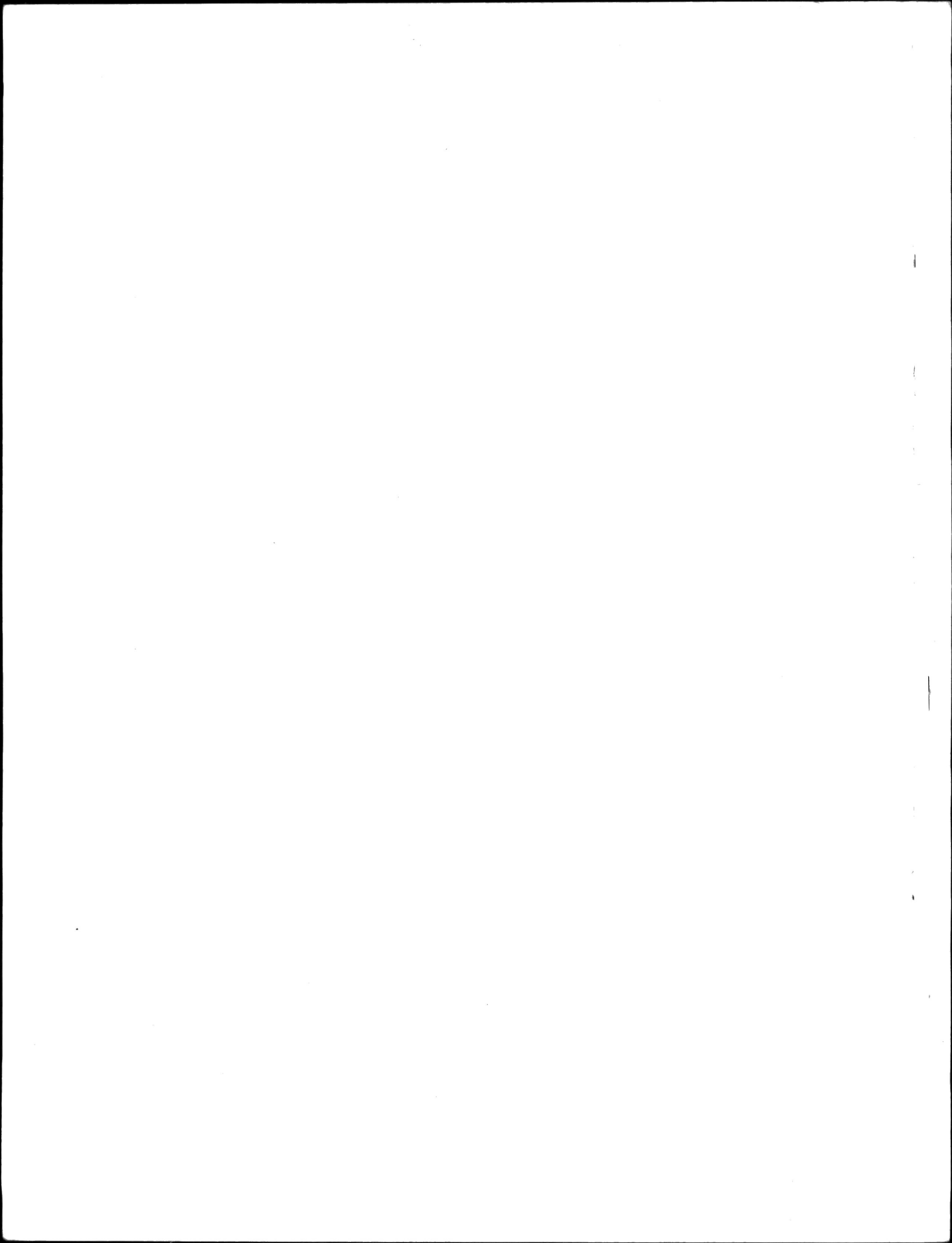
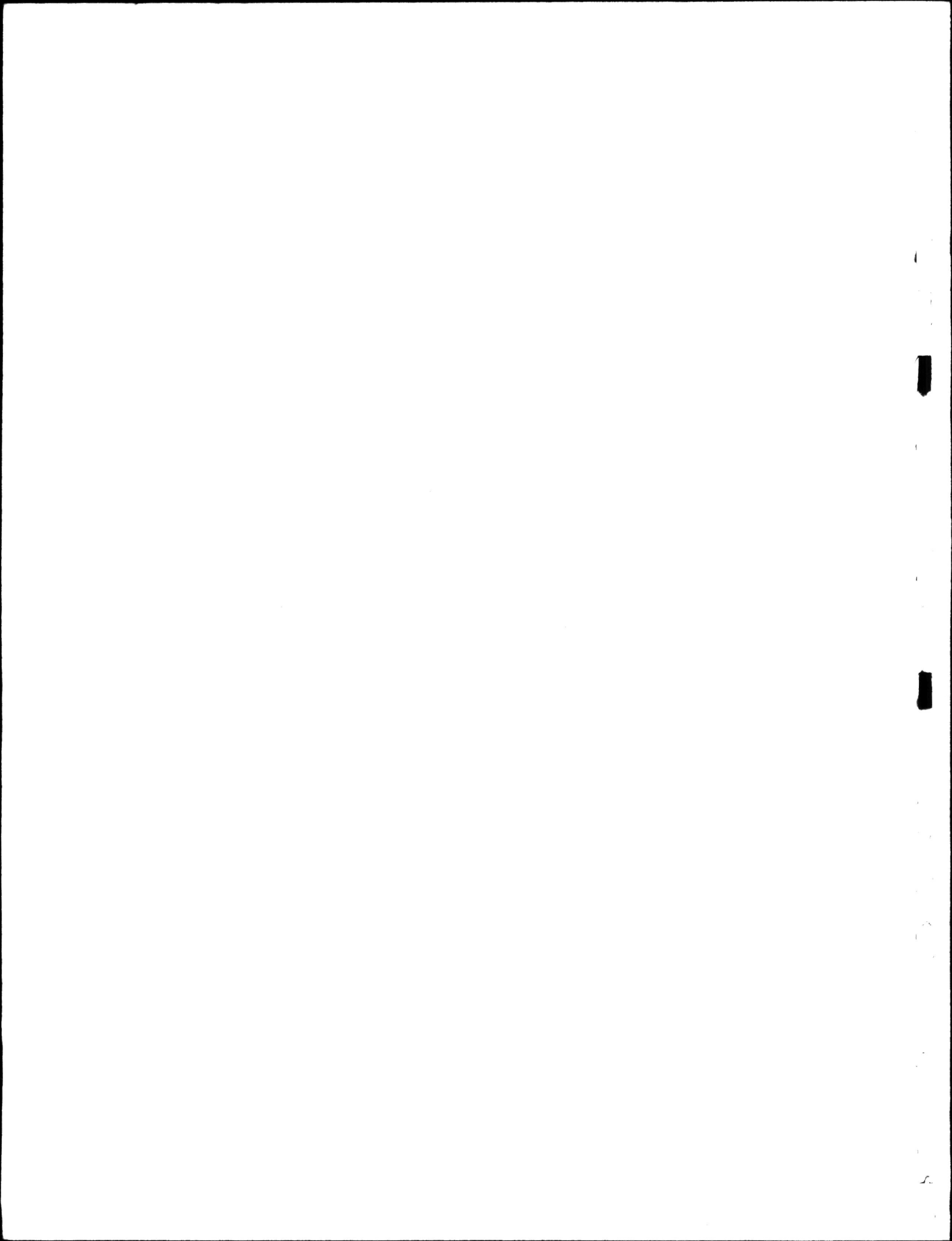


CANADA - ALBERTA
MEMORANDUM OF AGREEMENT
FOR
WATER QUANTITY SURVEYS
ANNUAL REPORT 1987-88



CANADA — ALBERTA
MEMORANDUM OF AGREEMENT
FOR
WATER QUANTITY SURVEYS

ANNUAL REPORT 1987-88



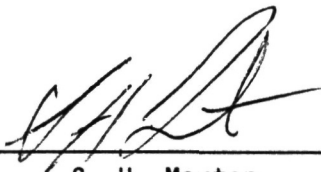
TO: R. K. Deeprise
Administrator for Alberta

R. A. Halliday
Administrator for Canada

We hereby submit an annual report for fiscal year 1987-88 covering activities under the Memorandum of Agreement for Water Quantity Surveys for the Province of Alberta.

Government of Canada

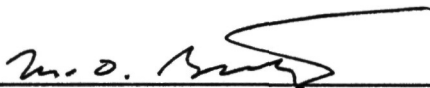
Province of Alberta



G. H. Morton
Environment Canada



P. Valentine
Alberta Environment



M. O. Spitzer
Environment Canada

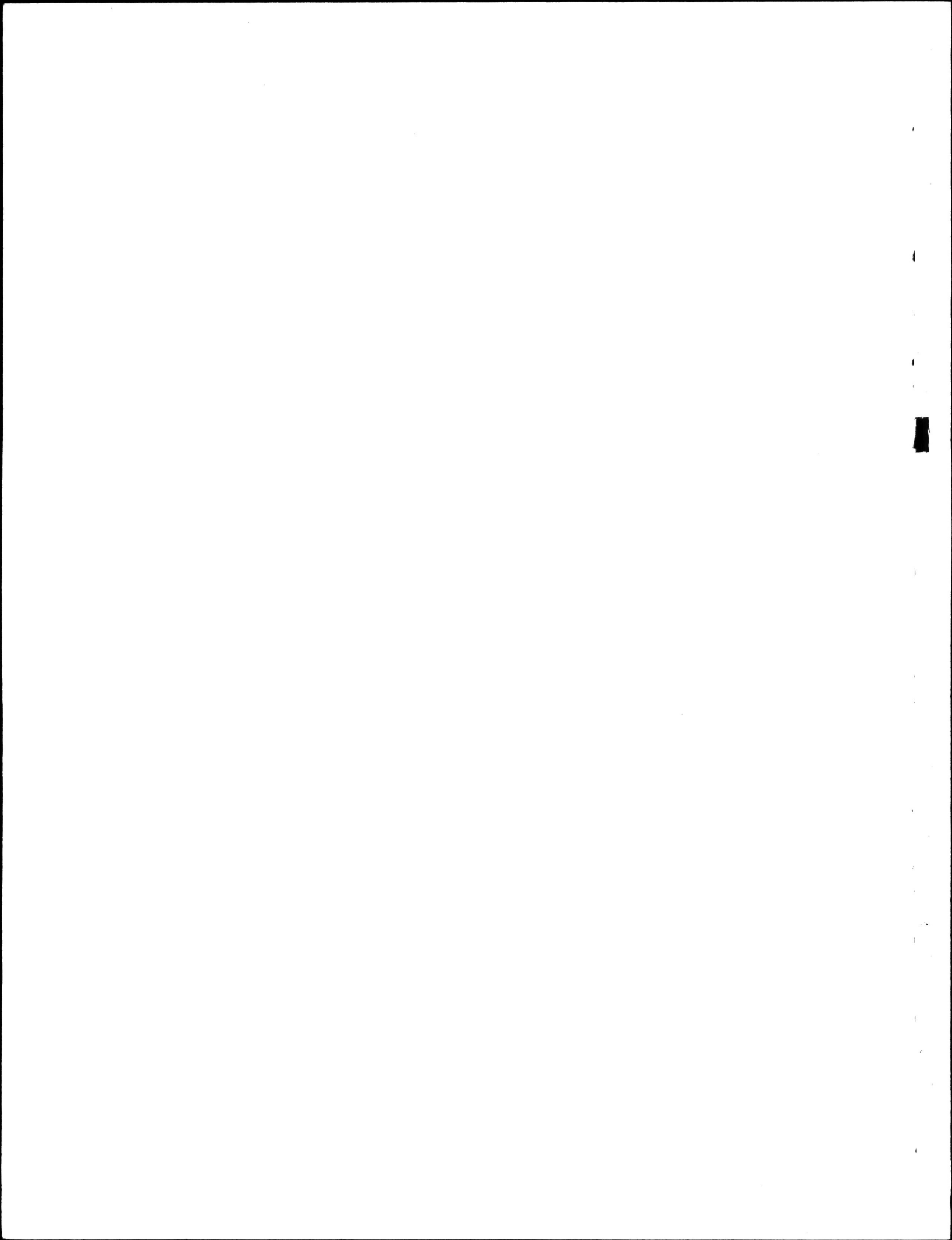


G. Coles
Alberta Environment

Members

Alberta Co-ordinating Committee

July 1988.



EXECUTIVE SUMMARY

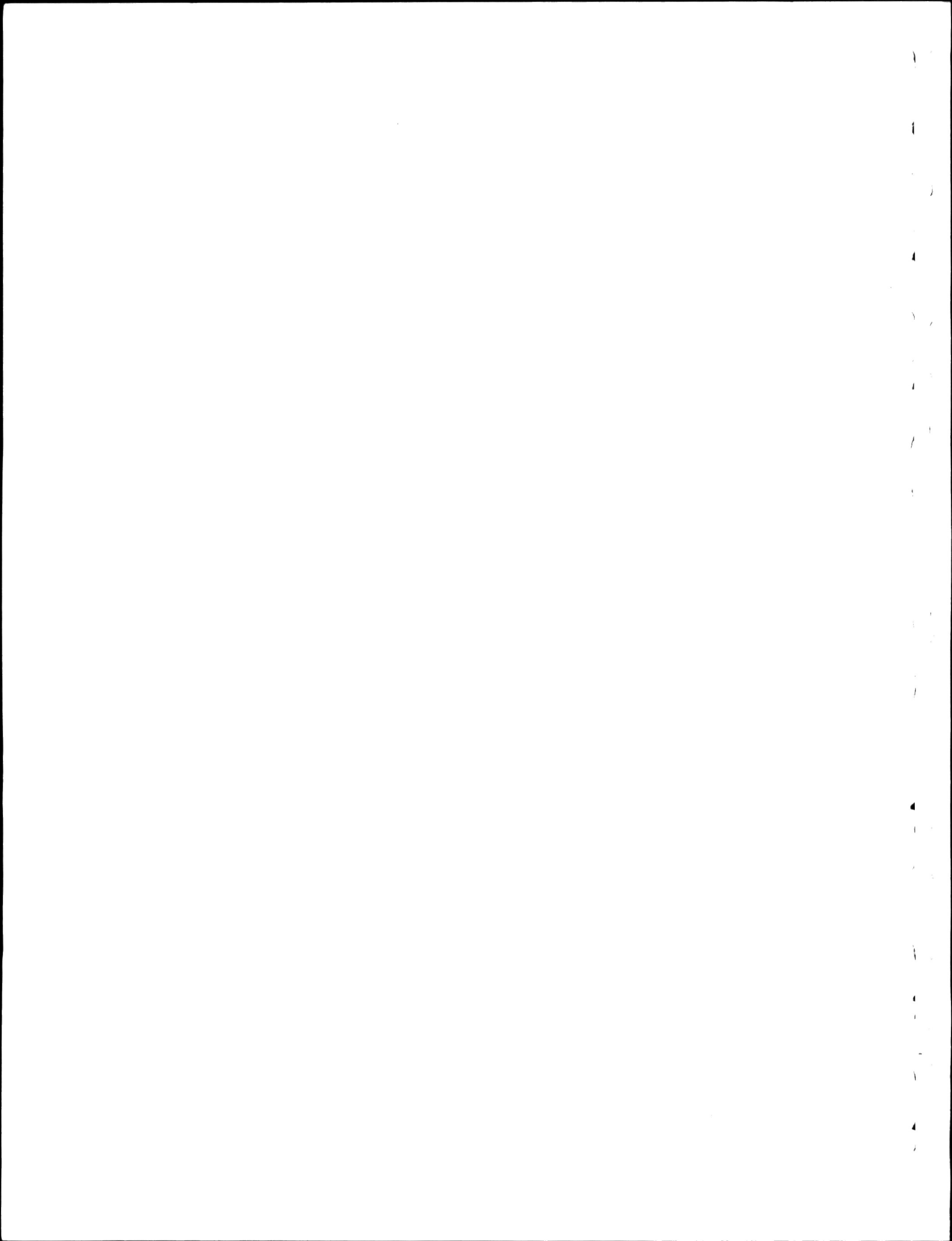
The Canada-Alberta Co-ordinating Committee met three times during the year and there was also one national meeting of the Co-ordinators. Frequent contact was maintained between the members of the committee and senior staff of both agencies. Major items discussed at the Canada-Alberta Co-ordinating Committee meeting were the federal proposal that Canada Employee Pension and Benefits be cost-shared; Alberta operating a portion of the existing WSC network; and surplus 1987-88 Schedule "D" funds, and discussion of Alberta utilizing a portion of these to balance off past accumulative deficits.

Hydrologic events during 1987-88 were mainly non-existent with the low runoff trend of the 1980s continuing. However, even with these conditions, there was one major flood in the Simonette River basin which occurred shortly after the major tornado disaster in Edmonton.

The only new construction conducted was by Alberta Environment in the Peace-Athabasca Delta, where two FP stations were installed. WSC carried out maintenance at 51 hydrometric stations and major reconstruction at 8 stations.

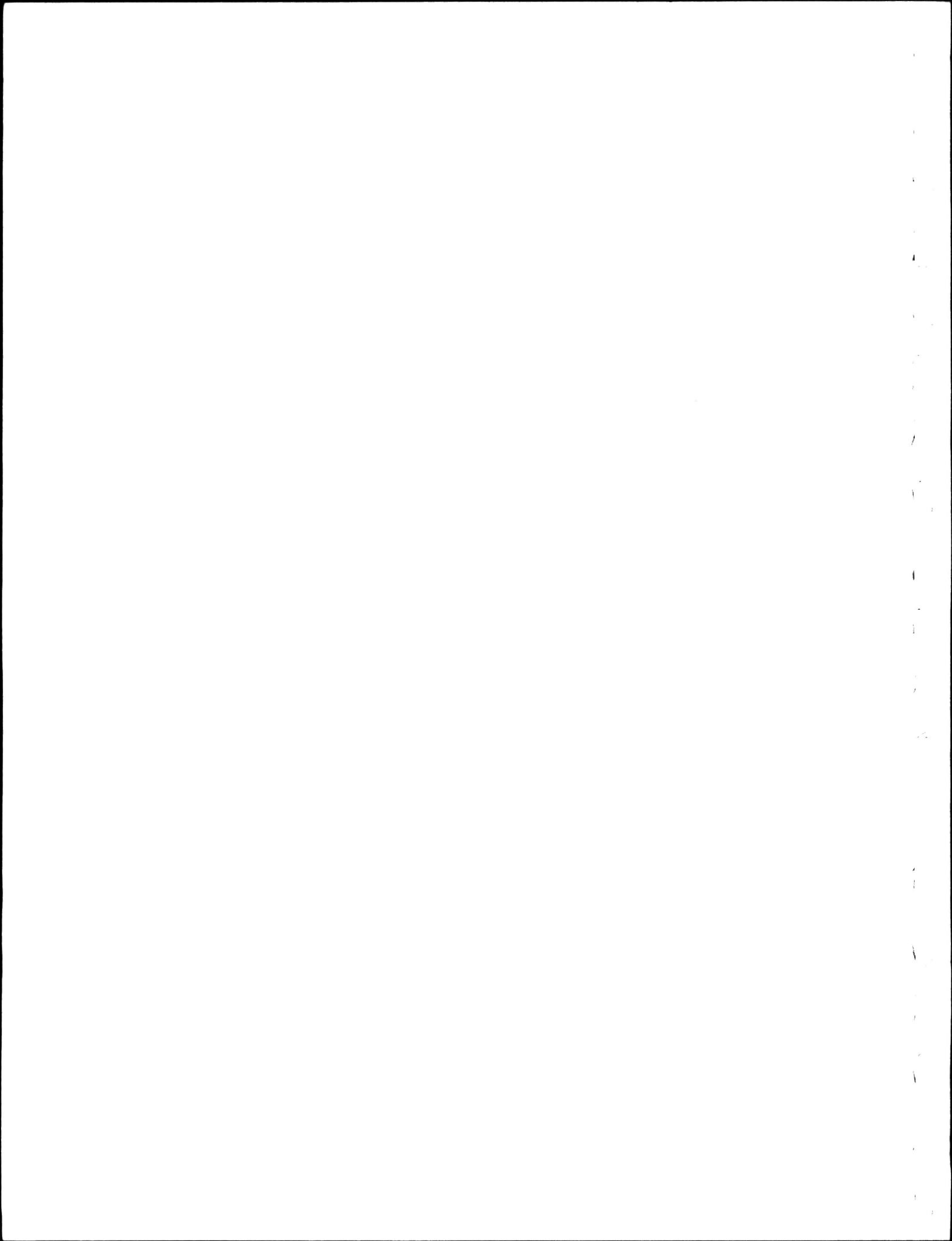


During 1987-88 Alberta paid \$830,579 to the hydrometric agreement, which was \$10,955 in excess of actual costs. Based on an end of February estimate of year-end actual costs, Alberta endeavoured to make an overpayment of \$30,314 to balance the deficit in payments which had occurred over the period of the agreement. That the provincial share of final expenditures was \$19.3K greater than the late fiscal year forecast points out the need for better fiscal control and tracking of expenditures. This will be implemented during 1988-89.



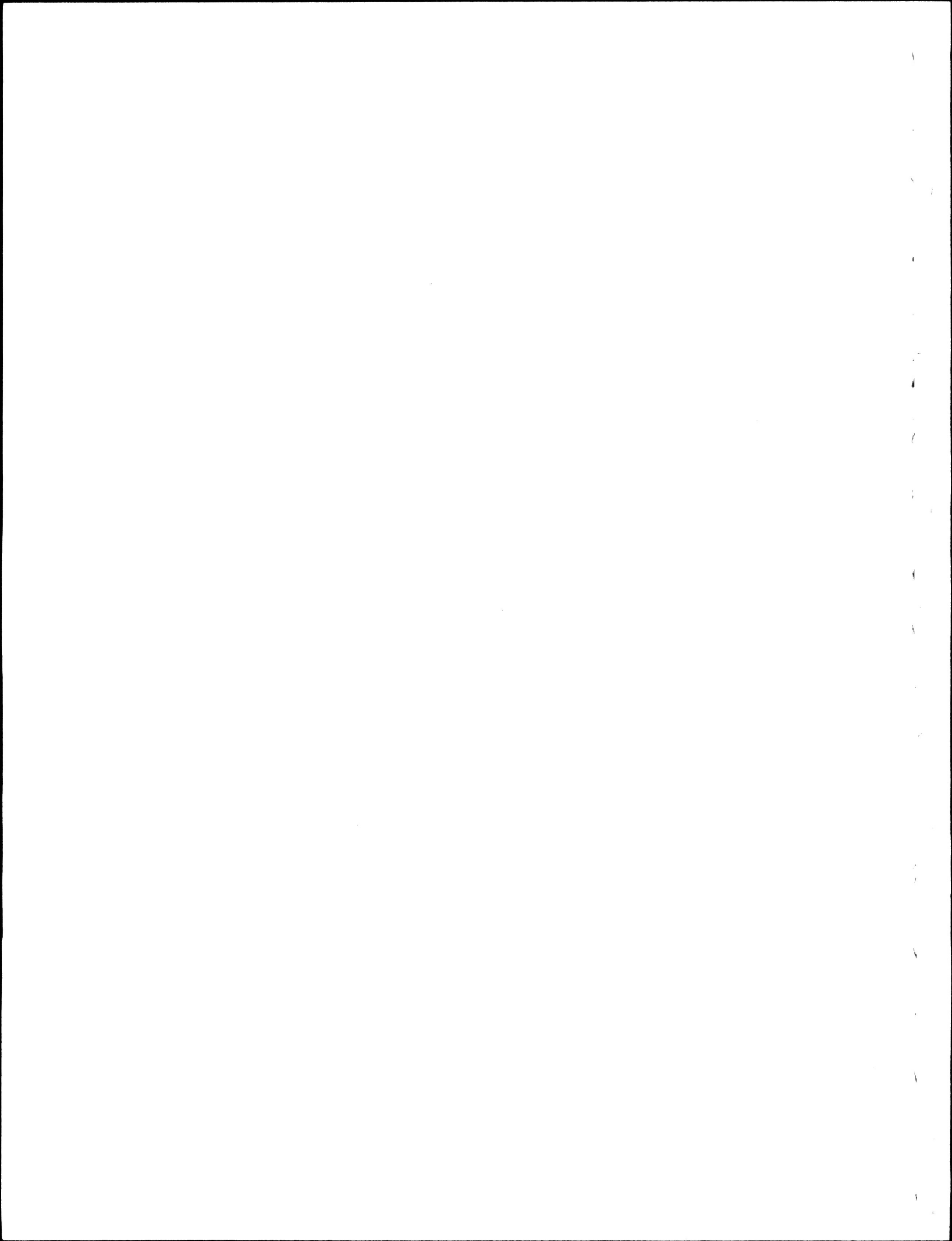
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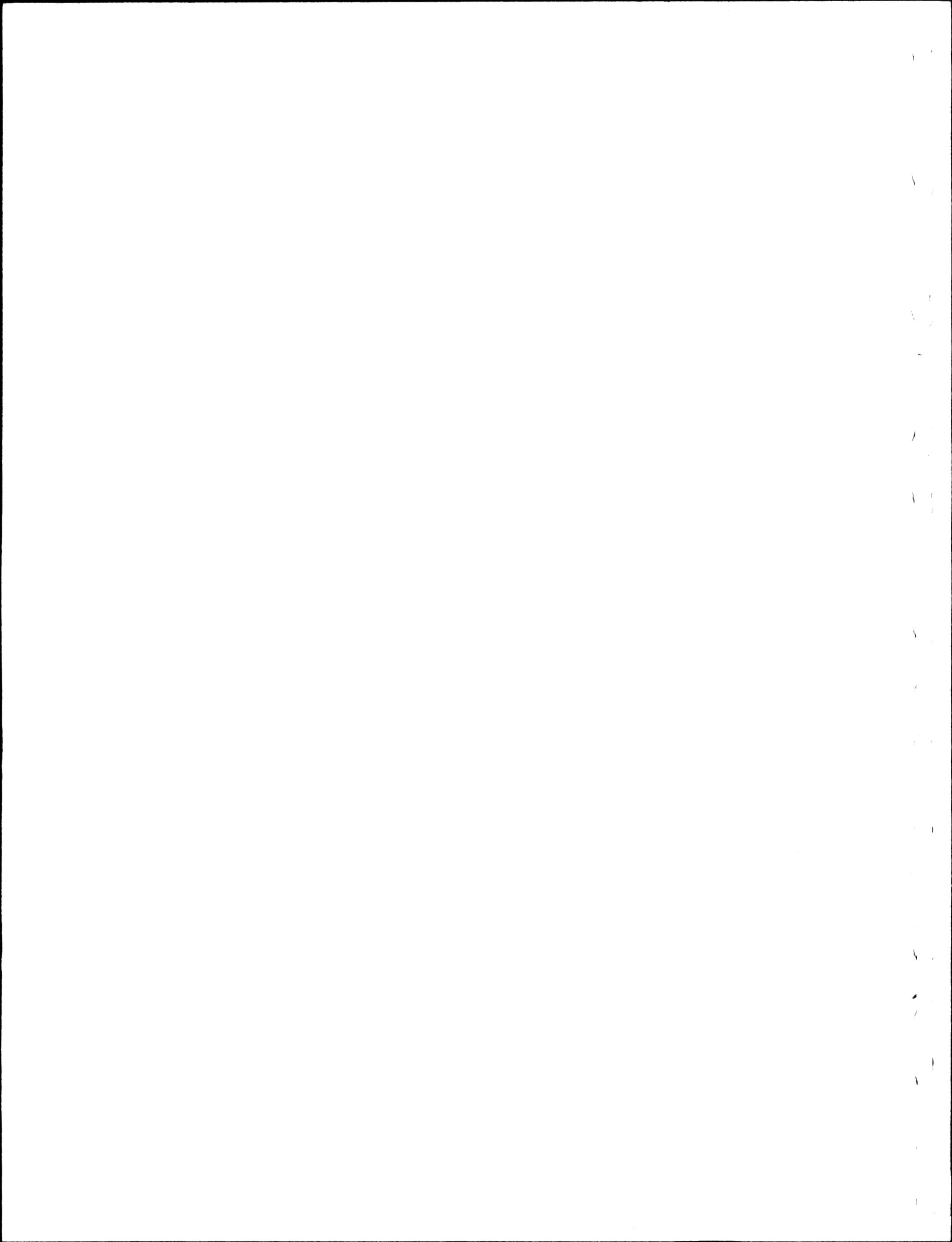
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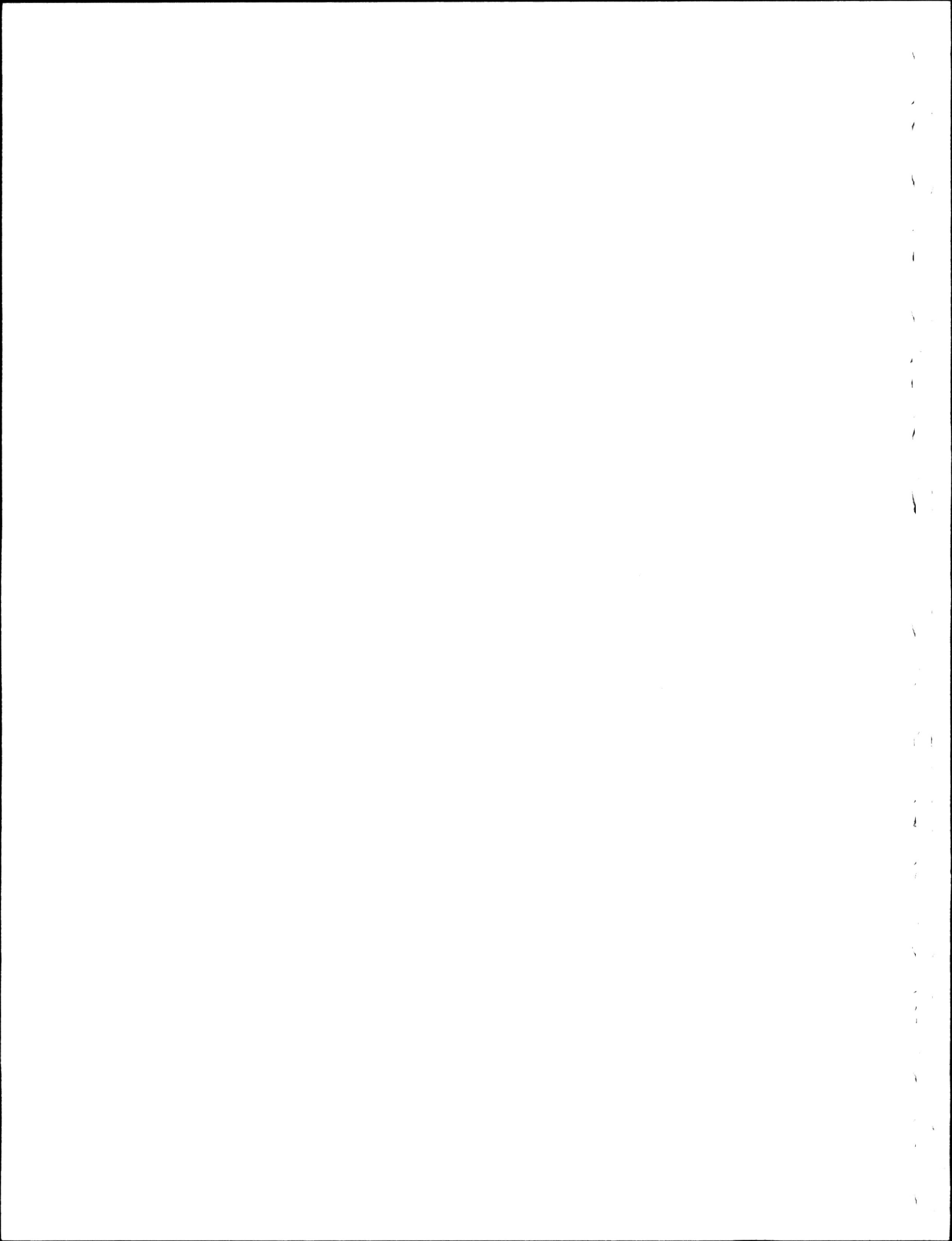


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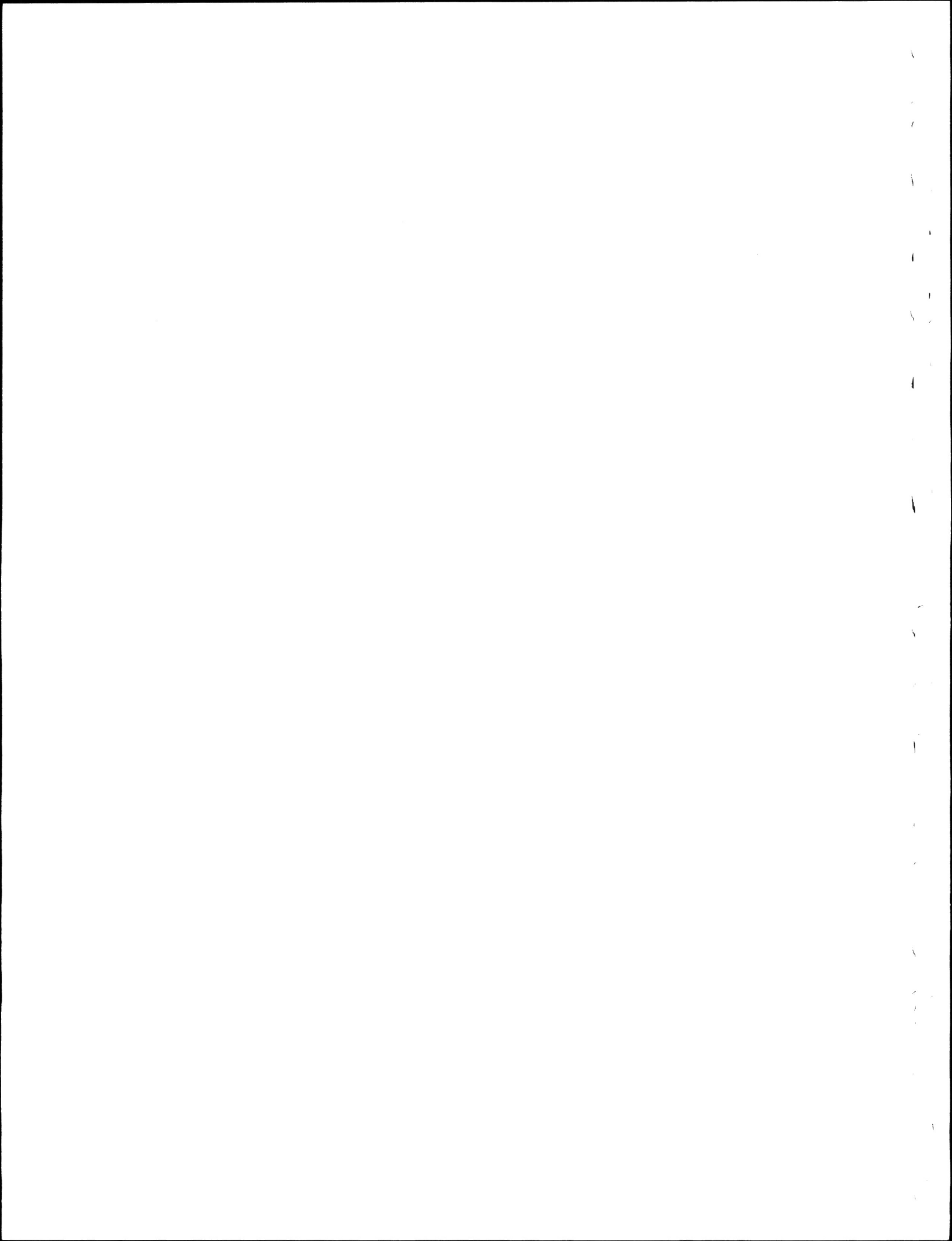
INTRODUCTION

This is the thirteenth 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 relatively similar 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, designation for cost sharing purpose, and operational responsibility. Schedule "D" (Appendix C) gives the annual cost sharing payment to be paid by Alberta to Canada.

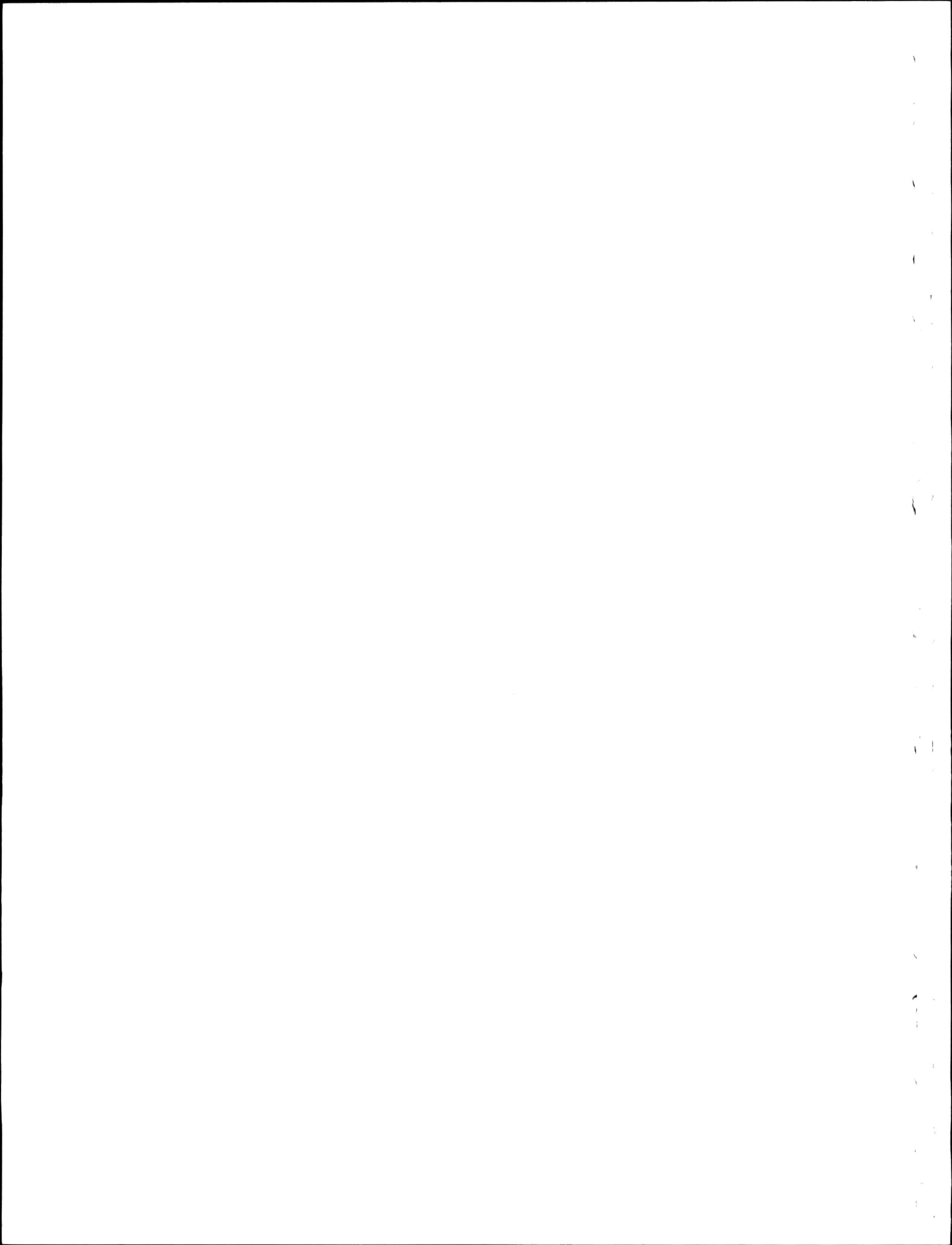
The water quantity survey network in operation on March 31, 1975 was reviewed to determine the division of responsibility between the federal and provincial governments. Each station was designated either 'Federal', 'Federal-Provincial' or 'Provincial', the designation not only indicating the prime need, but also the financial responsibility.

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



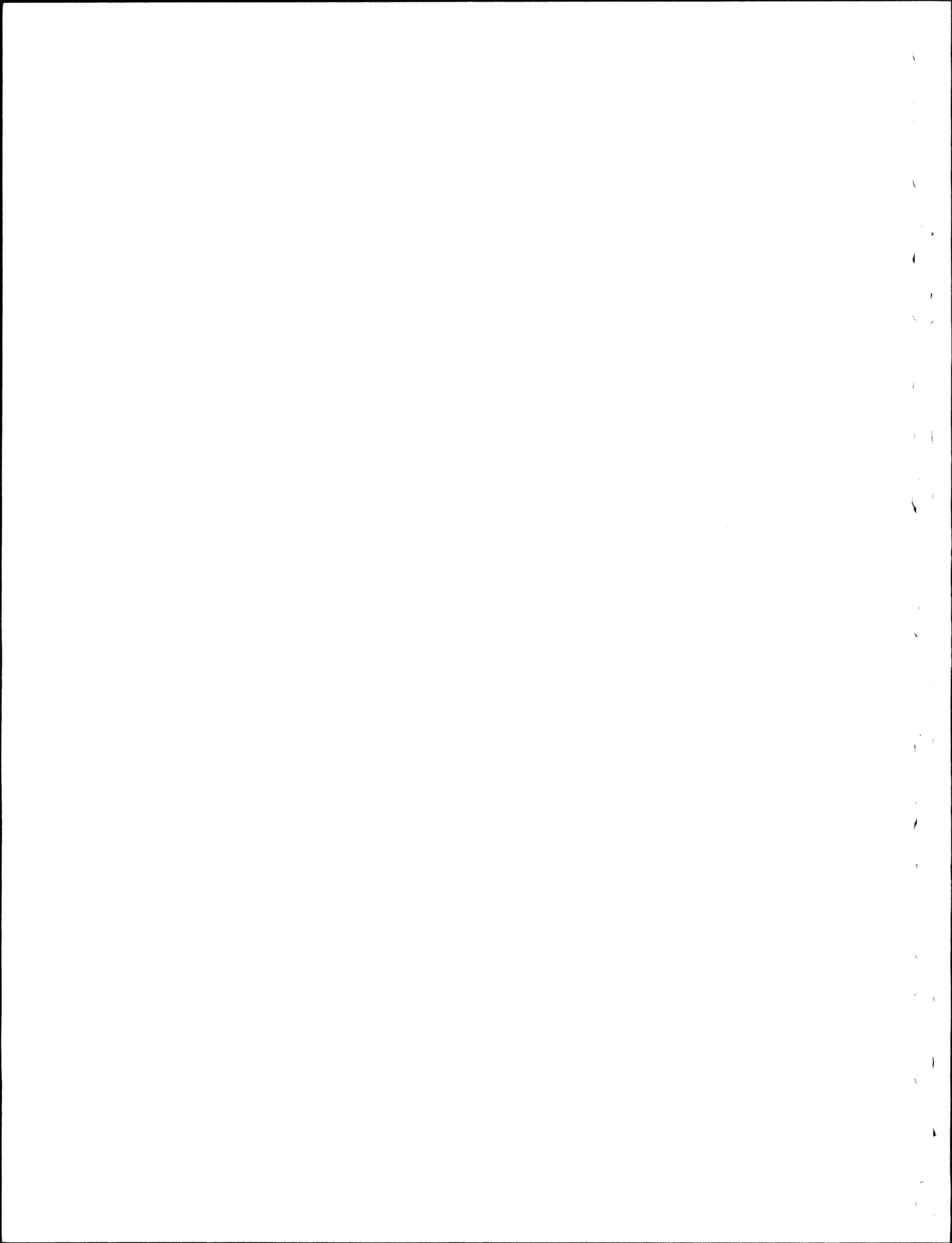
Schedule "B" (contained in the National Report) of the agreement, lists the items to be included in computing the annual payments. The federal government pays 100% of the cost of operation and construction of stations designated 'Federal' and 50% of the cost of stations designated 'Federal-Provincial'. The provincial government pays 100% of the cost of operation and construction of stations designated 'Provincial' and 50% of the cost of operation and construction of stations designated 'Federal-Provincial'. In 1977 a set of guidelines was developed for the three categories. This set of guidelines was reviewed and discussed at many 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.

Section 2.0 of this report summarizes the operational considerations of the 1987-88 water quantity program. Significant issues discussed at the Co-ordinating Committee meetings are identified in sub-section 2.1. Operational achievements are then outlined in sub-section 2.2. Changes to the network, which were previously agreed upon but which affect Schedule "A" for April 1, 1988 are listed in the sub-section 2.3, "Water Quantity and Sediment Networks" and Tables 1 to 3 summarize the designation of hydrometric stations. Sub-section 2.4 includes a brief summary of network planning activities. Figures are provided to indicate the financial responsibility and network changes from 1975 to 1988, and the history of the size of the hydrometric network. Histograms of



gauging station maturity are also presented. The final subsection provides a description of program plans for 1988-89.

Section 3.0 summarizes the cost of operation for the 1987-88 program. This section contains a summary of the federal and provincial costs associated with the water quantity network operations and construction activities. Detailed cost calculations for the 1987-88 fiscal year are presented in Appendix B. Tables 4 and 5 summarize the Total Program and Shareable Costs, Schedule "D", and a Comparison of Schedule "D" Costs with Actual Costs.



