

**ANNUAL REPORT**  
**TO**  
**DECEMBER 31, 1988**  
Technical Report A.5

Prepared for:

CANADA-SASKATCHEWAN SOUTH SASKATCHEWAN RIVER BASIN STUDY

Prepared by:

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



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DECEMBER 31, 1988

CANADA - SASKATCHEWAN  
SOUTH SASKATCHEWAN RIVER BASIN STUDY

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# SOUTH SASKATCHEWAN RIVER BASIN STUDY

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Our File S15-6-4-2

May 15, 1989

The Honourable Lucien Bouchard  
Minister of the Environment  
Government of Canada  
Room 533  
Confederation Building  
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. Bouchard and Mr. Swan:

We are pleased to present the third Annual Report of the Study Board for the Canada-Saskatchewan South Saskatchewan River Basin Study. This report describes the progress made and the expenses incurred during 1988.

Efforts during 1988 were devoted to the basin planning process. The Study continued to overcome information gaps in several key areas, including water use and water quality. In addition, 1988 saw the completion of a computer model capable of simulating the hydrology of the basin. All of this information is essential for the development of the final product--the Basin Framework Plan.

Total expenditures since the start of the Study to the end of 1988, totalled some \$940,000. Of the total Study Budget of \$1.6 million, approximately \$660,000 remains.

Yours truly,



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



W. L. Dybvig  
Study Board Co-Chairman  
Saskatchewan Water Corporation

RAH/WLD/sdm  
Enclosure

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## I INTRODUCTION

The South Saskatchewan River, shared by the provinces of Alberta and Saskatchewan, has its headwaters 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 follows a northeasterly course to join the North Saskatchewan River near Prince Albert to form the Saskatchewan River which then flows into Manitoba (Figure 1).

The South Saskatchewan River is vitally important to all three prairie provinces. The water resources of the basin support economic growth in each of the provinces. Recognizing the importance of the South Saskatchewan River, Alberta Environment completed a major basin study in 1984. The study evaluated future water management options which would meet the growing water uses within the province, while meeting downstream commitments to Saskatchewan as a first priority. The study concluded that after the year 2000, if maximum development occurs, 57 percent of the natural flow, on average, 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 and Environment Canada developed a proposal to conduct a water management study for the basin in Saskatchewan. 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 to:

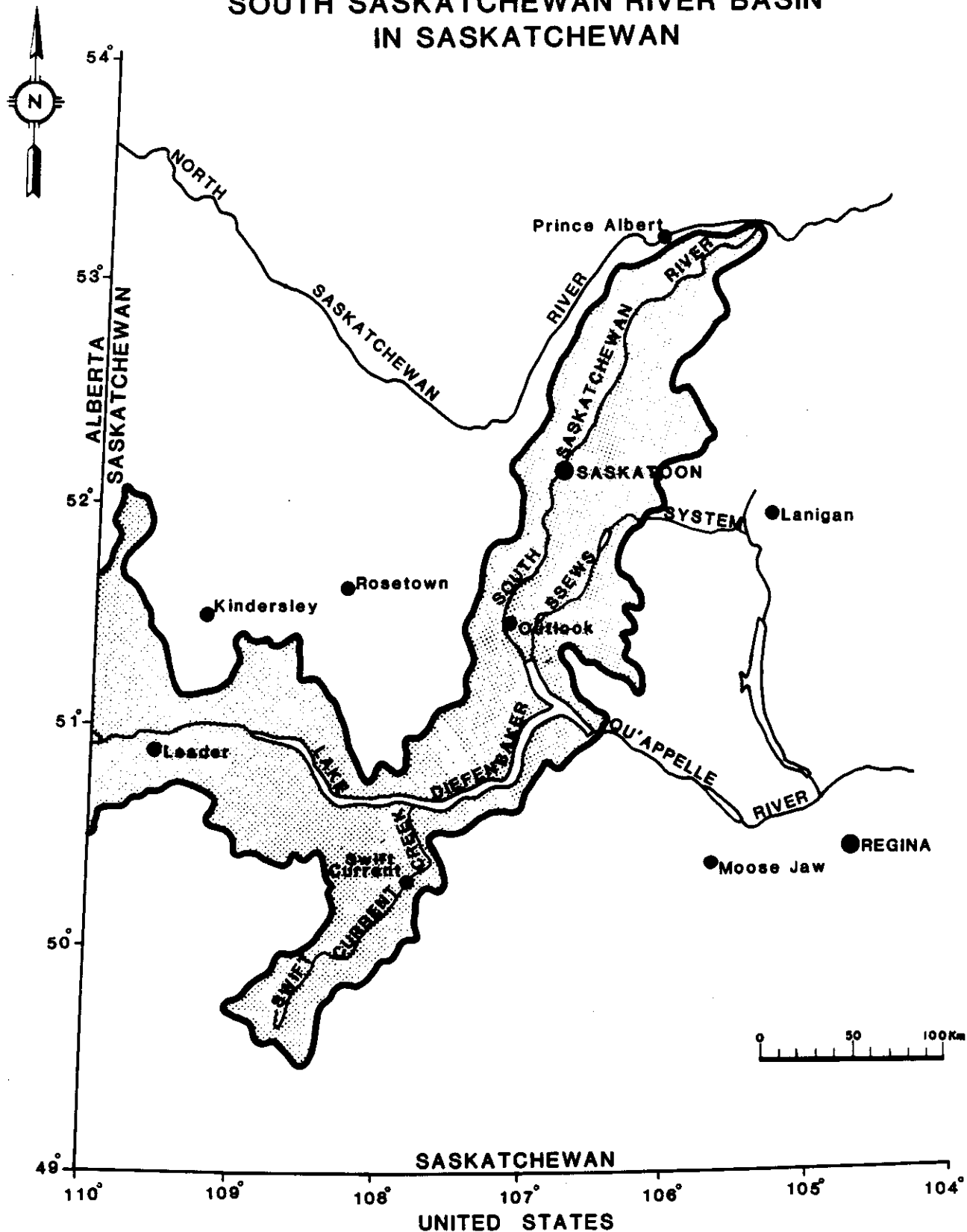
- document current and emerging water management issues;
- assess the water and related resources of the basin; and,
- develop a framework plan for the future management of the water resources of the basin.

