

**PRAIRIE PROVINCES WATER BOARD**

**PUBLIC**  
**REPORT LIST**

**1950 – 2017**

**July 2018**

## **REPORT AVAILABILITY**

Most Prairie Provinces Water Board Reports are available free of charge upon request, exceptions being those that are out of print or incomplete. Older reports are often available only in hard copy whereas more recent reports are more likely to be available in electronic format ([PDF](#)) as well as hard copy. All reports are available in English only. Terms used to describe report availability include:

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## Surface Water Quantity

### *General Stream Flow*

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7 Title: Compilation and Reconstruction of Monthly Streamflow Records for the Qu'Appelle-Assiniboine Study (OUT OF PRINT)

Contents: Summary tables of monthly streamflow for forty gauging stations each having at least nine years of record.

Prepared by: Hydrology Division, PFRA, October 1963

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7 Supp. Title: Supplement to Report #7 (OUT OF PRINT)

Contents: Summarizes the available streamflow records in the Swan Lake and Dauphin Lake Basins. It also provides an index of Lake and Reservoir gauges in the Assiniboine-Souris-Qu'Appelle Watershed.

Prepared by: Hydrology Division, PFRA, February 1964

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22 Title: Streamflow Forecasts in the Prairie Provinces as of January 1965. (OUT OF PRINT)

Contents: This memorandum summarizes current streamflow forecasting activities in the Prairie Provinces.

Prepared by: E.F. Durrant, Engineering Secretary, PPWB, March 1965

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36 Title: Progress Report No. 2 of the Data Network Planning Committee to the Prairie Provinces Water Board. (OUT OF PRINT)

Contents: Progress report on activities of the Data Network Planning Committee.

Prepared by: Data Network Planning Committee, PPWB, November 1967

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44

Title: Streamflow Forecasting. (LIMITED DISTRIBUTION)

Contents: This series of reports represents the results of a study to determine the methods and networks required to provide water supply and river flow forecasts at various points in five major interprovincial river basins: the South Saskatchewan, North Saskatchewan, Saskatchewan, Qu'Appelle, and Churchill. The report package includes a main report and water supply, river routing, and basin simulation user manuals for each basin (OUT OF PRINT)

Prepared by: Water Survey of Canada, Calgary

Report Package:

South Saskatchewan River Basin - Main Report  
South Saskatchewan River Basin - Combined User Manual  
North Saskatchewan River Basin - Main Report  
North Saskatchewan River Basin - Combined User Manual  
Saskatchewan River Basin - Main Report  
Saskatchewan River Basin - Combined User Manual  
Qu'Appelle River Basin - Main Report  
Qu'Appelle River Basin - Combined User Manual  
Churchill River Basin - Main Report  
Churchill River Basin - Combined User Manual

Forecast Network Evaluation: Forecast Centre Investigation, December 1977

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47

Title: Streamflow Forecasting for Water Management and Flood Control (OUT OF PRINT)

Contents: This report summarizes the results of the study, 'Streamflow Forecasting' (Report No. 44). It contains the recommendations of the Committee on Hydrology with regard to procedures and the necessary associated networks for Streamflow Forecasting in five major interprovincial river basins: the South Saskatchewan, North Saskatchewan, Saskatchewan, Qu'Appelle and Churchill. The recommendations are a distillation of the original study recommendations amended in light of practical considerations and knowledge gained during the study.

Prepared by: Committee on Hydrology, September 1977

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127 Title: Hydrometric Monitoring Strategy. ([PDF available](#))

Contents: This report describes the strategies that may be used by the Board for determining the hydrometric network needed for apportionment purposes. It outlines the general principle in administrating the 1969 Master Agreement on Apportionment, monitoring responsibilities, monitoring requirements, and apportionment monitoring guidelines. Revised guidelines incorporated for monitoring small interprovincial streams.

Prepared by: PPWB, Committee on Hydrology, April 1996

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145 Title: A Review of Instream Flow Needs Methodologies ([PDF available](#))

Contents: The report provides a review and discussion of methods to estimate the instream flow needs that have been used in Alberta, Manitoba and Saskatchewan as well as some of the nearby jurisdictions in the United States. Recommendations are included as regards instream flow needs for fish.

Prepared by: Instream Flow needs Committee, October 1999

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### ***General Apportionment***

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11 Title: Apportionment of the Water of Interprovincial Streams between the Provinces of Alberta, Manitoba and Saskatchewan (OUT OF PRINT)

Contents: The report deals with the historical development leading to the need for apportionment, the methods of apportionment, the methods that may be used to determine the natural flow and the administrative arrangements required to implement the apportionment.

Prepared by: Apportionment Committee, PPWB, November 1965

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30 Title: Study of Problems in Water Allocation in the Prairie Provinces. (OUT OF PRINT)

Contents: Three volumes: Economic significance of water requirements relative to human activities and needs in the Saskatchewan River Basin; Physical features of the Saskatchewan River Basin; Annotated bibliography of selected documents pertaining to water allocation and utilization in the Saskatchewan River Basin.

Prepared by: John Boan and Craig Duncan, CDA, Economics Division, July 1961

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34 Title: Apportionment of the Water of Interprovincial Streams Between the Provinces of Alberta, Manitoba and Saskatchewan (OUT OF PRINT)

Contents: Report on methods of determining natural flow, depletions and other factors necessary for apportionment of the waters of the Saskatchewan-Nelson River system.

Prepared by: Apportionment Committee, PPWB, November 1965

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45 Title: Natural Flow. (OUT OF PRINT)

Contents: This series of reports represents the results of a study to determine the methods and networks required to compute apportionment flows at the interprovincial boundary crossings of the South Saskatchewan, North Saskatchewan, Saskatchewan, Qu'Appelle and Churchill Rivers. The report package includes a main report for each basin plus user manuals for the South Saskatchewan and Qu'Appelle River Basins.

Prepared by: Water Survey of Canada, Calgary, December 1977

Report Package:  
South Saskatchewan River Basin - Main Report  
South Saskatchewan River Basin - User Manual  
North Saskatchewan River Basin - Main Report  
Saskatchewan River Basin - Main Report  
Qu'Appelle River Basin - Main Report  
Qu'Appelle River Basin - User Manual  
Churchill River Basin - Main Report  
Natural Flow Network Evaluation.

Note: South. Sask. R. below Red Deer River Report Published April 1985.

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48 Title: Determination of Natural Flow for Apportionment Purposes. (OUT OF PRINT)

Contents: This report summarizes the results of the study, 'Natural Flow' (Report No. 45) which was carried out to develop procedures for the determination of flows required for apportionment proposals at interprovincial boundaries. The report identifies the methods and networks required to compute apportionment flows at the boundary crossings of the South Saskatchewan, North Saskatchewan, Saskatchewan, Qu'Appelle and Churchill Rivers.

Prepared by: Committee on Hydrology, May 1976

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58 Title: Administration of the Apportionment Agreement (OUT OF PRINT)

Contents: The report describes the role that the Board and participating agencies will take in administering the 1969 Agreement on Apportionment. It discusses apportionment, balance and audit periods, procedures in the event of shortages, forecasting, the effects of storage and diversion and makes recommendations on several administrative procedures related to these subjects (Refer to PPWB Report #84).

Prepared by: Committee on Hydrology, April 1980

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58(a) Title: Guidelines for Negotiating Equitable Apportionment. (OUT OF PRINT)

Contents: The report describes procedures that might be used to negotiate mutually satisfactory agreements to maintain an equitable division of interprovincial flow on streams where revisions to their operational conditions are indicated.

Prepared by: The Committee on Hydrology, May 1981

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65. Title: Westward Flowing Tributaries of Eastward Flowing Streams Apportionment Study

Contents: The 1969 Master Agreement on Apportionment provides direction regarding the apportionment of eastward flowing waters among the Provinces of Alberta, Saskatchewan and Manitoba but makes no specific reference to the apportionment of flows that cross interprovincial boundaries in a westerly direction. This report deals with westward flowing tributaries of eastward flowing streams. It outlines the extent of problems of such tributaries, investigates the effects of using alternative methods of apportioning these tributaries, and makes recommendations on how they may be apportioned.

Prepared by: Committee on Hydrology, May 1986

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122 Title: Strategies For Apportionment Monitoring of Small Interprovincial Streams (LIMITED DISTRIBUTION) ([PDF available](#))

Contents: This report summarizes the strategies that the COH recommended for dealing with apportionment monitoring of small interprovincial streams. It includes: a categorization of streams for potential apportionment problems (i.e., long, medium and short term); a cost-effective strategy for improving the existing data base (i.e., relocation of existing stations, monitoring of water use); and a procedure for keeping the Committee informed of potential apportionment problems and for notifying the Board when monitoring is required.

