75

ANNUAL REPORT

FOR THE YEAR ENDING MARCH 31, 1976

PRAIRIE PROVINCES WATER BOARD

CANADA ALBERTA SASKATCHEWAN MANITOBA

1975-76

ANNUAL REPORT

FOR THE YEAR ENDING MARCH 31, 1976

PRAIRIE PROVINCES WATER BOARD

403 - 1955 SMITH STREET REGINA, SASKATCHEWAN S4P 2N9

CANADA . ALBERTA . SASKATCHEWAN . MANITOBA

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INTRODUCTION

On October 30, 1969, Canada and the Provinces of Manitoba, Saskatchewan and Alberta entered into an agreement for the apportionment of interprovincial waters in the Prairie Provinces. Under Schedule C of the Master Agreement on Apportionment, the Prairie Provinces Water Board was reconstituted and given the responsibility for the administration of the Agreement as well as other related duties.

Two meetings were held by the Prairie Provinces Water Board during this fiscal year. Both meetings were held in Regina, Saskatchewan. The first, Meeting No. 12, was held on June 10, 1975, and the second, Meeting No. 13, was held on November 13, 1975.

This report summarizes the activities and progress of the Prairie Provinces Water Board for the period from April 1, 1975 to March 31, 1976.

RECONSTITUTION OF BOARD ADMINISTRATION

During the 22 year history of the original Prairie Provinces Water Board, the Engineering Secretary of the Board was a Federal Government PFRA employee who served in this capacity as part of his regular duties. In addition, support staff for studies and office accommodation were provided by the PFRA in Regina at no charge.

Schedule C of the Master Agreement on Apportionment reconstituted the Prairie Provinces Water Board and provides for the necessary Board staff, accommodation and supplies, to be financed by the four governments party to the Agreement. Following the reconstitution of the Board, the members agreed to the establishment of a semi-autonomous Board Secretariat.

The Secretariat is composed of Federal Public Servants that receive direction entirely from the Board and have no working connection with any part of the Federal Government. The Board has direct control over the operation of the Secretariat through approval of an Annual Budget. The Board has Federal spending authority up to an amount equal to the total Board budget with the Provincial Governments' shares recovered after the fiscal year audit is completed.

The effective change of the Board's administration came with the appointment of an Executive Director on June 1, 1972. The Board now operates through the Executive Director and his staff, supported by various committees. The organization chart is shown on page 34.

With the appointment of a permanent staff, the By-laws, and Rules and Procedures came into effect July 1, 1972.

ADMINISTRATIVE DECISIONS

Interim Method of Natural Flow Determination

Quarterly reports on natural flows, consumptive use, and storage changes in the South Saskatchewan River Basin in Alberta were prepared and distributed. A summary table of these quarterly report results is shown on page 20 in this report. The method used by the previous Board to determine natural flows in this basin was continued in order to administer the Apportionment Agreement, and will be used until the results of a current study of all available methods are adopted.

During 1975, the recorded flow of the Saskatchewan and Red Deer Rivers passing the Alberta-Saskatchewan Boundary was 7,070,100 acre-feet. This volume is 90.8% of the calculated natural flow for the same period.

PPWB Common Water Quality - Quantity Monitoring Stations

The Board has designated 11 locations for the establishment of common water quality-quantity monitoring stations to carry out the responsibilities of the PPWB. The Inland Waters Directorate of Environment Canada were requested, and agreed, to ensure monitoring of the flow and quality of the waters at these locations. The map at the end of this Annual Report shows the location of these 11 monitoring stations.

At the November 13, 1975 meeting, the Board changed the designated Qu'Appelle River station from St. Lazare to near Welby because the St. Lazare station is frequently affected by backwater from the Assiniboine River. In addition, the water quality monitoring location on the Churchill River was changed from Island Falls to the outlet of Wasawakasik Lake because of logistics problems of collecting samples at the original site.

Storage of Old PPWB Files

At the November 5, 1974 meeting, the Board members agreed that the old PPWB and SNBB files should be microfilmed in two copies, and the originals stored for a period of three years during which time the Archivists in Alberta, Manitoba,

Saskatchewan and the Glenbow Institute would be invited to inspect the material for possible historic interest and retention by them. Following the three year period, the Board will review the situation and decide on the future disposition of the files.

The files were microfilmed in duplicate during the past year with one copy being retained by the Secretariat and one copy deposited in the PFRA vault. Correspondence has begun with the three Provincial Archivists as to the best method of storing the original documents.

Public Relations

At the June 10, 1975 meeting, the members noted that the Board is now more involved and concerned with the integrated development and use of interprovincial water resources and is making significant progress in this direction. It was felt that the type of work the Board is doing, and the nature of the studies being undertaken by the Board should be conveyed to those involved in the field of water resources. One way to accomplish this would be to prepare a brochure outlining the objectives and responsibilities of the Board and the type of work that the Board is doing, which could be displayed at conferences, conventions, and seminars. The members agreed to the production of a brochure with a printing run of 5,000 copies. The design and printing of the brochure will be completed during the next fiscal year.

Drainage Area Delineation

At the November 5, 1974 meeting of the PPWB, the members agreed to request the PFRA to accept responsibility on a continuing basis for delineation of gross and effective drainage areas above gauging stations on streams covered by the Apportionment Agreement. These delineations are carried out in consultation with the Provinces and Water Survey of Canada to resolve delineation differences and to provide a standardized set of drainage area maps. PFRA accepted the Board's request and work on the assignment has continued during the past fiscal year. A final report is expected late next fiscal year.

BOARD STUDIES

Natural Flow and Streamflow Forecasting Study

This study was carried out under contract to the Board by Water Survey of Canada and was under the direction of the Committee on Hydrology. This was a two-part study. One part was the development of procedures for the determination of natural flow for apportionment purposes, and the other part was the development of procedures to meet streamflow forecasting requirements on interprovincial streams.