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.

The Study was originally scheduled for completion by December 31, 1989. However, to ensure that adequate attention is paid to all aspects of the planning process, the Study Board is seeking a time-only extension to the Study Agreement, with the proposed completion date being March 31, 1991.

Figure 1

# SOUTH SASKATCHEWAN RIVER BASIN IN SASKATCHEWAN



## II ORGANIZATION

The Study Board, which was established under the terms of the Study Agreement, is responsible for the administration of the Study. The Study Board members in 1988 were R. A. Halliday for Environment Canada, and W. L. Dybvig for the Saskatchewan Water Corporation (Figure 2). The alternates were R. D. Bjonback for Environment Canada, and, D. Fast for Saskatchewan Environment and Public Safety.

The Study Board has overall responsibility for the conduct of the Study. The Board is structured with two members and two alternates. The alternates attend all meetings and provide input as desired. Although the day to day administration is handled by the Study Office, the Board regularly reviews Study progress and finances, and provides general direction on all the Study components to ensure that the activities are directed towards the achievement of the study goals as outlined in the Agreement. At the conclusion of the Study the Board will be responsible for developing a final report for presentation to the Ministers.

During the year the Board met 10 times. It also met with the Management Strategies Technical Committee and attended all meetings of the Advisory Committee.

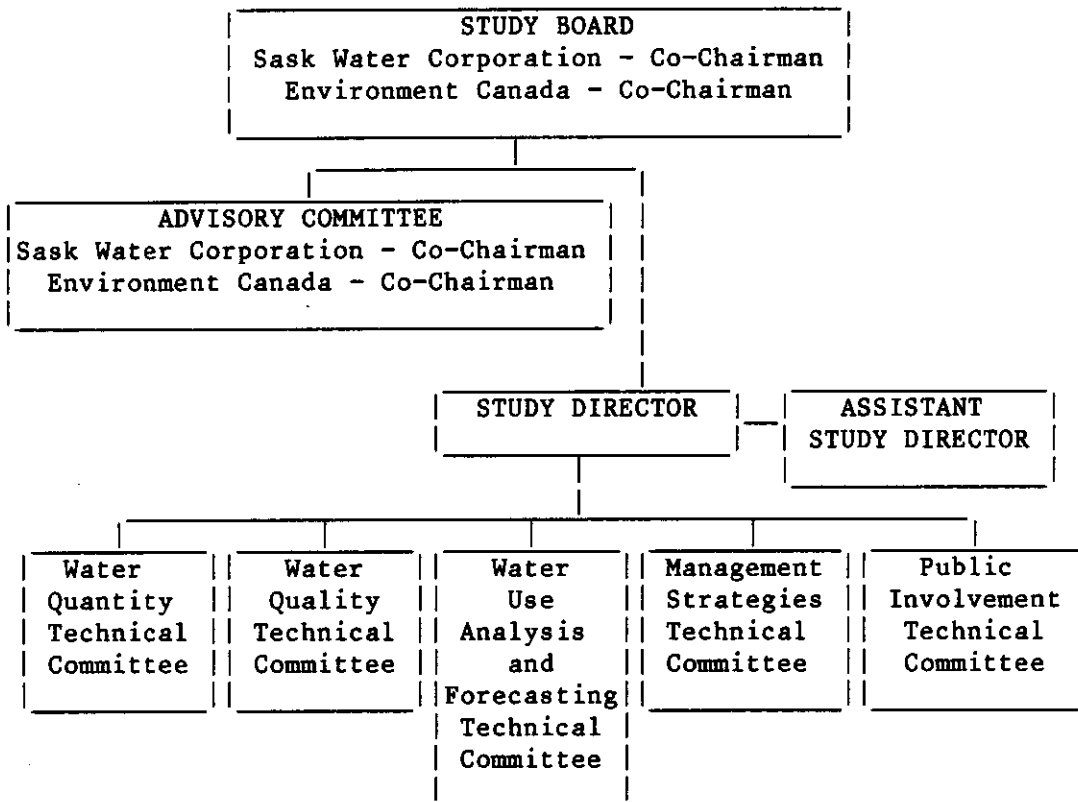
The Study Director, reporting directly to the Study Board, is responsible for overseeing the planning, communication, scheduling, co-ordination, budget control and other day-to-day matters associated with the Study. The Study Director also chairs the Technical Committees established for each of the Study components. He is assisted in his responsibilities by the Assistant Director and the Study Office 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 consultants and in reviewing the results of these studies as they become available. As well, the Committees will be involved with defining and revising alternative management strategies for the Basin.

Members of the Technical and Advisory Committees for 1988 are listed in Appendix 2.

Figure 2: Study Organization





### III PROGRESS BY STUDY COMPONENT

#### A. STUDY OFFICE ADMINISTRATION

During 1988, the Study Office continued to produce monthly and quarterly progress reports for the Study Board. Expenditure forecasts to December 31, 1988 and to March 31, 1989 were provided for Sask Water and Environment Canada respectively.