Prepared by: PPWB, Committee on Hydrology, April 1993

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133            Title:            Assessment of Natural Flow Computation Procedures and Monitoring Network for the Administering Apportionment of the South Saskatchewan River Basin at the Alberta-Saskatchewan Boundary [\(PDF available\)](#)

                 Contents:        This report provides the results of the evaluation on natural flow computation procedures and apportionment monitoring network of the South Saskatchewan River. The evaluation begins by examining the 1969 Master Agreement on Apportionment as it relates to the South Saskatchewan River. It then examines the natural flow computation procedures, which form the basis for apportionment, as well as the level of licensing in the basin. Lastly, the current hydrometric monitoring network is examined and recommendations are made on the location and number of hydrometric stations required in the basin to administer the Agreement.

                 Prepared by:    Alberta Environmental Protection for COH, March 1995

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141            Title:            An Evaluation of Apportionment Monitoring Networks for the Saskatchewan River at the Saskatchewan-Manitoba Boundary [\(PDF available\)](#)

                 Contents:        In recent years, because of budget restraints, Environment Canada has indicated difficulties in continuing to maintain apportionment monitoring networks at the existing level. The Committee on Hydrology, at its January 1995 meeting, agreed that the Saskatchewan River's apportionment monitoring network be evaluated. This report is a summary of that evaluation. It provides an assessment of water use projects in the Saskatchewan portion of the Saskatchewan River basin, describes the alternative methods for estimating flow or water level at a site, and performs a sensitivity analysis for six scenarios of apportionment monitoring networks. Recommendations of this report were adopted by the Board for apportionment monitoring of the Saskatchewan River.

                 Prepared by:    Committee on Hydrology, January 1997

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143            Title:            Apportionment Period for Eastward Flowing Streams Crossing the Saskatchewan-Manitoba Boundary ([PDF available](#))

                 Contents:        In recent years, concerns were raised regarding the continuing use of water year for apportioning the waters of eastward flowing streams crossing the Saskatchewan-Manitoba boundary, particularly on the suitability of a water year and its effects on apportionment monitoring and reporting. This report provides the historical background as to why the water year was used for the apportionment monitoring of streams crossing the Saskatchewan-Manitoba boundary. It also describes the disadvantage of apportioning the water based on water year and recommends that Schedule B of the Master Agreement on Apportionment be revised to change the apportionment period from the water year to the calendar year.

                 Prepared by:    PPWB Committee on Hydrology, April 1996

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### ***Apportionable (Natural) Flows for Specific Rivers***

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1                Title:            Summary Reports of Recorded and Natural Monthly Flows at Certain Points on the South Saskatchewan River (OUT OF PRINT)

                 Contents:        Tables of natural and recorded flow at several points on the South Saskatchewan River.

                 Prepared by:    PPWB Staff, November 1950

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1A              Title:            Summary Report of Natural Yearly Flows at Certain Points on the Saskatchewan River system, by Calendar Year, for the Period 1912-1963 Inclusive (OUT OF PRINT)

                 Contents:        Tables of natural flows at certain points on the Saskatchewan River system.

                 Prepared by:    Hydrology Division, PFRA, May 1966

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1-A             Title:            Report No. 1-A Addendum (OUT OF PRINT)

                 Contents:        Summary report of natural yearly flows at certain points on the Saskatchewan River system, by calendar year, for the period 1964-1966 inclusive.

                 Prepared by:    Hydrology Division, PFRA, December 1968

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- 2 Title: Streamflow at Three Selected Points on South and Main Saskatchewan Rivers after Alberta's 1949 Request (OUT OF PRINT)
- Contents: Tables of flow of three points on the South Saskatchewan and Saskatchewan Rivers showing the effect of Alberta's 1949 request on water supply of Saskatchewan and Manitoba.
- Prepared by: PPWB Staff, December 1950
- 
- 52 Title: Antler River at Saskatchewan-Manitoba Boundary - Natural Flow. (OUT OF PRINT)
- Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.
- Prepared by: Hydrology Division, PFRA, December, 1978
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- 55 Title: Pipestone Creek at Saskatchewan-Manitoba Boundary - Natural Flow.
- Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes. Updated report #116 done in December 1992.
- Prepared by: Hydrology Division, PFRA, March 1979
- 
- 56 Title: Boxelder and Mackay Creeks at Alberta-Saskatchewan Boundary - Natural Flow (LIMITED DISTRIBUTION)
- Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with two interprovincial streams that cross the boundary between Alberta and Saskatchewan several times before draining into Many Island Lake.
- Prepared by: Water Survey of Canada, Regina, September 1981
-

57 Title: Assiniboine River at Saskatchewan-Manitoba Boundary – Natural Flow (LIMITED DISTRIBUTION)

Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.

Prepared by: Hydrology Division, PFRA, November 1980

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61 Title: Battle and Lodge Basins Apportionment Study (OUT OF PRINT)

Contents: The report describes water supply and use in Battle Creek, Middle Creek and Lodge Creek tributary to the Alberta-Saskatchewan Boundary. An apportionment formula is recommended that will divide the water equitably between Alberta, Saskatchewan and the United States of America. Specific administrative procedures to monitor the apportionment are recommended.

Prepared by: The Committee on Interjurisdictional Agreements, Administration - March 1981

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62 Title: Graham Creek at Saskatchewan-Manitoba Boundary - Natural Flow

Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.

Prepared by: Hydrology Division, PFRA, July 1981

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63 Title: Gainsborough Creek at Saskatchewan-Manitoba Boundary – Natural Flow

Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.

Prepared by: Hydrology Division, PFRA, July 1987

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- 64            Title:            Battle River at Alberta-Saskatchewan Boundary - Natural Flow
- Contents:        The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Alberta to Saskatchewan. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.
- Prepared by:    Hydrology Branch, Technical Services Division, Alberta Environment, July 1982
- 
- 67            Title:            Procedures for Interprovincial Apportionments of the Waters of Battle, Lodge and Middle Creeks - Natural Flow. (LIMITED DISTRIBUTION)
- Contents:        The report describes a procedure to determine Natural Flow at the Alberta-Saskatchewan boundary for Battle Creek, Lodge Creek, and Middle Creek. The procedures described are similar to those used at the international boundary and are designed to take advantage of the field work needed to make those calculations.
- Prepared by:    Water Resources Branch, Calgary, Inland Waters Directorate, Environment Canada, February 1983
- 
- 68            Title:            Eyehill Creek at the Alberta-Saskatchewan Boundary - Natural Flow
- Contents:        The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Alberta to Saskatchewan. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.
- Prepared by:    Water Resources Branch, Inland Waters Directorate, Environment Canada, July 1984
- 
- 69            Title:            Beaver River at Alberta-Saskatchewan Boundary - Natural Flows - May 1984.
- Contents:        The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Alberta to Saskatchewan. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.
- Prepared by:    PPWB Secretariat, May 1984
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- 71 Title: Boxelder Creek Basin Apportionment Study - May 1984  
([PDF available](#))
- Contents: The report reviews the existing allocations of waters in the basins, reconstructs historical natural flow data of the Box Elder and Mackay Creeks at the Alberta-Saskatchewan boundary, evaluates possible apportionment methods, and makes recommendations on how the water resources of these two creeks may be equitably used by both Alberta and Saskatchewan. Recommendations are made on the procedures that should be used to manage water in these interprovincial basins.
- Prepared by: Committee on Interjurisdictional Agreements, Administration, PPWB Secretariat, May 1984
- 
- 73 Title: A Review of the SSARR Versus SIMPAK Models for the Qu'Appelle River Basin - May 1984. (LIMITED DISTRIBUTION) ([PDF available](#))
- Contents: The report evaluates the functions of the SIMPAK Model, identifying the advantages and disadvantages including operating costs of both the SIMPAK and the SSARR, and whether SIMPAK may be used to replace the SSARR Model for the Qu'Appelle River.
- Prepared by: D.R. Richards, Hydrology Branch, Saskatchewan Environment, May 1984
- 
- 74 Title: Big Gully Creek at Alberta-Saskatchewan Boundary - Natural Flow - October 1984 (LIMITED DISTRIBUTION) ([PDF available](#))
- Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Alberta to Saskatchewan. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.
- Prepared by: Hydrology Division, PFRA, October 1984
- 
- 81 Title: Swan River at Alberta-Saskatchewan Boundary - Natural Flow - December 1985.
- Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.
- Prepared by: Hydrology Division, PFRA, December 1985
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82 Title: Woody River at Saskatchewan-Manitoba Boundary - Natural Flow - December 1985.

Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.

Prepared by: PFRA, Hydrology Division, December 1985

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85 Title: Birch (Saskeram) River at the Saskatchewan-Manitoba Boundary - Natural Flow.

Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.

Prepared by: Saskatchewan Water Corporation, July 1987

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86 Title: Stony Creek at Saskatchewan-Manitoba Boundary – Natural Flow.

Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.

Published by: PPWB Secretariat, July 1987

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87 Title: Gopher and Bosshill Creeks at Saskatchewan-Manitoba Boundary – Natural Flow.

Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.

Prepared by: PPWB Secretariat, July 1987

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88 Title: Jackson Creek at Saskatchewan-Manitoba Boundary – Natural Flow.

Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.