The study group started work in mid 1971. As a first step, a thorough review of existing methods of natural flow determination was undertaken. A pilot project was initiated and different computation methods were tested. These included the Project Depletion, Stream Depletion, Rimflow and Consumptive Use methods. The Saskatchewan-Nelson Basin Board approach to natural flows was also considered. Based on these investigations it was concluded that the Project Depletion Method produced the most accurate results, and was easiest to apply, particularly for the South Saskatchewan River Basin. Studies in the remaining basins were not as exhaustive and were primarily involved with assessing the adequacy of the Project Depletion Method in the basin under consideration. The Project Depletion Method was found to be suitable also for the North Saskatchewan, Saskatchewan, Qu'Appelle and Churchill River Basins. In the Qu'Appelle River Basin the Project Depletion Method was supplemented by a computer model which was used primarily to perform the complex routing procedures necessitated by the hydrologic characteristics of the basin.

During this fiscal year the work was completed on the Natural Flow portion of the study with only some final printing remaining. The Committee on Hydrology believes it will now be possible to calculate natural flows in all basins studied in a manner satisfactory to the water managers and hydrologists responsible for the practical administration of the Apportionment Agreement. The accuracy of these methods approximates the accuracy with which the Water Survey of Canada can determine streamflow at apportionment points.

The Committee on Hydrology began the task of reviewing methods and conclusions presented in the reports in order to present recommendations on the results of the study to the Board. The Committee recommendations will be presented to the Board early in the next fiscal year.

The following reports, describing the Natural Flow portion of the study have been prepared or will be completed early in the next fiscal year.

PPWB Report No. 45 - Natural Flow Report Package

A.1	South Saskatchewan River Basin	-	Main Report
A.2	South Saskatchewan River Basin	-	User Manual
B.1	North Saskatchewan River Basin	-	Main Report
C.1	Saskatchewan River Basin	-	Main Report
D.1	Qu'Appelle River Basin	-	Main Report
D.2	Qu'Appelle River Basin	-	User Manual
E.1	Churchill River Basin	-	Main Report
F.1	Natural Flow Network Evaluation		

The Streamflow Forecasting component of the study began by consulting the member agencies as to the types of forecasts being used and the types of forecasts required. On the basis of these consultations and discussions during the study it was established that procedures to perform long range volume or water supply forecasts, as well as real time flow forecasts were desired. For water supply forecasts, a regression approach was adopted using existing regression relationships or new relationships where it was found that better results could be obtained. Real time flow forecasts can be separated into two general categories, basin simulation and flow routing. Basin simulation uses meteorologic data, such as rainfall, to make preliminary estimates of the streamflow at gauging stations in the headwaters. Flow routing requires recorded or simulated upstream discharges which are routed and attenuated to predict discharges at specific downstream points. For the simulation and routing aspects of the forecast procedures complex hydrologic models such as the US Army Corps of Engineers Streamflow Synthesis and Reservoir Regulation (SSARR) Model, the US National Weather Service River Forecasting System (NWSRFS), which is based on the Modified Stanford Model, and the University of British Columbia Basin Simulation Model were obtained. These models were made operational and the model or combination of models giving the best result for a particular basin was used for that basin.

The study group completed their work on streamflow forecasting during the year and are now mainly involved with report writing and publishing. When completed, the reports will outline procedures to meet streamflow forecasting requirements on the five major interprovincial streams.

Early in the next fiscal year the Committee on Hydrology will start digesting the reports and preparing its recommendations to the Board on the Streamflow Forecasting portion of the study.

At the November 5, 1974 meeting of the PPWB, the members agreed to have 150 copies of the reports and user manuals resulting from this study published, and the report be classified as a committee report with initial distribution to the participating agencies, their legislative libraries, and university engineering libraries across Canada, with future releases of the reports to be at the request of a Board member. Distribution of the reports should be completed by the end of the next fiscal year.

Water Quality Objectives Study

This study is being conducted by the Committee on Water Quality and the Secretariat. The goal of the study is to revise the current PPWB Water Quality Objectives where necessary in light of new and more comprehensive data and changed philosophies regarding the setting of interprovincial water quality criteria.

The Committee has reviewed all Federal water quality data available at the 11 PPWB water quality monitoring stations from January 1970 to September 1974 and identified parameters which exceed current PPWB Water Quality Objectives. Investigations aimed at determining the natural background levels of parameters which exceed the objectives and the frequency and significance of exceedence are in progress. To aid in this background study, a copy of the Federal water quality data computer tape for this region was obtained and all historical results obtained near the boundaries have been retrieved and are now being plotted. This historical plot will be completed during the next fiscal year.

Members of the committee are proceeding with a comparison of the PPWB Water Quality Objectives and recent water quality criteria published by the US Environmental Protection Agency.

Water Demand Study

The Board established a Task Force in 1970 to examine the need for, and the Terms of Reference of, a Water Demand (Use) Study for the Prairie Region. The Task Force completed its assignment and submitted a two volume report to the Board, dated January 1972. The report concluded that coordinated planning and development in the water sector requires knowledge of the entire supply and demand picture. The Saskatchewan-Nelson Basin Board investigation provides information as to the engineering

feasibility and costs of providing various levels of supply at many locations throughout the region. However, data concerning demands and uses are lacking. The Task Force report states that this essential element in the planning process should be provided soon, in the form of assessments of the quantities of water, of the specific qualities and price ranges, needed for all major purposes at various times in the future at a number of points in the Prairie Region.

At the December, 1972 meeting of the Saskatchewan-Nelson Basin Board Committee of Ministers in Winnipeg, a summary of the PPWB Task Force's Water Demand Study Report was presented with the comment that the SNBB Report recommended a complementary demand study. The Ministers agreed that a water demand study should be undertaken, however, the consensus was that the study should not be as extensive as outlined in the Task Force Report. They suggested that the work be done in two parts. The first part would consist of a study of water use, and the second part would consist of forecasting water demands.

Following the meeting, the Board recalled the Task Force and requested that it develop a new proposal and cost estimate of a study in accordance with the Ministers' instructions. During January 1973, the individual sector study outlines were reworked by the Task Force.

The Board reviewed the modified proposal at its March 1973 meeting and agreed that a study of past and current water uses was needed, but recognized that this would be but one part of a two-part study. The second part would consist of forecasting short and long term water demands based on alternative futures, and should be the responsibility of the Provinces, to ensure adequate consideration of Provincial policies. The Board recognized that, following the completion of the two-part demand (use) study, a reconciliation of the supply and demand studies will be necessary to support the planning of water resource developments.

The Board forwarded the modified study proposal to the Ministers in March 1973 for their review, concurrence and approval. During fiscal 1973-74, the Ministers of the three Provincial Environment Departments replied that they concurred with the recommendations of the Board for a Water Demand Study. The Minister of Environment Canada agreed with the study in principle, but could not commit financial support for the study during that fiscal year.