At the end of 1988 the staff complement for the Study Office was:

Director	Brad Fairley
Public Involvement Coordinator	Jim Engel
Secretary	Sharon Monkhouse

The Assistant Director position is vacant.

#### B. STUDY OFFICE PLANNING/COORDINATION/COMMUNICATION

A major undertaking of this component of the Study for 1988 was the identification of problems and issues in the basin. An objective setting survey, which was part of the Public Involvement Component, was completed early in 1988. This survey was used to ensure that all relevant issues in the basin were brought to the attention of the Study. A report, documenting the survey process and the issues identified, is being prepared and will be completed in 1989.

Two contracts within this component that were initiated in 1987 were completed in 1988.

James C. MacPherson Consultants Ltd. of Saskatoon was hired to document the legal and administrative arrangements for water resources management within the South Saskatchewan River Basin. This information will assist in developing an effective inter-agency implementation plan, one of the three major components of the basin framework plan. Although this project was to originally conclude with a final report, the Study Board decided instead to have the consultant prepare an interim report. This report must undergo further review by various agencies to ensure that the report is accurate in its description of agency roles and responsibilities. The interim report was submitted in March.

The second contract, started in 1987 but not completed until 1988, involved the preparation of a computer program, by M.R.2-McDonald and Associates Limited, to support the numerical interpretation method for multiple objective analysis. This technique and the supporting computer software will assist in evaluating alternate basin management strategies. After some revisions, the computer program was completed in May.

Water Resource Consultants (WRC) Limited was engaged in late 1988 as a General Technical Investigations consultant. The consultant was retained to provide ongoing technical support to the Study Office.

### C. WATER QUANTITY

The emphasis for 1988 was the development of a procedure for dealing with drought, preparing a recommendation to the Study Board with respect to ground water, and completing the computer model capable of simulating the hydrology of the basin. The model will be a vital component of future work in evaluating alternative basin management strategies.