Prepared by: PPWB Secretariat, July 1987

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89 Title: Elm Creek at Saskatchewan-Manitoba Boundary - Natural Flow.

Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.

Prepared by: PPWB Secretariat, September 1988

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102 Title: Red Deer (Saskatchewan) River at Saskatchewan-Manitoba Boundary - Natural Flow ([PDF available](#))

Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.

Prepared by: Hydrology Division, PFRA, July 1988

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103 Title: Overflowing River at Saskatchewan-Manitoba Boundary - Natural Flow. ([PDF available](#))

Contents: The report is one of a series of reports describing natural flow studies conducted for the Prairie Provinces Water Board. It deals with an interprovincial stream flowing from Saskatchewan to Manitoba. Comments are made on the hydrometric network that will be needed if this basin is formally monitored for apportionment purposes.

Prepared by: Hydrology Division, PFRA, July 1988

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- 112            Title:            Qu'Appelle River SSARR Model Modification Study. (LIMITED DISTRIBUTION) ([PDF available](#))
- Contents:        This report summarizes the modifications that were made to the Qu'Appelle River SSARR Natural Flow Model. Also summarized in this report are simulation results for the 1975 to 1988 period that was obtained using the modified model. The modified model was found to simulate lake elevations and streamflows under both existing and natural conditions that were much more realistic than those obtained using the original model.
- Prepared by:    Saskatchewan Water Corporation, Hydrology Branch, January 1991
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- 116            Title:            Pipestone Creek Natural Flow Study at the Saskatchewan-Manitoba Boundary. ([PDF available](#))
- Contents:        This report documents the results of a COH Study to develop a strategy on apportionment monitoring for small interprovincial streams. It provides a categorization of streams for potential apportionment problems, a cost-effective strategy for improving the existing monitoring network, and procedures for keeping the Committee informed of potential apportionment problems and for notifying the Board when monitoring of apportionment is required.
- Prepared by:    Saskatchewan Water Corporation, December 1992
- 
- 168            Title:            Battle River at the Saskatchewan-Alberta Boundary Natural Flow Update 1980 – 2004 ([PDF available](#))
- Contents:        A Battle River report was completed in 1982, covering estimated mean monthly natural flow at the Alberta-Saskatchewan boundary for the period 1912 to 1979. The PPWB Committee on Hydrology recommended a natural flow study update was needed to note the significant water use changes in the basin.
- This updated report provides estimates of Battle River's natural flow at the Saskatchewan-Alberta border from 1980 to 2004 and the current level of water use in Alberta.
- Prepared by:    Saskatchewan Watershed Authority for the PPWB Committee on Hydrology, March 2008
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172	<p>Title: Basin Review Calculation of Apportionable Flow for the North Saskatchewan River at the Alberta/Saskatchewan Interprovincial Boundary (<a href="#">PDF available</a>)</p> <p>Contents: In 2011, the Prairie Provinces Water Board's Committee on Hydrology embarked on a process of reviewing the apportionable flow calculation procedures for each of the basins subject to apportionment under the <i>Master Agreement on Apportionment</i>. The North Saskatchewan River is the first basin to undergo this review.</p> <p style="padding-left: 40px;">This report evaluates current apportionable flow calculation procedures and recommends improvements as appropriate.</p> <p>Prepared by: PPWB Committee on Hydrology, December 2015</p>
173	<p>Title: Basin Review Calculation of Apportionable Flow for the Cold River at the Outlet of Cold Lake (<a href="#">PDF available</a>)</p> <p>Contents: Cold Lake is one of the bodies of water that is apportioned between Alberta and Saskatchewan under the terms of the <i>Master Agreement on Apportionment</i>, administered by the Prairie Provinces Water Board. In 2011, the Prairie Provinces Water Board's Committee on Hydrology embarked on a process of reviewing the apportionable flow calculation procedures for each of the basins subject to apportionment under the <i>Master Agreement on Apportionment</i>. This basin is the second to undergo this review process.</p> <p style="padding-left: 40px;">The conclusion of this review was that several improvements could be made to the apportionable flow calculation procedures. The report discusses its findings and provides recommendations.</p> <p>Prepared by: R. Halliday &amp; Associates for the PPWB Committee on Hydrology, December 2015</p>

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178	<p>Title: Basin Review Calculation of Apportionable Flow for the Saskatchewan River at the Saskatchewan/Manitoba Boundary (<a href="#">PDF available</a>)</p> <p>Content: Apportionable flow for the Saskatchewan River is calculated at the interprovincial boundary based on the project depletion method, as follows:</p> <p style="text-align: center;"><i>Apportionable Flow = Recorded Flow at the Boundary + Annual Water Use in Saskatchewan</i></p> <p>In the case of the Saskatchewan River there is no gauging station located at the boundary, so recorded flow at the boundary is estimated by adjusting the recorded flow at station 05KJ001 Saskatchewan River at the Pas to account for local inflow between the boundary and the gauging station.</p> <p>This basin review study looked at all aspects of the apportionable flow calculation and presented options for improvements.</p> <p>Prepared by: Optimal Solutions Ltd Recommended by the PPWB Committee on Hydrology Approved by the Prairie Provinces Water Board, November 2017</p>
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### ***Runoff or Drainage***

10	<p>Title: The Distribution and Variability of Runoff in Alberta, Saskatchewan and Manitoba. (OUT OF PRINT)</p> <p>Contents: Presents a three-part analysis of the "Compilation of runoff records for the Canadian Prairies" to determine the recurrence probability of low runoff years, and to study the nature of low runoff persistence in various regions.</p> <p>Prepared by: Hydrology Division, PFRA</p>
31	<p>Title: Report of the Effect of a Change in Vegetation on the Runoff Characteristics of Alberta Streams. (OUT OF PRINT)</p> <p>Contents: A summation of the information available on the effect of a change in vegetative cover on total runoff.</p> <p>Prepared by: A.G. Underhill, September 1962</p>

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37 Title: Compilation of Runoff Records for the Canadian Prairies  
(OUT OF PRINT)

Contents: A compilation of recorded and estimated monthly flows for over 200 hydrometric stations on the Prairies.

Prepared by: Hydrology Division, PFRA, April 1967

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164 Title: Report of the Organizing Committee on the PPWB Drainage Workshop of September 24, 2001, Saskatoon. ([PDF available](#))

Contents: Summary of the Drainage Workshop with Conclusions.

Prepared by: Prairie Farm Rehabilitation Administration for the PPWB Committee on Hydrology, December 2004.

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### *Other*

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28 Title: A Survey of the Law of Water in Alberta, Saskatchewan and Manitoba.  
(OUT OF PRINT)

Contents: A survey of the main body of the Law of Water in force in the Prairie Provinces as of 1959.

Prepared by: Per Gisvold, CDA, Economics Division, May 1959

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77 Title: Prairie Hydrology Workshop #2, Brandon, Manitoba, October 16-17, 1984 (OUT OF PRINT)

Contents: Four topics were discussed at this workshop: Generation of Historic Natural Flow Data; Estimation of Problem Maximum Floods; Frequency Analysis for Floods and Droughts; and Operational Procedures for Reservoir Regulation. The report summarizes discussions on each of these four topics.

Prepared by: PPWB Secretariat, November 1984

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- 83            Title:            A Summary of Prairie Provinces Water Board Committee on Hydrology Activities from 1972 to 1985.
- Contents:        The activities of the Committee on Hydrology for the period from 1972 to 1985 inclusive are summarized in this report. They are divided into eight different categories: Natural Flow, Forecasting, Apportionment, Monitoring, Evaporation, Drainage, Forest Management and Impact Assessments for Projects that may have interprovincial implications. The work completed by the Committee on Hydrology in each of these eight categories has been highlighted.
- Prepared by:    PPWB Secretariat, November 1986
- 
- 105           Title:            Prairie Hydrology Workshop No. 3, October 18/19, 1988, Saskatoon, Saskatchewan ([PDF available](#))
- Contents:        The report contains the technical papers presented at the workshop which describes various hydrologic, hydraulic, and water management models used by Board Agencies.
- Prepared by:    PPWB Secretariat, December 1988
- 
- 170           Title            South Saskatchewan River Natural Flow and Apportionment: Irrigation Return Flows 2001 - 2005 - Phase 1 ([PDF available](#))
- Contents:        This report reviews the impact of irrigation return flow in the natural flow determinations for the South Saskatchewan River Basin. The report looks in detail at the return flow data obtained from the 13 irrigation districts of southern Alberta as compiled by Alberta Agriculture and from the Water Survey of Canada (WSC) with respect to the adequacy of the data in terms of its accuracy and timeliness.
- Prepared by:    Greg MacCulloch and Barkat Khan, Meteorological Service of Canada, March 2011
-