Towards the end of the last fiscal year, Environment Canada indicated that monies would be available for this study. Because of the lapse of time since the original study outline and costs were prepared, the Board established a Committee on Water Demand to review the original proposal in light of new data and methodologies, and to prepare a new study outline, schedule, and cost estimate for their consideration. This work was completed near the end of the fiscal year, and will be presented to the Board at their meeting early next fiscal year.

Westward Flowing Streams

The Board recognized that there are streams which cross interprovincial boundaries in an east to west direction and are therefore not covered by the Apportionment Agreement. At the November 1973 meeting of the Board, the members observed that although no problems have arisen, the situation should be considered in view of the probable time involved to develop a satisfactory solution.

It was realized that the problem was two-fold and involved westward flowing streams which are tributary to streams covered by the Apportionment Agreement as well as westward flowing streams not tributary to eastward flowing streams.

The Board asked the Committee on Hydrology, with the aid of the Secretariat, to prepare a report on the number and size of both types of streams, to consider possible apportionment problems, and to speculate on solutions taking into account any relevant precedents.

The subject was discussed at several meetings of the Committee on Hydrology with particular attention given to streams which cross Provincial Boundaries several times along their course. Various methods for apportioning westward flowing watercourses have been reviewed and discussed by the Committee. The Secretariat is presently working on a draft report based on the comments and suggestions of the Committee members.

Administration of Apportionment

At the November 5, 1974 meeting of the PPWB, the members discussed some of the problems that may be encountered in the administration of the Apportionment Agreement when water use increases to the point where apportionment is critical. The Committee on Hydrology was asked to draft Terms of Reference for a study which would address itself to these problems.

The Board, at their meeting of June 10, 1975, approved the draft Terms of Reference for a study and agreed that the Committee on Hydrology should be responsible for the study. The Secretariat, in conjunction with the Committee, has prepared a draft outline of the study and will start the study next fiscal year.

Natural Flow on Small Interprovincial Basins

At the June 10, 1975 meeting of the Board, the members agreed that a continuing study be done by the Secretariat of natural flow computations on small interprovincial river basins not dealt with in the Natural Flow Study. The members provided the Secretariat with a list of small interprovincial streams where more information is needed.

BOARD COMMITTEES

Committee on Hydrology

The Committee on Hydrology met five times during the 1975-76 fiscal year. The meetings were held on May 21, 1975 in Regina, on October 15 and 16, 1975 in Edmonton, on December 9 and 10, 1975 in Regina, on February 10 and 11, 1976 in Calgary, and on March 23 and 24, 1976 in Winnipeg.

The major task of the Committee at these meetings has been the continuing review and direction of the Natural Flow and Streamflow Forecasting studies being done for the Board by the Calgary District Office of Water Survey of Canada. The work on these studies was completed during the fiscal year with some final report printing remaining for next year. During the year the Committee reviewed the methods, results, and recommendations of the Natural Flow Study reports and prepared a report to the Board containing the Committee's comments and recommendations of the study. This report will be presented to the Board early next fiscal year.

Sufficient streamflow data was accumulated over the past two years for the Committee to recommend to the Board the move of the Qu'Appelle River PPWB station from the St. Lazare site to a site near Welby.

In response to the Board's request for the Committee's view on the Board's involvement in groundwater, the Committee on Hydrology submitted the following statement to the Board at their June 10, 1975 meeting.

> The Committee on Hydrology recognizes that groundwater plays an important role in the prairie hydrology. Information on groundwater discharge and recharge areas is largely speculative and is to a large degree based on surface water measurements rather than detailed groundwater data. The Committee also recognizes that groundwater often forms an important source of water supply which may in the future, require apportionment. The Committee therefore recommends that the Board keep informed of progress toward the identification and mapping of major aquifers and groundwater discharge and recharge areas. The Committee considers that groundwater problems are not of sufficient urgency to warrant financial participation by the Board in groundwater studies, but recommends that the Board support efforts directed to acquiring more data on interprovincial groundwater resources.

The Committee has also been involved in the study of Apportionment of Westward Flowing Watercourses. This study is being done by the Committee and the Secretariat. Direction on the study was provided to the Secretariat and interim results were reviewed at several meetings. Starting with the December 1974 meeting, the Committee on Hydrology worked on the preparation of Terms of Reference for a study of the mechanisms required to administer the Apportionment Agreement. These Terms of Reference were approved by the Board at the June 30, 1975 meeting. The Board agreed that the Committee should be responsible for this study and report the results back to the Board by March 1978.

The Committee heard several presentations throughout the year that evoked considerable discussion. Mr. H. S. Loijens of Environment Canada talked on snow water equivalent determination by natural gamma radiation measurement, particularly the results of a test of the method in the Souris River Basin; Mr. A. Coulson of Environment Canada and two members of his staff described and demonstrated WATDOC, a computer based system for the storage and retrieval of textual information related to water resources documents and publications; Mr. A. Coulson also displayed maps, plotted by computer, from satellite remote sensing data; and Drs. D. Gray and D. Male of the University of Saskatchewan discussed the current research program of the Division of Hydrology.

Committee on Water Quality

The Committee on Water Quality met four times during the 1975-76 fiscal year. The meetings were held on April 8, 1975 in Winnipeg, on June 26, 1975 in Regina, on October 21, 1975 in Edmonton, and on February 5, 1976 in Regina.

The members provided the Secretariat with lists of all significant pollution sources on interprovincial rivers, and discussed methods of ensuring an annual update of this information. The Committee reviewed the results of a three month concurrent monitoring program that evaluated the water quality monitoring sites on the Qu'Appelle and Churchill Rivers. They recommended that the PPWB water quality monitoring station on the Qu'Appelle River be moved from St. Lazare to Welby, and the Churchill River station be moved away from the influence of the Island Falls generating station downstream to the outlet of Wasawakasik Lake.

The first radioactivity results were obtained in January. All results were well below present PPWB objectives.

The Committee arranged for a meeting of their personnel involved in water quality computer data files. The meeting was held in January 1976. The purpose of the meeting was to review the compatibility of output, and exchange information on the current status of water quality data storage systems used in the Prairie Provinces.