The need for a strategy to deal with drought, a difficult and recurring problem in the basin, was identified in 1987. In response to this need the Study carried out three projects. The first involved a frequency analysis of meteorologic drought which was completed by the National Hydrology Research Centre (NHRC) in July. The second involved a frequency analysis of hydrologic drought completed by Environment Canada. A draft report was circulated in 1988 with the final expected to be completed early in 1989. The last study, which was carried out by Water Resource Consultants Limited, involved an analysis of the frequency of hydrologic drought by the method of runs. This method provides information regarding the severity of the drought not provided by the traditional frequency analysis carried out by Environment Canada.

Although ground water is an important resource within the South Saskatchewan River Basin, the information describing it is limited. This lack of information creates difficulties for managers, particularly when attempting to develop a plan for integrated management of water resources. Clifton Associates Limited was hired to evaluate the information on the water resources of the basin and to make recommendations as to how ground water should be dealt with within the Basin Study. The final report was submitted in March, and formed the basis for recommendations from the Study Office to the Study Board as to how ground water should be dealt with in the context of the Basin Study.

Two specific recommendations were made to the Study Board concerning ground water. The first was that the Study should not undertake any further investigations into ground water because of the poor match between the surface water drainage basin (i.e., the Study area) and the aquifers. To ensure that surface water resources of the basin are used efficiently, the second recommendation indicated that the framework plan developed by the Study should ensure that ground water alternatives are considered in water resource development projects.

With the aid of the report from the Information Base Study completed early in 1987, the Water Quantity Technical Committee evaluated the various water management models available to the Basin Study. Later in 1987 the Committee recommended Alberta Environment's Water Resources Management Model (WRMM) as the most suitable model. The Committee also recommended that Saskatchewan Power Corporation's HYDSIM model and Environment

Canada's Water Use Analysis Model (WUAM) play supporting roles for simulation of hydro-electric production and water use respectively. Sask Water was engaged to carry out the modelling using the WRMM while the other agencies were engaged to carry out the modelling using their in-house models. All three simulation models employ the same structural representation of the basin and the same data input files. The WRMM project carried out by Sask Water was completed in April, while the other two projects should be completed in early 1989.

#### **D. WATER QUALITY**

The Water Quality Technical Committee continued work on three major tasks: review of the existing water quality data; developing water quality models; and preparing basin specific water quality objectives.

As a follow-up to the review of organic contaminant water quality data carried out in 1987, the Committee organized reviews of all the other major parameter groups. A water quality review project started by the Saskatchewan Research Council (SRC) late in 1987 was completed in June. SRC carried out a review of current data for the major categories of water quality variables, including major ions, metals, and physical characteristics. Late in 1988, HydroQual Consultants Limited was hired to review all nutrient data. The final report will be completed in 1989.

In order to provide a more complete picture of the water quality databases, Saskatchewan Environment and Public Safety initiated a review of the water quality monitoring programs which produce the data. A report is expected early in 1989.

There was also considerable effort devoted to the development of water quality models for the basin. Saskatchewan Environment and Public Safety prepared a model to predict the trophic status of Lake Diefenbaker under different flow and nutrient loading conditions. Since completing the model early in 1988, Saskatchewan Environment and Public Safety began refining the model by adding a sediment component. These refinements should be completed early in 1989. Saskatchewan Environment and Public Safety also began work on models capable of predicting water quality conditions in rivers. These models, which can also be used to evaluate alternate basin management strategies, should be completed early in 1989.

The Water Quality Technical Committee continued working on the development of water quality objectives for the basin. During 1988 the Committee reviewed existing water quality data and information on water use generated by the Water Use Technical Committee. Near the end of the year, Committee members began drafting basin-specific water quality objectives. These objectives will be combined into a single report which is expected in early 1989.

One additional project started under the Water Quality component was a Reservoir Salinity Study. M.R.2 - McDonald and Associates was engaged to examine the salinity conditions of twelve small reservoirs in the basin.

The objectives of the project were to determine the salinity conditions in the twelve reservoirs and the cause for high levels if they were found. This information is necessary to determine if water quality may impair present or future use of those reservoirs. The draft report for the project was submitted and reviewed in December; the final report will be completed in early 1989.

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

The work on this component consisted of completing several projects that were started in late 1987, and initiating some additional work in environmental and economic areas. Two Subcommittees, Environmental and Economic, were formed to coordinate the work proceeding in these areas. Membership lists for these two Subcommittees are located in Appendix 2.

