

Report to

**THE INTERNATIONAL JOINT COMMISSION**

On

**THE DIVISION OF THE WATERS OF**

**THE ST. MARY AND MILK RIVERS**

**2005**



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**Cover Photo:**

St. Mary River at International Boundary, looking west towards Chief Mountain,  
December, 2005.

*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 2005**

**Submitted By**

**William J. Carswell, Jr.**

**Representing the United States**

**And**

**Timothy Goos**

**Representing Canada**

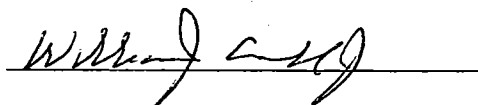
March 2006

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

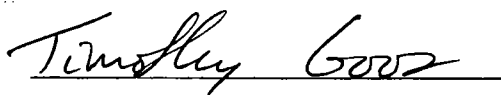
Commissioners:

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, 2005.

Respectfully submitted,

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

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

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

Timothy Goos  
Accredited Officer of Her Majesty

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## **SYNOPSIS**

During the 2005 irrigation season the natural flows of the St. Mary River were 83 percent and of the Milk River 54 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, 2005, was 592 000 cubic decametres ( $\text{dam}^3$ ) (480,000 acre-feet). Under the terms of the Boundary Waters Treaty, the Canadian share was 369 000  $\text{dam}^3$  (299,000 acre-feet). The total flow recorded at the International Boundary during the irrigation season was 106 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, 2005, was 73 300  $\text{dam}^3$  (59,400 acre-feet). Under terms of the Treaty, the United States' allotment was 51 200  $\text{dam}^3$  (41,500 acre-feet). The United States received 135 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 23 percent of the individual long-term average for the Lodge Creek at the International Boundary, 59 percent for the Battle Creek at the International Boundary, and 49 percent for the Frenchman River at the International Boundary.

The annual meeting of the Field Representatives was held at Helena, Montana, on February 17, 2006. Mutual problems, future plans, and changes in computational procedures were discussed and a schedule of field operations for 2006 was adopted.

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### **MAP**

Map of St. Mary and Milk River Drainage Basins

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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 2005 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 the Accredited Officer of Her Majesty, was represented in the field by Mr. R.G. Boals, Chief, Water Survey Division, Prairie and Northern Region. Mr. Robert M. Hirsch, United States Geological Survey, as the 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, Water Survey 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 17, 2006. Mutual concerns, future plans, and changes in computational procedures were discussed and a schedule of field operations for 2006 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 31 500 dam<sup>3</sup> (25,500 acre-feet) on October 31, 2004. Storage increased to 62 800 dam<sup>3</sup> (50,900 acre-feet) on March 26, 2005, when the 2005 irrigation season releases began. Maximum storage was 75 700 dam<sup>3</sup> (61,400 acre-feet) on July 5, 2005 and storage decreased to 37 900 dam<sup>3</sup> (30,700 acre-feet) by the end of the irrigation season on October 31, 2005. The minimum storage occurred on September 10, 2005 when the contents of Lake Sherburne lowered to 10 500 dam<sup>3</sup> (8,510 acre-feet).

Water was initially diverted for two days from the St. Mary River into the Milk River via the St. Mary Canal March 27 and March 28. Diversion resumed on March 31 until the final seasonal closure of the canal on September 16, 2005. The total flow recorded at the gauging station on the St. Mary Canal at St. Mary Crossing (station 05AE029) was 226 000 dam<sup>3</sup> (183,000 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, 2004 to October 31, 2005 was 712 000 dam<sup>3</sup> (577,000 acre-feet) of which 592 000 dam<sup>3</sup> (480,000 acre-feet) occurred during the irrigation season, April 1 to October 31, 2005. For the irrigation season, Canada's and the United States' shares were 369 000 dam<sup>3</sup> (299,000 acre-feet) and 223 000 dam<sup>3</sup> (181,000 acre-feet), respectively. During the irrigation season, a total discharge of 390 000 dam<sup>3</sup> (317,000 acre-feet) was recorded at the International Boundary, which was 106 percent of the Canadian share. The computed natural flow during the irrigation season was 83 percent of the average of the previous 102 years of record.

Deficit deliveries were recorded in five (5) of the 16 division periods during the 2005 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<sup>3</sup>) (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 than 2,000 cfs-days (4 900 dam<sup>3</sup>) (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 2005, the outstanding deficit to Canada of 4 900 dam<sup>3</sup> (3,970 acre-feet) remaining on the St. Mary River as of September 15 was partially balanced by a deficit of 826 dam<sup>3</sup> (670 acre-feet) which remained to the United States on the Milk River. The outstanding deficit on the St. Mary River was repaid by October 11, 2005.

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 2005\***  
**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	7,092	3,546	5,296	1,750	
MAR 16 - MAR 31	7,464	3,732	6,857	3,125	
APR 1 - APR 15	9,820	7,366	6,168		1,198
APR 16 - APR 30	19,514	14,298	10,510		3,788
MAY 1 - MAY 15	40,333	26,267	21,463		4,804
MAY 16 - MAY 31	78,299	45,667	44,640		1,027
JUNE 1 - JUNE 15	126,360	69,289	85,557	16,268	
JUNE 16 - JUNE 30	78,282	45,250	44,870		380
JULY 1 - JULY 15	52,916	32,566	33,016	450	
JULY 16 - JULY 31	30,972	21,780	22,137	357	
AUG 1 - AUG 15	17,660	13,245	13,298	53	
AUG 16 - AUG 31	15,945	11,958	12,008	50	
SEP 1 - SEP 15	16,574	12,203	18,473	6,270	
SEP 16 - SEP 30	14,903	11,177	11,997	820	
OCT 1 - OCT 15	50,738	31,478	37,244	5,766	
OCT 16 - OCT 31	39,206	26,119	29,062	2,943	
TOTAL	606,078	375,941	402,596		

\* 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, 2005: 10 817 dam<sup>3</sup> (8,769 acre-feet) (4,421 cfs-days)  
as of July 15, 2005: 4 900 dam<sup>3</sup> (3,970 acre-feet) (2,000 cfs-days)  
as of September 15, 2005: 4 900 dam<sup>3</sup> (3,970 acre-feet) (2,000 cfs-days)

U.S.A. share of Milk River waters outstanding as of September 15, 2005: 826 dam<sup>3</sup> (670 acre-feet) (338 cfs-days)

Allowable deficit carryovers, as per 2001 Letter of Intent respecting St. Mary-Milk Rivers streamflow transfers, are:

as of May 31, 2005: 9 800 dam<sup>3</sup> (7,940 acre-feet) (4,000 cfs-days)  
as of July 15, 2005: 4 900 dam<sup>3</sup> (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 2005\***  
**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	5,749	2,875	4,293	1,419	
MAR 16 - MAR 31	6,051	3,026	5,559	2,533	
APR 1 - APR 15	7,961	5,972	5,000		971
APR 16 - APR 30	15,820	11,591	8,520		3,071
MAY 1 - MAY 15	32,698	21,295	17,400		3,895
MAY 16 - MAY 31	63,477	37,022	36,190		833
JUNE 1 - JUNE 15	102,440	56,173	69,361	13,188	
JUNE 16 - JUNE 30	63,463	36,684	36,376		308
JULY 1 - JULY 15	42,899	26,401	26,766	365	
JULY 16 - JULY 31	25,109	17,657	17,946	289	
AUG 1 - AUG 15	14,317	10,738	10,781	43	
AUG 16 - AUG 31	12,927	9,694	9,735	41	
SEP 1 - SEP 15	13,437	9,893	14,976	5,083	
SEP 16 - SEP 30	12,082	9,061	9,726	665	
OCT 1 - OCT 15	41,133	25,519	30,194	4,675	
OCT 16 - OCT 31	31,784	21,175	23,561	2,386	
TOTAL	491,347	304,776	326,384		

\* 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, 2005: 8,769 acre-feet (10 817 dam<sup>3</sup>) (4,420 cfs-days)

as of July 15, 2005: 3,970 acre-feet (4 900 dam<sup>3</sup>) (2,000 cfs-days)

as of September 15, 2005: 3,970 acre-feet (4 900 dam<sup>3</sup>) (2,000 cfs-days)

U.S.A. share of Milk River waters outstanding as of September 15, 2005: 670 acre-feet (826 dam<sup>3</sup>) (338 cfs-days)