## Water Uses

### *Impacts of Development Projects*

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- 3            Title:            Preliminary Report on Effects of Certain Major Projects in the Saskatchewan River Basin (OUT OF PRINT)
- Contents:        Comprehensive water supply studies for four conditions to estimate the effect of two different stages of development in Alberta on downstream interests.
- Prepared by:    PPWB Staff, March 1951
- 
- 3 App. A    Title:            Appendix 'A' to Report #3 (OUT OF PRINT)
- Contents:        Extends Report #3 to cover period 1911-1922.
- Prepared by:    PPWB Staff, December 1951
- 
- 3 App. B    Title:            Appendix 'B' to Report #3 (OUT OF PRINT)
- Contents:        Extends Report #3 to cover period 1947-1952.
- Prepared by:    Hydrology Division, PFRA, July 1954
- 
- 4            Title:            Comparison of Two Alternate Developments in the Saskatchewan River Basin (OUT OF PRINT)
- Contents:        Determination of the physical results of two alternate developments in the Saskatchewan River Basin as expressed in acres irrigated, KWH produced, and dollars.
- Prepared by:    Hydrology Division, PFRA, October 1951
- 
- 14           Title:            The Effect of Lake Diefenbaker on Flood Frequencies at the Pas. (OUT OF PRINT)
- Contents:        Effect of Lake Diefenbaker on the flood frequencies of the Pas and to produce a new set of frequency curves at the Pas that would reflect the regulatory effect of Lake Diefenbaker.
- Prepared by:    L.K. Szojka, Hydrology Division, PFRA, October 1970
- 
- 15           Title:            Memorandum on Commercial Power Potential on the South Saskatchewan River Project. (OUT OF PRINT)
- Contents:        Sets out the commercial power possibilities of this project and indicates the future benefits which will accrue.
- Prepared by:    PPWB Staff, January 1951

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16	Title:	Memorandum on Effect of Alberta Developments on the South Saskatchewan River Project. (OUT OF PRINT)
	Contents:	This memorandum summarizes the effects of Alberta developments on the South Saskatchewan River Projects.
	Prepared by:	Hydrology Division, PFRA, March 1951

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23	Title:	Study of Merits of Alternative Plans for the Use of the Waters of the Saskatchewan River Drainage Basin in Alberta and Saskatchewan. (OUT OF PRINT)
	Contents:	Study of merits of alternative plans for the use of waters of the Saskatchewan River Drainage Basin in Alberta and Saskatchewan. This report contains approximate cost estimates of alternative plans of development.
	Prepared by:	Ben Russell, Alberta Member of PPWB, September 1951

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24	Title:	History of Decision to Fully Investigate the Separate Projects (Red Deer and South Saskatchewan River projects). (OUT OF PRINT)
	Contents:	History of decision to fully investigate the Red Deer and South Saskatchewan River Projects.
	Prepared by:	Hydrology Division, PFRA, October 1951

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27	Title:	A Preliminary Report on the William Pearce Project. (OUT OF PRINT)
	Contents:	This report summarizes the history, engineering investigations, cost studies and benefits of the proposed William Pearce Project.
	Prepared by:	A.G. Underhill, October 1958

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59	Title:	The Probable Impact of the Proposed Dickson Dam on the Quality of Water Crossing the Alberta-Saskatchewan Boundary. (OUT OF PRINT)
	Contents:	The report evaluates the effect that Dickson Dam might have on the quality of water at the Alberta-Saskatchewan boundary. It concludes that there will be no adverse effects during the construction or the operational period and that there will be an improvement to water quality if the dam is operated to enhance low flows in the Red Deer River.
	Prepared by:	PPWB Secretariat, March 1980

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75 Title: Estimating Minor Project Use in the Qu'Appelle River System at the Alberta-Saskatchewan Boundary - June 1985 (LIMITED DISTRIBUTION) [\(PDF available\)](#)

Contents: The report evaluates the alternate methods for estimating minor project use in the Qu'Appelle River and proposes an interim method that may be used to estimate small project use by storage reservoirs with the understanding that the methodology will be reviewed when more information has been gathered.

Prepared by: PPWB Secretariat, June 1985

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76 Title: Moosomin Dam and Its Effect on the Apportionment of Pipestone Creek Flows

Contents: Pipestone Creek is not monitored for interprovincial apportionment purposes, but downstream water users in Manitoba are concerned about the availability of water and the effect that Moosomin Reservoir has on the water supply. This report describes computerized water use studies related to those problems and was undertaken as a result of a meeting between Manitoba, Saskatchewan and PFRA Administration officials.

Prepared by: PPWB Secretariat, August 1985

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### *Irrigation Uses*

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32 Title: Irrigation Water Use. (OUT OF PRINT)

Contents: A report on allocation procedures used by various agencies, on methods of computing gross diversions used by various agencies, and the procedures under which diversion requirements are administered.

Prepared by: A.G. Underhill, Irrigation Water Use Committee, PPWB, October 1963

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43 Title: Determination of Irrigation Return Flow in Southern Alberta. (LIMITED DISTRIBUTION).

Contents: A miscellaneous measurement program was carried out at approximately 80 return flow sites in the St. Mary, Taber and Lethbridge Northern irrigation districts to develop a hydrometric network plan to monitor return flows.

Prepared by: Water Survey of Canada, Calgary, February 1973

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72 Title: Return Flow From Irrigation - Southern Alberta.  
(LIMITED DISTRIBUTION) ([PDF available](#))

Contents: The report reviews the results of the study conducted in 1971 and 1972 on return flow from irrigation projects in the Oldman River Basin of Southern Alberta. Changing irrigation patterns have changed return flow patterns and 12 key return flow index stations have been selected to represent return flow. Checking procedures are recommended to determine whether the proposed pattern of index stations will continue to adequately measure return flow in future years.

Prepared by: Water Resources Branch, Calgary, Inland Waters Directorate,  
Environment Canada, October 1985

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### ***Water Supply and/or Demand***

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8 Title: Water Deficiency Patterns in the Prairie Provinces (OUT OF PRINT)

Contents: A Study of the major patterns of drought and moisture surplus in the Prairie Provinces. Superseded by Report #13.

Prepared by: A.H. Laycock

Compiled by: Hydrology Division, PFRA, February 1964

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9 Title: Estimated Water Requirements - Qu'Appelle and Assiniboine River Basins (OUT OF PRINT)

Contents: This Report is a tabulation of the estimated future water requirements in the Assiniboine and Qu'Appelle River Systems. (Prepared by the Provinces of Manitoba and Saskatchewan).

Prepared by: Hydrology Division, PFRA, June 1964

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9 Supp. Title: Memorandum Re: Saskatchewan and Manitoba Estimates of Future Water Requirements in the Assiniboine-Qu'Appelle Watershed as Listed in Report #9 (OUT OF PRINT)

Contents: Summarizes discrepancies between figures calculated in the Hydrology Division and those listed in tables in Report #9.

Prepared by: W.L. Kreuder, Hydrology Division, PFRA, July 1964

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- 12 Title: Water Supply and Water Use in the Assiniboine and Qu'Appelle Basins.  
(OUT OF PRINT)
- Contents: This Report describes a study of water supply and water use in the Assiniboine-Qu'Appelle for two levels of development: Year 1980 and Year 2000.
- Prepared by: Hydrology Division, PFRA, May 1966
- 
- 12 App. Title: Appendix to Report #12 (OUT OF PRINT)
- Contents: This appendix lists the detailed components of the study of water supply and water use in the Assiniboine-Qu'Appelle watershed.
- Prepared by: W.L. Kreuder & J.G.S. McMarine, Hydrology Division, PFRA, September 1966
- 
- 13 Title: Water Deficiency and Surplus Patterns in the Provinces.  
(OUT OF PRINT)
- Contents: This Report defines and maps the major patterns of water deficit and water surplus in the Prairie Provinces.
- Prepared by: A.H. Laycock
- Compiled by: Hydrology Division, PFRA, March 1967
- 
- 17 Title: Water Supply Study of South Saskatchewan River Project.  
(OUT OF PRINT)
- Contents: This memorandum contains two water supply studies undertaken for the South Saskatchewan River project based upon different stages of irrigation development in the Province of Alberta.
- Prepared by: Hydrology Division, PFRA, March 1951
- 
- 18 Title: Preliminary Report on Regulation Possibilities in the Assiniboine Basin above Brandon (OUT OF PRINT)
- Contents: This memorandum shows the extent to which Manitoba's future requirements concerning water to be obtained from the South Saskatchewan Reservoir via the Qu'Appelle Valley could be met.
- Prepared by: W.G. Salway, Hydrology Division, PFRA, September 1962
-

