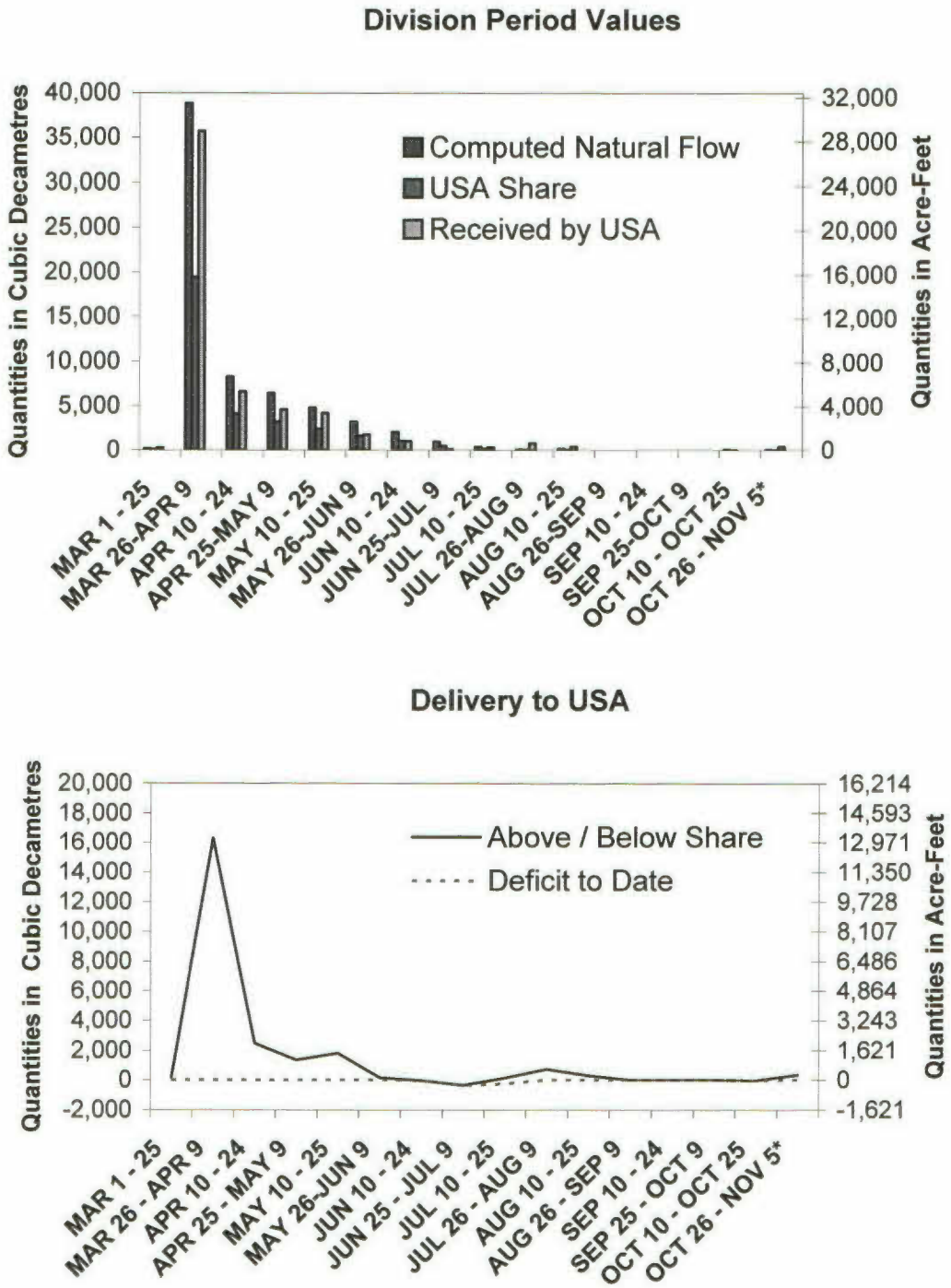
DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	139	69	203	135	
MAR 16 - MAR 31	31,515	15,758	28,970	13,213	
APR 1 - APR 15	6,678	3,339	5,360	2,021	
APR 16 - APR 30	5,215	2,608	3,717	1,109	
MAY 1 - MAY 15	3,878	1,939	3,420	1,480	
MAY 16 - MAY 31	2,620	1,310	1,436	126	
JUNE 1 - JUNE 15	1,681	841	816		24
JUNE 16 - JUNE 30	780	390	111		279
JULY 1 - JULY 15	289	145	266	121	
JULY 16 - JULY 31	90	45	648	602	
AUG 1 - AUG 15	134	66	309	242	
AUG 16 - AUG 31	2	1	2	1	
SEP 1 - SEP 15	0	0	0	0	
SEP 16 - SEP 30	0	0	0	0	
OCT 1 - OCT 15	59	30	0		30
OCT 16 – NOV 5[1]	55	28	307	280	
TOTAL	53,135	26,569	45,565		

* All values are conversions of data from Table 5.