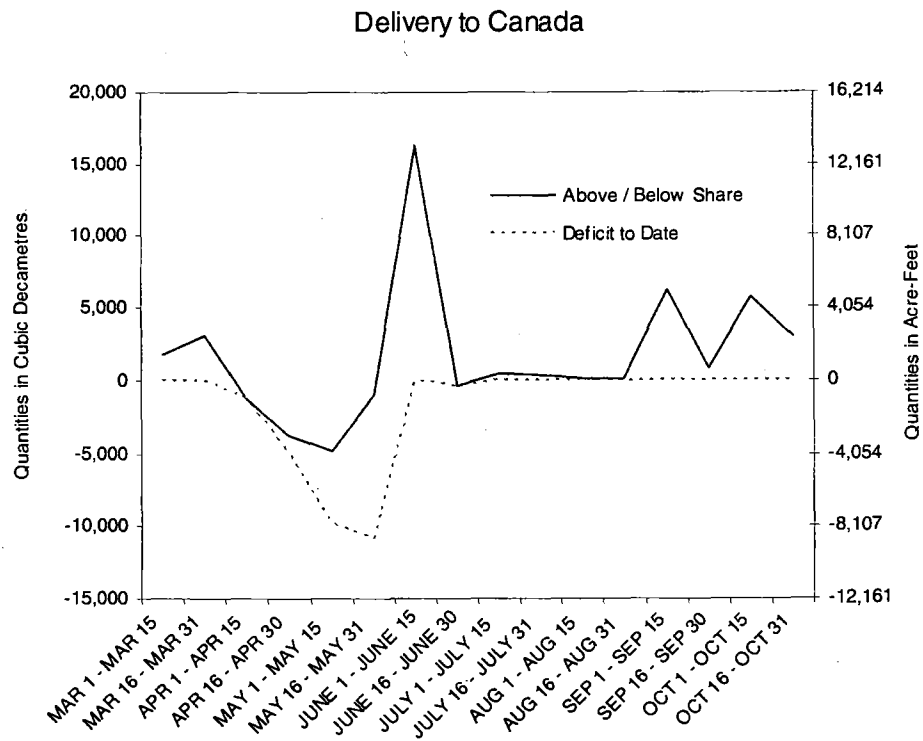
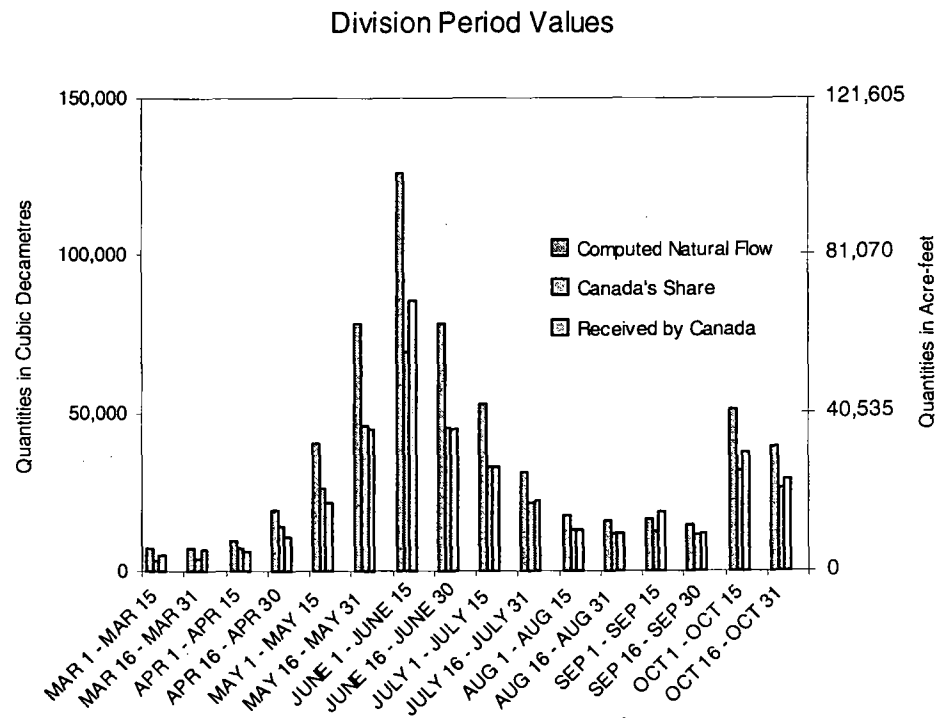
Allowable deficit carryovers, as per 2001 Letter of Intent respecting St. Mary-Milk Rivers streamflow transfers, are:

as of May 31, 2005: 8,770 acre-feet (9,800 dam<sup>3</sup>) (4,000 cfs-days)

as of July 15, 2005: 3,970 acre-feet (4,900 dam<sup>3</sup>) (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, 2005**



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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 2005, evapo-transpiration was estimated using the Onefour pan evaporation data as an index of Morton's model results.

During 2005, the United States' and Canada's respective estimated consumptive uses were 4 040 dam<sup>3</sup> (3,280 acre-feet) and 4 120 dam<sup>3</sup> (3,340 acre-feet). No inter-basin transfers from Verdigris Coulee near the Mouth (station 11AA038) were 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, 2005 was 73 300 dam<sup>3</sup> (59,400 acre-feet). This flow was 54 percent of the average computed natural flow of the previous 93 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 51 200 dam<sup>3</sup> (41,500 acre-feet) and 22 100 dam<sup>3</sup> (17,900 acre-feet). The United States received 135 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 three (3) 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<sup>3</sup>) (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.

As of September 15, 2005, an accumulated deficit of 826 dam<sup>3</sup> (670 acre-feet) remained on the Milk River to the United States, which was repaid by September 19, 2005. An off-setting accumulated deficit of 4 900 dam<sup>3</sup> (3,970 acre-feet) remained on the St. Mary River to Canada as of September 15, 2005.

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 2005\***  
**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	2,996	1,498	2,996	1,498	
MAR 16 - MAR 31	2,792	1,396	2,792	1,396	
APR 1 - APR 15	2,157	1,618	2,157	539	
APR 16 - APR 30	2,996	2,247	2,996	749	
MAY 1 - MAY 15	1,397	1,048	1,397	349	
MAY 16 - MAY 31	909	681	123		558
JUNE 1 - JUNE 15	26,924	17,852	26,157	8,305	
JUNE 16 - JUNE 30	12,432	9,324	12,142	2,818	
JULY 1 - JULY 15	3,790	2,842	3,261	419	
JULY 16 - JULY 31	507	381	0		437
AUG 1 - AUG 15	184	138	0		389
AUG 16 - AUG 31	2,215	1,661	1,750	89	
SEP 1 - SEP 15	2,984	2,238	2,694	456	
SEP 16 - SEP 30	4,884	3,663	4,884	1,221	
OCT 1 - OCT 15	2,912	2,184	2,912	728	
OCT 16 - OCT 31	3,221	2,416	3,221	805	
TOTAL	73,300	51,187	69,175		

\* 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, 2005: 826 dam<sup>3</sup> (670 acre-feet) (338 cfs-days)

Canadian share of St. Mary R. waters deficit outstanding

as of May 31, 2005: 10,800 dam<sup>3</sup> (8,770 acre-feet) (4,420 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<sup>3</sup> (2,000 cfs-days) (3,970 acre-feet), whichever is less.

**Table 2A: Summary of Milk River Division for 2005\***  
**Quantities in Acre-Feet**

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	2,429	1,214	2,429	1,214	
MAR 16 - MAR 31	2,263	1,132	2,263	1,132	
APR 1 - APR 15	1,749	1,312	1,749	437	
APR 16 - APR 30	2,429	1,822	2,429	607	
MAY 1 - MAY 15	1,133	850	1,133	283	
MAY 16 - MAY 31	737	552	100		452
JUNE 1 - JUNE 15	21,827	14,473	21,205	6,733	
JUNE 16 - JUNE 30	10,079	7,559	9,844	2,285	
JULY 1 - JULY 15	3,073	2,304	2,644	340	
JULY 16 - JULY 31	411	309	0		354
AUG 1 - AUG 15	149	112	0		315
AUG 16 - AUG 31	1,796	1,347	1,419	72	
SEP 1 - SEP 15	2,419	1,814	2,184	370	
SEP 16 - SEP 30	3,959	2,970	3,959	990	
OCT 1 - OCT 15	2,361	1,771	2,361	590	
OCT 16 - OCT 31	2,611	1,959	2,611	653	
TOTAL	59,424	41,497	56,080		