- 20 Title: Proposals for the Study of Water Supply and Water Use in the Qu'Appelle and Assiniboine Basin (OUT OF PRINT)
- Contents: This memorandum contains an outline of the Assiniboine and Qu'Appelle Basin study. It provides background information necessary for the recommendation of reservations, allocations, and/or apportionment of waters between Manitoba and Saskatchewan, and water requirements for South Saskatchewan River project.
- Prepared by: E.F. Durrant, Engineering Secretary, PPWB, November 1962
- 
- 21 Title: Glossary of Terms. (OUT OF PRINT) \* Unavailable \*
- Contents: Glossary of terms, based upon those used in A.G. Underhill's Report entitled, "The effect of a change in vegetation on the runoff characteristics of Alberta Streams".
- Prepared by: Hydrology Division, PFRA, February 1964
- 
- 25 Title: Water Supply Study of South Saskatchewan River Project. (OUT OF PRINT)
- Contents: Investigation of available water supply undertaken by PFRA in connection with the South Saskatchewan River Project.
- Prepared by: Hydrology Division, PFRA, January 1952
- 
- 26 Title: An Introductory and Preliminary Statement of Some Significant Physical Factors Relevant to Utilizing Saskatchewan River Water. (OUT OF PRINT)
- Contents: This report outlines, in general terms, the basic data relevant to Saskatchewan River Basin planning.
- Prepared by: J.A. Boan and C.C. Spence, March 1954
- 
- 29 Title: Preliminary Studies for the Development of Integrated Basin Plans for the Nelson River Drainage Basin. (OUT OF PRINT)
- Contents: Report outlines the nature and extent of the investigations considered essential by the Board before decisive planning of integrated Basin development can be pursued.
- Prepared by: E.F. Durrant, Engineering Secretary, PPWB, September 1960
-

40	Title:	Report to the Prairie Provinces Water Board on Water Use and Water Supply Studies of Battle and Lodge Creek Basins. (OUT OF PRINT)
	Contents:	This report provides an inventory of natural flows and water use in the Battle and Lodge Creek basins for the period 1911 to 1969.
	Prepared by:	Water Planning and Management Branch, Canada, Department of the Environment, November 1972
<hr style="border-top: 1px dashed black;"/>		
41	Title:	Water Supply for the Saskatchewan-Nelson Basin - A Summary Report.
	Contents:	The report of the Saskatchewan-Nelson Basin Board describes in detail how they studied the feasibility and cost of improving the water supply to the Saskatchewan-Nelson Basin. This document presents the highlights of that report.
	Prepared by:	Saskatchewan-Nelson Basin Board, December 1972
<hr style="border-top: 1px dashed black;"/>		
42	Title:	Water Supply for the Saskatchewan-Nelson Basin (LIMITED DISTRIBUTION)
	Contents:	The report of the Saskatchewan-Nelson Basin Board, which includes eight appendices, describes in considerable detail how they studied the feasibility and cost of improving the water supply to the Saskatchewan-Nelson basin, and presents the results, findings, and recommendations.
	Prepared by:	Saskatchewan-Nelson Basin Board, December 1972
	Main Report:	Water Supply for the Saskatchewan-Nelson Basin
	Appendices:	Appendix 1: Study Background; Appendix 2: Project Investigations; Appendix 3: Project Catalogue; Appendix 4: Hydrology; Appendix 5: Systems Analysis; Appendix 6: Regulation Studies; Appendix 7: Environmental and Other Considerations; and Appendix 8: Effects of Diversion on Donor Basins
<hr style="border-top: 1px dashed black;"/>		
49	Title:	A Water Demand Study Design for the Saskatchewan-Nelson Basin - Part One, Current and Historical Uses. (OUT OF PRINT)
	Contents:	Outlines proposed terms of reference, general methodology, budgets, schedules and administrative arrangements for part one of the PPWB Water Demand Study which is designed to document the development of historical and current water uses in the Saskatchewan-Nelson Basin.
	Prepared by:	Committee on Water Demand, May 1976
<hr style="border-top: 1px dashed black;"/>		

70 Title: Historical and Current Water Use in the Saskatchewan-Nelson Basin (consists of a main report and seven volumes of appendices) (LIMITED DISTRIBUTION)

Contents: The Water Demand Study deals with municipal, industrial, and agricultural water uses and with instream requirements for energy generation, recreation, and fish and wildlife habitat. Changes in water use between 1951 and 1978 and the factors affecting water use are documented. They indicate that water use is growing at a much faster rate than population. Six recommendations are made as part of the study. All six are designed to improve the quantity and quality of the information used to administer water resources in future years. The study report is bound in eight volumes.

Main Report  
Appendices:

1. Regional Economic Base
2. Municipal and Industrial Use, Vol. 1 of 2
3. Municipal and Industrial Use, Vol. 2 of 2
4. Agriculture
5. Power Generation
6. Recreation
7. Environmental Consideration

Prepared by: The Committee on Water Demand, February 1983

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107 Title: Evaluation of the Prairie Provinces Water Board Water Demand Data Base. (OUT OF PRINT) ([PDF available](#))

Contents: Reviews contents and use of the existing data base. Contains recommendations for streamlining and updating the data base.

Prepared by: PPWB Secretariat, September 1989

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108 Title: Water Uses in the Saskatchewan-Nelson Basin, 1951-1986. (OUT OF PRINT) ([PDF available](#))

Contents: This report is an update of the 1982 PPWB Water Demand Study. Contains figures and tables of water used for municipal, industrial, agricultural and power generating purposes as well as population trends in the basin for the period 1951-1986 (The tables and figures were updated to include 1991 data. As of January 2000, PFRA is evaluating the process of updating the WDS data base).

Prepared by: PPWB Secretariat, 1990

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- 156            Title:            Valuation of Water Resources in the Prairie Provinces: Some Needed Research Areas ([PDF available](#))
- Contents:        The report is submitted in partial fulfilment of a Request for Proposal (RFP) PPWB members have recognized the need for information on value for water in the Prairie Provinces. This need is perceived for aiding water managers. To this effect a RFP was issued by the PPWB. It was felt that there may exist a need for a fresh look at prairie water resources - use and values. Detailed terms of reference for the study are presented in this report.
- Prepared by:    Suren Kulshreshtha, University of Saskatchewan, Saskatoon for the Prairie Provinces Water Board March 5, 2001
- 
- 165            Title:            Economic Value of Water in Alternative Uses in the South Saskatchewan (Alberta and Saskatchewan Portions) River Basin – Research Report ([PDF available](#))
- Contents:        The study encompasses the value of water in the all consumptive and non-consumptive uses in the South Saskatchewan River Basin for both the current time period and future period (under climate change). The second objective is to conceptualize the relationship between the value of water and climate change.
- Prepared by:    Prepared for the PPWB by S.N. Kulshreshtha, Department of Agricultural Economics, University of Saskatchewan, Saskatchewan. March 2006.
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## Meteorological

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- 5            Title:            Evaporation from Lakes and Reservoirs on the Canadian Prairies - A Study Based on Thirty Years of Meteorological Records, 1921-1950 (OUT OF PRINT)
- Contents:        Procedure for estimating large lake, free water surface evaporation. The report utilizes the Meyer evaporation equation as a basis for this procedure.
- Prepared by:    W.M. Berry & W. Stichling; Hydrology Division, PFRA, December 1952
- 
- 5 Supp. A    Title:            Supplement A to Report #5 (OUT OF PRINT)
- Contents:        Extends tables of estimated large lake evaporation to cover period 1921-1962 inclusive.
- Prepared by:    G.A. McKay; Hydrology Division, PFRA, April 1965
- 
- 6            Title:            Precipitation and Streamflow in the Mountain and Foothill Region of the Saskatchewan River Basin. (OUT OF PRINT)
- Contents:        Outlines the approximate patterns of precipitation and streamflow in the mountain and foothill region of the Saskatchewan River Basin and suggests ways in which watershed management might affect and be affected by the patterns outlined.
- Prepared by:    A.H. Laycock, January 1957
- 
- 19           Title:            The Use of Hydrometeorological Information for Flood Forecasts on the Prairies. (OUT OF PRINT)
- Contents:        This memorandum summarizes flood forecasting activities and data requirements on the Prairies, as of 1961.
- Prepared by:    E.F. Durrant, Engineering Secretary, PPWB, December 1961
- 
- 33           Title:            Water Board Requirements for Meteorological Data and Services (OUT OF PRINT)
- Contents:        This brief summarizes the needs of the PPWB for meteorological information and its interest in meteorological networks. A committee is proposed to study meteorological networks.
- Prepared by:    E.F. Durrant, Engineering Secretary, PPWB, October 1964
-

46 Title: Rainfall Intensities and Topographic Features. (OUT OF PRINT)

Contents: The results presented in this report provide the basis of the rain gauge network requirements proposed for the North and South Saskatchewan River Basins (Report No. 44) to meet short term streamflow forecasting requirements. The report begins by developing a climatology of extreme point rainfall events. Selected extremes are correlated with topographical parameters to determine local terrain influences and synoptic characteristics of severe rain producing events.

Prepared by: Water Survey of Canada, Calgary, June 1974

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90 Title: Design Wind Study (Phase I) for the Prairie Provinces Water Board. (OUT OF PRINT)

Contents: This document describes the station selection, station anemometer history, and programs CLEANUP3 and WINDOW which were written specifically for this design wind study.

Prepared by: Atmospheric Environment Services, Environment Canada, Dec. 1987

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115 Title: PPWB Design Wind Program: User's Manual ([PDF available](#))

Contents: Phase II of the Prairie Provinces Water Board (PPWB) design wind project was divided into parts A and B. Part A was completed in December 1988 and represented a significant enhancement to the utility of the data provided in Phase I (see PPWB Report No. 90, December 1986).

