

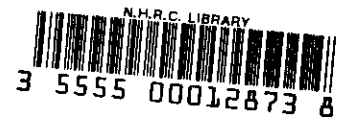
**ANNUAL REPORT  
TO  
DECEMBER 31, 1986  
Technical Report A.3**

Prepared for:

CANADA-SASKATCHEWAN SOUTH SASKATCHEWAN RIVER BASIN STUDY

Prepared by:

CANADA-SASKATCHEWAN SOUTH SASKATCHEWAN RIVER BASIN STUDY  
Moose Jaw, Saskatchewan



ANNUAL REPORT  
TO  
DECEMBER 31, 1986

CANADA - SASKATCHEWAN  
SOUTH SASKATCHEWAN RIVER BASIN STUDY

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August 14, 1987

The Honourable Tom McMillan  
Minister of the Environment  
Government of Canada  
Room 582, Confederation Building  
House of Commons  
Ottawa, Ontario  
K1A 0A6

The Honourable H.J. Swan  
Minister Responsible for the  
Saskatchewan Water Corporation  
Room 302  
Legislative Building  
Regina, Saskatchewan  
S4S 0B3

Dear Mr. McMillan and Mr. Swan:

We are pleased to present the first annual progress report of the Study Board for the Canada-Saskatchewan South Saskatchewan River Basin Study. This report describes the progress made since the signing of the Agreement on May 16, 1986. Expenditures are outlined for both the calendar year of 1986 and to March 31, 1987, to correspond to fiscal years used by Saskatchewan Water Corporation and Environment Canada, respectively.

Included among the major achievements during 1986 were the establishment of a Study Office in Moose Jaw, the formation of an Advisory Committee and four Technical Committees, the approval of financial and administrative procedures, the initiation of a Public Involvement Program and the development of a Study Plan.

Expenditures for the period to December 31, 1986 totalled \$93,000. Of this amount 75 percent was required to establish and maintain Study Office activities. Technical studies in water quantity, quality and use, as well as public involvement activities will become more significant in subsequent years of the Study.

The attention given to organization and planning during this first year has established clear financial responsibilities in developing a Basin Framework Plan. This was felt to be important, given the need to exercise fiscal restraints at both levels of government.

Yours sincerely,



R.A. Halliday  
Study Board Co-Chairman  
Environment Canada



R.L. Kellow  
Study Board Co-Chairman  
Saskatchewan Water Corporation

RAH/RLK/lc  
Enclosure

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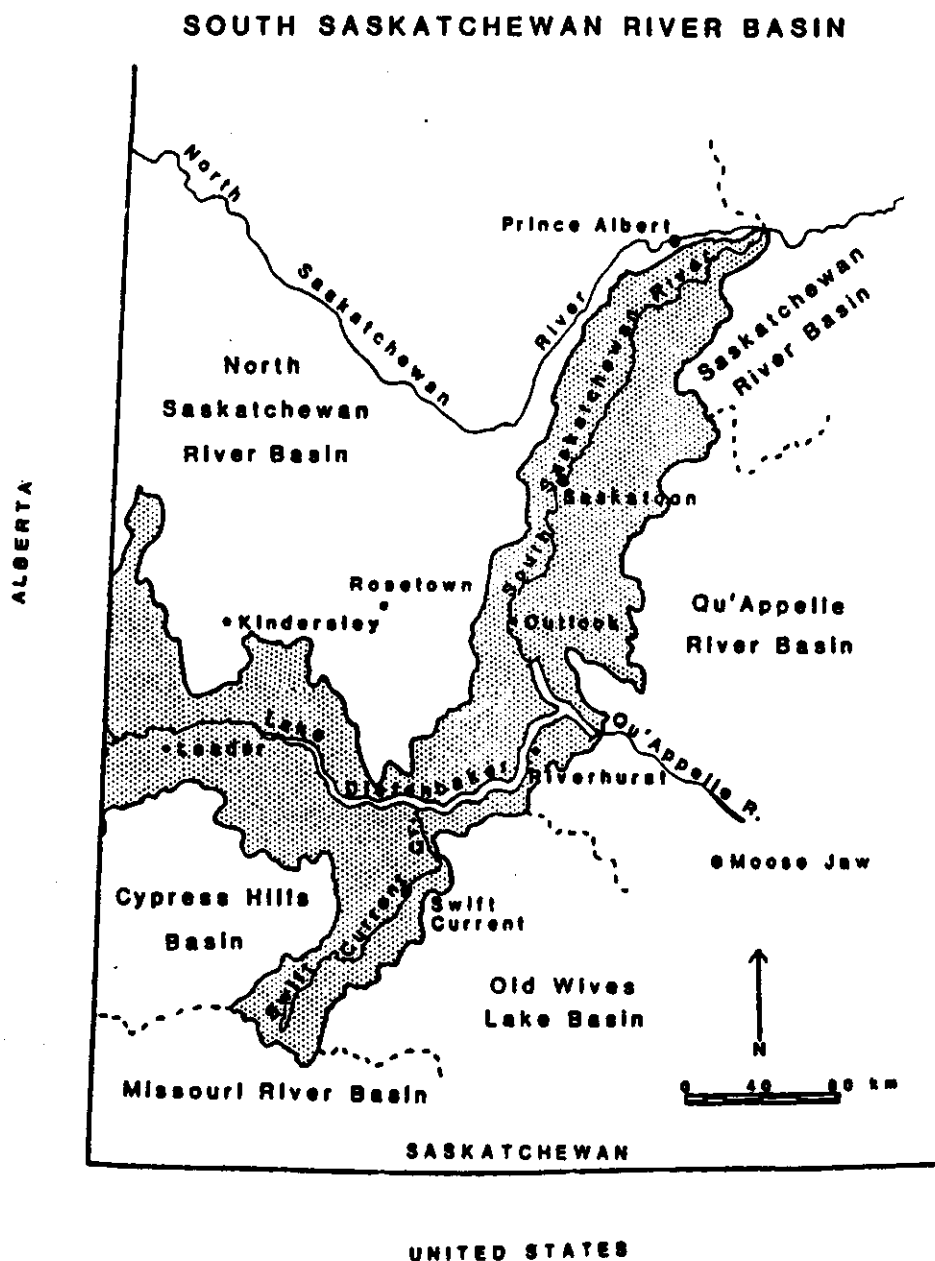
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# I INTRODUCTION