2.0 SUMMARY OF OPERATIONAL CONSIDERATIONS

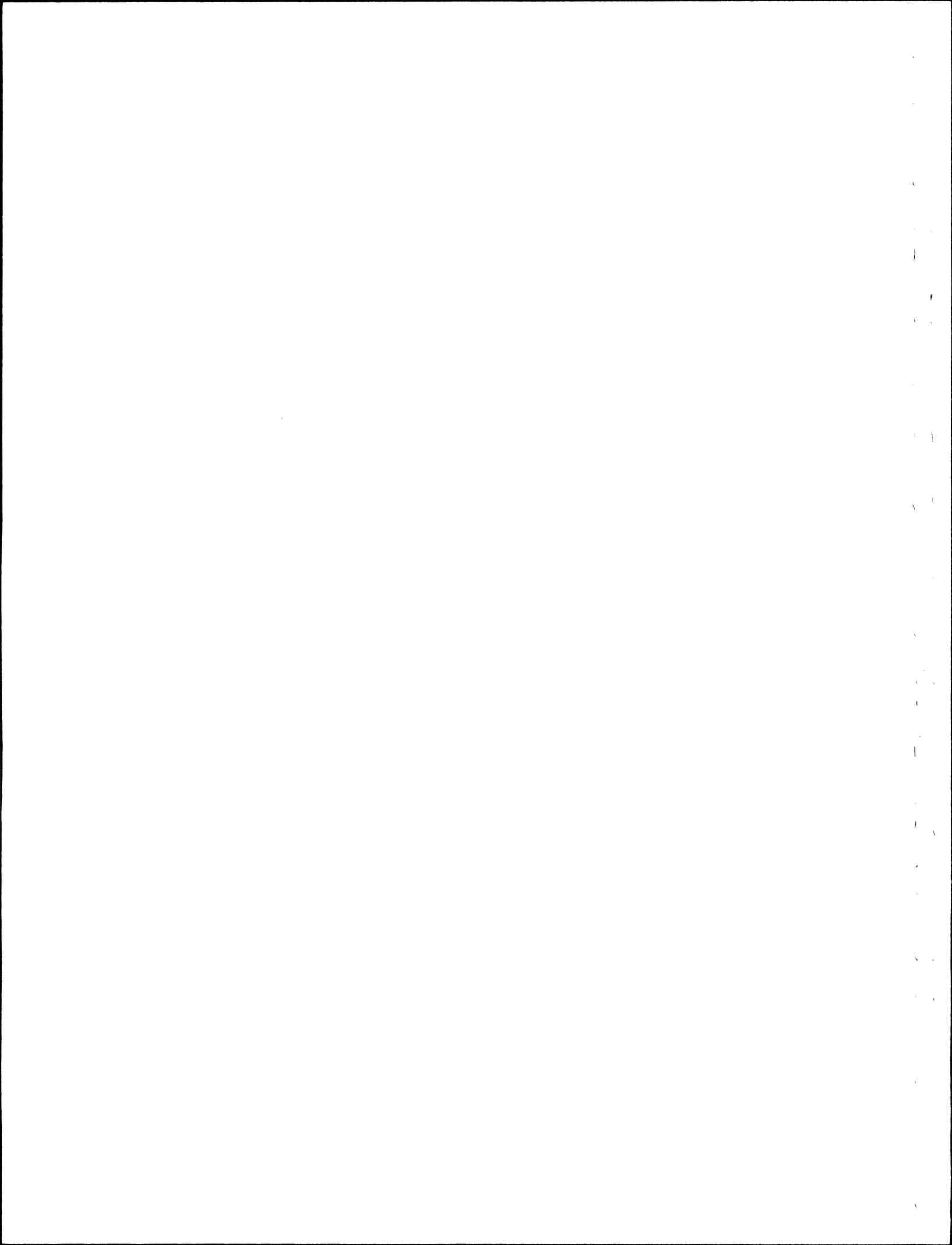
2.1 CO-ORDINATING COMMITTEE MEETINGS

Three Canada-Alberta and one national Co-ordinating Committee meetings were held. Highlights of these meetings follow.

2.1.1 Canada-Alberta Co-ordinating Committee Meeting,
May 18, 1987

The only item discussed at this meeting was the impact of cost-sharing the Canada Employee Pension and Benefits (C.E.P.B.) package, which was first raised by Canada at an Administrators' meeting of April 23, 1987. Numerous difficulties in incorporating this additional payment by the Province were noted and included:

- In the Compendium report issued in 1985 it stated "CEPB benefits are not cost-shared under this agreement."
- Alberta expressed the opinion that the subject could only be addressed by opening up the agreement to facilitate an amendment, which would have to be ratified by all parties.
- The proposal applied to all provinces, except Quebec, is a 'one way road' with no benefits to the provinces.



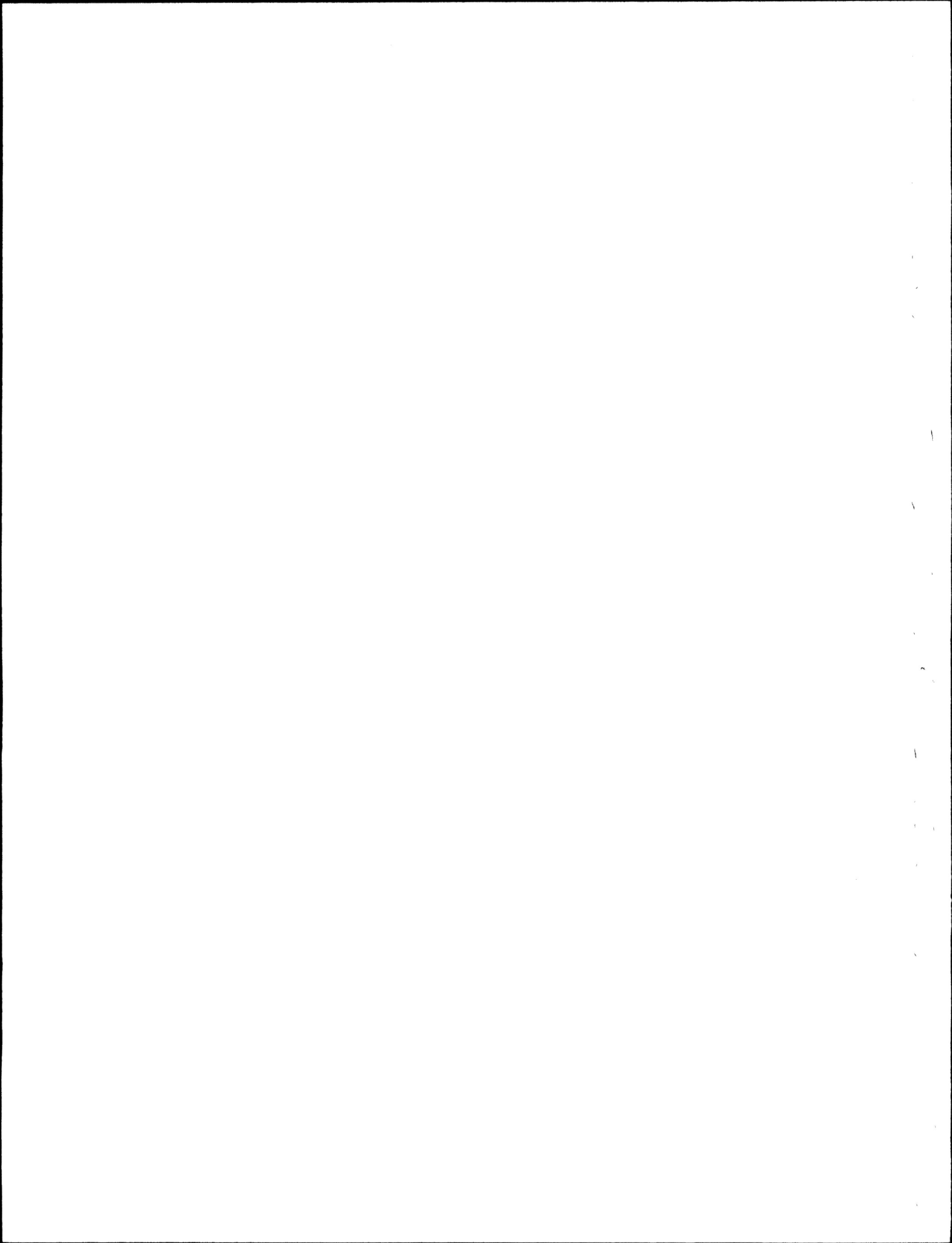
2.1.2 Canada-Alberta Co-ordinating Committee Meeting,
August 13, 1987

2.1.2.1 Annual Report 1986-87

Final revisions to the draft report were discussed. The major item of discussion pertained to the estimated 'Operation' costs for 1988-89, which left insufficient Schedule "D" funds for a satisfactory level of maintenance.

2.1.2.2 Alberta Operation of Existing Networks

Alberta raised the subject of their operating a portion of the existing WSC operated network to reduce their share of Schedule "D" costs, and thereby minimize reductions to the network. Canada noted that if it became necessary to follow this undesirable course of action it could only be done by re-assignment of a block of stations equating to work for one person-year. It was also noted that any shift in operating responsibility would also mean Alberta would be responsible for providing the water level recording equipment.



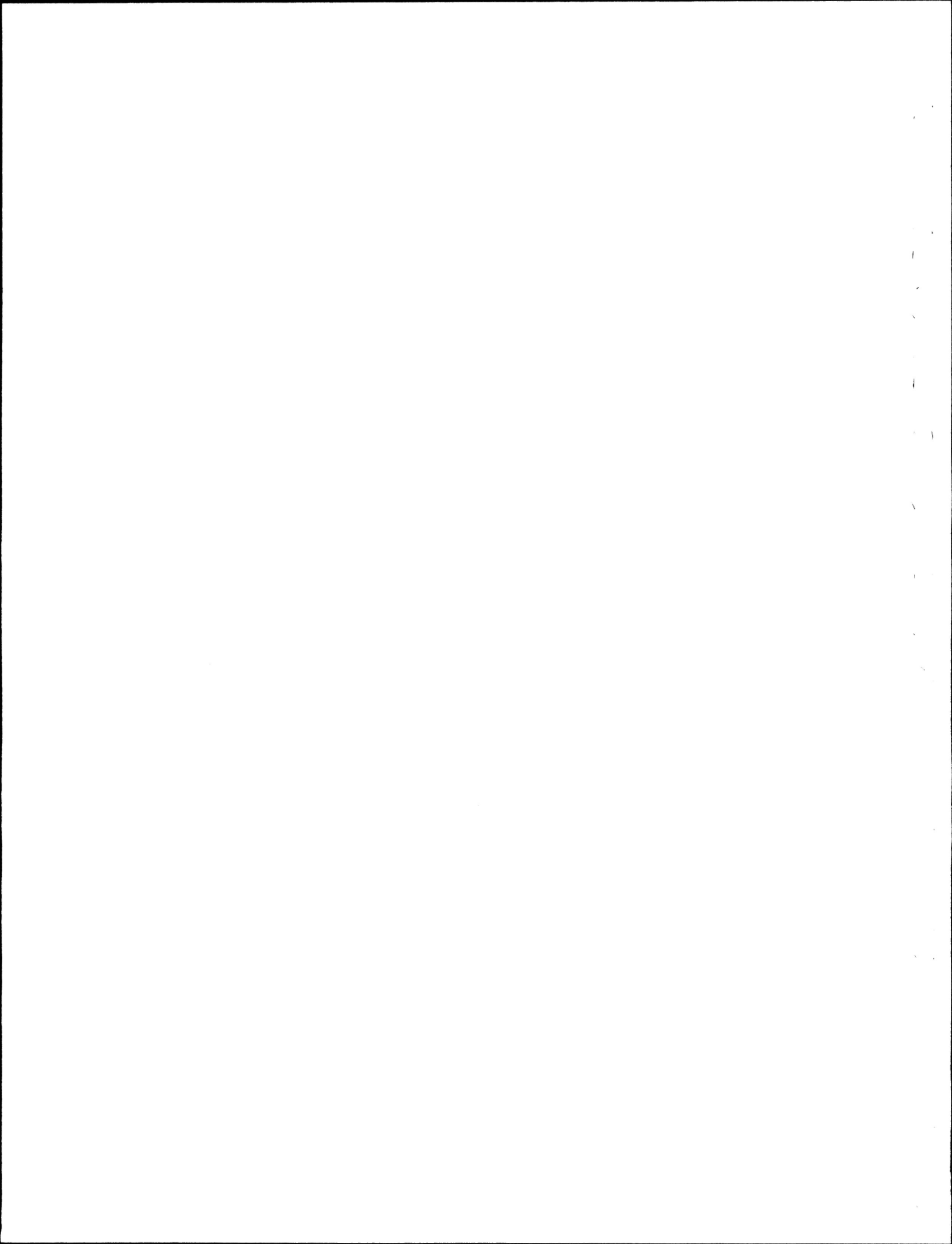
2.1.2.3 Maintenance 1987-88

Canada tabled an estimate of maintenance costs and noted projected provincial expenditures were only \$28K relative to the \$50K budgeted in Schedule "D". However, they noted there may not be surplus funds to the overall Agreement due to WSC being charged minimum hour helicopter costs in the Ft. McMurray area. Alberta raised the point that if surplus funds became available it may be worthwhile to pursue the often delayed electrification program.

2.1.3 Eighth National Co-ordinating Committee Meeting, October 29, 1987.

2.1.3.1 Provincial Update on Water Resources Programs

Alberta indicated strong support for the co-operative effort occurring through the Cost-Sharing Agreement. They noted the requirement to reduce the network in 1987-88, for the first time, due to a significant reduction in provincial funding. Alberta described their activities in the areas of water development projects, other Federal-Provincial initiatives, basin planning initiatives, and hydrologic analysis.



2.1.3.2 Federal Report

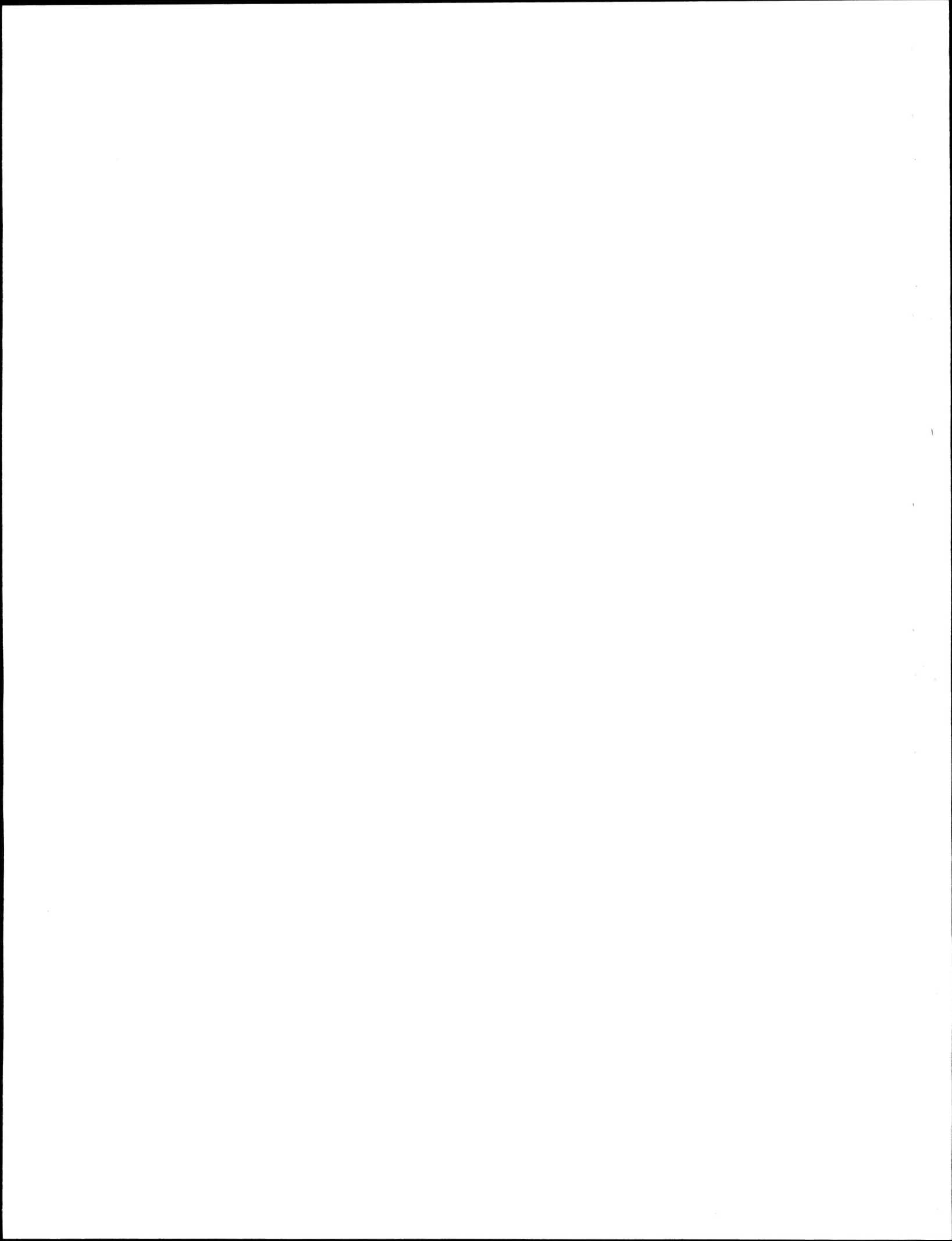
The Director of the federal Water Resources Branch highlighted the continuing era of restraint, and the federal government undergoing a reduction in the number of employees. He noted attempts to raid the human resources of the federal hydrometric program, and the need to protect this program by improved communication to senior managers, of the program's importance.

2.1.3.3 Network Planning and Evaluation

A presentation was made by the Chief of the federal Hydrology Division. The main item discussed was the 'station management profiles', and it was agreed that changes could be made to the format of the station profile form. Also, Co-ordinating Committees were urged to work together in the preparation of the profiles. The Chief of the Hydrology Division also described plans for a Network Evaluation and Planning Workshop to be held late in 1988.

2.1.3.4 Real Time Data Acquisition

The Chief, WSC provided a status report pertaining to history of the data collection platform installation



and operation program, and the installation and implementation of direct readout ground stations (DRGS). Concerns were raised by many parties as to the apparent increased costs using the Canadian DRGS facilities, rather than United States facilities. It was agreed that a federal-provincial working group would be established to address this matter.

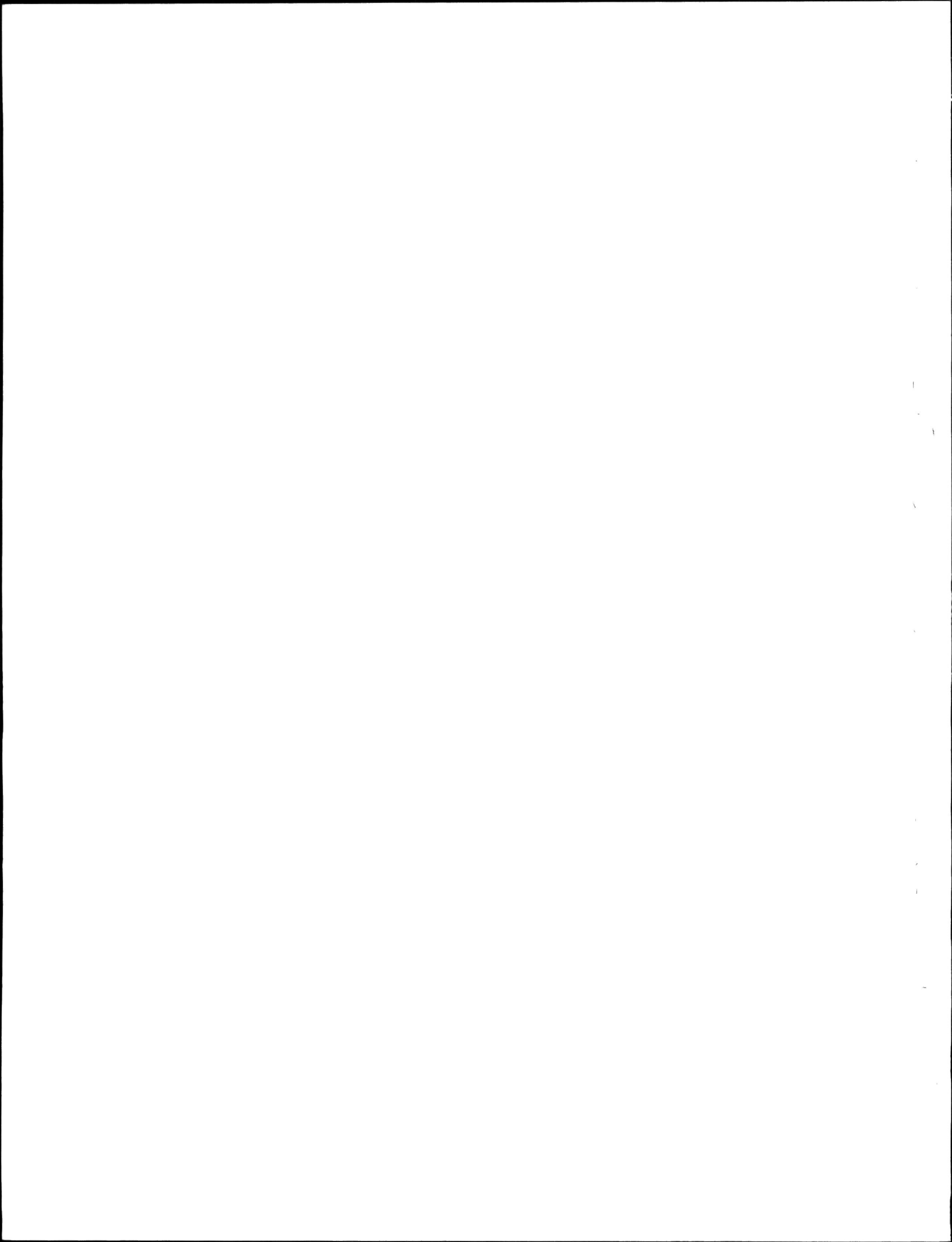
2.1.4 Canada-Alberta Co-ordinating Committee Meeting, March 7, 1988

2.1.4.1 Peace-Athabasca Delta Gauging Station Designations

Canada tabled a memorandum indicating the stations which are required to support the Peace-Athabasca Delta one dimensional model for future hydrologic studies in the Delta. Subsequently, cost-sharing designation and period of operation changes were made to five hydrometric stations, resulting in a slight increase in station units credited to the Province.

2.1.4.2 Schedule "D" Estimates for 1987-88 and 1988-89

The most up-to-date estimate for the provincial share of 1987-88 costs was addressed. Considerable discussion ensued regarding the reasons for the considerably less than estimated expenditures in 1987-88, with

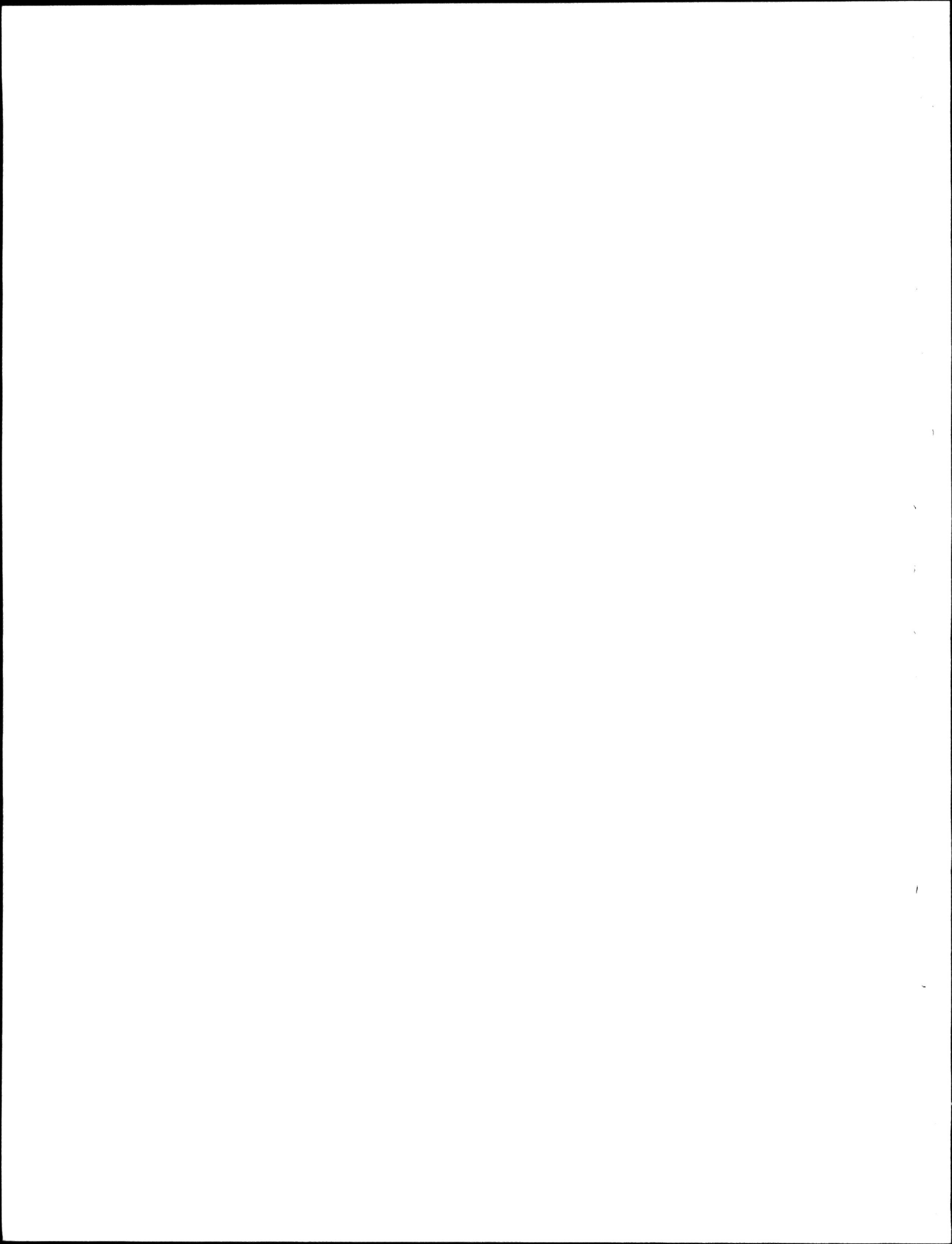


the major reason being that 1987-88 was a low impact year with respect to hydrologic events. In order to minimize future surprises it was agreed Canada would institute a procedure for tracking interim expenditures.

Alberta queried the estimated funds for the gauging stations maintenance program in 1988-89, as they were substantially greater than those utilized in 1987-88. Canada assured the Province the funds could be beneficially expended, as the 1987-88 maintenance program was a bare minimum to meet safety and operational requirements.

2.1.4.3 Final Invoice 1987-88

Alberta had discussed the possibility of applying surplus 1987-88 Schedule "D" funds to the accumulated deficit. It was agreed that Canada would revise the final payment invoice to include this payment and prepare a statement showing the accumulated deficit to be included with the invoice.



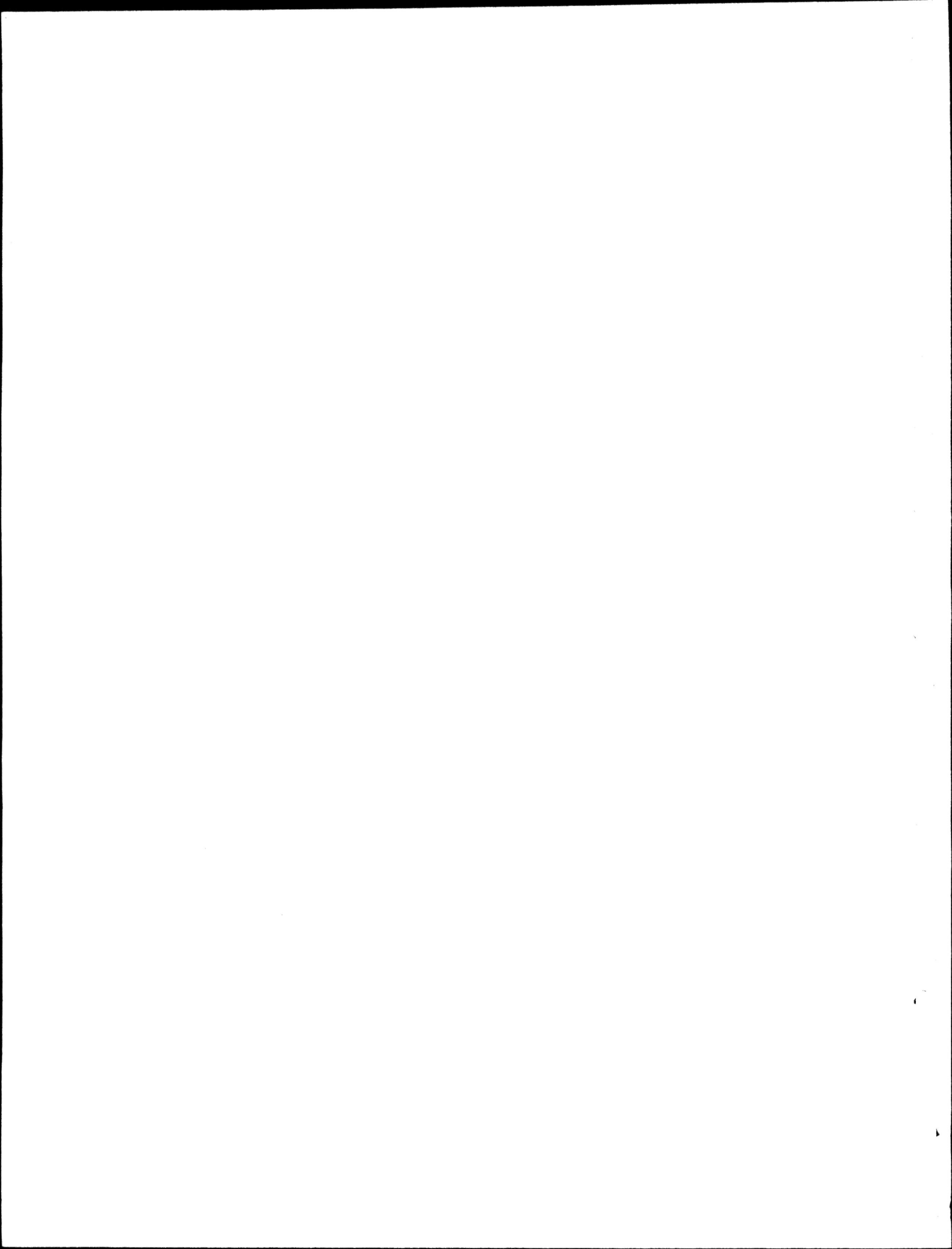
2.1.4.4 Re-activating Previously Discontinued Stations

As there was a considerable surplus of funds in the 1987-88 budget, Alberta raised the possibility of re-opening some of the stations closed down due to budget restraints. Canada expressed a number of reasons why they felt there wouldn't be a surplus of funds in 1988-89 and it was agreed that these stations wouldn't be considered for re-opening at this time.

2.1.4.5 Sediment Program

Canada presented a proposal for a cost-shared sediment study for a characterization report for use by environmental groups. Alberta indicated that they had never fielded any concerns regarding the lack of interpretive sediment data in Alberta, and thus couldn't support this type of study.

Canada noted that two recent reports have indicated a lack of sediment data along the North Saskatchewan River, and the data that does exist indicates an anomalous situation between Edmonton and Prince Albert. It was agreed that a temporary full program suspended sediment station would be established at Edmonton.



2.1.4.6 Study on Open Water Measurement Frequency

Canada provided a brief rundown on the initial phases of this study designed to ascertain if a lesser number of visits or measurements can be made at some hydro-metric stations. Alberta suggested that any reduction of visits should be done at stations that had telemetry as a backup source of water level data.

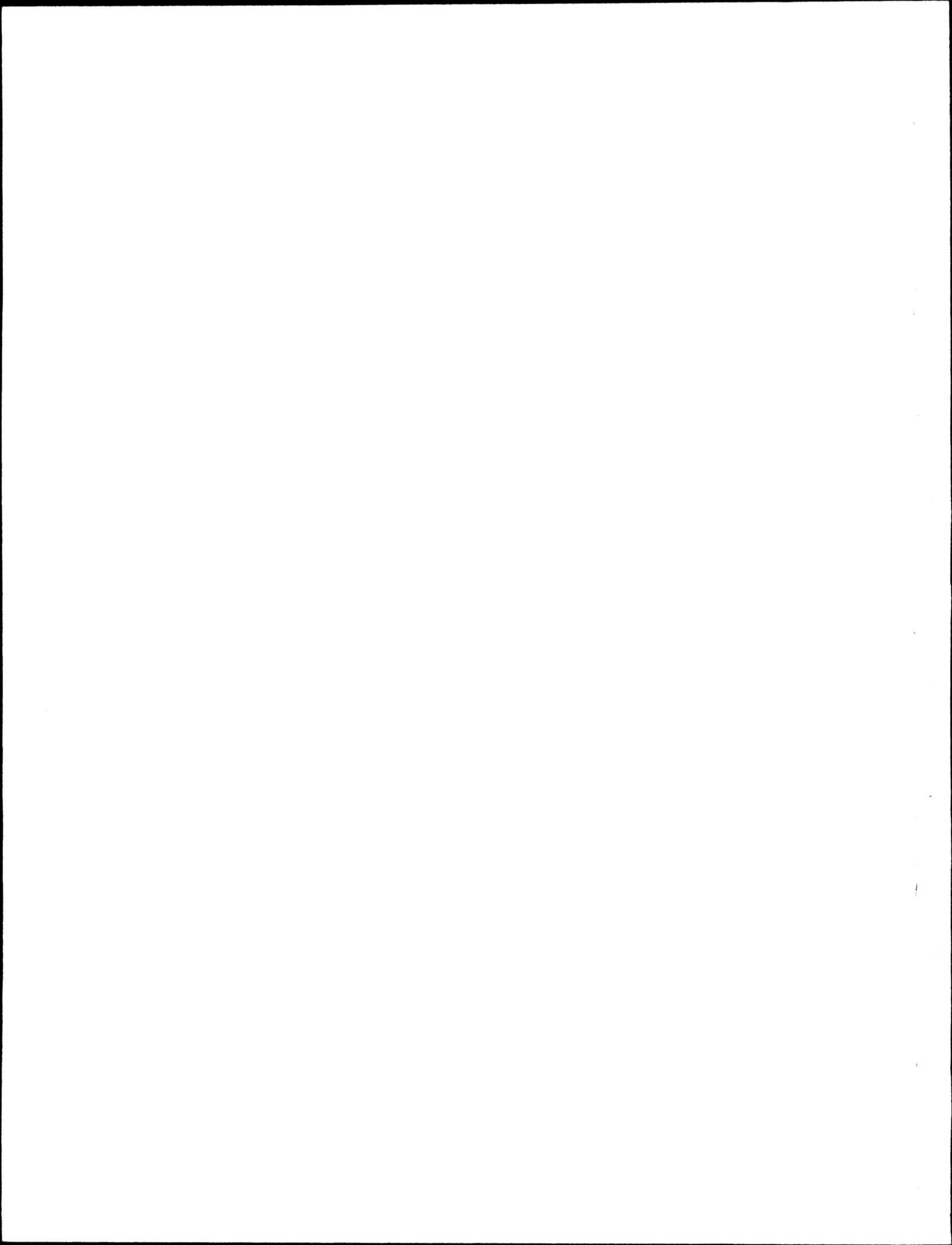
2.1.4.7 Winter Streamflow Inaccuracies

Canada gave a brief rundown of potential errors involved in making winter streamflow measurements. Alberta indicated their willingness to co-operate wherever possible if a program to investigate these errors is initiated.

2.2 OPERATIONAL ACHIEVEMENTS

2.2.1 Major Flooding

This year, a major flood occurred in the Simonette River Basin in west-central Alberta. It struck on the August long weekend, shortly after the major tornado disaster in Edmonton. The flood peak was 6.5m higher than what was thought to be a major flood in 1982, and the computed flow of 6 500 m³/s

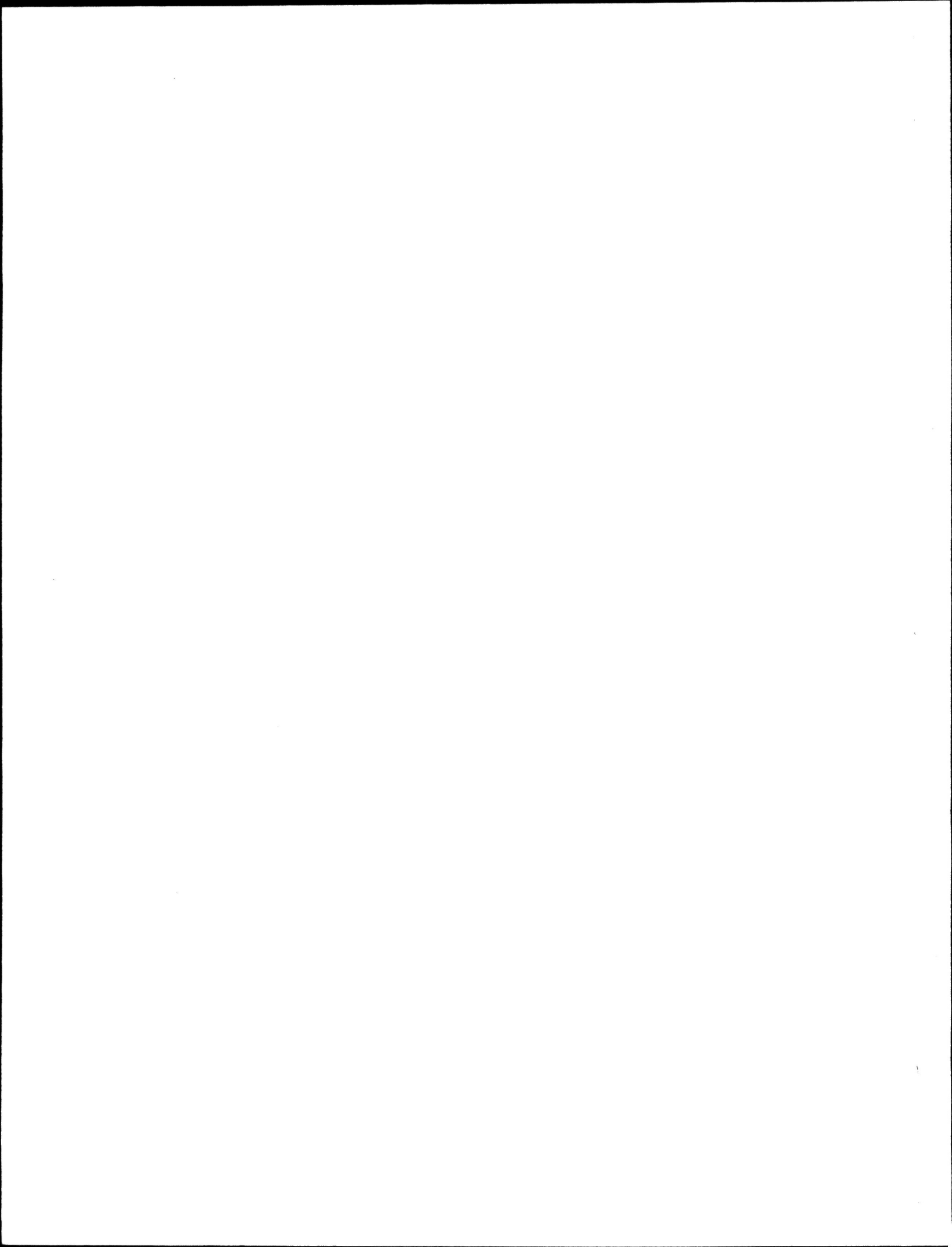


from a drainage area of 5 050 km² is one of the highest yield events ever recorded in Alberta.

Although the storm struck at a time when many staff were on holidays, the remaining staff provided excellent coverage of the runoff event. Attempts to meter at many locations were frustrated by the flow of heavy debris, and the need to save instrumentation from inundation. Alberta Environment field personnel provided invaluable data with prompt response to the flood event. In addition to their routine activities during a storm event, they obtained frequent water levels at sites at which the recorders were inoperable. These water levels enabled WSC to complete the storm hydrographs which, without these extra data, could only have been estimated. Where required, slope-area surveys were conducted after the flood had subsided. Only the Simonette River gauge was destroyed, with the shelter being deposited 0.5 km downstream of the original gauge site.

2.2.2 Training Program

The major aspect of this program during the year was the preparation of six training modules for the technician Career Development Program. This work was mainly carried out by Hydrometric Supervisors and the Area Head, and comprised 1/6th of the 37 training modules prepared. When published in



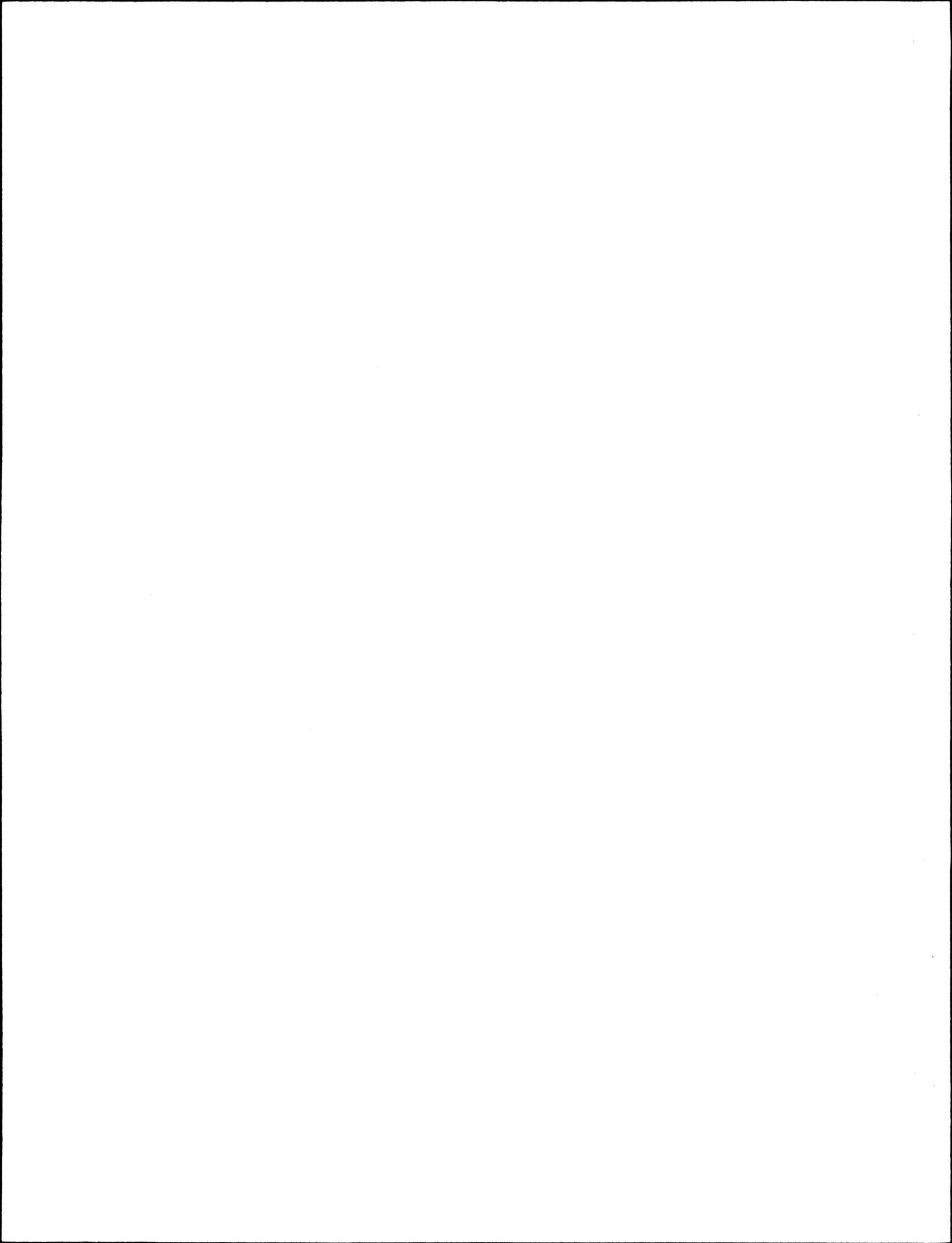
1988-89 this handbook will be very valuable to WSC and other agencies involved in the collection and computation of streamflow data.

As a followup to the extensive slope-area surveys in 1986 a two-day open channel hydraulics course was presented to technical staff. Additionally, a two-day district staffmeeting was held with both technical and management subjects addressed.

2.2.3 Construction and Maintenance Programs

During 1987-88 there was no construction of new stations by WSC; however, two Federal-Provincial hydrometric stations were installed in the Peace-Athabasca Delta by Alberta Environment. Maintenance was carried out at 51 stations and major reconstruction was conducted at eight stations. Localities where both maintenance and construction were carried out are shown in Appendix B, Table II and Figure I. Additional details regarding the construction and maintenance program are provided in the annual report, "Alberta Gauging Station Construction and Maintenance, 1987-88".

The provincial share of the maintenance program was approximately \$18K less than the Schedule "D" amount of \$54.1K. Reasons for this large discrepancy are twofold.



During 1987-88 assistance to the construction unit was provided by hydrometric survey technicians and their costs were charged to the hydrometric program rather than construction program. Also, damages from flood events were for less than amounts normally expended on previous floods in Alberta.

2.3 WATER QUANTITY AND SEDIMENT NETWORKS

Changes which are reflected in Schedule "A", April 1, 1988 are summarized as follows:

2.3.1 New Stations Established during 1987-88

<u>Station Name</u>	<u>Station No.</u>	<u>Designation</u>
1. Embarras Breakthrough to Mamawi Creek	07KF015	FP1
2. Embarras River below Divergence	07DD003	FP1
3. Connor Creek near Sangudo*	07BB009	P1
4. Paddle River Res. nr Rochfort Bridge	07BB914	P1
5. Spotted Lake near Mirror	05CD903	P1
6. Whitburn Drainage Project nr Spirit R.	07FD912	P1
7. Whitearth Creek above Edward Creek	05EC916	P1

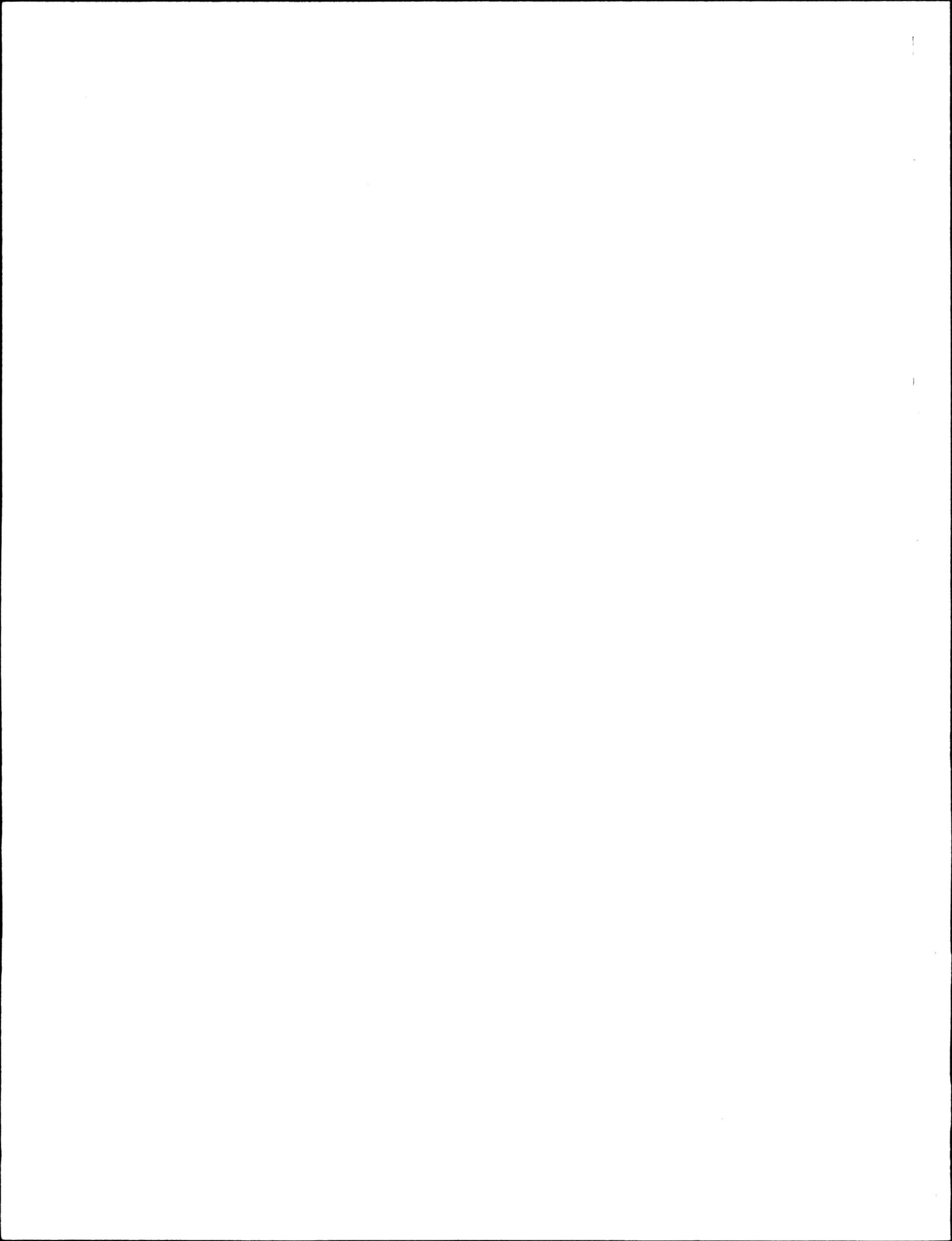
All stations were installed and are operated by Alberta Environment.