The final report, for the 1987, Irrigation Water Use Pilot Study was submitted in early 1988. The study was intended to determine the best approach for field measurement of actual water use by irrigators in the basin and to determine the size of the sample that would be required in future studies to accurately estimate water use. The contract for a follow-up study was awarded to UMA Engineering Limited in March. The final report for the second study was submitted in December.

Late in 1987, the Study awarded a contract to Stanley Associates Engineering Limited to determine the current water use requirements of the industries using water from within the basin. This project was in response to the Water Use Committee's concern that better information on industrial water use was required if it was to be properly addressed in this Study. The final report for the study was completed in October.

As noted in the Water Quantity Component, the Study Board decided that the Study would use Environment Canada's Water Use Analysis Model (WUAM) to supplement the WRMM modelling output with additional information on water use. Environment Canada began the process of configuring the model to the basin in 1987. The WUAM modelling is expected to be complete in early 1989.

Sask Trends Monitor was hired late in 1987 to update the regional economic base information in the 1982, Water Demand Study, carried out by the Prairie Provinces Water Board. The final report could not be completed until the publication of the 1986 census data by Statistics Canada, which delayed completion until June.

In 1987, the Study Office engaged Beak Associates Consulting Limited to identify instream water users and their preferences with respect to water flow and depth. The consultant assessed whether the existing information on instream water use was adequate to determine if the criteria were being met and, where necessary, developed work programs to provide the missing information. The report indicated that the information on hydro-electric power generation, ferry operation and waste assimilation was adequate, but

recommended additional work on fisheries and recreation. Follow-up work on fisheries and recreation was carried out in 1988.

A Fisheries Study was conducted by Saskatchewan Parks, Recreation and Culture under a project authorization. The study examined the species, number, and other physical characteristics of fish netted at several sampling sites throughout the basin. The draft report was submitted in November, and should be completed in early 1989.

A Recreation Demand Survey was started in May. Four summer students were hired to survey 14 recreation sites within the basin. Information was collected on the distance travelled, length of stay and activities pursued by recreationists at each site. Initial data compilation was completed in September. The data will be used to develop a recreation demand model based on a travel-cost method. This project will be completed in 1989.

Because economic evaluation is an integral part of resource planning, a general Economic Studies consultant was hired. A contract was awarded to UMA Engineering Limited. A number of tasks are included in this project, including developing the recreation demand model described above, forecasting water use, analyzing the effects of drought and water demand management, and developing project evaluation techniques. This study was started in September and will continue well into 1989.

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

The objective of this component is to facilitate public involvement in the Study. Such involvement is essential if the framework plan produced by the Basin Study is to be successfully implemented.

In order to keep those that have expressed an interest in the Study up to date, the Study Office continued to distribute newsletters to the more than 500 groups or individuals on the Study Office's mailing list. The newsletters included information on water resource management issues in the basin and updates on progress.

The last three rounds of a five round Objective Setting Survey effort were completed in early 1988. The survey was initiated in an attempt to involve a wide range of interests in setting objectives for water management in the basin. The participants in the survey represented an approximately equal split between water management agencies and the public. This survey provided the Study with an opportunity to begin the integration of contributions from the public with those from the participating government agencies. The survey process and results will be documented in a report in 1989.

The Study also set up a display, attended by Study Office staff, at two conferences. The Annual Conference of the Canadian Water Resources Association (CWRA) was held in Saskatoon in June. This conference was attended by water resource professionals and CWRA members from within and outside the province. In November the Saskatoon Board of Trade, Meewasin

Valley Authority, and the City of Saskatoon sponsored a one day information conference/seminar on the South Saskatchewan River. This conference was open to the public and provided an ideal opportunity for the Basin Study to provide information to local residents interested in the management of the South Saskatchewan River.

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

The Management Strategies Technical Committee had its first meeting in June. A list of Committee members is included in Appendix 2. This committee has the responsibility for using the information and models to design feasible, comprehensive water resource management and development strategies for the basin that address water use and management objectives; conduct evaluations of alternative basin management strategies in terms of objectives achievement; and, design an effective inter-agency implementation program for the Framework Plan.

Most of the Committee's work in 1988 consisted of familiarizing itself with the Basin Study, reviewing information collected by the other technical committees, and reviewing its role in developing the Basin Framework Plan. For the remainder of the Basin Study this Committee will be, by far, the most active. Its role will be to use the information generated under components C to F and devise and analyze alternative management scenarios. In addition, it will begin working on a plan for the post-Study implementation of the Basin Framework Plan by the various water management agencies operating within the basin.