The South Saskatchewan River, shared by the provinces of Alberta and Saskatchewan, begins in the Rocky Mountains of southwestern Alberta. The easterly course of the river takes it through southern Alberta and southwestern Saskatchewan, one of Canada's most arid regions. The river then embarks on a northeasterly course to join the North Saskatchewan River near Prince Albert to form the Saskatchewan River (Figure 1), which then flows into Manitoba.

Figure 1



UNITED STATES

The interprovincial nature of this river and the importance of water resource development in support of economic growth are key factors in the water management picture. Hydro-electric facilities in the Rockies and the foothills, major urban centers such as Calgary, Medicine Hat and Lethbridge, some 450,000 hectares of land under irrigation and important fish and wildlife resources are dependent upon the basin's water supplies in southern Alberta. In Manitoba, the waters originating in the South Saskatchewan River basin contribute to flows in the Saskatchewan River system which help to support that province's vast hydro-electric power industry.

In Saskatchewan, 56,000 hectares of irrigated land, major cities (Saskatoon, Regina and Moose Jaw) and industries (potash mines), recreation, fisheries and wildlife, and hydro power facilities utilize the basin's water resources. Much of this development was encouraged by the Canada-Saskatchewan South Saskatchewan River Project which constructed the Gardiner and Qu'Appelle Dams and associated canal facilities and created the Lake Diefenbaker Reservoir in the 1960's. Water-based economic developments, especially irrigation expansion around Lake Diefenbaker, are a high priority under the 1984-1994 Canada-Saskatchewan Economic and Regional Development Agreement (ERDA).

The Master Agreement on Apportionment, an agreement among Canada and the three prairie provinces, established the rules by which the waters of the South Saskatchewan River basin are shared. The Master Agreement on Apportionment is administered by the Prairie Provinces Water Board. It provides the constraints within which each province can conduct its own basin planning.

In 1984, Alberta Environment completed a major four-year study to evaluate future management options to meet the range of growing uses within the province, while meeting downstream commitments to Saskatchewan as a first priority. The Alberta study forecasts that by the year 2000 Alberta, in an average year, would pass 73 percent of the natural flow of the South Saskatchewan system to Saskatchewan, down from the current 78 percent, but still more than the minimum of 50 percent required by the Apportionment Agreement. This forecast was based on existing growth trends and provincial government development policies. However, should maximum irrigation development occur over the long term in Alberta after the year 2000, the Alberta study concluded that only 57 percent of the natural flow would be passed on to Saskatchewan.

Given the conclusions of the Alberta basin study, as well as the occurrence of three severe drought years during the past ten years, the Saskatchewan Water Corporation approached Environment Canada with a proposal to conduct a water management study for the basin in Saskatchewan under the Canada Water Act. In May, 1986, the Canada-Saskatchewan South

Saskatchewan River Basin Study Agreement (Appendix 1) was signed. Under the \$1.6 million cost-shared agreement, the two parties undertook by December 31, 1989 to:

- document current and emerging water management issues;
- assess the water and related resources of the basin; and,
- develop a framework plan for the future management of the water resources of the basin.