\* 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

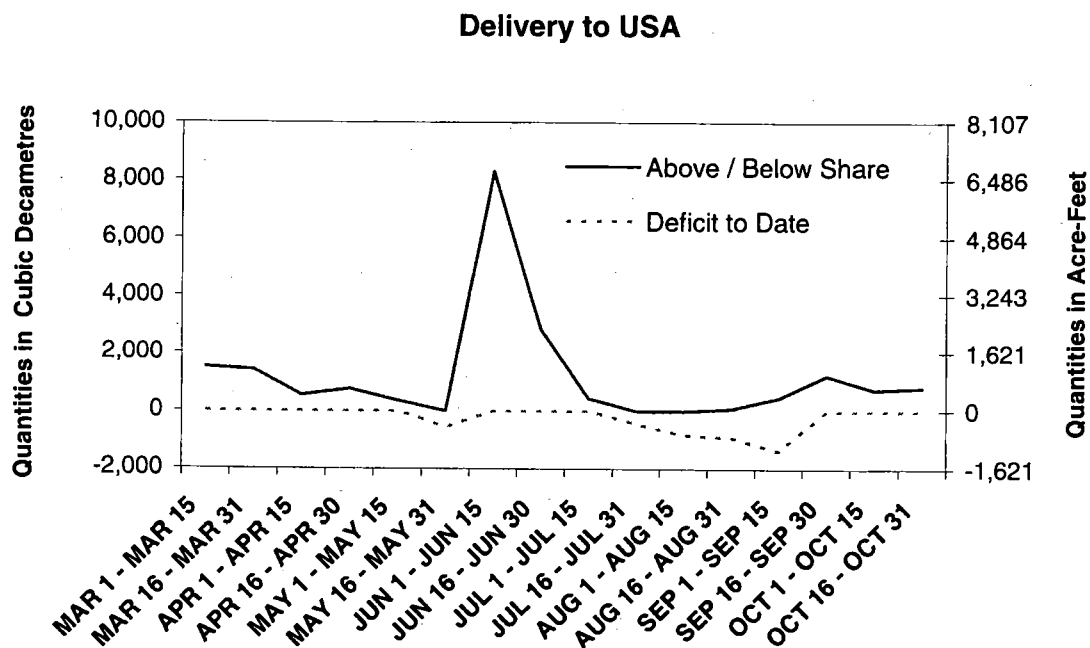
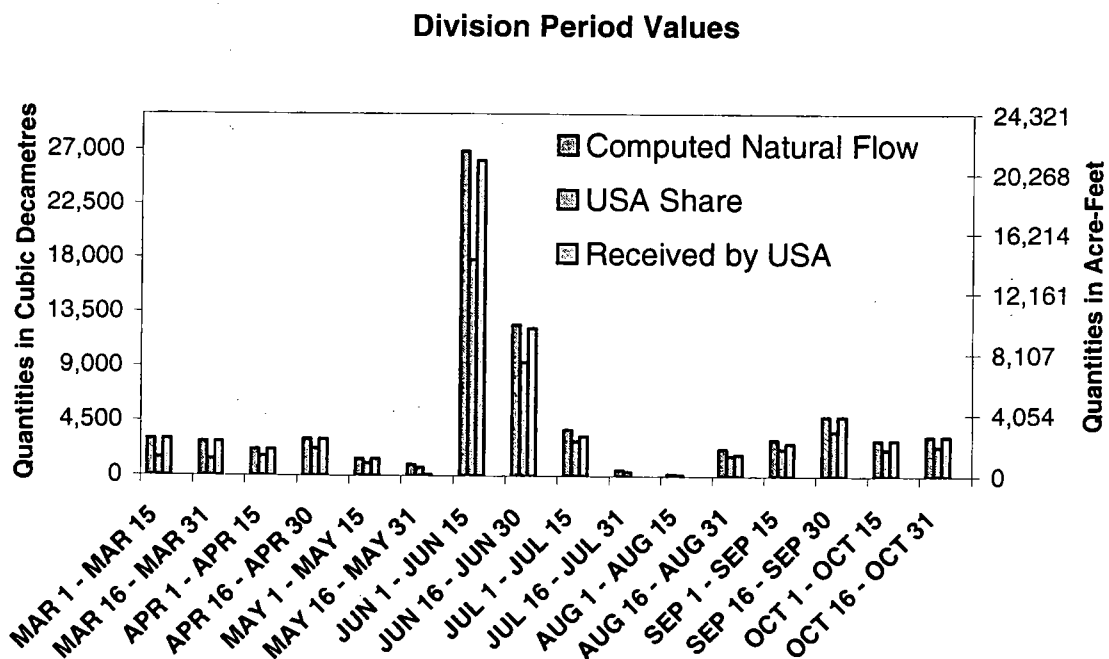
as of September 15, 2005: 670 acre-feet (826 dam<sup>3</sup>) (338 cfs-days)

Canadian share of St. Mary R. waters deficit outstanding

as of May 31, 2005: 8,770 acre-feet (10 800 dam<sup>3</sup>) (4,420 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<sup>3</sup> (2,000 cfs-days) (3,970 acre-feet), whichever is less.

Figure 2. Milk River Division, 2005





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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 the 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 2005.

Flows for March through October 2005 for the southern tributaries were as follows:

- o Bear Creek near International Boundary – 2 200 dam<sup>3</sup> (1,790 acre-feet).
- o Miners Coulee near International Boundary – 710 dam<sup>3</sup> (576 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) which 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.

Two modifications in the procedures for the computation of the natural flows on Lodge Creek were implemented in 2004 and continued in 2005. One modification adjusted the amount of evaporation applied in the upper Lodge Creek basin reservoirs based upon elevation differences between the data collection site and reservoirs. The other modification applied minor diversions to the channel reach area in which those diversions occurred as opposed to previous method of applying minor diversions at the border. Both modifications better reflect actual conditions and decrease the likelihood of the computed negative natural flows.

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 247 dam<sup>3</sup> (200 acre-feet) were recorded on Lyons Creek for the year 2005.

Volumes for unmeasured diversions to private irrigation projects in the Lodge Creek, Battle Creek, and Frenchman River basins in Saskatchewan were based on year-end reports provided by the Saskatchewan Watershed Authority, and for the Lodge Creek and Battle Creek basins in Alberta by Alberta Environment. Lists of reported diversions are contained in Appendix B.

The snow pack of the winter of 2004 – 05 was average to below average when, in the last week of January, a prolonged warm spell depleted nearly all of the snow and initiated an early runoff event. Lodge Creek snowmelt runoff increased Altawan Reservoir water levels by 0.3 metres. Battle Creek flows also increased substantially and 1 350 dam<sup>3</sup> (1,090 acre-feet) was diverted for storage in Cypress Lake. The Eastern Tributaries Technical Working Group (ETTWG) recommended a new division period (February 1-28) be added to the Battle Creek apportionment calculation to determine if any deficit deliveries to the United States occurred as a result of this diversion. A deficit delivery did occur during this period but the event did not have a long term effect since the deficit was completely refunded by period eight. There was little subsequent snow accumulation after this event and spring runoff flowed in the primed channels, ending by early April.

Cypress Lake had only enough water to support half an irrigation this year. Water was removed from Cypress Lake by utilizing two diesel pumps as the lake was too low for a gravity fed irrigation. The three irrigation reservoirs located in the Frenchman River basin filled in the spring period and two full irrigations were completed this season (May 9 to June 4 and July 27 to Aug 20). The Spangler irrigation project in the Lodge Creek basin was operated May 15 to June 6 and again from August 2 to 10. The second irrigation was made easier by June precipitation, whereby

in excess of 100 mm of rainfall was recorded at the Squaw Coulee and Consul rain gauges, which added approximately one metre of storage to Altawan Reservoir.