2.3.2 Discontinued Hydrometric Stations at End of 1987/88

<u>Station Name</u>	<u>Station No.</u>	<u>Designation</u>
1. Bridlebit Creek near Valleyview	07GF005	P1
2. Horse Creek near Valleyview	07GF007	P1
3. Rocky Creek near Valleyview	07GF006	P1
4. Spring Creek near Valleyview	07GF002	FP1
5. Spring Creek (Upper) near Valleyview	07GF004	P1
6. Wolverine Creek near Valleyview	07GF003	P1

All stations were formerly operated by Alberta Environment.

* Station actually re-established and operated by ADOE in 1987/88. This station had formerly been operated by WSC from 1972 to 1986.



2.3.3 Changes to Sediment Program (Sediment Program Discontinued)

<u>Station Name</u>	<u>Station No.</u>	<u>Sediment Program Designation</u>
1. Clearwater River at Draper	07CD001	FP3
2. Lesser Slave River at Highway 2A	07BK006	P1

2.3.4 Designation Changes

<u>Station Name</u>	<u>Station Number</u>	<u>Former Designation</u>	<u>Present Designation</u>
1. Chenal des Quatre Fourches at Quatre Fourches	07KF001	F1	P1
2. Lake Athabasca at Bustard Is.	07MD002	P1	F1
3. Mamawi Lk. Channel at Dog Camp	07KF010	F1	P1
4. Mamawi Lk. Channel at Old Dog Camp	07KF003	P1	F1

All stations are operated by Alberta Environment.

2.3.5 Operation Period Changes

2.3.5.1 From Annual to Seasonal

<u>Station Name</u>	<u>Station No.</u>	<u>Designation</u>
1. Marmot Creek Main Stem	05BF016	FP1

2.3.5.2 From Seasonal to Annual

<u>Station Name</u>	<u>Station No.</u>	<u>Designation</u>
1. Riviere des Rochers East of Little Rapids	07NA007	F1

(Also changed from a water level only to a discharge station).

Table 1 indicates additions and deletions to the hydrometric network during 1987-88 and the station designation effective April 1, 1987.

Table 2 illustrates the changes which have occurred in each of the designation categories from the commencement of the cost-sharing

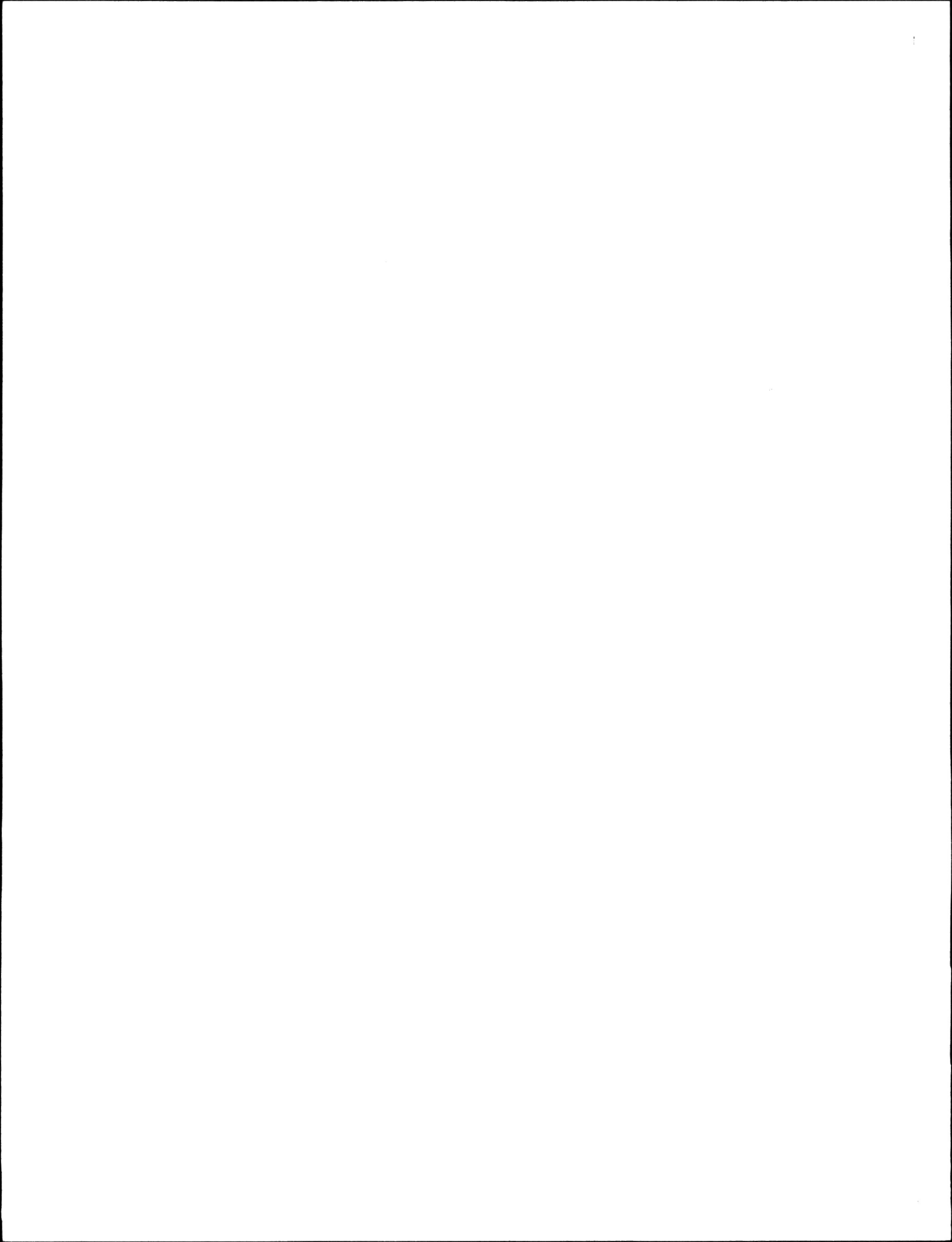


TABLE 1
WATER QUANTITY SURVEYS
GAUGING STATION DATA FOR 1987-88

No. of Stations(1)		No. of Stations Added 1987/88(2)	No. of Stations Discontinued 1987-88(2)	NET	Stn. Designation April 1, 1987			
April 1/86	April 1/87				FED.	FEDERAL PROV.	PROV.	CONTRI-BUTED
573	549	0	0	0	123 (1)	208 (4)	197 (4)	21

- (1) Includes Contributed Data Stations
- (2) Stations operated by WSC.
- () Bracketed numbers are for sediment stations

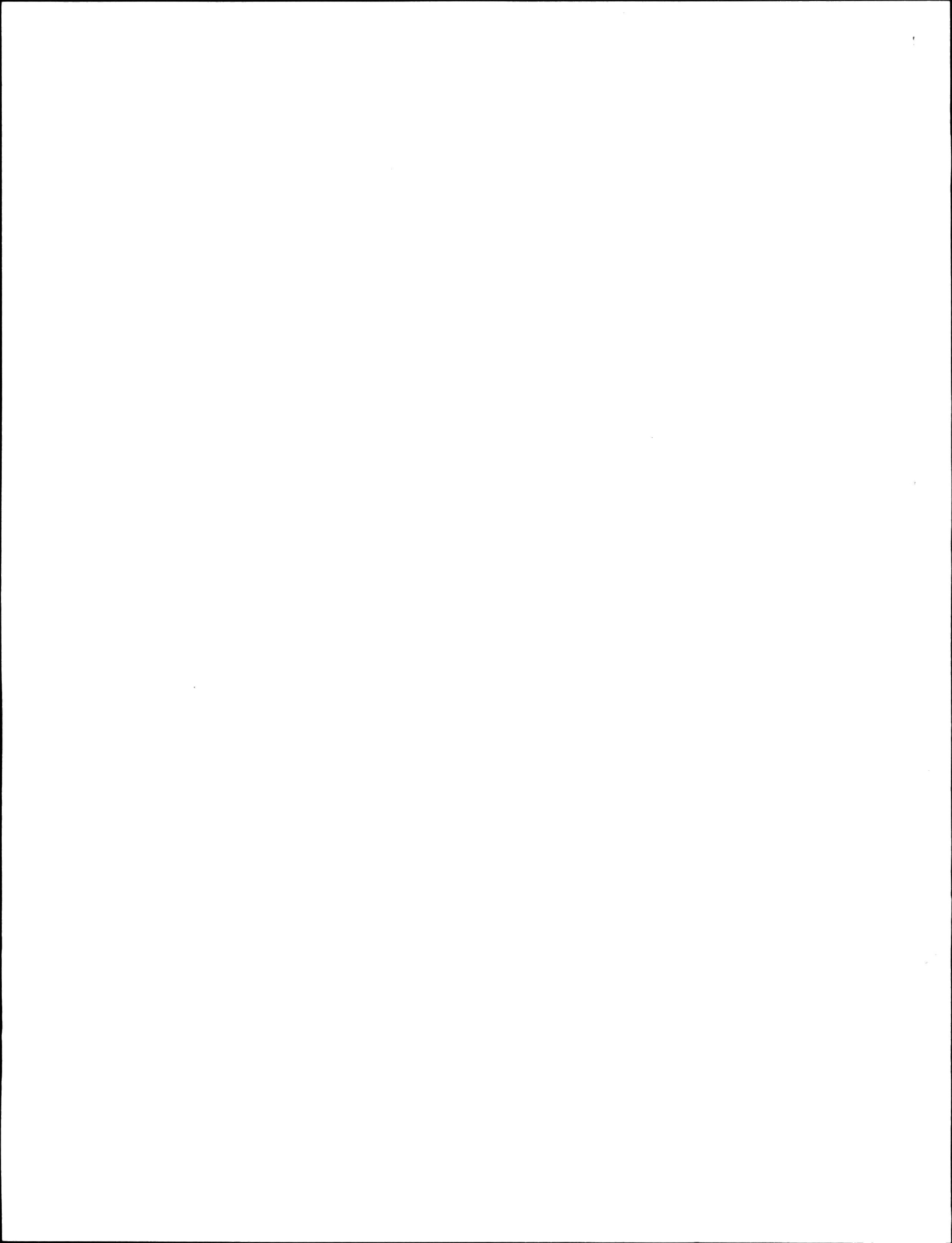
TABLE 2
WATER QUANTITY SURVEYS
COMPARATIVE GAUGING STATION DATA, APRIL 1/75 TO APRIL 1/87

Federal Stations			Federal-Provincial Stations			Provincial Stations			Total Stations		
Apr 1/75	Apr 1/87	Change	Apr 1/75	Apr 1/87	Change	Apr 1/75	Apr 1/87	Change	Apr 1/75	Apr 1/87	Change
157	123	-34	221	208	-13	46	197	+151	424	528	+104

TABLE 3
WATER QUANTITY SURVEYS
DETAILED GAUGING STATION DATA, APRIL 1, 1987

F1	F2	F3	F4	Total F	FP1	FP2	FP3	Total FP	P1	P2	Total P	Contributed	Total All
25 (0)	58 (0)	30 (0)	10 (1)	123 (1)	15 (0)	25 (0)	168 (4)	208 (4)	197 (3)	0(1)	197 (4)	21 (0)	549 (9)

() Bracketed numbers are for sediment stations.



agreement in April 1975 to April 1, 1987. Table 3 provides detailed gauging station data as of April 1, 1987.

2.4 NETWORK PLANNING ACTIVITIES

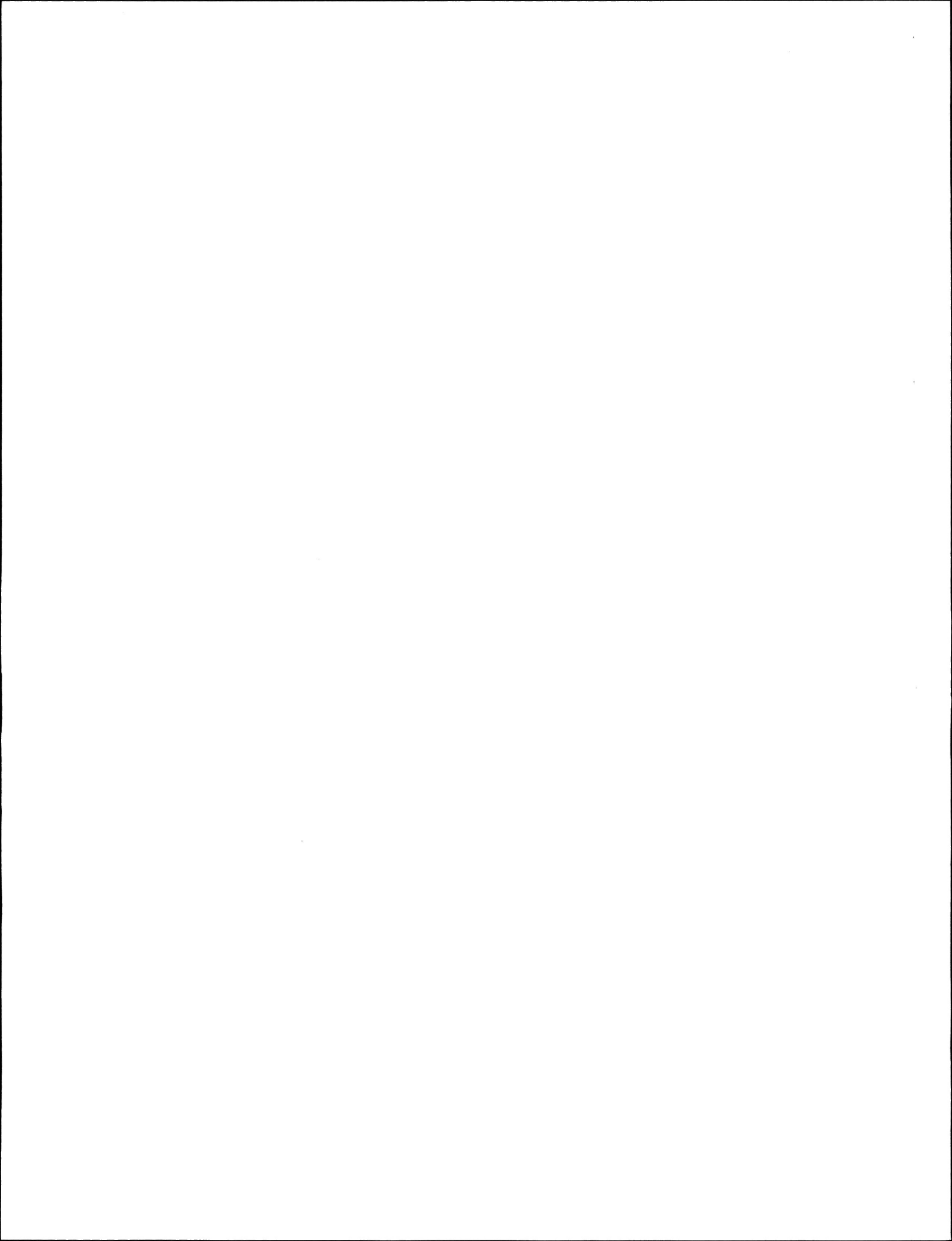
2.4.1 Sediment

Under a contract issued by WSC, sediment management plans (SMP) were prepared for 160 active and discontinued full program and miscellaneous stations. Considerable in-house work remains to finalize the SMPs and this will be carried out during 1988-89.

The only sediment station analysis report completed was for the Milk River Basin. Because of co-operative federal-provincial water management studies in this basin, the report was in demand long before it could be finalized.

2.4.2 Hydrometric

Hydrometric network planning focused on the preparation of station management profiles. Some portions of the profiles were prepared in co-operation with the provinces. This will be a major work project during 1988-89, which will hopefully see the finalization of these profiles.



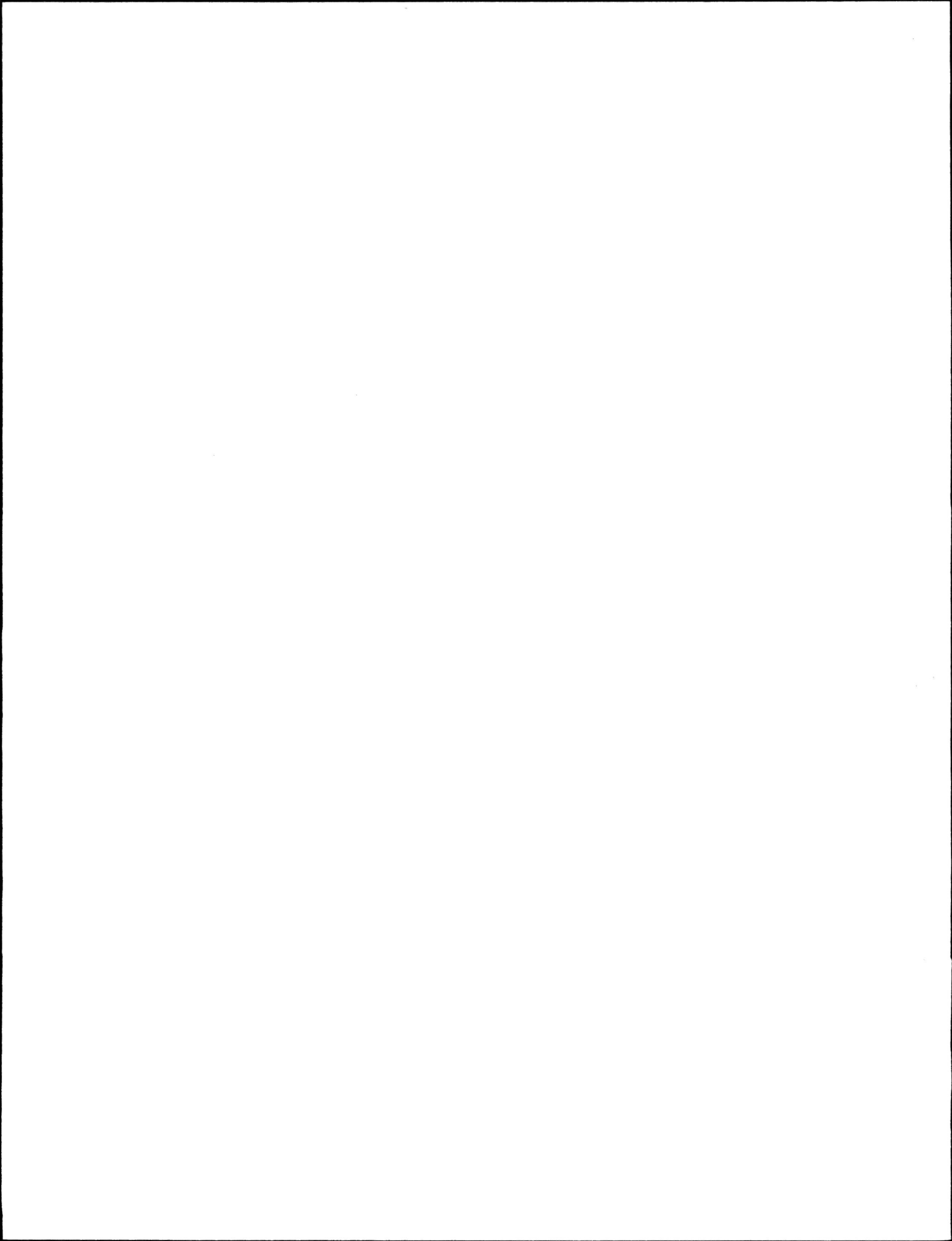
2.4.3 Provincial Operated Network

This network is operated and financed by the Province and is not subject to the cost-sharing aspects of the federal-provincial agreement. Mention is made of the network in order to provide a complete resume of hydrometric data collection in Alberta for 1987. The network's primary purposes is to provide data for specialized hydrological studies related to water management.

2.4.4 Historical Network Changes

As the total number of stations in the hydrometric network may remain the same or change by a small amount from year to year, it can appear that the network is dormant and that network planning is not occurring. This is actually far from the truth, and in fact, dynamic changes have occurred in the network from the inception of the cost-sharing agreement, as indicated in the following summary:

<u>Year</u>	<u>New Stations Established</u>	<u>Stations Discontinued</u>
1975-76	33	15
1976-77	21	9
1977-78	11	25
1978-79	15	11
1979-80	5	5
1980-81	17	8



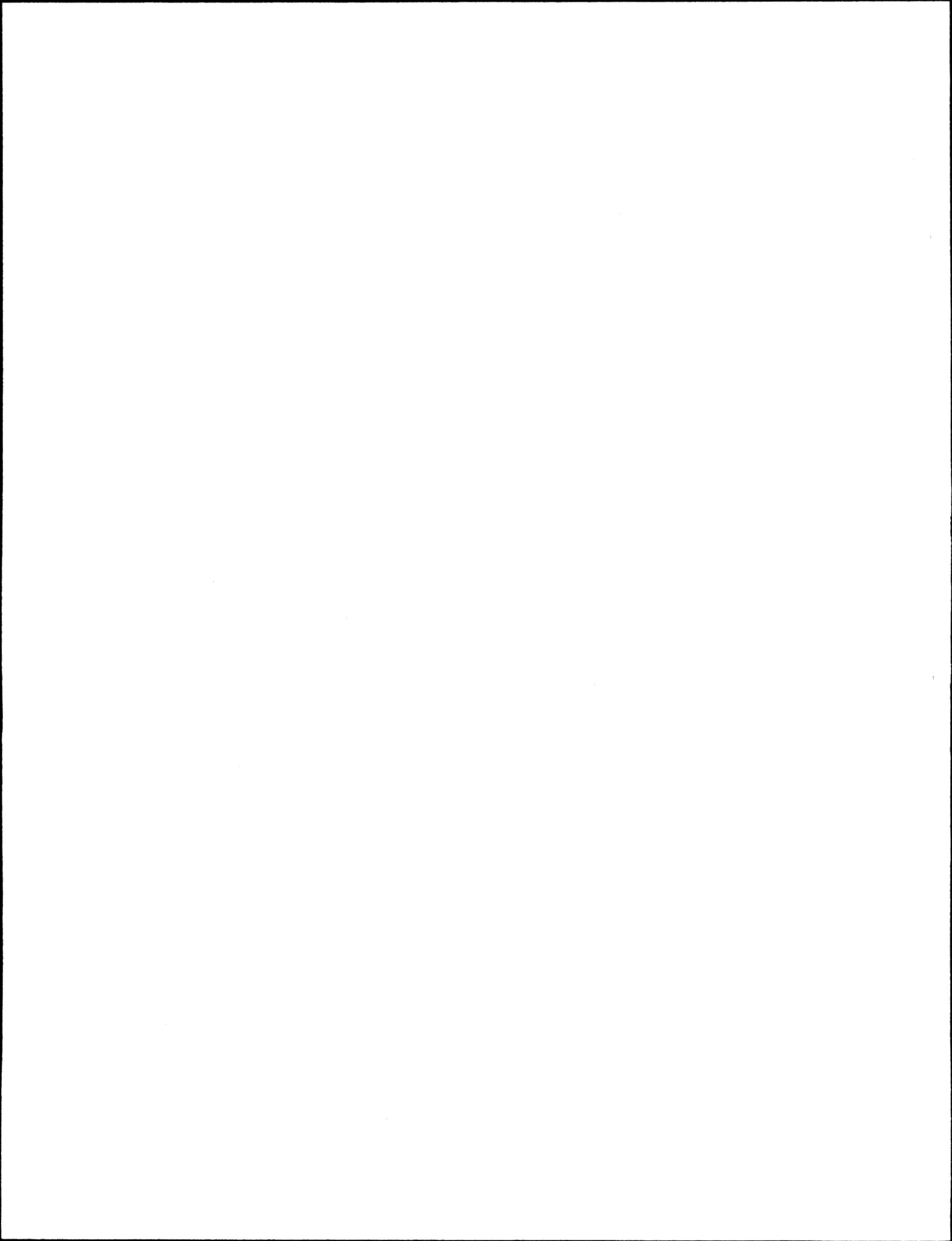
<u>Year</u>	<u>New Stations Established</u>	<u>Stations Discontinued</u>
1981-82	17	0
1982-83	17	3
1983-84	22	8
1984-85	27	14
1985-86	11	8
1986-87	10	33
1987-88	<u>7</u>	<u>6</u>
Total:	213	145

(NOTE: These values differ from the total station change presented in Table 2. The reason for this is that in 1986-87 a number of stations operated by the Province outside of the PAD and Spring Creek areas, formerly considered as contributed, were designated Provincial and were included in Table 2. However, the history of these Provincial stations isn't presented in the foregoing summary.)

The new stations established over this twelve-year period represent 39% of the hydrometric network operated by Water Survey of Canada and Alberta Environment, as of April 1, 1988 and the discontinued stations represent 26% of the network.

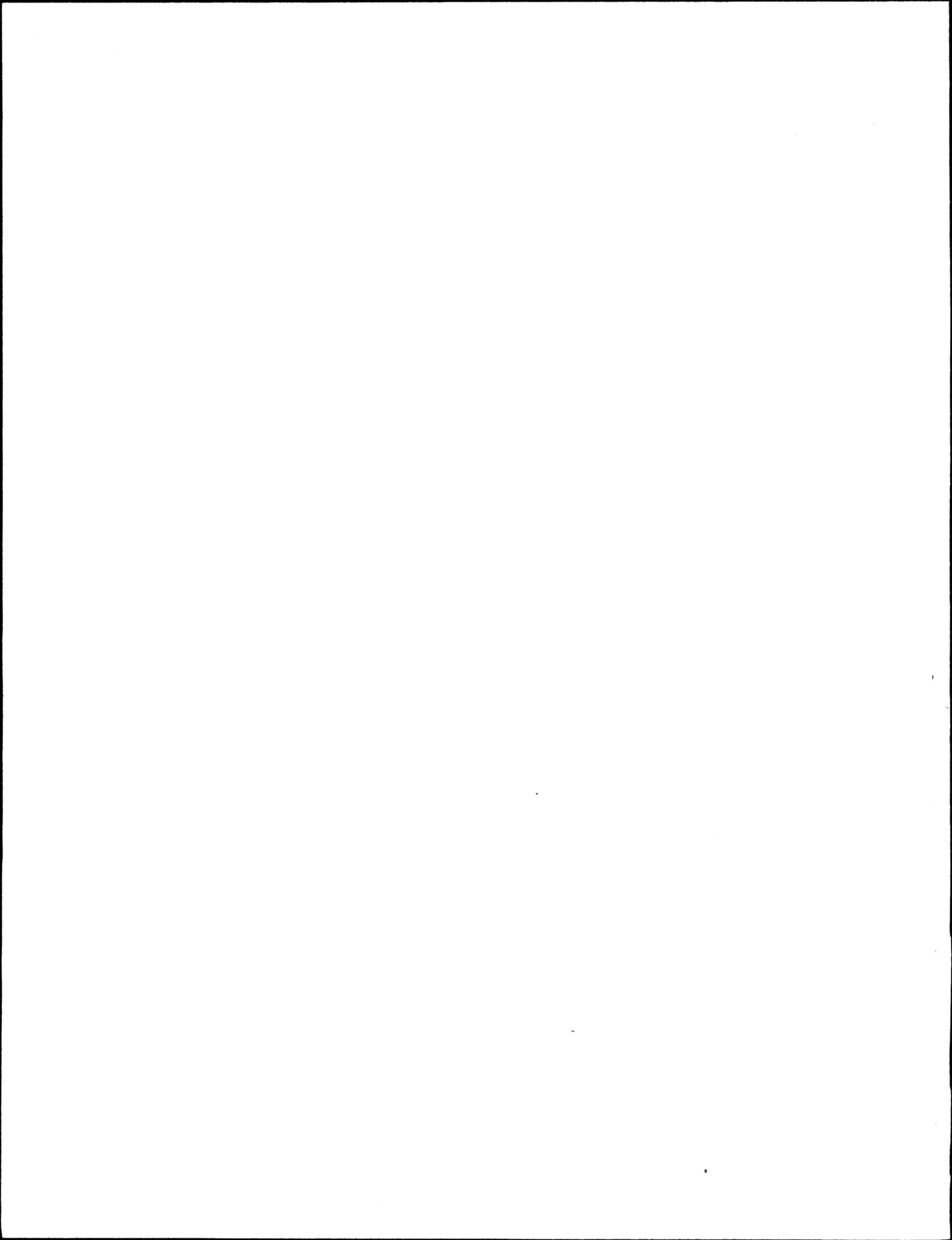
In addition to the 358 stations which have been added or deleted from the network, a large number of station designation changes have also occurred over the twelve-year period and these are summarized as follows:

<u>Designation Change</u>	<u>Number of Stations</u>
F to FP	15
F to P	18
FP to F	8
FP to P	27
FP to Contributed	1
P to F	4
P to FP	2
F to FP (Sediment)	5
FP to P (Sediment)	<u>5</u>
Total:	85

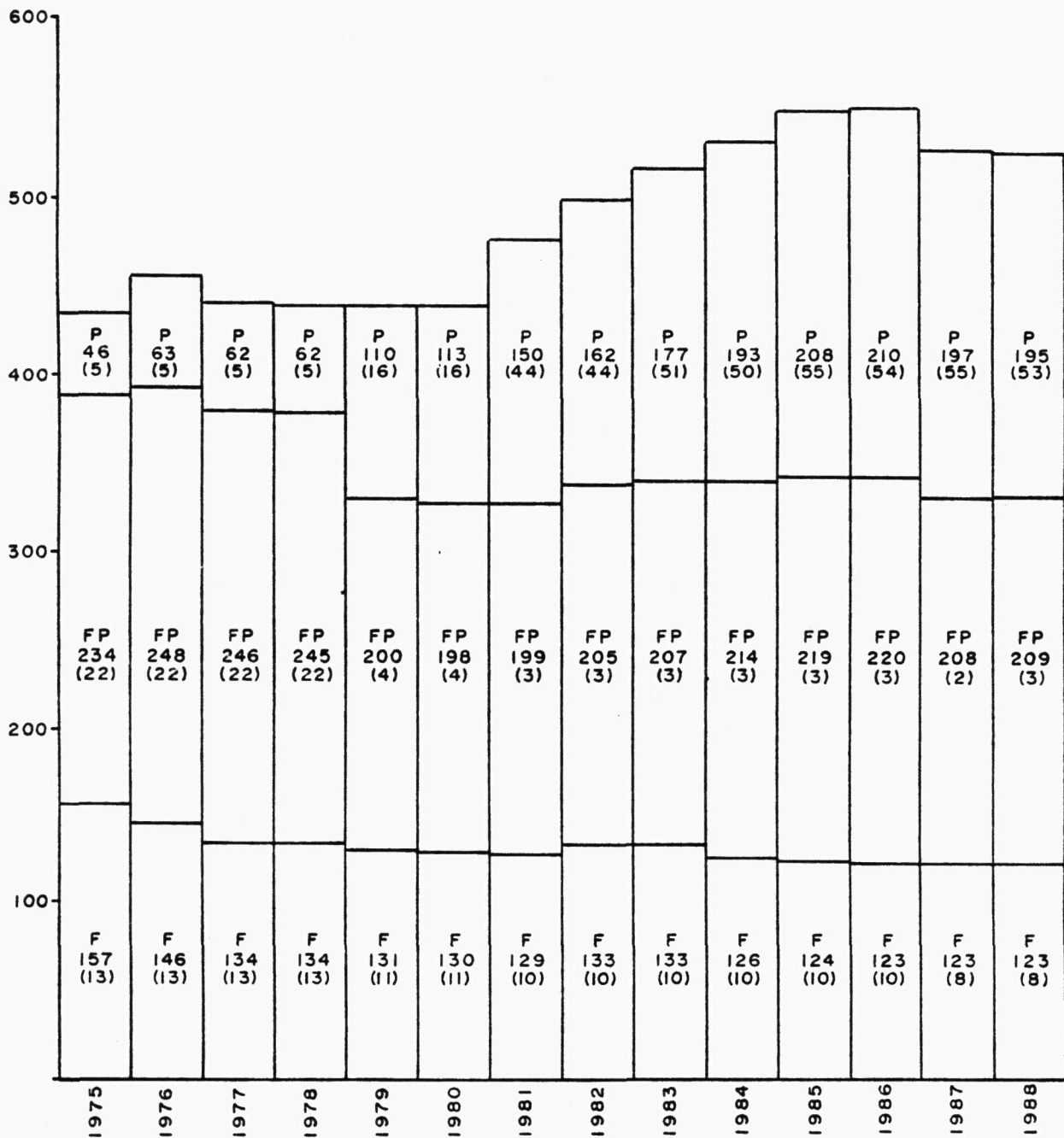


These designation changes represent 15% of the network and therefore between designation changes, new station construction and station discontinuance, there has been an apparent change of 81% during the period of the cost-sharing agreement.

The changing nature for financial responsibility of the hydrometric network since the inception of the cost-sharing agreement is illustrated in Figure 1. 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; however, at the same time, it should be noted that initially the federal government financed the majority of the network and it wasn't until April 1, 1982 that the respective shares were approximately equal. One of the major reasons for the shift in financial responsibility is that a thorough review of 'Federal' and 'Federal-Provincial' designated stations indicated that there was no longer a federal interest in a large number of stations and the province assumed financial responsibility for these stations. Also, since the inception of the agreement, 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.



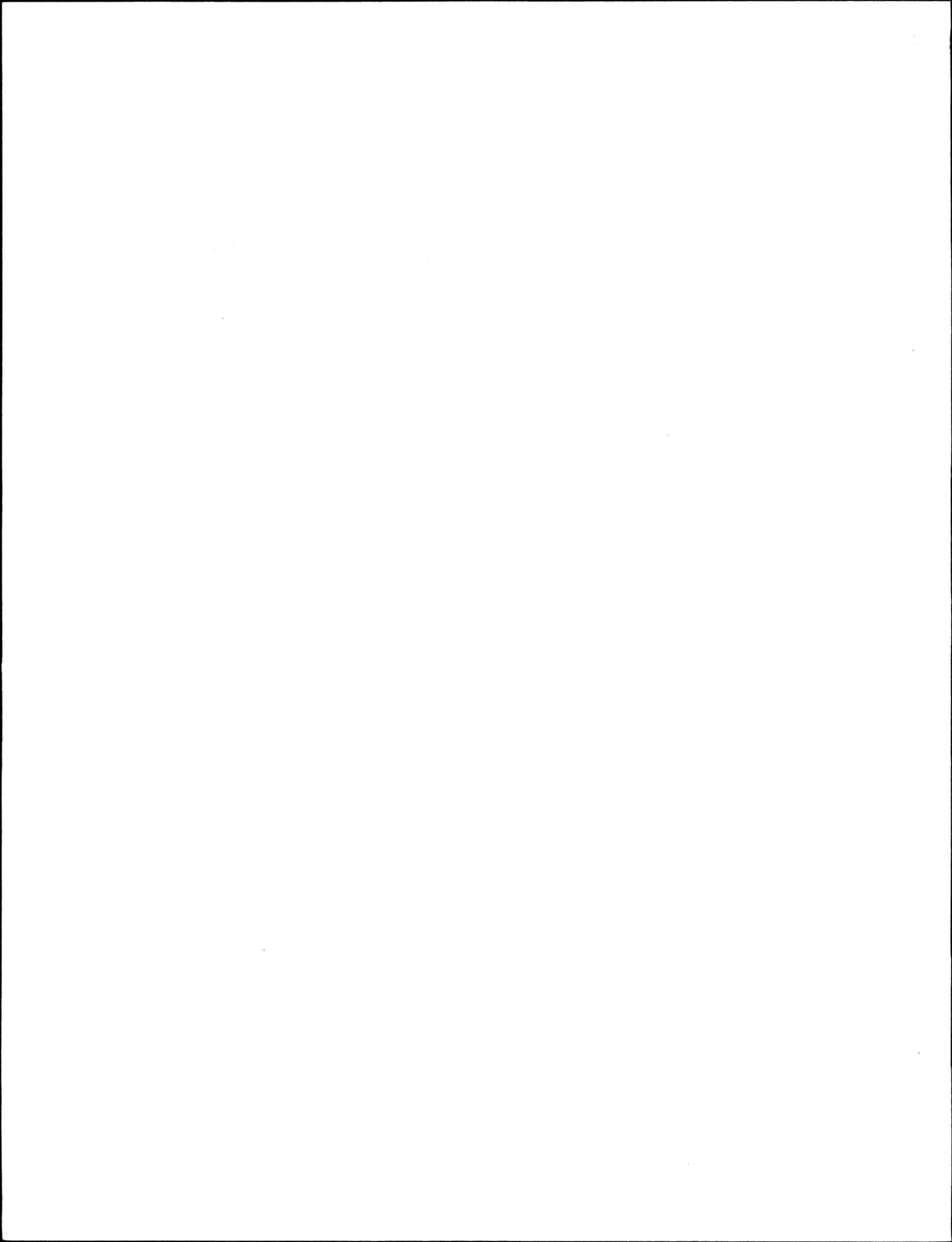
NOTE: Bracketed values indicate the number of stations operated by Alberta Environment, and these are included in the non-bracketed value. Prior to 1981 only stations operated by Alberta Environment in the Peace-Athabasca Delta and Spring Creek Basin are shown in the bar graph.



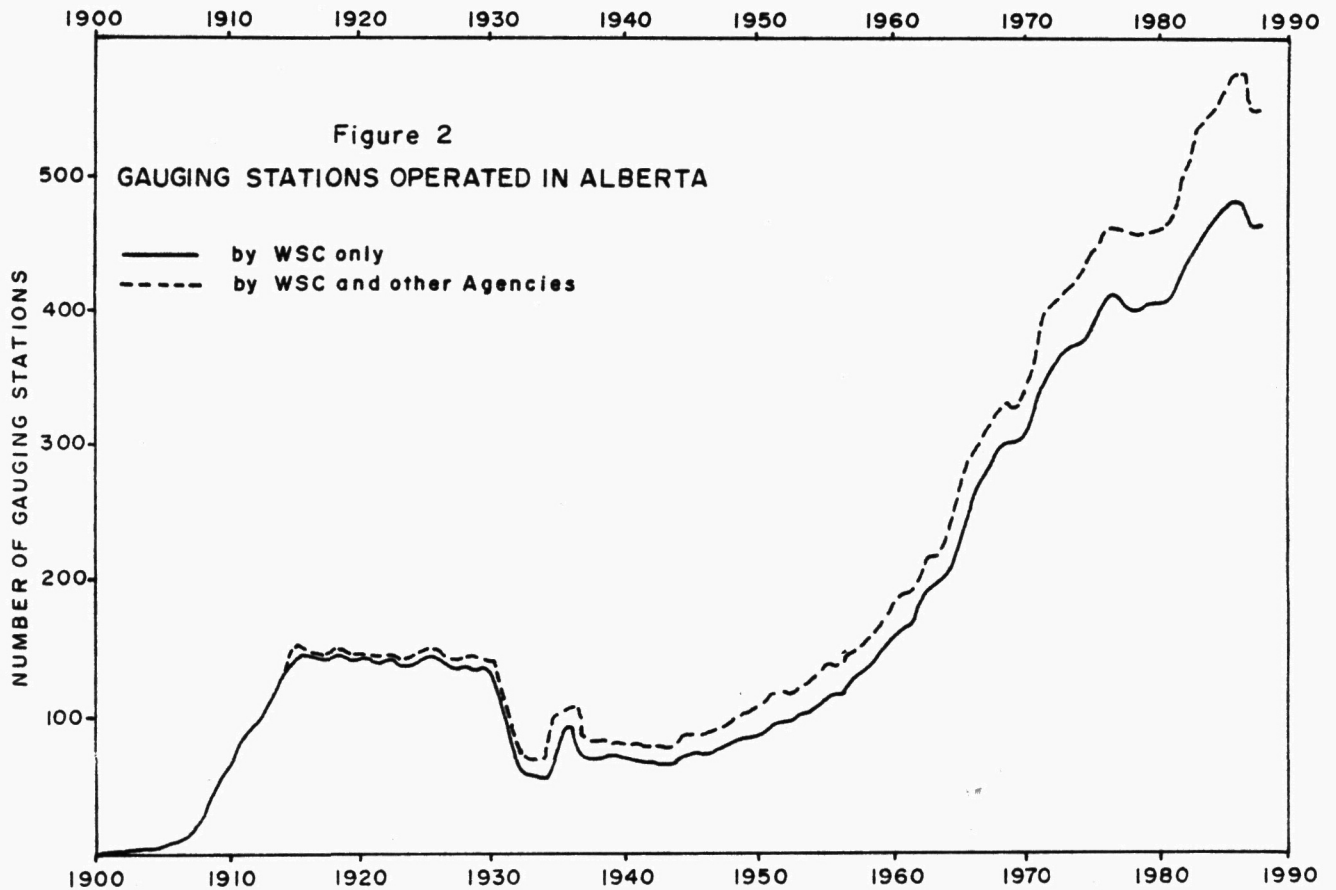
NETWORK AS OF APRIL 1 OF CORRESPONDING YEAR

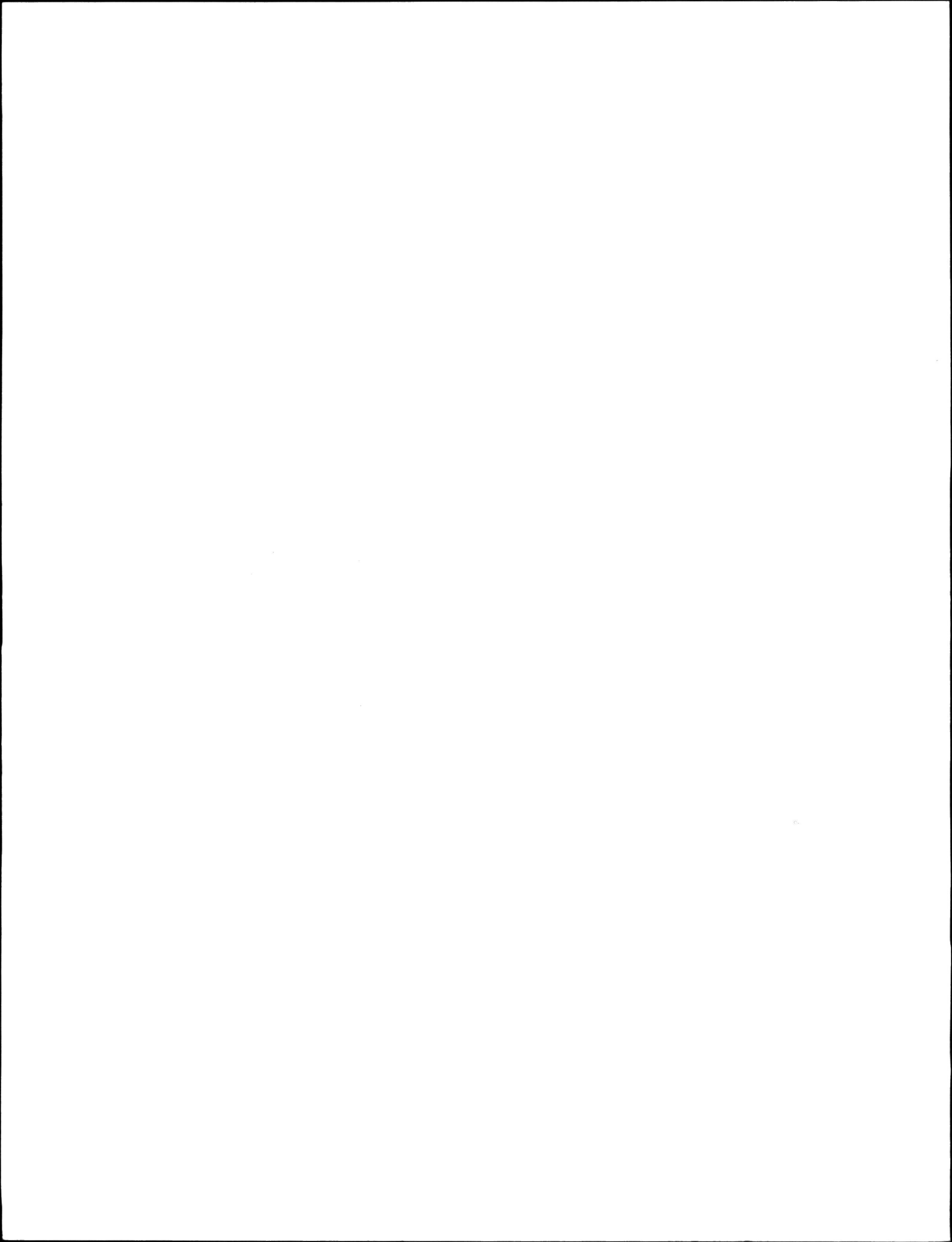
Figure 1

FINANCIAL RESPONSIBILITY AND NETWORK CHANGES
IN ALBERTA 1975 - 1988



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 2. 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



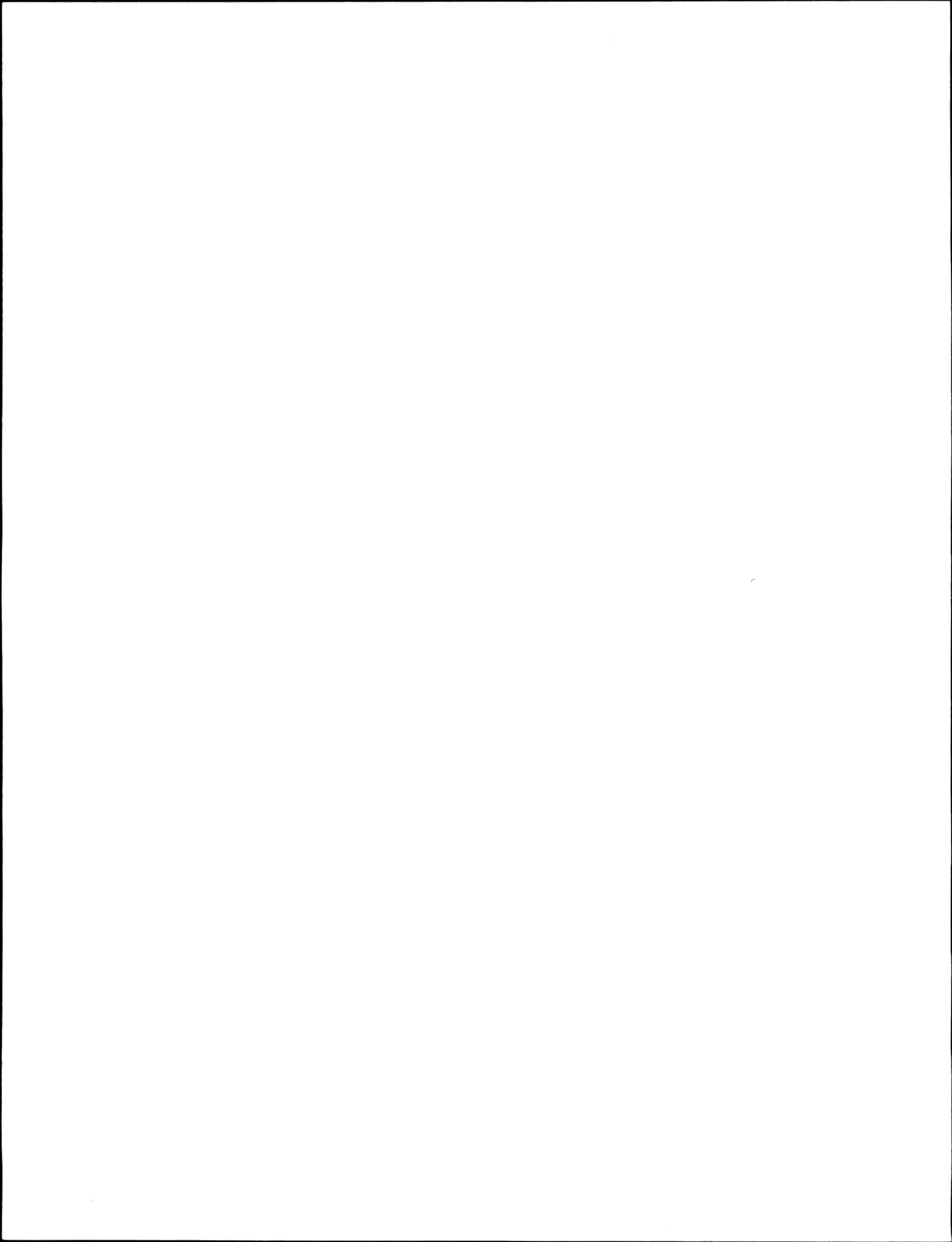


1975. Since the implementation of the agreement, the network has remained relatively stable in size with an increase of 20% of the stations in the cost-sharing agreement occurring from April 1, 1975 to the end of 1987-88. The majority of this increase occurred during the few years preceding the Alberta hydrometric enhancement program and during the enhancement program period.