Water is supplied by the South Saskatchewan River system to 40 percent of Saskatchewan's residents. Instream benefits, such as hydropower generation and recreation, are also significant. Meeting downstream apportionment requirements and balancing the needs of competing users within Saskatchewan presents an important challenge to water managers. Shortages due to below normal natural flows can, in the future, be expected to occur more often as withdrawals for irrigation and other uses increase both in Alberta and Saskatchewan. The South Saskatchewan River Basin Study is intended to provide essential information to guide water management and development decisions in the interests of all water users dependent upon the water resources of the basin.

Although availability of water and its allocation to competing uses is of major concern, the quality of the water resource is of equal importance. Prairie streams and lakes are often naturally eutrophic. Because the major portion of water in the South Saskatchewan River is derived from snowmelt in the mountains, its natural quality exceeds that of other surface waters in southern Saskatchewan. Maintaining the high quality of water in the system is vital to support both economic activities and the quality of life in the basin.

Residents of southern Saskatchewan have a vested interest in the use and development of the water resources in the South Saskatchewan River basin. Their participation in identifying issues and management objectives is therefore considered essential to the study.

## II ORGANIZATION

The Study Board, established under the terms of the agreement, is responsible for administering the study. In 1986, the Study Board consisted of R.A. Halliday for Environment Canada and R.L. Kellow for Saskatchewan Water Corporation (Figure 2).

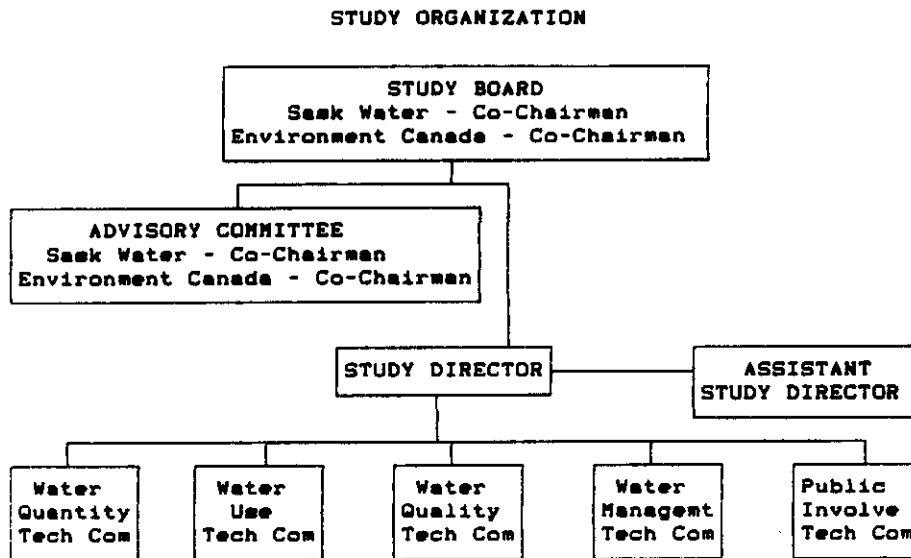
A Study Director, reporting directly to the Study Board, is responsible for overseeing the work, planning, communication, scheduling, coordinating, budget control and other day-to-day matters associated with the study. The Study Director also chairs the Technical Committees established for each of the study components. He is assisted in his responsibilities by an Assistant Study Director and a secretary.

An Advisory Committee, consisting of senior officials from provincial and federal departments, provides policy advice to the Board.

The Technical Committees assist the Study Office in defining the need for technical studies to be undertaken by contractors and in reviewing the results of these studies as they become available.

Members of the Technical and Advisory Committees are listed in Appendix 2.

Figure 2





### III PROGRESS BY STUDY COMPONENT

#### A. STUDY OFFICE ADMINISTRATION

The Study Board's most important initial task was to engage Study Office Staff. Stephen Kendall was hired to fill the Study Director's position. He began work on July 14th. A full time secretary, Linda Cheyne, was engaged on September 8th. Esther Kienholz, who had been seconded from Environment Canada in June to work as Assistant Study Director, decided in October to return to work in Environment Canada. The Assistant Study Director position was advertised in late October. Brad Fairley accepted the job offer in mid-December and was scheduled to begin work on January 5th, 1987.

Space at 110 Ominica St. W. in Moose Jaw was rented to serve as a Study Office. Furniture was obtained on loan from Environment Canada. Two IBM PC compatible micro computers, a printer and word processing, spreadsheet and data base management software were acquired to facilitate Study Office administrative support.

The Study Board approved the documented Financial and Administrative Arrangements for the study in August. Under this arrangement Sask Water assumed the lead role in administrative support for the Study. A financial reporting and control system was worked out between the Study Office and the Sask Water accounting group. Arrangements for Sask Water invoices to Environment Canada were established. An operating budget for the remainder of 1986 was approved by the Study Board and a draft 1987 budget was prepared before the end of the year.