The members agreed to supply the Secretariat with the location of all regularly sampled water quality stations under their jurisdiction so that an up-to-date and comprehensive network map of the region can be produced. In addition, a start has been made on gathering current effluent data, current sampling and preservation techniques, analytical methodology, and water quality related biological parameters being measured.

The Committee, in conjunction with the Secretariat, have nearly completed the computer plotting of all historical water quality data at or near PPWB monitoring stations from January 1960 to April 1974. When this is completed, the Committee has requested an annual plot of all parameters monitored at all 11 PPWB stations.

At the February meeting, the Committee heard a presentation by Mr. W. Ward of Manitoba's Department of Mines, Resources and Environmental Management, on Manitoba's approach to water quality objectives.

The Committee continued discussions centering on the merits of, and alternatives to the current PPWB Water Quality Objectives. The members are concerned about the philosophy upon which the objectives are based, the values or limits assigned to the parameters, and the frequency and location of sampling. This work will continue with a review of water quality management techniques currently employed by other agencies.

Committee on Interjurisdictional Agreements Administration

At the March 1973 meeting of the Board, the members agreed to establish a committee to develop procedures for the efficient administration of interjurisdictional agreements, and to provide procedural guidelines for various management situations. This committee was instructed to proceed, with particular attention to the Battle Creek and Lodge Creek Basins.

Since that time, the Committee and the Secretariat have completed work on the natural flow at boundary crossings, the uses in each Province, and the identity of all pre-1969 allocations as to owner, date, size and location for the Battle and Lodge

Creek Basins. Provincial streamflow shares have been calculated several different ways and comparisons have been made between supply, shares, allocations, modified allocations, and effect of new storage.

Following completion of the above work, the Committee decided that the base data supplied by the Water Rights Offices and used in the computations, should be reviewed and up-dated and the computations repeated, before recommendations could be submitted to the Board. This review and up-date was in progress in the Provincial Water Rights Offices at the end of the Fiscal year.

Committee on Water Demand

At the November 13, 1975 meeting of the Board, the members agreed to establish a Committee on Water Demand to aid in the development of the study design and to advise the study director throughout the course of the study.

The Committee met three times during the 1975-76 fiscal year. The meetings were held on January 16, 1976 in Regina, on March 2, 1976 in Edmonton, and on March 31, 1976 in Winnipeg.

Draft Terms of Reference for the Committee and for the study were prepared for submission to the Board. Mr. D. Tate was seconded from Environment Canada to work on the study outline. The Committee and Mr. Tate prepared a report containing a study outline, a study schedule, and a study budget for presentation to the Board at their meeting early next fiscal year.

SECRETARIAT

Accommodation and Staff

The Secretariat is still temporarily located in the Income Tax Building pending a move to permanent space in the soon-to-be renovated Motherwell Building in Regina, Saskatchewan.

Mrs. D. V. Bauman, Secretary to the Executive Director, resigned on March 31, 1975. The position was filled by Mrs. J. E. Nelson on May 5, 1975. A temporary employee was hired for several weeks during the summer to assist with microfilming preparation, water quality data preparation, and some SNBB filing cleanup work.

Reports

The Secretariat completed the second draft of a report on Alternate Methods for the Apportionment of Westward Flowing Watercourses, and distributed it to members of the Committee on Hydrology for their comments. In addition, these members were given a first draft of a report that summarized some 28 USA Interstate Water Compacts as background material for the Administration of Apportionment Agreement Study. The Secretariat prepared two reports for the Board. One in conjunction with the Committee on Hydrology summarizing the Natural Flow Study, the other in conjunction with the Committee on Water Demand outlining the Water Demand Study work, schedule, and budget.

Information

During the year progress continued on the update of the SNBB hydrometric data files from 1968 to 1973. To date, about 85 percent of the A, B, and C files are complete.

The Secretariat obtained a computer tape of the Ottawa NAQUADAT water quality computer system relative to the 11 PPWB monitoring stations. When this water quality data is added to the PPWB data files, there will be a complete historical record of all parameters tested at all 11 stations. Current monthly data will be added to these files as it becomes available from the Environment Canada laboratory in Calgary.

Financial

The Secretariat expenditures for fiscal 1974-75 were audited on June 3rd, 1975 by the Audit Services Bureau of the Department of Supply and Services, Canada. The audited expenditures are shown on page 33.

Natural Flow Reports

Water Survey of Canada, Inland Waters Directorate, provides the Board with quarterly reports on the natural flow of the South Saskatchewan River below the junction with the Red Deer River. The natural flows are calculated using the Interim Method of Determination until such time as the Natural Flow Study recommendations are accepted and approved by the Board.

1975 FLOW DATA

NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
(ACRE-FEET)

FOR THE YEAR 1975

SOUTH SASKATCHEWAN RIVER - ALBERTA-SASKATCHEWAN BOUNDARY

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTALS
RECORDED DISCHARGE	157,000	119,000	191,000	333,000	1,000,000	1,950,000	1,100,000	271,000	254,000	263,000	186,000	214,000	6,038,000
CONSUMPTIVE USE	460	320	1,230	16,014	58,473	84,962	216,621	215,533	110,125	10,998	-11,645	0	703,091
CHANGE IN RESERVOIRS	-83,300	-60,900	-67,900	8,030	-31,860	122,810	161,320	60,700	-39,200	-8,900	-13,800	-44,400	2,600
DIVERSION FROM BASIN	0	0	0	0	4,968	16,852	23,066	29,628	17,884	12,369	1,890	0	106,577
NATURAL FLOW ALTA. BDRY.	74,268	78,127	123,859	338,006	1,019,008	2,162,808	1,451,805	593,313	383,173	293,572	179,655	165,074	6,862,668