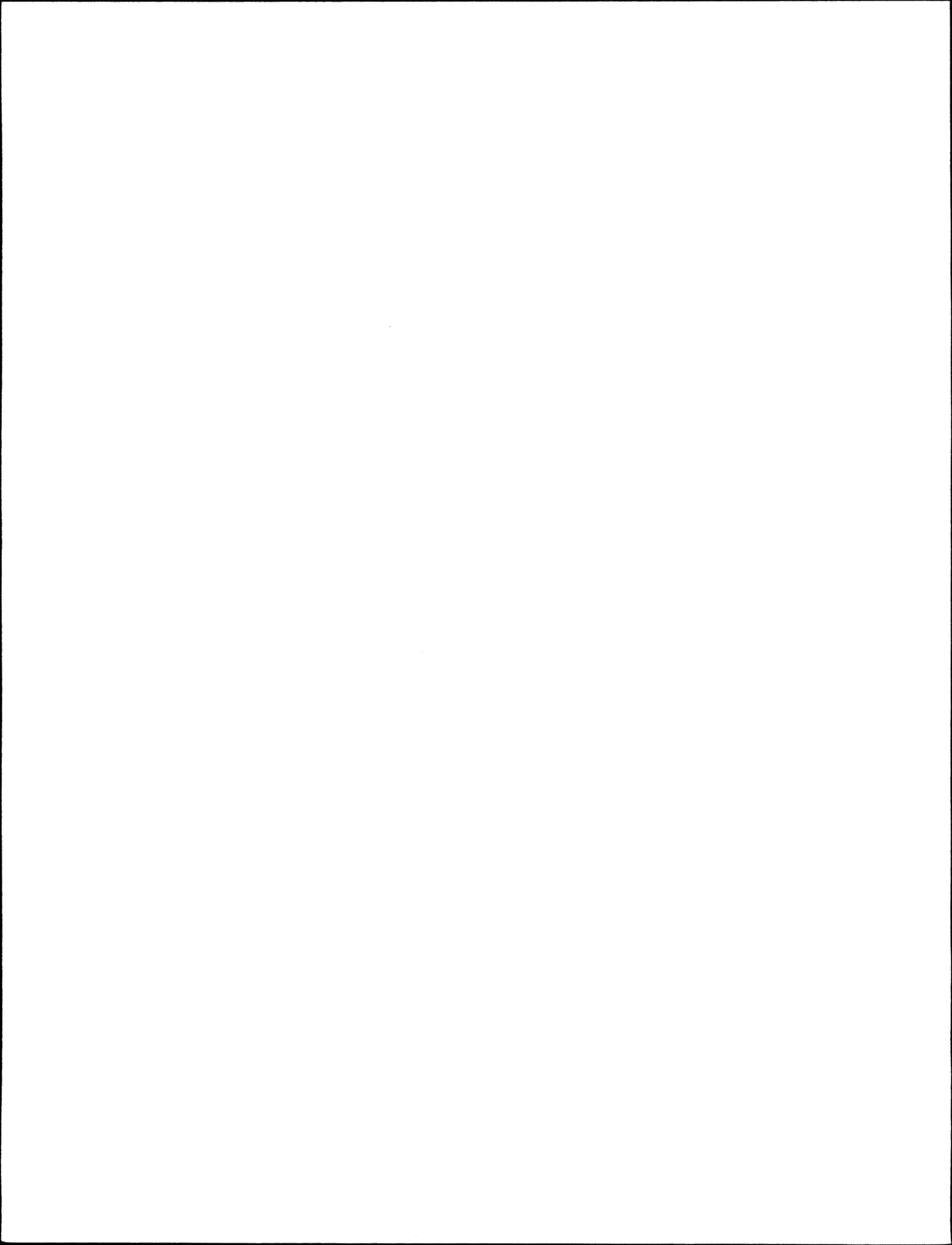
Figure 3 is a histogram of active gauging station maturity in Alberta, and Figure 4 is a similar histogram, which also includes discontinued gauging stations. The histogram of active gauging stations depicts the lack of maturity of the Alberta network.

2.5 PROGRAM PLANS FOR 1988-89

Program plans for 1988-89 are primarily directed at maintaining a satisfactory quality of data, and meeting the needs of client agencies. Office studies conducted by the federal Water Resources Branch pertaining to the hydrometric program will include continuing analysis of long-term sediment stations, and network planning and evaluation studies. During the fall of 1988 a multi-agency sediment workshop will be hosted. Also, during the fall of 1988 a national network planning workshop will be held for Co-ordinators of the agreement and senior managers.



The construction and maintenance program will be similar to that conducted during 1987-88. There will be minimal new construction and maintenance will be carried out at approximately 55 sites.



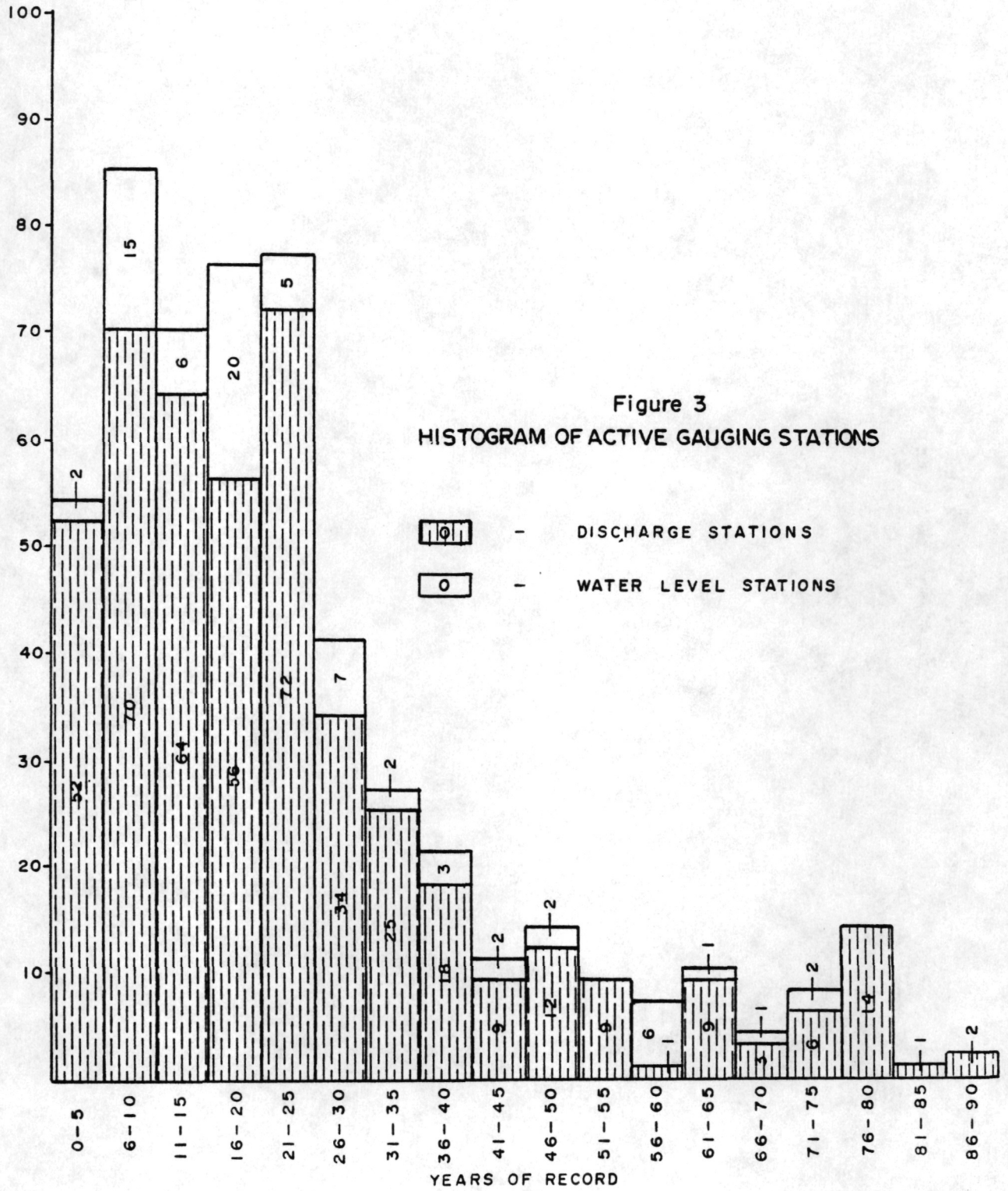


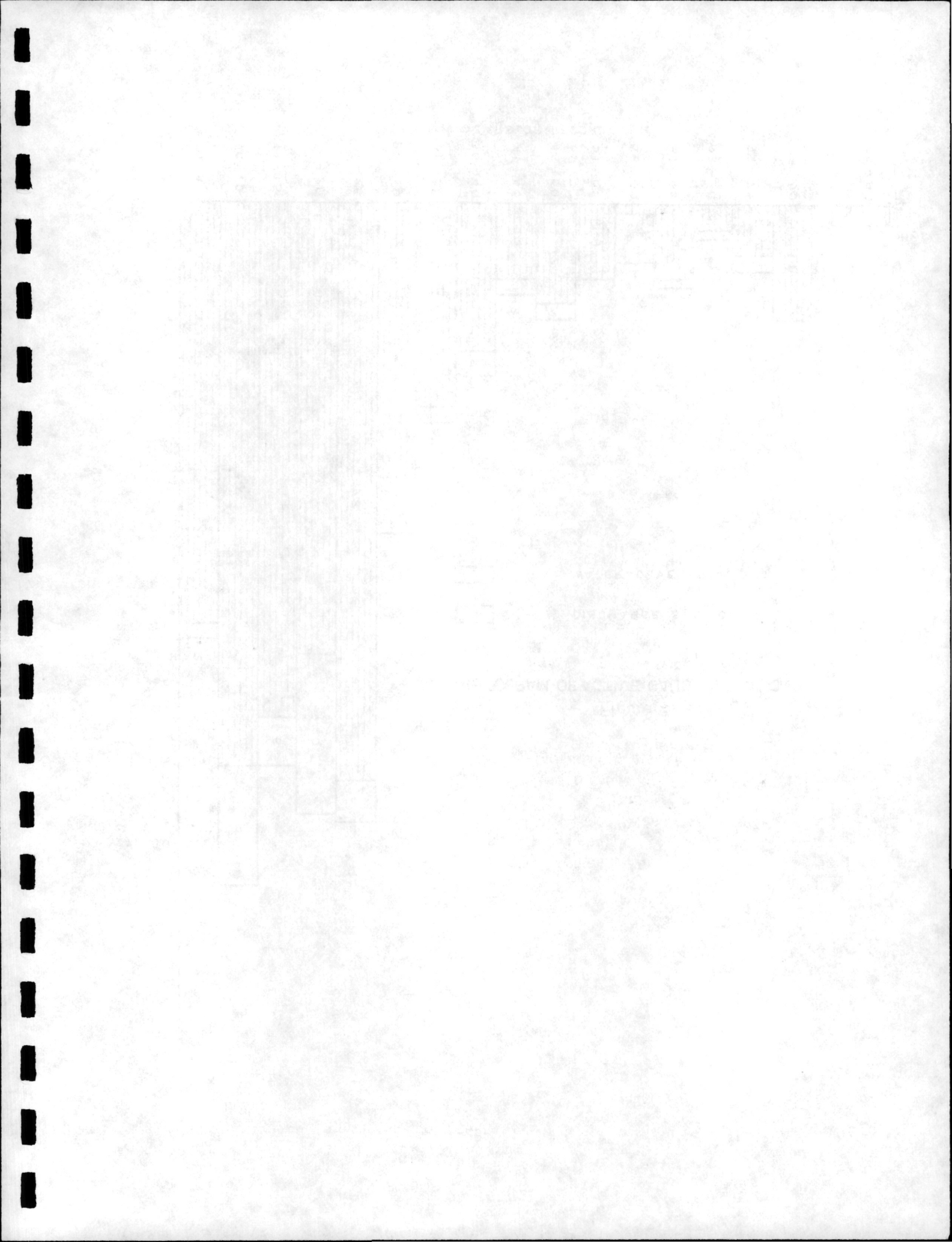
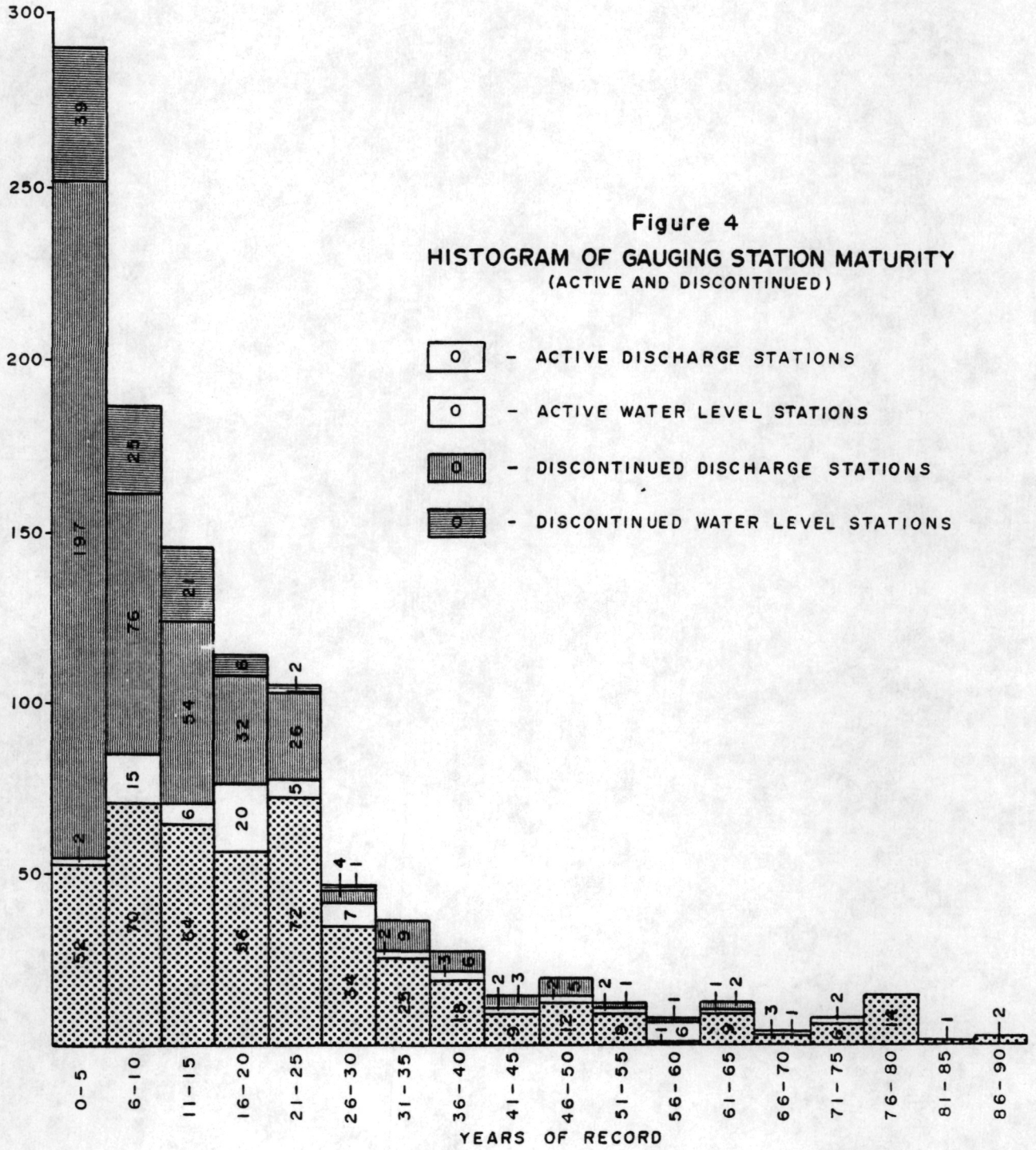
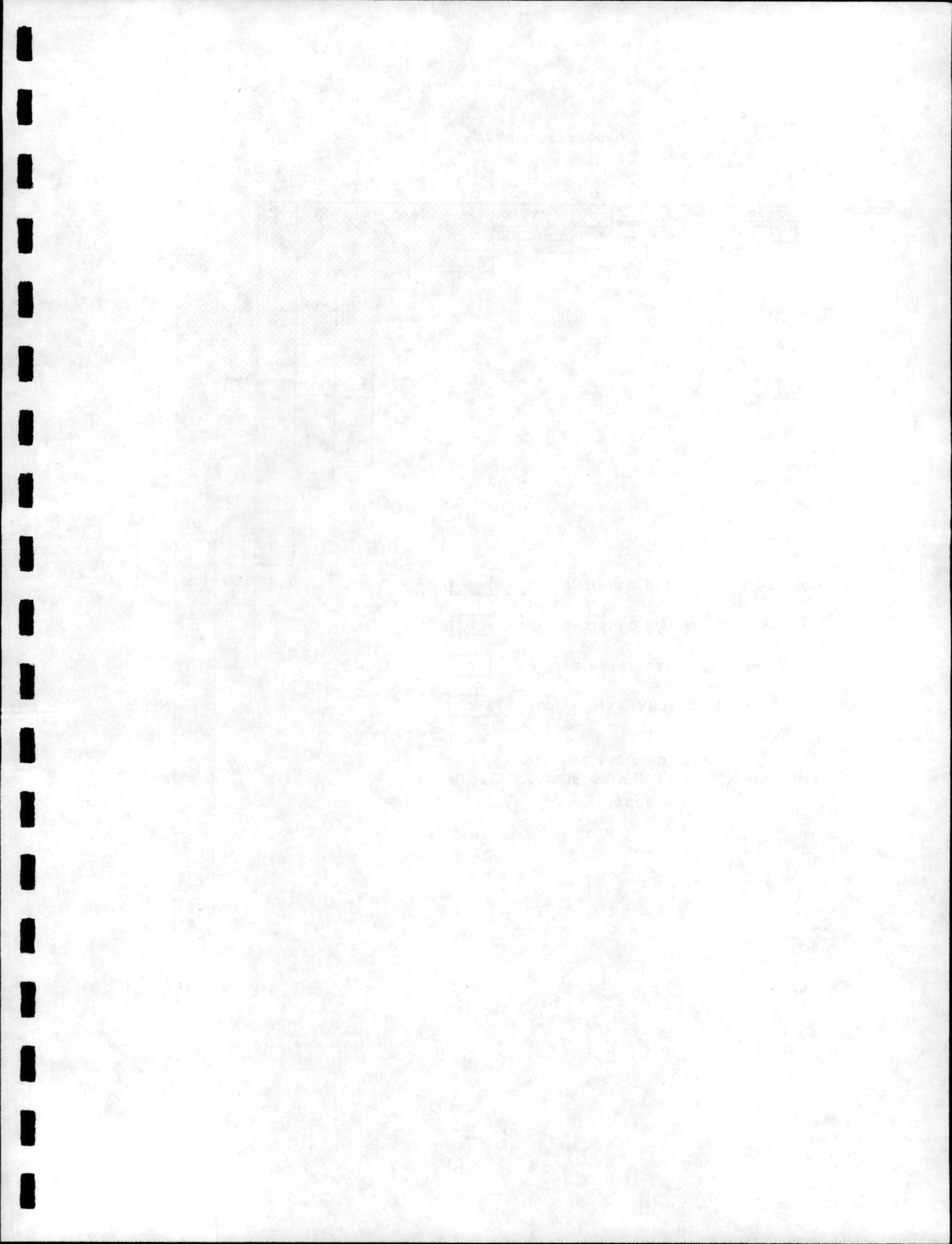


Figure 3
HISTOGRAM OF ACTIVE GAUGING STATIONS

 - DISCHARGE STATIONS
 - WATER LEVEL STATIONS







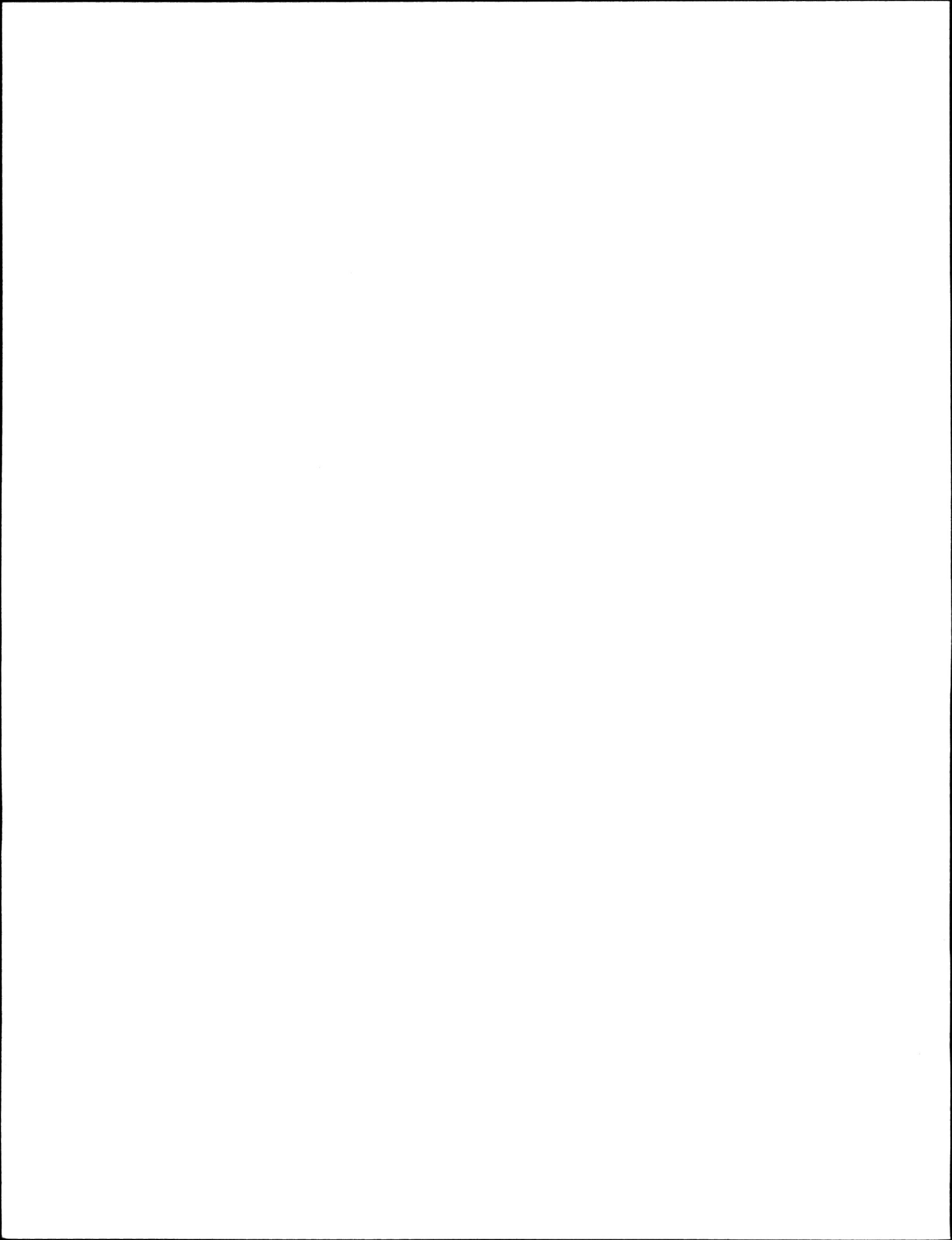
3.0

COST OF OPERATION

The Summary of Financial Considerations 1987-88 (p. 28) is largely based upon information contained in Appendix "B", which provides detailed information on the respective federal and provincial shares of salaries and O&M for the hydrometric and sediment networks. Appendix "B" also provides a detailed breakdown of hydrometric station construction and maintenance costs and a brief description of the procedure utilized for the calculation of depreciation. During 1987-88 Alberta paid the amount of \$830,579 to the hydrometric agreement, whereas the Alberta net share was \$819,624.

In mid-February 1988 it became apparent that the Alberta share of the agreement would be much less than the Schedule "D" amount of \$858.1K. In mid-March an estimate of Alberta's share was made based on expenditures to the end of February and forecasted March expenditures. This estimate indicated Alberta's net share would only be \$800.3K, and in view of this, Alberta agreed to an adjustment in the fourth quarter invoice to make a payment of \$30.3K to balance off the deficit in payment which had accumulated over the period of the agreement. However, as final expenditures were greater than forecast, the additional payment intended to balance the deficit was only \$11.0K (i.e., \$830.6K - \$819.6K).

The main reason for this discrepancy is that Alberta's share of underestimated final salary and O&M expenditures was \$20.K. Added to



SUMMARY OF FINANCIAL CONSIDERATIONS

1987-88

	No. of Stns.	Total Cost	Share	
			Federal	Alberta
1. <u>Hydrometric Network</u>				
Operated by Water Survey of Canada	449	1,422,712	685,752	736,960
Depreciation-Hydrometric Equipment and Vehicles		101,400	48,875	52,525
DCP and Memomark (Boxelder Creek at Hargraves Ranch)		7,600	-	7,600
2. <u>Sediment Stations</u>				
Full program operated by Water Survey of Canada(a)	8	34,933	9,130	25,803
Depreciation - Sediment Equipment		200	52	148
Laboratory-Alberta Program		100	-	100
3. <u>Construction & Maintenance</u>				
Maintenance of hydrometric stations	59	99,687	66,250	33,437
Depreciation - Construction Equipment and Vehicles		7,400	4,918	2,482
TOTAL:		1,674,032	814,977	859,055

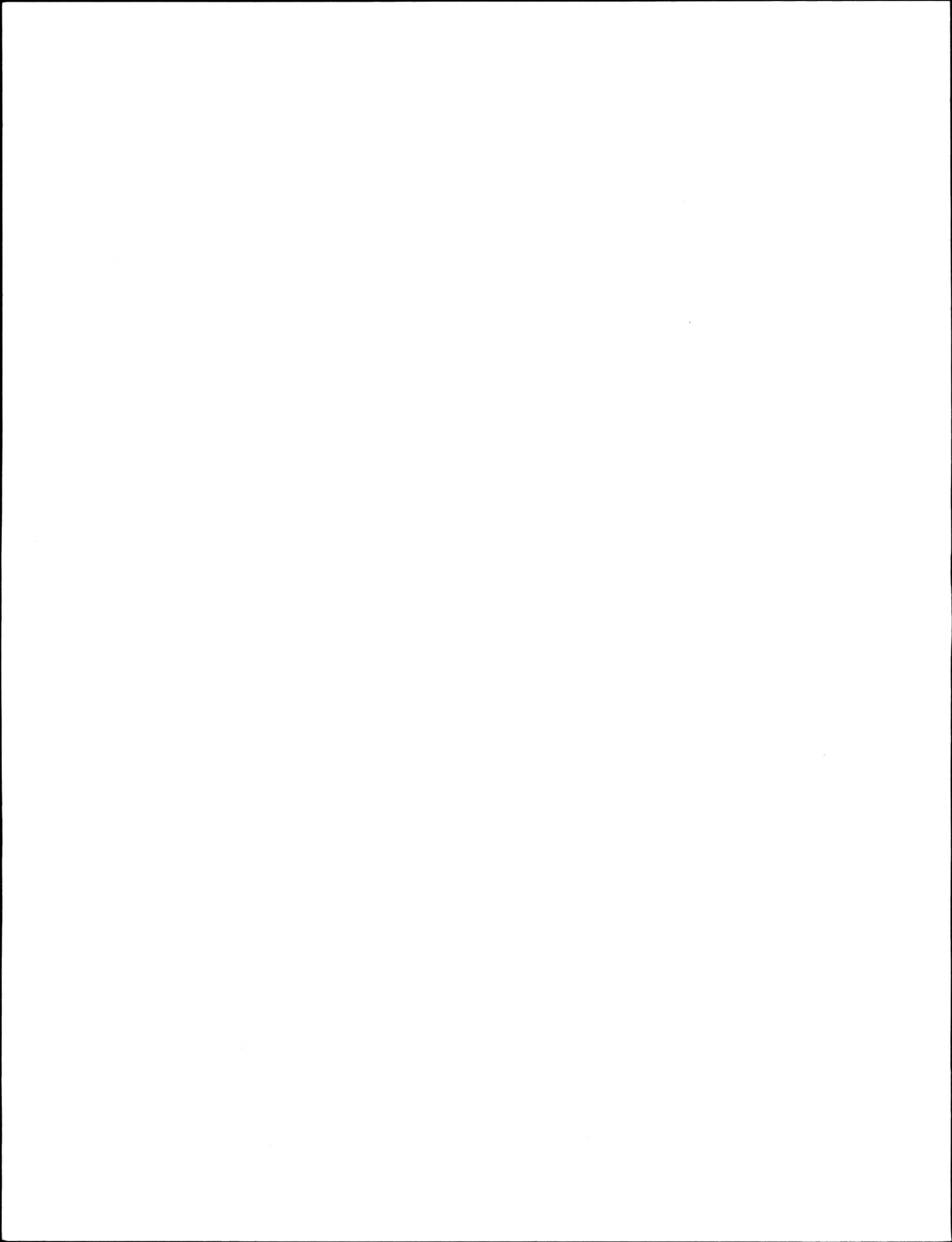
Alberta Net Share: 859,055 - 36,869(b) - 1,488(c) - 1,074(d) = 819,624

(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
(8.68 units x 3,969.62) + (8.62 units x 278.05 per unit depreciation)

(c) Credit to Alberta for FP station Spring Creek near Valleyview
(0.75 x 0.5 x 3,969.62)

(d) Credit to Alberta for construction of FP stations:
Embarras River Breakthrough to Mamawi Creek and Embarras River below the Divergence

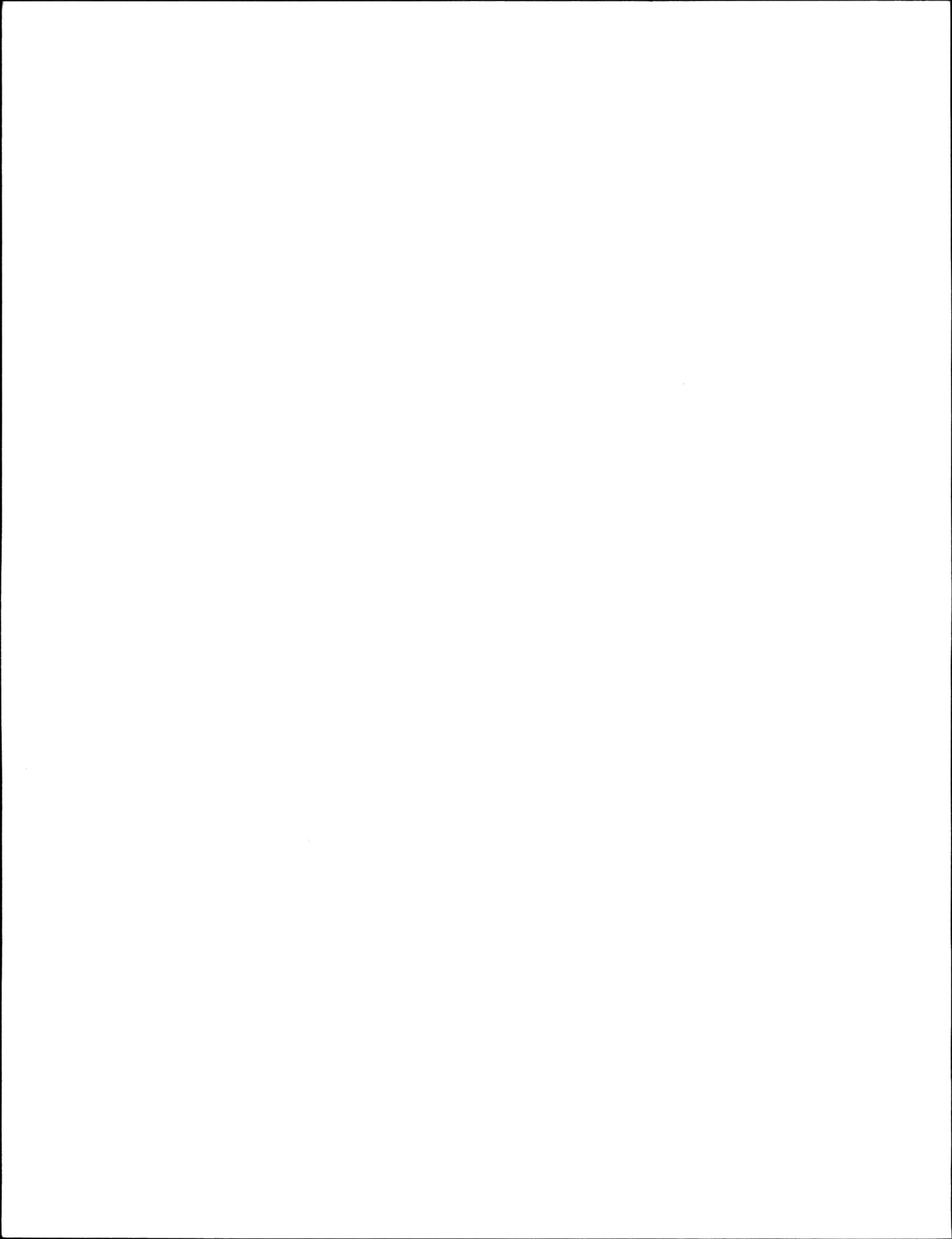


this was a misinterpretation of maintenance expenditures in the amount of \$6.5K, as instrumentation costs had erroneously been omitted from the summary of construction costs. A portion of these increased costs were offset by lesser costs in some other areas outlined in the Summary of Financial Considerations, 1987-88. Although a portion of this discrepancy was to be expected, it points out the need for better control and tracking of expenditures, which will be implemented during 1988-89.

A summary of hydrometric units per staff indicates a steady increase from the inception of the hydrometric agreement in 1975-76 to 1980-81 with the first decrease occurring in 1981-82. During 1986-87 the units per staff rose above the 1980-81 level and remained there during 1987-88; however, it should be recognized that units/staff of 13.43 may be excessive, with data collection and computations stretched to the limit in terms of providing quality data.

HYDROMETRIC UNITS VERSUS HYDROMETRIC STAFF

Year Item	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
Hydrometric Units	289.55	309.80	302.41	326.20	342.95	346.00	351.15	364.35	374.30	382.45	393.40	394.65	365.40
Hydrometric Person-Years	32.4	32.7	28.6	26.5	26.4	26.1	27.9	27.5	29.3	30.8	31.8	28.8	27.2
Hydrometric Units/staff	8.94	9.47	10.57	12.31	12.99	13.26	12.59	13.25	12.77	12.42	12.37	13.70	13.43

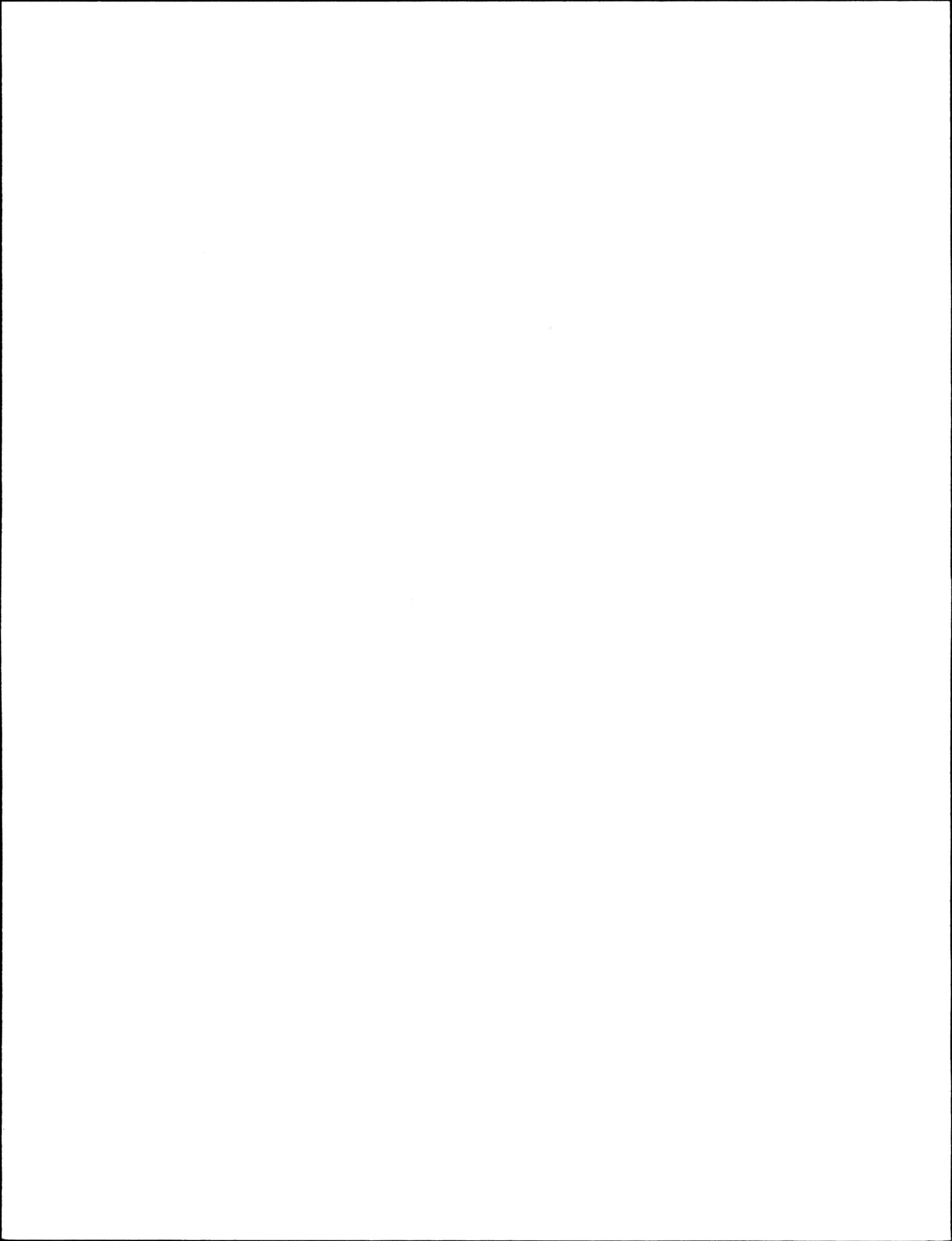


A similar type of summary for hydrometric station unit costs indicates a minimal annual increase during the first five years of the agreement. During 1980-81 a significant increase in unit costs occurred and this trend remained to the end of 1982-83. A significant decrease in the percent increase from the previous year occurred in 1983-84 and is a reflection of the federal government's 6 and 5 program. The principal reason for the small increases which occurred during the initial years of the agreement is due to the large increase in each year of the hydrometric units/staff. The decrease which occurred in 1985-86 is unusual, as is the slight increase in 1987-88.

UNIT COSTS PER HYDROMETRIC STATION

Year Item	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
Unit Cost per Station	\$2,072	\$2,137	\$2,264	\$2,242	\$2,250	\$2,529	\$2,945	\$3,285	\$3,521	\$3,840	\$3,823	\$3,963	\$3,970
% Increase from Pre- vious Year	-	3.1	5.9	(-)1.0	0.4	12.4	16.4	11.5	7.2	9.1	(-)0.4	3.7	0.2

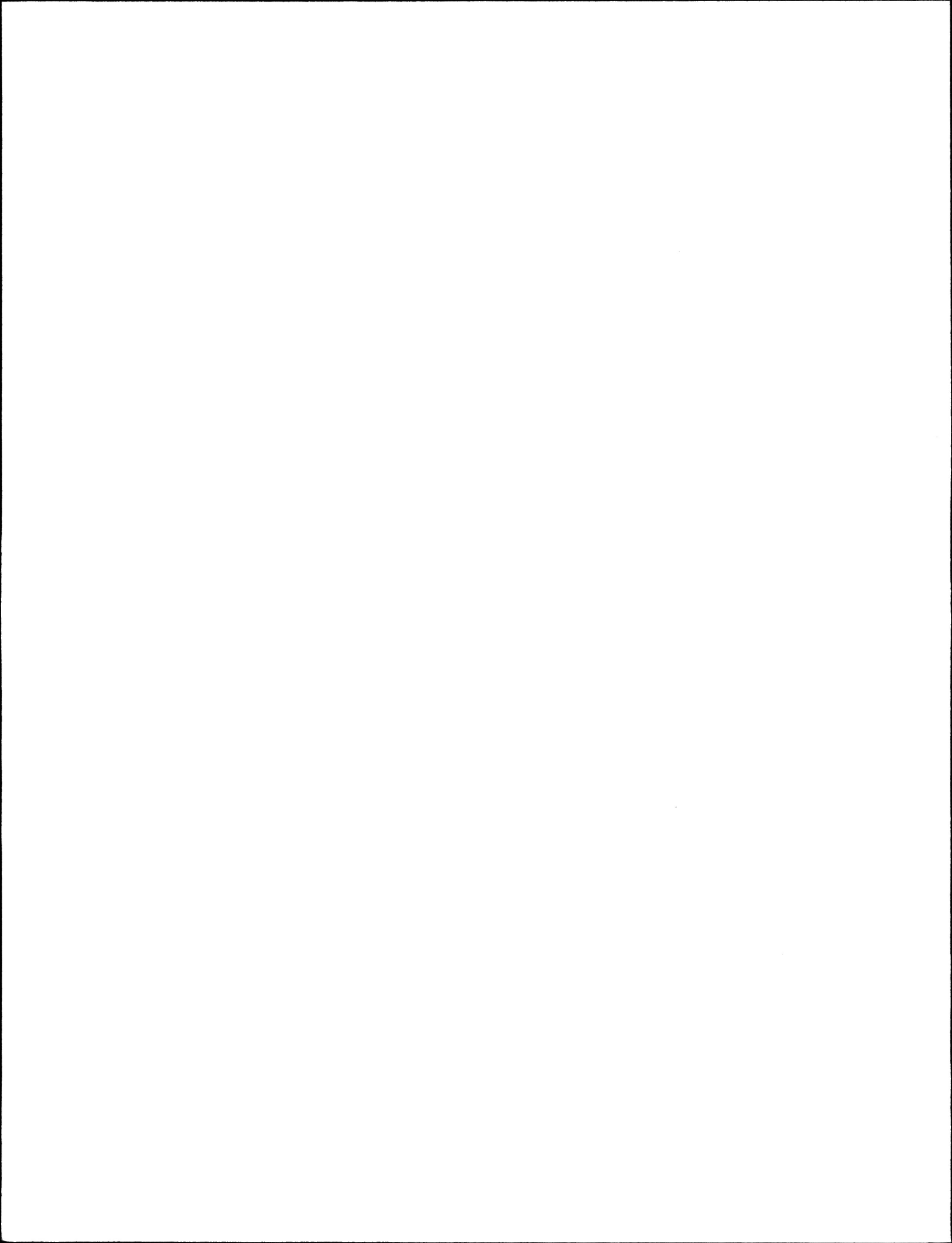
The following summary of over and under annual payments by Alberta for the period of the agreement indicates that although Alberta had underpaid during the initial years of the agreement the overpayment in 1979-80 had brought the payments for the five-year period up to that time to be almost identical to the actual cost of the program to Alberta (N.B. The actual



cost for 1978-79 differs from the amount in the National Memorandum of Agreement report and the reason for this is provided in the 1978-79 Alberta Memorandum of Agreement report). At the end of the twelve-year period from 1975-76 to 1987-88 the underpayment by Alberta was 0.26% of the total payment Alberta made during this period. As previously noted, Alberta endeavoured to balance the deficit in payments during 1987-88.

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

<u>Year</u>	<u>Actual Cost</u>	<u>Annual Payment</u>	<u>Overpayment (+) Underpayment(-)</u>	<u>% of Annual Payment</u>
1975-76	197,852	197,400	(-) 452	(-) 0.23
1976-77	231,000	231,100	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	<u>819,624</u>	<u>830,579</u>	<u>(+)10,955</u>	<u>(+) 1.32</u>
Total:	7,473,263	7,453,904	(-)19,359	(-) 0.26



Schedule "C" of the Memorandum of Agreement for Water Quantity Surveys describes procedures for preparation of annual reports. The procedure described in Schedule "C" is designed to make an approximation of Schedule "D" for the forecast year of 1989-90 for utilization, by both the federal and provincial agencies, for budgetary purposes. Data contained in this report with respect to annual unit costs for operating water quantity survey and sediment stations, Schedule "A" estimated for 1989-90, depreciation, a cost index factor, and an estimate of construction and maintenance costs for 1988-89 are utilized in the preparation of the cost estimate for the forecast year. Based upon the average annual unit costs contained in this report and proposed designation and operation changes, it was possible to calculate the estimated operation costs of Schedule "D" for 1989-90 and this is provided in Appendix "D".