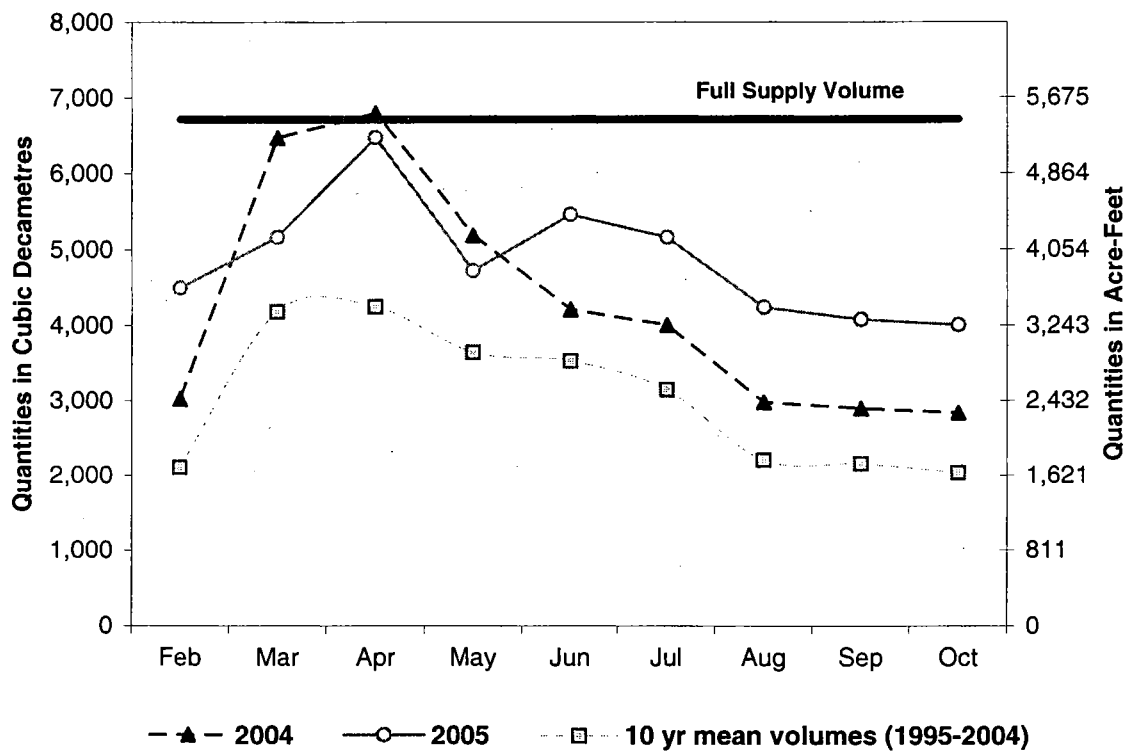
Periods six and seven were combined in the Lodge Creek apportionment calculation this season to incorporate period six irrigation releases and return flows associated with those releases which appeared much later in period seven. This change was made to alleviate the unrealistic negative natural flow initially calculated in period six (and which disappeared when the two periods were combined).

Even though spring runoff volumes were below normal, good summer rains and spring-fed coulees kept the base flows in the Battle Creek and Frenchman River basins relatively high throughout the 2005 season. Water was intermittently diverted to Cypress Lake through out the season and the small Battle Creek deficit was repaid in the last period. A small release from Newton Lake was made late in October and maintained through the winter of 2005-06 to repay an accumulating deficit related to late season storage in the Frenchman River system. The Frenchman River deficit was estimated to have been repaid by the third week of November. Both Battle Creek and Frenchman River apportionment calculations retired their deficits this season while the Lodge Creek basin ended with a 116 dam<sup>3</sup> outstanding deficit.

Michel and Cressday reservoirs in the Lodge Creek basin were drawn down to make way for dam rehabilitation in 2006.

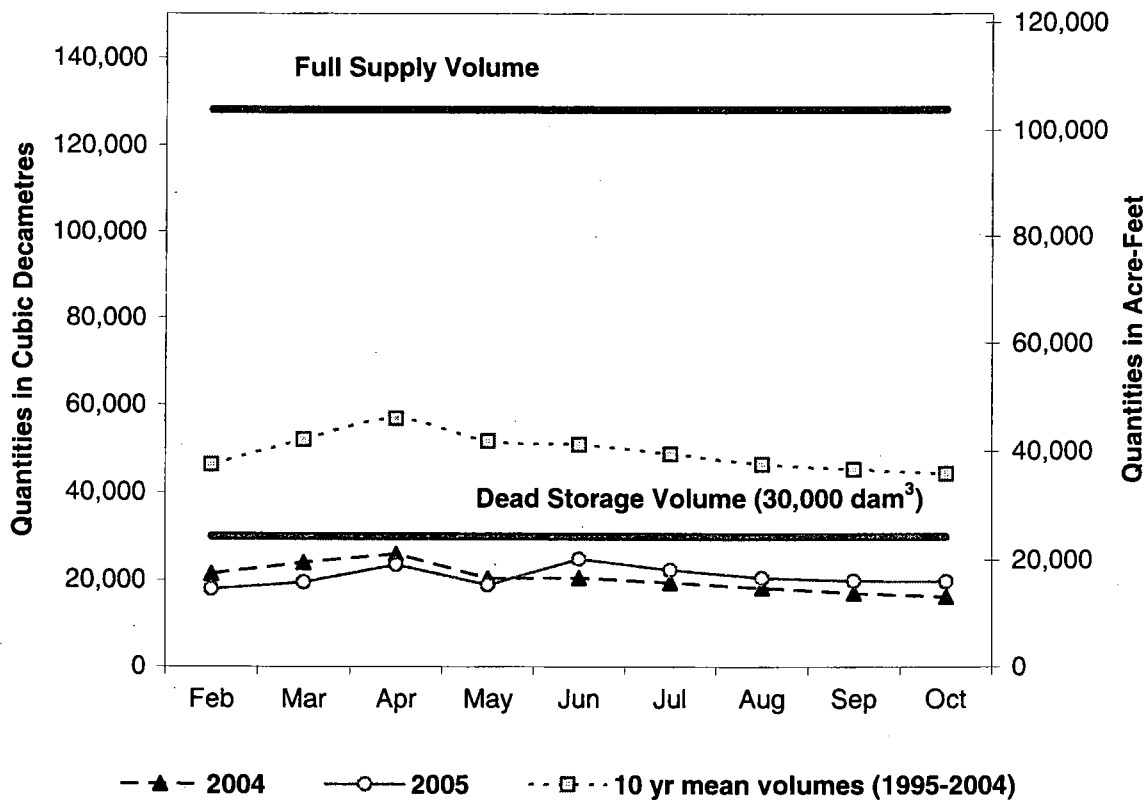
**Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins**  
**Month-End Contents: 2004, 2005, and 1995-2004 Mean**