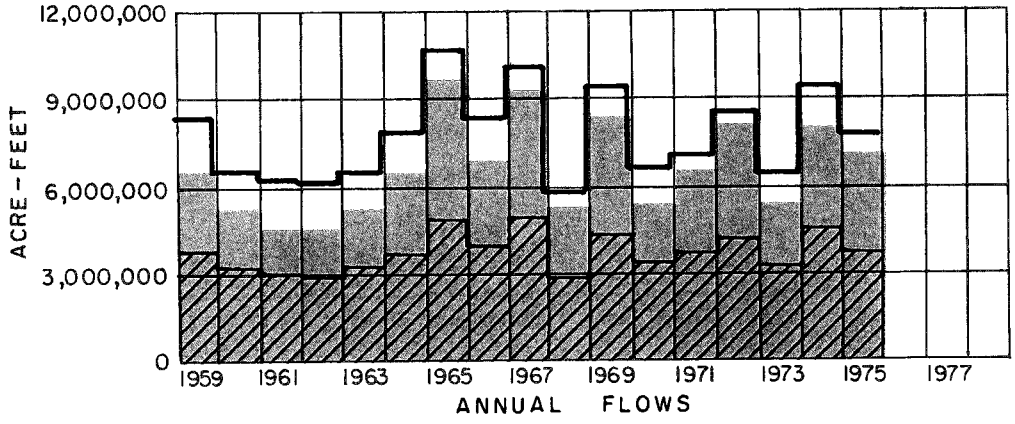
RED DEER RIVER - ALBERTA-SASKATCHEWAN BOUNDARY

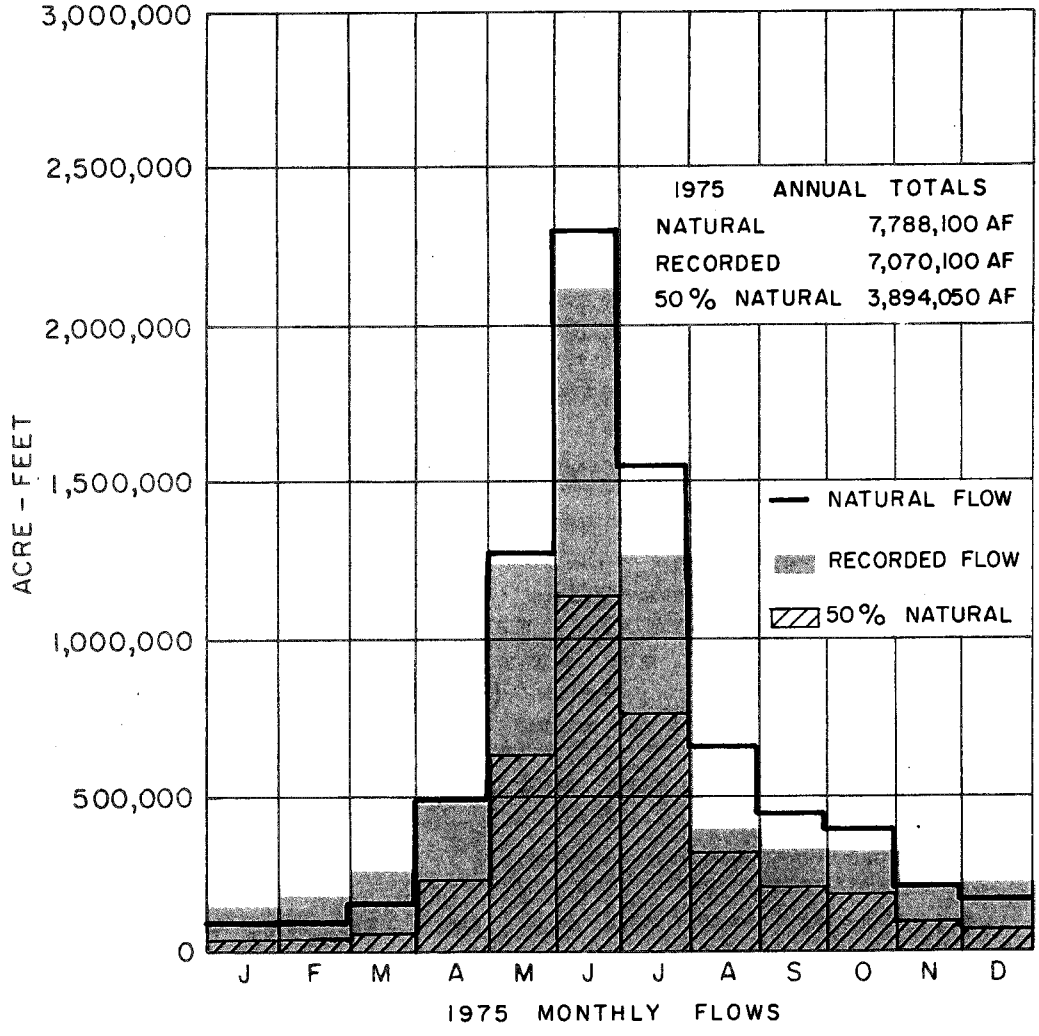
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTALS
RECORDED DISCHARGE	14,800	12,100	14,200	156,000	243,000	162,000	146,000	118,000	70,100	57,700	26,000	12,200	1,032,100
CONSUMPTIVE USE	0	0	0	0	0	0	0	0	0	0	0	0	0
DIVERSION FROM BASIN	0	0	0	0	-4,968	-16,852	-23,066	-29,628	-17,884	-12,369	-1,890	0	-106,657
NATURAL FLOW ALTA. BDRY.	14,800	12,100	14,200	156,000	238,479	145,652	124,266	88,710	51,531	43,728	23,804	12,175	925,445

SOUTH SASKATCHEWAN RIVER - BELOW JUNCTION WITH RED DEER

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTALS
RECORDED DISCHARGE	171,800	131,100	205,200	489,000	1,243,000	2,112,000	1,246,000	389,000	324,100	320,700	212,000	226,200	7,070,100
NATURAL FLOW	89,068	90,227	138,059	494,006	1,257,487	2,308,460	1,576,071	682,023	434,704	337,300	203,459	177,249	7,788,113

QUANTITIES SHOWN IN TABLE HAVE BEEN ROUTED TO ALBERTA BOUNDARY





SOUTH SASKATCHEWAN RIVER NEAR ALBERTA-SASKATCHEWAN BOUNDARY
(INCLUDES RED DEER RIVER)

RECORDED DISCHARGE - SUMMARY
SELECTED INTERPROVINCIAL STREAMS
(ACRE-FEET)

