CANADA - ALBERTA

MEMORANDUM OF AGREEMENT

FOR

WATER QUANTITY SURVEYS

ANNUAL REPORT 1993-94

TO: Administrator for Canada

Administrator for Alberta

We hereby submit an annual report for fiscal year 1993-94 covering activities under the Memorandum of Agreement for Water Quantity Surveys for the Province of Alberta.

Government of Canada

R. Boals
Environment Canada

Province of Alberta

R. Bothe
Alberta Environmental Protection

G. Coles
Alberta Environmental Protection

Members

Alberta Co-ordinating Committee

September, 1995

EXECUTIVE SUMMARY

The 1993/94 year was a very busy one for the field technologists. While spring runoff was essentially a non-event with below normal runoff in most areas, the summer was busy with 7 major storm events (4 in south-western Alberta and the remaining 3 scattered across northern Alberta) requiring streamflow measurement coverage. As a result volumes of runoff in southern Alberta were much above normal whereas in the northern half of the province it was below normal.

Computational deadlines were met with the 1992 hydrometric data completed on April 30, 1993 and returned from Ottawa in hard copy by mid-June, 1993. Unfortunately the CD-ROM was not delivered until February , 1994. A special achievement was the completion of the 1993 hydrometric data computations by March 29, 1994.

Only one meeting of the Canada/Alberta Co-ordinating Committee was held but a sub-committee meeting was also held late in the year to make necessary network adjustments for 1994/95. Topics at the Co-ordinating Committee meeting included: information regarding organization changes and impacts; station changes and adjustments; CD-ROM changes and delivery delays; Bow River Modelling Project; and estimates and Schedule D for future years.

No major network changes were made although one station was discontinued because of access difficulties and 4 stations were re-designated from Federal to Federal-Provincial. No stations were established. The construction program included major maintenance at 47 sites and power installations to 3 sites.

All field staff were provided with "Advanced Driver Skill Training". Other training was directed to computer skills upgrading although specialized GPS training was provided to staff involved in the cross-section work on the Bow River Modelling Project.

This was the first year of operation of the complete pilot modernization network and also saw another first with all the instruments working at one time. Most major problems have been resolved and minor problem solutions were achieved while some are still being sought. The office aspect however is not as far advanced, in spite of CompuMod upgrades, and it is still not a viable working tool. Several workshops were held during the year including: SDI/EPROM; Field Computer; Information Workshop for New Players due to Re-organization; and specialized equipment workshops including Transducers and Hydrolabs.

Alberta Environmental Protection (AEP) paid $1,048,000 for their share of the program in 1993/94. The province's share was calculated at $1,050,459. A refund of $30,149 for overpayment in 1992/93 was given to the province in the second quarter of 1993/94. During the life of the agreement AEP has made a net overpayment of $9,000 or 0.07% more than calculated. Schedule "D" for 1994/95 has been struck at $964,400. The decrease as a result of a 7.8% reduction in contracts by the province which has resulted in the discontinuation of 24 gauging stations.

C O N T E N T S

	PAGE
LETTER OF TRANSMITTAL	i
EXECUTIVE SUMMARY	ii
CONTENTS	iii
LIST OF FIGURES	vi
LIST OF TABLES	vii
1.0 INTRODUCTION	1
2.0 ALBERTA SURFACE WATER	3
2.1 OVERVIEW OF RESOURCE	3
2.2 1993-94 RUNOFF CONDITIONS	4
3.0 HYDROMETRIC NETWORKS	6
3.1 HISTORICAL NETWORK CHANGES	6
3.2 NETWORK CHANGES 1993-94	10
3.2.1 New Stations Established During 1993-94	10
3.2.2 Discontinued Stations at End of 1993-94	10
3.2.3 Designation Changes to End of 1993-94	10
3.3 NETWORK PLANNING	11
3.3.1 Sediment	11
3.3.2 Hydrometric	11

CONTENTS
(CONTINUED)

4.0 WATER QUANTITY SURVEY AGREEMENTS 13

4.1 CO-ORDINATING COMMITTEE MEETINGS 13

4.1.1 October 21, 1993 Meeting 13

4.1.2 February 18, 1994 Sub-Committee Meeting 16

4.2 OPERATIONAL ACHIEVEMENTS 17

4.2.1 Training Program 17

4.2.2 Construction and Maintenance Program 17

4.2.3 Hydrometric Program Achievements 19

4.2.4 Pilot Project 2000 Progress. 20

4.2.5 Cost of Operation 22

5.0 FUTURE PROGRAM PLANS 26

APPENDIX "A" - SCHEDULE "A" OF MEMORANDUM OF AGREEMENT BETWEEN GOVERNMENT OF CANADA AND GOVERNMENT OF ALBERTA - April 1, 1993 . . . . . A-1

APPENDIX "B" - SCHEDULE "B" - COSTING PROCEDURE COMPUTATION OF ALBERTA SHARE B-1

CALCULATION OF ANNUAL PAYMENTS B-1

A. COSTING PROCEDURE B-1
I. Water Quantity Stations B-1
II. Sediment Stations B-1
III. New Construction, Major Maintenance and Reconstruction B-1
B. APPLICATION OF PROCEDURE B-1
I. Normal Access B-2
II. Remote Access B-2
III. Sediment Stations B-2
C. SPECIAL CONSIDERATIONS B-3
I. Stations Operated by Regina B-3
II. Stations Operatead by Yellowknife . . . B-3
III. Depreciation B-3

CONTENTS
(CONTINUED)

TABLE B-I Hydrometric and Sediment Costings for 1993-94 (Stations Operated by WSC - Alberta) B-4

APPENDIX "C" - SCHEDULE "D", 1993-94 . . . . . C-1

APPENDIX "D" - ESTIMATE OF ALBERTA ANNUAL PAYMENT FOR 1995-96 . . D-1

LIST OF FIGURES

		PAGE
Figure 1:	Gauging Stations Operated in Alberta	7
Figure 2:	Financial Responsibility and Network Changes in Alberta	8
Figure 3:	Histogram of Active Gauging Stations	12
Figure 4:	Histogram of Gauging Station Maturity	12

LIST OF TABLES

		PAGE
Table 1:	Accumulated Streamflow Volumes at Selected Points in Alberta	4
Table 2:	Water Quantity Surveys Gauging Station Data for 1993-94	9
Table 3:	Water Quantity Surveys Comparative Gauging Station Data April 1, 1975 - April 1, 1993	9
Table 4:	Water Quantity Surveys Detailed Gauging Station Data April 1, 1993	9
Table 5:	Specific Site Construction Costs, 1993-94 . .	18
Table 6:	Summary of Financial Considerations 1993-94	23
Table 7:	Cummulative Provincial Over or Under Payments for Period of Agreement (Dollars) . .	24
Table 8:	Water Quantity Surveys Comparison - Schedule "D" Costs with Actual Costs & Payments - 1993-94	25
Table B-I:	Hydrometric and Sediment Costings for 1993-94 (Stations Operated by Water Survey of Canada, Alberta)	B-4

1.0 INTRODUCTION

This is the nineteenth annual report summarizing the activities of the Canada-Alberta Co-ordinating Committee established by the Memorandum of Agreement in 1975. A sample copy of the agreement, which is essentially the same for all provinces and the territories, is contained in the Annual National Cost Sharing Report.[1]

The agreement establishes the basis on which co-operative water quantity surveys are carried out in Alberta and describes the costs which are shareable and the costs borne solely by the party operating the network. It requires that the Administrators of the agreement establish a Co-ordinating Committee to plan and review network operations and to prepare annually, Schedules "A" and "D" for approval by the Administrators. Schedule "A" (Appendix A) lists the gauging stations covered by the agreement, indicates the designation of each station for cost sharing purpose, and shows the agency which operates the station. Schedule "D" (Appendix C) gives the annual cost-sharing payment to be paid by Alberta to Canada.

When the Memorandum of Agreement was signed on March 31, 1975 the existing network was reviewed to determine the division of responsibility between the federal and provincial governments. Each station was designated either 'Federal', 'Federal-Provincial' or 'Provincial', the designation not only indicating the prime need, but also the financial responsibility.

Schedule "B" (contained in the National Report) of the agreement, lists the items to be included in computing the annual payments. The federal government pays 100% of the cost of operation and construction of stations designated 'Federal' and 50% of the cost of stations designated 'Federal-Provincial'. The Provincial government pays 100% of the cost of operation and construction of stations designed 'Provincial' and 50% of the cost of operation and construction of stations designated 'Federal-Provincial'. In 1977 a formal set of guidelines was developed for the three categories. This set of guidelines was reviewed and discussed at several National Co-ordinating Committee meetings. During 1982-83 the guidelines were reviewed and rewritten by both Administrators and Co-ordinating Committees. At the end of 1982-83 agreement was reached on the new set of guidelines which were utilized commencing in 1984-85. A copy of the approved guidelines is contained in the National Report.

In Alberta, the demand for surface water quantity data and information has largely been driven by a growing population, economic decisions and resource management. Today, additional needs associated with environmental concerns and the growing public involvement in decision-making are becoming evident. Meanwhile, because of governmental fiscal constraints and, particularly in the case of the Federal

---

[1] Environment Canada, Water Quantity Surveys, Federal-Provincial Cost-Sharing Agreements, Annual Report.

Government, changes in policy and program support, resources to meet these needs have been reduced. The number of hydrometric stations in Alberta peaked in 1986 and numbers have declined since. It is anticipated that further reductions will occur during the period of governmental deficit reductions.

It is clear that over the next decade, technological and operational changes must be made to increase efficiency to respond to these dual pressures of limited resources and increasing demand for new, improved and changing services. With these changes federal-provincial cooperation at all levels will be even more important than in the past.

Section 2.0 of this report addresses Alberta's surface water. An overview of the resource, trends and extremes of streamflow and sediment, and 1993 runoff conditions are addressed.

Section 3.0 summarizes the hydrometric network. Network changes for 1992-93 are itemized and Tables 2 to 4 summarize the designation of hydrometric stations. Historical network changes are addressed and figures are provided to indicate the evolution of the hydrometric network. Financial responsibility for the network and changes that have occurred from 1975 to 1994 are also described. A brief summary of network planning activities is provided and histograms of gauging station maturity are presented.

Operational considerations of the 1993-94 water quantity program are addressed in Section 4.0. Significant issues discussed at Co-ordinating Committee meetings are outlined; operational achievements are addressed including training, the construction and maintenance program, the hydrometric operation, and the modernization pilot project. The cost of operation is addressed in a detailed manner.

Section 5.0 presents an overview of planned and potential future projects.

2.0 ALBERTA SURFACE WATER

2.1 OVERVIEW OF RESOURCE

The uneven distribution of surface water runoff in the province of Alberta results in unique water management problems. Eighty-seven percent of the surface water outflow from Alberta flows to the Northwest Territories whereas less than 6 percent of the outflow comes from the low precipitation, high population, area of the South Saskatchewan River basin.

Management of the water resource in the low precipitation and high population area of southern Alberta has always been challenging. As a result, the hydrometric network in the south is considerably denser than that in central Alberta and very much denser than in the north. Sufficient water to satisfy irrigation requirements and to meet the demands of instream flow needs is particularly challenging in southern Alberta.

Problems or concerns with northern water resources didn't surface until the mid-1960's. The first event of concern was the construction of the Bennett Dam on the Peace River in B.C., which was evaluated as having detrimental effects on the Peace-Athabasca Delta. As a mitigating measure, weirs were constructed on two of the rivers from Lake Athabasca, and a hydrometric network put in place to analyze the effects of the weirs. Development of the oil sands in the Fort McMurray area during the 1970's prompted joint federal-provincial funding for cooperative studies in the area. These studies provided the impetus for establishing a more comprehensive hydrometric network in this area. The hydrometric network in this area has since been reduced because of the economic downturn and hence the slowed development of the oil sands resource.

In the late 1980's emphasis on economic development within the province shifted with the significant expansion of the pulp mill industry within the Slave River basin. This has made the flow data for the effluent receiving streams, the Peace, Athabasca and Wapiti Rivers, particularly important. To this end a Canada Water Act Agreement, the "Northern Rivers Basin Study" between the governments of Canada and Alberta was signed in September, 1991. A major component of this study will be a modelling of the major river reaches requiring accurate flow records at strategic locations. Water Survey of Canada continued to test acoustic flow meters (AFFRA) on the Athabasca River (at Hinton and near Obed) to potentially improve ice-affected streamflow data. To date, results have been disappointing.

2.2 1993-94 RUNOFF CONDITIONS

In general, the 1993 surface water runoff in northern Alberta was below the long term average while that in the southern half of the province was above the long term average. An exception to this generalization was the extreme south-western portion of the province which had flows somewhat less that the long term average (i.e., Waterton River @ Waterton Park's accumulated runoff in 1993 was 82% of average). While flows in the Beaver River basin were considerably below the long term average (30%), there was a definite increase over the past few years when flows were in the 10% of normal range.

Volumes of runoff for January 1 to October 31, 1993 for some of the major basins in Alberta are detailed in Table 1 which follows:

TABLE 1

Accumulated Streamflow Volumes
at Selected Points
in Alberta
For the Period January 1 to October 31

Station Number	Station Name	1993 Accumulated Streamflow		Comparative Accumulative Streamflow (1,000 Dam³)		
		Volume (1000 Dam³)	% of Long Term Mean	1992	1991	1990
05AA023	Oldman R.nr Waldron's Cnr	626	159	254	540	523
05AD003	Waterton R. nr Waterton Pk	455	82	325	675	543
05AJ001	S.Sask.R. @ Medicine Hat	7 305	126	2 852	6 063	5 437
05BC024	Highwood R. nr the Mouth	1 072	207	601	623	732
05CC002	Red Deer R. @ Red Deer *	1 840	127	1 303	1 557	2 229
05GA003	Monitor Creek nr Monitor	7	226	0.3	2	1
06AD006	Beaver R.@ Cold L. Reserve	189	30	59	127	255
07BB002	Pembina R. nr Entwistle	412	66	302	757	1 191
07GE001	Wapiti R.nr Grande Prairie	1 488	48	1 907	3 146	3 796

* Includes 35 300 dam³ in storage in Oldman Reservoir

South Saskatchewan Basin:

The computed natural flow for 1993 for the South Saskatchewan River below the Red Deer River, as prepared for the Prairie Provinces Water Board (PPWB) by the Water Resources Branch (WRB) indicated a surplus delivery to Saskatchewan of 750 000 dam³. The calculated natural flow was 11 275 000 dam³ or 82% of the mean for the period 1967 to 1993.

In general the snow melt runoff from the plains of Alberta was a non-event with no flooding being recorded although higher than expected flows were recorded in Berry Creek and in Cypress Hills' streams.

The summer months were cool and wet in southern Alberta. Three significant storm events occurred in June in southern Alberta producing peaks in the Willow Creek basin which were the highest since 1975 and in the Highwood River basin which were somewhat less than in 1990 but which were higher than any other peaks since 1967. A fourth storm event occurred in southern Alberta in August which produced even higher peak flows in the Willow Creek basin. These peaks were the highest since 1963.

In northern Alberta a storm event occurred in the Swan Hills region in June producing peak events rivalling those of 1988 and 1989 but falling short of those recorded in 1983. However, for the most part this half of the province was dry until August when two major storm events occurred in the north alleviating the very dry conditions. The mid-August storm in particular was extremely beneficial in that it was centred over the drought affected Beaver River basin. This storm swelled Beaver River flows to near normal levels for the first time in many years and raised the very low levels of Cold Lake by 0.1m.