**Figure 3a. Altawan Reservoir**



**Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins  
Month-End Contents: 2004, 2005, and 1995-2004 Mean**

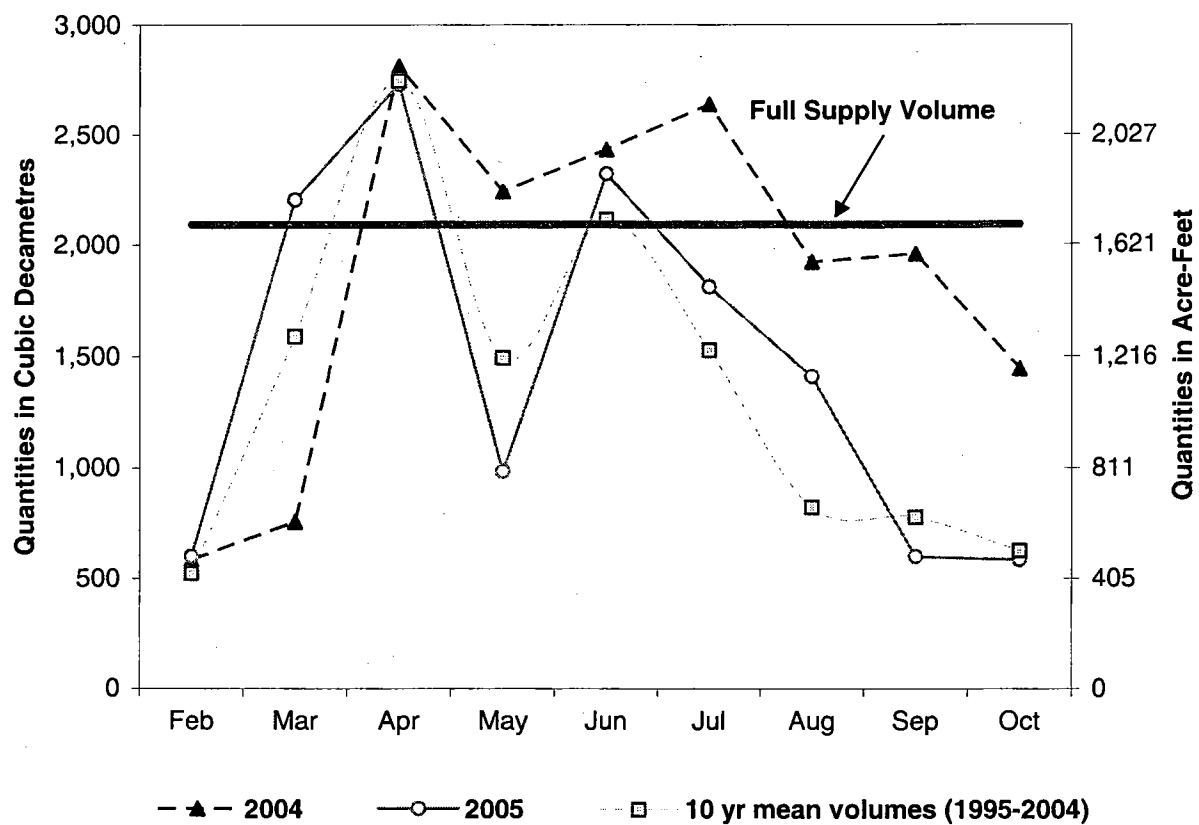
**Figure 3b. Cypress Lake**





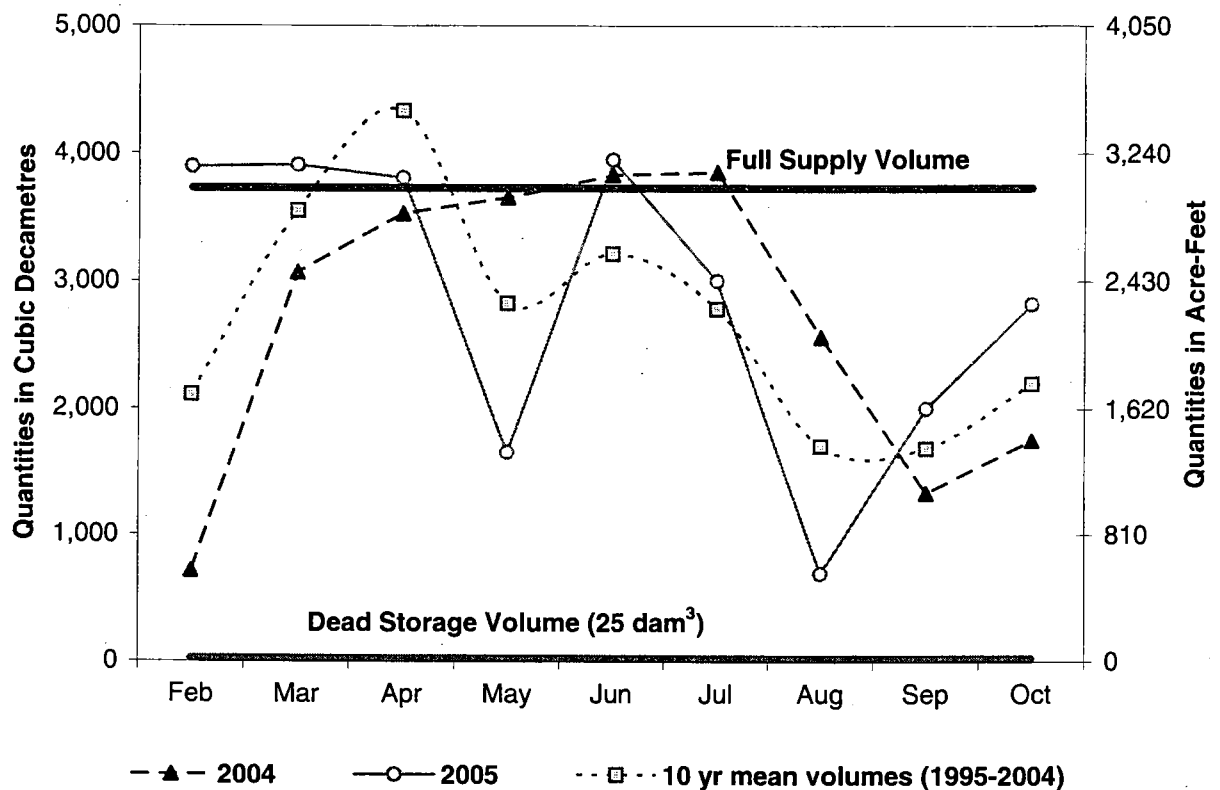
**Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins**  
**Month-End Contents: 2004, 2005, and 1995-2004 Mean**

**Figure 3c. Eastend Reservoir**



**Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins**  
**Month-End Contents: 2004, 2005, and 1995-2004 Mean**

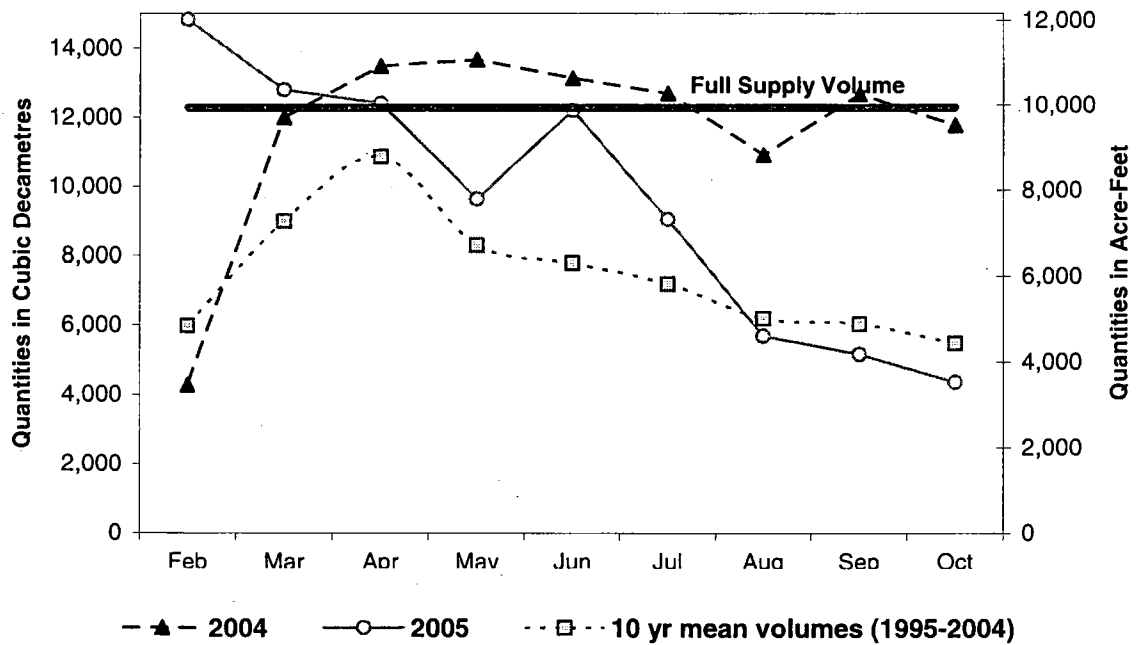
**Figure 3d. Huff Lake**



Huff Lake stage-storage table was revised in 2005, increasing the dead storage and decreasing the full supply storage volumes from previous years.

**Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins  
Month-End Contents: 2004, 2005, and 1995-2004 Mean**

**Figure 3e. Newton Lake**



## LODGE CREEK

The computed natural flow of Lodge Creek at the International Boundary from March 1 to October 31, 2005 was 6 860 dam<sup>3</sup> (5,560 acre-feet). This volume is 23 percent of the average natural flow of the previous 55 years of record. Each country is entitled to 50 percent of the natural flow or 3 430 dam<sup>3</sup> (2,780 acre-feet) for the irrigation season. A total of 3 310 dam<sup>3</sup> (2,680 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 five (5) of the 16 division periods during the irrigation season. The normal May 16 – May 31 (sixth) and June 1 to June 15 (seventh) division periods were combined into one period (May 16 to June 15) as mentioned earlier in the report. An outstanding deficit of 116 dam<sup>3</sup> (94 acre-feet) remained at the end of October 2005.

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 2005\***  
**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	82	41	20		21
MAR 16 - MAR 31	295	147	28		119
APR 1 - APR 15	2,247	1,123	26		1,097
APR 16 - APR 30	289	144	6		138
MAY 1 - MAY 15	63	32	0		32
MAY 16 - JUNE 15 **	1,271	636	1,656	1,020	
JUNE 16 - JUNE 30	2,565	1,282	1,549	267	
JULY 1 - JULY 15	43	22	26	4	
JULY 16 - JULY 31	0	0	0		
AUG 1 - AUG 15	0	0	0		
AUG 16 - AUG 31	0	0	0		
SEP 1 - SEP 15	0	0	0		
SEP 16 - SEP 30	0	0	0		
OCT 1 - OCT 15	0	0	0		
OCT 16 - OCT 31	0	0	0		
TOTAL	6,855	3,427	3,311		

\* 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.

\*\* Sixth and Seventh Periods are combined.