FOR THE YEAR 1975

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV		
BEAVER RIVER - ALBERTA-SASKATCHEWAN BOUNDARY (AT COLD LAKE RESERVE)												
13,500	12,700	13,000	88,300	180,000	123,000	180,000	84,700	75,800	42,100	23,800	17,400	854,000
NORTH SASKATCHEWAN RIVER - ALBERTA-SASKATCHEWAN BOUNDARY (NEAR DEER CREEK)												
270,000	217,000	234,000	459,000	604,000	460,000	443,000	303,000	266,000	209,000	158,000	248,000	3,870,000
BATTLE RIVER - ALBERTA-SASKATCHEWAN BOUNDARY (NEAR UNWIN)												
3,400	2,670	3,230	35,000	111,000	35,100	25,500	10,700	5,150	5,030	4,580	2,360	244,000
CHURCHILL RIVER - SASKATCHEWAN-MANITOBA BOUNDARY (NEAR SANDY BAY)												
1,830,000	1,840,000	2,060,000	2,070,000	2,280,000	2,160,000	2,170,000	2,320,000	2,230,000	2,100,000	1,830,000	1,880,000	24,800,000
SASKATCHEWAN RIVER - SASKATCHEWAN-MANITOBA BOUNDARY (NEAR MANITOBA BOUNDARY)												
1,070,000	1,240,000	1,310,000	1,340,000	2,310,000	2,070,000	2,040,000	1,200,000	875,000	872,000	863,000	740,000	15,900,000
CARROT RIVER - SASKATCHEWAN-MANITOBA BOUNDARY (NEAR TURNBERRY)												
5,840	4,160	4,120	41,700	245,000	176,000	94,100	25,500	23,300	33,500	15,100	4,180	674,000
RED DEER RIVER - SASKATCHEWAN-MANITOBA BOUNDARY (NEAR ERWOOD)												
4,790	4,320	4,860	108,000	239,000	107,000	27,600	6,500	11,900	21,500	8,550	3,500	548,000
ASSINIBOINE RIVER - SASKATCHEWAN-MANITOBA BOUNDARY (AT KAMSACK)												
1,770	1,410	1,270	94,800	194,000	40,900	14,500	3,200	2,850	2,940	3,590	1,810	363,000
QU'APPELLE RIVER - SASKATCHEWAN-MANITOBA BOUNDARY (NEAR WELBY)												
20,900	16,900	16,100	65,000	171,000	96,400	49,100	32,000	34,700	32,400	27,300	16,600	578,000

APPENDIX

APPENDIX INDEX

PPWB MEMBERS

Chairman	Dr. J. S. Tener	Assistant Deputy Minister Environmental Management Service Environment Canada
	Mr. W. B. Thomson	Director Prairie Farm Rehabilitation Administration Department of Regional Economic Expansion
	Mr. R. E. Bailey	Special Projects Director Department of the Environment Province of Alberta
	Mr. S. R. Blackwell	Chief, Water Management Service Department of the Environment Province of Saskatchewan
	Mr. T. E. Weber	Senior Assistant Deputy Minister Manitoba Department of Mines, Resources and Environmental Management
Secretary	Mr. R. J. Wettlaufer	Operations Engineer PPWB Secretariat

ALTERNATE MEMBERS

Mr. E. F. Durrant	Regional Director, Western & Northern Region Inland Waters Directorate Environmental Management Service Environment Canada
Mr. W. M. Berry	Chief Engineer Prairie Farm Rehabilitation Administration Department of Regional Economic Expansion
Mr. W. Solodzuk (May 1970-October 1975)	Deputy Minister Alberta Department of the Environment
Mr. P. G. Melnychuk (Appointed October 1975)	Assistant Deputy Minister Environmental Engineering Support Services Alberta Department of the Environment
Mr. D. L. MacLeod	Director, Hydrology Branch Water Management Service Saskatchewan Department of the Environment
Mr. N. Mudry	Director of Planning Water Resources Branch Manitoba Department of Mines, Resources and Environmental Management

COMMITTEE ON HYDROLOGY

Terms of Reference

At the request of, and under the direction of the PPWB, the Committee on Hydrology shall investigate, oversee, review, report and recommend on matters pertaining to hydrology of interprovincial or interjurisdictional basins.

The Committee may consider such things as natural flow; forecasting; network design; collection, processing and transmission of data; basin studies and other items of interprovincial interest involving hydrology.

Members

D. J. Berry Chairman	Executive Director Prairie Provinces Water Board Secretariat
D. A. Davis	Water Survey of Canada Environment Canada
R. B. Godwin	Prairie Farm Rehabilitation Administration Department of Regional Economic Expansion
G. H. MacKay	Water Resources Branch Manitoba Department of Mines, Resources and Environmental Management
D. L. MacLeod	Hydrology Branch Saskatchewan Department of the Environment
R. K. Deeprose	Technical Services Division Alberta Department of the Environment
H. F. Cork	Atmospheric Environment Service Environment Canada

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R. J. Wettlaufer Secretary	Operations Engineer PPWB Secretariat

COMMITTEE ON WATER QUALITY

Terms of Reference

At the request of, and under the direction of the Prairie Provinces Water Board, the Committee on Water Quality shall investigate, oversee, review, report and recommend on matters pertaining to water quality of interprovincial and interjurisdictional basins.

Carrying out the above responsibilities may include such things as natural quality assessment; quality forecasting; network design; processing and dissemination of data; determination of implications of proposed projects that may significantly alter the water quality of interprovincial streams; consideration of special problems; establishment of procedures for emergency situations; and other items of interprovincial interest involving water quality.

Members

D. J. Berry Chairman	Executive Director Prairie Provinces Water Board Secretariat
P. Fee (Jan. 1974–June 1975)	Water Quality Branch Environment Canada
K. W. Reid (appointed June 1975)	Water Quality Branch Environment Canada
R. B. Godwin	Prairie Farm Rehabilitation Administration Department of Regional Economic Expansion
J. N. Warrener	Environmental Protection Branch Manitoba Department of Mines, Resources and Environmental Management
R. A. McDonald	Water Pollution Control Branch Saskatchewan Department of the Environment
P. G. Shewchuk	Standards and Approvals Division Alberta Department of the Environment

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E. W. Allison Secretary	Water Quality Analyst PPWB Secretariat

COMMITTEE ON INTERJURISDICTIONAL AGREEMENTS ADMINISTRATION

Members

D. J. Berry Chairman	Executive Director Prairie Provinces Water Board Secretariat
E. F. Durrant	Environmental Management Service Environment Canada
E. L. Jones	Water Rights Branch Saskatchewan Department of the Environment
B. Boyson	Water Resources Division Alberta Department of the Environment

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R. J. Wettlaufer Secretary	Operations Engineer PPWB Secretariat

COMMITTEE ON WATER DEMAND

Terms of Reference

The Committee on Water Demand shall be composed of one member representing each of the Provinces of Alberta, Saskatchewan and Manitoba, two members representing Canada, and the Executive Director of the Prairie Provinces Water Board who shall be Chairman. The Committee shall function during the life of the Water Demand Study in the Saskatchewan-Nelson Basin and shall have the responsibility of providing technical guidance and financial management for the Water Demand Study on behalf of the Board.