The fall months of September and October were hot and dry throughout the province.

In general, the first part of the winter was mild, mid-winter saw near normal temperatures while late winter temperatures plummeted with several all time lows being recorded in several locales. Winter snowfall was below normal in southern Alberta, near average in most of the remainder of Alberta, the exceptions being in the Edmonton region where snowfall amounts were above normal.

3.0 HYDROMETRIC NETWORKS

3.1 HISTORICAL NETWORK CHANGES

Since the hydrometric cost-sharing agreement was signed in 1975-76, there have been significant changes in the composition of the network. These changes have included the following, during the nineteen year period from 1975-76 to 1993-94:

- 226 stations established
- 176 stations discontinued
- 114 station designation changes

Between designation changes, new station construction and station discontinuance, there has been an apparent change of nearly 115% during the period of the cost-sharing agreement.

The history of the size of the hydrometric network in Alberta, which includes hydrometric stations operated by Water Survey of Canada, Alberta Environment, and TransAlta Utilities, is illustrated in Figure 1. In terms of the current era, it can be seen that the hydrometric network increased rapidly from the mid-50's until the signing of the cost-sharing agreement in 1975. Since the implementation of the agreement, the size of the network has remained relatively stable with an increase of 19% of the stations in the cost-sharing agreement occurring from April 1, 1975 to the end of 1988-89. The majority of this increase occurred during the few years preceding the Alberta hydrometric enhancement program and during the enhancement program period. Resource problems after this period, first by Alberta and more recently by the Federal Government, have resulted in a reduction in the number of stations operated. There was a particularly large number of stations (17) discontinued at the end of the 1990-91 year. This figure indicates a large drop (23 stations) in 1994/95 which will be detailed later in this report.

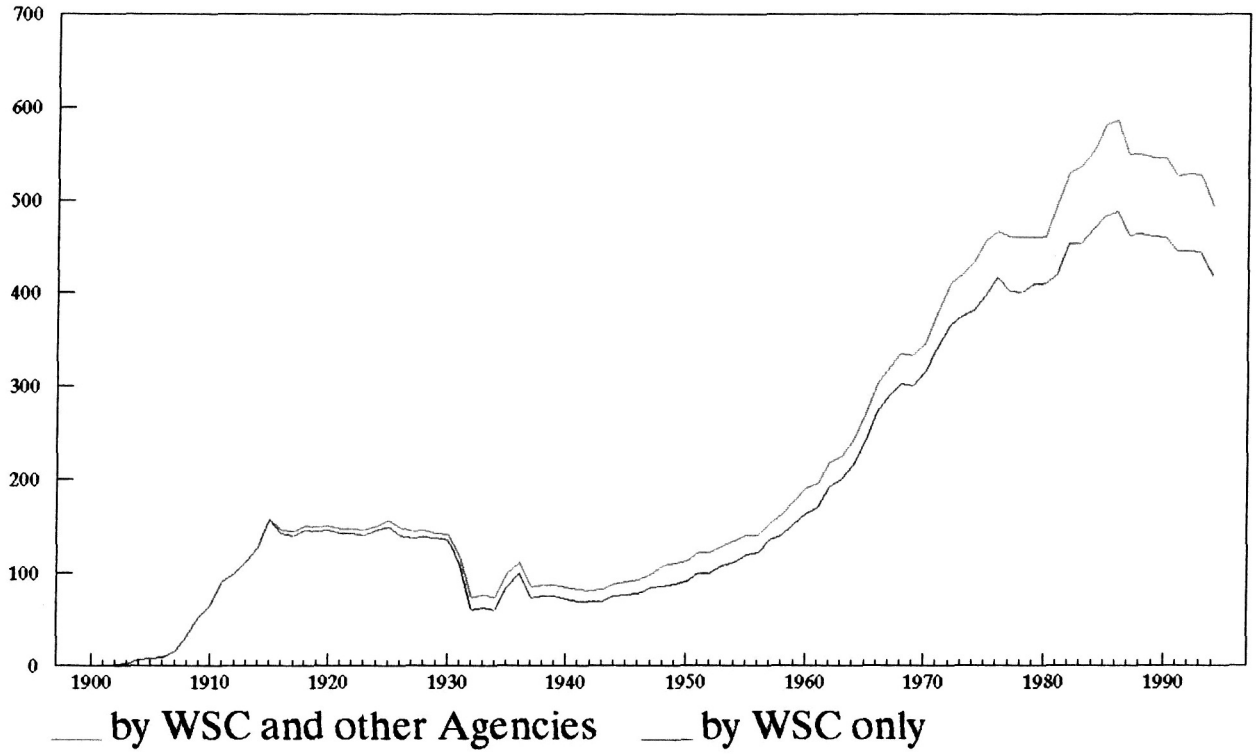
Table 2 indicates additions and deletions to the hydrometric network during 1993-94 and the station designations effective April 1, 1993.

Table 3 illustrates the changes which have occurred in each of the designation categories from the commencement of the cost sharing agreement in April 1975 to April 1, 1993.

Table 4 provides detailed gauging station data as of April 1, 1993.

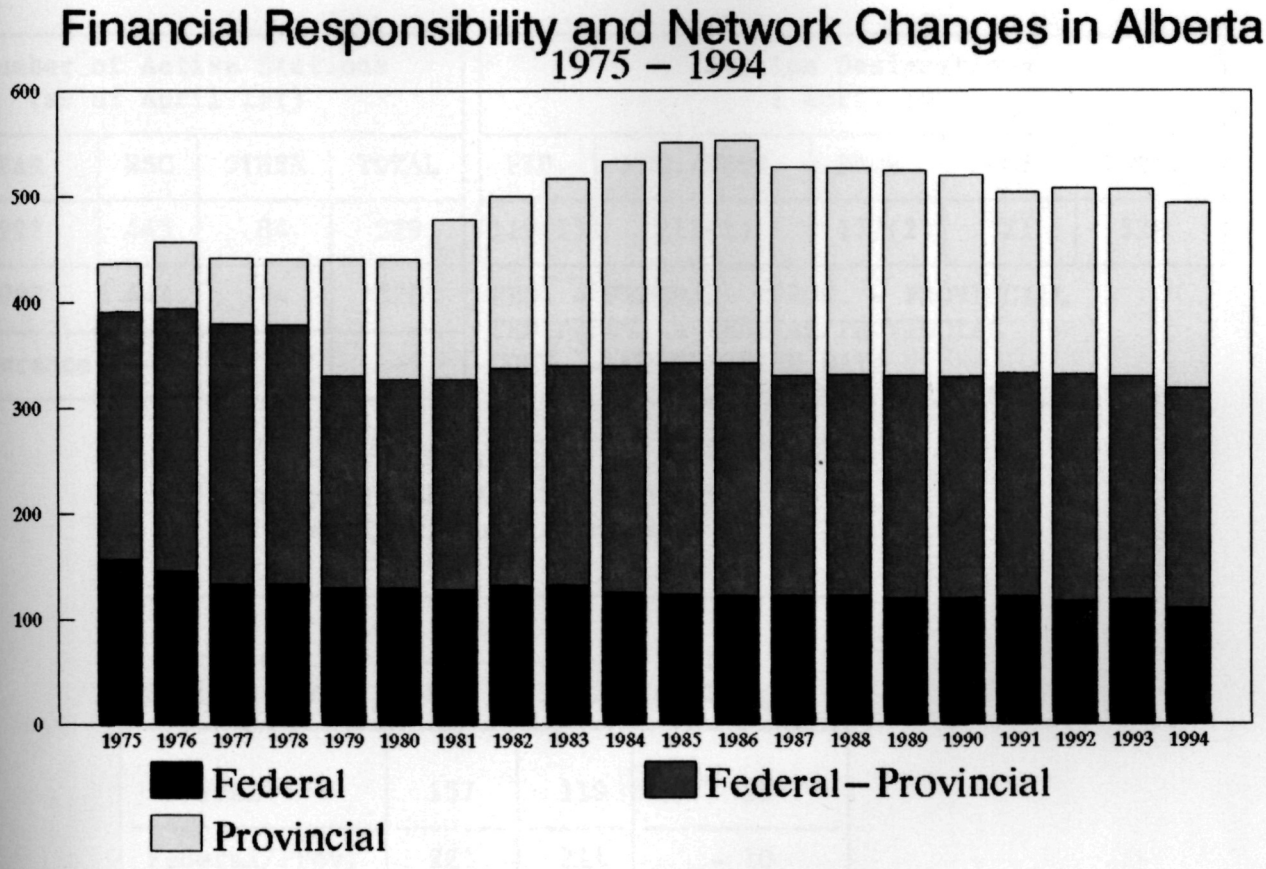
Figure 1

Gauging Stations Operated In Alberta



The changing nature for financial responsibility of the hydrometric network since the inception of the cost-sharing agreement is illustrated in Figure 2. This figure includes stations in Schedule "A" operated by the province. It is readily apparent from this graph that there has been a decrease in the percentage of the federal financial contribution to the network and a significant increase in the percentage of the provincial contribution since the inception of the agreement. This is because the requirements for additional stations have mainly been of a provincial nature for regional water resource inventory and analysis, water allocation and management and flow forecasting purposes.

Figure 2



NOTE: This graph includes stations operated by Alberta Environmental Protection. Prior to 1981, only stations operated by Alberta Environmental Protection in the Peace Athabasca Delta and Spring Creek basin are shown in the bar graph.

TABLE 2
Gauging Station Data for 1993-94

Number of Active Stations (as of April 1st)			
YEAR	WSC	OTHER	TOTAL
1992	445	84	529
1993	444	84	528
Difference	-1	0	-1

Station Designations 1 April 1993				
FED.	FED./PROV.	PROV.	CONT.	TOTAL
119(1)	211(1)	177(2)	21	528

FED. = FEDERAL PROV. = PROVINCIAL
FED./PROV. = FEDERAL/PROVINCIAL
CONT. = CONTRIBUTED DATA
() = NUMBER OF SEDIMENT STATIONS INCLUDED

TABLE 3
Comparative Gauging Station Data
1 April 75 to 1 April 93

Station Designation	1 April		Net Change
	1975	1993	
Federal	157	119	- 38
Federal/Prov.	221	211	- 10
Provincial	46	177	+131
TOTAL	424	507	+ 83

TABLE 4
Detailed Gauging Station Designation Data
as of 1 April 1993

Desig-nation	Number	Desig-nation	Number	Desig-nation	Number	Contributed	TOTAL
F1	27 (0)	F-P1	15 (0)	P1	177 (2)	21(0)	-
F2	51 (0)	F-P2	35 (0)	P2	0 (0)	-	-
F3	28 (0)	F-P3	161 (1)	-	-	-	-
F4	13 (1)	-	-	-	-	-	-
Total (F)	119 (1)	Total (F-P)	211 (1)	Total (P)	177 (2)	21(0)	528(4)

( ) BRACKETED NUMBERS INDICATE SEDIMENT STATION(S)

Figure 3 is a histogram of active gauging station maturity in Alberta, and Figure 4 is a similar histogram, which also includes discontinued gauging stations. The histogram of active gauging stations depicts the lack of maturity of the Alberta network. As a rule, it is generally accepted that a minimum of 25 years of record are required for statistical analysis. It is evident that sufficient data, for the majority of the network, isn't available for scientific interpretation.

3.2 NETWORK CHANGES 1993-94

Changes which were made during the 1992/93 year and which are reflected in the April 1, 1993 Schedule A (contained in Appendix A of this report) are detailed in the 1992-93 report. In summary these changes included the establishment of two new gauging stations, the discontinuance of 1 station, and the redesignation of 7 stations.

Changes which will be reflected in Schedule "A", April 1, 1994 are summarized as follows:

3.2.1 New Stations Established During 1993-94 (Apr.1 - Mar.31)

None.

3.2.2 Stations Discontinued During 1993-94 (Apr.1 - Mar.31)

Station Name	Station No.	Designation
Snake Indian River near the Mouth	07AB002	F1

3.2.3 Station Designation Changes During 1993-94

Station Name	Station No.	Designation	
		From	To
Lee Creek at Cardston	05AE002	F3	FP2
Belly River near Mountainview	05AD005	F3	FP2
Sage Creek at Q Ranch	11AA026	F3	FP2
Rolph Creek near Kimball	05AE005	F3	FP2

There were no new stations established in 1993-94 in Alberta.

The Snake Indian River near the Mouth was discontinued due to access problems. Parks Canada decided to close the road to the station and it was agreed that flying to the site was not economical.

The re-designation of the four F3 (International) stations was done on the basis of a strict interpretation of the definition of international stations. That is, these four sites are not required to administer international treaties nor are they required for allocation purposes.

3.3 NETWORK PLANNING

3.3.1 Sediment

Due to budget restraint, no further sediment data analyses were started. The sediment analysis reports for the North Saskatchewan River at Whirlpool Point and Oldman River at Waldron's Corner were prepared in 1992-93 but were published and distributed in 1993-94.

3.3.2 Hydrometric

Much of the Network Planning/Evaluation activities in Alberta in 1993-94 were dictated by operational concerns. With funding at near static levels and needs for existing network data remaining the same, little could be accomplished with regard to network changes. The adjustments planned for 1994-95 (24 stations to be discontinued) were primarily based on operational difficulty assessments and economics. Operational difficulties was the factor involved in the discontinuance of the one gauging station.