The financial information contained in Tables 4 and 5 are a summary for input to the Annual National Cost-Sharing Report. The format and required input to Table 4 vary from the determination of the cost-sharing amounts in Alberta, and thus these values should not be compared.

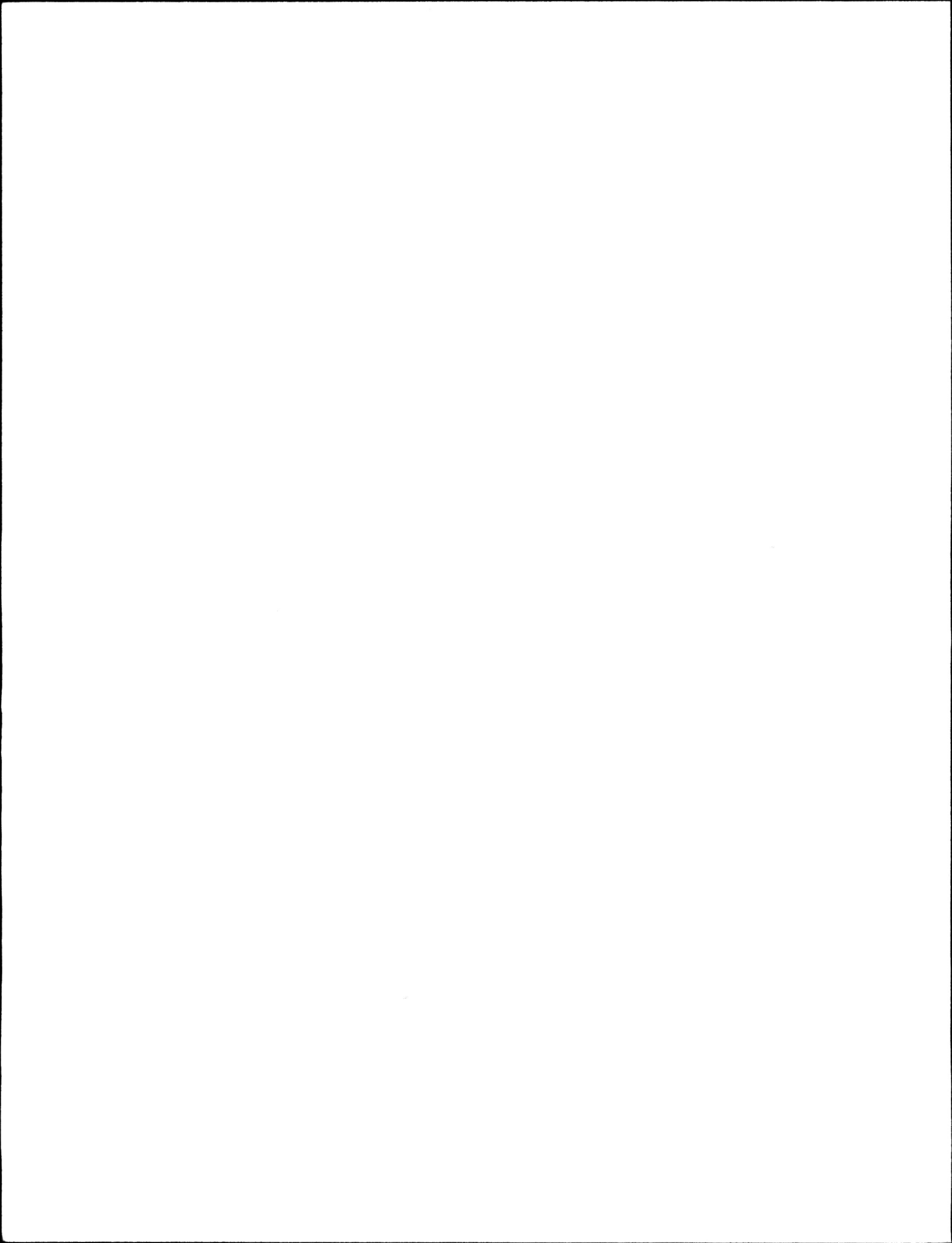


TABLE 4

WATER QUANTITY SURVEYS

TOTAL PROGRAM COSTS & SHAREABLE COSTS FOR 1987-88
(\$1000)

Province	Total Program ¹					Shareable Costs						
	P/Yrs	Salary	Operating	Capital	Total	P/Yrs	Salary	Operating ²	Const. ³	Total	Fed. Share	Prov. Share ⁴
Alberta	42.4	1606.1	728.8	254.0	2588.9	27.2	973.6	585.8	114.6	1674.0	815.0	859.0

NOTE: ¹ These costs don't include those associated with the F&A unit.

² Operating costs are comprised of \$484.1K as described in Appendix B, \$101.6K for depreciation, and \$.1K for Alberta sediment laboratory costs, as shown in Summary of Financial Considerations.

³ Construction costs are comprised of \$99.6K for the program, \$7.4K depreciation and \$7.6K for a DCP purchased by Alberta.

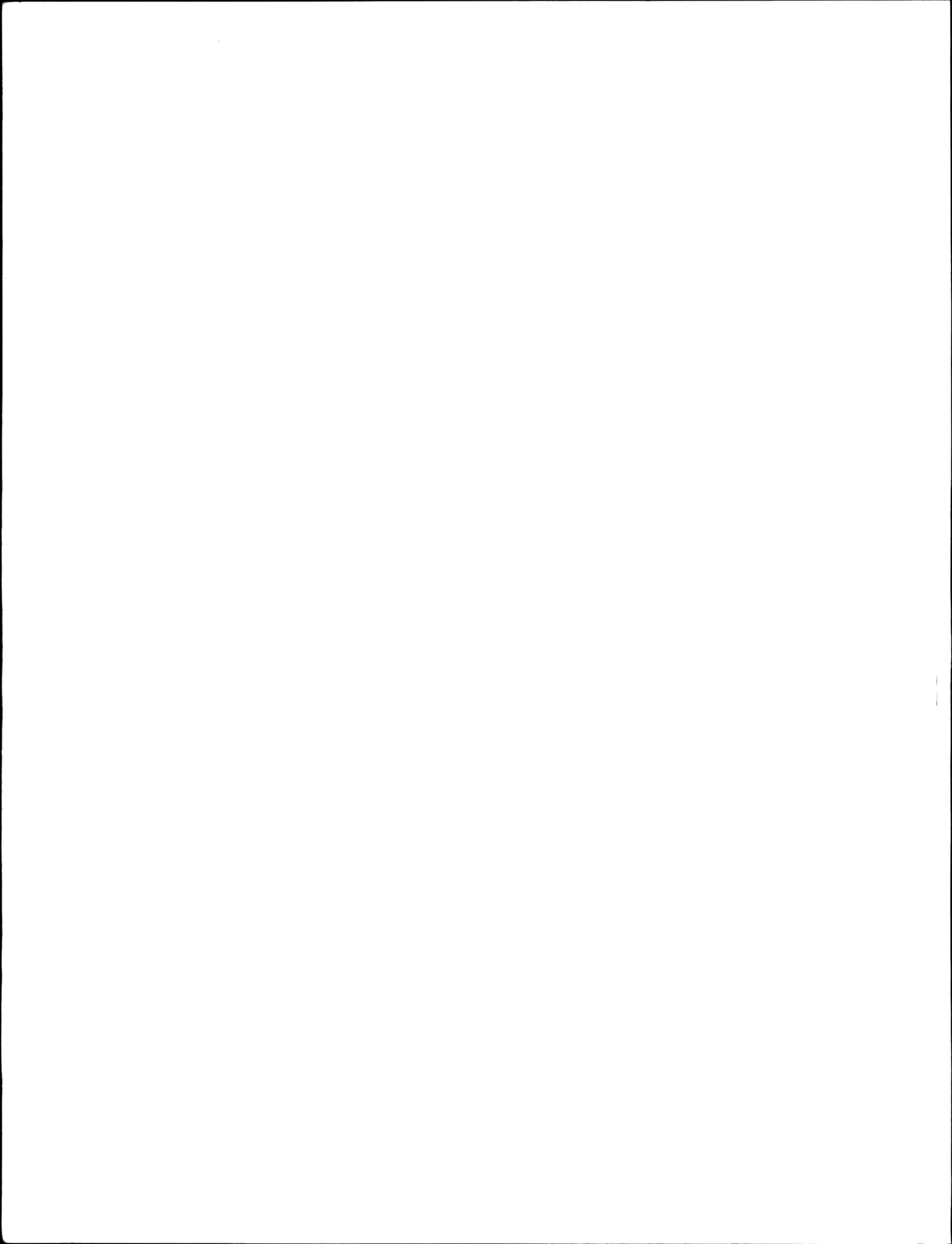
⁴ Credit to Alberta for operation of F and FP stations in the Peace-Athabasca Delta (PAD), construction of two FP stations in the PAD, and operation of one other FP station, resulted in an Alberta actual cost of \$819.6K, as shown in Table 5.

TABLE 5

WATER QUANTITY SURVEYS

COMPARISON - SCHEDULE "D" COSTS WITH ACTUAL COSTS & PAYMENTS
1987-88 (Dollars)

Province	Salary & Operation		Construction		Total			Annual Payment Received	Received Minus Actual
	Sched. "D"	Actual Cost	Sched. "D"	Actual Cost	Sched. "D"	Actual Cost	Difference		
Alberta	804,000	783,705	54,100	35,919	858,100	819,624	38,476	830,579	10,955



A P P E N D I X "A"

SCHEDULE "A"

OF

MEMORANDUM OF AGREEMENT

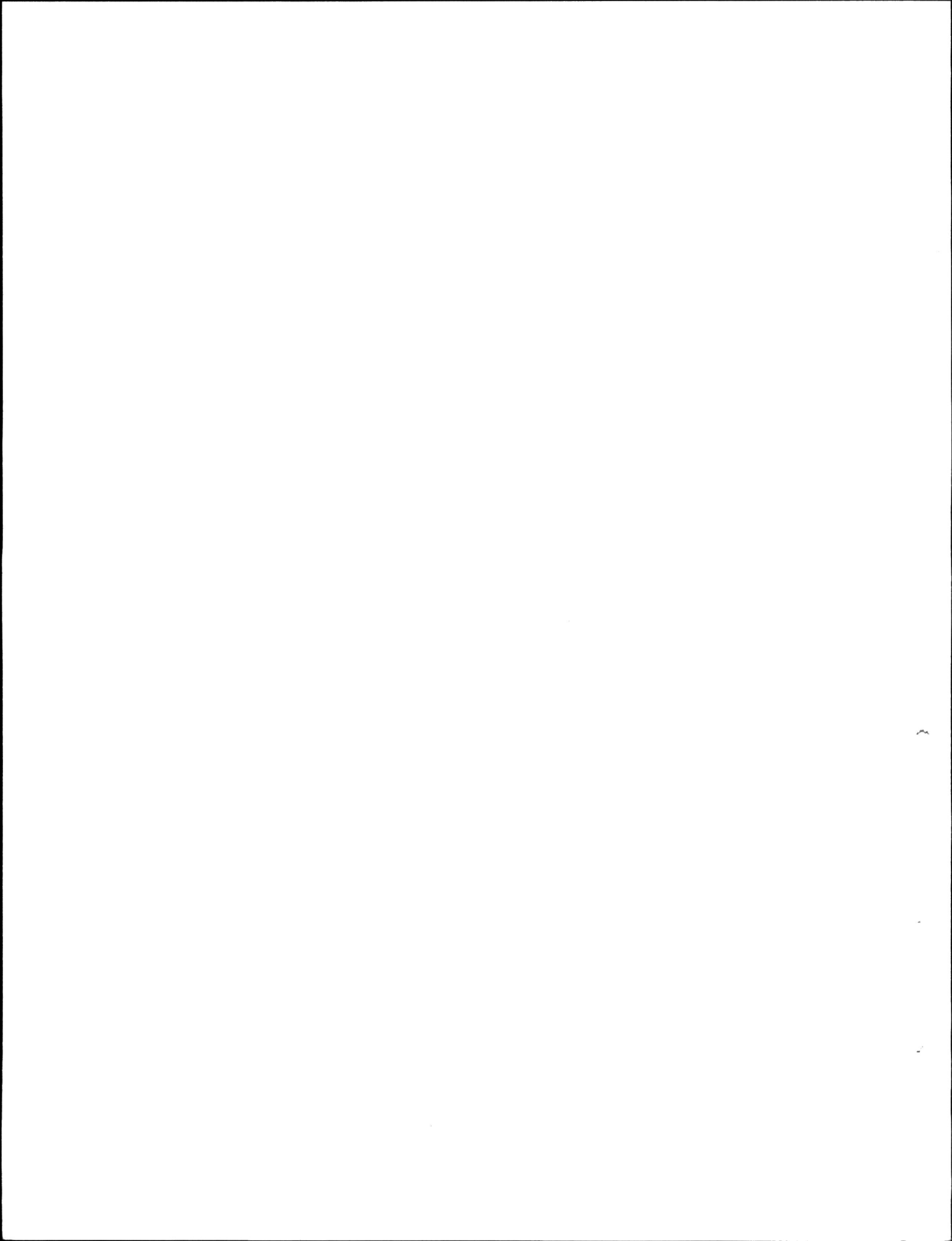
BETWEEN

GOVERNMENT OF CANADA

AND

GOVERNMENT OF ALBERTA

April 1, 1987



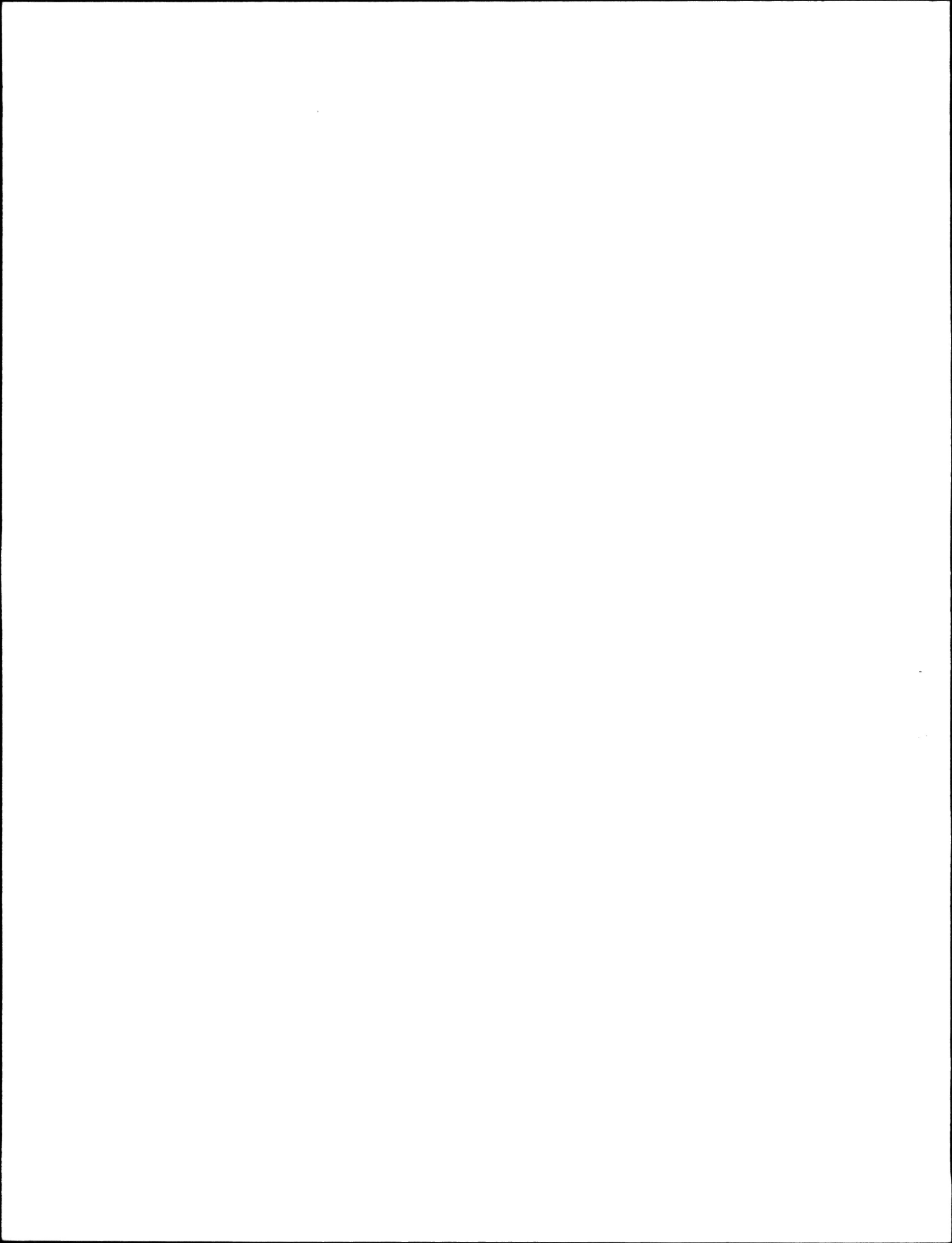
MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - FEDERAL DEPARTMENTAL PROGRAMS (1)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
<u>OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT</u>									
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	BREMSTER 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 HIGHWAY NO. 2	07BK006	X	X			X		X
8	MALIGNE RIVER NEAR JASPER	07AA004	X				X		X
9	NIETTE 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	WHIRLPOOL RIVER NEAR THE MOUTH	07AA009	X				X		X

OPERATED BY - ALBERTA GOVERNMENT

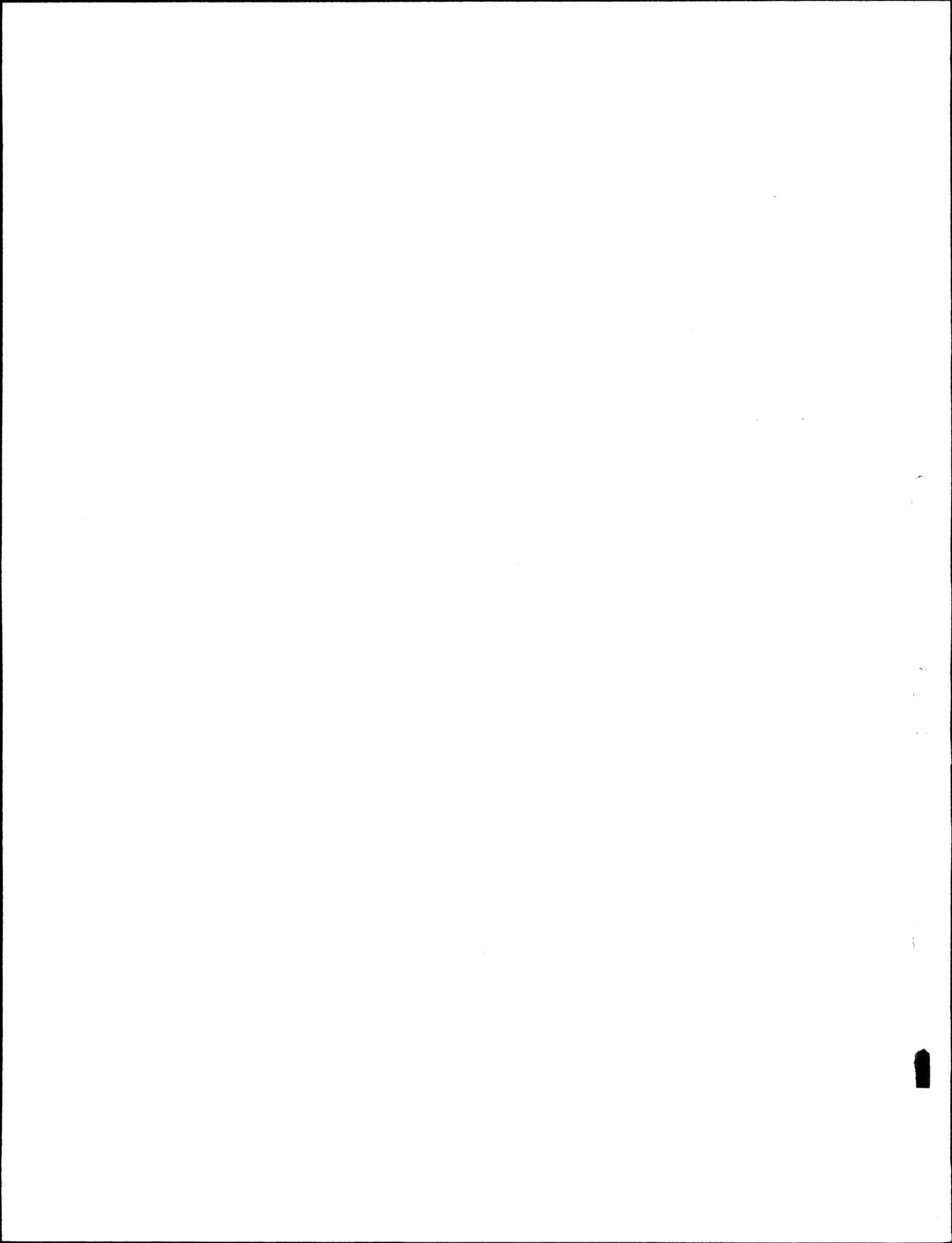
1	CHENAL DES QUATRE FOURCHES AT QUATRE FOURCHES	07KF001	X			X			X
2	LAKE ATHABASCA AT FORT CHIPEWYAN	07MD001	X				X		X
3	LAKE CLAIRE NEAR OUTLET TO PRAIRIE RIVER	07KF002	X				X		X
4	MAMAMI LAKE CHANNEL AT DOG CAMP	07KF010	MISC X			X			X
5	PEACE RIVER BELOW CHENAL DES QUATRE FOURCHES	07KC005	X				X		X
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			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT									
1	ANTELOPE COULEE SPILLWAY	05BN010	X			X			X
2	BATTERSEA DRAIN NEAR THE MOUTH	05AD038	X			X			X
3	*BATTLE RIVER NEAR THE SASKATCHEWAN BOUNDARY	05FE004	X				X		X
4	BEAVER RIVER AT COLD LAKE RESERVE	06AD006	X				X		X
5	BERRY CREEK NEAR THE MOUTH	05CH007	X			X			X
6	BOUNTIFUL COULEE INFLOW NEAR CRANFORD	05AG026	X			X			X
7	BOW RIVER AT CALGARY	05BN004	X				X		X
8	BOW RIVER NEAR THE MOUTH	05BN012	X				X		X
9	B.R.D. DRAIN K NEAR VAUXHALL	05BN009	X			X			X
10	B.R.D. MAIN CANAL	05AC004	X			X			X
11	-BOXELDER CREEK AT HARGRAVES RANCH	05AH050	X			X			X
12	-BOXELDER CREEK NEAR WALSH	05AH001	X			X			X
13	BULLPOUND CREEK NEAR THE MOUTH	05CB003	X			X			X
14	CAIRN HILL SPILLWAY NEAR THE MOUTH	05BN012	X			X			X
15	CANADIAN ST. MARY CANAL NEAR SPRING COULEE	05AE026	X			X			X
16	CLEARWATER RIVER ABOVE CHRISTINA RIVER	07CD005	X				X	X	
17	COAL LAKE RESERVOIR NEAR METASKIWIN	05FA016		X			X		X
18	COLD LAKE AT COLD LAKE	06AF002		X			X		X
19	CROWFOOT CREEK NEAR CLUNY	05BN008	X			X			X
20	DICKSON REVERVOIR NEAR DICKSON	05CB006		X			X		X
21	DRAIN L-5 NEAR DIAMOND CITY	05AD040	X			X			X
22	DRAIN 9-6 NEAR BOW ISLAND	05AJ004	X			X			X
23	DRAIN 9-10 NEAR BOW ISLAND	05AJ003	X			X			X
24	DRAIN T-1 NEAR TABER	05AG027	X			X			X
25	DRY COULEE NEAR MAGRATH	05AE041	X			X			X
26	E.I.D. EAST BRANCH CANAL NEAR LATHOM	05CJ003	X			X			X
27	E.I.D. NORTH BRANCH CANAL NEAR BASSANO	05CJ001	X			X			X
28	E.I.D. SPRINGHILL CANAL NEAR LATHOM	05CJ004	X			X			X
29	EXPANSE COULEE NEAR THE MOUTH	05AG003	X			X			X
30	HIGHMOOD DIVERSION CANAL NEAR HEADGATES	05BL025	X			X			X
31	L.N.I.D. CANAL ABOVE OLDMAN FLUME	05AB019	X			X			X
32	LITTLE BOW CANAL AT HIGH RIVER	05BL015	X				X		X
33	LITTLE BOW RIVER AT CARMANGAY	05AC003	X				X		X
34	LITTLE BOW RIVER BELOW TRAVERS DAM	05AC012	X			X			X
35	LITTLE BOW RIVER NEAR THE MOUTH	05AC023	X			X			X
36	M.I.D. CANAL NEAR SPRING COULEE	05AE021	X			X			X
37	MATZHIWIN CREEK ABOVE WARE COULEE	05CJ007	X			X			X
38	NEW WEST COULEE NEAR THE MOUTH	05BN006	X			X			X
39	OLDMAN RIVER NEAR LETHBRIDGE	05AD007	X		X		X		X
40	ONETREE CREEK NEAR PATRICIA	05CJ006	X			X			X
41	*PEACE RIVER AT PEACE POINT	07KC001	X				X	X	
42	PIYAMI DRAIN NEAR PICTURE BUTTE	05AD037	X			X			X
43	POTHOLE CREEK AT RUSSELL'S RANCH	05AE016	X			X			X
44	RED DEER RIVER NEAR BINDLOSS	05CX004	X				X		X
45	RONALANE WASTEWAY NEAR HAYS	05BN007	X			X			X
46	ROSEBUD RIVER AT REDLAND	05CE005	X			X			X
47	ROSS CREEK AT MEDICINE HAT	05AH049	X			X			X
48	SEVEN PERSONS CREEK AT MEDICINE HAT	05AH005	X			X			X
49	SOUTH SASKATCHEWAN RIVER AT HIGHWAY NO. 41	05AK001	X			X			X
50	*SLAVE RIVER AT FITZGERALD	07NB001	X	X			X	X	



MAJOR DESIGNATION - FEDERAL

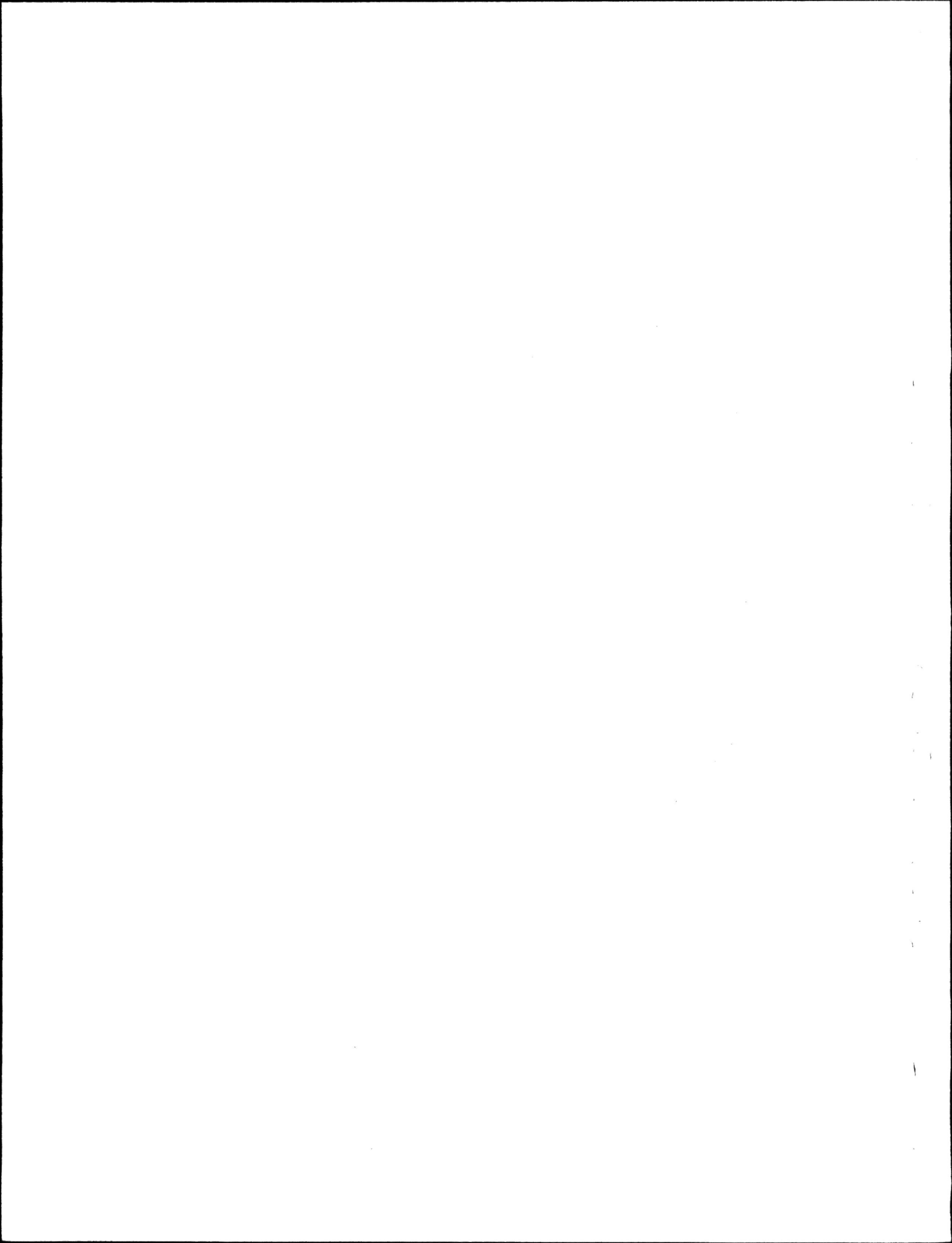
SUBDESIGNATION - INTERPROVINCIAL WATERS (2)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL SED.	8M	12M	REMOTE	NORMAL
<u>OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT</u>								
51	ST. MARY RESERVOIR NEAR SPRING COULEE	05AE025		X		X		X
52	TWELVE MILE COULEE SPILLWAY NEAR CARSELAND	05BM009	X		X			X
53	TWELVE MILE CREEK NEAR CECIL	05BM002	X		X			X
54	U.I.D. CANAL NEAR HILL SPRING	05AD013	X		X			X
55	WAPITI RIVER NEAR GRANDE PRAIRIE	07GE001	X			X		X
56	WARE COULEE ABOVE MATZIHWIN CREEK	05CJ008	X		X			X
57	WATERTON RESERVOIR	05AD026		X		X		X
58	W.I.D. CANAL NEAR CHESTERMERE LAKE	05BM003	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



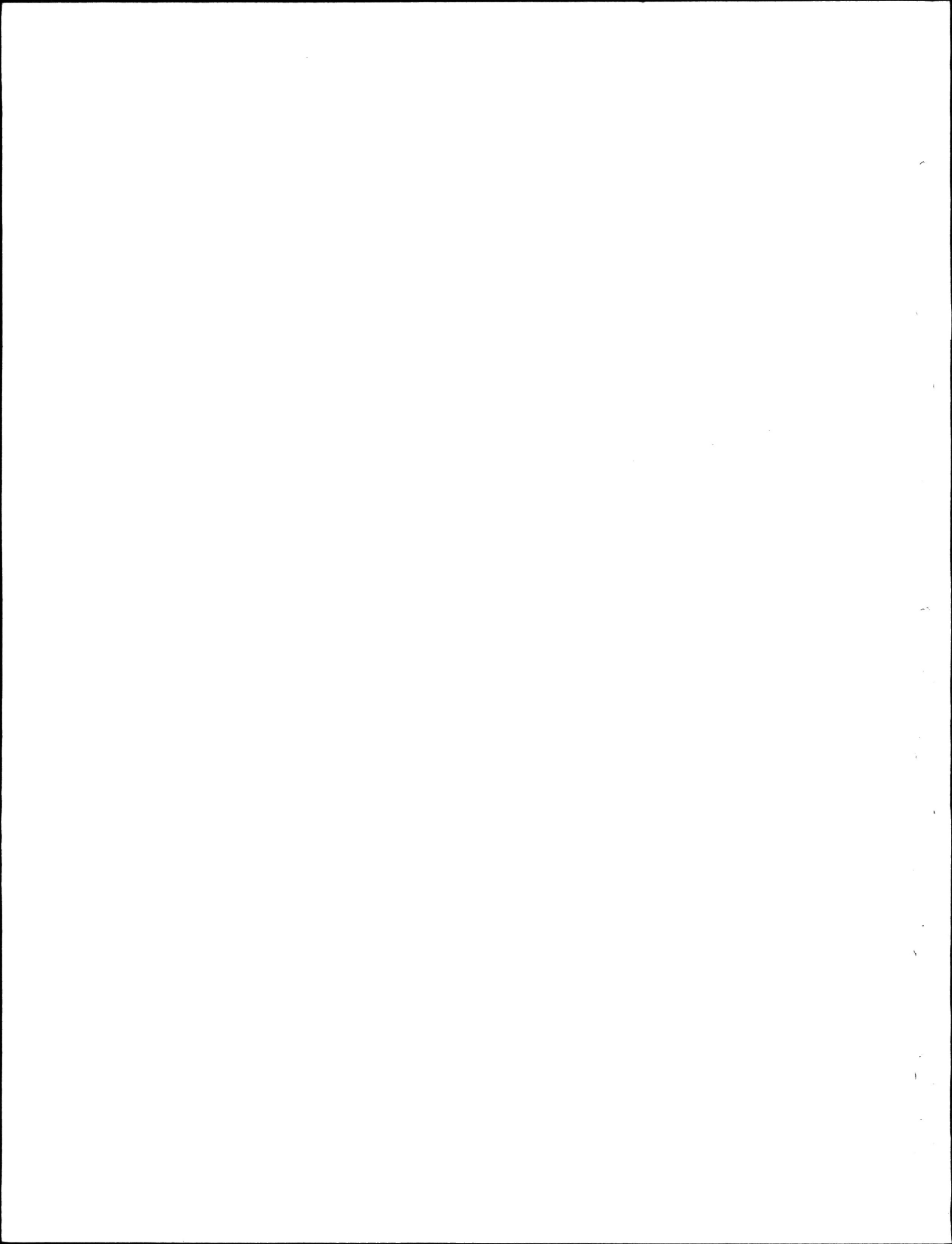
MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - INTERNATIONAL WATERS (3)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL SED.	8M	12M	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	*CRESSDAY RESERVOIR NEAR CRESSDAY	11AB097		X		X		X
5	*GREASEWOOD RESERVOIR NEAR ELKWATER	11AB092		X		X		X
6	*JAYDOT RESERVOIR NEAR JAYDOT	11AB098		X		X		X
7	+LAKE SHERBURNE	05AE036		X			X	X
8	LEE CREEK AT CARDSTON	05AE002	X				X	X
9	*MASSY RESERVOIR NEAR ELKWATER	11AB104		X		X		X
10	*MICHELE RESERVOIR NEAR ELKWATER	11AB091		X		X		X
11	*MIDDLE CREEK NEAR THE SASKATCHEWAN BOUNDARY	11AB009	X			X		X
12	+MILK RIVER AT EASTERN CROSSING OF INT'L BOUNDARY	11AA031	X			X		X
13	MILK RIVER AT MILK RIVER	11AA005	X				X	X
14	MILK RIVER AT WESTERN CROSSING OF INT'L BOUNDARY	11AA025	X			X		X
15	MINERS COULEE NEAR INTERNATIONAL BOUNDARY	11AA029	X			X		X
16	*MITCHELL RESERVOIR NEAR ELKWATER	11AB099		X		X		X
17	MOUNTAIN VIEW IRRIGATION DISTRICT CANAL	05AD017	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
29	WATERTON LAKE AT WATERTON PARK	05AD025		X			X	X
30	WATERTON RIVER NEAR WATERTON PARK	05AD003	X				X	X

* STATIONS OPERATED BY WATER SURVEY OF CANADA,
REGINA DISTRICT

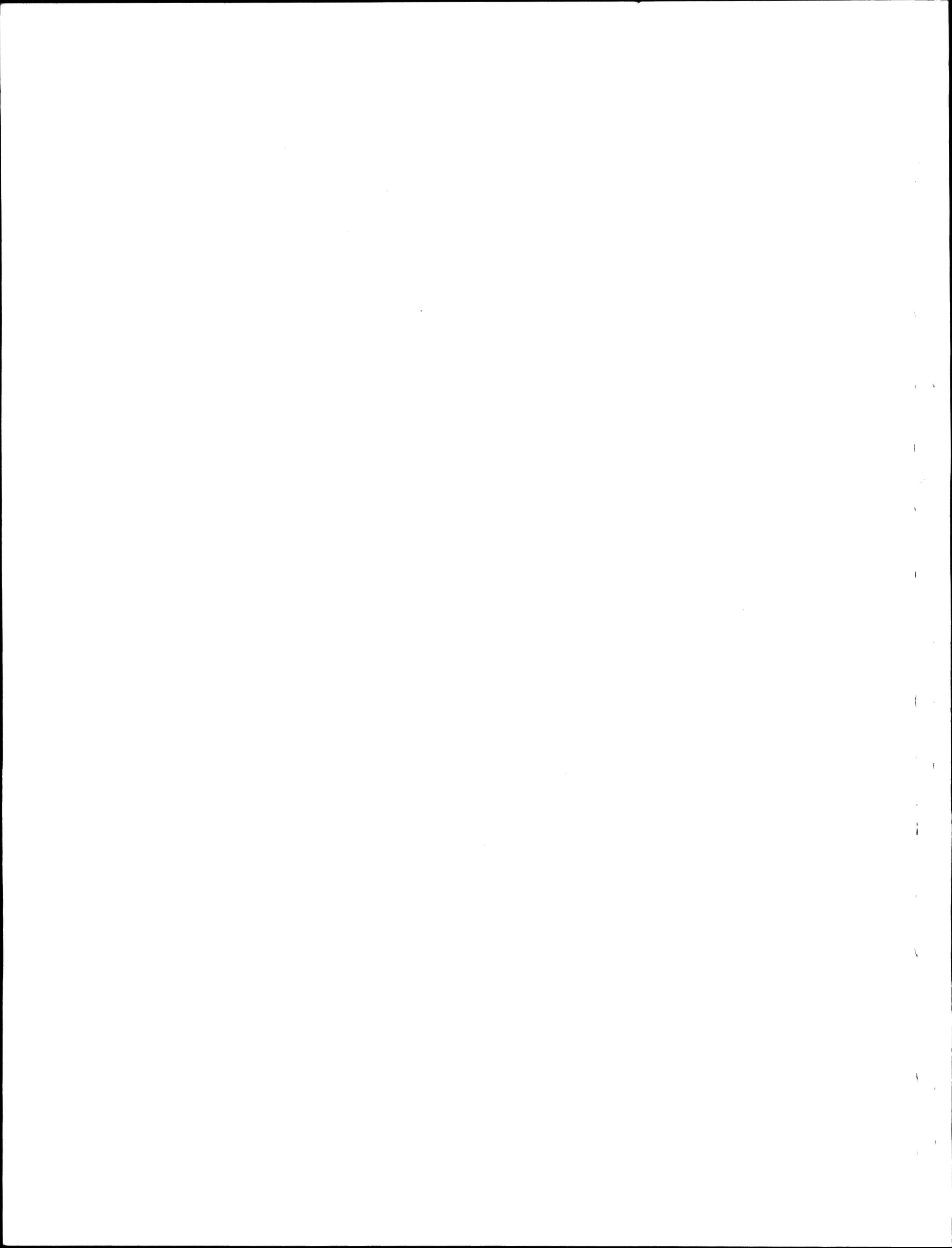
+ STATIONS LOCATED IN MONTANA



MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - NATIONAL WATER QUANTITY INVENTORY (4)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
<u>OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT</u>									
1	ATHABASCA RIVER AT HINTON	07AD002	X				X		X
2	ATHABASCA RIVER BELOW McMURRAY	07DA001	X	X			X	X	
3	McLEOD RIVER NEAR ROSEVEAR	07A6007	X				X		X
4	NORTH SASKATCHEWAN RIVER AT EDMONTON	05DF001	X				X		X
5	NOTIKWIN RIVER AT MANNING	07HC001	X				X		X
6	PEACE RIVER AT DUNVEGAN BRIDGE	07FD003	X				X		X
7	PEMBINA RIVER AT JARVIE	07BC002	X				X		X
8	RED DEER RIVER AT RED DEER	05CC002	X				X		X
9	SMOKY RIVER AT WATINO	07GJ001	X				X		X
10	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
<u>OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT</u>									
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	X	
4	EUNICE CREEK NEAR HINTON	07AF005	X			X			X
5	FIREBAG RIVER NEAR THE MOUTH	07DC001	X			X		X	
6	GREGOIRE LAKE NEAR FORT McMURRAY	07CE001		X		X		X	
7	HANGINGSTONE RIVER AT McMURRAY	07CD004	X			X		X	
8	MACKAY RIVER NEAR FORT MACKAY	07DB001	X			X		X	
9	MARMOT CREEK MAIN STEM	05BF016	X				X		X
10	MUSKEG RIVER NEAR FORT MACKAY	07DA008	X			X		X	
11	RICHARDSON RIVER NEAR THE MOUTH	07DD002	X			X		X	
12	STEEP BANK RIVER NEAR FORT McMURRAY	07DA006	X			X		X	
13	WHISKEYJACK CREEK NEAR HINTON	07AD004	X			X			X

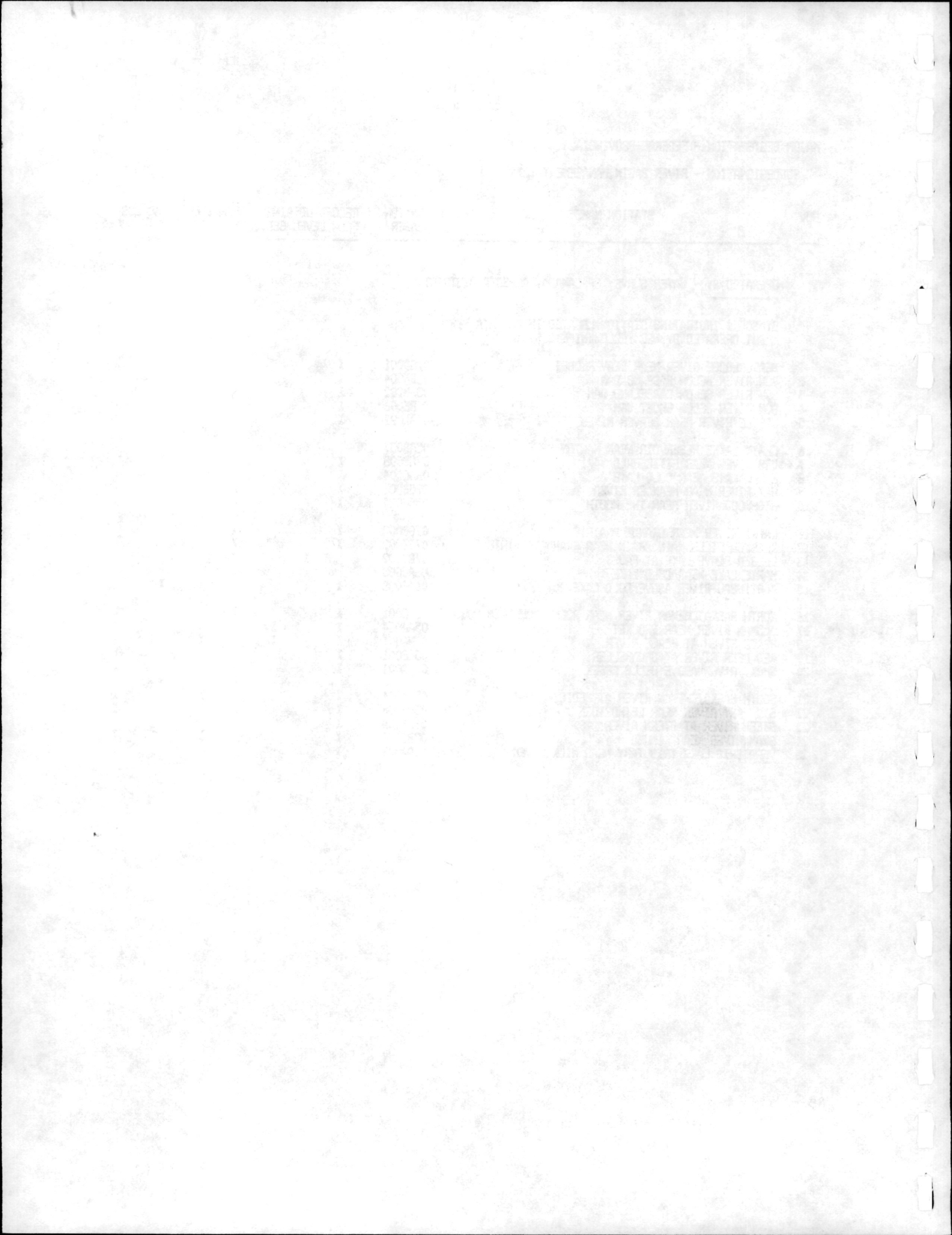
OPERATED BY - ALBERTA GOVERNMENT

1	ATHABASCA RIVER NEAR OLD FORT	07DD011		X			X	X	
2	SPRING CREEK NEAR VALLEYVIEW	07GF002	X		X	X			X

MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - RIVER BASIN MANAGEMENT (2)