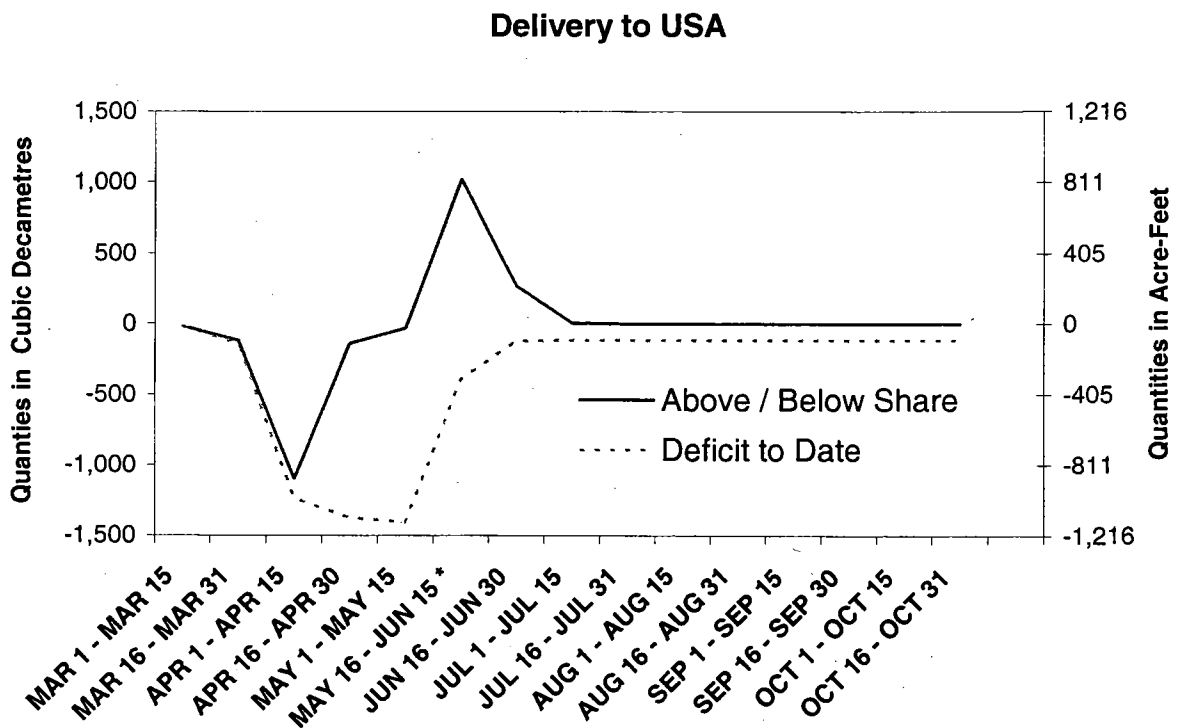
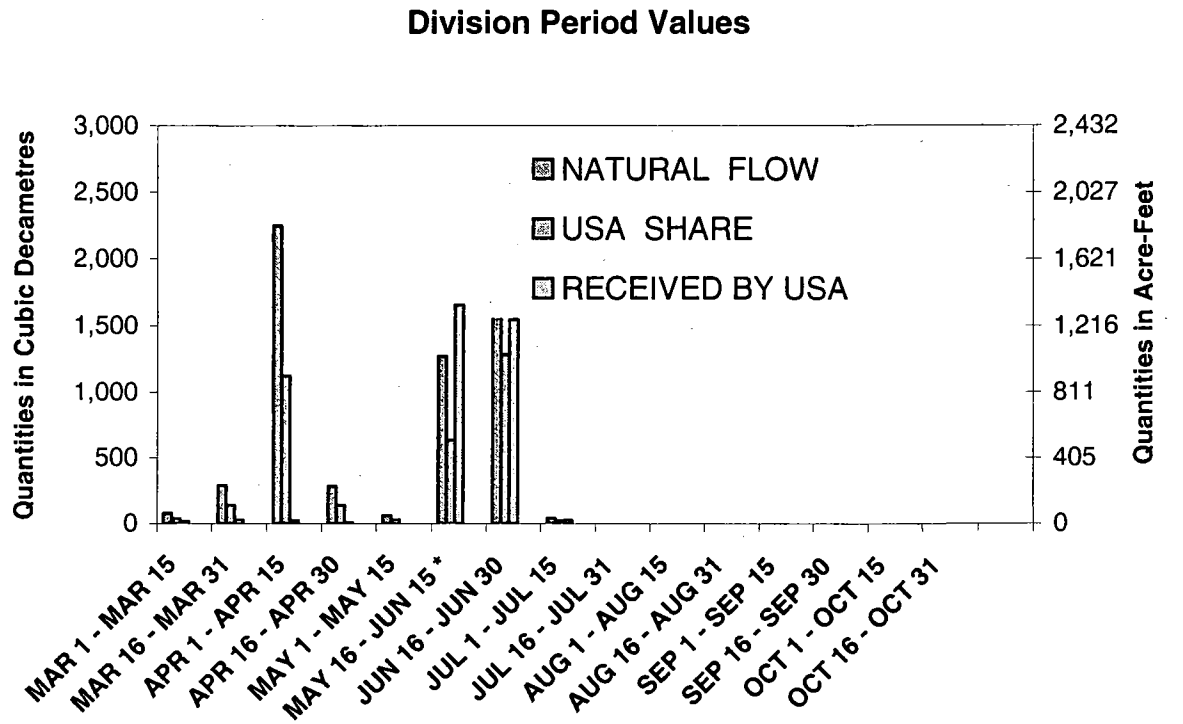
**Table 3A: Summary of Lodge Creek Division for 2005\***  
**Quantities in Acre-Feet**

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	67	33	16		17
MAR 16 - MAR 31	239	119	23		96
APR 1 - APR 15	1,822	910	21		889
APR 16 - APR 30	234	117	5		112
MAY 1 - MAY 15	51	26	0		26
MAY 16 - JUNE 15 **	1,030	516	1,343	827	
JUNE 16 - JUNE 30	2,079	1,039	1,256	216	
JULY 1 - JULY 15	35	18	21	3	
JULY 16 - JULY 31	0	0	0		
AUG 1 - AUG 15	0	0	0		
AUG 16 - AUG 31	0	0	0		
SEP 1 - SEP 15	0	0	0		
SEP 16 - SEP 30	0	0	0		
OCT 1 - OCT 15	0	0	0		
OCT 16 - OCT 31	0	0	0		
TOTAL	5,557	2,778	2,685		

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

\*\* Sixth and Seventh Periods are combined.

Figure 4. Lodge Creek Division, 2005



\* Sixth and Seventh Periods Combined

## BATTLE CREEK

The computed natural flow of Battle Creek at the International Boundary from March 1 to October 31, 2005, was 17 800 dam<sup>3</sup> (14,400 acre-feet). This volume is 59 percent of the average natural flow of the previous 65 years of record. Each country is entitled to 50 percent of the natural flow i.e., 8 900 dam<sup>3</sup> (7,220 acre-feet). A total of 9 480 dam<sup>3</sup> (7,680 acre-feet) was recorded at Battle Creek at International Boundary (station 11AB027) from March 1 to October 31. An estimated additional 2 020 dam<sup>3</sup> (1,640 acre-feet) of natural flow occurred during a winter thaw in February 2005.

Deficit deliveries were recorded in eight (8) of the 16 division periods during the March 1 to October 31 irrigation season. An additional division period (February 1 to February 28) this year accounted for flows diverted to Cypress Lake during February. 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 2005\***  
**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
FEB 1 - FEB 28	2,015	1,008	860		148
MAR 1 - MAR 25	1,562	781	796	15	
MAR 26 - APR 9	2,662	1,331	920		411
APR 10 - APR 24	2,694	1,347	1,291		56
APR 25 - MAY 9	1,616	808	561		247
MAY 10 - MAY 25	799	400	192		208
MAY 26 - JUNE 9	1,198	599	1,047	448	
JUNE 10 - JUNE 24	3,158	1,579	1,577		2
JUNE 25 - JULY 9	1,091	546	1,088	542	
JULY 10 - JULY 25	745	373	450	77	
JULY 26 - AUG 9	271	136	68		68
AUG 10 - AUG 25	166	83	164	81	
AUG 26 - SEP 9	371	186	368	182	
SEP 10 - SEP 24	285	143	261	118	
SEP 25 - OCT 9	435	218	200		18
OCT 10 - OCT 25	496	248	246		2
OCT 26 - OCT 31	250	125	248	123	
TOTAL	19,814	9,911	10,337		