#### B. STUDY OFFICE - PLANNING & COORDINATION

Much effort was devoted at an early stage to establishing and organizing the inter-departmental committees that support the study. The Study Office confirmed the membership of Technical Committees in the water quantity, water quality, water use analysis and forecasting and public involvement areas (Appendix 2) while the federal and provincial co-chairmen organized the Advisory committee. All these committees had two or three meetings before the end of the year and contributed to the initial organization and planning for the completion of the study.

In October, the Study Board approved the Basin Framework Plan: Working Definition. Thereafter, the emphasis in this component of the study was on the preparation of the overall Study Plan. Preliminary versions of the Study Plan were reviewed with the Technical Committees and the Advisory Committee.

The Study Board re-defined the study area in October by deleting the Cypress Hills drainage area. While this area is part of the gross drainage basin of the South Saskatchewan River, it has an internal drainage system and does not contribute to river flow. This sub-basin has

different water management problems than the rest of the South Saskatchewan River Basin and it is a candidate for a separate, future study by Sask Water.

Two standard maps were prepared for this re-defined area, one at 1:500,000 scale and one in a report format size, and these were available by November for use by the Study Office, Technical Committees and consultants.

### **C. WATER QUANTITY**

The Water Quantity Technical Committee consisted of four members drawn from Sask Water, Environment Canada, PFRA and Saskatchewan Power Corporation. The Committee participated in the first step in problem analysis by identifying water quantity management issues relevant to the basin. The Committee also aided the Study Office in developing terms of reference for a contract to review the existing information on surface water hydrology, water use and water development proposals. The Study Office awarded the contract to Stanley and Associates Engineering Ltd. on December 2, 1986. The first phase of the contract dealing with an inventory of water development projects and existing and anticipated water use was completed by December 31, 1986.

The Water Quantity Technical Committee concentrated on the anticipated simulation modeling requirements of the study. Some difficulty was experienced in assembling the information required to adequately compare and select among the available models. Dr. R. Divi, Saskatchewan Power Corporation, and Dr. A. Kassem, Inland Waters Directorate, Ottawa, were invited to attend meetings to provide more information on the HYSIM (Hydro Simulation) and WUAM (Water Use Analysis Model) models, respectively. The Committee felt that the results of the information base contract would be essential in deciding which model would best suit the needs of the study and postponed its recommendation until the draft report is available from the consultant early in the new year.

### **D. WATER QUALITY**

The Water Quality Technical Committee initially consisted of members from Environment Canada, Saskatchewan Environment Saskatchewan Parks and Renewable Resources and the Saskatchewan Research Council. With the addition of two new members from City of Saskatoon the National Hydrology Research Institute in the fall, the committee reached a full complement of six.

The Committee participated in an early step in problem analysis by identifying water quality management issues relevant to the basin. The Committee reviewed a proposed study plan for the water quality component prepared before the study began by Environment Canada and Sask Environment. This plan focussed entirely on the development of basin specific water quality objectives. The Committee saw a need to re-orient

this original plan to the needs of the study. Specifically, the Committee has identified three tasks: the definition of a positive approach to water quality management, the development of the basin specific water quality objectives approach as a planning tool, and recommendations for work in Year two - that were not accomplished at the end of this year. The completion of these tasks should take up much of the first two months of 1987.

#### **E. WATER USE ANALYSIS AND FORECASTING**

The Water Use Analysis and Forecasting Technical Committee had thirteen members from eight different organizations. Because of its size, this committee met less frequently than the others, but the meetings tended to be longer and to cover a wider range of topics.

The Committee assisted in identifying water management issues relevant to the basin. It adopted a definition of short- and long-term planning horizons for the study and identified several other areas (e.g. regionalization) where economically related concepts must be defined for purposes of the study. There was a considerable cross-over between the concerns of this Committee and those of the Water Quantity Technical Committee in regard to the application of basin simulation models.

The Water Use Analysis and Forecasting Committee had some substantive tasks to deal with in its role in review and appraisal of new work performed to support the study. Specifically, this work was related to the municipal water use survey, the residential water use survey and the recreation survey. The two former studies were undertaken by Sask Water staff while the latter was contracted to a consultant. These studies were initiated by the Study Board immediately after the Study Agreement was signed and before the Study Office or any of the Technical Committees had been set up in order to take full advantage of the summer field season. The municipal water use survey was completed by September. The data were summarized and made available in November. The residential water demand survey was originally to have been completed during this year, but it has been re-scheduled for completion at the end of February. The recreation survey was completed, but no summary of the data had been produced by the end of the year.

#### **F. PUBLIC INVOLVEMENT**

By the end of Year One, the Study Board had approved a proposed approach to the Public Involvement Program, and a Public Involvement Program Technical Committee had been formed consisting of two public relations officers, one from Sask Water and one from Environment Canada. In the communications area, a newsletter had been produced and distributed (approx. 30,000 copies) by the end of November, the Study Office's directory of contacts expanded to include about 400 individuals and organizations, some consultation with interest groups had been initiated and some media contact had begun.