Figure 3

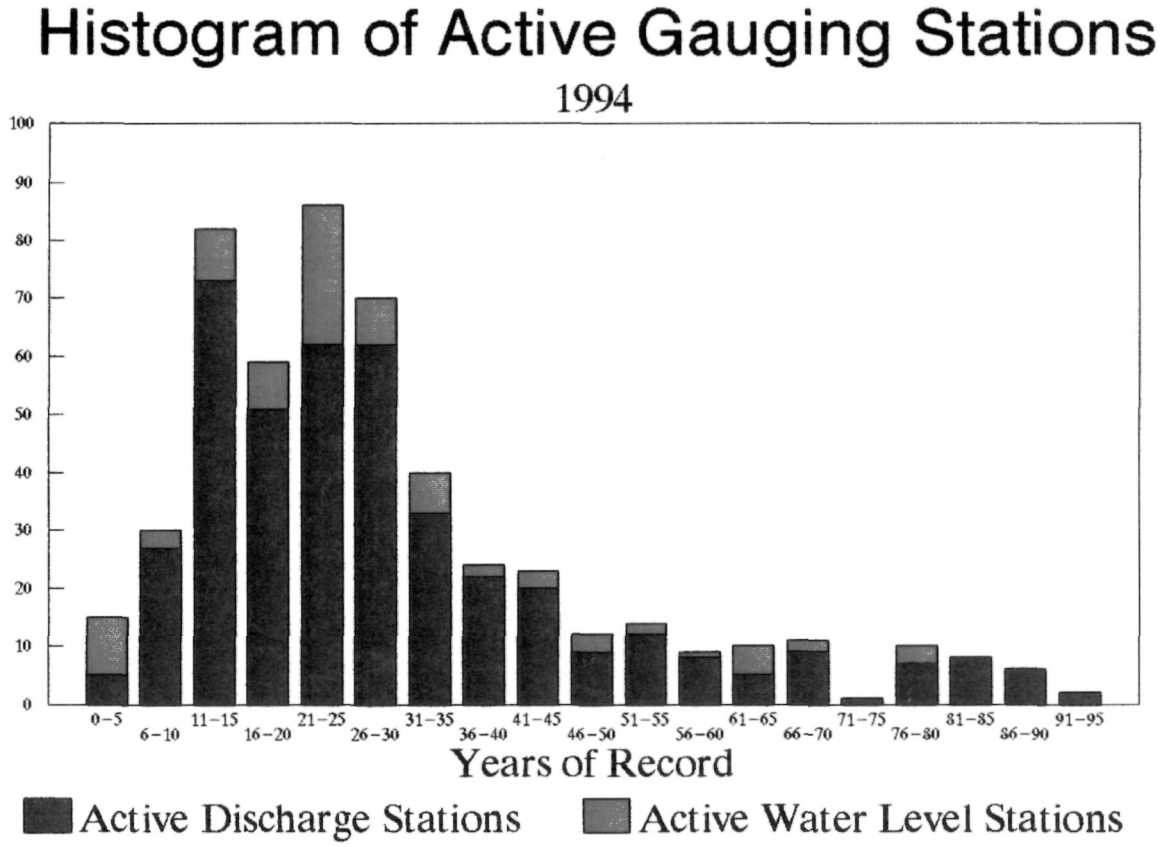
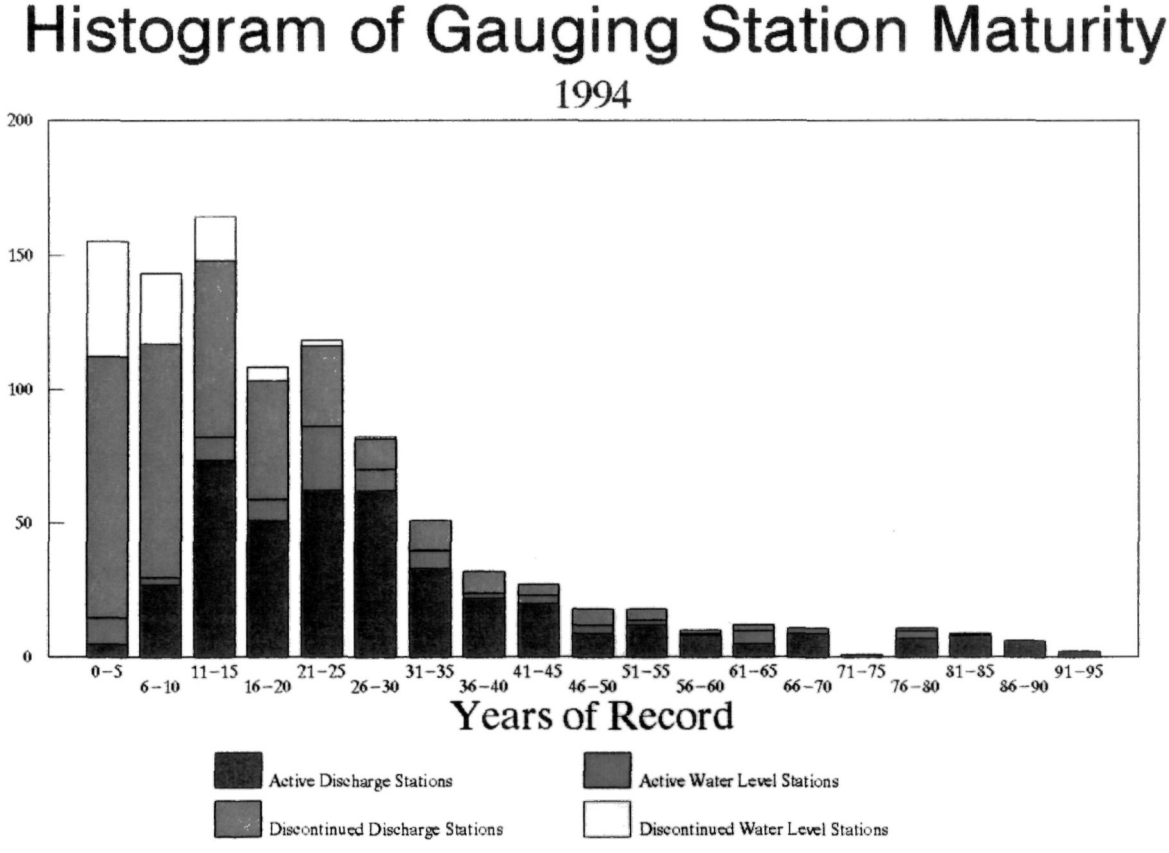


Figure 4



4.0 WATER QUANTITY SURVEY AGREEMENTS

4.1 CO-ORDINATING COMMITTEE MEETINGS

Only one Co-ordinating Committee meeting was held in 1993-94 and that was on October 21, 1993. A second meeting, scheduled for February 8, 1994, had to be cancelled due to conflicting events. However one Co-ordinator from each agency (Alberta Environmental Protection and Environment Canada) met on February 18, 1994 to make appropriate network reductions to respond to the provincial cut of 7.8% in contract work.

4.1.1 October 21, 1993 Meeting

4.1.1.1 Action Items Reviewed

All outstanding action items were completed.

4.1.1.2 Review of 1992-93 Shareable Costs

Costs were reviewed and 1993-94 estimates for Schedule "D" re-calculated. The re-calculation indicated a reduction in the 1993-94 Schedule "D" of $5K but since this was less than 0.5% of the total, no revisions were made.

4.1.1.3 Re-organization

4.1.1.3.1 New Structures and Impacts

Mr. Halliday presented a probable Environment Canada re-organization structure with the Atmospheric Environment Service (AES) combining with the Water Survey of Canada (WSC) to be in a Monitoring and Systems Service. As a consequence, the WSC and AES Federal/Provincial agreements will very likely come under one Federal umbrella. In addition, there will be one head of monitoring in Alberta but as to where the water quality component or the Flood Damage Reduction Program will reside is still being decided.

4.1.1.3.2 Provincial Changes

Mr. Valentine presented the new organizational structure of Alberta Environmental Protection, which is now made up of 7 services: Land & Forest, Fish & Wildlife, Parks, Environmental Regulatory, Research & Strategic Planning, Finance, and Water Resources. Mr. Valentine described his own area of responsibility, the Technical Services and Monitoring Division (TS&MD), which includes water quantity, quality and groundwater monitoring.

4.1.1.3.3 Impact of Budget Changes on Monitoring Programs

Mr. Halliday mentioned that DOE planned to cut $15.6 million from their budget in the coming year. Over the next few years, a 10% reduction in resources for the departmental monitoring program has been proposed. He said that it would take about a year to determine the effect that the proposed cuts would have on the hydrometric agreement.

Mr. Valentine mentioned that provincial cuts were also possible but he didn't know exactly how much they would be.

It was agreed the implementation of any costs should be done through the Co-ordinating Committee with the maximum degree of consultation and cooperation. In addition, the committee felt it would be futile to estimate Schedule "D" for 1994-95.

4.1.1.4 Network Adjustments in 1994-95

4.1.1.4.1 Re-location of Peace River below Quatre Fourches

An investigation will be started about the possibility of re-locating this station upstream to a site not as susceptible to damage. If a satisfactory site is found, it would be re-located during the fall, weather permitting. Until then, the outlet has been re-located to a deeper channel with the hope that it won't be disturbed next spring.

4.1.1.4.2 Federal Stations Re-designated

Alberta Environmental Protection (AEP) has agreed that the following stations should be continued and agreed to a re-designation as Federal/Provincial stations;

Lee Creek at Cardston
Belly River near Mountainview
Rolph Creek near Kimball
Sage Creek at "Q" Ranch

4.1.1.4.3 Return Flow Stations

Mr. Valentine reported that a letter has been sent to the Eastern Irrigation District requesting they become involved in hydrometric data collection, eventually assuming responsibility for the stations in their district. No meetings have taken place yet but if this approach is successful, similar efforts would be made with other irrigation districts.

4.1.1.4.4 Snake Indian River near the Mouth

AEP agreed to the discontinuance of this station.

4.1.1.4.5 Todd Creek at Elton's Ranch

AEP wants to continue this station but WSC indicated the present site is unsuitable. it was agreed that a joint (WSC and AEP) reconnaissance would be carried out in an attempt to find a more suitable location.

4.1.1.4.6 Cold lake at Outlet of Cold Lake

A flow station, which will operate during the open water period and have a station unit = 1.00, has been established at the outlet of Cold Lake. Water levels from the Cold Lake station will be utilized to compute winter streamflow.

4.1.1.4.7 Oldman River Sediment Program Review

It was brought to the attention of the Co-ordinating Committee that AEP staff employed at the Oldman Dam had given up the job of collecting suspended sediment samples. The only sediment data being collected are those taken when a flow measurement is performed. Mr. Valentine noted that these data are needed and he will contact Headworks Branch for further discussions. The 1992 sediment data will be forwarded to AEP shortly.

4.1.1.5 CD-ROM Distribution and Cost Recovery

Discussion centred around a letter from DOE Ottawa proposing that cost-sharing partners be supplied with only one free copy of the CD-ROM. It was agreed that WSC Calgary and AEP would each respond directly to Ottawa indicating why the proposal was not acceptable.

4.1.1.6 Bow River Modelling Project's Report

Using the GPS expertise provided by Energy, Mines and Resources, 160 cross-sections were completed this past summer, along with the 249 cross-sections done previously through the Federal Damage Reduction Program (FDRP), that should provide the information necessary to calibrate the One-D model for the Bow River from the Ghost Reservoir to Bassano Dam. Mr. Warner doesn't anticipate any problems with the hydraulics and is optimistic that the model will allow for both water quantity and quality data which is essential for Instream Flow Needs (IFN). The model

would be used to derive "what if" scenarios to determine the environmental effects of various flow assumptions. Mr. Halliday suggested that a non-technical workshop for managers be planned and conducted to explain the model's potential.

4.1.1.7 Bow River Basin Preliminary Flow Data

AEP supplied a list of WSC stations for which they need preliminary data by the end of February. No problems in supplying these data on a timely basis were anticipated.

4.1.1.8 Real-Time Data Acquisition

After some discussion, the Committee decided that Mr. Barnetson (WSC) and Mr. Graham (AEP) should meet to discuss how both agencies are dealing with accessing real-time data to prevent any overlap between the agencies.

4.1.1.9 P2K Implementation in PAD Area

Five of six stations planned for P2K instrumentation in the Peace-Athabasca Delta have been installed. it was suggested, and agreed to by AEP, that a DCP be moved to Peace River below Quatre Fourches at the earliest opportunity.

4.1.2 Meeting Between Co-ordinating Committee Members Coles & Spitzer; February 18, 1994

This meeting was held to agree to network changes in 1994-95 necessary because of the provincial government cuts of 7.8% to its contract work (Federal/Provincial Hydrometric & Cost-Sharing Agreement was deemed to be part of the contracts' programs).

In all it was agreed to discontinue the operation of 23 stations (at nine of these sites the appurtenances would be left in for AEP or future re-activation). One other site was changed from a flow station to a water level only station and the period of operation was shortened.

4.2 OPERATIONAL ACHIEVEMENTS

4.2.1 Training Program

The major emphasis on training for hydrometric field staff in 1993/94 was advanced Drivers' Skills Training. All hydrometric field staff participated in this training. In addition the Peace River sub-office staff attended a one-day, "Introduction to DOS" computer course. GPS training was given to those staff participating in the Bow River One-D Modelling Project. Significant training was again concentrated on the staff in the modernization pilot project. This will be described in section 4.2.4 Pilot Project 2000 Progress.

4.2.2. Construction and Maintenance Program

No new stations were built in 1993/94 although a temporary demonstration station was installed on the Kananaskis River for the National Boy Scout Jamboree. After the Jamboree, this station was removed and installed on Nose Creek in Calgary for demonstration purposes for the Girl Guides of Canada.

Major maintenance was carried out at 47 gauging station sites including:

- removal of 6 stations;
- re-location of 7 stations;
- upgrading of 2 stations;
- cableway installations at 2 stations;
- cableway repairs at 9 stations;
- minor maintenance at 21 stations

Power was installed at 3 sites.

The total cost of the construction program (excluding depreciation) was $118,000 plus $3,600 for power installations. of this total $61,000 was a provincial responsibility.

Table 5 which follows is directly extracted from the "Alberta Gauging Station Construction and Maintenance Annual Report, 1993-94" and is a breakdown of project costs for each gauging station at which work was performed.