#### IV. FINANCIAL REPORT

##### Expenditures to January 1, 1988 to December 31, 1988

The 1988 budget was confirmed in April as \$500,000; split approximately \$155,000 (31%) for Study Office Administration and \$345,000 (69%) for contractual services as shown in Table 1.

The year end expenditure for Study Office support was \$197,000. The over-expenditure of \$42,000 was due to an accumulation of variances throughout the year. Notable over-expenditures were in the employee salary and benefits, and travel categories. These were largely a result of the Study Office undertaking the Recreation Water Demand Survey described in component E. This project had been budgeted for under consulting services. The Public Involvement Program Coordinator had originally been budgeted for under consulting services, although it became a part-time position in March which moved the expenditure to Study Office Administration. In addition, a \$3,900 capital expenditure for computer equipment had not been included in the budget.

A total of 15 contracts and project authorizations were undertaken during the year. The total expenditure for consulting services paid out by the end of December was \$282,000, which was some \$63,000 under budget. This under-expenditure was the result of the Study Office undertaking the Recreation Survey and some contracts coming in under budget.

The net result was a year end actual expenditure of \$197,000 (41%) for Study Office Administration and \$282,000 (59%) for contractual services for a total of \$479,000. Adding the 1986 and 1987 expenditures, the Study costs to date are \$939,000, about \$60,000 under budget overall. Approximately \$661,000 of the \$1.6 million committed to the Study under the Agreement remained at the end of the year.





**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

Don McKel  
Minister of the Environment

GOVERNMENT OF SASKATCHEWAN

Henry Mann  
Witness

[Signature]  
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	55,000	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 5.

<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>	\$170,000	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>	\$105,000	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>	<u>10,000</u>	<u>140,000</u>	<u>140,000</u>	<u>140,000</u>	<u>175,000</u>
<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**



## APPENDIX 2

### SOUTH SASKATCHEWAN RIVER BASIN STUDY TECHNICAL COMMITTEES MEMBERSHIP December 31, 1988

#### PUBLIC INVOLVEMENT

Sharon Dominik	Environment Canada, Regina
Rod McLean	Saskatchewan Water Corporation, Moose Jaw

#### WATER QUALITY

Diane Blachford	Environment Canada, Regina
Wally Nicholaichuk	National Hydrology Research Center, Saskatoon
Randy Munch	City of Saskatoon, Saskatoon
Robert Ruggles	Saskatchewan Environment & Public Safety, Regina
Bill Sawchyn	Saskatchewan Parks, Recreation & Culture, Saskatoon
Ken Weagle	Saskatchewan Environment & Public Safety, Regina

#### WATER QUANTITY

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

#### MANAGEMENT STRATEGIES

Brian Abrahamson	Prairie Farm Rehabilitation Administration, Regina
Alex Banga	Saskatchewan Water Corporation, Moose Jaw
Dave Fairbairn	Environment Canada, Regina
William Gummer	Environment Canada, Regina
Bryan Ireland	Saskatchewan Water Corporation, Outlook
Tom Olson	Saskatchewan Water Corporation, Moose Jaw

**APPENDIX 2 (Continued)**

**WATER USE ANALYSIS AND FORECASTING**

Jim Atcheson	Agriculture Canada, Regina
David Donald	Environment Canada, Regina
Glen Grismer	Meewasin Valley Authority, Saskatoon
Murray Jones	Prairie Farm Rehabilitation Administration, Regina
Hasu Naik	Environment Canada, Regina
Tom Olson	Saskatchewan Water Corporation, Moose Jaw
Vipin Prasad	Saskatchewan Power Corporation, Regina
Jim Rogers	Environment Canada, Regina
Robert Smith	Public Works Canada, Edmonton
Larry Sukava	Saskatchewan Parks, Recreation & Culture, Saskatoon
Don Tate	Environment Canada, Ottawa

**WATER USE: ENVIRONMENTAL SUBCOMMITTEE**

David Donald	Environment Canada, Regina
Glen Grismer	Meewasin Valley Authority, Saskatoon
Bill Sawchyn	Saskatchewan Parks, Recreation & Culture, Saskatoon