#### **G. MANAGEMENT STRATEGIES**

There was no need to activate the Management Strategies component during the initial phases of the study. The Management Strategies Technical Committee will be formed during Year 2.

#### IV. FINANCIAL REPORT

The total expenditures on the study for Year 1 were \$93,000. The relatively small size of expenditures is explained by the fact that Year 1 of the study was effectively only six months long. During this initial year of the study, a considerable amount of time was devoted to the establishment and organization of the Study Office and the committee system. Little in the way of contract work was attempted in Year 1 and consequently the total expenditures were much lower than would be expected during the remaining three years of the study.

As Table 1 shows, the study completed Year 1 about \$41,000 under budget. Most of this discrepancy is accounted for by Study Office salaries and benefits. The budget covered a six month period. The Study Director was on salary for 5 1/2 months; the Assistant Study Director was seconded from Environment Canada and no salary or benefit costs for this position were attributed to the study; the Study office secretary was engaged September 8th so that less than 4 months of salary and benefits for this position were paid.

Table 1

**SOUTH SASKATCHEWAN RIVER BASIN STUDY  
BUDGET VS. ACTUALS  
December 31, 1986**

DESCRIPTION	ADMINISTRATION		WATER USE		QUALITY		QUANTITY		P. I. PROGRAM		TOTAL		
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL	VAR.
EMPLOYEE BENEFITS	57,795	26,519	12,100	9,975							69,895	36,494	33,401
TRAVEL	4,290	1,964	3,600	5,217							7,890	7,181	709
CONSULTING SERVICES			20,000	18,999			15,000	4,222			35,000	23,221	11,779
COMMUNICATIONS	1,225	1,221	2,850	3,915					900	5,496	4,975	10,632	(5,657)
OFFICE SUPPLIES	2,100	2,728									2,100	2,728	( 628)
RENTALS	5,880	4,456									5,880	4,456	1,424
REPAIRS & MAINTENANCE	440	444									440	444	( 4)
CAPITAL EXPENDITURES	8,000	8,086									8,000	8,086	( 86)
<b>TOTAL EXPENDITURES</b>	<b>79,730</b>	<b>45,418</b>	<b>38,550</b>	<b>38,106</b>	<b>0</b>	<b>0</b>	<b>15,000</b>	<b>4,222</b>	<b>900</b>	<b>5,496</b>	<b>134,180</b>	<b>93,242</b>	<b>40,938</b>

**APPENDIX 1**

CANADA-SASKATCHEWAN

SOUTH SASKATCHEWAN RIVER BASIN STUDY AGREEMENT

THIS AGREEMENT made this 16<sup>th</sup> day of May, 1986

BETWEEN:

THE GOVERNMENT OF CANADA, represented herein by the Minister of the Environment (hereinafter referred to as "Canada")

AND

THE GOVERNMENT OF SASKATCHEWAN, represented herein by the Minister in charge of the Saskatchewan Water Corporation (hereinafter referred to as "Saskatchewan"),

WHEREAS the Canada Water Act encourages federal-provincial cooperation in the examination and resolution of water resource issues;

WHEREAS the Saskatchewan Water Corporation has among its powers pursuant to Section 16 of the Saskatchewan Water Corporation Act the responsibility to manage, administer, develop, control and protect the water and related land resources of Saskatchewan;

WHEREAS the South Saskatchewan River Basin is an interprovincial river basin, and is a primary source of reliable, high quality water for the plains region of Saskatchewan, a region of national significance;

WHEREAS the social and economic welfare of the people in the plains region of Saskatchewan depends to a considerable degree on the way in which the water and related resources of the South Saskatchewan River Basin are managed to serve diverse and often competing activities such as agriculture (livestock and irrigation), recreation, tourism development, fisheries, hydro-electric power generation, and domestic, municipal and industrial uses;

WHEREAS there is a need to protect and enhance the quality of the water resource in the South Saskatchewan River Basin;

WHEREAS the water resources of the South Saskatchewan Basin could be altered by future, major water resource development projects, including interbasin transfers which could have potential economic and environmental effects in Saskatchewan, as well as in Manitoba and the United States.

WHEREAS there is a need to develop a framework in which the social, economic and environmental effects of future projects and programs can be evaluated;

WHEREAS the Governments of Canada and Saskatchewan agree that a cooperative approach to planning and managing the water and related resources in the South Saskatchewan River Basin is necessary and desirable;

WHEREAS Her Excellency, the Governor in Council, by Order in Council P. C. 1986-2/512 dated February 27, 1986, has authorized the Minister of the Environment to execute this Agreement on behalf of Canada; and

WHEREAS His Honour, the Lieutenant Governor in Council, by Order in Council 1087/85 dated October 28, 1985, has authorized the Minister in charge of the Saskatchewan Water Corporation to execute this Agreement on behalf of Saskatchewan.