This report provides documentation for Part A and the User's Manual for Part B of the Design Wind Study. The Part A documentation is included as an Addendum to the User's Manual because most of the information is superseded by the User's Manual. There are a few references to Part A in the text of the User's Manual, but otherwise the manual can stand alone.

Prepared by: Atmospheric Environment Service, Environment Canada, February 1992

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- 154            Title:            Estimation of the Influence of Elevation on Evaporation in Southeast Alberta and Southwest Saskatchewan ([PDF available](#))
- Contents:        This report provides a review and analysis on the Influence of elevation on evaporation in Southeast Alberta and Southwest Saskatchewan. Recommendations in this report suggest that the net evaporation at the upper Lodge reservoirs is determined by modifying the Altawan pan evaporation by the elevation adjustment of 0.884 and then the pan coefficient of 0.70 before subtracting the Eagle Butte precipitation.
- Prepared by:    R. F. Hopkinson, Meteorologist Atmospheric Environment Branch, Environment Canada for the PPWB Committee on Hydrology April 1999
- 
- 162            Title:            Status Report on Studies and Research to Address Guidelines for Evaporation Estimates Required by Prairie Provinces Water Board ([PDF available](#))
- Contents:        Provides an overview of evaporation related studies in the Prairie Provinces since mid-1980=s.
- Prepared by:    Ron Hopkinson, Environment Canada for the PPWB Committee on Hydrology, May 2003.
- 
- 171            Title            Evaluation of Lake Evaporation in the North Saskatchewan River Basin ([PDF available](#))
- Contents:        This report is a study of various evaporation methods and their application on two large water bodies (Lake Abraham and Brazeau Reservoir) in the North Saskatchewan River Basin (NSRB). The aim of the report is to develop a generic approach for the PPWB-COH to evaluate lake evaporation by comparing various methods to calculate evaporation from open water; and to estimate precipitation-evaporation balance over Lake Abraham and Brazeau Reservoir located in the Alberta Foothills within the NSRB.
- Prepared by:    Prepared for the PPWB Committee on Hydrology by Anthony Liu, Neil Taylor, Ali Kiyani and Curtis Mooney, Meteorological Service of Canada, University of Alberta, December 2014
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## Surface Water Quality

### *PPWB Monitoring*

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50            Title:            Interprovincial River Water Quality Data at the Alberta-Saskatchewan and Manitoba-Saskatchewan Boundaries -- January 1960 to April 1974. (OUT OF PRINT)

                 Contents:        Summarizes all river water quality data collected by Environment Canada at 11 PPWB monitoring stations near the Manitoba-Saskatchewan, and Alberta-Saskatchewan Interprovincial Boundaries from January 1960 to April 1974 (See PPWB Report #120 for data from 1974 to 1991).

                 Prepared by:    PPWB Secretariat, September 1976

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51            Title:            A Long Term First Order Minimum Water Quality Network for the Prairie Provinces. (LIMITED DISTRIBUTION)

                 Contents:        This report summarizes water quality network investigations conducted by the Committee on Water Quality from February 4, 1976 to February 2, 1978. It recommends that the PPWB recommend that all member agencies should work toward the implementation of the first order, long term, minimum water quality network of 94 monitoring sites documented in the report. In addition, this report includes: a detailed network rationale, guidelines to be used to fix the location of monitoring sites, specific water quality parameters and monitoring frequencies for developed and remote basins, and a monitoring history of the 94 proposed stations.

                 Prepared by:    Committee on Water Quality, April 1978

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53            Title:            Interim Water Quality Requirements for the Beaver River at the Alberta-Saskatchewan Boundary. (OUT OF PRINT)

                 Contents:        The report describes interim water quality requirements for the Beaver River at the Alberta-Saskatchewan boundary. The Board has adopted these requirements which define acceptable levels of water quality pending finalization of an overall water quality management approach.

                 Prepared by:    The Prairie Provinces Water Board, October 5, 1979

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- 60            Title:            A summary of Prairie Provinces Water Board Water Quality Activities 1969 - 1980. (LIMITED DISTRIBUTION)
- Contents:        The report was prepared to provide background information to members of the PPWB and its Committee on Water Quality. It documents the water quality mandate of the Board outlined in the 1969 Master Agreement on Apportionment, reviews the recommendations of the 1972 PPWB Water Quality Task Force, and summarizes action taken by the Board on water quality matters form 1969 to 1980.
- Prepared by:    PPWB Secretariat, October 1980
- 
- 66            Title:            Prairie Provinces Water Board Water Quality Administrative Procedures Manual. (OUT OF PRINT)
- Contents:        Document was not finalized. Contents were incorporated into Report No. 110.
- Prepared by:    PPWB Secretariat, October 1991
- 
- 110          Title:            PPWB Water Quality Procedures Manual. (LIMITED DISTRIBUTION) [\(PDF available\)](#)
- Contents:        The document outlines procedures adopted by the Prairie Provinces Water Board to facilitate the carrying out of the Board's interprovincial water quality management responsibilities in accordance with the 1969 PPWB Master Agreement on Apportionment. It defines the goals, objectives, responsibilities and all water quality activities of the Prairie Provinces Water Board.
- Prepared by:    PPWB Secretariat, August 1991
- 
- 113          Title:            Trend Assessment Techniques: Application to Prairie Provinces Water Board Water Quality Data Set. (LIMITED DISTRIBUTION) [\(PDF available\)](#)
- Contents:        The report reviews and evaluates various trend analysis techniques used throughout North America. These techniques are applied to the PPWB historical water quality data base from 11 PPWB stations. The test results together with further analysis, such as additional data verification and analytical methodology changes, will allow conclusions to be drawn about water quality trends on interprovincial streams.
- Prepared by:    A.H. El-Shaarawi, S.R. Esterby, and J. Yip, National Water Research Institute, March 1991
-

- 120            Title:            Interprovincial River Water Quality Data at PPWB Monitoring Stations - April 1974 to December 1991 (OUT OF PRINT) ([PDF available](#))
- Contents:        Summarizes all river water quality data and provides time series graphs for all variables at the 11 PPWB monitoring stations along the interprovincial boundaries from the period 1974 to 1991.
- Prepared by:    PPWB Secretariat, Committee on Water Quality, February 1993
- 
- 144            Title:            PPWB Water Quality Monitoring Review Phase 1: Qu'Appelle and North Saskatchewan Rivers. ([PDF available](#))
- Contents:        The report provides a general ecological assessment of the current PPWB monitoring program at the Qu'Appelle and North Saskatchewan Rivers and makes recommendations on change for a more cost effective monitoring program.
- Prepared by:    Kevin J. Cash, Prairie & Northern Wildlife Research Centre, Environment Canada, Saskatoon, March 1998 for the PPWB, Committee on Water Quality.
- 
- 149            Title:            An Analysis of Non-Compliance Patterns to Prairie Provinces Water Board Objectives in the Red Deer River at the Alberta/Saskatchewan Boundary. (LIMITED DISTRIBUTION) ([PDF available](#))
- Contents:        The report is an initial attempt to understand why fecal coliforms, copper, zinc, lead, and iron do not meet the Prairie Provinces Water Board Objectives on some occasions in the Red Deer at Bindloss, Alberta, the PPWB long-term monitoring site. Long-term and seasonal patterns in non-compliance with PPWB Objectives were assessed at Bindloss and two provincial long-term monitoring sites upstream.
- Prepared by:    Anne-Marie Anderson, Alberta Environment Protection, Feb. 1996, for the PPWB Committee on Water Quality.
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- 150            Title:            Investigations of PPWB Excursions in the North Saskatchewan River at the Alberta-Saskatchewan Boundary 1997. (LIMITED DISTRIBUTION) ([PDF available](#))
- Contents:        The report summarizes the results of a 1997 study conducted to gain insight into the relative contribution of metals and fecal coliform bacteria in tributaries and effluents in the stretch of the North Saskatchewan River from Mymam Bridge to the Alberta/Saskatchewan border.
- Prepared by:    Patricia Mitchell, Alberta Environmental Protection, Feb. 1998, for the PPWB Committee on Water Quality.
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- 151            Title:            PPWB Water Quality Monitoring Review, Phase 2: Beaver, Red Deer (at the Alberta-Saskatchewan Boundary), South Saskatchewan, Churchill, Saskatchewan and Carrot Rivers.  
(LIMITED DISTRIBUTION) ([PDF available](#))
- Contents:        The report provides a general ecological assessment of the current PPWB monitoring program at the Beaver, Red Deer, South Saskatchewan, Churchill, Saskatchewan, and Carrot Rivers and makes recommendations on change for a more cost effective monitoring program.
- Prepared by:    Kevin J. Cash, Environment Canada, April 1999, for the PPWB Committee on Water Quality.
- 
- 157            Title:            Application of the Canadian Water Quality Index (CWQI) to PPWB Monitoring Program ([PDF available](#))
- Contents:        As part of an ongoing assessment of its water quality monitoring program the PPWB=s COWQ has agreed to assess the utility of using indices in reporting general water quality. The objectives of this report are to: (1) briefly describe the background and development of the CWQI; (2) provide an excel-based calculator of the CWQI; (3) apply the CWQI to a subset of PPWB monitoring data; and (4) provide recommendations as to utility of such an index to the PPWB.
- Prepared by:    National Water Research Institute, Saskatoon (K. Cash, etc.) for the Prairie Provinces Water Board, Committee on Water Quality March 2001
- 
- 158            Title:            PPWB Water Quality Monitoring Review, Phase 3: Assiniboine, Battle and Red-Deer (Alberta-Saskatchewan Boundary) (LIMITED DISTRIBUTION) ([PDF available](#))
- Contents:        The report provides a general ecological assessment of the current PPWB monitoring program at the Assiniboine, Battle, and Red-Deer Rivers and makes recommendations on change for a more cost effective monitoring program.
- Prepared by:    Kevin J. Cash, NWRI, Environment Canada, March 2001for the PPWB Committee on Water Quality.
-