TABLE 5
SPECIFIC SITE CONSTRUCTION COSTS

	FEDERAL/PROVINCIAL STATION		CONSTRUCTION COST	RECORDER	FEDERAL SHARE	PROVINCIAL SHARE
M-01	Amisk River at highway 36	06AA002	$509.79	$0.00	$254.90	$254.90
M-02	Battle River near Ponoka	05FA001	$741.96	$0.00	$370.98	$370.98
M-03	Beaverlodge Rr. nr. Beaverlodge	07GD001	$435.45	$0.00	$217.73	$217.73
M-04	Birch Rr. Below Alice Creek	07KE001	$3,093.06	$0.00	$1,546.53	$1,546.53
M-05	Clearwater Rr. above Limestone Cr.	05DB003	($835.56)	$0.00	($417.78)	($417.78)
M-06	Clearwater Rr. nr. Forestry Road	?	($751.81)	$0.00	($375.91)	($375.91)
M-07	Deer Cr. near Sundre	05CA003	$835.20	$0.00	$417.60	$417.60
M-08	Jackpine Cr. at Wadlin Lake Road	07JD003	$4,040.49	$0.00	$2,020.25	$2,020.25
M-09	Kneehills Cr. near Drumheller	05CE002	$7,391.88	$0.00	$3,695.94	$3,695.94
M-10	Little Red Deer Rr. nr. Water Valley	05CB002	$1,699.39	$0.00	$849.70	$849.70
M-11	Little Smoky Rr. near Guy	07GH002	$517.77	$0.00	$258.89	$258.89
M-12	Mackay Creek at Walsh	05AH002	$9,875.74	$0.00	$4,937.87	$4,937.87
M-13	Mackay Rr.near Fort Mackay	07DB001	$13,363.02	$0.00	$6,681.51	$6,681.51
M-14	McLeod Rr. above Embarras Rr.	07AF002	$479.08	$0.00	$239.54	$239.54
M-15	Meander Rr. at Outlet Hutch Lake	07OB005	$9,351.10	$0.00	$4,675.55	$4,675.55
M-16	Muskeg Rr. Nr. Fort Mackay	07DA008	$5,203.48	$0.00	$2,601.74	$2,601.74
M-17	Oldman Rr. near Brocket	05AA024	($4,676.49)	($2,500.00)	($4,838.25)	($2,338.25)
M-17	Oldman River below Oldman Dam	05AA024	$1,667.12	$0.00	$833.56	$833.56
M-18	Pipestone Cr. near Wetaskiwin	05FA012	$747.04	$0.00	$373.52	$373.52
M-19	Poplar Cr. near Fort MacMurray	07DA007	$915.65	$0.00	$457.83	$457.83
M-20	Punk Cr. near the Mouth	06AB003	$696.94	$0.00	$348.47	$348.47
M-21	Ray Cr. near Innisfail	05CE010	$1,408.13	$0.00	$704.07	$704.07
M-22	Stimson Cr. near Peklsko	05BL007	$1,541.90	$0.00	$770.95	$770.95
M-23	Threepoint Cr. near Millarville	05BL013	$314.56	$0.00	$157.28	$157.28
M-24	Todd Cr. at Elton's Ranch	05AA006	$502.10	$2,500.00	$2,751.05	$251.05
	TOTAL F/P MAINTENANCE COSTS		$59,066.99	$0.00	$29,533.49	$29,533.49
	FEDERAL STATION					
M-25	Athabasca River at Hinton	07AD002	$112.05	$0.00	$112.05	$0.00
M-26	Bow River at Calgary	05BH004	$122.00	$0.00	$122.00	$0.00
M-27	Cold Rr. at Outlet Cold Lake	06AF001	$2,118.07	$2,500.00	$4,618.07	$0.00
M-28	Kananaskis Rr(Boy Scout Jamboree)	N/A	$3,242.26	$0.00	$3,242.26	$0.00
M-29	Little Bow Canal at High River	05BL015	$348.14	$0.00	$348.14	$0.00
M-30	Nose Cr. at Calgary	05BH003	$10,266.16	$0.00	$10,266.16	$0.00
M-31	Silverhorn Cr. near the Mouth	05AD010	$780.52	$0.00	$780.52	$0.00
M-32	Snake Indian Rr. near the Mouth	07AB002	$615.15	$0.00	$615.15	$0.00
M-33	Sunwapta Rr. at Athabasca Glacier	07AA007	$1,164.66	$0.00	$1,164.66	$0.00
M-34	W.I.D. Canal near Chestermere Lake	05BM003	$1,329.85	$0.00	$1,329.85	$0.00
M-35	Whirlpool Rr. near the Mouth	07AA009	$4,886.37	$0.00	$4,886.37	$0.00
	TOTAL FEDERAL MAINTENACE COSTS		$24,985.23	$2,500.00	$27,485.23	$0.00
	PROVINCIAL STATION					
M-36	Chip Lake at Outlet Lobstick R.	07BB008	$1,607.43	$0.00	$0.00	$1,607.43
M-37	Bear Creek at Valhalla Center	07GE007	$1,595.56	$0.00	$0.00	$1,595.56
M-38	Colquhoun Cr. nr. Grande Prairie	07GE006	$409.77	$0.00	$0.00	$409.77
M-39	Fawcett Lake near Smith	07BK008	$2,519.90	$0.00	$0.00	$2,519.90
M-40	Gregg Rr. nr. the Mouth	07AF015	$1,878.55	$0.00	$0.00	$1,878.55
M-41	Highwood Rr. near Aldersyde	05BL009	$238.75	$0.00	$0.00	$238.75
M-42	Little Bow Rr. above Travers Dam	05AC034	$696.07	$0.00	$0.00	$696.07
M-43	Parlby Cr. at Alix	05CD007	$7,489.10	$0.00	$0.00	$7,489.10
M-44	Pony Creek near Chard	07CE003	$9,539.37	$0.00	$0.00	$9,539.37
M-45	Redwillow Rr. near Beaverlodge	07GD003	$2,065.05	$0.00	$0.00	$2,065.05
M-46	Reita Cr. near Angling Lake Road	06AD013	$696.94	$0.00	$0.00	$696.94
M-47	Unamed Cr. near Fort Mackay	07DA011	$2,706.10	$0.00	$0.00	$2,706.10
	TOTAL PROVINCIAL MAINTENANCE COSTS		$31,442.59			$31,442.59
	TOTAL COST OF CONSTRUCTION		$115,494.81	$2,500.00	$57,018.72	$60,976.08

4.2.3 Hydrometric Program Achievements

The 1992 Alberta hydrometric data computations were completed right on the deadline date of April 30, 1993. They were submitted to Ottawa on this date with the laser re-produced hard copy being returned to Calgary on June 17, 1993. Copies of these data were provided to AEP by the end of June, 1993. Unfortunately the delivery of the CD-ROM was not nearly as timely as the CD-ROM for hydrometric data for Canada, containing data to 1992 inclusive, was not received until February 7, 1994.

The 1993 Alberta hydrometric data were completed and submitted to Ottawa on March 29, 1994.

The sediment data computations for 1992 were completed and submitted to Ottawa on September 1, 1993.

The fourth hydrometric data collections and computation audit was performed on June 24 and 25, 1993. In all, data from 10 gauging stations were audited by a team of three: I. McLaurin, Ottawa, T. Cheng and N. Chapin, Calgary. Included in this audit were two stations operated by AEP. The audit team found that for the most part the programs and computations were being carried out to national standards and found improvement from the third audit findings. AEP audited sites were conducted and computed to national standards.

The Chief, Water Resources Branch, Mr. G. H. Morton retired in December, 1993 creating a major loss of knowledge and abilities to the hydrometric program. Because of re-organization, his position will not be filled compounding the loss to the program. Another loss to the program occurred when Mr. G. McDonald, field technologist, retired in May, 1993. A second field technologist, Mr. C. Reynolds, was transferred from the hydrometric program on July 1, 1993. Neither position was filled.

On December 1, 1993 the agency known as the Water Resources Branch, Environment Canada ceased to exist with the integration of the atmospheric and water programs in the Western and Northern Region of Environment Canada. The Water Survey program was integrated into the Monitoring Operations Division, Environmental Monitoring and Systems Branch.

In all seven major storm events occurred throughout Alberta (4 in southern Alberta, 3 in the northern half). Of particular note was the runoff in the Willow Creek basin which was the highest since 1963. With the four events in southern Alberta stage

discharge curves for all affected gauging stations were well defined by streamflow measurement as, if particular measurements were missed in the first or second events, third and fourth chances presented themselves to the hydrometric technologists to fill in gaps in these relationships.

Only one data review, Sylvan Lake at Sylvan Lake, was carried out with resulting revisions to 1978 and 1979 data.

Special projects carried out in 1993/94 included: the operation of a Hydrolab and AFFRA installations at Athabasca River at Hinton and an AFFRA on the EID Main Branch Canal at outlet of Bassano Dam.

An automatic station was constructed on Cold River at Outlet Cold Lake to replace the former procedure (Lake Level/Outflow relationship) for determining outflow from Cold Lake. The relationship was very inaccurate at low flows.

AEP and WSC Co-ordinators met with Eastern Irrigation District officials in November 1993 to discuss the monitoring of diversions to, and return flows from, the Irrigation District. A field trip to EID installations was included. It appeared that EID had done a very credible job in return flow monitoring and further discussions will be held to turn monitoring responsibilities in the district over to the EID.

4.2.4 Pilot Project 2000 Progress

1993-94 was the first complete year in which data were collected utilizing the pilot project instrumentation at the entire P2K network of 56 stations (the exception was one site in the PAD area where the instrumentation was installed in October, 1993). For the most part the operation of the gauging station field instrumentation was successful with only minor problems being encountered and with minor adjustments to field instruments, including the replacement of voltage regulators. The P2K team members became much more confident in the servicing and operation of the P2K instrumentation and likely their confidence and facility with the operation of the instruments greatly improved the record recovery from the modernized instruments.

June, 1993 was a banner month to the P2K operation in that all the DCP instrumented sites were on the air and operating successfully and as well all data loggers were functioning. A lower limit of operation was also determined when four of five instruments failed in the PAD area when temperatures dropped to -40 degrees C.

Unfortunately the application of modernized computational techniques was much less successful. The CompuMod procedure was upgraded from version 2.0 to 3.01 but, while this greatly increased the program speed, it also produced problems with compatibility of 1992 data. The decision was made to compute 1993 data onlyusing CompuMod procedures (at least until the problem is resolved).

1993-94 was therefore the first actual year of full operation of the Pilot Project and the data collected will be the baseline for assessing the efficacy of the modernization approach.

While the major problems concerning modernized water level data collection instrumentation have been resolved the same cannot be stated about automation of streamflow discharge measurements utilizing the hand-held computer PC9000 and magnetic head current meters. The problem of spurious and/or missed counts of the magnetic head current meter has not been resolved nor have all the bugs been cleared up regarding the discharge measurement computation program. By the end of 1993-94 the program issues appear to be resolved but no progress had been made concerning the resolution of problems with the meter.

Some of the lesser achievements of the P2K project during the year included: the preparation of a national progress report and the preparation of a "tricks of the trade" document.

Other modernization effects included the continued operations of AFFRA's @ Athabasca River at Hinton and EID Main Branch Canal near Bassano and a Hydrolab installation on the Athabasca River at Hinton.

In addition to on-the-job experience, formal training was provided as follows:

- SDI and EPROM Workshop, June 22/23, WSC staff from across the country, AEP, B.C. Environment and Manitoba Hydro representatives

- Tavis Transducer Demonstration, August 26, to P2K team

- Hydrolab Workshop, September 16/17, conducted by AEP, two Environment Canada attendees

- Modernization Workshop, March 15 to 17, Introduction of the P2K Project to newly integrated members (re-organization of Environment Canada) of the Modernization effort.

One of the original P2K team members was re-assigned other duties during the year and a new member was brought on board in July, 1993. This change was serendipitous in that it provides an opportunity for assessing not only the abilities of the team members to pass on their knowledge but also a means of assessing the ease with which the switch to modernized procedures can be made by traditional technologists.

4.2.5 Cost of Operation

The "Summary of Financial Considerations, 1993-94", Table 6 is based upon information contained in Appendix "B" which provides detailed information on procedures utilized to determine the respective federal and provincial shares of operating the hydrometric and sediment networks. Detailed calculations based on these procedures are further explained in the introduction of this report and are further defined in the manual, "Water Quantity Surveys, Federal-Provincial Cost Sharing Agreements, Compendium Report", 1985.

For the 1993-94 fiscal year Alberta paid $1,048,000 for the operation of the hydrometric and sediment networks. The calculated Alberta share to operate these networks was $1,050,459 or an underpayment of 0.23 percent.

The actual payment from Alberta to Canada was reduced by $30,149 in the second quarter of 1993-94 to compensate for the 1992-93 overpayment by Alberta of $31,609. This adjustment was made because 1992-93 was the second year in a row in which Alberta had overpaid by more than $30,000. The history of Alberta's share of the program, Alberta's annual payment and over/underpayments for each year since the inception of the agreement are detailed in Table 7. Over the 19 years of the agreement, the Alberta government has overpaid her share by almost $9,000 of Alberta's total share of $13,305,233 or 0.07 percent.

The total units operated by WSC in 1993-94 was 341.85, a slight decrease from those operated in 1992-93; 343.00. Unit cost of operating the program in 1993-94 was $5,460.72 as compared to the unit cost of

TABLE 6

SUMMARY OF FINANCIAL CONSIDERATIONS

1993-94

Type of Expenditure	No. of Stns.	Total Cost	Share	
			Federal	Alberta
1. Hydrometric Network				
Operated by Water Survey of Canada	430	$1,876,576	$ 914,397	$ 962,179
Depreciation - Hydrometric Equipment and Vehicles		143,095	69,716	73,379
2. Sediment Network				
Full program operated by Water Survey of Canada (a)	3	$ 17,201	$ 2,867	$ 14,334
Depreciation - Sediment Equipment		179	79	100
Cost of Analysis of AEP Stations		3,594	0	3,594
3. Construction and Maintenance				
Major Maintenance at 47 sites	47	$ 117,995	$ 57,019	$ 60,976
Plus Power at 3 Sites	3	3,634	3,634	0
Depreciation - Construction Vehicles & Equipment		5,826	2,905	2,921
Total		$2,168,100	$1,050,617	$1,117,483

ALBERTA NET SHARE: $1,117,483 - $67,024 (b)= **$1,050,459**

(a) As specified in Appendix B, these are incremental costs.

(b) Credit to Alberta for stations of federal interest operated in the Peace-Athabasca Delta (PAD) Area by Alberta Environment.

11.40 Federal units x $5,460.72	= $62,252
Depreciation units: $143,095 x (11.40/341.85)	= 4,772
	$67,024

TABLE 7

CUMULATIVE PROVINCIAL OVER OR UNDERPAYMENT FOR PERIOD OF AGREEMENT (DOLLARS)

Year	Actual Cost	Annual Payment	Overpayment (+) Underpayment(-)	% of Annual Payment
1975-76	197,852	197,400	(-) 452	(-) 0.23
1976-77	231,000	231,000	Nil	Nil
1977-78	247,430	240,000	(-) 7,430	(-) 3.10
1978-79	267,055	260,000	(-) 7,055	(-) 2.71
1979-80	353,768	370,000	(+) 16,232	(+) 4.39
1980-81	423,906	390,000	(-) 33,906	(-) 8.69
1981-82	556,741	568,240	(+) 11,499	(+) 2.02
1982-83	747,352	747,352	Nil	Nil
1983-84	812,593	796,033	(-) 16,560	(-) 2.08
1984-85	935,664	933,500	(-) 2,164	(-) 0.23
1985-86	917,865	927,000	(+) 9,135	(+) 0.99
1986-87	962,413	962,700	(+) 287	(+) 0.03
1987-88	819,624	830,579	(+) 10,955	(+) 1.32
1988-89	868,131	856,000	(-) 12,131	(-) 1.42
1989-90	922,430	920,000	(-) 2,430	(-) 0.26
1990-91	1,002,759	1,008,350	(+) 5,591	(+) 0.57
1991-92	957,200	995,600	(+) 38,400	(+) 3.86
1992-93	1,030,991	1,062,600	(+) 31,609	(+) 3.07
*1993-94		(-) 30,149	(-) 30,149	
1993-94	1,050,459	1,048,000	(-) 2,459	(-) 0.23
Total:	13,305,233	13,314,205	(+) 8,972	(+) 0.07

* Credit to Alberta for Overpayment in 1992/93.

$5,373.59 in 1992-93, a small increase of $87.13 (1.6%). In 1992-93 the number of units operated per hydrometric staff member was 12.15. In 1993-94 this ratio was 12.32 units/staff, a very similar workload. More details concerning unit costs, total units and units per staff are depicted in graphs and described in previous annual cost sharing reports.

Schedule "C" of the Memorandum of Agreement for Water Quantity Surveys describes procedures for the preparation of annual reports. This procedure calls for an approximation of Schedule "D" for the forecast year which in this case is 1995-96. This forecast estimates that Schedule "D" for 1995-96 should be signed for $965K. This estimate along with Schedule "D" for 1993-94 is contained in Appendix "C" of this report.

Table 8 which follows compares Schedule "D" with actual costs and payments.

TABLE 8
WATER QUANTITY SURVEYS

COMPARISON - SCHEDULE "D" COSTS WITH ACTUAL COSTS AND PAYMENTS

1993-94

($1000s)

Salary & Operation		Construction		Total			Annual Payment Received	Payment Received Minus Actual
Schedule D	Actual Cost	Schedule D	Actual Cost	Schedule D	Actual Cost	Difference		
$985.90	$986.60	$62.10	$64.0	$1,048.0	$1,050.60	$2.6	$1,048.0	(-) $2.6

Note the $1048K was reduced by $30,149 as a credit for overpayment in 1992/93.

5.0 FUTURE CONSIDERATIONS

With the Alberta Government cut to monies available for contracts and the Federal Government re-engineering of the Water Program, the re-organization of Environment Canada and significant cuts to the Environment Canada budget, the hydrometric and sediment networks are under considerable stress and attack and there will no doubt be adjustments (downward) to the networks.