IT IS THEREFORE AGREED BETWEEN THE PARTIES HERETO AS FOLLOWS:

Section 1 - Definitions

1. In this Agreement, unless the context otherwise requires:
  - (a) "eligible costs" means directly related costs that have been approved and recorded by the Board as having been reasonably and properly incurred for the study;
  - (b) "Ministers" means the Minister of the Environment for Canada and the Minister in charge of the Saskatchewan Water Corporation;
  - (c) "study" means the South Saskatchewan River Basin Study as outlined in Schedule A;
  - (d) "Study Director" means the director appointed pursuant to Section 3.4; and
  - (e) "The Board" means the Canada-Saskatchewan South Saskatchewan River Basin Study Board established pursuant to Clause 3.1.

Section 2 - Purpose

- 2.1 The purpose of this Agreement is to provide for a study having the following objectives:
  - (a) document current and emerging water and related issues in the South Saskatchewan River Basin in Saskatchewan;
  - (b) carry out an assessment of the water and related resources of the South Saskatchewan Basin, and their current and future use;
  - (c) develop a framework plan for the conservation and management of the water in the South Saskatchewan Basin in Saskatchewan which allows for the evaluation of water resource projects.

Section 3 - Management and Coordination

- 3.1 This Agreement shall be administered by a Study Board consisting of one member appointed by the Minister of the Environment for Canada, and one appointed by the Minister in charge of the Saskatchewan Water Corporation.
- 3.2 Each Board member shall designate an alternate to assume responsibilities during periods of absence.
- 3.3 The Board shall:
  - (a) be responsible for the carrying out of the terms of reference of the study as set out in Schedule A, and be responsible for determining the manner in which the funds allocated to the study will be spent;
  - (b) keep minutes of its meetings and records of decisions taken at its meetings;
  - (c) report annually to the respective Ministers;
  - (d) provide a final report of the study with recommendations to the Ministers by December 31, 1989;
  - (e) carry out a program of public information;

- (f) determine eligible costs pursuant to this Agreement; and
  - (g) carry out such other related duties as the Ministers may direct.
- 3.4 Subject to the recommendation of the Board, the parties will establish:
- (a) a study office; and
  - (b) technical and advisory committees as required;
- and Saskatchewan will appoint a Study Director, and such other staff as may be required;
- 3.5 The parties to this Agreement may, on the recommendation of the Board, enter into contracts to carry out various aspects of the work associated with the study.

Section 4 - Financial Provisions

- 4.1 Total costs shall not exceed \$1,600,000, to be shared equally by Canada and Saskatchewan;
- 4.2 Canada and Saskatchewan shall bear the entire costs of the salary, travel, and related expenses of:
- (a) each of its members of the Board; and
  - (b) any other employee who, although engaged in an activity hereunder, does not have a specified portion of his workday, week, month or year assigned exclusively to the carrying out of this Agreement;
- and such costs shall not count against the limit stipulated under Clause 4.1.
- 4.3 Where Canada and Saskatchewan are supplying goods or services, such goods or services shall be supplied at cost.
- 4.4 The parties shall, with respect to the costs to which Clause 4.1 is applicable:
- (a) pay such costs as they come due; and
  - (b) submit, at least quarterly, progress claims to the other party for its share of the eligible costs incurred and paid for in the performance of work, as certified by a senior financial officer of that party, and in a mutually agreed manner.
- 4.5 The parties shall pay the progress claims submitted by the other party after the claims are certified by a senior officer of that latter party.
- 4.6 Payments to be made by Canada under this Agreement shall be paid by Canada to the Saskatchewan Water Corporation.
- 4.7 The provisions of this Agreement respecting the payment and reimbursement of eligible costs that are to be shared by Canada and Saskatchewan shall remain in effect until March 31, 1990.
- 4.8 Canada and Saskatchewan shall maintain adequate documentation and records of the costs that are to be shared by them and which are incurred pursuant to this Agreement and shall, upon request, make such records and documents available for examination by auditors of the other.



4.9 Any discrepancy in the documents and records of costs incurred under this Agreement disclosed by an audit under Section 4.8 shall be promptly adjusted between Canada and Saskatchewan.

Section 5 - Amendment

5.1 This Agreement may be amended by the Ministers with the exception of Clauses 4.1 and 7.1 which can only be amended with the approval of the Governor in Council for Canada and the Lieutenant Governor in Council for Saskatchewan.

Section 6 - Evaluation

6.1 Canada and Saskatchewan may undertake an evaluation of this Agreement. Where Canada or Saskatchewan undertake to make an evaluation of this Agreement, the other shall supply such information as may reasonably be necessary for such evaluation to be undertaken.