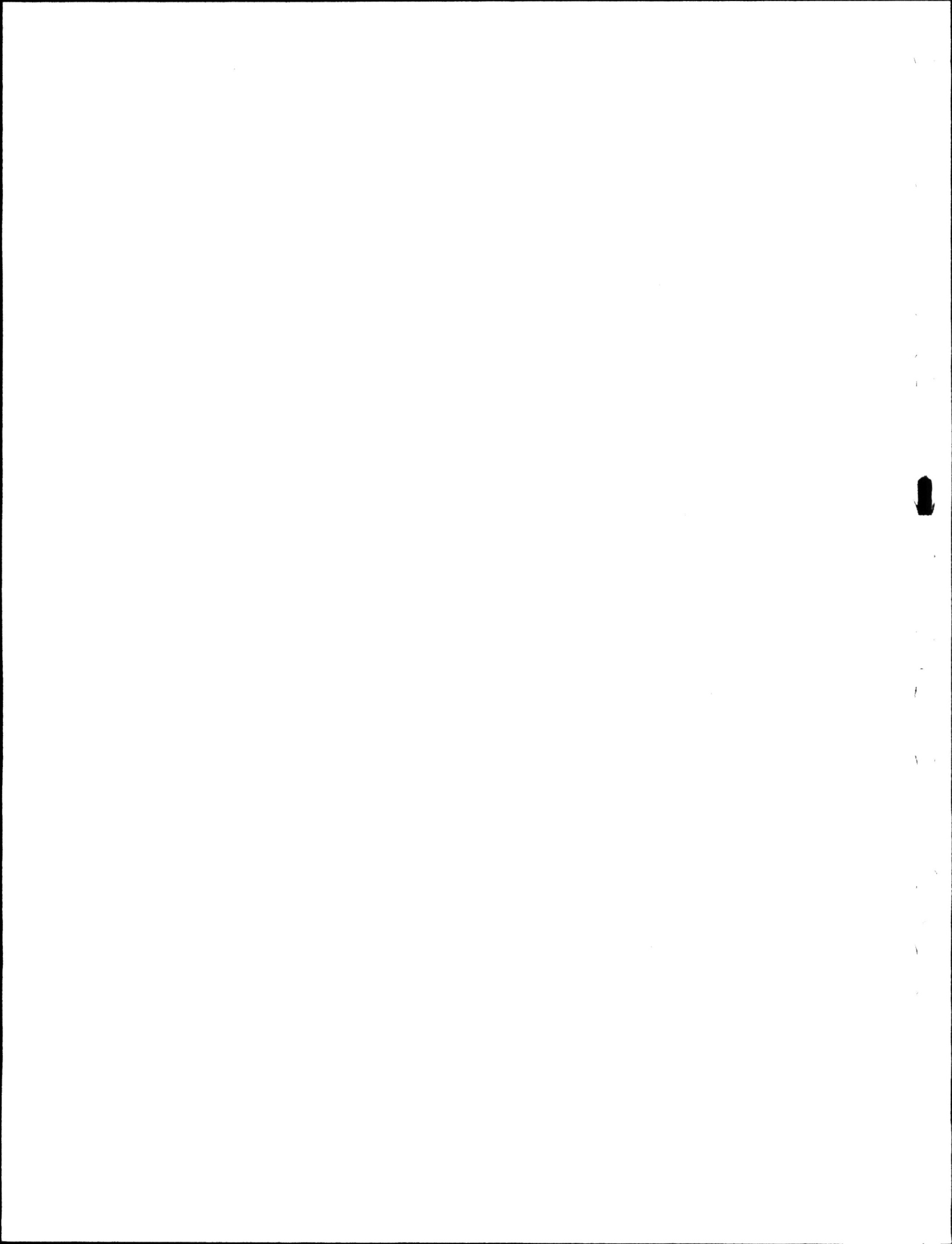
NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT									
SYMBOL \$ INDICATING STATION LOCATED IN ALBERTA BUT OPERATED BY WSC YELLOWKNIFE DISTRICT									
1	BEAVERLODGE RIVER NEAR BEAVERLODGE	076D001	X				X		X
2	BOW RIVER BELOW BASSANO DAM	05BM004	X				X		X
3	BOW RIVER BELOW CARSELAND DAM	05BM002	X				X		X
4	BOW RIVER BELOW GHOST DAM	05BE006	X					X	X
5	CASTLE RIVER NEAR BEAVER MINES	05AA022	X					X	X
6	CHAIN LAKES RESERVOIR NEAR NANTON	05AB037		X			X		X
7	\$DOG RIVER NEAR FITZGERALD	07NB008	X				X	X	X
8	ETHEL LAKE NEAR COLD LAKE	06AC004		X			X		X
9	HAY RIVER NEAR MEANDER RIVER	070B003	X				X		X
10	HIGHWOOD RIVER NEAR THE MOUTH	05BL024	X					X	X
11	KAKWA RIVER NEAR GRANDE PRAIRIE	076B002	X				X		X
12	KLESKUN HILLS MAIN DRAIN NEAR GRANDE PRAIRIE	076E002	X				X		X
13	LESSER SLAVE LAKE AT FAUST	07BJ002		X			X		X
14	MARIE LAKE NEAR COLD LAKE	06AC005		X			X		X
15	MARTINEAU RIVER ABOVE COLD LAKE	06AF008	X					X	X
16	NORTH SASKATCHEWAN RIVER NEAR ROCKY MOUNTAIN HOUSE	05DC001	X				X		X
17	OLDMAN RIVER NEAR BROCKET	05AA024	X		X			X	X
18	PEACE RIVER AT PEACE RIVER	07HA001	X		X			X	X
19	RED DEER RIVER AT DRUMHELLER	05CE001	X				X		X
20	SMOKY RIVER ABOVE HELLS CREEK	07GA001	X				X		X
21	SOUTH SASKATCHEWAN RIVER AT MEDICINE HAT	05AJ001	X					X	X
22	ST. MARY RIVER NEAR LETHBRIDGE	05AE006	X					X	X
23	STEEN RIVER AT STEEN RIVER	070B004	X				X		X
24	SWAN RIVER NEAR KINUSO	07BJ001	X		X			X	X
25	VERDIGRIS LAKE TRIBUTARY NEAR MILK RIVER	11AA039	X				X		X



MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

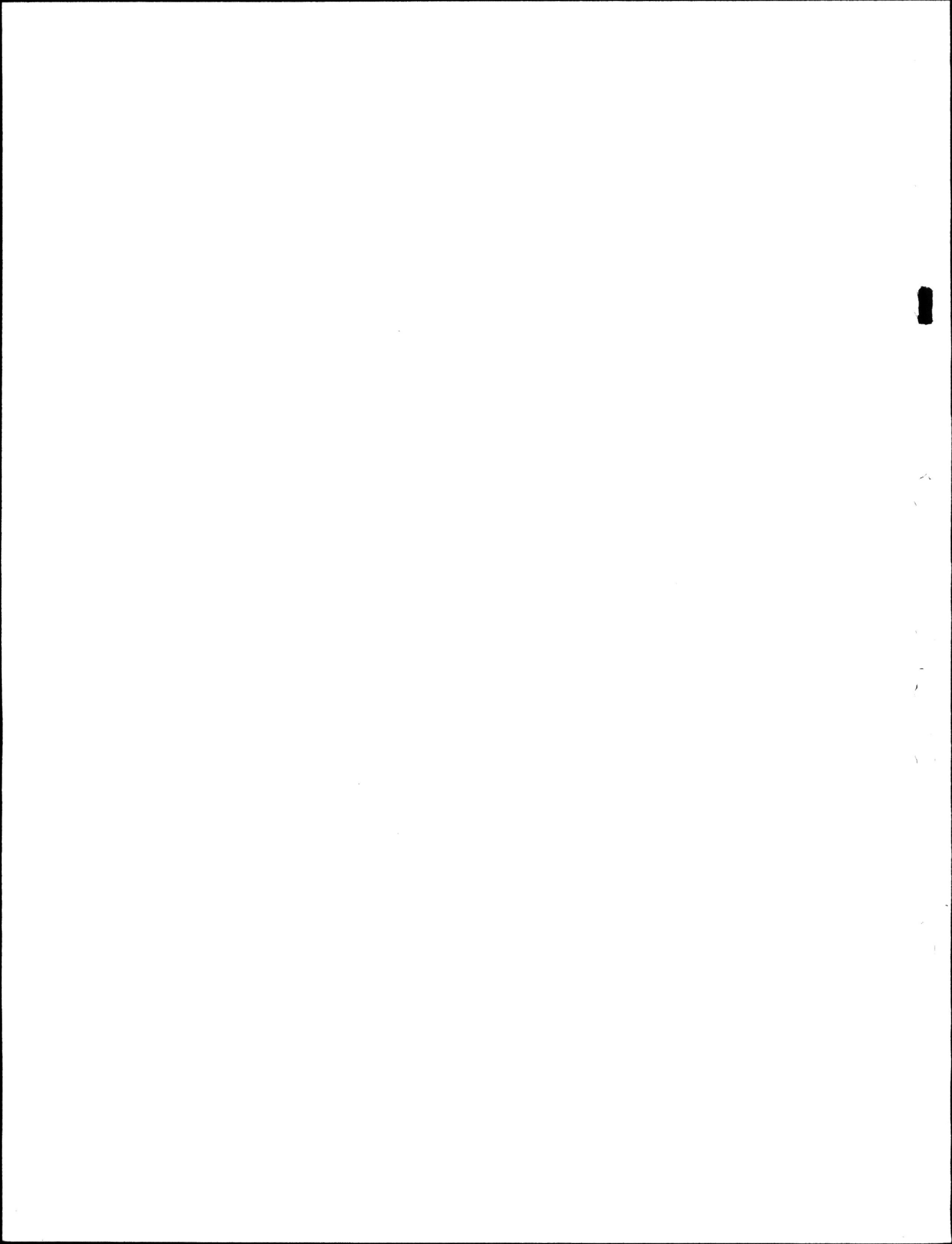
NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT									
1	ADAMS CREEK NEAR KINUSO	07BJ004	X			X			X
2	ALKALI CREEK NEAR THE MOUTH	05CX005	X			X			X
3	AMISK CREEK NEAR SHONTS	05EB016	X			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	BEAVERDAM CREEK NEAR COCHRANE	05CB005	X			X			X
11	BELLY RIVER NEAR GLENWOOD	05AD041	X				X		X
12	BERLAND RIVER NEAR THE MOUTH	07AC007	X			X			X
13	BERRY CREEK NEAR ROSE LYNN	05CH008	X			X			X
14	BIGKNIFE CREEK NEAR GADSBY	05FC002	X			X			X
15	BLACKMUD CREEK NEAR ELLERSLIE	05DF003	X			X			X
16	BLINDMAN RIVER NEAR BLACKFALDS	05CC001	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 MATTS	05CG004	X			X			X
23	CADOTTE RIVER AT OUTLET CADOTTE LAKE	07HB001	X			X			X
24	CARDINAL RIVER NEAR THE MOUTH	05DD008	X			X			X
25	CASTLE RIVER AT RANGER STATION	05AA028	X			X			X
26	CATARACT CREEK NEAR FORESTRY ROAD	05BL022	X				X		X
27	CHINCHAGA RIVER NEAR HIGH LEVEL	07DC001	X				X		X
28	CHRISTINA RIVER NEAR CHARD	07CE002	X			X		X	
29	CHRISTMAS CREEK NEAR BLUE RIDGE	07AH002	X			X			X
30	CLEAR RIVER NEAR BEAR CANYON	07FD009	X			X			X
31	CLEARWATER RIVER ABOVE LIMESTONE CREEK	05DB003	X			X			X
32	CLEARWATER RIVER NEAR DOVERCOURT	05DB006	X				X		X
33	CROWSNEST RIVER AT FRANK	05AA008	X				X		X
34	CUTBANK RIVER NEAR GRANDE PRAIRIE	07GB001	X			X		X	
35	DAPP CREEK AT HIGHWAY NO. 44	07BC006	X			X			X
36	DEEP VALLEY CREEK NEAR VALLEYVIEW	07GF008	X			X			X
37	DEER CREEK MAIN STEM	05CA003	X			X			X
38	DRIEDMEAT CREEK NEAR THE MOUTH	05FA018	X			X			X
39	DRIFTWOOD RIVER NEAR THE MOUTH	07BK007	X				X		X
40	DRYWOOD CREEK NEAR THE MOUTH	05AD016	X				X		X
41	DUTCH CREEK NEAR THE MOUTH	05AA026	X			X			X
42	EAST PRAIRIE RIVER NEAR ENILDA	07BF001	X			X			X
43	ELBOW RIVER AT BRAGG CREEK	05BJ004	X				X		X
44	EUREKA RIVER NEAR WORSLEY	07FD013	X			X			X
45	FISH CREEK NEAR PRIDDIS	05BK001	X			X			X
46	FLAT CREEK NEAR BOYLE	07CA003	X			X			X
47	FREEMAN RIVER NEAR FORT ASSINIBOINE	07AH001	X			X			X
48	GHOST RIVER ABOVE WAIPOROUS CREEK	05B6010	X				X		X
49	GRANDE PRAIRIE CREEK NEAR SEXSMITH	07GE003	X			X			X
50	GROS VENTRE CREEK NEAR DUNMORE	05AH037	X			X			X



MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

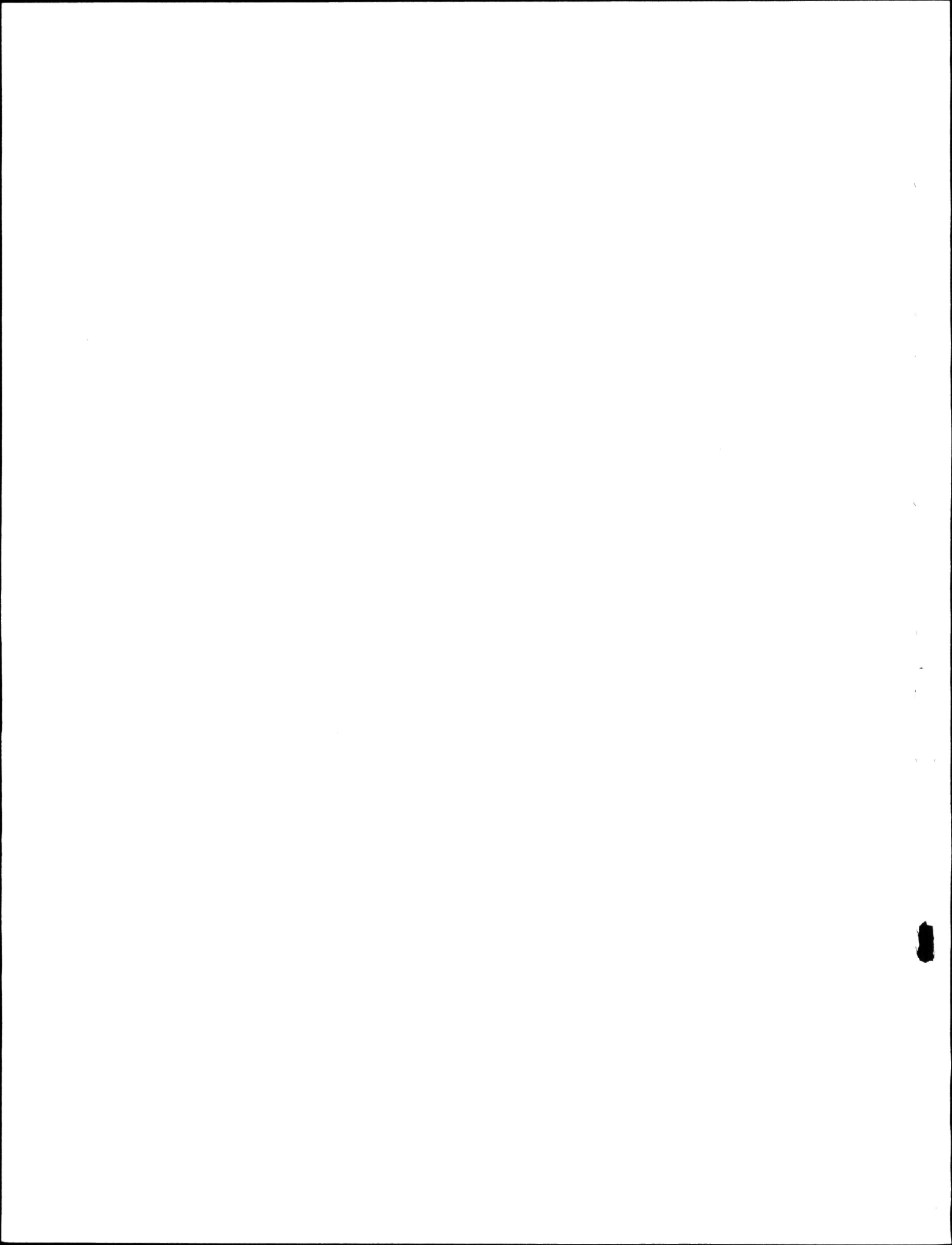
NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT									
51	HAYNES CREEK NEAR HAYNES	05CD006	X			X			X
52	HEART RIVER NEAR NAMPA	07HA003	X				X		X
53	HIGHMOOD RIVER AT DIEBEL'S RANCH	05BL019	X			X			X
54	HINES CREEK ABOVE GERRY LAKE	07FD011	X			X			X
55	HOUSE RIVER AT HIGHWAY NO. 63	07CB002	X			X			X
56	IOSEGUN RIVER NEAR LITTLE SMOKY	0768003	X			X			X
57	IRON CREEK NEAR HARDISTY	05FB002	X			X			X
58	JACKFISH CREEK NEAR LA COREY	06AC001	X			X			X
59	JACKPINE CREEK AT MADLIN LAKE ROAD	07JD003	X			X			X
60	JAMES RIVER NEAR SUNDRE	05CA002	X			X			X
61	JUMPINGPOUND CREEK NEAR COX HILL	05BH013	X			X			X
62	JUMPINGPOUND CREEK NEAR THE MOUTH	05BH009	X				X		X
63	KEB RIVER AT HIGHWAY NO. 35	07HF002	X			X			X
64	KNEEHILLS CREEK NEAR DRUMHELLER	05CE002	X			X			X
65	LA BICHE RIVER AT HIGHWAY NO. 63	07CA011	X				X		X
66	LAFOND CREEK NEAR RED EARTH CREEK	07JC001	X			X			X
67	LALBY CREEK NEAR GIROUXVILLE	076J005	X			X			X
68	LITTLE PADDLE RIVER NEAR MAYERTHORPE	07BB005	X			X			X
69	LITTLE RED DEER RIVER NEAR THE MOUTH	05CB001	X				X		X
70	LITTLE RED DEER RIVER NEAR WATER VALLEY	05CB002	X			X			X
71	LITTLE SMOKY RIVER NEAR GUY	076H002	X				X		X
72	LLOYD CREEK NEAR BLUFFTON	05CC009	X			X			X
73	LOGAN RIVER NEAR THE MOUTH	07CA012	X			X		X	X
74	LOVETT RIVER NEAR THE MOUTH	07BA003	X			X			X
75	LUTOSE CREEK NEAR STEEN RIVER	07DB006	X			X			X
76	MACKAY CREEK AT WALSH	05AH002	X			X			X
77	MANYBERRIES CREEK AT BRODIN'S FARM	05AF010	X			X			X
78	MASKWA CREEK NO. 1 ABOVE BEARHILLS LAKE	05FA014	X			X			X
79	McLEOD RIVER ABOVE EMBARRAS RIVER	07AF002	X				X		X
80	MEADOW CREEK NEAR THE MOUTH	05AB029	X			X			X
81	MEDICINE RIVER NEAR ECKVILLE	05CC007	X				X		X
82	MEETING CREEK NEAR DONALDA	05FC006	X			X			X
83	MONITOR CREEK NEAR MONITOR	05GA003	X			X			X
84	MONTAGNEUSE RIVER NEAR HINES CREEK	07FD012	X			X			X
85	MUSKEG RIVER NEAR GRANDE CACHE	076A002	X			X			X
86	NAMEPI CREEK NEAR THE MOUTH	05EC004	X			X			X
87	NORDEGG RIVER AT SUNCHILD ROAD	05DD009	X				X		X
88	NORTH RAM RIVER AT FORESTRY ROAD	05DC011	X			X			X
89	OLDMAN RIVER NEAR WALDRON'S CORNER	05AA023	X	X			X		X
90	OWL RIVER BELOW PICHE RIVER	07CA013	X			X		X	X
91	PADDLE RIVER AT BARRHEAD	07BB006	X			X			X
92	PADDLE RIVER NEAR ROCHFORD BRIDGE	07BB004	X			X			X
93	PARFLESH CREEK NEAR CHANCELLOR	05BM007	X			X			X
94	PEAVINE CREEK NEAR FALHER	076H004	X			X			X
95	PEIGAN CREEK NEAR PAKOWKI ROAD	05AH041	X			X			X
96	PEKISKO CREEK NEAR LONGVIEW	05BL023	X			X			X
97	PEMBINA RIVER BELOW PADDY CREEK	07BA001	X			X			X
98	PIGEON LAKE CREEK NEAR USONA	05FA019	X			X			X
99	PINCHER CREEK AT PINCHER CREEK	05AA004	X			X			X
100	PINE CREEK NEAR GRASSLAND	07CA005	X			X			X



MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

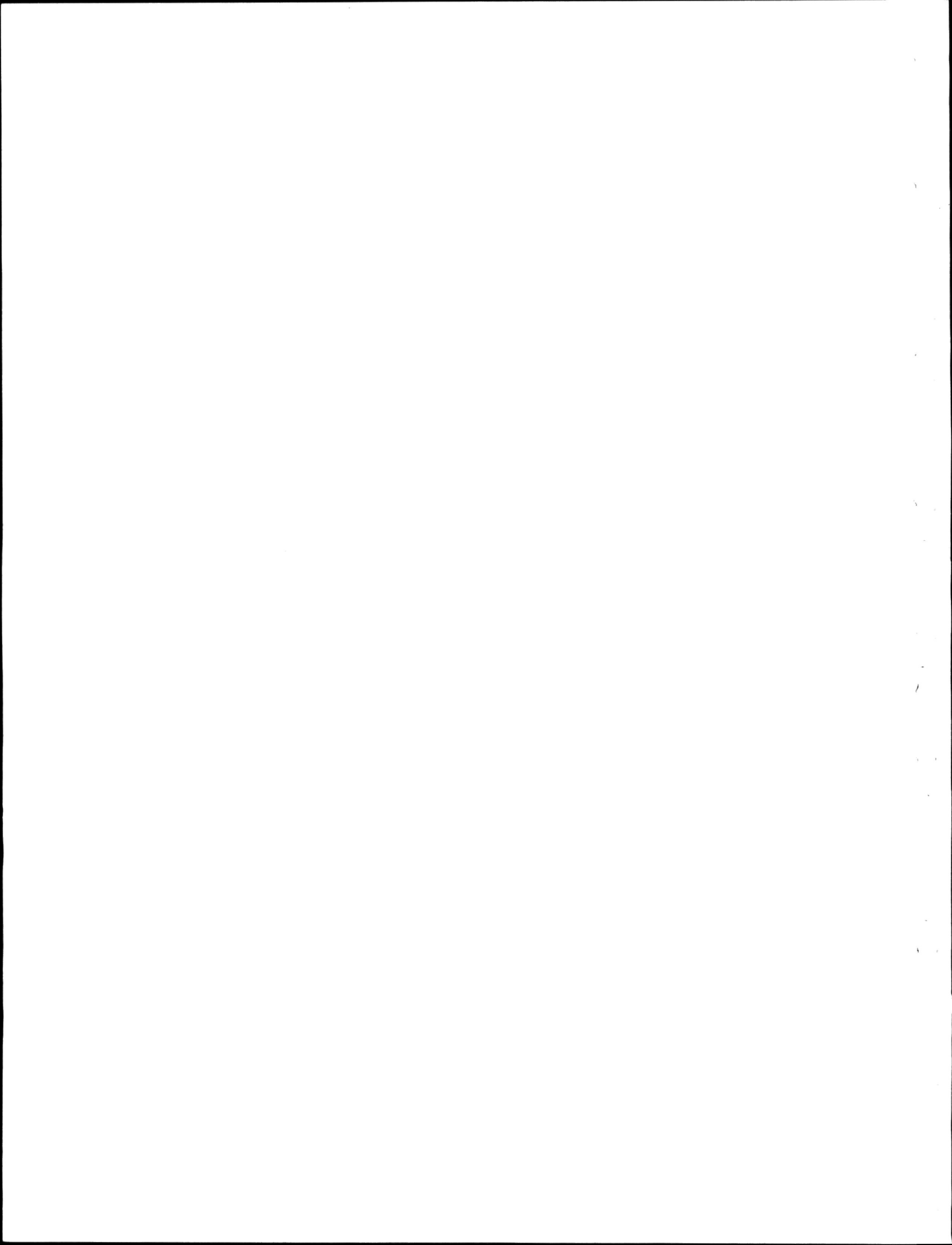
NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL SED.	6M	12M	REMOTE	NORMAL
OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT								
101	PINTO CREEK NEAR GRANDE PRAIRIE	076C002	X		X			X
102	PIPESTONE CREEK BELOW BIGSTONE CREEK	05FA022	X		X			X
103	PONTON RIVER ABOVE BOYER RIVER	07JF003	X		X			X
104	PRAIRIE BLOOD COULEE NEAR LETHBRIDGE	05AD035	X		X			X
105	PRAIRIE CREEK BELOW LICK CREEK	05DB005	X		X			X
106	PRAIRIE CREEK NEAR ROCKY MOUNTAIN HOUSE	05DB002	X			X		X
107	PUNK CREEK NEAR THE MOUTH	06AB003	X		X			X
108	RACEHORSE CREEK NEAR THE MOUTH	05AA027	X		X			X
109	RAM RIVER NEAR THE MOUTH	05DC006	X			X		X
110	RAT CREEK NEAR CYNTHIA	07BA002	X		X			X
111	RAVEN RIVER NEAR RAVEN	05CB004	X			X		X
112	RAY CREEK NEAR INNISFAIL	05CE010	X		X			X
113	RED DEER RIVER ABOVE PANTHER RIVER	05CA004	X		X			X
114	RED DEER RIVER BELOW BURNT TIMBER CREEK	05CA009	X			X		X
115	REDEARTH CREEK NEAR RED EARTH	07JC002	X		X			X
116	REDWATER RIVER NEAR THE MOUTH	05EC005	X		X			X
117	REITA CREEK NEAR OUTLET ANGLING LAKE	06AD013	X		X			X
118	RENNICK CREEK NEAR THREE HILLS	05CE011	X		X			X
119	RIBSTONE CREEK NEAR CZAR	05FD005	X		X			X
120	RIBSTONE CREEK NEAR EDGERTON	05FD001	X		X			X
121	RIBSTONE CREEK TRIBUTARY NEAR CORONATION	05FD006	X		X			X
122	ROSE CREEK NEAR ALDER FLATS	05DE007	X		X			X
123	ROSEBUD RIVER BELOW CARSTAIRS CREEK	05CE006	X		X			X
124	ROSS CREEK NEAR IRVINE	05AH003	X		X			X
125	SADDLE RIVER NEAR WOKING	07FD006	X		X			X
126	SAKWATAMAU RIVER NEAR WHITECOURT	07AH003	X		X			X
127	SAM LAKE TRIBUTARY NEAR SCHULER	05AH047	X		X			X
128	SAND RIVER NEAR THE MOUTH	06AB001	X		X			X
129	SAULTEAUX RIVER NEAR SPURFIELD	07BK005	X		X			X
130	SAWRIDGE CREEK NEAR SLAVE LAKE	07BK009	X		X			X
131	SHEEP COULEE NEAR CARSTAIRS	05CE019	X		X			X
132	SHEEP RIVER AT BLACK DIAMOND	05BL014	X			X		X
133	SIFFLEUR RIVER NEAR THE MOUTH	05DA002	X		X			X
134	SIMONETTE RIVER NEAR GOODWIN	07GF001	X		X			X
135	SOUNDING CREEK NEAR OYEN	05GA008	X		X			X
136	SOLSA CREEK NEAR HIGH LEVEL	07DA001	X		X			X
137	STINSON CREEK NEAR PEKISKO	05BL007	X		X			X
138	STRAWBERRY CREEK NEAR THE MOUTH	05DF004	X		X			X
139	STRETTON CREEK NEAR MARWAYNE	05EE005	X		X			X
140	STURGEON RIVER NEAR FORT SASKATCHEWAN	05EA001	X		X			X
141	SUNDANCE CREEK NEAR BICKERDIKE	07AF010	X		X			X
142	SWAN RIVER NEAR SWAN HILLS	07BJ003	X		X			X
143	THREEHILLS CREEK BELOW RAY CREEK	05CE018	X		X			X
144	THREEHILLS CREEK NEAR CARBON	05CE007	X		X			X
145	THREEPOINT CREEK NEAR MILLARVILLE	05BL013	X		X			X
146	TODD CREEK AT ELTON'S RANCH	05AA006	X		X			X
147	TOMAHAWK CREEK NEAR TOMAHAWK	05DE009	X		X			X
148	VERMILION RIVER NEAR MARWAYNE	05EE007	X		X			X
149	WABAMUN CREEK NEAR DUFFIELD	05DE003	X		X			X
150	WABASCA RIVER BELOW TROUT RIVER	07JB002	X			X	X	



MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

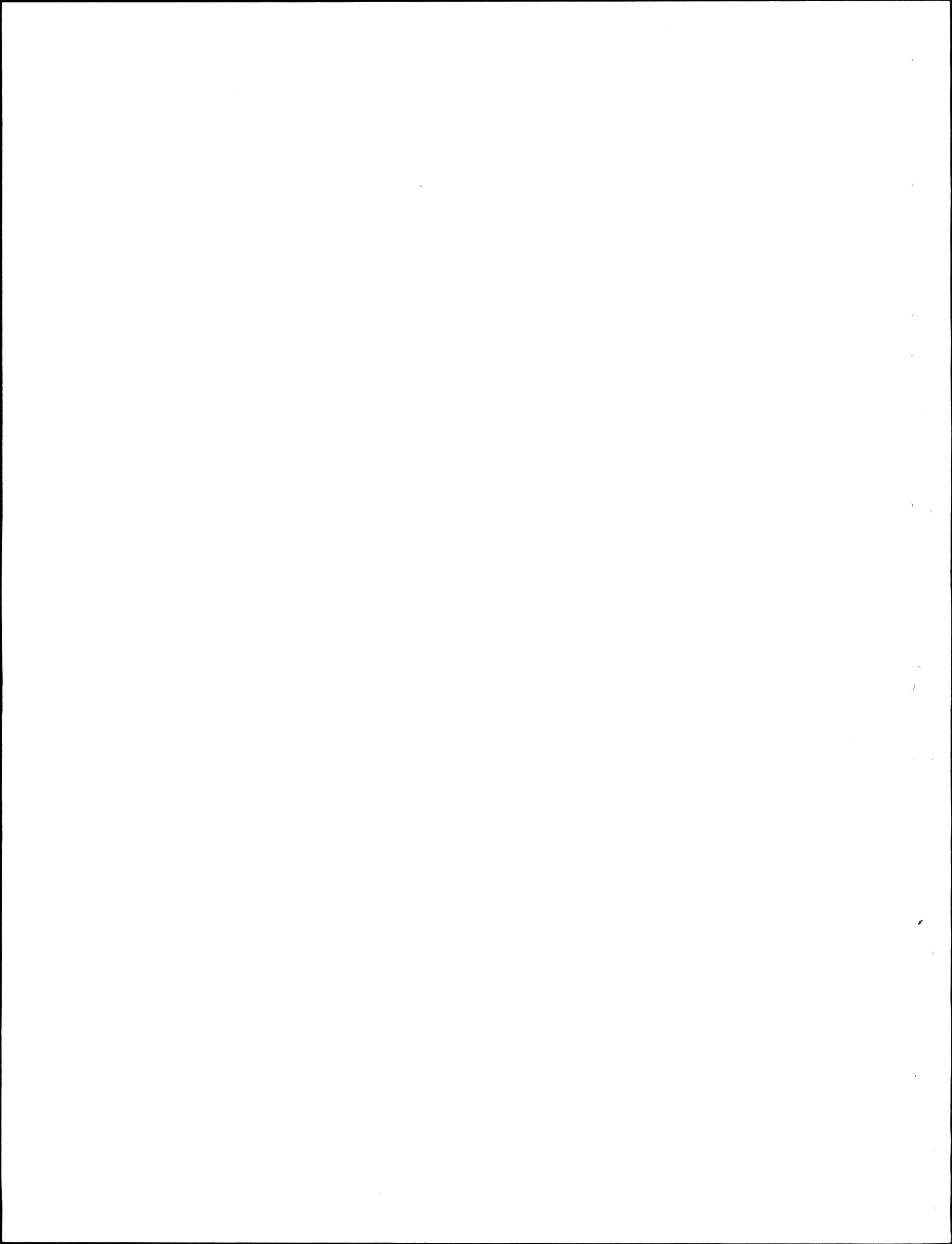
NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
<u>OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT</u>									
151	WABASH CREEK NEAR PIBROCH	07BC007	X			X			X
152	WAINSCOTT COULEE NEAR BROWNVALE	07FD014	X			X			X
153	WAIPAROUS CREEK NEAR THE MOUTH	05BG006	X				X		X
154	WANDERING RIVER NEAR WANDERING RIVER	07CA006	X				X		X
155	WASKAHIGAN RIVER NEAR THE MOUTH	07GG001	X				X		X
156	WASKATENAU CREEK NEAR WASKATENAU	05EC002	X			X			X
157	WELCH CREEK TRIBUTARY NEAR LEEDALE	05CC010	X			X			X
158	WEST ARROWWOOD CREEK NEAR ARROWWOOD	05BM014	X			X			X
159	WEST PRAIRIE RIVER NEAR HIGH PRAIRIE	07BF002	X				X		X
160	WHITEMUD CREEK NEAR ELLERSLIE	05DF006	X			X			X
161	WHITEMUD CREEK (WEST BRANCH) NEAR IRETON	05DF007	X			X			X
162	WHITEMUD RIVER NEAR DIXONVILLE	07HA005	X			X			X
163	WILDHAY RIVER NEAR HINTON	07AC001	X			X			X
164	WILLOW CREEK ABOVE CHAIN LAKES	05AB02B	X				X		X
165	WILLOW CREEK NEAR NOLAN	05AB002	X			X			X
166	WILLOW RIVER NEAR WABASCA	07JA003	X			X			X
167	WOLF CREEK AT HIGHWAY NO. 16A	07AG003	X				X		X
168	WOLF RIVER AT OUTLET OF WOLF LAKE	06AB002	X				X	X	



MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

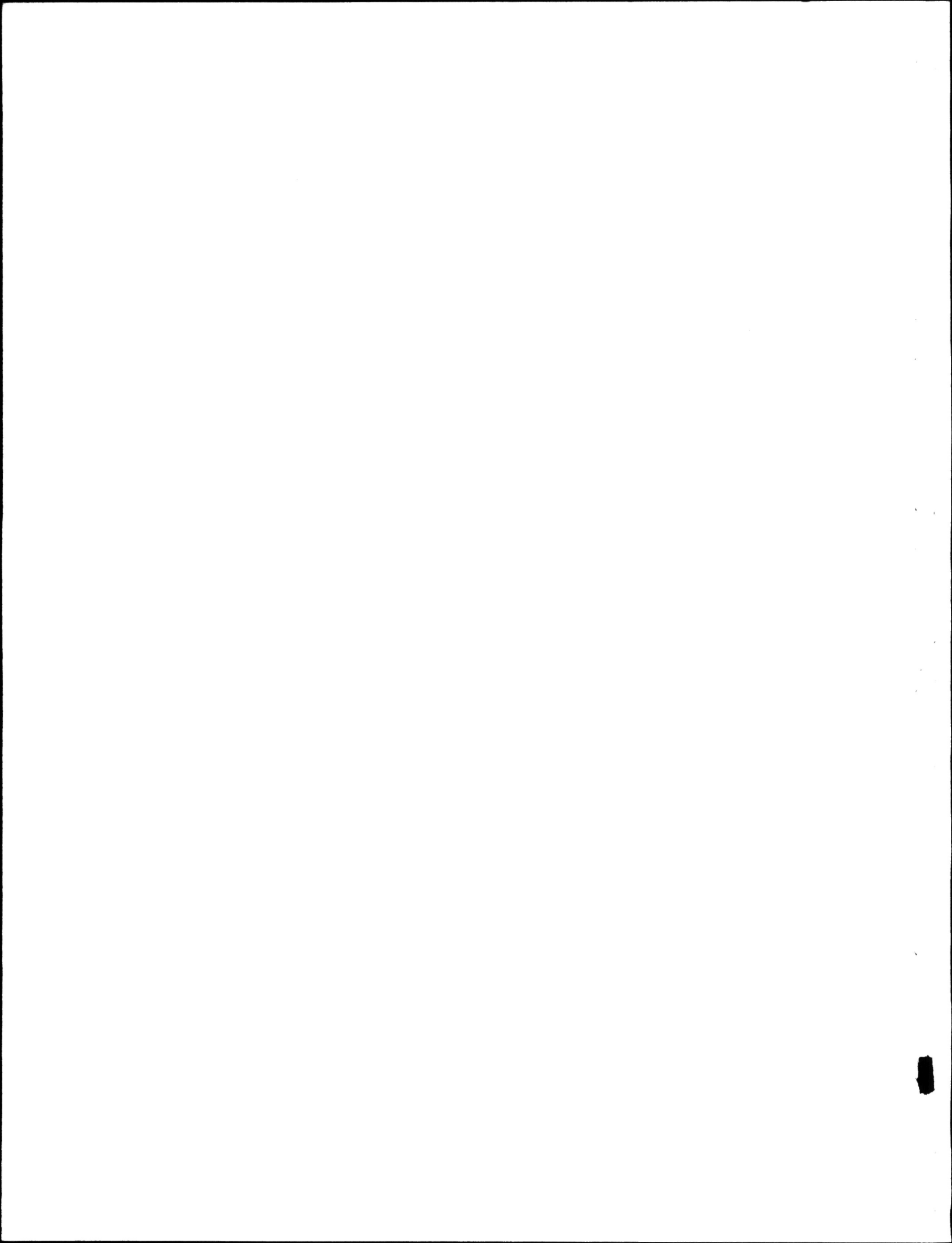
NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT									
1	ALBERTA POWER LIMITED COOLING POND OUTLET	05CG007	X				X		X
2	ATHABASCA RIVER NEAR WINDFALL	07AE001	X				X		X
3	BABETTE CREEK 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	BEAVER LAKE AT RANGER STATION	06AA003		X			X		X
9	BEAVERTAIL CREEK NEAR HYTHE	07GD002	X				X		X
10	BELLY-ST. MARY DIVERSION CANAL	05AD021	X				X		X
11	BERRY CREEK BELOW DEADFISH CREEK	05CH016	X				X		X
12	BERRY CREEK RESERVOIR NEAR SUNNYNOOK	05CH014		X			X		X
13	BERRY CREEK RESERVOIR OUTLET	05CH011	X				X		X
14	BIRCH CREEK NEAR CONKLIN	07CE006	X				X	X	
15	BLINDMAN RIVER NEAR BLUFFTON	05CC008	X				X		X
16	BLOOD INDIAN CREEK NEAR CABIN LAKE	05CX007	X				X		X
17	BLOOD INDIAN CREEK NEAR THE MOUTH	05CX001	X				X		X
18	B.R.D. DRAIN D NEAR VAUXHALL	05BN008	X				X		X
19	B.R.D. DRAIN T NEAR HAYS	05AG005	X				X		X
20	BOYER RIVER NEAR PADDLE PRAIRIE	07JF004	X				X		X
21	BUFFALO LAKE NEAR ERSKINE	05CD005		X			X		X
22	CALLING LAKE AT RANGER STATION	07CB001		X			X		X
23	CANADIAN ST. MARY CANAL AT DROP NO. 1	05AF028	X				X		X
24	CAVAN LAKE DIVERSION NEAR DUNMORE	05AH044	X				X		X
25	CAVAN LAKE NEAR DUNMORE	05AH048		X			X		X
26	CHIP LAKE AT OUTLET TO LOBSTICK RIVER	07BB008		X			X		X
27	COLQUHOUN CREEK NEAR GRANDE PRAIRIE	07GE006	X				X		X
28	COOKING LAKE AT COOKING LAKE	05EB012		X			X		X
29	COYOTE CREEK NEAR CHERHILL	07BB014	X				X		X
30	DEADFISH INFLOW CANAL NEAR CESSFORD	05CH012	X				X		X
31	DEERLICK CREEK NEAR HINTON	07AF004	X				X		X
32	DICKSON DAM TUNNEL OUTLET	05CB007	X					X	X
33	ELBOW RIVER ABOVE ELBOW FALLS	05BJ006	X				X		X
34	ELBOW RIVER BELOW GLENMORE DAM	05BJ001	X					X	X
35	ELDER CREEK AT HIGHWAY NO. 686	07HB002	X				X		X
36	ELKWATER LAKE AT ELKWATER	05AH025		X			X		X
37	EMBARASS RIVER NEAR WEALD	07AF014	X				X		X
38	FANCETT LAKE NEAR SMITH	07BK008		X			X		X
39	FISH CREEK ABOVE LITTLE FISH LAKE	05CG006	X				X		X
40	FORSTER RESERVOIR NEAR CESSFORD	05CH013		X			X		X
41	GOLD CREEK NEAR FRANK	05AA030	X				X		X
42	GREGG RIVER NEAR THE MOUTH	07AF015	X				X		X
43	GROAT CREEK NEAR WHITECOURT	07AG008	X				X		X
44	GULL LAKE AT ASPEN BEACH	05CC006		X			X		X
45	HARGRAVES DIVERSION FROM BOXELDER CREEK	05AH051		X			X		X
46	HARTLEY CREEK NEAR FORT MACKAY	07DA009	X				X	X	
47	HASTINGS LAKE NEAR DEVILLE	05EB011		X			X		X
48	HIGHMOOD RIVER BELOW LITTLE BOW CANAL	05BL004	X					X	X
49	HIGHMOOD RIVER NEAR ALDERSYDE	05BL009	X				X		X
50	HILDA LAKE NEAR COLD LAKE	06AC003		X			X		X



MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT									
51	HINES CREEK NEAR FAIRVIEW	07FD008	X			X			X
52	IRON CREEK NEAR VIKING	05FB003	X			X			X
53	ISLE LAKE AT EUREKA BEACH	05EA008		X		X			X
54	JACKFISH RIVER BELOW CHRISTINA LAKE	07CE005	X			X		X	
55	JOSLYN CREEK NEAR FORT MACKAY	07DA016	X			X		X	
56	KENNEDY COULEE NEAR ACADIA VALLEY	05CX006	X			X			X
57	KILLARNEY LAKE TRIBUTARY NEAR CHAUVIN	05GA010	X			X			X
58	KYISKAP CREEK NEAR GRANUM	05AB038	X			X			X
59	LAC LA BICHE AT LAC LA BICHE	07CA004		X			X		X
60	LAC LA NONNE AT LAC LA NONNE	07BB007		X		X			X
61	LAC STE. ANNE AT ALBERTA BEACH	05EA006		X		X			X
62	LATERAL 10 SPILLWAY NEAR CHIN	05AG007	X			X			X
63	LESSER SLAVE LAKE AT SLAVE LAKE	07B3006		X			X		X
64	LILY CREEK NEAR SLAVE LAKE	07BG004	X			X			X
65	LITTLE BERLAND RIVER AT HIGHWAY NO. 40	07AC008	X			X			X
66	LITTLE ELBOW RIVER ABOVE NIIHAHI CREEK	05BJ009	X			X			X
67	LITTLE SMOKY RIVER AT LITTLE SMOKY	07BG002	X			X			X
68	LOMOND LATERAL NEAR HEADGATE	05AC017	X			X			X
69	LOYALIST CREEK NEAR CONSORT	05GA013	X			X			X
70	MACKAY CREEK NEAR GRABURN GAP	05AH042	X			X			X
71	MACKAY RIVER ABOVE DUNKIRK RIVER	07DB005	X			X		X	
72	MANATOKAN CREEK NEAR IRON RIVER	06AC009	X			X			X
73	McALPINE CREEK (EAST FORK) NEAR ELKWATER	05AH043	X			X			X
74	McGREGOR LAKE INFLOW NEAR MILD	05AC024	X			X			X
75	McGREGOR-TRAVERS CANAL NEAR CHAMPION	05AC025	X			X			X
76	McLEOD RIVER NEAR CADOMIN	07AF013	X			X			X
77	McLEOD RIVER NEAR WHITECOURT	07AG004	X			X			X
78	MICHICHI CREEK AT DRUMHELLER	05CE020	X			X			X
79	MILK RIVER RIDGE RESERVOIR	05AF030		X		X			X
80	MINISTIK LAKE NEAR NEW SAREPTA	05EB013		X		X			X
81	MIGUELON LAKE AT PROVINCIAL PARK	05EB014		X		X			X
82	MONITOR CREEK NEAR CONSORT	05GA011	X			X			X
83	MOORE LAKE NEAR COLD LAKE	06AC002		X		X			X
84	MOOSEHILLS CREEK NEAR ELK POINT	05ED003	X			X			X
85	MOOSELAKE RIVER NEAR FRANCHERE	06AC006	X			X			X
86	MOSQUITO CREEK NEAR THE MOUTH	05AC031	X			X			X
87	MURIEL LAKE NEAR GURNEYVILLE	06AC007		X			X		X
88	NINE MILE COULEE NEAR LETHBRIDGE	05AE042	X			X			X
89	NORTH SASKATCHEWAN RIVER NEAR LODGEPOLE	05DE006		X		X			X
90	OLDMAN RIVER NEAR THE MOUTH	05AG006	X				X		X
91	PADDLE RIVER AT HWY. 764	07BB013		X		X			X
92	PADDLE RIVER NEAR ANSELMO	07BB011	X			X			X
93	PADDLE RIVER NEAR SANGUDO	07BB012		X		X			X
94	PAINTEARTH CREEK NEAR HALKIRK	05FC004	X			X			X
95	PARLBY CREEK AT ALIX	05CD007	X			X			X
96	PEACE RIVER AT FORT VERMILION	07HF001		X		X			X
97	PEERLESS LAKE NEAR PEERLESS LAKE	07JB001		X		X		X	
98	PEMBINA RIVER NEAR ENTWISTLE	07BB002	X				X		X
99	PIGEDON LAKE AT GRANDVIEW	05FA013		X		X			X
100	PONY CREEK NEAR CHARD	07CE003	X			X		X	