**WATER USE: ECONOMIC SUBCOMMITTEE**

Derek Bjonback	Environment Canada, Regina
Wayne Dybvig	Saskatchewan Water Corporation, Moose Jaw

## APPENDIX 2 (Continued)

### ADVISORY COMMITTEE MEMBERSHIP

B. Abrahamson	Chief, Planning for Engineering Service Prairie Farm Rehabilitation Administration
R. Bjonback	Chief, Water Planning & Management Branch Inland Waters & Lands Directorate Environment Canada
W. Dybvig	Chief Planner Saskatchewan Water Corporation
D. Fast	Director, Water Quality Branch Saskatchewan Environment & Public Safety
H. Foerstel	Chief, Socio-Economic Division Inland Waters & Lands Directorate Environment Canada
W. Gummer	Chief, Water Quality Branch Inland Waters & Lands Directorate Environment Canada
F. Heal	Executive Director Meewasin Valley Authority
D. James	Analyst Western Diversification Office
S. Kramer	Assistant Deputy Minister Saskatchewan Agriculture
J. Lowe	Regional Director Agriculture Development Branch Agriculture Canada
W. Pepper	Director, Integrated Resource Policy Saskatchewan Parks, Recreation & Culture
D. Richards	Manager, Special Projects Saskatchewan Water Corporation
L. Talbot	Director, Community Planning Services Br. Saskatchewan Rural Development

**APPENDIX 3**

### APPENDIX 3

#### **SOUTH SASKATCHEWAN RIVER BASIN STUDY LIST OF COMPLETED REPORTS December 31, 1988**

These reports are available at the following government libraries in Saskatchewan:

Environment Canada, Regina  
Saskatchewan Water Corporation, Moose Jaw  
Saskatchewan Environment & Public Safety, Regina  
National Hydrology Research Center, Saskatoon  
Prairie Provinces Water Board, Regina

<u>TITLE OF REPORT</u>	<u>DATE COMPLETE</u>
Annual Report to December 31, 1986	November 1, 1987
Annual Report to December 31, 1987	July 21, 1988
Compendium of Water Quality Objectives Development Methodologies	1988
Contaminant Organic Compounds in the Surface Waters of the South Saskatchewan River Basin	December 31, 1987
Data Collection and Data Base Development: South Saskatchewan River Basin Recreation Survey	November 30, 1986
Economic Profile and Trends 1951-86	June 1, 1988
Flood Frequencies in the South Saskatchewan River Basin	August 1988
Framework Plan Working Definition	September 3, 1987
Frequency Analysis of Meteorological Drought in the Saskatchewan Portion of the South Saskatchewan River Basin	July 1988
Ground Water and the South Saskatchewan River Basin: Recommendation to the Study Board	March 2, 1988
Ground Water Study South Saskatchewan River Basin	March 15, 1988
Hydrologic Drought Analysis of Simulated Flows - South Saskatchewan River Basin	November 1, 1988
Information Base: Surface Water Hydrology and Water Use	March 13, 1987

APPENDIX 3 (Continued)

<u>TITLE OF REPORT</u>	<u>DATE COMPLETE</u>
Instream Water Use South Saskatchewan River Basin	December 31, 1987
Irrigation Water Use Pilot Study	April 1, 1988
Lake Diefenbaker Trophic State Model	January 31, 1988
Land Use in the Effective Drainage Area of the South Saskatchewan River Basin	October 31, 1987
Legal and Administrative Analysis Interim Report	March 31, 1988
Major Industrial Water Users in the South Saskatchewan River Basin	October 19, 1988
Municipal and Residential Water Use Study	August 31, 1987
Municipal Water Use Survey	July 30, 1987
Phosphorous Loading from Non-point Sources Relevant to the Lake Diefenbaker Basin	September 30, 1987
Public Involvement Program Position Paper	October 30, 1986
Public Opinion Survey, 1988 Survey Design	March 7, 1988
Recreational Data Analysis Report South Saskatchewan River Basin	July 30, 1987
South Saskatchewan River Basin Study Irrigation Water Use Survey	December 1, 1988
Study Plan and Annual Work Plans - 1987	February 15, 1987
Study Proposal for the South Saskatchewan River Basin	April 30, 1986
Water Intake and Outfall Survey South Saskatchewan River Basin	December 30, 1987
Water Management Model Study South Saskatchewan River Basin	January 1988
Water Quality Data Review	March, 1988
Water Quality Trend Analysis and Data Base Summary	November 12, 1987