Section 7 - General

7.1 This Agreement shall take effect on the date of signing, and terminate on December 31, 1989.

7.2 Canada and Saskatchewan shall make available to the Board all reports and related available information from prior and current studies for use in the study.

7.3 Where Canada or Saskatchewan undertakes or is responsible for any portion of the study, it shall indemnify and save harmless the other, its officers, servants and agents, against all claims and demands of third parties in any way arising out of any work undertaken pursuant to this Agreement, except as such claims or demands relate to the act or negligence of any officer, employee or agent of the other.

7.4 No member of the Parliament of Canada or member of the Legislative Assembly of Saskatchewan shall hold, enjoy or be admitted to any share or part of any contract, agreement, commission or benefit arising out of this Agreement.

IN WITNESS WHEREOF, the Honourable Thomas McMillan, Minister of the Environment, has hereto set his hand on behalf of Canada; and the Honourable Eric Berntson, Minister in charge of the Saskatchewan Water Corporation, has hereto set his hand on behalf of Saskatchewan.

IN THE PRESENCE OF

GOVERNMENT OF CANADA

Marc Choier  
Witness

Thomas McMillan  
Minister of the Environment

GOVERNMENT OF SASKATCHEWAN

Harry Harris  
Witness

Eric Berntson  
Minister in charge of the  
Saskatchewan water Corporation

SCHEDULE A

STUDY COMPONENTS AND ANNUAL BUDGETS  
South Saskatchewan River Basin Study

<u>Study Component</u>	<u>Total Cost</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>
1. <u>Water Quantity</u>	<u>\$125,000</u>	0	65,000	45,000	15,000	0

This component focuses on the quantitative aspects of water management in the Saskatchewan portion of the South Saskatchewan River Basin, in particular:

- . analysis and modelling of present and future supplies (incl. reservoir operations, Alberta supply scenarios);
- . developing future supply scenarios, to complement the water demand scenarios in component 3 (including concepts and costs of development projects, reservoir operating plans); and
- . evaluating the quantitative effects on the South Saskatchewan Basin in Saskatchewan of water management alternatives, including currently proposed alternatives by Alberta and any major interbasin transfers which have already been identified.

The cost is relatively modest because of a good water quantity data base, and extensive earlier supply studies by both federal and provincial agencies, as well as the Prairie Provinces Water Board.

<u>Study Component</u>	<u>Total Cost</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>
2. <u>Water Quality</u>	<u>\$295,000</u>	0	135,000	105,000	55,000	0

This component deals with the qualitative aspects of water management in the basin, in particular:

- . basic data for identifying sources for, trends in, and causes of water quality change;
- . analysis of present water quality and future implications (e.g., of Alberta scenarios);
- . assessing future water quality, as part of the water supply and demand scenarios in components 1 and 3; and
- . evaluating quality implications of water management alternatives, both within and downstream of the basin (including management proposals, water quality objectives, project concepts and costs, to maintain or improve water quality).

The high cost of this component reflects the recentness of water quality management (hence, a limited data base and few basin-wide studies) and the increasing complexity and seriousness of water quality issues. Water quality is a special concern for Lake Diefenbaker, because of its critical location and role in the basin.

<u>Study Component</u>	<u>Total Cost</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>
3. <u>Water Use Analysis and Forecasting</u>	<u>\$300,000</u>	0	180,000	80,000	40,000	0

The approach, of taking a balanced look at both supply and demand management, is a distinct departure from the traditional supply-oriented approach. This is a central component of the study, the first step toward planning for a more water-efficient economy. The component includes:

- . analysis of current and future water use by major water use sectors (irrigation, power, manufacturing, service industry, municipal); and
- . analysis of economic trends and projections, changing technology, climatic change, and economic value/pricing of water, as they may affect water use (both short- and long-term);

- . parallel analysis for instream uses and related uses (fisheries, wildlife, recreation, tourism), especially water quantity/quality aspects, economic value, downstream issues; and
- . development of a regional water supply/demand model for the South Saskatchewan River Basin (Saskatchewan portion) for evaluating supply/demand balances for various scenarios (economic, pricing, water quality and instream needs) and for evaluating management options in component b.

<u>Study Component</u>	<u>Total Cost</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>
4. <u>Public Involvement</u>	<u>\$170,000</u>	0	45,000	50,000	40,000	35,000

Public involvement is an essential input to the study. An understanding and enumeration of public views and concerns on water issues in the basin and adjacent basins is required for the development of alternative management strategies and formulation of recommendations.

<u>Study Component</u>	<u>Total Cost</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>
5. <u>Water Management Strategies</u>	<u>\$105,000</u>	0	5,000	25,000	25,000	50,000

This is the crucial stage of the study: how the ever-increasing competition for a finite water resource can be dealt with, with due consideration to the economic, social environmental, technological, and institutional realities and changes.