The first major change to the network will take effect April 1, 1995 as the hydrometric network will be reduced by 23 stations (discontinued) and a major change in operation schedule and type of operation of one other site. This network change will reduce the station units in 1994-95 to 321.6 from 341.85 operated in 1993-94. This change was made to adapt to the 7.8% cut to contracts imposed by the Provincial Government. Of the 24 stations, 16 are designated "Provincial", 6 "Federal-Provincial", and 2 "Federal". While the 2 federal sites do not reduce, directly, the cost to the province they are so situated that their discontinuance has a large impact on reducing total O&M costs. This network reduction will reduce Schedule "D" (Alberta's share of the program) from $1,048,000 in 1994-95 to $964,400 in 1995-96.

No new station construction is anticipated during the next several years but the program will instead concentrate on station maintenance and safety issues and will likely be largely involved with the removal of stations that were discontinued.

1993-94 was the first full year of the operation of the full P2K network and it is anticipated that the pilot project will be extended through 1994-95 to provide two full years of data with which to assess the attributes of modernization and the potential savings which might accrue by modernizing the network and computation procedures.

No doubt further adjustments to be networks will be required in 1995-96 and beyond, although the extent and specifics are unknown at this time. One potential saving to the program is the operation of irrigation gauging stations (diversions and return flow channels) by the individual irrigation districts. To this end discussions have been held with the Eastern Irrigation District officials.

A P P E N D I X "A"

SCHEDULE "A"

OF

MEMORANDUM OF AGREEMENT

BETWEEN

GOVERNMENT OF CANADA

AND

GOVERNMENT OF ALBERTA

April 1, 1993

SCHEDULE A

OF

MEMORANDUM OF AGREEMENT

BETWEEN

GOVERNMENT OF CANADA

AND

GOVERNMENT OF ALBERTA

MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - FEDERAL DEPARTMENTAL PROGRAMS (1)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
1	ATHABASCA RIVER NEAR JASPER	07AA002	X				X		X
2	BOW RIVER AT BANFF	05BB001	X				X		X
3	BOW RIVER AT LAKE LOUISE	05BA001	X			X			X
4	BREWSTER CREEK NEAR BANFF	05BB004	X			X			X
5	CASCADE RIVER ABOVE LAKE MINNEWANKA	05BD005	X			X			X
6	JOHNSTON CREEK NEAR THE MOUTH	05BA006	X			X			X
7	LESSER SLAVE RIVER AT SLAVE LAKE	07BK001	X				X		X
8	MALIGNE RIVER NEAR JASPER	07AA004	X				X		X
9	MIETTE RIVER NEAR JASPER	07AA001	X				X		X
10	MISTAYA RIVER NEAR SASKATCHEWAN CROSSING	05DA007	X				X		X
11	NORTH SASKATCHEWAN RIVER AT WHIRLPOOL POINT	05DA009	X				X		X
12	PIPESTONE RIVER NEAR LAKE LOUISE	05BA002	X				X		X
13	REDEARTH CREEK NEAR THE MOUTH	05BB005	X			X			X
14	SILVERHORN CREEK NEAR THE MOUTH	05DA010	X				X		X
15	SNAKE INDIAN RIVER NEAR THE MOUTH	07AB002	X			X			X
16	SUNWAPTA RIVER ATHABASCA GLACIER	07AA007	X			X			X
17	WATERTON LAKE AT WATERTON PARK	05AD025		X			X		X
18	WATERTON RIVER NEAR WATERTON PARK	05AD003	X				X		X
19	WHIRLPOOL RIVER NEAR THE MOUTH	07AA009	X			X			X
	OPERATED BY - ALBERTA GOVERNMENT								
1	LAKE ATHABASCA AT BUSTARD ISLAND	07MD002		X			X	X	
2	LAKE ATHABASCA AT FORT CHIPEWYAN	07MD001		X			X	X	
3	LAKE CLAIRE NEAR OUTLET TO PRAIRIE RIVER	07KF002		X			X	X	
4	MAMAWI LAKE CHANNEL AT OLD DOG CAMP	07KF003		X			X	X	
5	PEACE RIVER BELOW CHENAL DES QUATRE FOURCHES	07KC005		X			X	X	
6	RIVIERE DES ROCHERS ABOVE SLAVE RIVER	07NA001		X			X	X	
7	RIVIERE DES ROCHERS EAST OF LITTLE RAPIDS	07NA007	X				X	X	
8	RIVIERE DES ROCHERS WEST OF LITTLE RAPIDS	07NA008		X		X		X	

MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - INTERPROVINCIAL WATERS (2)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
1	BATTERSEA DRAIN NEAR THE MOUTH	05AD038	X			X			X
2	*BATTLE RIVER NEAR THE SASKATCHEWAN BOUNDARY	05FE004	X				X		X
3	BEAVER RIVER AT COLD LAKE RESERVE	06AD006	X				X		X
4	BOUNTIFUL COULEE INFLOW NEAR CRANFORD	05AG026	X			X			X
5	BOW RIVER AT CALGARY	05BH004	X				X		X
6	BOW RIVER NEAR THE MOUTH	05BN012	X				X		X
7	B.R.D. DRAIN A NEAR HAYS	05AG004	X			X			X
8	B.R.D. MAIN CANAL	05AC004	X			X			X
9	-BOXELDER CREEK AT HARGRAVES RANCH	05AH050	X			X			X
10	-BOXELDER CREEK NEAR WALSH	05AH001	X			X			X
11	CANADIAN ST. MARY CANAL NEAR SPRING COULEE	05AE026	X			X			X
12	COAL CREEK AT BOW CITY	05BN014	X			X			X
13	CLEARWATER RIVER ABOVE CHRISTINA RIVER	07CD005	X				X	X	
14	COLD LAKE AT COLD LAKE	06AF002		X			X		X
15	COLD RIVER AT OUTLET OF COLD LAKE	06AF008	X			X			X
16	CROWFOOT CREEK NEAR CLUNY	05BM008	X			X			X
17	DICKSON REVERVOIR NEAR DICKSON	05CB006		X			X		X
18	DRAIN L-5 NEAR DIAMOND CITY	05AD040	X			X			X
19	DRY COULEE NEAR MAGRATH	05AE041	X			X			X
20	E.I.D. EAST BRANCH CANAL NEAR LATHOM	05CJ003	X			X			X
21	E.I.D. NORTH BRANCH CANAL NEAR BASSANO	05CJ001	X			X			X
22	E.I.D. SPRINGHILL CANAL NEAR LATHOM	05CJ004	X			X			X
23	EXPANSE COULEE NEAR THE MOUTH	05AG003	X			X			X
24	HIGHWOOD DIVERSION CANAL NEAR HEADGATES	05BL025	X			X			X
25	L.N.I.D. CANAL ABOVE OLDMAN FLUME	05AB019	X			X			X
26	LITTLE BOW CANAL AT HIGH RIVER	05BL015	X				X		X
27	LITTLE BOW RIVER AT CARMANGAY	05AC003	X				X		X
28	LITTLE BOW RIVER BELOW TRAVERS DAM	05AC012	X			X			X
29	LITTLE BOW RIVER NEAR THE MOUTH	05AC023	X			X			X
30	M.I.D. CANAL NEAR SPRING COULEE	05AE021	X			X			X
31	MARTINEAU RIVER ABOVE COLD LAKE	06AF008	X				X	X	
32	MATZHIWIN CREEK BELOW WARE COULEE	05CJ012	X			X			X
33	MOUNTAIN VIEW IRRIGATION DISTRICT CANAL	05AD017	X			X			X
34	NEW WEST COULEE NEAR THE MOUTH	05BN006	X			X			X
35	OLDMAN RIVER NEAR LETHBRIDGE	05AD007	X		X		X		X
36	$PEACE RIVER AT PEACE POINT	07KC001	X				X	X	
37	POTHOLE CREEK AT RUSSELL'S RANCH	05AE016	X			X			X
38	RED DEER RIVER NEAR BINDLOSS	05CK004	X				X		X
39	RONALANE WASTEWAY NEAR HAYS	05BN007		X		X			X
40	ROSEBUD RIVER AT REDLAND	05CE005	X			X			X
41	ROSS CREEK AT MEDICINE HAT	05AH049	X			X			X
42	SEVEN PERSONS CREEK AT MEDICINE HAT	05AH005	X			X			X
43	SOUTH SASKATCHEWAN RIVER AT HIGHWAY NO. 41	05AK001	X			X			X
44	$SLAVE RIVER AT FITZGERALD	07NB001	X		X		X	X	
45	ST. MARY RESERVOIR NEAR SPRING COULEE	05AE025		X			X		X
46	TWELVE MILE CREEK NEAR CECIL	05BN002	X			X			X
47	U.I.D. CANAL NEAR HILL SPRING	05AD013	X			X			X
48	WAPITI RIVER NEAR GRANDE PRAIRIE	07GE001	X				X		X
49	WATERTON RESERVOIR	05AD026		X			X		X
50	W.I.D. CANAL NEAR CHESTERMERE LAKE	05BM003	X			X			X

MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - INTERPROVINCIAL WATERS (2)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
	OPERATED BY - ALBERTA GOVERNMENT								
1	OLDMAN DAM RESERVOIR NEAR PINCHER CREEK	05AA032		X			X		X

-GAUGING STATION LOCATED ON SASKATCHEWAN SIDE OF ALBERTA-SASKATCHEWAN BOUNDARY BUT OPERATED BY THE ALBERTA DISTRICT.

*GAUGING STATIONS LOCATED IN ALBERTA BUT OPERATED BY THE REGINA DISTRICT

$GAUGING STATIONS LOCATED IN ALBERTA BUT OPERATED BY THE YELLOWKNIFE DISTRICT

MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - INTERNATIONAL WATERS (3)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
1	*BARE CREEK RESERVOIR NEAR ELKWATER	11AB094		X		X			X
2	BEAR CREEK NEAR INTERNATIONAL BOUNDARY	11AA028	X			X			X
3	BELLY RIVER NEAR MOUNTAIN VIEW	05AD005	X				X		X
4	BREED CREEK NEAR INTERNATIONAL BOUNDARY	11AA040	X			X			X
5	*CRESSDAY RESERVOIR NEAR CRESSDAY	11AB097		X		X			X
6	*GREASEWOOD RESERVOIR NEAR ELKWATER	11AB092		X		X			X
7	*JAYDOT RESERVOIR NEAR JAYDOT	11AB098		X		X			X
8	+LAKE SHERBURNE	05AE036		X			X		X
9	LEE CREEK AT CARDSTON	05AE002	X				X		X
10	*MASSY RESERVOIR NEAR ELKWATER	11AB104		X		X			X
11	*MICHELE RESERVOIR NEAR ELKWATER	11AB091		X		X			X
12	*MIDDLE CREEK NEAR THE SASKATCHEWAN BOUNDARY	11AB009	X			X			X
13	+MILK RIVER AT EASTERN CROSSING OF INT'L BOUNDARY	11AA031	X			X			X
14	MILK RIVER AT MILK RIVER	11AA005	X				X		X
15	MILK RIVER AT WESTERN CROSSING OF INT'L BOUNDARY	11AA025	X			X			X
16	MINERS COULEE NEAR INTERNATIONAL BOUNDARY	11AA029	X			X			X
17	*MITCHELL RESERVOIR NEAR ELKWATER	11AB099		X		X			X
18	+NORTH FORK MILK RIVER ABOVE ST. MARY CANAL	11AA032	X			X			X
19	NORTH MILK RIVER NEAR INTERNATIONAL BOUNDARY	11AA001	X			X			X
20	*REESOR RESERVOIR NEAR ELKWATER	11AB090		X		X			X
21	ROLPH CREEK NEAR KIMBALL	05AE005	X			X			X
22	SAGE CREEK AT Q RANCH NEAR WILD HORSE	11AA026	X			X			X
23	+SOUTH FORK MILK RIVER NEAR BABB	11AA033	X			X			X
24	+ST. MARY CANAL AT ST. MARY CROSSING	05AE029	X			X			X
25	ST. MARY RIVER AT INTERNATIONAL BOUNDARY	05AE027	X				X		X
26	+SWIFTCURRENT CREEK AT SHERBURNE	05AE033	X			X			X
27	VERDIGRIS COULEE NEAR THE MOUTH	11AA038	X			X			X
28	*WALBURGER COULEE BELOW DIVERSIONS	11AB086	X			X			X

* STATIONS OPERATED BY WATER SURVEY OF CANADA, REGINA DISTRICT

\+ STATIONS LOCATED IN MONTANA

MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - NATIONAL WATER QUANTITY INVENTORY (4)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
1	ATHABASCA RIVER AT HINTON	07AD002	X				X		X
2	ATHABASCA RIVER BELOW McMURRAY	07DA001	X				X	X	
3	LAC LA BICHE AT LAC LA BICHE	07CA004		X			X		X
4	LESSER SLAVE LAKE AT FAUST	07BJ002		X		X			X
5	McLEOD RIVER NEAR ROSEVEAR	07AG007	X				X		X
6	NORTH SASKATCHEWAN RIVER AT EDMONTON	05DF001	X				X		X
7	NOTIKEWIN RIVER AT MANNING	07HC001	X				X		X
8	PEACE RIVER AT DUNVEGAN BRIDGE	07FD003	X				X		X
9	PEERLESS LAKE NEAR PEERLESS LAKE	07JB001		X		X		X	
10	PEMBINA RIVER AT JARVIE	07BC002	X				X		X
11	RED DEER RIVER AT RED DEER	05CC002	X				X		X
12	SMOKY RIVER AT WATINO	07GJ001	X				X		X
13	WABASCA RIVER AT WADLIN LAKE ROAD	07JD002	X				X		X

MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - FEDERAL-PROVINCIAL AGREEMENTS (1)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
1	BEAVER RIVER ABOVE SYNCRUDE	07DA018	X			X		X	
2	BIRCH RIVER BELOW ALICE CREEK	07KE001	X			X		X	
3	CLEARWATER RIVER AT DRAPER	07CD001	X				X	X	
4	FIREBAG RIVER NEAR THE MOUTH	07DC001	X			X		X	
5	GREGOIRE LAKE NEAR FORT McMURRAY	07CE001		X		X		X	
6	HANGINGSTONE RIVER AT McMURRAY	07CD004	X			X		X	
7	MACKAY RIVER NEAR FORT MACKAY	07DB001	X			X		X	
8	MARMOT CREEK MAIN STEM	05BF016	X			X			X
9	MUSKEG RIVER NEAR FORT MACKAY	07DA008	X			X		X	
10	RICHARDSON RIVER NEAR THE MOUTH	07DD002	X			X		X	
11	STEEPBANK RIVER NEAR FORT McMURRAY	07DA006	X			X		X	
12	WHISKEYJACK CREEK NEAR HINTON	07AD004	X			X			X
	OPERATED BY - ALBERTA GOVERNMENT								
1	ATHABASCA RIVER NEAR OLD FORT	07DD011		X			X	X	
2	EMBARRAS BREAKTHROUGH TO MAMAWI CREEK	07KF015	X			X		X	
3	EMBARRAS RIVER BELOW DIVERGENCE	07DD003	X			X		X	

MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - RIVER BASIN MANAGEMENT (2)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
	SYMBOL $ INDICATING STATION LOCATED IN ALBERTA BUT OPERATED BY WSC YELLOWKNIFE DISTRICT								
1	BEAVER LAKE AT RANGER STATION	06AA003		X		X			X
2	BEAVERLODGE RIVER NEAR BEAVERLODGE	07GD001	X			X			X
3	BERRRY CREEK NEAR THE MOUTH	05CH007	X			X			X
4	BERRY CREEK RESERVOIR NEAR SUNNYNOOK	05CH014		X		X			X
5	BOW RIVER BELOW BASSANO DAM	05BM004	X			X			X
6	BOW RIVER BELOW CARSELAND DAM	05BM002	X			X			X
7	BULLPOUND CREEK NEAR THE MOUTH	05CG003	X			X			X
8	CASTLE RIVER NEAR BEAVER MINES	05AA022	X				X		X
9	CHAIN LAKES RESERVOIR NEAR NANTON	05AB037		X			X		X
10	COOKING LAKE AT COOKING LAKE	05EB012		X		X			X
11	$DOG RIVER NEAR FITZGERALD	07NB008	X				X	X	
12	ETHEL LAKE NEAR COLD LAKE	06AC004		X		X			X
13	FORSTER RESERVOIR NEAR CESSFORD	05CH013		X		X			X
14	HAMMERHILL SPILLWAY NEAR GLEICHEN	05BM005	X			X			X
15	HAY RIVER NEAR MEANDER RIVER	07OB003	X			X			X
16	HIGHWOOD RIVER NEAR THE MOUTH	05BL024	X				X		X
17	HILDA LAKE NEAR COLD LAKE	06AC003		X		X			X
18	KAKWA RIVER NEAR GRANDE PRAIRIE	07GB002	X			X		X	
19	KLESKUN HILLS MAIN DRAIN NEAR GRANDE PRAIRIE	07GE002	X			X			X
20	MARIE LAKE NEAR COLD LAKE	06AC005		X		X			X
21	MOORE LAKE NEAR COLD LAKE	06AC002		X		X			X
22	MURIEL LAKE NEAR GURNEYVILLE	06AC007		X			X		X
23	NORTH SASKATCHEWAN RIVER NEAR ROCKY MOUNTAIN HOUSE	05DC001	X			X			X
24	OLDMAN RIVER NEAR BROCKET	05AA024	X		X		X		X
25	ONETREE CREEK NEAR PATRICIA	05CJ006	X			X			X
26	PEACE RIVER AT PEACE RIVER	07HA001	X				X		X
27	PIYAMI DRAIN NEAR PICTURE BUTTE	05AD037	X			X			X
28	RED DEER RIVER AT DRUMHELLER	05CE001	X				X		X
29	SMOKY RIVER ABOVE HELLS CREEK	07GA001	X			X			X
30	SOUTH SASKATCHEWAN RIVER AT MEDICINE HAT	05AJ001	X				X		X
31	ST. MARY RIVER NEAR LETHBRIDGE	05AE006	X				X		X
32	STEEN RIVER AT STEEN RIVER	07OB004	X			X			X
33	SWAN RIVER NEAR KINUSO	07BJ001	X				X		X
34	VERDIGRIS LAKE TRIBUTARY NEAR MILK RIVER	11AA039	X			X			X
35	WABAMUN LAKE AT WABAMUN	05DE002		X			X		X

MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
1	ADAMS CREEK NEAR KINUSO	07BJ004	X			X			X
2	ALKALI CREEK NEAR THE MOUTH	05CK005	X			X			X
3	AMISK CREEK NEAR SHONTS	05EB016	X			X			X
4	AMISK RIVER AT HIGHWAY NO. 36	06AA002	X			X			X
5	ATHABASCA RIVER AT ATHABASCA	07BE001	X				X		X
6	ATIMOSME CREEK NEAR ELK POINT	05ED002	X			X			X
7	BATTLE RIVER NEAR PONOKA	05FA001	X				X		X
8	BEAVER CREEK NEAR BROCKET	05AB013	X			X			X
9	BEAVER RIVER NEAR GOODRIDGE	06AA001	X			X			X
10	BELLY RIVER NEAR GLENWOOD	05AD041	X				X		X
11	BERLAND RIVER NEAR THE MOUTH	07AC007	X			X			X
12	BERRY CREEK NEAR ROSE LYNN	05CH008	X			X			X
13	BIGKNIFE CREEK NEAR GADSBY	05FC002	X			X			X
14	BLACKMUD CREEK NEAR ELLERSLIE	05DF003	X			X			X
15	BLINDMAN RIVER NEAR BLACKFALDS	05CC001	X				X		X
16	BLOCK CREEK NEAR LEEDALE	05CC010	X			X			X
17	BOYER RIVER NEAR FORT VERMILION	07JF002	X			X			X
18	BRAZEAU RIVER BELOW CARDINAL RIVER	05DD007	X			X			X
19	BROWN CREEK AT FORESTRY ROAD	05DD004	X			X			X
20	BUCHANAN CREEK NEAR MANNING	07HC002	X			X			X
21	BUFFALO CREEK AT HIGHWAY NO. 41	05FE002	X			X			X
22	BULLPOUND CREEK NEAR WATTS	05CG004	X			X			X
23	CADOTTE RIVER AT OUTLET CADOTTE LAKE	07HB001	X			X			X
24	CASTLE RIVER AT RANGER STATION	05AA028	X			X			X
25	CATARACT CREEK NEAR FORESTRY ROAD	05BL022	X				X		X
26	CHINCHAGA RIVER NEAR HIGH LEVEL	07OC001	X				X		X
27	CHRISTINA RIVER NEAR CHARD	07CE002	X			X		X	
28	CHRISTMAS CREEK NEAR BLUE RIDGE	07AH002	X			X			X
29	CLEAR RIVER NEAR BEAR CANYON	07FD009	X			X			X
30	CLEARWATER RIVER NEAR DOVERCOURT	05DB006	X				X		X
31	CROWSNEST RIVER AT FRANK	05AA008	X				X		X
32	CUTBANK RIVER NEAR GRANDE PRAIRIE	07GB001	X			X		X	
33	DAPP CREEK AT HIGHWAY NO. 44	07BC006	X			X			X
34	DEEP VALLEY CREEK NEAR VALLEYVIEW	07GF008	X			X			X
35	DEER CREEK MAIN STEM	05CA003	X			X			X
36	DRIEDMEAT CREEK NEAR THE MOUTH	05FA018	X			X			X
37	DRIFTWOOD RIVER NEAR THE MOUTH	07BK007	X				X		X
38	DRYWOOD CREEK NEAR THE MOUTH	05AD010	X				X		X
39	DUTCH CREEK NEAR THE MOUTH	05AA026	X			X			X
40	EAST PRAIRIE RIVER NEAR ENILDA	07BF001	X			X			X
41	ELBOW RIVER AT BRAGG CREEK	05BJ004	X				X		X
42	EUREKA RIVER NEAR WORSLEY	07FD013	X			X			X
43	FISH CREEK NEAR PRIDDIS	05BK001	X			X			X
44	FLAT CREEK NEAR BOYLE	07CA003	X			X			X
45	FREEMAN RIVER NEAR FORT ASSINIBOINE	07AH001	X			X			X
46	GHOST RIVER ABOVE WAIPOROUS CREEK	05BG010	X				X		X
47	GRANDE PRAIRIE CREEK NEAR SEXSMITH	07GE003	X			X			X
48	GROS VENTRE CREEK NEAR DUNMORE	05AH037	X			X			X
49	HAYNES CREEK NEAR HAYNES	05CD006	X			X			X
50	HEART RIVER NEAR NAMPA	07HA003	X				X		X

MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
51	HIGHWOOD RIVER AT DIEBEL'S RANCH	05BL019	X			X			X
52	HINES CREEK ABOVE GERRY LAKE	07FD011	X			X			X
53	HOUSE RIVER AT HIGHWAY NO. 63	07CB002	X			X			X
54	IOSEGUN RIVER NEAR LITTLE SMOKY	07GG003	X			X			X
55	IRON CREEK NEAR HARDISTY	05FB002	X			X			X
56	JACKPINE CREEK AT WADLIN LAKE ROAD	07JD003	X			X			X
57	JAMES RIVER NEAR SUNDRE	05CA002	X			X			X
58	JUMPINGPOUND CREEK NEAR COX HILL	05BH013	X			X			X
59	JUMPINGPOUND CREEK NEAR THE MOUTH	05BH009	X				X		X
60	KEG RIVER AT HIGHWAY NO. 35	07HF002	X			X			X
61	KNEEHILLS CREEK NEAR DRUMHELLER	05CE002	X			X			X
62	LA BICHE RIVER AT HIGHWAY NO. 63	07CA011	X				X		X
63	LAFOND CREEK NEAR RED EARTH CREEK	07JC001	X			X			X
64	LALBY CREEK NEAR GIROUXVILLE	07GJ005	X			X			X
65	LITTLE PADDLE RIVER NEAR MAYERTHORPE	07BB005	X			X			X
66	LITTLE RED DEER RIVER NEAR THE MOUTH	05CB001	X				X		X
67	LITTLE RED DEER RIVER NEAR WATER VALLEY	05CB002	X			X			X
68	LITTLE SMOKY RIVER NEAR GUY	07GH002	X				X		X
69	LLOYD CREEK NEAR BLUFFTON	05CC009	X			X			X
70	LOGAN RIVER NEAR THE MOUTH	07CA012	X			X		X	
71	LOVETT RIVER NEAR THE MOUTH	07BA003	X			X			X
72	LUTOSE CREEK NEAR STEEN RIVER	07DB006	X			X			X
73	MACKAY CREEK AT WALSH	05AH002	X			X			X
74	MANYBERRIES CREEK AT BRODIN'S FARM	05AF010	X			X			X
75	MASKWA CREEK NO. 1 ABOVE BEARHILLS LAKE	05FA014	X			X			X
76	McLEOD RIVER ABOVE EMBARRAS RIVER	07AF002	X				X		X
77	MEADOW CREEK NEAR THE MOUTH	05AB029	X			X			X
78	MEANDER RIVER AT OUTLET HUTCH LAKE	07DB005	X			X			X
79	MEDICINE RIVER NEAR ECKVILLE	05CC007	X				X		X
80	MONITOR CREEK NEAR MONITOR	05GA003	X			X			X
81	MONTAGNEUSE RIVER NEAR HINES CREEK	07FD012	X			X			X
82	MUSKEG RIVER NEAR GRANDE CACHE	07GA002	X			X			X
83	NAMEPI CREEK NEAR THE MOUTH	05EC004	X			X			X
84	NORDEGG RIVER AT SUNCHILD ROAD	05DD009	X				X		X
85	NORTH RAM RIVER AT FORESTRY ROAD	05DC011	X			X			X
86	OLDMAN RIVER NEAR WALDRON'S CORNER	05AA023	X		X		X		X
87	OWL RIVER BELOW PICHE RIVER	07CA013	X			X		X	
88	PADDLE RIVER AT BARRHEAD	07BB006	X			X			X
89	PADDLE RIVER NEAR ROCHFORT BRIDGE	07BB004	X			X			X
90	PARFLESH CREEK NEAR CHANCELLOR	05BM007	X			X			X
91	PEAVINE CREEK NEAR FALHER	07GH004	X			X			X
92	PEIGAN CREEK NEAR PAKOWKI ROAD	05AH041	X			X			X
93	PEKISKO CREEK NEAR LONGVIEW	05BL023	X			X			X
94	PEMBINA RIVER BELOW PADDY CREEK	07BA001	X			X			X
95	PIGEON LAKE CREEK NEAR USONA	05FA019	X			X			X
96	PINCHER CREEK AT PINCHER CREEK	05AA004	X			X			X
97	PINE CREEK NEAR GRASSLAND	07CA005	X			X			X
98	PINTO CREEK NEAR GRANDE PRAIRIE	07GC002	X			X			X
99	PIPESTONE CREEK BELOW BIGSTONE CREEK	05FA022	X			X			X
100	PONTON RIVER ABOVE BOYER RIVER	07JF003	X			X			X

MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
101	PRAIRIE BLOOD COULEE NEAR LETHBRIDGE	05AD035	X			X			X
102	PRAIRIE CREEK BELOW LICK CREEK	05DB005	X			X			X
103	PRAIRIE CREEK NEAR ROCKY MOUNTAIN HOUSE	05DB002	X				X		X
104	RACEHORSE CREEK NEAR THE MOUTH	05AA027	X			X			X
105	RAM RIVER NEAR THE MOUTH	05DC006	X				X		X
106	RAT CREEK NEAR CYNTHIA	07BA002	X			X			X
107	RAVEN RIVER NEAR RAVEN	05CB004	X				X		X
108	RAY CREEK NEAR INNISFAIL	05CE010	X			X			X
109	RED DEER RIVER ABOVE PANTHER RIVER	05CA004	X			X			X
110	RED DEER RIVER BELOW BURNT TIMBER CREEK	05CA009	X				X		X
111	REDEARTH CREEK NEAR RED EARTH	07JC002	X			X			X
112	REDWATER RIVER NEAR THE MOUTH	05EC005	X			X			X
113	RENWICK CREEK NEAR THREE HILLS	05CE011	X			X			X
114	RIBSTONE CREEK NEAR EDGERTON	05FD001	X			X			X
115	ROSE CREEK NEAR ALDER FLATS	05DE007	X			X			X
116	ROSEBUD RIVER BELOW CARSTAIRS CREEK	05CE006	X			X			X
117	ROSS CREEK NEAR IRVINE	05AH003	X			X			X
118	SADDLE RIVER NEAR WOKING	07FD006	X			X			X
119	SAKWATAMAU RIVER NEAR WHITECOURT	07AH003	X			X			X
120	SAM LAKE TRIBUTARY NEAR SCHULER	05AH047	X			X			X
121	SAND RIVER NEAR THE MOUTH	06AB001	X			X			X
122	SAULTEAUX RIVER NEAR SPURFIELD	07BK005	X			X			X
123	SAWRIDGE CREEK NEAR SLAVE LAKE	07BK009	X			X			X
124	SHEEP COULEE NEAR CARSTAIRS	05CE019	X			X			X
125	SHEEP RIVER AT BLACK DIAMOND	05BL014	X				X		X
126	SIFFLEUR RIVER NEAR THE MOUTH	05DA002	X			X			X
127	SIMONETTE RIVER NEAR GODWIN	07GF001	X			X			X
128	SOUNDING CREEK NEAR OYEN	05GA008	X			X			X
129	SOUSA CREEK NEAR HIGH LEVEL	07DA001	X			X			X
130	SOUTH WABASCA LAKE NEAR DESMARAIS	07JA002		X		X			X
131	STIMSON CREEK NEAR PEKISKO	05BL007	X			X			X
132	STRAWBERRY CREEK NEAR THE MOUTH	05DF004	X			X			X
133	STRETTON CREEK NEAR MARWAYNE	05EE005	X			X			X
134	STURGEON RIVER NEAR FORT SASKATCHEWAN	05EA001	X			X			X
135	SUNDANCE CREEK NEAR BICKERDIKE	07AF010	X			X			X
136	SWAN RIVER NEAR SWAN HILLS	07BJ003	X			X			X
137	THREEHILLS CREEK BELOW RAY CREEK	05CE018	X			X			X
138	THREEHILLS CREEK NEAR CARBON	05CE007	X			X			X
139	THREEPOINT CREEK NEAR MILLARVILLE	05BL013	X			X			X
140	TODD CREEK AT ELTON'S RANCH	05AA006	X			X			X
141	TOMAHAWK CREEK NEAR TOMAHAWK	05DE009	X			X			X
142	UTIKUMA LAKE NEAR NIPISI	07JA001		X		X			X
143	VERMILION RIVER NEAR MARWAYNE	05EE007	X			X			X
144	WABAMUN CREEK NEAR DUFFIELD	05DE003	X			X			X
145	WABASCA RIVER BELOW TROUT RIVER	07JB002	X				X	X	
146	WABASH CREEK NEAR PIBROCH	07BC007	X			X			X
147	WAINSCOTT COULEE NEAR BROWNVALE	07FD014	X			X			X
148	WAIPAROUS CREEK NEAR THE MOUTH	05BG006	X				X		X
149	WANDERING RIVER NEAR WANDERING RIVER	07CA006	X				X		X
150	WASKAHIGAN RIVER NEAR THE MOUTH	07GG001	X				X		X

MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
151	WEST ARROWWOOD CREEK NEAR ARROWWOOD	05BM014	X			X			X
152	WEST PRAIRIE RIVER NEAR HIGH PRAIRIE	07BF002	X				X		X
153	WEST WHITEMUD CREEK NEAR IRETON	05DF007	X			X			X
154	WHITEMUD CREEK NEAR ELLERSLIE	05DF006	X			X			X
155	WHITEMUD RIVER NEAR DIXONVILLE	07HA005	X			X			X
156	WILDHAY RIVER NEAR HINTON	07AC001	X			X			X
157	WILLOW CREEK ABOVE CHAIN LAKES	05AB028	X				X		X
158	WILLOW CREEK NEAR NOLAN	05AB002	X			X			X
159	WILLOW RIVER NEAR WABASCA	07JA003	X			X			X
160	WOLF CREEK AT HIGHWAY NO. 16A	07AG003	X				X		X
161	WOLF RIVER AT OUTLET OF WOLF LAKE	06AB002	X				X	X	

MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
1	ALBERTA POWER LIMITED COOLING POND OUTLET	05CG007	X			X			X
2	ATHABASCA RIVER NEAR WINDFALL	07AE001	X			X			X
3	BABETTE CREEK NEAR COLINTON	07CA008	X			X			X
4	BAPTISTE LAKE NEAR ATHABASCA	07BE002		X		X			X
5	BAPTISTE RIVER NEAR THE MOUTH	05DC012	X				X		X
6	BATTLE RIVER NEAR FORESTBURG	05FC001	X			X			X
7	BEAR CREEK NEAR VALHALLA CENTRE	07GE007	X			X			X
8	BEAVERTAIL CREEK NEAR HYTHE	07GD002	X			X			X
9	BELLY-ST. MARY DIVERSION CANAL	05AD021	X				X		X
10	BERRY CREEK BELOW DEADFISH CREEK	05CH016	X			X			X
11	BERRY CREEK RESERVOIR OUTLET	05CH011	X			X			X
12	BIRCH CREEK NEAR CONKLIN	07CE006	X			X		X	
13	BLINDMAN RIVER NEAR BLUFFTON	05CC008	X			X			X
14	BLOOD INDIAN CREEK NEAR CABIN LAKE	05CK007	X			X			X
15	BLOOD INDIAN CREEK NEAR THE MOUTH	05CK001	X			X			X
16	B.R.D. DRAIN D NEAR VAUXHALL	05BN008	X			X			X
17	B.R.D. DRAIN T NEAR HAYS	05AG005	X			X			X
18	BOYER RIVER NEAR PADDLE PRAIRIE	07JF004	X			X			X
19	BUFFALO LAKE NEAR ERSKINE	05CD005		X		X			X
20	CALLING LAKE AT RANGER STATION	07CB001		X		X			X
21	CANADIAN ST. MARY CANAL AT DROP NO. 1	05AF028	X			X			X
22	CAVAN LAKE DIVERSION NEAR DUNMORE	05AH044	X			X			X
23	CHIP LAKE AT OUTLET TO LOBSTICK RIVER	07BB008		X		X			X
24	COAL LAKE RESERVOIR NEAR WETASKIWIN	05FA016		X		X			X
25	COLQUHOUN CREEK NEAR GRANDE PRAIRIE	07GE006	X			X			X
26	COYOTE CREEK NEAR CHERHILL	07BB014	X			X			X
27	DEADFISH INFLOW CANAL NEAR CESSFORD	05CH012	X			X			X
28	DICKSON DAM TUNNEL OUTLET	05CB007	X				X		X
29	ELBOW RIVER ABOVE ELBOW FALLS	05BJ006	X			X			X
30	ELBOW RIVER BELOW GLENMORE DAM	05BJ001	X				X		X
31	ELDER CREEK AT HIGHWAY NO. 686	07HB002	X			X			X
32	ELKWATER LAKE AT ELKWATER	05AH025		X		X			X
33	EMBARASS RIVER NEAR WEALD	07AF014	X			X			X
34	ERITH RIVER BELOW HANLAN CREEK	07AF016	X			X			X
35	FAWCETT LAKE NEAR SMITH	07BK008		X		X			X
36	FISH CREEK AT BOW BOTTOM TRAIL	05BK003	X			X			X
37	FISH CREEK ABOVE LITTLE FISH LAKE	05CG006	X			X			X
38	GOLD CREEK NEAR FRANK	05AA030	X			X			X
39	GREGG RIVER NEAR THE MOUTH	07AF015	X			X			X
40	GROAT CREEK NEAR WHITECOURT	07AG008	X			X			X
41	GULL LAKE AT ASPEN BEACH	05CC006		X		X			X
42	HARGRAVES DIVERSION FROM BOXELDER CREEK	05AH051		X		X			X
43	HARTLEY CREEK NEAR FORT MACKAY	07DA009	X			X		X	
44	HASTINGS LAKE NEAR DEVILLE	05EB011		X		X			X
45	HIGHWOOD RIVER BELOW LITTLE BOW CANAL	05BL004	X				X		X
46	HIGHWOOD RIVER NEAR ALDERSYDE	05BL009	X			X			X
47	IRON CREEK NEAR VIKING	05FB003	X			X			X
48	ISLE LAKE AT EUREKA BEACH	05EA008		X		X			X
49	JACKFISH RIVER BELOW CHRISTINA LAKE	07CE005	X			X		X	
50	JOSLYN CREEK NEAR FORT MACKAY	07DA016	X			X		X	

MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
51	KENNEDY COULEE NEAR ACADIA VALLEY	05CK006	X			X			X
52	KILLARNEY LAKE TRIBUTARY NEAR CHAUVIN	05BA010	X			X			X
53	KYISKAP CREEK NEAR GRANUM	05AB038	X			X			X
54	LAC LA NONNE AT LAC LA NONNE	07BB007		X		X			X
55	LAC STE. ANNE AT ALBERTA BEACH	05EA006		X		X			X
56	LATERAL 10 SPILLWAY NEAR CHIN	05AG007	X			X			X
57	LESSER SLAVE LAKE AT SLAVE LAKE	07BJ006		X			X		X
58	LILY CREEK NEAR SLAVE LAKE	07BG004	X			X			X
59	LITTLE BERLAND RIVER AT HIGHWAY NO. 40	07AC008	X			X			X
60	LITTLE BOW RIVER ABOVE TRAVERS RESERVOIR	05AC034	X			X			X
61	LITTLE ELBOW RIVER ABOVE NIHAHI CREEK	05BJ009	X			X			X
62	LITTLE SMOKY RIVER AT LITTLE SMOKY	07GG002	X			X			X
63	LOMOND LATERAL NEAR HEADGATE	05AC017	X			X			X
64	LOYALIST CREEK NEAR CONSORT	05BA013	X			X			X
65	MACKAY CREEK NEAR GRABURN GAP	05AH042	X			X			X
66	McALPINE CREEK (EAST FORK) NEAR ELKWATER	05AH043	X			X			X
67	McGREGOR LAKE INFLOW NEAR MILO	05AC024	X			X			X
68	McGREGOR-TRAVERS CANAL NEAR CHAMPION	05AC025	X			X			X
69	McLEOD RIVER NEAR CADOMIN	07AF013	X			X			X
70	McLEOD RIVER NEAR WHITECOURT	07AG004	X			X			X
71	MICHICHI CREEK AT DRUMHELLER	05CE020	X			X			X
72	MILK RIVER RIDGE RESERVOIR	05AF030		X		X			X
73	MINISTIK LAKE NEAR NEW SAREPTA	05EB013		X		X			X
74	MIQUELON LAKE AT PROVINCIAL PARK	05EB014		X		X			X
75	MONITOR CREEK NEAR CONSORT	05BA011	X			X			X
76	MOOSEHILLS CREEK NEAR ELK POINT	05ED003	X			X			X
77	MOOSELAKE RIVER NEAR FRANCHERE	06AC006	X			X			X
78	MOSQUITO CREEK NEAR THE MOUTH	05AC031	X			X			X
79	NORTH SASKATCHEWAN RIVER NEAR LODGEPOLE	05DE006		X		X			X
80	OLDMAN RIVER NEAR THE MOUTH	05AG006	X				X		X
81	PADDLE RIVER AT HWY. 764	07BB013		X		X			X
82	PADDLE RIVER NEAR ANSELMO	07BB011	X			X			X
83	PADDLE RIVER NEAR SANGUDO	07BB012		X		X			X
84	PAINTEARTH CREEK NEAR HALKIRK	05FC004	X			X			X
85	PARLBY CREEK AT ALIX	05CD007	X			X			X
86	PEACE RIVER AT FORT VERMILION	07HF001		X		X			X
87	PEMBINA RIVER NEAR ENTWISTLE	07BB002	X				X		X
88	PIGEON LAKE AT GRANDVIEW	05FA013		X		X			X
89	PONY CREEK NEAR CHARD	07CE003	X			X		X	
90	PORTER CREEK ABOVE BAPTISTE LAKE	07BE003	X			X			X
91	POTHOLE TURNOUT NEAR MAGRATH	05AE038	X			X			X
92	REDWATER RIVER NEAR VIMY	05EC007	X			X			X
93	REDWILLOW RIVER NEAR BEAVERLODGE	07GD003	X				X		X
94	ROBERT CREEK NEAR ANZAC	07CE004	X			X		X	
95	RUSH LAKE DRAIN NEAR NEW DAYTON	05AF031	X			X			X
96	SALT CREEK NEAR GROUARD	07BF009	X			X			X
97	SNAKE CREEK NEAR VULCAN	05AC030	X			X			X
98	SOUNDING CREEK NEAR CHINOOK	05BA012	X			X			X
99	SOUTH HEART RESERVOIR NEAR McLENNAN	07BF008		X		X			X
100	SPRAY RIVER AT BANFF	05BC001	X				X		X

MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
101	STEELE LAKE NEAR JARVIE	07BC005		X		X			X
102	STIRLING LAKE OUTFLOW NEAR STIRLING	05AF029	X			X			X
103	STONY CREEK NEAR TAWATINAW	07BE004	X			X			X
104	STURGEON LAKE AT WILLIAMSON PARK	07GH003		X		X			X
105	STURGEON RIVER NEAR MAGNOLIA BRIDGE	05EA010	X			X			X
106	STURGEON RIVER NEAR VILLENEUVE	05EA005	X				X		X
107	SYLVAN LAKE AT SYLVAN LAKE	05CC003		X		X			X
108	TEEPEE CREEK NEAR LA CRETE	07JD004	X			X			X
109	TINDASTOLL CREEK NEAR MARKERVILLE	05CC012	X			X			X
110	TRAP CREEK NEAR LONGVIEW	05BL027	X			X			X
111	TROUT CREEK NEAR GRANUM	05AB005	X			X			X
112	UNNAMED CREEK NEAR FORT MACKAY	07DA011	X			X		X	
113	VERMILION PARK LAKE NEAR VERMILION	05EE008		X		X			X
114	VERMILION RIVER AT VEGREVILLE	05EE009	X			X			X
115	VERMILION RIVER TRIBUTARY NEAR BRUCE	05EE006	X			X			X
116	WAMPUS CREEK NEAR HINTON	07AF003	X			X			X
117	WASKASOO CREEK AT RED DEER	05CC011	X			X			X
118	WATERTON RIVER NEAR GLENWOOD	05AD028	X				X		X
119	WATERTON-BELLY DIVERSION CANAL	05AD027	X				X		X
120	WEILLER CREEK NEAR WETASKAWIN	05FA024	X			X			X
121	WEST ARROWWOOD CREEK NEAR ENSIGN	05BM018	X			X			X
122	WHITE EARTH CREEK NEAR SMOKY LAKE	05EC006	X			X			X
123	WILLOW CREEK BELOW LANE CREEK	05AB039	X			X			X
124	WILLOW CREEK NEAR CLARESHOLM	05AB021	X				X		X
125	WINAGAMI LAKE AT PROVINCIAL PARK	07BF006		X		X			X
126	YOUNG CREEK NEAR CASTOR	05FC007	X			X			X
	OPERATED BY - ALBERTA GOVERNMENT								
	PAD AREA								
1	ATHABASCA RIVER ABOVE JACKFISH CREEK	07DD007		X			X	X	
2	BIG POINT CHANNEL BELOW DIVERGENCE	07DD006	MISC X				X	X	
3	CHENAL DES QUATRE FOURCHES BELOW FOUR FORKS	07KF006	MISC X				X	X	
4	FLETCHER CHANNEL BELOW DIVERGENCE	07DD004	MISC X				X	X	
5	GOOSE ISLAND CHANNEL BELOW DIVERGENCE	07DD005	MISC X				X	X	
6	MAMAWI LAKE CHANNEL AT DOG CAMP	07KF010	MISC X			X		X	
7	PRAIRIE RIVER NEAR LAKE CLAIRE	07KF014	MISC X			X		X	
8	REVILLON COUPE BELOW RIVIERE DES ROCHERS	07NA004	MISC X					X	
9	RIVIERE DES ROCHERS BELOW REVILLON COUPE	07NA902	MISC X				X	X	
	OTHER AREAS OF ALBERTA								
1	AETNA CREEK AT HIGHWAY NO. 501	05AE912	X			X			X
2	ATIM CREEK NEAR SPRUCE GROVE	05EA009	X			X			X
3	BEARBERRY CREEK NEAR SUNDRE	05CA011	X			X			X
4	BEAR LAKE NEAR CLAIRMONT	07GE004		X		X			X
5	BEDDINGTON CREEK NEAR CALGARY	05BH904	X			X			X

MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	LEVEL	SED.	OPERATION 8M	12M	ACCESS REMOTE	NORMAL
	OPERATED BY - ALBERTA GOVERNMENT								
6	BIGELOW RESERVOIR NEAR WIMBOURNE	05CE901		X		X			X
7	BRD CANAL AT DROP NO. 3	05AC902	X			X			X
8	B.R.I.D. WESTERN BLOCK LATERAL A NEAR HEADGATES	05AC013	X			X			X
9	CHESTERMERE LAKE AT SOUTH OUTLET	05BM904		X		X			X
10	COLUMBINE CREEK NEAR THE MOUTH	06AA004	X			X			X
11	DRIEDMEAT LAKE AT OUTFLOW	05FA020		X		X			X
12	ELBOW RIVER AT SARCEE BRIDGE	05BJ010	X			X			X
13	ETZIKOM COULEE NEAR NEMISKAM	05AF905	X			X			X
14	FALLENTIMBER CREEK NEAR SUNDRE	05CA012	X			X			X
15	FOOTHILLS CREEK NEAR PINCHER CREEK	05AD901	X			X			X
16	JACKFISH CREEK NEAR LACOREY	06AC001	X			X			X
17	KEHO LAKE NEAR NOBLEFORD	05AC914		X		X			X
18	KRAWCHUK DRAINAGE NEAR McLENNAN	07HA902	X			X			X
19	LAKE MCGREGOR AT SOUTH DAM	05AC022		X		X			X
20	LEE CREEK BELOW CONFLUENCE OF EAST FORK	05AE904	X			X			X
21	LITTLE BOW RESERVOIR NEAR ENCHANT	05AC922		X		X			X
22	L.N.I.D. CANAL BELOW KEHO OUTFLOW	05AC026	X			X			X
23	L.N.I.D. MONARCH BRANCH CANAL BELOW HEADWORKS	05AC028	X			X			X
24	LODGE CREEK AT HIGHWAY NO. 41	11AB902	X			X			X
25	PADDLE RIVER RESERVOIR NEAR ROCHFORT BRIDGE	07BB914		X			X		X
26	PARLBY CREEK NEAR MIRROR	05CD902	X			X			X
27	POINTE-AUX-PINS CREEK NEAR ARDROSSAN	05EB902	X			X			X
28	POINTE-AUX-PINS TRIBUTARY 1 NEAR ARDROSSAN	05EB909	X			X			X
29	POINTE-AUX-PINS TRIBUTARY 2 NEAR ARDROSSAN	05EB910	X			X			X
30	POINTE-AUX-PINS TRIBUTARY 3 NEAR ARDROSSAN	05EB911	X			X			X
31	ROMEO CREEK ABOVE ROMEO LAKE	07BB903	X			X			X
32	RYCROFT SURVEY #3 NEAR RYCROFT	07FD910	X			X			X
33	SPOTTED LAKE NEAR MIRROR	05CD903		X		X			X
34	SQUAW COULEE DIVERSION BELOW SQUAW COULEE DAM	05AC917	X			X			X
35	TODD CREEK NEAR HIGHWAY NO. 22	05AA909	X			X			X
36	TRAVERSE RESERVOIR NEAR ENCHANT	05AC921		X		X			X
37	UID CANAL REACH #1 AT 12+344	05AD933	X			X			X
38	VERMILION RIVER DRAINAGE NEAR HOLDEN	05EE913	X			X			X
39	VIXEN CREEK NEAR BELLOY	07FD921	X			X			X
40	WASKATENAU CREEK NEAR WASKATENAU	05EC002	X			X			X
41	WHITBURN DRAINAGE PROJECT NEAR SPIRIT RIVER	07FD912	X			X			X
42	YOUNG DRAINAGE PROJECT NEAR SPIRIT RIVER	07FD913	X			X			X

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED FLOW	RECORD OBTAINED LEVEL	RECORD OBTAINED SED.	OPERATION 8M	OPERATION 12M	ACCESS REMOTE	ACCESS NORMAL
	OPERATED BY - TRANSALTA UTILITIES LTD.								
1	BARRIER LAKE NEAR SEEBE	05BF024		X			X		X
2	BOW RIVER BELOW BEARSPAW DAM	05BH008	X				X		X
3	BOW RIVER NEAR SEEBE	05BE004	X				X		X
4	BRAZEAU RESERVOIR	05DD006		X			X		X
5	BRAZEAU RIVER BELOW BRAZEAU PLANT	05DD005	X				X		X
6	CASCADE POWER DIVERSION NEAR BANFF	05BD004	X				X		X
7	GHOST LAKE NEAR COCHRANE	05BE005		X			X		X
8	GHOST RIVER DIVERSION TO LAKE MINNEWANKA	05BG003	X				X		X
9	GHOST RIVER NEAR BLACK ROCK MOUNTAIN	05BG002	X			X			X
10	GOAT CREEK AT BANFF PARK BOUNDARY	05BC008	X				X		X
11	KANANASKIS RIVER ABOVE POCATERRA CREEK	05BF003	X				X		X
12	KANANASKIS RIVER BELOW BARRIER DAM	05BF025	X				X		X
13	LAKE ABRAHAM NEAR NORDEGG	05DC009		X			X		X
14	LAKE MINNEWANKA NEAR BANFF	05BD003		X			X		X
15	LOWER KANANASKIS LAKE AT POCATERRA DAM	05BF009		X			X		X
16	MUD LAKE DIVERSION CANAL	05BF013	X			X			X
17	NORTH SASKATCHEWAN RIVER BELOW BIGHORN PLANT	05DC010	X				X		X
18	SPRAY POWER DIVERSION AT CANMORE	05BE007	X				X		X
19	SPRAY RESERVOIR AT THREE SISTERS DAM	05BC006		X			X		X
20	UPPER KANANASKIS LAKE AT MAIN DAM	05BF005		X			X		X
	OPERATED BY - CITY OF CALGARY								
1	GLENMORE RESERVOIR AT CALGARY	05BJ008		X			X		X

MAJOR DESIGNATION - SEDIMENT PROGRAM

NO.	STATION NAME	STATION NUMBER	HYDROMETRIC DESIGNATION	OPERATION 8M	OPERATION 12M	ACCESS REMOTE	ACCESS NORMAL
	FEDERAL - 4						
1	SLAVE RIVER AT FITZGERALD	07NB001	F-2	X		X	
	FEDERAL - PROVINCIAL - 3						
1	OLDMAN RIVER NEAR LETHBRIDGE	05AD007	F-2	X			X
	PROVINCIAL - 1						
1	OLDMAN RIVER NEAR WALDRONS CORNER	05AA023	FP-3	X			X
	PROVINCIAL - 2						
1	OLDMAN RIVER NEAR BROCKET	05AA024	FP-2	X			X

A P P E N D I X "B"

SCHEDULE "B"

COSTING PROCEDURE

COMPUTATION OF ALBERTA SHARE

CALCULATION OF ANNUAL PAYMENTS

A. COSTING PROCEDURE

Schedule "B" of the Memorandum of Agreement (included in the National Report) outlines the items to be included in the preparation of the annual report.

I. Water Quantity Stations

The costs shared include only the salaries and expenses of the staff directly involved in the field and office in the collection and compilation of water quantity data. Depreciation, operation, and maintenance of field transportation and equipment are included costs.

II. Sediment Stations

In the case of sediment stations, the cost of sample analysis is added to the costs outlined in I above.

III. New Construction, Major Maintenance, and Reconstruction

Construction costs include both new construction and major maintenance and are shared on the basis of station designation as being 'Federal', 'Federal-Provincial' or 'Provincial'. If a station is designated as 'Federal-Provincial' the cost would be shared fifty-fifty; otherwise 100% to either Canada or Alberta. Water level instrumentation is at the expense of the agency operating the station irrespective of designation; special instrumentation (telemark, data platform) is a cost to the party requiring the service.

B. APPLICATION OF PROCEDURE

The cost of operations varies as to the type and duration of records so standard units have been developed and assigned. The figures used are based upon experience over the years and have been adopted as standards in the Western and Northern Region.

I. Normal Access

A 12 month discharge station defines the hydrology regime under both ice cover and open water. The period of operation for an 8 month discharge station is normally March 1 to October 31 and is intended to define the period beginning with snowmelt runoff to freeze-up in the fall.

Weight Factor	Type of Station
1.00	12 month discharge
0.75	8 month discharge
0.40	12 month water level
0.25	8 month water level

II. Remote Access

Salary and operation costs exceed those for normal access stations. This is to account for aircraft costs, additional preparation and travelling time on a field trip and maintenance problems in a sparse network located in a harsh environment. Weighting factors have, therefore, been assigned as follows:

Weight Factor	Type of Station
1.80	12 month discharge
1.50	8 month discharge
1.10	12 month water level
0.95	8 month water level

III. Sediment Stations

The third category of stations requiring weighting factors are sediment stations. A hydrometric station designated 'Federal' for the collection of streamflow data may be designated either 'Federal', 'Federal-Provincial' or 'Provincial' for sediment data. Therefore, the resultant sediment weighting factors, as listed, are only the incremental sediment costs.

Weight Factor	Type of Station
1.05	12 month normal access Q & 8 month sediment
1.05	8 month normal access
1.25	12 month remote access Q & 8 month sediment
1.25	8 month remote access
0.45	8 month research

SPECIAL CONSIDERATIONS

Due to the complexity of the operation it is necessary to apply a number of practical considerations which are described as follows:

I. Stations Operated by Regina

Twelve F stations in Alberta were operated by the Saskatchewan District. These stations and their operations costs have not been included in Table I of this Appendix as they are of no value in computing the provincial share. The effect of neglecting these stations is that the federal share shown is less than the actual share. Although these stations have not been utilized in the costing, they are included in Tables 2 and 4 of the main body of this report, as are the following stations operated in the NWT.

II. Stations Operated by Yellowknife

Three F stations and one FP station in Alberta are operated by the Northwest Territories District. The federal stations have not been included in Table I of this Appendix as they are of no value in computing the provincial share. As the Yellowknife salaries and O&M to operate the FP station on 'Dog River near Fitzgerald' were not readily available from accounting statements, it was necessary to determine these costs based upon Alberta costs. The one FP station operated by Yellowknife isn't included in Table 1, but comprises 1.80 weighted units. Based upon the unit cost of $ 5,460.72 the cost of operating 'Dog River near Fitzgerald' is $ 9,829.30. One-half of this amount was added to the share of each party in Table B-1 to obtain the costs shown in 'Summary of Financial Considerations' and Tables 6 and 7 in the main body of the report.

III. Depreciation

Depreciation was determined by utilizing standard accounting and 'national' procedures. The total depreciation costs shown in the 'Summary of Financial Considerations' was pro rated, based on the respective Federal and Alberta shares of hydrometric and sediment operations.

TABLE B-I

HYDROMETRIC AND SEDIMENT COSTINGS FOR 1993-94 (Stations Operated by WSC-Alberta)

Category	Operation Schedule	Number of Stations	Weight Factor	Weighted Units	Salaries	O&M	Total	Share	
								Federal	Provincial
FEDERAL									
Normal Access Flow	12	31	1.00	31.00					
	8	53	0.75	39.75					
Normal Access W.L.	12	7	0.40	2.80					
	8	2	0.25	0.50					
Remote Access Flow	12	3	1.80	5.40					
	8	0	1.50	0.00					
Remote Access W.L.	12	0	1.10	0.00					
	8	1	0.95	0.95					
Sub-Total		97		80.40	$306,938	$132,105	$439,043	$439,043	—
FEDERAL-PROVINCIAL									
Normal Access Flow	12	40	1.00	40.00					
	8	137	0.75	102.75					
Normal Access W.L.	12	3	0.40	1.20					
	8	10	0.25	2.50					
Remote Access Flow	12	3	1.80	5.40					
	8	13	1.50	19.50					
Remote Access W.L.	12	0	1.10	0.00					
	8	1	0.95	0.95					
Normal Access Sediment	8	1	1.05	1.05					
Sub-total		*207		173.35	$661,785	$284,830	$946,615	$473,308	$473,307
PROVINCIAL									
Normal Access Flow	12	13	1.00	13.00					
	8	78	0.75	58.50					
Normal Access W.L.	12	1	0.40	0.40					
	8	27	0.25	6.75					
Remote Access Flow	12	0	1.80	0.00					
	8	7	1.50	10.50					
Remote Access W.L.	12	0	1.10	0.00					
	8	0	0.95	0.00					
Normal Access Sediment	8	2	1.05	2.10					
Sub-total		*126		91.25	$348,358	$149,932	$498,290	-	$498,290
TOTAL		*430		345.00	$1,317,081	$566,867	$1,883,948	$912,351	$971,597

* Does not include Sediment Stations. These are already counted in the Hydrometric station portion.

Unit Salary Cost = $3,817.63 Unit O&M = $1,643.09 Total Unit Cost = $5,460.72

A P P E N D I X "C"

SCHEDULE "D"
1993-94

SCHEDULE "D"

This schedule provides a summary of the annual payment. The details of the calculation for operation and construction are available and have been jointly reviewed by officers of each party.

ANNUAL PAYMENT FOR 1993/94 TO BE PAID TO CANADA BY ALBERTA:

	Operation	Construction	Total
a) Streamflow and water level installations	$ 971.0K	$ 62.1K	$1033.1K
b) Sediment installations	$ 14.9K		$ 14.9K
		ANNUAL PAYMENT:	$1048.0K

Administrator for Canada

(Signature)

Director
Inland Waters Directorate
Conservation and Protection
ENVIRONMENT CANADA

Administrator for Alberta

(Signature)

Director
Technical Services and Monitoring Division
Water Resources Services
ALBERTA ENVIRONMENTAL PROTECTION

A P P E N D I X "D"

ESTIMATE OF

ALBERTA PAYMENT FOR 1995-96

ESTIMATE OF ALBERTA'S SHARE OF COST-SHARING PROGRAM IN 1995-96

1. Units

- Should be no major changes.
- Perhaps EID, RF Stations may be discontinued:
  - Twelve Mile Creek nr. Cecil F-2 0.75 Units
  - Coal Creek at Bow City F-2 0.75 Units
  - One Tree Creek nr. Patricia FP-2 0.375 Units each

Therefore Units in 1995-96:

	Hydrometric	Sediment	Total
Federal	157.575	0.525	158.100
Provincial	161.775	2.625	164.400
Total	319.350	3.150	322.500

2. Salaries

Salaries will remain relatively the same:
e.g., Chomica returned but Waiting likely going. No change for Reynolds but basically only charged for one month in 1994-95 94,000).

Use shareable salaries as $1,210,000

Unit Salary Cost: = $1,210,000 / 322.5
= $3,752
Use = **$3,750**

3. Shareable O&M Costs

Assume the same as 1994-95 = $550,000
Unit O&M Cost - $550,000 / 322.5
= $1,705
Use = **$1,700**

4. Total Unit Costs

Salaries:	$3,750
O&M	1,700
	$5,450

5. Alberta Credits for 95-96

PAD Area			
10.78 x 5,450	= $58,751		
Oldman Res.			
0.4 x 5,450	= 2,180		
	$60,931	Use	$61,000

6. Alberta Share of Hydrometric Depreciation:

Approximately same as 94-95 (72,148)	Use	$72,000

7. Alberta Share of Sediment Depreciation:

Approximately same as 94-95 (179)	Use	$ 200

8. Estimated Alberta Share of Hydrometric Costs

8.1	Hydrometric Network Operated by WSC, Alberta/Sask. 161.775 x 5,450 = $881,673	Use	$882,000
8.2	Alberta Credits (Item 5)		- 61,000
8.3	Dog River nr. Fitzgerald 0.9 x 5,450 = 4,905	Use	+ 4,900
8.4	Alberta Share of Hyd. Depr. (Item 6)		+ 72,000
8.5	Alberta Credit for Hyd. Depr. 11.18/161.775 x 72,000 = 4,975	Use	- 5,000
			$892,900

9. Estimated Alberta Share of Sediment Costs

9.1	Sediment Network Operations 2.625 x 5,450 = 14,306	Use	$14,300
9.2	Sediment Equipment Depr. (Item 7)		200
9.3	Analysis Costs for Alberta Samples 3,594 in 94-95	Use	3,600
			$18,100

10. Construction & Maintenance Program

Alberta Share	$50,000
Depreciation	3,000
	$53,000

11. Total Estimated Alberta Share for 1995-96

Hydrometric	(Item 8)	$892,900
Sediment	(Item 9)	18,100
Construction	(Item 10)	53,000
		$964,000

SCHEDULE "D" AVAILABLE IS $964.4

Canada Alberta
Memorandum of
Agreement
1993-94

DATE	ISSUED TO

DATE	ISSUED TO