MAJOR DESIGNATION - PROVINCIAL

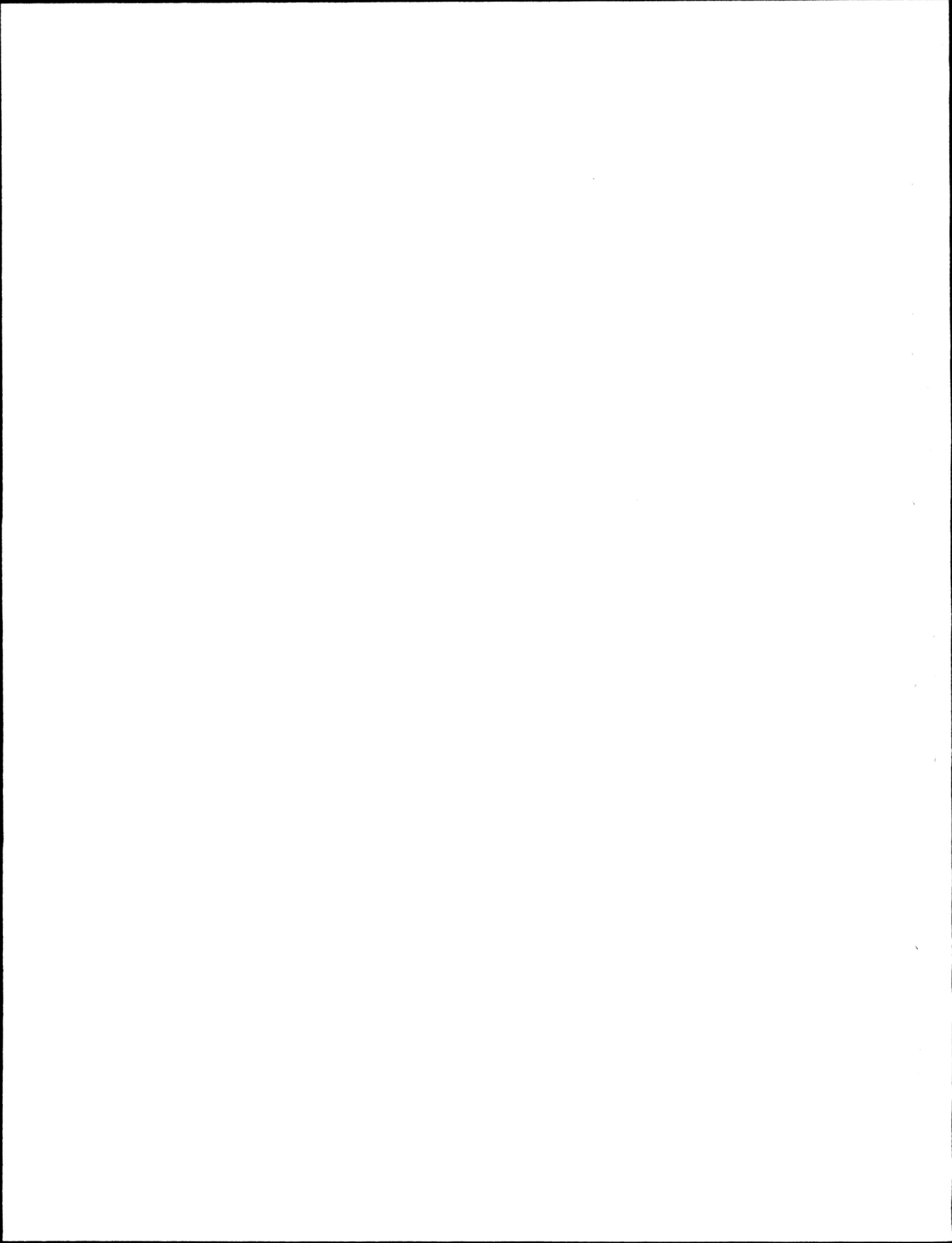
SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
OPERATED BY - WATER SURVEY OF CANADA, ALBERTA DISTRICT									
101	PORTER CREEK ABOVE BAPTISTE LAKE	07BE003	X			X			X
102	POTHOLE TURNOUT NEAR MAGRATH	05AE038	X			X			X
103	REDWATER RIVER NEAR VIMY	05EC007	X			X			X
104	REDWILLOW CREEK NEAR RED WILLOW	05FC005	X			X			X
105	REDWILLOW RIVER NEAR BEAVERLODGE	07GD003	X				X		X
106	ROBERT CREEK NEAR ANZAC	07CE004	X			X		X	
107	RUSH LAKE DRAIN NEAR NEW DAYTON	05AF031	X			X			X
108	SALT CREEK NEAR GROUARD	07BF009	X			X			X
109	SNAKE CREEK NEAR VULCAN	05AC030	X			X			X
110	SOUNDING CREEK NEAR CHINDOK	05GA012	X			X			X
111	SOUTH HEART RESERVOIR NEAR McLENNAN	07BF008		X		X			X
112	SOUTH WABASCA LAKE NEAR DESMARAIS	07JA002		X		X			X
113	SPRAY RIVER AT BANFF	05BC001	X				X		X
114	STEELE LAKE NEAR JARVIE	07BC005		X		X			X
115	STIRLING LAKE OUTFLOW NEAR STIRLING	05AF029	X			X			X
116	STONY CREEK NEAR TAMATINAW	07BE004	X			X			X
117	STURGEON LAKE AT WILLIAMSON PARK	07GH003		X		X			X
118	STURGEON RIVER NEAR MAGNOLIA BRIDGE	05EA010	X			X			X
119	STURGEON RIVER NEAR VILLENEUVE	05EA005	X				X		X
120	SYLVAN LAKE AT SYLVAN LAKE	05CC003		X		X			X
121	TEEPEE CREEK NEAR LA CRETE	07JD004	X			X			X
122	TINDASTOLL CREEK NEAR MARKERVILLE	05CC012	X			X			X
123	TRAP CREEK NEAR LONGVIEW	05BL027	X			X			X
124	TROUT CREEK NEAR GRANUM	05AB005	X			X			X
125	UNNAMED CREEK NEAR FORT MACKAY	07DA011	X			X		X	
126	UTIKUMA LAKE NEAR NIPISI	07JA001		X		X			X
127	VERMILION PARK LAKE NEAR VERMILION	05EE008		X		X			X
128	VERMILION RIVER AT VEGREVILLE	05EE009	X			X			X
129	VERMILION RIVER TRIBUTARY NEAR BRUCE	05EE006	X			X			X
130	WABAMUN LAKE AT WABAMUN	05DE002		X			X		X
131	WABATANISK RIVER AT HIGHWAY NO. 676	07GH005	X			X			X
132	WAMPUS CREEK NEAR HINTON	07AF003	X			X			X
133	WASKASOD CREEK AT RED DEER	05CC011	X			X			X
134	WATERTON RIVER NEAR GLENWOOD	05AD028	X				X		X
135	WATERTON-BELLY DIVERSION CANAL	05AD027	X			X			X
136	WEILLER CREEK NEAR WETASKAWIN	05FA024	X			X			X
137	WEST ARROWOOD CREEK NEAR ENSIGN	05BM018	X			X			X
138	WHITE EARTH CREEK NEAR SMOKY LAKE	05EC006	X			X			X
139	WILLOW CREEK BELOW LANE CREEK	05AB039	X			X			X
140	WILLOW CREEK NEAR CLARESHOLM	05AB021	X				X		X
141	WINAGAMI LAKE AT PROVINCIAL PARK	07BF006		X		X			X
142	YOUNG CREEK NEAR CASTOR	05FC007	X			X			X

OPERATED BY - ALBERTA GOVERNMENT

PAD AREA

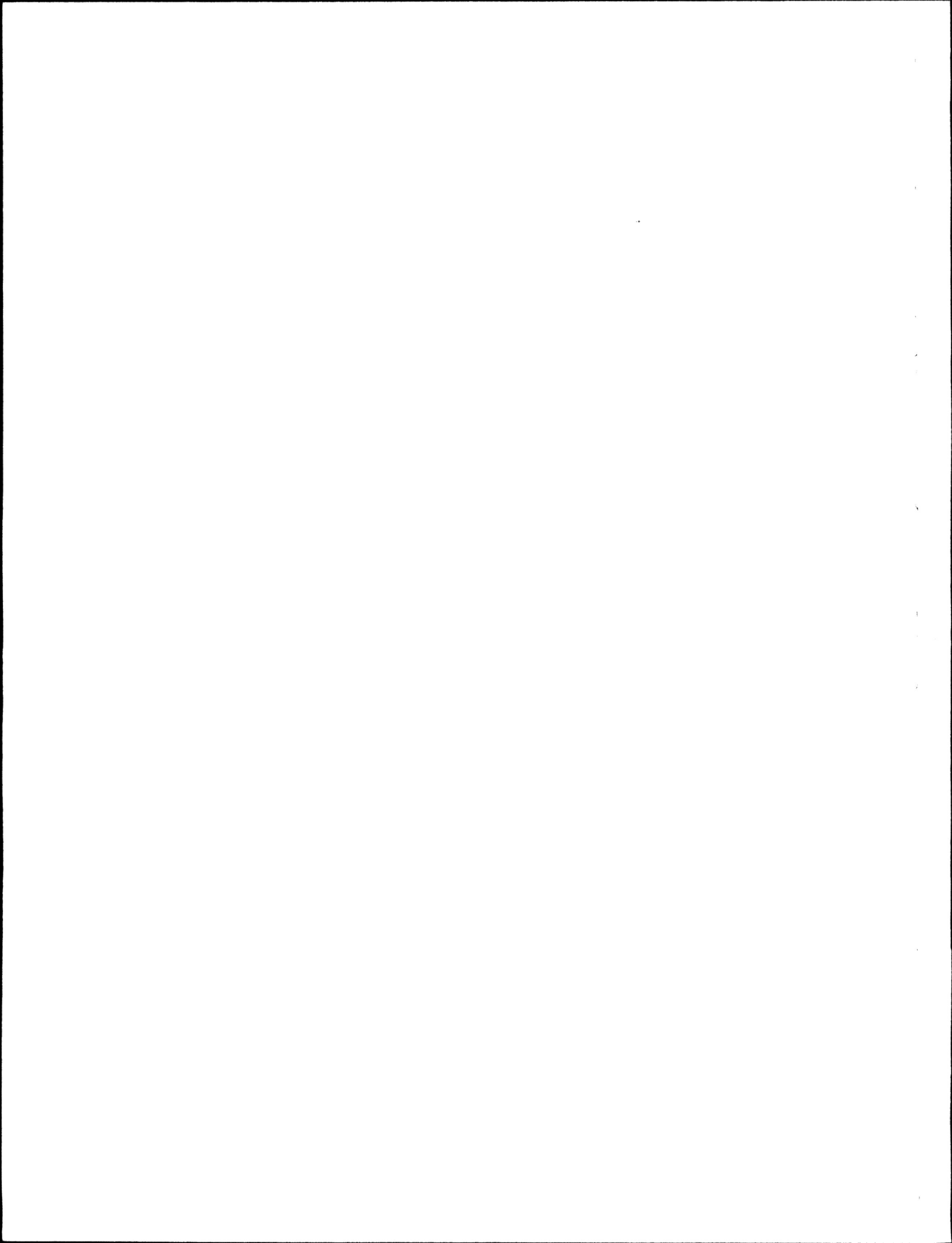
1	ATHABASCA RIVER ABOVE JACKFISH CREEK	07DD007		X			X		X
2	BIG POINT CHANNEL BELOW DIVERGENCE	07DD006 MISC	X				X		X
3	CHEVAL DES QUATRE FOURCHES BELOW FOUR FORKS	07KF006 MISC	X				X		X
4	EMBARRAS RIVER BELOW DIVERGENCE	07DD003 MISC	X				X		X
5	EMBARRAS RIVER DIVERGENCE TO CREED CREEK	07KF901 MISC	X			X			X



MAJOR DESIGNATION - PROVINCIAL

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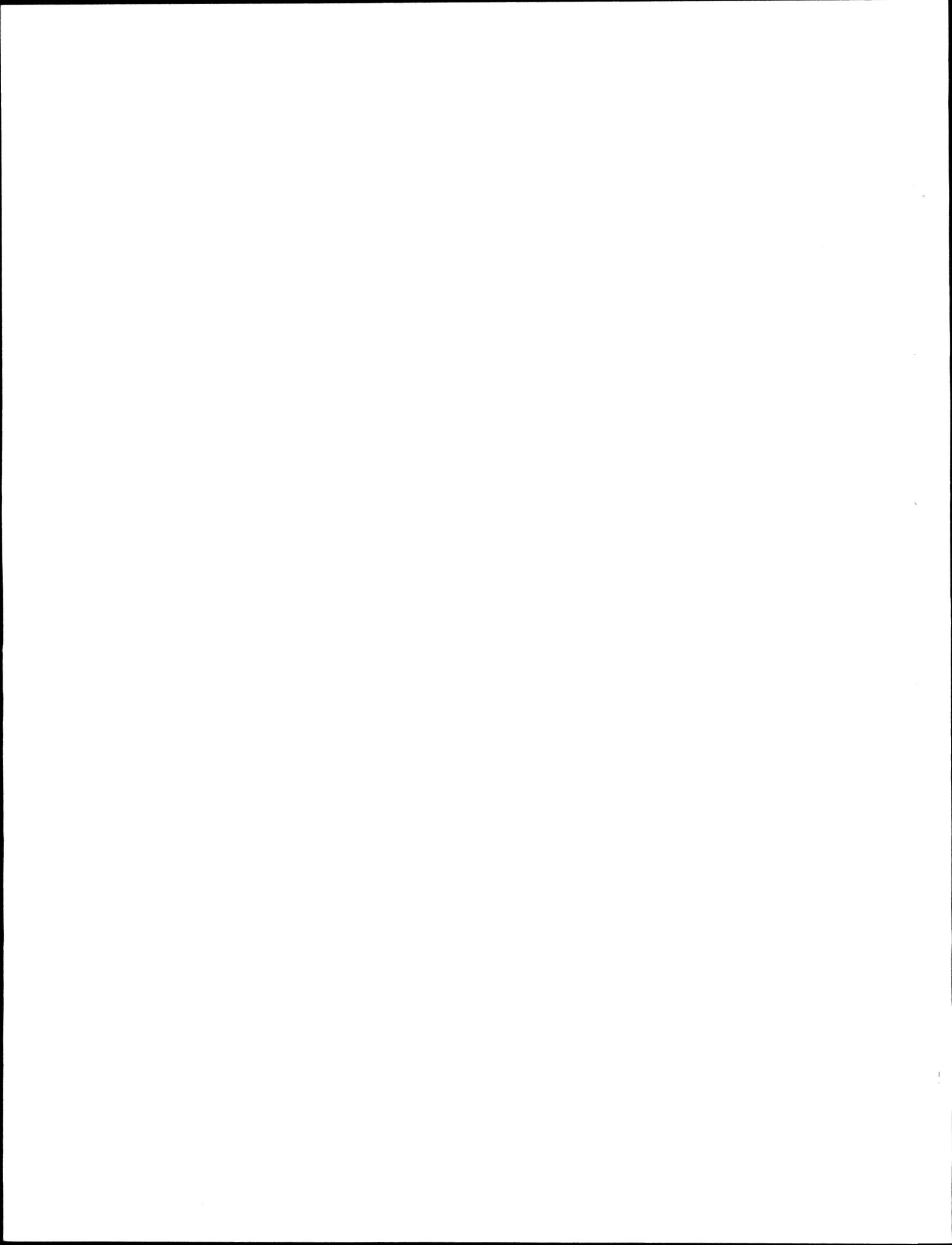
NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
OPERATED BY - ALBERTA GOVERNMENT									
6	FLETCHER CHANNEL BELOW DIVERGENCE	07DD004	MISC	X			X		X
7	GOOSE ISLAND CHANNEL BELOW DIVERGENCE	07DD005	MISC	X			X		X
8	LAKE ATHABASCA AT BUSTARD ISLAND	07MD002			X		X		X
9	MAMAWI LAKE CHANNEL AT OLD DOG CAMP	07KF003			X		X		X
10	PRAIRIE RIVER NEAR LAKE CLAIRE	07KF014	MISC	X			X		X
11	REVILLON COUPE BELOW RIVIERE DES ROCHERS	07NA004	MISC	X					X
12	RIVIERE DES ROCHERS AT BEN HOULE'S CABIN	07NA002	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	BEDDINGTON CREEK NEAR CALGARY	05BH904		X			X		X
5	BIGELOW RESERVOIR NEAR WIMBOURNE	05CE901			X		X		X
6	B.R.I.D. MAIN CANAL AT DROP NO. 3	05AC902		X			X		X
7	B.R.I.D. WESTERN BLOCK LATERAL A NEAR HEADGATES	05AC013		X			X		X
8	BRIDLEBIT CREEK NEAR VALLEYVIEW	07GF005		X	X		X		X
9	COLLUMBINE CREEK NEAR THE MOUTH	06AA004		X			X		X
10	COTTONWOOD CREEK NEAR TWIN BUTTE	05AD903		X			X		X
11	DRIEDMEAT LAKE AT OUTFLOW	05FA020			X		X		X
12	ELBOW RIVER AT SARCEE BRIDGE	05B3010		X			X		X
13	EMBARRAS RIVER AT ROBB	07AF909		X			X		X
14	ERITH RIVER BELOW HANLAN CREEK	07AF907		X			X		X
15	ETZIKOM COULEE NEAR NEMISKAM	05AF905		X			X		X
16	FALLENIMBER CREEK NEAR SUNDRE	05CA012		X			X		X
17	FOOTHILLS CREEK NEAR PINCHER CREEK	05AD901		X			X		X
18	GALWEY BROOK NEAR WATERTON PARK	05AD904		X			X		X
19	HORSE CREEK NEAR VALLEYVIEW	07GF007		X	X		X		X
20	KRAWCHUK DRAINAGE NEAR McLENNAN	07HA902		X			X		X
21	LEE CREEK BELOW CONFLUENCE OF EAST FORK	05AE904		X			X		X
22	L.N.I.D. CANAL BELOW KEHD 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	MUSKEG CREEK NEAR WESTROSE	05FA912		X			X		X
26	NOSE CREEK NEAR THE MOUTH	05BH901		X			X		X
27	PARLBY CREEK NEAR MIRROR	05CD902		X			X		X
28	POINTE-AUX-PINS CREEK NEAR ARDROSSAN	05EB902		X			X		X
29	POINTE-AUX-PINS TRIBUTARY 1 NEAR ARDROSSAN	05EB909		X			X		X
30	POINTE-AUX-PINS TRIBUTARY 2 NEAR ARDROSSAN	05EB910		X			X		X
31	POINTE-AUX-PINS TRIBUTARY 3 NEAR ARDROSSAN	05EB911		X			X		X
32	ROCKY CREEK NEAR VALLEYVIEW	07GF006		X	X		X		X
33	ROMED CREEK ABOVE ROMED LAKE	07BB903		X			X		X
34	RYCROFT SURVEY #3 NEAR RYCROFT	07FD910		X			X		X
35	SPRING CREEK (UPPER) NEAR VALLEYVIEW	07GF004		X	X		X		X
36	SQUAW COULEE DIVERSION BELOW SQUAW COULEE DAM	05AC917		X			X		X
37	TODD CREEK NEAR HIGHWAY NO. 22	05AA909		X			X		X
38	TOUGH CREEK NEAR BEAZER	05AE039		X			X		X
39	VERMILION RIVER DRAINAGE NEAR HOLDEN	05EE913		X			X		X
40	VIXEN CREEK NEAR BELLOY	07FD921		X			X		X



MAJOR DESIGNATION - PROVINCIAL

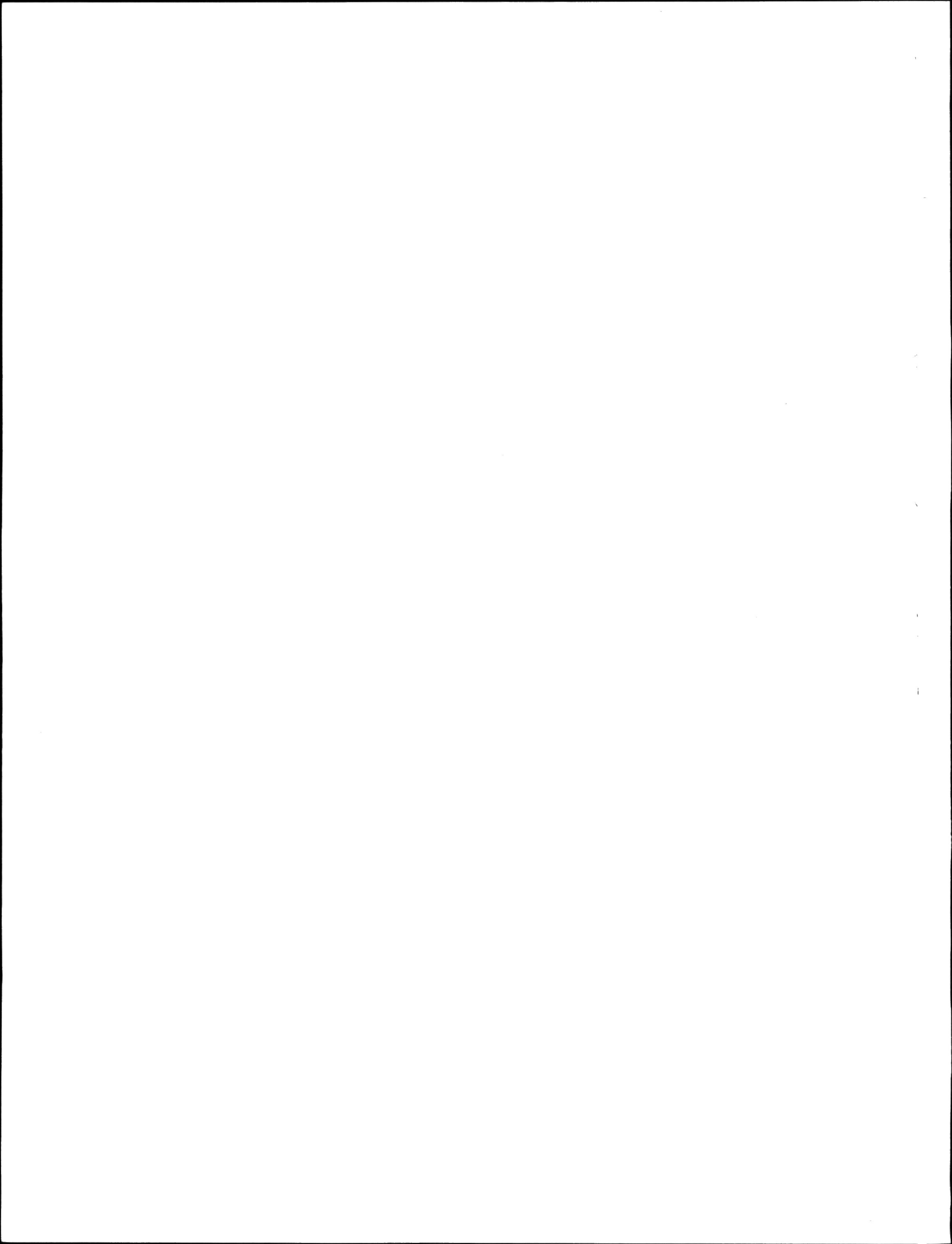
SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
<u>OPERATED BY - ALBERTA GOVERNMENT</u>									
41	WHITEHORSE CREEK NEAR CADOMIN	07AF910	X			X			X
42	WOLVERINE CREEK NEAR VALLEYVIEW	07GF003	X	X		X			X
43	YOUNG DRAINAGE NEAR SPIRIT RIVER	07FD913	X			X			X



MAJOR DESIGNATION - CONTRIBUTED DATA

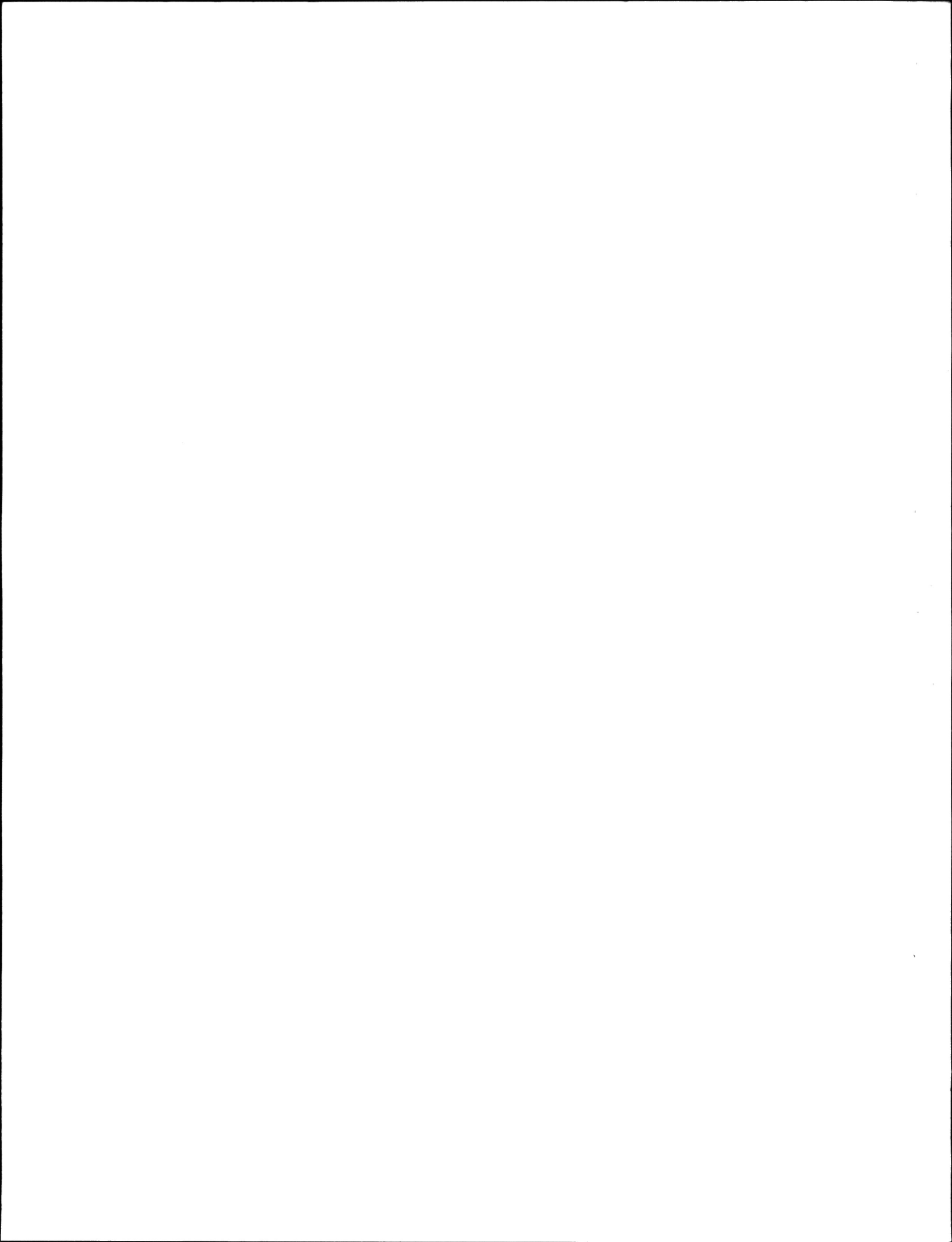
NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
<u>OPERATED BY - TRANSALTA UTILITIES LTD.</u>									
1	BARRIER LAKE NEAR SEEBE	05BF024		X			X		X
2	BOW RIVER BELOW BEARSPAW DAM	05BH008	X				X		X
3	BOW RIVER NEAR SEEBE	05BE004	X				X		X
4	BRAZEAU 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
<u>OPERATED BY - CITY OF CALGARY</u>									
1	GLENMORE RESERVOIR AT CALGARY	05BJ008		X			X		X



MAJOR DESIGNATION - SEDIMENT PROGRAM

NO.	STATION NAME	STATION NUMBER	HYDROMETRIC DESIGNATION	OPERATION		ACCESS	
				8M	12M	REMOTE	NORMAL
<u>FEDERAL - 4</u>							
1	SLAVE RIVER AT FITZGERALD	07NB001	F-2	X		X	
<u>FEDERAL - PROVINCIAL - 3</u>							
1	ATHABASCA RIVER AT McMURRAY***	07CC002	FP-1	X		X	
2	CLEARWATER RIVER AT DRAPER	07CD001	FP-1	X		X	
3	OLDMAN RIVER NEAR LETHBRIDGE	05AD007	F-2	X			X
4	PEACE RIVER AT PEACE RIVER	07HA001	F-4	X			X
<u>PROVINCIAL - 1</u>							
1	LESSER SLAVE RIVER AT HIGHWAY NO. 2A	07BK006	F-1	X			X
2	OLDMAN RIVER NEAR WALDRONS CORNER	05AA023	FP-3	X			X
3	SWAN RIVER NEAR KINUSO	07BJ001	FP-2	X			X
<u>PROVINCIAL - 2</u>							
1	OLDMAN RIVER NEAR BROCKET	05AA024	FP-2	X			X

***NO HYDROMETRIC STATION AT THIS SITE. FLOWS ARE DETERMINED BY ARITHMETICALLY MANIPULATING FLOW DATA FROM THE STATIONS ATHABASCA RIVER BELOW McMURRAY (07DA001) AND CLEARWATER RIVER AT DRAPER (07CD001).

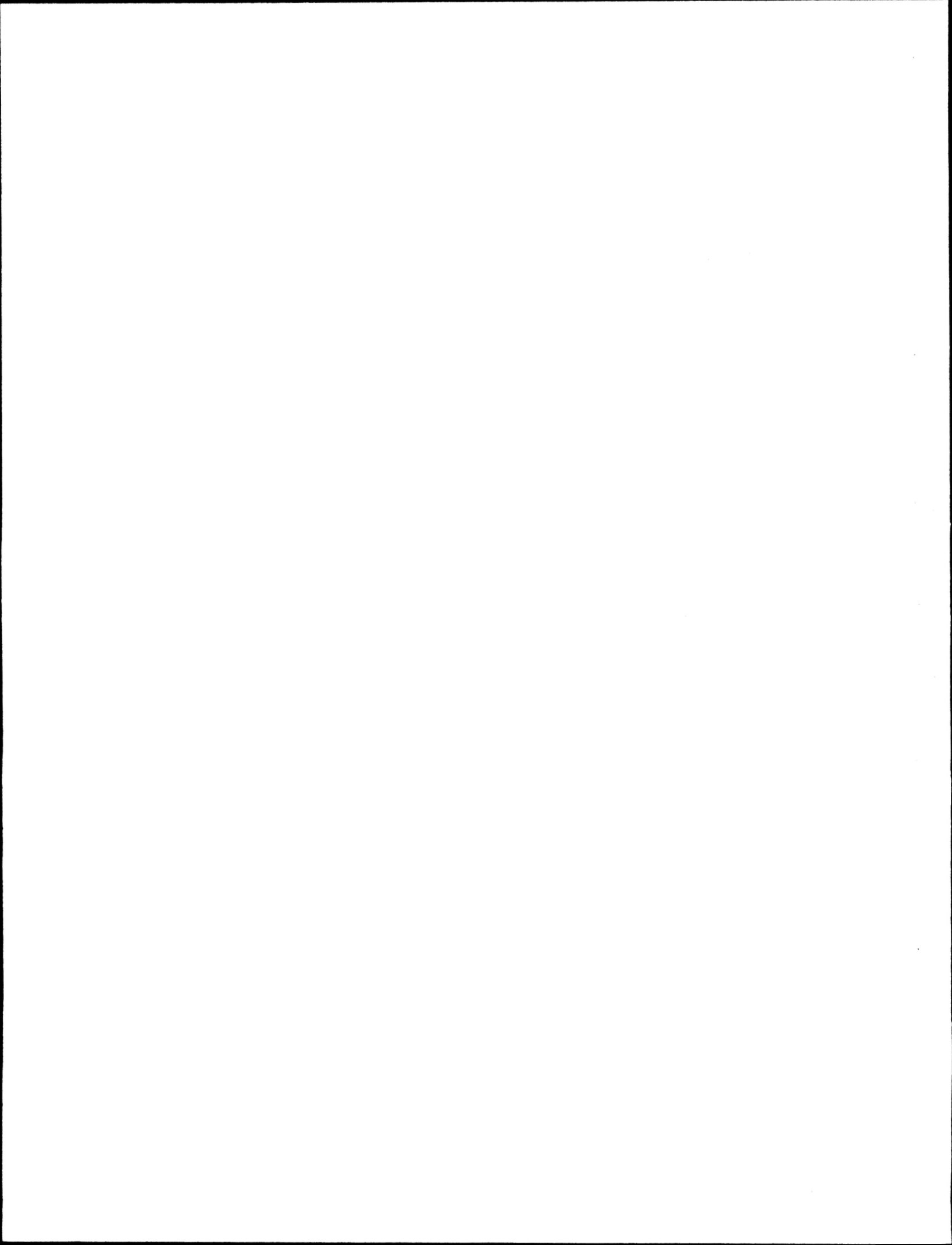


A P P E N D I X "B"

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

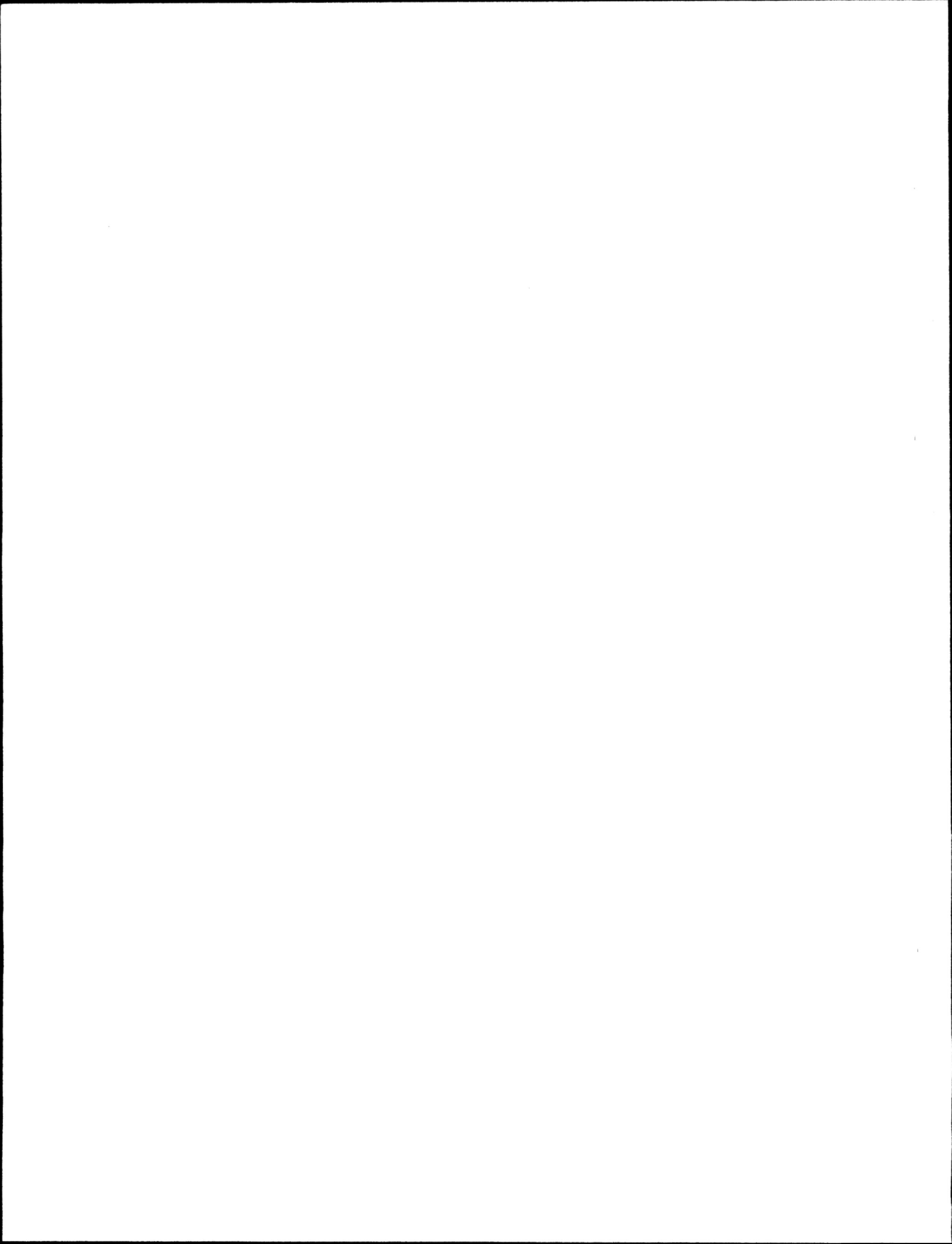
The costs shared include only the salaries and expenses of the staff directly involved in the field and office in the collection and compilation of water quantity data. Depreciation, operation, and maintenance of field transportation and equipment are included costs.

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.

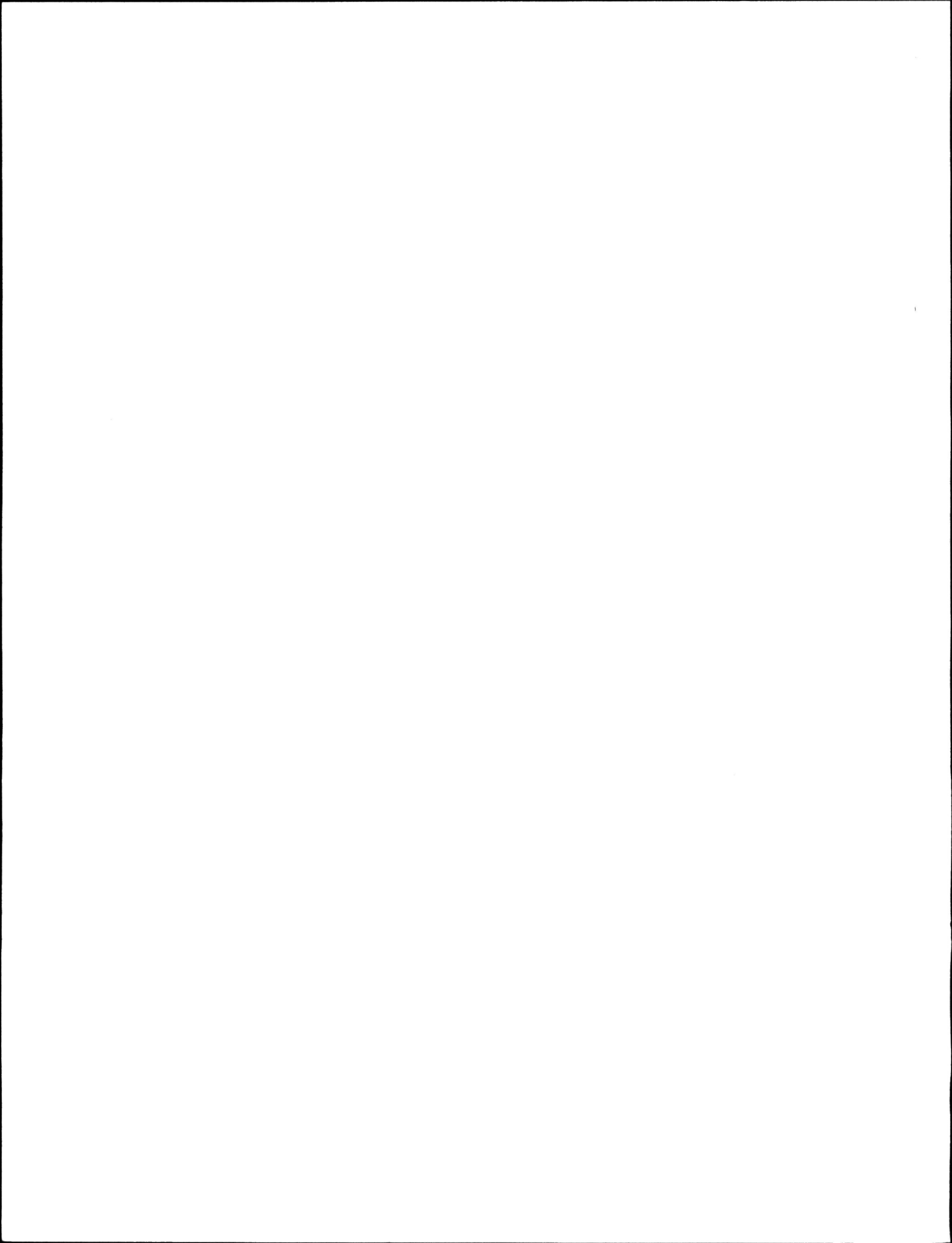
B. APPLICATION OF PROCEDURE

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.

<u>Weight Factor</u>	<u>Type of Station</u>
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

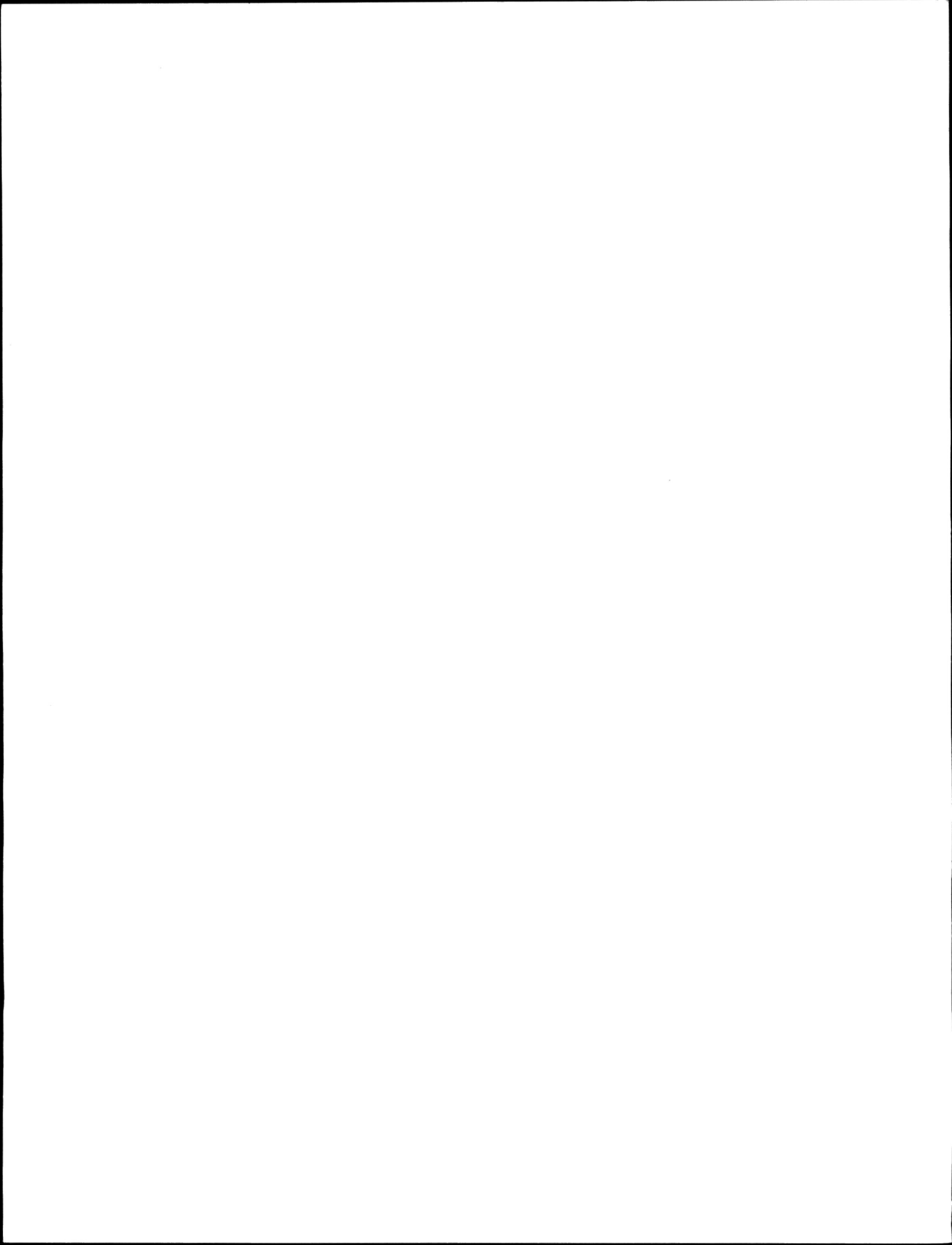
Salary and operation costs exceed those for normal access stations. This is to account for aircraft costs, additional preparation and travelling time on a field trip and maintenance problems in a sparse network located in a harsh environment. Weighting factors have, therefore, been assigned as follows:

<u>Weight Factor</u>	<u>Type of Station</u>
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.

<u>Weight Factor</u>	<u>Type of Station</u>
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



C. SPECIAL CONSIDERATIONS

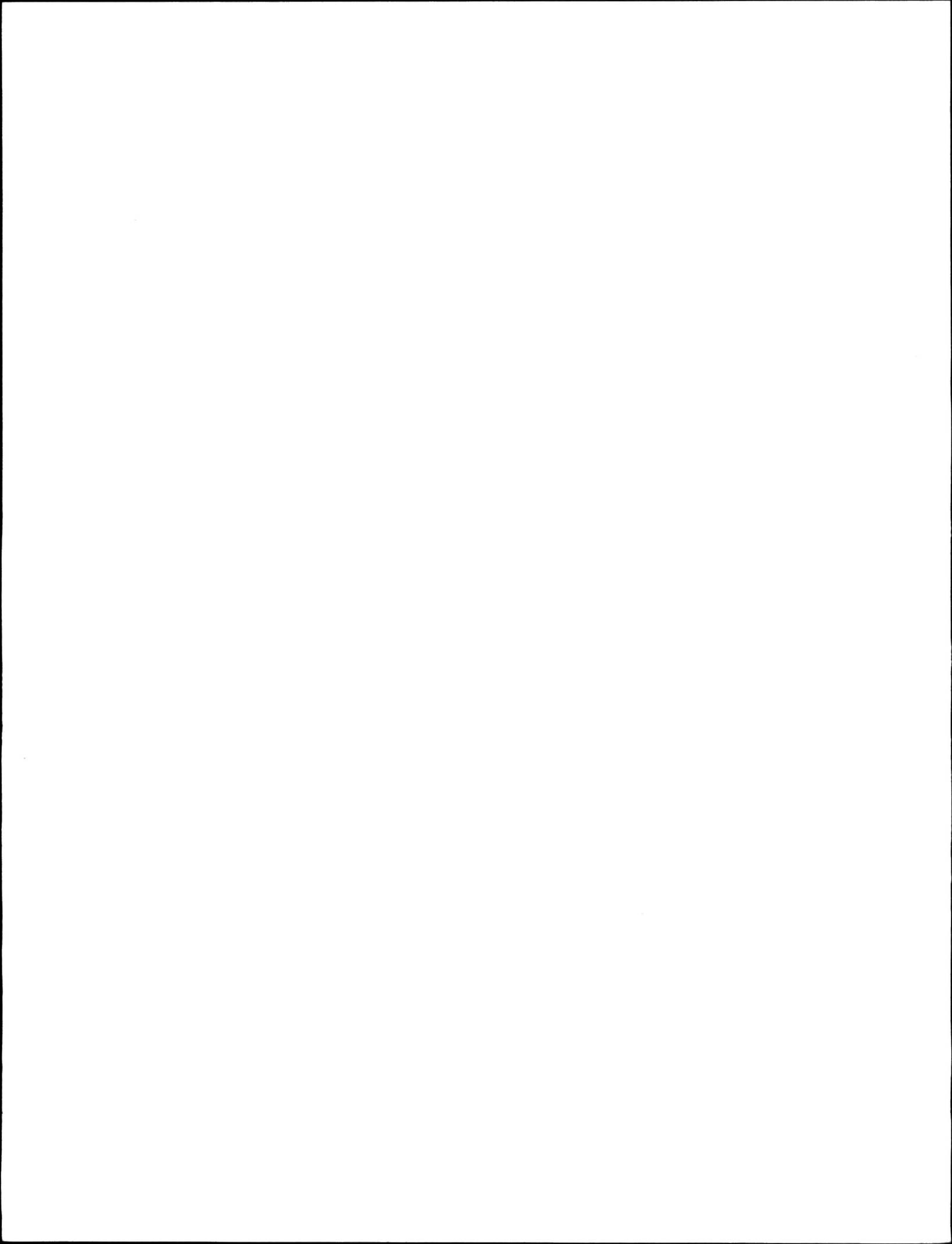
Due to the complexity of the operation it is necessary to apply a number of practical considerations which are described as follows:

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.