The intent here is to integrate the results of the first four study components in alternative management strategies, both short- and long-term for the basin. Specific guidance is being sought among others, on:

- . future operation plans for Lake Diefenbaker;
- . the range of future growth opportunities;
- . need for establishing water use priorities;
- . implications of interbasin transfers;
- . measures to protect water quality; and
- . social response to the long-term prospects.

The strategies are not "blueprints for the future". The strategies will, however, provide a series of carefully developed views of the region's water future. Demands for water in the basin will continue to grow. The study will provide information on the nature of the water management choices that are necessary now, and in the future, to meet the challenge of supporting a larger economic base with a diminishing supply of high quality water.

<u>Study Component</u>	<u>Total Cost</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>
6. <u>Study Management</u>						
- Study office, Director and support staff	\$ 530,000	10,000	140,000	140,000	140,000	100,000
- Final report production	75,000					75,000
<u>Sub-totals</u>	<u>\$ 605,000</u>	10,000	140,000	140,000	140,000	175,000
<u>Totals</u>	<u>1,600,000</u>	<u>10,000</u>	<u>570,000</u>	<u>445,000</u>	<u>315,000</u>	<u>260,000</u>

<u>All Components</u>							
<u>Cost sharing:</u>	Canada	\$ 800,000	5,000	285,000	222,500	157,500	130,000
	Saskatchewan	800,000	5,000	285,000	222,500	157,500	130,000

APPENDIX 2

SOUTH SASKATCHEWAN RIVER BASIN STUDY  
TECHNICAL COMMITTEE MEMBERSHIP  
December 31, 1986

MANAGEMENT STRATEGIES

Henry Epp                                      Saskatchewan Environment

PUBLIC INVOLVEMENT

Sharon Dominik                              Environment Canada  
Rod McLean                                    Saskatchewan Water Corporation

WATER QUALITY

Diane Blachford                              Environment Canada  
Wally Nicholaichuk                           National Hydrology Research  
Randy Munch                                   City of Saskatoon  
Robert Ruggles                                Saskatchewan Environment  
Bill Sawchyn                                  Parks, Recreation & Culture  
Ken Thomson                                  Environment Canada  
Patricia Tones                                 Saskatchewan Research Council  
Ken Weagle                                     Saskatchewan Environment

WATER QUANTITY

Alex Banga                                    Saskatchewan Water Corporation  
Fred Martin                                   Prairie Farm Rehabilitation Administration  
Vipin Prasad                                   Saskatchewan Power Corporation  
Larry Wiens                                    Environment Canada

WATER USE

Jim Atcheson                                  Agriculture Canada  
David Donald                                  Environment Canada  
Harvey Fjeld                                  Saskatchewan Agriculture  
Glen Grismer                                 Meewasin Valley Authority  
Mike Kowalchuk                               Environment Canada  
Tom McIntosh                                 Saskatchewan Water Corporation  
Hasu Naik                                      Environment Canada  
George Pearson                               Prairie Farm Rehabilitation Administration  
Vipin Prasad                                 Saskatchewan Power Corporation  
Jim Rogers                                     Environment Canada  
Robert Smith                                 Public Works Canada  
Larry Sukava                                  Parks, Recreation & Culture  
Don Tate                                        Environment Canada

APPENDIX 2 cont'd

**SOUTH SASKATCHEWAN RIVER BASIN STUDY**  
**ADVISORY COMMITTEE MEMBERSHIP**  
**December 31, 1986**

R. Bjonback	Acting Chief, Water Planning & Management Branch Inland Waters Directorate Environment Canada
W. Dybvig	Manager, River Basin Planning Saskatchewan Water Corporation
D. Fast	Director, Water Pollution Control Branch Saskatchewan Environment
H. Foerstel	Chief, Socio-Economic Division Inland Waters Directorate Environment Canada
W. Gummer	Chief, Water Quality Branch Inland Waters Directorate Environment Canada
D. James	Analyst, Office of the Federal Economic Development Coordinator
J. Jonsson	Assistant Deputy Minister Community Planning Services Branch Saskatchewan Rural Development
S. Kramer	Assistant Deputy Minister Saskatchewan Agriculture
J. Lowe	Regional Director Agriculture Development Branch Agriculture Canada
A. Lukey	Director, Engineering Service Prairie Farm Rehabilitation Administration
W. Pepper	Director, Integrated Resource Policy Parks, Recreation & Culture

APPENDIX 3

SOUTH SASKATCHEWAN RIVER BASIN STUDY  
LIST OF COMPLETED REPORTS  
December 31, 1986

<u>TITLE OF REPORT</u>	<u>DATE COMPLETE</u>
Study Proposal for the South Saskatchewan River Basin in Saskatchewan	April, 1986
Financial and Administrative Arrangements	August 29, 1986
Framework Plan : Working Definition	September 3, 1986
Public Involvement Program	October 30, 1986