The Water Demand Study shall be divided into two parts. Part One shall be done under the auspices of the Prairie Provinces Water Board and consist of a study of water demand based on current needs and historical uses in accordance with the Terms of Reference for Part One. Part Two may be done at a later date and would provide estimates of future water demands.

The Committee shall: prepare draft Terms of Reference for Part One of the Water Demand Study for consideration of the Board; develop detailed study outlines for each study sector and make recommendations to the Board thereon; be responsible upon receiving Board approval to proceed with Part One, for hiring a study director, preparing his Terms of Reference and directing his work; ensure a final report for Part One is prepared in accordance with a format and time schedule to be established by the Board; upon completion of Part One, recommend Terms of Reference for Part Two to the Board.

Throughout Part One of the study the Committee shall: monitor and oversee the technical and financial aspects of the study as directed by the Board; ensure that there is no duplication of studies; report regularly to the Board on the progress of the study.

Members

D. J. Berry Chairman	Executive Director Prairie Provinces Water Board Secretariat
E. Caligiuri	Prairie Farm Rehabilitation Administration Department of Regional Economic Expansion
V. M. Austford	Water Resources Branch Manitoba Department of Mines, Resources and Environmental Management
R. L. Kellow	Policy, Planning and Research Branch Saskatchewan Department of the Environment
T. V. Mussivand	Planning Division Alberta Department of the Environment

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E. W. Allison Secretary	Water Quality Analyst PPWB Secretariat

Note: Committee established by Prairie Provinces Water Board November 13, 1975.

STATEMENT OF EXPENDITURES

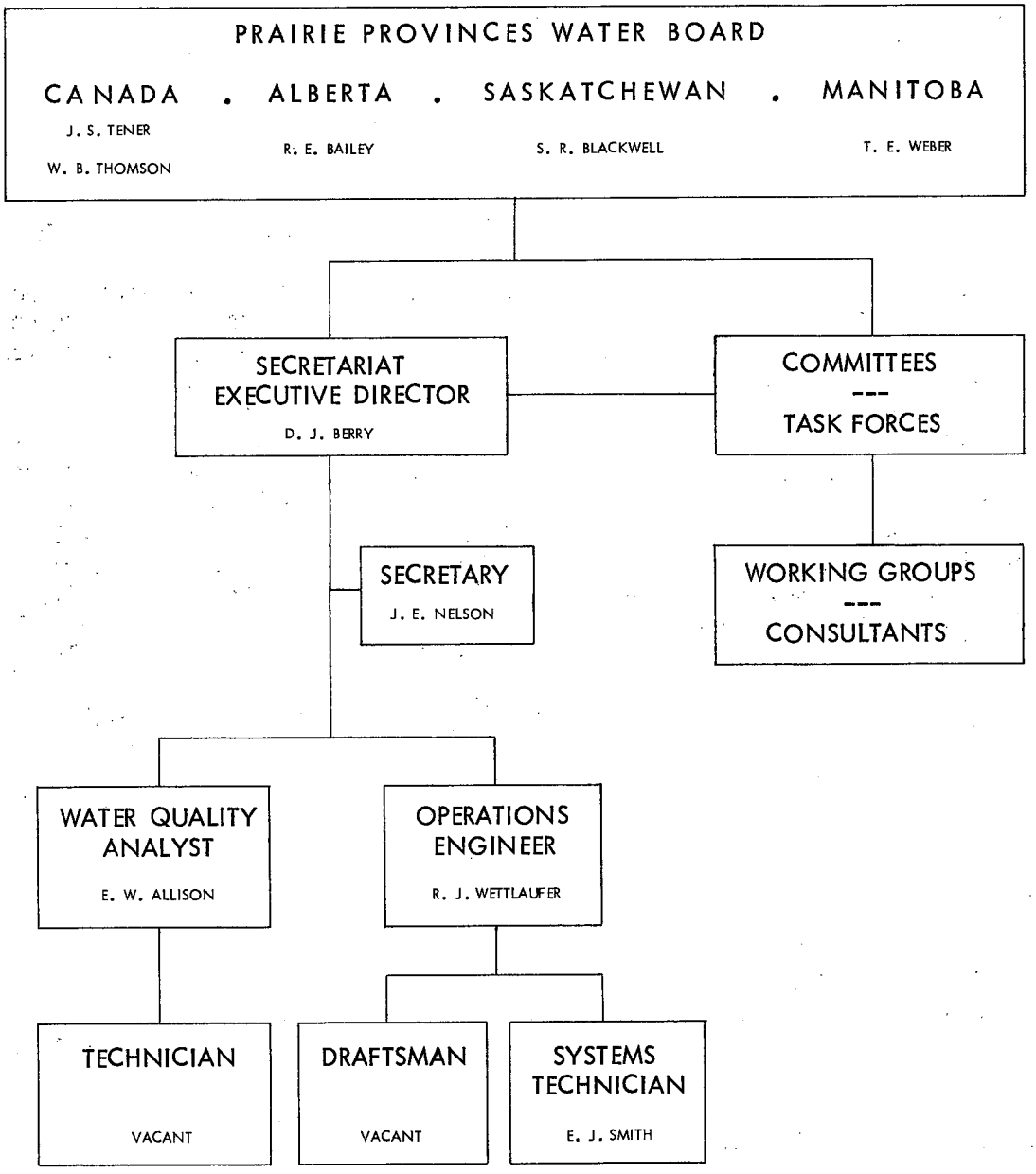
	1973-74	1974-75	1975-76
Natural Flow and Forecasting Study	$83,970.39	$111,180.22	$20,000.00
Natural Flow Reporting	2,900.00	2,900.00	5,300.00
Personnel	53,658.72	73,584.77	87,992.74
Transportation and Communication	2,624.79	4,179.74	5,889.42
Removal Expenses	0	2,181.31	0
Information, Printing	2,726.79	1,720.70	3,059.81
Admin. and Audit Services	1,150.00	1,512.14	1,465.22
Office Rental	6,678.26	6,155.08	10,974.48
Computer Rental	3,121.26	4,695.04	6,861.24
Materials and Supplies	1,022.91	687.50	1,193.95
Acquisition, Machinery and Equipment	277.00	736.05	859.29
Maintenance, Office Machines	0	0	180.47
Miscellaneous	143.70	14.23	18.58
	$158,273.82	$209,546.78	$143,805.20
	(audited)	(audited)	(audited)