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. Although these stations have not been utilized in the costing, they are included in Tables 1, 2 and 3 of the main body of this report. 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 the 365.40



weighted units but comprises 1.80 weighted units. Based upon the unit cost of \$3,969.62 the cost of operating 'Dog River near Fitzgerald' is \$7,145.32. One-half of this amount was added to the share of each party in Table I to obtain the costs shown in 'Summary of Financial Considerations' and Tables 4 and 5 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.

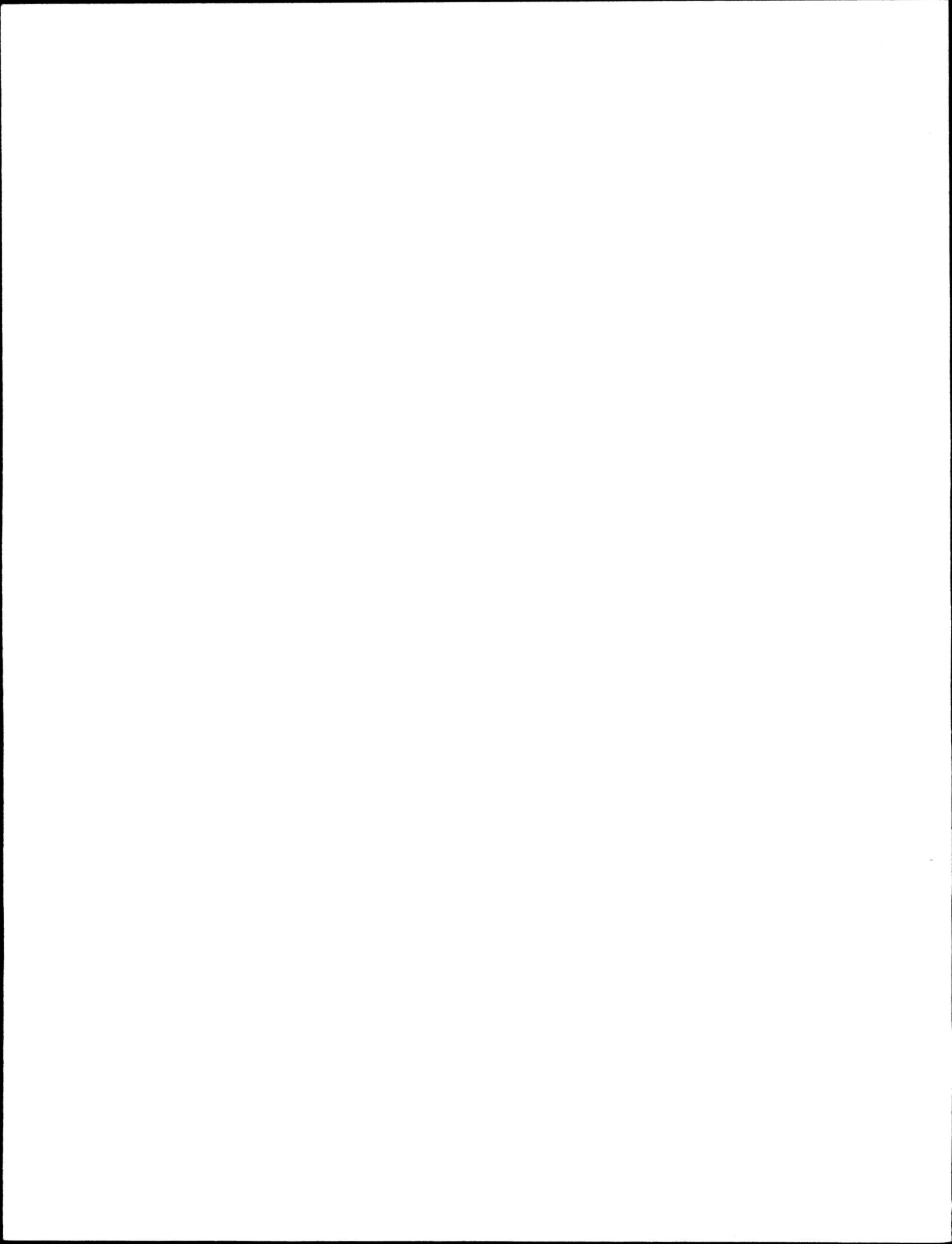


TABLE I

HYDROMETRIC AND SEDIMENT COSTINGS FOR 1987-88 (Stations Operated by WSC-Calgary)

Category	Month	Number of Stations	Weight Factor	Weighted Units	Salaries	O & M	TOTAL	Share	
								Federal	Provincial
<u>FEDERAL</u>									
Normal Access Flow	12	30	1.00	30.00					
	8	63	0.75	47.25					
Normal Access W.L.	12	7	0.40	2.80					
Remote Access Flow	12	2	1.80	3.60					
Sub-total				83.65	221,784	110,275	332,059	332,059	-
<u>FEDERAL-PROVINCIAL</u>									
Normal Access Flow	12	42	1.00	42.00					
	8	141	0.75	105.75					
Normal Access W.L.	8	4	0.25	1.00					
Remote Access Flow	12	4	1.80	7.20					
	8	13	1.50	19.50					
Remote Access W.L.	8	1	0.95	0.95					
Normal Access Sediment	8	2	1.05	2.10					
Remote Access Sediment	8	2	1.25	2.50					
Sub-total				181.00	479,892	238,608	718,500	359,250	359,250
<u>PROVINCIAL</u>									
Normal Access Flow	12	11	1.00	11.00					
	8	83	0.75	62.25					
Normal Access W.L.	12	4	0.40	1.60					
	8	35	0.25	8.75					
Remote Access Flow	8	8	1.50	12.00					
Remote Access W.L.	8	1	0.95	0.95					
Normal Access Sediment	8	4	1.05	4.20					
Sub-total				100.75	267,124	132,817	399,941	-	399,941
TOTAL				365.40	968,800	481,700	1,450,500	691,309	759,191

Unit O&M = \$1,318.28

Unit Salary = \$2,651.34

One Unit = \$3,969.62

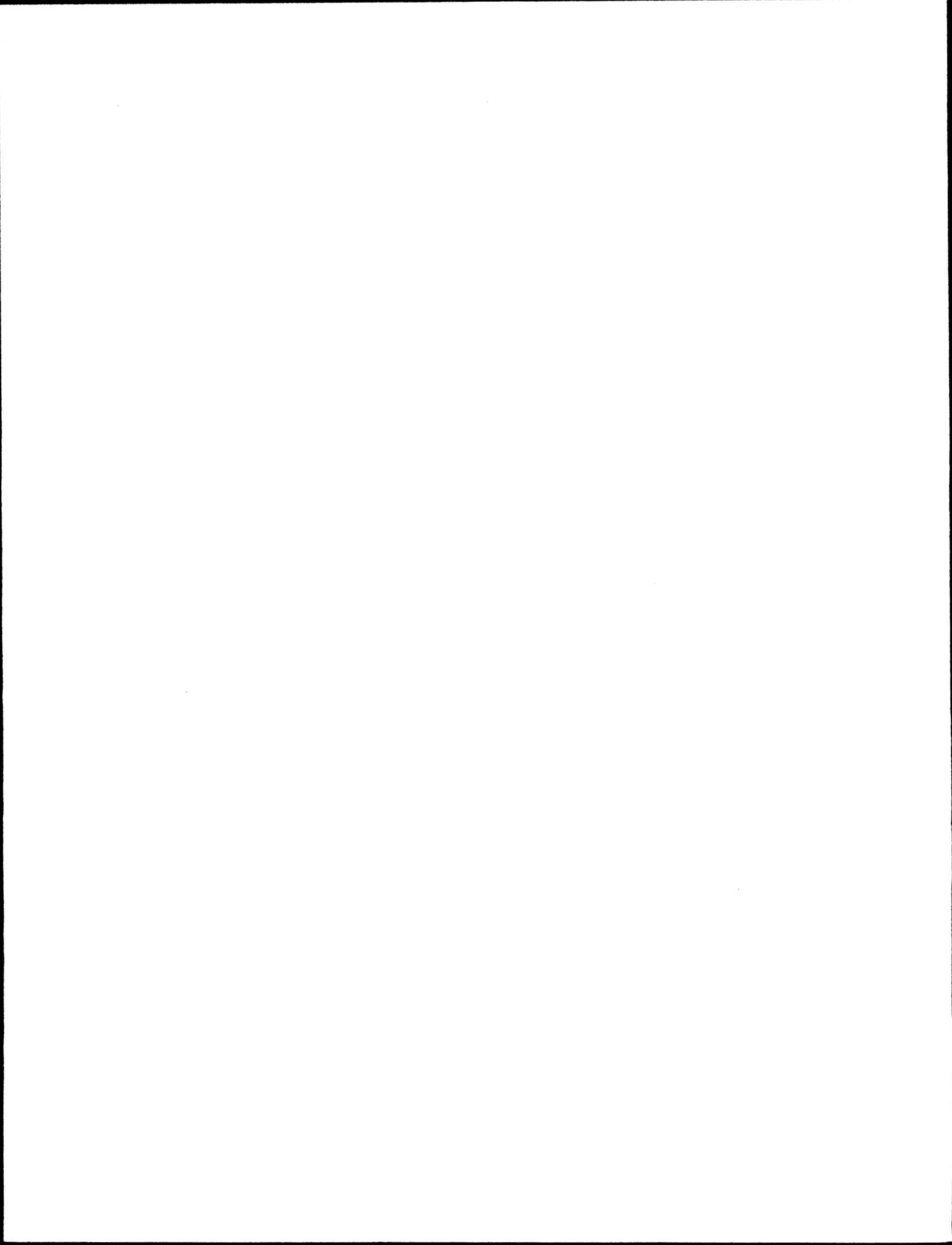


TABLE II
CONSTRUCTION COSTS AT EACH SITE
 1987/88

Station	Construction Cost	Instrumentation		Share	
		Provincial	Federal	Provincial	Federal
Federal-Provincial					
C-1 Embarras River breakthrough to Mamawi Creek (07KF901)	2,073.50	4,636.50	2,136.50		
C-2 Embarras River below the Divergence (07D0003)	<u>2,073.50</u>	<u>4,636.50</u>	<u>2,136.50</u>		
TOTAL F/P NEW CONSTRUCTION COSTS	\$4,147.00	\$9,273.00	\$4,273.00	\$11,346.50	\$6,346.50
M-1 Beaverhill Creek near the Mouth (05EB015)	687.70				
M-2 Bow River below Carseland Dam (05BM002)	569.46				
M-3 Boyer River near Ft. Vermilion (07JF002)	356.70				
M-4 Brown Creek at Forestry Road (05D0004)	2,224.18	2,136.50	2,136.50		
M-5 Clear Brook near Stavely (05AC003)	380.74				
M-6 Driftpile River near Driftpile (07BH003)	626.99				
M-7 Eureka River near Worsley (07FD013)	300.00				
M-8 Haynes Creek near Haynes (05CD006)	737.23				
M-9 Jackpine Creek at Wadlin Lake Road (07JD003)	1,919.37				
M-10 Keg River at Highway 35 (07HF002)	387.74				
M-11 Lobstick River near Styal (07BB003)	440.09				
M-12 Lloyd Creek near Bluffton (05CC009)	232.74				
M-13 Muskwa Creek No. 1 ab Bearhills Lake (05FA014)	340.30				
M-14 Meadow Creek near the Mouth (05AB029)	561.99				
M-15 Meander River above Hutch Lake (07OB005)	857.82				
M-16 Middle Fork Creek near Seebe (05BF017)	921.29				
M-17 Middle Fork Crk. in Cirque nr Seebe (05BF020)	1,235.12				
M-18 Mill Creek near the Mouth (05AA011)	544.59				
M-19 Montagneuse River near Hines Creek (07FD012)	2,965.38				
M-20 Namepi Creek near the Mouth (05EC004)	5,739.65				
M-21 Nordegg River at Sunchild Road (05D0009)	1,169.38				
M-22 Oldman River at Waldron's Corner (05AA023)	1,792.36				
M-23 Ram River near the Mouth (05DC006)	4,362.61				
M-24 Red Deer River above Panther River (05CA004)	2,169.18				
M-25 Simonette River near Goodwin (07GF001)	609.10				
M-26 Streeter Creek Main Stem near Nanton (05AB030)	767.58				
M-27 Todd Creek at Elton's Ranch (05AA006)	441.76		2,500.00		
M-28 Twin Creek near Seebe (05BF018)	929.79				
TOTAL F/P MAINTENANCE COSTS	\$34,270.84	\$2,136.50	\$4,636.50	\$19,271.92	\$21,771.92
Federal					
M-29 Bear Creek. nr International Bdry. (11AA028)	3,707.95				
M-30 Bow River at Banff (05BB001)	2,358.92				
M-31 Bow River near the Mouth (05BN012)	338.75				
M-32 Brewster Creek near Banff (05BB004)	402.54				
M-33 Cascade River above Lake Minnewanka (05BD005)	262.09				
M-34 Coal Lake Reservoir near Wetaskiwin (05FA016)	1,908.37				
M-35 Little Bow River below Travers Dam (05AC012)	3,936.17				
M-36 Milk River Natural Flow Study	416.71				
M-37 Milk River near Pendant d'Oreille (11AA035)	449.10				
M-38 Milk River at Milk River (11AA005)	2,266.26				
M-39 Miners Coulee nr International Bdry. (11AA029)	7,859.75				
M-40 Mountain View Irrigation Dist. Canal (05AD017)	267.03				
M-41 Notikewin River at Manning (07HC001)	945.29				
M-42 Redearth Creek near the Mouth (05BB005)	327.94				
M-43 Smoky River at Watino (07GJ001)	653.01				
M-44 Waterton Lake at Waterton Park (05AD025)	100.00		2,500.00		
M-45 Waterton River at Waterton Park (05AD003)	<u>188.02</u>				
TOTAL F MAINTENANCE COSTS	\$26,387.90		\$2,500.00		\$28,887.90
Provincial					
M-46 Battle River above Pipestone Creek (05FA023)	340.45				
M-47 Baptiste River near the Mouth (05DC012)	1,977.00	4,273.00	2,500.00		
M-48 Bear River near Grande Prairie (07GE005)	522.77				
M-49 Boyer River near Paddle Prairie (07JF004)	975.53				
M-50 Cabin Creek near Seebe (05BF019)	560.78				
M-51 Hines Creek near Fairview (07F0008)	776.82				
M-52 Kirkpatrick Lake Trib. near Spondin (05GA009)	386.74				
M-53 Nose Creek at Calgary (05BH003)	553.34				
M-54 Oldman River near the Mouth (05AG006)	338.75				
M-55 Pembina River near Entwistle (07BB002)	1,363.18				
M-56 South Wabasca Lake near Desmarais (07JA002)	<u>1,200.70</u>				
TOTAL P MAINTENANCE COSTS	\$8,996.06	\$4,273.00	\$2,500.00	\$13,269.06	\$2,500.00
... continued					

C = Construction
M = Maintenance
E = Electrical power installation

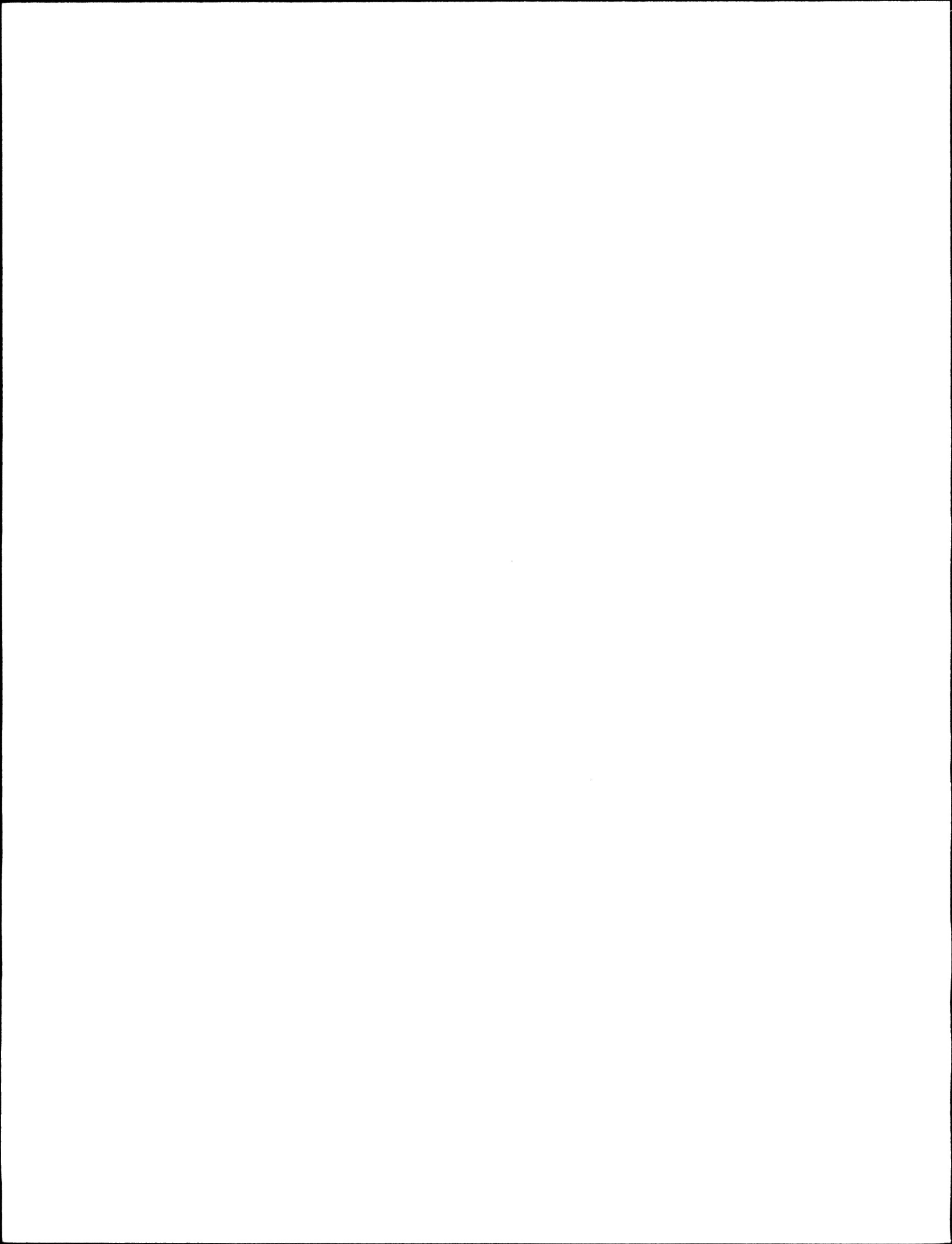
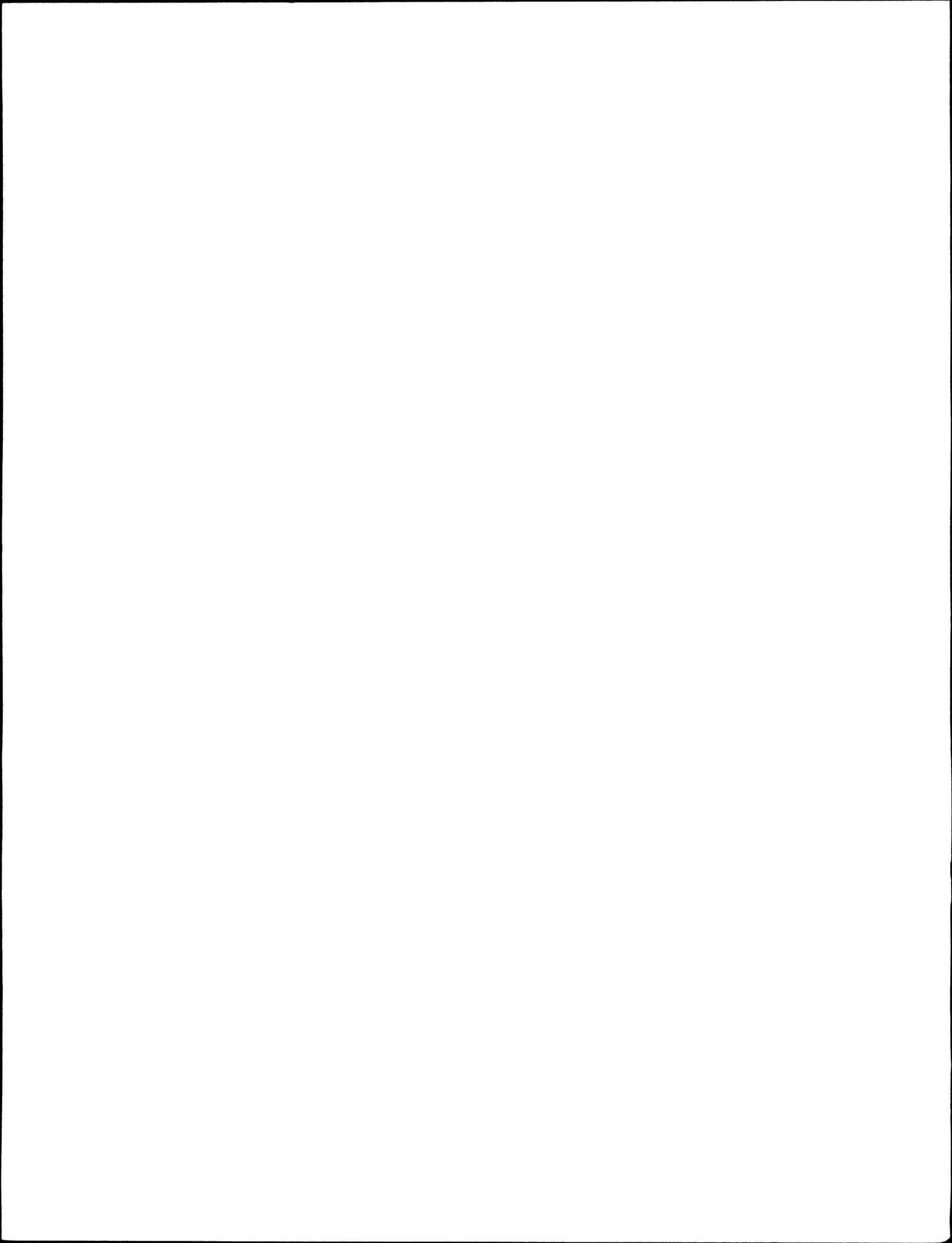


TABLE II (continued)

Station	Construction Cost	Instrumentation		Share	
		Provincial	Federal	Provincial	Federal
Power Installations					
Federal					
E-1 Bow River at Banff (058B001)	2,780.00				
E-2 McLeod River near Rosevear (07AG007)	673.10				
	\$ 3,453.10				\$ 3,453.10
Provincial					
E-3 Pembina River near Entwistle (078B002)	953.82				
	\$ 953.82			\$ 953.82	
SUBTOTAL	\$ 4,406.92			\$ 953.82	\$ 3,453.10
Total Cost of Construction and Maintenance	\$78,208.72	\$15,682.50	\$13,909.50	\$44,841.30	\$62,959.42
Construction of C-1 and C-1 by Province ⁽¹⁾	(4,147.00)	(9,273.00)	(4,273.00)	(11,346.50)	(6,346.50)
1986-87 Provincial Funding of M-4 and M-47 ⁽²⁾				(6,466.50)	
TOTAL COST OF CONSTRUCTION AND MAINTENANCE PROGRAM CONDUCTED BY CANADA	\$74,061.71	\$ 6,409.50	\$ 9,636.50	\$27,028.30	\$56,612.92
<p>(1) Stations C-1 and C-2 were constructed by the Province. Both parties provided bubble gauges, and the Province, as the operating party, provided the water level recording equipment. The cost of shelters are included in the construction cost, but weren't costed to Canada as Alberta had salvaged these from TransAlta Utilities. Therefore, the only recoverable costs from Canada is the amount of \$1,073.50, which is 50% of the total installation cost of \$2,147.00.</p> <p>(2) The maintenance costs shown are in gross dollars, whereas, during 1986-87 the Province paid \$6,466.50 towards the cost of purchasing materials and instrumentation for these two sites.</p>					

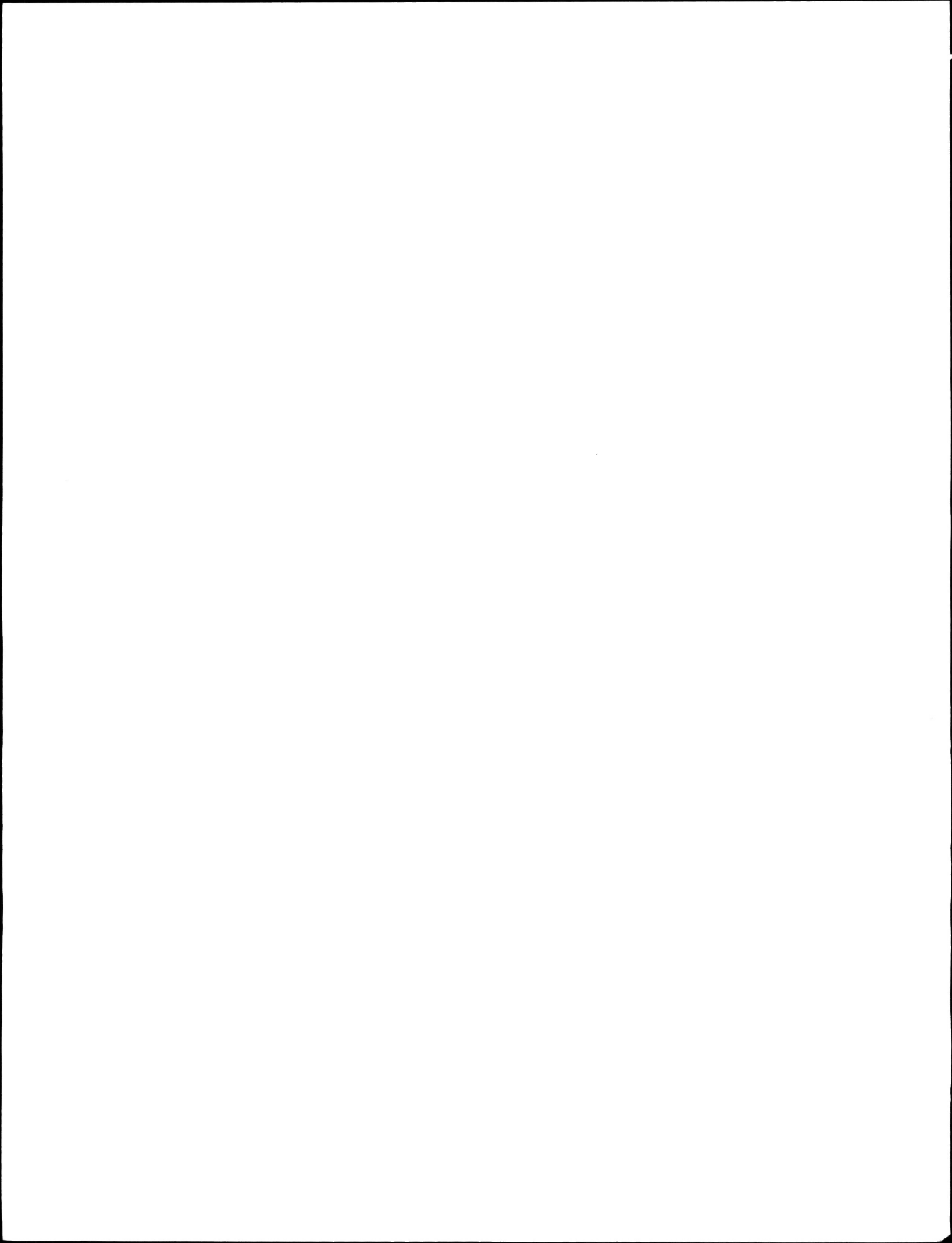
C = Construction
M = Maintenance
E = Electrical power installation



A P P E N D I X "C"

SCHEDULE "D"

1987-88



SCHEDULE "D"

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

ANNUAL PAYMENT FOR 1987/88 TO BE PAID TO CANADA BY ALBERTA:

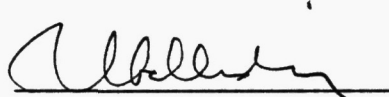
	<u>Operation</u>	<u>Construction</u>	<u>Total</u>
a) Streamflow and water level installations	\$ 771.2K	\$ 54.1K	\$ 825.3K
b) Sediment installations	\$ 32.8K		<u>\$ 32.8K</u>
		ANNUAL PAYMENT	<u>\$ 858.1K</u>

Administrator for Alberta

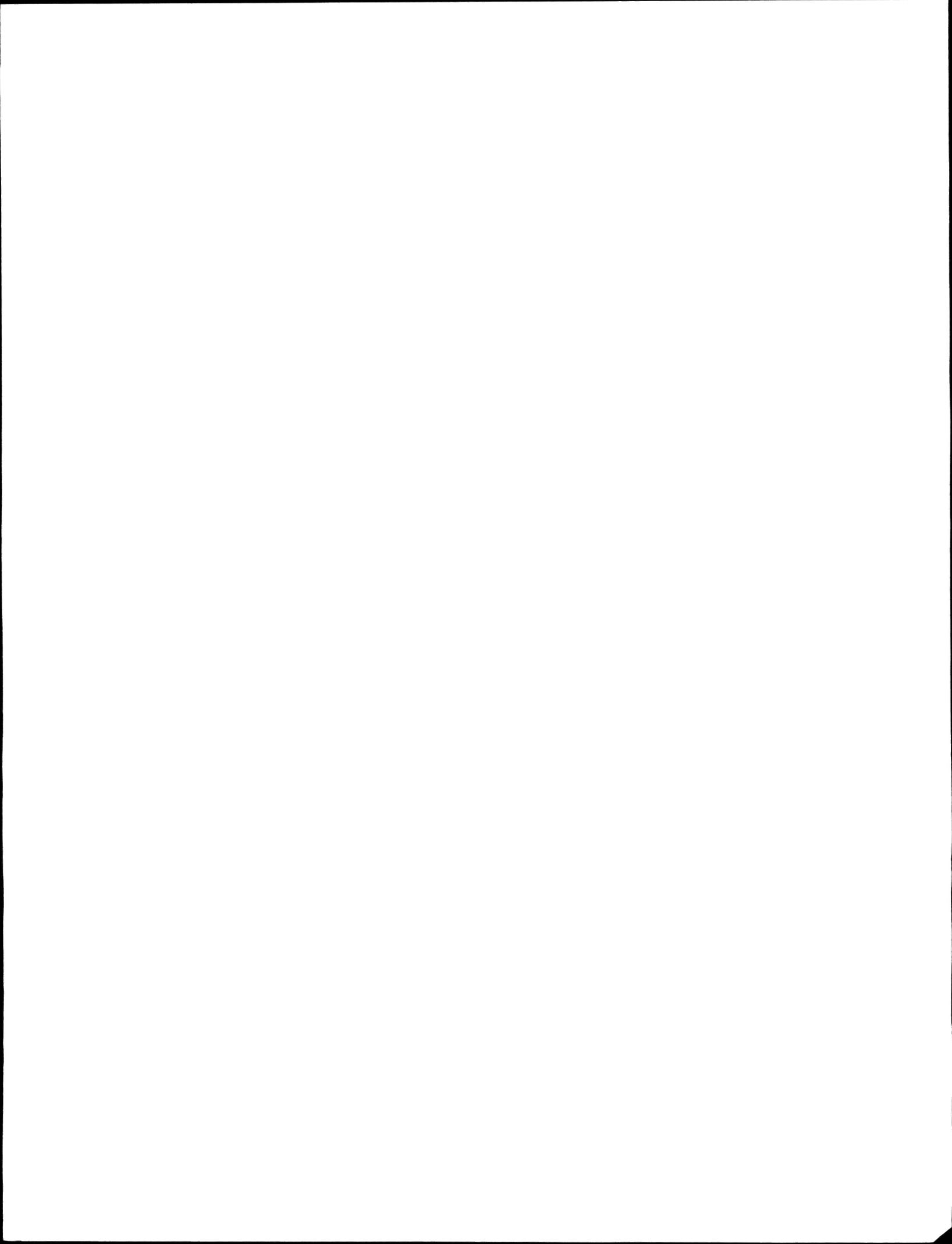

(Signature)

Director
Technical Services Division
Water Resources Management Services
ALBERTA ENVIRONMENT

Administrator for Canada

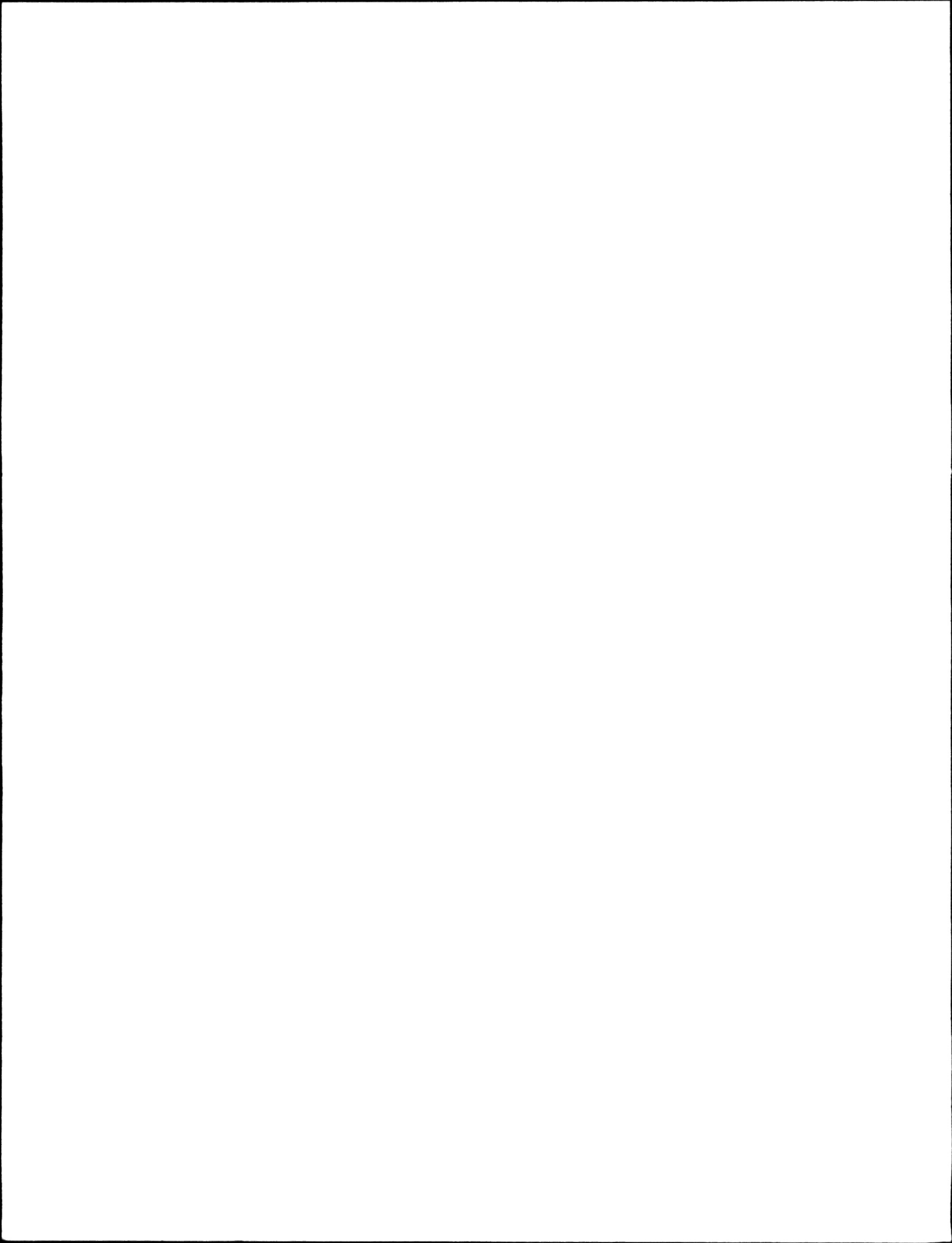

(Signature)

Regional Director
Inland Waters/Lands
ENVIRONMENT CANADA



A P P E N D I X "D"

ESTIMATE OF ALBERTA
ANNUAL PAYMENT FOR 1989-90
BASED ON PROCEDURES
FOR PREPARATION OF
ANNUAL PAYMENTS (SCHEDULE "C")



ESTIMATES FOR APPENDIX "D"
FOR 1989-90

1. Station Units Costs

1.1 Unit Cost for 1987-88	\$ 3,969.62
(Unit Salary = \$2,651.34; Unit O&M \$1,318.28)	
1.2 Estimated Unit Cost for 1988-89	\$ 4,128.40
(Assume 4% Cost Increase)	
1.3 Estimated Unit Cost for 1989-90	\$ 4,293.54
(Assume 4% Cost Increase)	

2. Provincial Station Units (Operated by WSC)

2.1 Station Units in 1988-89

Hydrometric	184.625
Sediment	5.45

2.2 Estimated Provincial Units in 1989-90

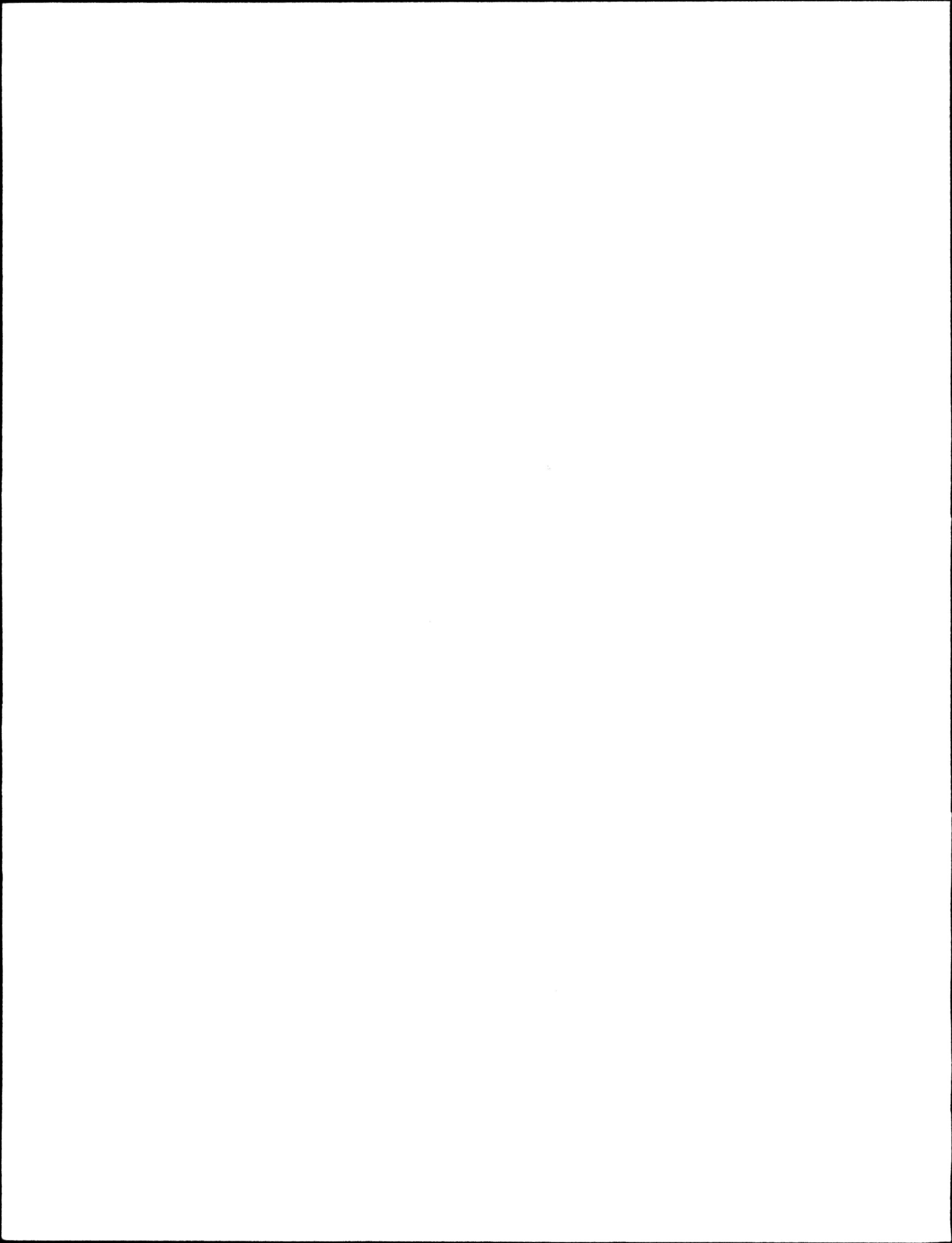
The only known change to the hydrometric network during 1988-89 will be the addition of the FP twelve month discharge station, 'Meander River at Outlet Hutch Lake'. Therefore, provincial station units are estimated to be:

Hydrometric (184.625 existing + 0.50 Meander River)	185.125
Sediment	5.45

3. Alberta Credit for Network Operations (1989/90)

PAD Operations (10.78 x 4,293.54)	<u>\$ 46,284.36</u>
--------------------------------------------	---------------------

(N.B. Previous 1987-88, 8.68 - Chenal des Quatre Fourches at Quatre Fourches (0.95) and Mamawi Lake Channel at Dog Camp (0.95) + Mamawi Lake Channel at Old Dog Camp (1.10) Lake Athabasca at Bustard Island (1.10), Embarras River below Divergence (0.75), Embarras River Breakthrough to Mamawi Creek (0.75), and Riviere des Rochers East of Little Rapids (0.30).



4. Alberta Share of Maintenance & Replacement
of Hydrometric Equipment and Vehicles 1989-90

Total depreciation during 1987-88 was \$101,400 and it is estimated that this amount will remain relatively stable into 1989-90, excluding the possible addition of new DCPs. The total 'Schedule A' hydrometric units for 1989-90 are 357.35 and Alberta's component of this is 185.125 units. Therefore, Alberta estimated 1989-90 Share of Hydrometric Depreciation is:

$$185.125/357.35 \times \$101,400 = \dots\dots\dots \underline{\underline{\$ 52,530.17}}$$

5. Alberta Share of Depreciation Sediment
Equipment 1989-90

It is estimated the Alberta share will remain similar to that of 1987-88

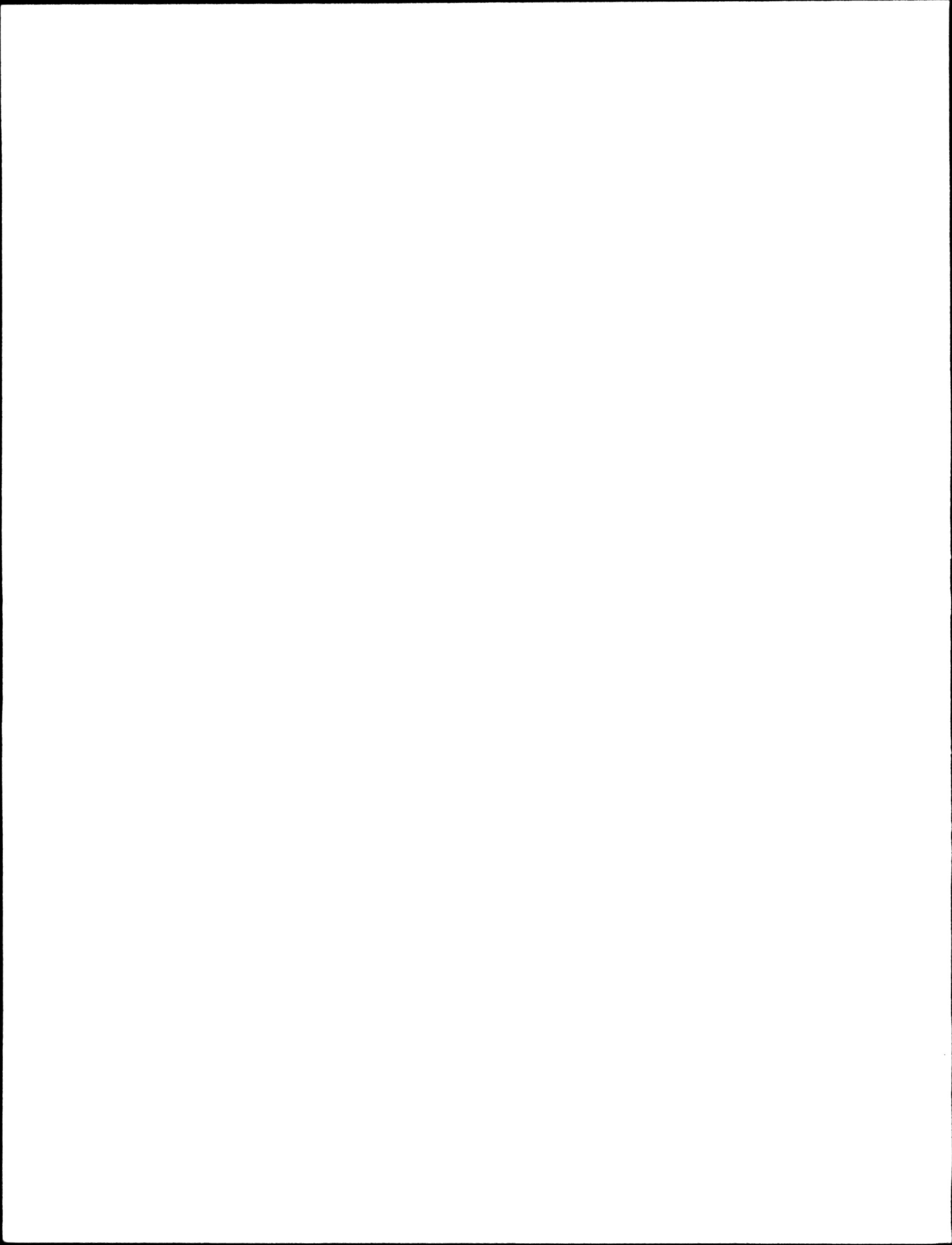
$$\underline{\underline{\$ 148.00}}$$

6. Estimated Alberta Share of Hydrometric
Costs in 1989-90

Hydrometric Network Operations (185.125 x \$4,293.54) =	\$794,841.59
Alberta Credits (Item 3)	(-) 46,284.36
Dog River nr Fitzgerald (0.9 x 4,293.54)	3,864.19
Alberta Share of Hydrometric Depreciation	52,530.17
Alberta Credit for Hydrometric Depreciation (52,530.17/185.125 x 10.78)	(-) <u>3,058.88</u>
	\$801,892.71

7. Estimated Share of Sediment Costs in 1989-90

Sediment Network Operations (5.45 x 4,293.54)	\$ 23,399.79
Sediment Equipment Depreciation	148.00
Analysis Costs for Alberta Sediment Operations ...	<u>200.00</u>
	\$ 23,747.79



8. Total Estimated Alberta Share for 1989/90

Hydrometric	\$801,892.71
Sediment	<u>23,747.79</u>
Sub-Total:	\$825,640.50
Construction Equipment Depreciation: (185.125/357.35)	<u>3,833.56</u>
Sub-Total:	\$829,474.06
Maintenance Estimate (Maintenance estimate is based on upper provincial funding of \$850K).....	<u>20,525.94</u>
Total:	\$850,000.00