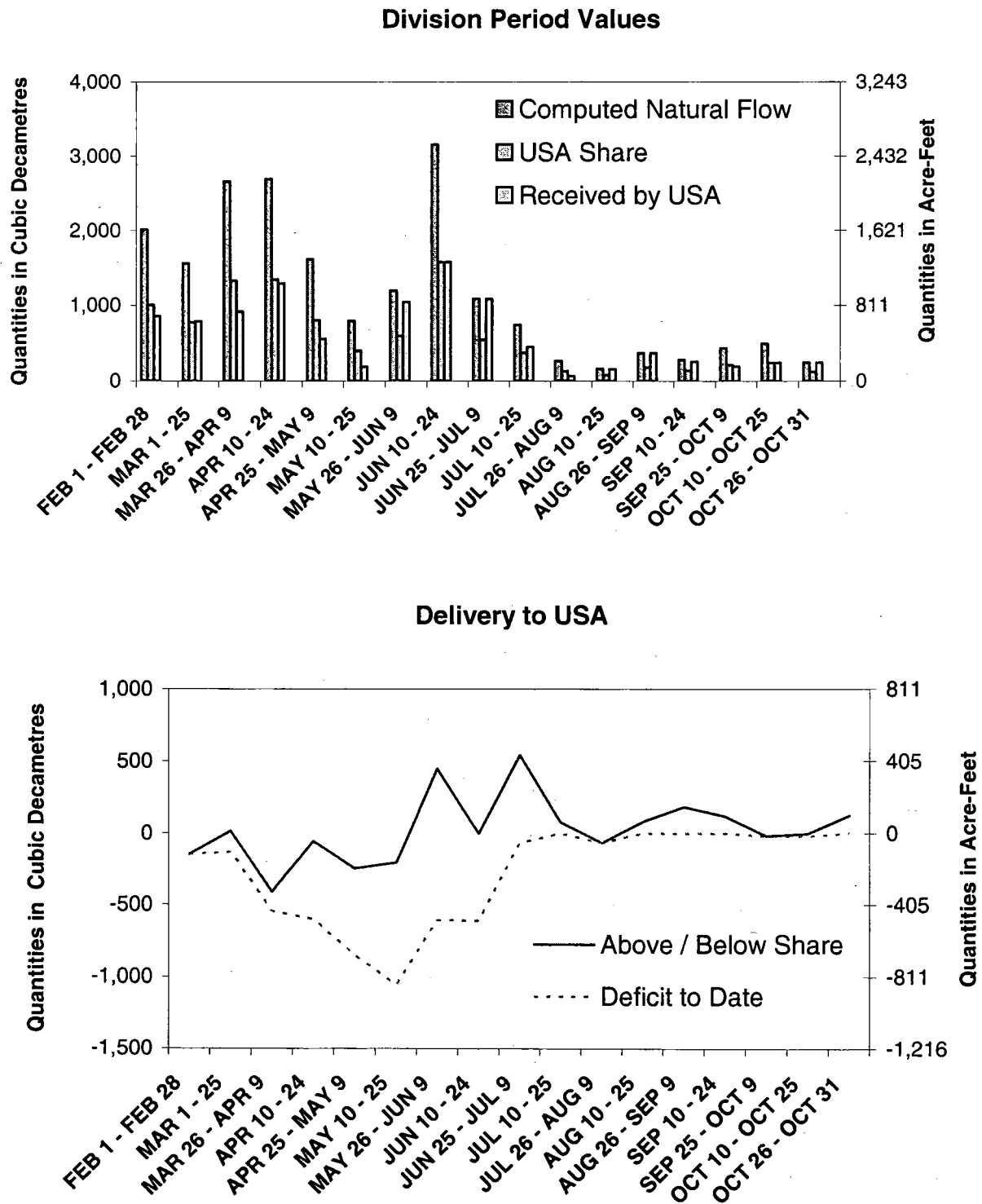
\* This is a summary of data from Table 12, Appendix A. Totals and shares may not add or subtract exactly as a result of rounding.

**Table 4A: Summary of Battle Creek Division for 2005\***  
**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
FEB 1 - FEB 28	1,634	817	697		120
MAR 1 - MAR 25	1,266	633	645	12	
MAR 26 - APR 9	2,158	1,079	746		333
APR 10 - APR 24	2,184	1,092	1,047		45
APR 25 - MAY 9	1,310	655	455		200
MAY 10 - MAY 25	648	324	156		169
MAY 26 - JUNE 9	971	486	849	363	
JUNE 10 - JUNE 24	2,560	1,280	1,278		2
JUNE 25 - JULY 9	884	443	882	439	
JULY 10 - JULY 25	604	302	365	62	
JULY 26 - AUG 9	220	110	55		55
AUG 10 - AUG 25	135	67	133	66	
AUG 26 - SEP 9	301	151	298	148	
SEP 10 - SEP 24	231	116	212	96	
SEP 25 - OCT 9	353	177	162		15
OCT 10 - OCT 25	402	201	199		2
OCT 26 - OCT 31	203	101	201	100	
TOTAL	16,063	8,035	8,380		

\* 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, 2005



## **FRENCHMAN RIVER**

The computed natural flow of the Frenchman River at the International Boundary from March 1 to October 31, 2005, was 38,800 dam<sup>3</sup> (31,500 acre-feet). This volume of natural flow is 49 percent of the average natural flow of the previous 65 years of record. Each country is entitled to 50 percent of the natural flow, i.e., 19 400 dam<sup>3</sup> (15,800 acre-feet). A total flow of 27 800 dam<sup>3</sup> (22,500 acre-feet) was recorded at Frenchman River at International Boundary (station 11AC041) from March 1 to October 31.

Deficit deliveries were recorded in five (5) of 16 division periods during the irrigation season. An outstanding deficit of 94 dam<sup>3</sup> (76 acre-feet) remained at the end of October 2005.

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 2005\***  
**Quantities in Cubic Decametres**

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	3,145	1,573	817		756
MAR 16 - MAR 31	2,117	1,058	4,944	3,886	
APR 1 - APR 15	10,405	5,203	8,243	3,040	
APR 16 - APR 30	5,395	2,697	4,125	1,428	
MAY 1 - MAY 15	2,257	1,128	1,152	24	
MAY 16 - MAY 31	1,973	986	1,344	358	
JUNE 1 - JUNE 15	3,742	1,871	653		1,218
JUNE 16 - JUNE 30	4,214	2,107	484		1,623
JULY 1 - JULY 15	1,544	772	1,343	571	
JULY 16 - JULY 31	226	113	975	862	
AUG 1 - AUG 15	820	410	1,149	739	
AUG 16 - AUG 31	1,006	503	1,006	503	
SEP 1 - SEP 15	907	454	1,107	653	
SEP 16 - SEP 30	477	238	20		218
OCT 1 - OCT 15	312	156	1		155
OCT 16 - OCT 31	305	152	431	279	
TOTAL	38,844	19,421	27,794		

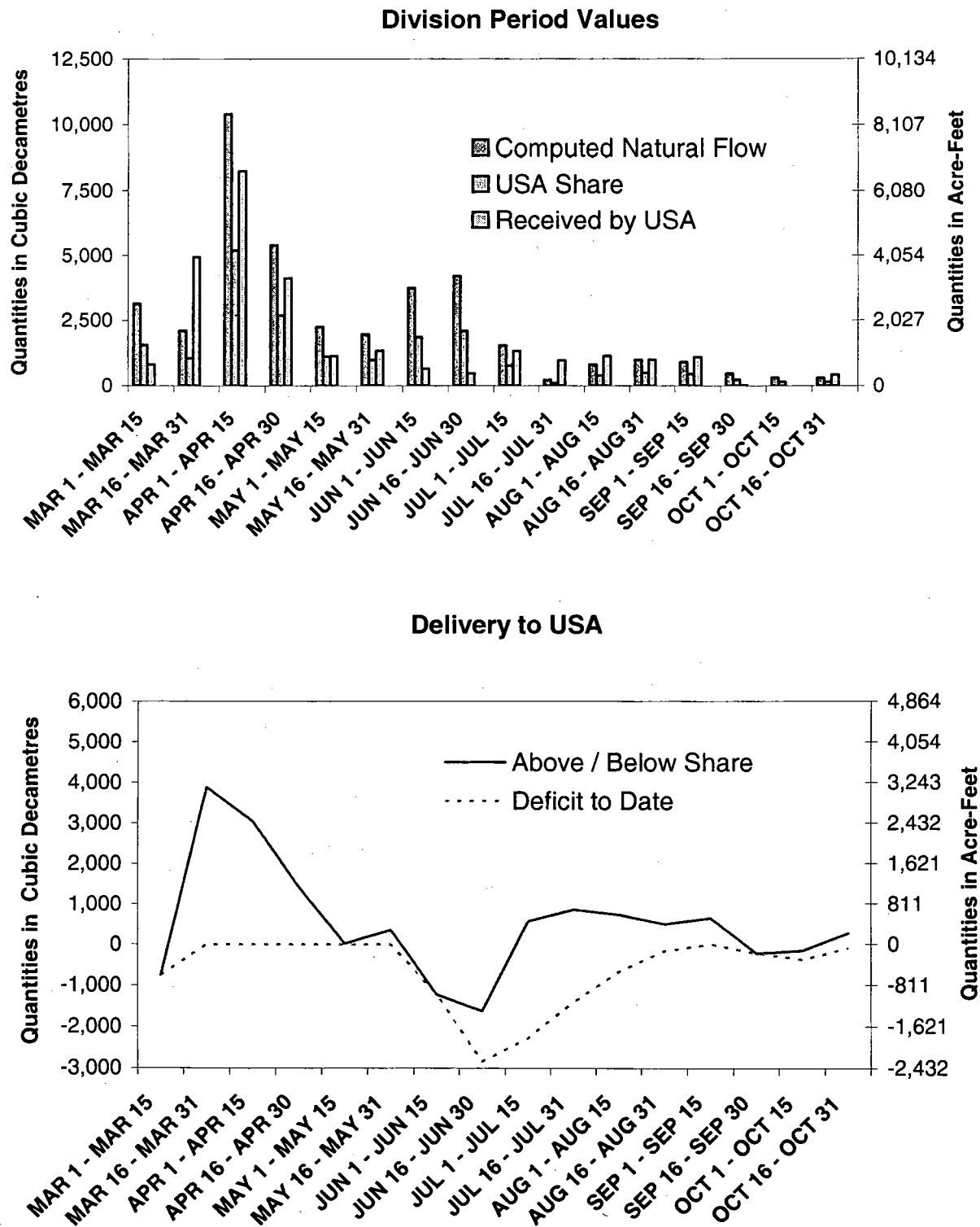
\* This is a summary of data from Table 14, Appendix A. Totals and shares may not add or subtract exactly as a result of rounding.