Totals and shares may not add or subtract exactly as a result of rounding.

[1]The normal season ending date is October 31 but was extended to November 5 for 2003, to allow for refunding of deficit deliveries, by agreement of the Field Representatives.

Figure 6. Frenchman River Division, 2003



*The normal season ending date is October 31 but was extended to November 5 for 2003, to allow for refunding of deficit deliveries, by agreement of the Field Representatives.

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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 dam^3) 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 dam^3) 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 dam^3) 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 dam^3). Deficit deliveries greater than the allowed cumulative total of 4,000 cfs-days (9 800 dam^3) 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 dam^3), 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 dam^3) 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 dam^3) 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 dam^3). Deficit deliveries greater than the allowed total of 2,000 cfs-days (4 900 dam^3) 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 dam^3) 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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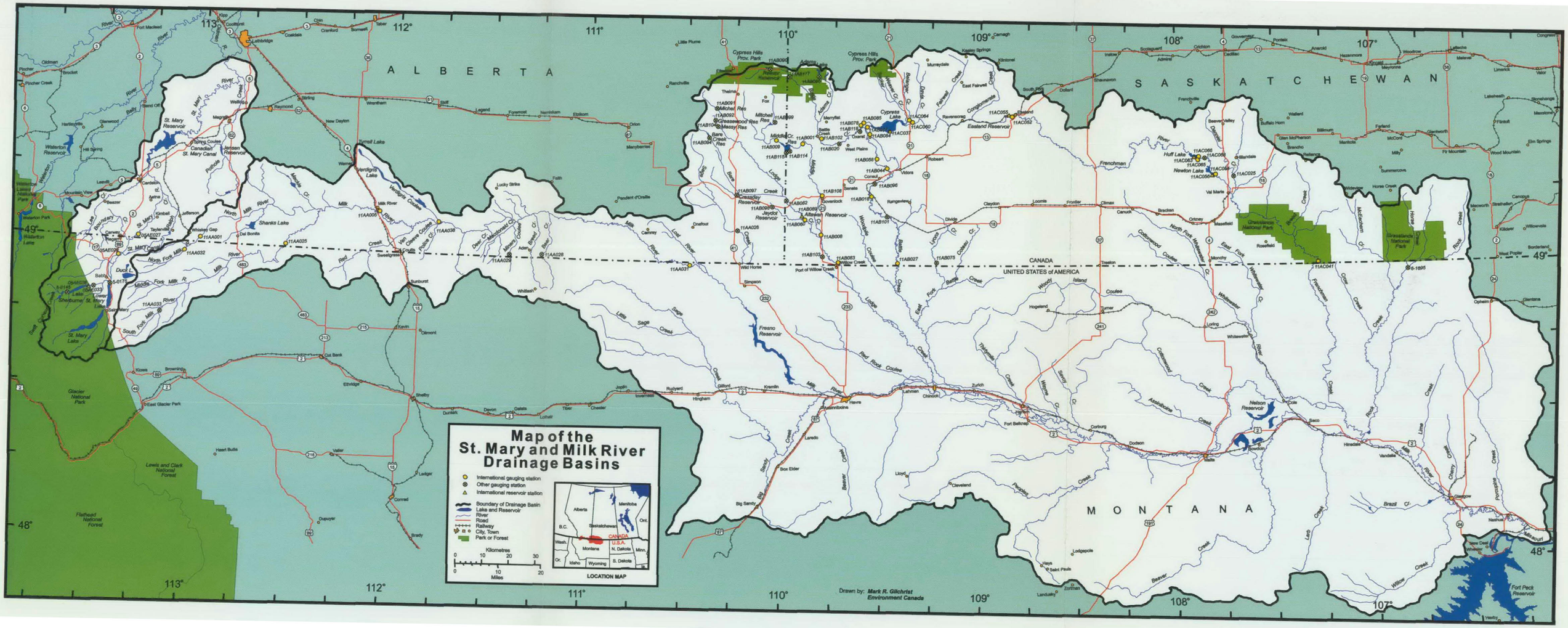
INTERNATIONAL GAUGING STATIONS OPERATED JOINTLY
BY
THE UNITED STATES AND CANADA
ST. MARY AND MILK RIVER BASINS
2003

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
2003

*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
0 10 20
Miles
LOCATION MAP
Alberta
Saskatchewan
Manitoba
Ont.
B.C.
CANADA
U.S.A.
Wash.
Montana
N. Dakota
Minn.
Or.
Idaho
Wyoming
S. Dakota
ALBERTA
SASKATCHEWAN
MONTANA
CANADA
UNITED STATES of AMERICA
Drawn by: Mark R. Gilchrist
Environment Canada

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

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2003

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