Shares -

Canada	$ 79,136.91	$104,773.40	$ 71,902.60
Province of Alberta	26,378.97	34,924.46	23,967.53
Province of Saskatchewan	26,378.97	34,924.46	23,967.53
Province of Manitoba	26,378.97	34,924.46	23,967.53

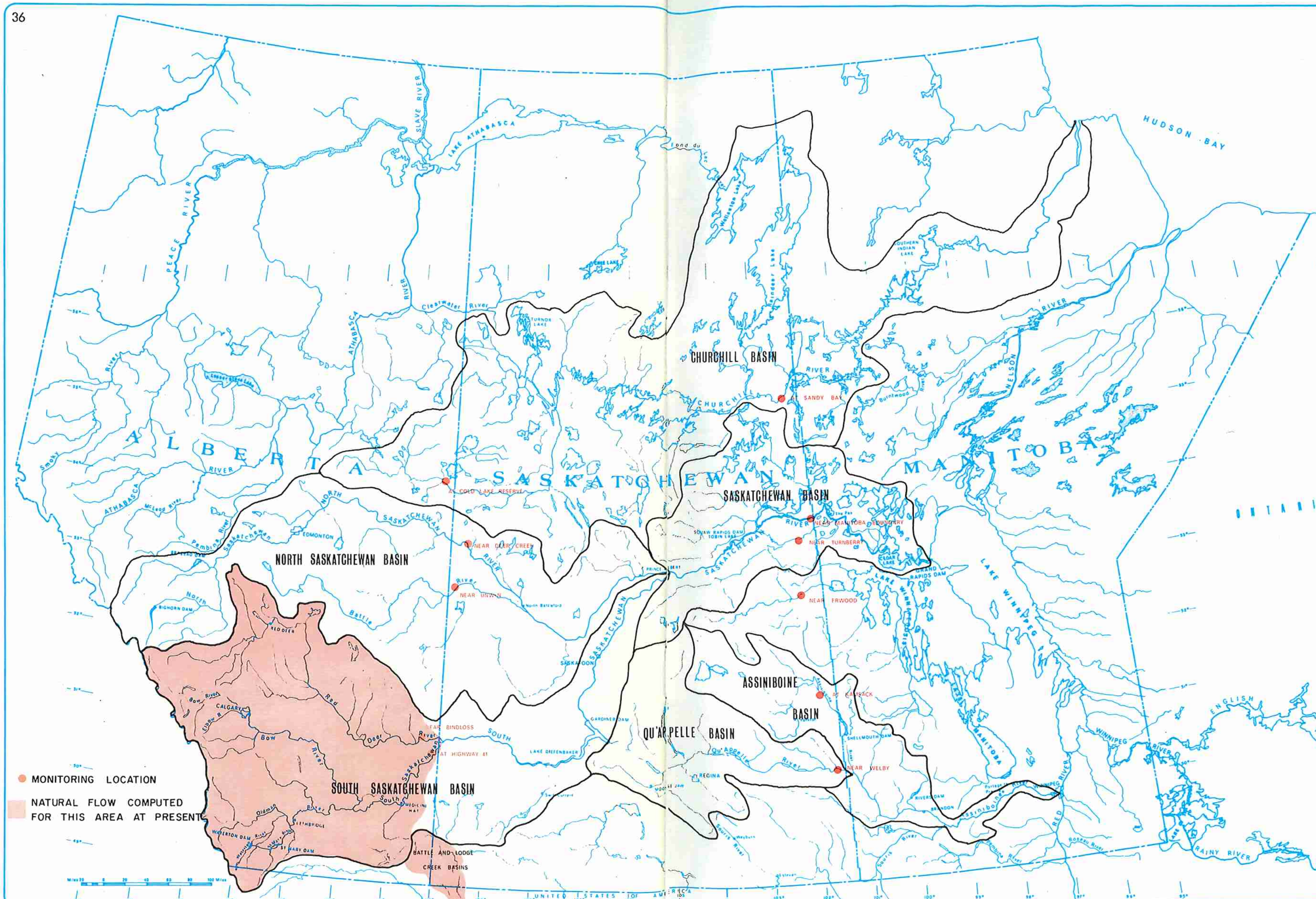
Previous Board Expenditures

Fiscal 1970 - 1971	$ 0
Fiscal 1971 - 1972	$105,174.12
Fiscal 1972 - 1973	$136,816.45



ORGANIZATION CHART
MARCH 1976

MAP


HUDSON BAY
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
CHURCHILL BASIN
SASKATCHEWAN BASIN
NORTH SASKATCHEWAN BASIN
SOUTH SASKATCHEWAN BASIN
ASSINIBOINE BASIN
QU'APPELLE BASIN
BATTLE AND LODGE CREEK BASINS
LAKE ATHABASCA
SLAVE RIVER
PEACE RIVER
ATHABASCA RIVER
Clearwater River
CHURCHILL RIVER
NELSON RIVER
LAKE WINNIPEG
LAKE MANITOBA
LAKE WINNIPEGOSIS
EDMONTON
CALGARY
REGINA
SASKATOON
AT SANDY BAY
AT COLD LAKE RESERVE
NEAR DEER CREEK
NEAR UNWIN
NEAR MANITOBA BOUNDARY
NEAR TURNBERRY
NEAR ERWOOD
NEAR WELBY
NEAR BINDLOSS
AT HIGHWAY 41
GRAND RAPIDS DAM
GARDINER DAM
LAKE DIEFENBAKER
RED RIVER
WINNIPEG RIVER
ENGLISH R.
RAINY RIVER
UNITED STATES OF AMERICA
MONITORING LOCATION
NATURAL FLOW COMPUTED FOR THIS AREA AT PRESENT