169 Title: North Saskatchewan River Water Quality Sampling Site Relocation: Effects on Selected Water Quality Parameters ([PDF available](#))

Contents: This report reviews water quality results from the PPWB sampling site on the North Saskatchewan River at the Alberta-Saskatchewan border. The site has been moved twice since it was initially established in 1974; the first time being in October 1982 and the second time in April 1988. No reports are on record to indicate the effect of station relocations on the water quality characteristics recorded at this site. The report recommends that: reports and reasons for site relocation should be well documented in the future; specific steps should be followed if a change in site location is necessary, including simultaneous monitoring for at least one year at both station locations; and data distribution for this site be accompanied by the information on site relocation

Prepared by: Prepared for the PPWB Committee on Water Quality by Nancy E. Glozier and Emily K. Wallace, March 2008

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174 Title: Review of the 1992 Interprovincial Water Quality Objectives and Recommendations for Change ([PDF available](#))

Contents: Schedule E of the Master Agreement on Apportionment directs the PPWB to review the interprovincial water quality objectives for each transboundary river reach on a periodic basis of at least every five years. This report describes the process the Committee on Water Quality undertook to review and provide recommendations on the update of the interprovincial water quality objectives that were set in 1992.

Prepared by: Prepared by the PPWB Committee on Water Quality, November 2015

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175 Title: Response to the 2011 Pesticide Excursions in Transboundary Rivers in the Prairie Provinces of Canada ([PDF available](#))

Contents: A Response to Excursion Process (REP) was developed by COWQ as an approach to address excursions to the water quality objectives. The REP is a series of steps and guidelines that are to be executed following observation of any excursion. Steps outlined in the REP include (1) determining, based on an observed water quality excursion, whether there is sufficient concern for further examination, (2) evaluating conditions relating to the observed excursion, (3) determining, based on evaluation of conditions, whether further examination is required and, if so, determining the scope of the examination and whom is responsible for conducting such examination, and (4) developing any reasonable recommendations to related government(s).

The purpose of this report was to use the PPWB REP to develop a response to 2011 pesticide excursions in the transboundary rivers.

Prepared by: PPWB Committee on Water Quality, February 2016

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176	<p>Title: Long-Term Trends in Water Quality Parameters at Twelve Transboundary River Reaches (<a href="#">PDF available</a>)</p> <p>Contents: The report provides an analysis of long-term water quality data that has been collected from the PPWB transboundary sites since the beginning of the long-term monitoring program. In this analysis, the period of record is defined as the earliest available sample dates us to and including the end of 2008.</p> <p>The report describes the trend assessment methods used by the PPWB, the parameters assessed, and the results of the trend assessment for the 12 transboundary river reaches. Trends were assessed for a variety of parameters including nutrients, major ions, physical parameters and metals.</p> <p>Prepared by: PPWB Committee on Water Quality, December 2016</p>
179	<hr/> <p>Title: Long-Term Trends in Water Quality Parameters at Twelve Transboundary River Reaches (from the beginning of the data record until the end of 2013) (<a href="#">PDF available</a>).</p> <p>Contents: The report represents the second report to provide an analysis of the long-term water quality data that has been collected from the PPWB interprovincial transboundary sites using the Seasonal Mann-Kendall/Mann Kendall non-parametric method.</p> <p>This report has extended the period of record five years and includes data from the beginning of the period of record to the end of 2013.</p> <p>Prepared by: PPWB Committee on Water Quality, March 2018</p> <hr/>

***General***

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35	<p>Title: Interim Report - Problems Associated with the Determination of Dilution Water Requirements on Interprovincial Streams (OUT OF PRINT)</p> <p>Contents: This report summarizes problems and requirements of the Pollution Committee in regard to completion of its task.</p> <p>Prepared by: Pollution Committee, PPWB, March 1966</p>
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54 Title: The Impact of the Proposed Cold Lake Oil Sands Project on the Water Quality of the Beaver River at the Alberta-Saskatchewan Boundary. (OUT OF PRINT)

Contents: The report contains an assessment of the impact that the proposed Esso Resources Cold Lake Oil Sands Project might have on the water quality of the Beaver River at the Alberta-Saskatchewan boundary based on an assessment of the proposed operation plan of the plant and on estimates of municipal expansion.

Prepared by: The Prairie Provinces Water Board, October 5, 1979

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104 Title: Initial Report on Assessing the Comparability of Water Quality Data Generated by the Federal (IWD) and Provincial Laboratories on the Prairies. (OUT OF PRINT) ([PDF available](#))

Contents: This report interprets the results of an interlaboratory quality assurance program established between the Federal (IWD) and the Manitoba, Saskatchewan and Alberta Provincial water quality laboratories. It provides an assessment of the degree of comparability of data analysed by participating PPWB laboratories from 1985 to 1990 (See PPWB Report #111).

Prepared by: PPWB Water Quality Analytical Methods Task Force, January 1989

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111 Title: Report on Assessing the Comparability of Water Quality Data Generated by the Federal (IWD) and Provincial Laboratories on the Prairies. (OUT OF PRINT) ([PDF available](#))

Contents: This report interprets the results of the Federal/Provincial interlaboratory quality assurance program established between the Federal (IWD) and the Manitoba, Saskatchewan and Alberta Provincial Water Quality laboratories. It provides an assessment of the degree of comparability of data analysed by participating PPWB laboratories from 1985 to 1990.

Prepared by: PPWB Water Quality Analytical Methods Task Force, October 1991

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139 Title: Estimation of Time Series Sample Sizes and Sampling Frequencies for the Long-Term Water Quality Monitoring Network on the North Saskatchewan River in Alberta.  
(LIMITED DISTRIBUTION) ([PDF Available](#))

Contents: Descriptive statistics were computed and combined with graphical analysis of all water quality variables, over space and time; spatial and temporal trends were estimated; results used to evaluate and recommend alternative statistical sampling methods which can detect annual changes of at least 10% with probability of 85% or more with a nominal Type I error of 10% or less.

Prepared by: Alberta Environmental Protection, October 1995, for the PPWB Committee on Water Quality

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146 Title: Multi-Media Monitoring of Trace Metals and Pesticides in the Battle River 1989-1990. (LIMITED DISTRIBUTION) ([PDF available](#))

Contents: The report analyzes the results of the Alberta Multi-Media Monitoring Pilot Program on the Battle River. The program was undertaken to assess and compare the suitability of water and other media such as bottom sediments, suspended sediments, biota and fish for monitoring heavy metals and pesticides. The development or enhancement of sampling and analytical protocols and evaluation of seasonal and longitudinal trends in contaminant levels were also important components of this assessment.

Prepared by: Alberta Environmental Protection and Environment Canada, April 1994 for the PPWB Committee on Water Quality.

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147 Title: Effects of Storm and Combined Sewer Discharges in the City of Edmonton on Water Quality in the North Saskatchewan River.  
(LIMITED DISTRIBUTION) ([PDF available](#))

Contents: The report summarizes the results of a storm event study in September 1991 to determine the proportions of various substances contributed by storm and combined sewer discharges during a rainstorm, as compared to other sources, to calibrate the event model MULTI for future use in predicting the impact of storm events on river water quality downstream as far as the Alberta/Saskatchewan border.