**Table 5A: Summary of Frenchman River Division for 2005\***  
**Quantities in Acre-Feet**

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATUR AL FLOW	U.S.A. SHARE	RECEIVE D BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	2,550	1,275	662		613
MAR 16 - MAR 31	1,716	858	4,008	3,150	
APR 1 - APR 15	8,436	4,218	6,683	2,465	
APR 16 - APR 30	4,373	2,186	3,344	1,158	
MAY 1 - MAY 15	1,830	914	934	19	
MAY 16 - MAY 31	1,599	799	1,090	290	
JUNE 1 - JUNE 15	3,034	1,517	529		987
JUNE 16 - JUNE 30	3,416	1,708	392		316
JULY 1 - JULY 15	1,252	626	1,089	463	
JULY 16 - JULY 31	183	92	790	699	
AUG 1 - AUG 15	665	332	931	599	
AUG 16 - AUG 31	816	408	816	408	
SEP 1 - SEP 15	735	368	897	529	
SEP 16 - SEP 30	386	193	16		177
OCT 1 - OCT 15	253	126	1		126
OCT 16 - OCT 31	247	123	349	226	
TOTAL	31,491	15,745	22,533		

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

Figure 6. Frenchman River Division, 2005



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;

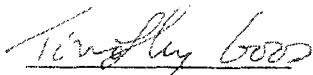
And whereas, Canada finds it beneficial to use more than its share of the Milk River in the June-September period each year to supply water to Canadian Milk River irrigators;

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;

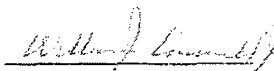
It is therefore ordered and directed by said Accredited Officers or their designates that the United States be allowed to accumulate a deficit on the St. Mary River of up to 4,000 cfs-days (9 800 dam<sup>3</sup>) between March 1 and May 31 of each year which, at the discretion of the United States, may be reduced to no less than 2,000 cfs-days (4 900 dam<sup>3</sup>) 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<sup>3</sup>) 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 8<sup>th</sup> day of February, 2001



William J. Carswell, Jr. for the  
Accredited Officer of the United States  
Dated this 8<sup>th</sup> 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<sup>3</sup>). Deficit deliveries greater than the allowed cumulative total of 4,000 cfs-days (9 800 dam<sup>3</sup>) 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<sup>3</sup>), 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<sup>3</sup>) 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<sup>3</sup>) 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<sup>3</sup>). Deficit deliveries greater than the allowed total of 2,000 cfs-days (4 900 dam<sup>3</sup>) 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<sup>3</sup>) 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 for volume is the cubic decametre ( $\text{dam}^3$ ).

1  $\text{dam}^3$  = 1 000 cubic metres  
1 cubic metre = 35.315 cubic feet  
1  $\text{dam}^3$  = 35,315 cubic feet  
1 acre-foot = 1.2335  $\text{dam}^3$   
1 cfs-day = 2.4466  $\text{dam}^3$   
1  $\text{dam}^3$  = 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  
2005

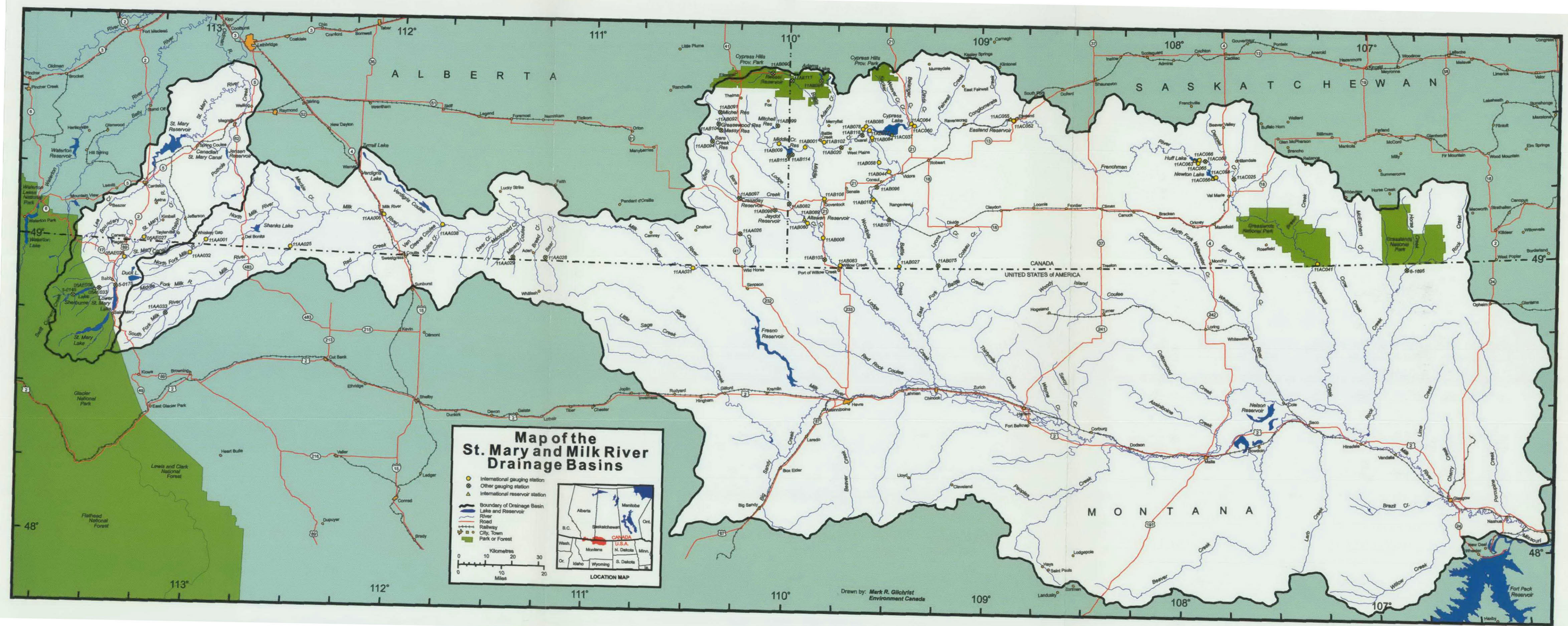
<u>Map Index</u>	<u>Station Name</u>
<u>ST. MARY RIVER BASIN</u>	
05AE027	St. Mary River at International Boundary
05AE029	St. Mary Canal at St. Mary Crossing near Babb, Montana
05AE036	Lake Sherburne at Sherburne, Montana
<u>MILK RIVER BASIN</u>	
11AA001	North Milk River near International Boundary
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  
2005

\*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.
<u>SAGE CREEK TRIBUTARY BASIN</u>		
11AA026*	Sage Creek at Q Ranch near Wildhorse	Canada







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

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