Prepared by: Patricia Mitchell, Alberta Environmental Protection, April 1994, for the PPWB Committee on Water Quality

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- 148            Title:            Effects of Wastewater Effluent Discharges on the Water Quality of the Beaver River. (LIMITED DISTRIBUTION) (PDF available)
- Contents:        The report summarizes water quality survey results conducted in the Beaver River in fall 1991 and in spring 1993. It describes the effects of spring and fall discharges from the Cold Lake/Grand Centre Regional sewage system and from the continuous treated municipal wastewater discharges from the Canadian Forces Base-Cold Lake. It determines if the long-term PPWB monitoring site at Beaver Crossing is representative of the Beaver River water quality that enters Saskatchewan.
- Prepared by:    Anne-Marie Anderson, Alberta Environmental Protection, Sept. 1994, for the PPWB Committee on Water Quality.
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- 152            Title:            Bacterial Surveys in the Red Deer River (1996-1998). (LIMITED DISTRIBUTION) (PDF available)
- Contents:        The report discusses the results of water quality surveys carried out in the summer of 1996 and 1998 in an attempt to identify sources which may be responsible for high fecal coliform counts and non-compliance with the PPWB Water Quality Objectives for the Red Deer River at the Alberta/Saskatchewan border. The report also discusses implications of discontinuing chlorine treatment of the Drumheller, East Coulee and Rosedale final municipal effluents on bacterial quality of the Red Deer River.
- Prepared by:    Anne-Marie Anderson, Alberta Environment, February 1999, for the PPWB Committee on Water Quality.
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- 153            Title:            Spatial and Temporal Patterns in Nutrients and Algal Abundance in Alberta Rivers. (LIMITED DISTRIBUTION) (PDF available)
- Contents:        This report reviewed plant biomass and nutrient relationships in glacial fed Alberta Rivers over time and space and proposed preliminary guideline values for management of plant abundance and nutrients.
- Prepared by:    Geneviève M. Carr, University of Ottawa, Dept. of Biology and Patricia A. Chambers, National Water Research Institute for the PPWB Committee on Water Quality November 1999
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177

Title: Prairie Water Quality Workshop  
With a Focus on Nutrients

Contents: The Prairie Provinces Water Board (PPWB) sponsored and organized their first workshop of its kind, focusing specifically on current and emerging water quality issues in prairie water management. The workshop was held in Regina, Saskatchewan on October 4-5, 2016.

The intent of the workshop was to provide a technical forum and learning opportunity for participants with the key focus on nutrients and emerging chemicals.

Prepared by: S. L. McLeod Consulting  
Recommended by the PPWB Committee on Water Quality  
Approved by the Prairie Provinces Water Board, February 2017

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## Groundwater

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- 78            Title:            Hydrogeologic Profile along Alberta-Saskatchewan Boundary. 1985.
- Contents:        A Hydrogeologic Profile related to Groundwater Management has been constructed from 49\_ 00' North to 57\_ 00' North latitude along the Alberta-Saskatchewan Boundary. Eight profiles were prepared on 1:250 000 horizontal scale and 1:5000 vertical scale with each profile covering one degree of latitude. The profiles include relevant geology and principle aquifers, bedrock topography, effective base of groundwater exploration and data control. A map showing bedrock topography and data control points accompanies each profile. A short descriptive text is included for each of the eight profiles.
- Prepared by:    O. Tokarsky, Geoscience Consulting Ltd. for Prairie Provinces Water Board, 1985.
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- 79            Title:            Hydrogeologic Profile along Saskatchewan-Manitoba Boundary. 1986.
- Contents:        A hydrogeologic profile related to groundwater management has been constructed from 49\_ 00' North to 55\_ 00' North latitude along the Saskatchewan-Manitoba Boundary. Six profiles were prepared on 1: 250 000 horizontal scale and 1:5000 vertical scale with each profile covering one degree of latitude. The profiles include relevant geology and principal aquifers, bedrock topography, effective base of groundwater exploration and data control. A map showing bedrock topography and data control points accompanies each profile. A short descriptive text is included for each of the six profiles.
- Prepared by:    O. Tokarsky, Geoscience Consulting Ltd. for Prairie Provinces Water Board, 1986.
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- 114          Title:            AVI: A Method for Groundwater Protection Mapping in the Prairie Provinces of Canada report including maps.  
(OUT OF PRINT) ([PDF Available](#))
- AVI:              'Narrative Only' - A Method for Groundwater Protection Mapping in the Prairie Provinces of Canada report (LIMITED DISTRIBUTION)
- Contents:        This report describes the results of a pilot study to develop criteria for groundwater protection mapping, to map various degrees of susceptibility to groundwater pollution, and indicate areas where information is insufficient, to recommend which guidelines or criteria should be used in the mapping, and to estimate the cost of extending the mapping program along the interprovincial boundary.
- Prepared by:    National Hydrology Research Institute, March 1992
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117	<p>Title: A Review of Groundwater Legislation in the Prairie Provinces (PDF available)</p> <p>Contents: This report documents the results of a comprehensive review of existing provincial groundwater legislation, regulations and related policies and identifies how they deal with potential groundwater concerns at the interprovincial boundaries.</p> <p>The report is divided into five chapters, including the Introduction. Chapter 2 provides an overview of groundwater management concepts. Chapter 3 identifies groundwater management issues in the region. Chapter 4 provides an overview of provincial groundwater legislation. Conclusions to the report are contained in Chapter 5. Matrices, identifying existing groundwater legislation pertaining to groundwater allocation and protection for Alberta, Saskatchewan and Manitoba, are provided in Appendices A, B, and C, respectively.</p> <p>Prepared by: PPWB, Committee on Groundwater, February 1991</p>
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118	<p>Title: Proposed Implementation Plan for Recommendations in the 1991 COG Report on Evaluation of Groundwater Legislation. (OUT OF PRINT) (PDF available)</p> <p>Contents: This report provides an implementation strategy for each of the five recommendations in the report entitled, "An Evaluation of Existing Groundwater Legislation in the Prairie Provinces". It describes the concerns to which each recommendation is responding, along with the objectives, activities, anticipated time schedule and costs to implement each recommendation.</p> <p>Prepared by: PPWB, Committee on Groundwater, September 1992</p>
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128	<p>Title: Groundwater Vulnerability Mapping Along the Alberta-Saskatchewan Boundary. (need to scan maps for pdf)</p> <p>Contents: Groundwater vulnerability maps have been constructed from 49_ N to 55_ N latitude on the Alberta-Saskatchewan boundary. The six maps were prepared on a 1:250,000 horizontal scale with each map covering one degree of latitude. The maps extend along the interprovincial boundaries from the U.S. boundary north to the limit of the "settled" portion of the Prairies.</p> <p>Prepared by: NHRI for PPWB, March 1995.</p>
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- 137            Title:            Groundwater Vulnerability Mapping along the Manitoba-Saskatchewan Boundary [\(need to scan maps for pdf\)](#)
- Contents:        Groundwater vulnerability maps have been constructed from 49\_ N to 53\_ N latitude on the Saskatchewan-Manitoba boundary. The four maps were prepared on a 1:250,000 horizontal scale with each map covering one degree of latitude. The maps extend along the interprovincial boundaries from the U.S. boundary north to the limit of the "settled" portion of the Prairies.
- Prepared by:    NHRI for PPWB, March 1995.
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- 142            Title:            Groundwater Apportionment in the Cold Lake Basin.  
(LIMITED DISTRIBUTION) [\(PDF available\)](#)
- Contents:        This report is an evaluation of groundwater withdrawals from Cold Lake. It provides an overview of geology and hydrogeology of the Cold Lake basin and comments on the potential impact of groundwater withdrawals. Recommendations of this report suggested that groundwater use not be included in the apportionment computations under current flow conditions in the Cold Lake basin.
- Prepared by:    Sask Water and Alberta Environmental Protection, March 1996 for the PPWB Committee on Groundwater.
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- 155            Title:            A Review of Transboundary Groundwater Apportionment  
[\(PDF available\)](#)
- Contents:        Report provides a review of existing practice with regard to allocation of groundwater in transboundary aquifers including agreements under the U.S.-Canada International Joint Commission, other international treaties and interstate pacts within nations.
- Prepared by:    K. Plaster and G. Grove, National Water Research Institute for the PPWB Committee on Groundwater, September 2000
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Title: Conceptual Aquifers Management Framework Study ([PDF available](#))

Contents: This report explores whether groundwater should be considered in the 1969 PPWB Master Agreement on Apportionment. The objectives of this study were:

1. Review a limited set of aquifer management plans in the prairies or similar settings, including plans for which digital models were developed, evaluate their comprehensiveness and how they can be applied to improve the effectiveness of groundwater management,
2. Identify the important elements that should be considered for the management of transboundary aquifers,
3. Review the recent reports on aquifers along the Saskatchewan – Manitoba (Judd-Henrey et al., 2004) and Saskatchewan – Alberta borders (Judd-Henrey and Simpson, 2005) with respect to identifying gaps in information needed for the development of aquifer management plans,
4. Identify possible consequences of water development decisions (e.g. drainage of wetlands, groundwater withdrawals, or sensitive area prescriptions that might limit water development);
5. Provide detailed consideration for the various kinds of information needed to allocate or apportion water in consideration of both surface and groundwater within a complete hydrological balance, and
6. Discuss how such a transboundary aquifer management plan would be administered, what are the long-term commitment associated with the administration of such a plan, and the management issues surrounding the development of aquifer management plan.

Prepared by: Saskatchewan Research Council prepared for the PPWB Committee on Groundwater, August 2007

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