ANNUAL REPORT • 2007

CANADA • ALBERTA • SASKATCHEWAN • MANITOBA

PRAIRIE PROVINCES WATER BOARD

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ANNUAL REPORT

FOR THE YEAR ENDING MARCH 31, 2008

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March 5, 2009

Honourable Jim Prentice
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Ottawa, Ontario

Honourable Rob Renner
Minister of Alberta Environment
Edmonton, Alberta

Honourable Gerry Ritz
Minister of Agriculture & Agri-Food
Ottawa, Ontario

Honourable Christine Melnick
Minister of Manitoba Water Stewardship
Winnipeg, Manitoba

Honourable Nancy Heppner
Minister Responsible for Saskatchewan Watershed Authority
Regina, Saskatchewan

Honourable Ministers:

On behalf of the members of the Prairie Provinces Water Board, it is my pleasure to submit herewith the Annual Report of the Prairie Provinces Water Board for the fiscal year ending March 31, 2008.

Yours truly

Randal Cripps
Chair
Prairie Provinces Water Board

MESSAGE FROM THE CHAIR

The Prairie Provinces Water Board (PPWB) Strategic Plan continued to guide the work of the Board and its committees during 2007-2008.

External influences on new Board activities were notably:

- the present or potential future impact of strong economic development on shared surface and groundwater resources;
- a growing interest in the relationship between climate variability, climate change, and water resources; and
- the need for involvement of upstream jurisdictions in resolving water quality issues in Lake Winnipeg.

Operations of the Board were also affected by the same factors that are challenging other government agencies to improve accountability and transparency. These challenges, together with human resource constraints, are expected to persist into the foreseeable future.

In December 2006, J. Vollmershausen represented PPWB in a meeting with Minister John Nilson and staff of the Saskatchewan Watershed Authority. Consideration was given by Minister Nilson to hosting a broader meeting of PPWB Ministers. This meeting, held April 20, 2007, contributed directly to meeting Goal 6, "Ministers, senior managers and appropriate staff of jurisdictions are informed about PPWB activities", as stated in the Strategic Plan. A commitment was made to meet again in 2008.

Wayne Dybvig, Executive Director since June 2005, informed the Board of his decision to return to the Saskatchewan Watershed Authority, effective as of May 1, 2007. His vast knowledge and experience in all aspects of water resources in the Prairie Provinces was evident as he led the work of the PPWB during a turbulent period. On behalf of the Board, I thank him for his dedication and hard work. The position of Executive Director was filled on an acting basis by Brian Yee and Mike Renouf. Mike Renouf was appointed as Executive Director in May 2008.

Jim Vollmershausen, Chair of the Board since 1993, advised the Board that he had accepted another position effective June 1, 2007. The continuity and experience which he brought to the Board was a great asset and will be missed. The position was filled on an acting basis by Tim Goos until the appointment of Randal Cripps, effective November 3, 2008.

The success of the Board is due in large part to the work of the Secretariat and its three standing committees, including the Committee on Hydrology (COH), the Committee on Water Quality (COWQ), and the Committee on Groundwater (COG). Secretariat support is housed within Environment Canada. The Executive Director manages the Secretariat staff and chairs the three standing committees. Committee members consist of representatives from all of the parties. It is their work that helps to ensure that the Board and the parties can meet their obligations under the *Master Agreement on Apportionment* (MAA). The Board members appreciate their professional conduct and dedication to the goals of the PPWB.

Randal Cripps
Chair

MESSAGE FROM THE EXECUTIVE DIRECTOR

The work of the PPWB Secretariat and three standing committees in 2007 focused on achieving the seven goals outlined in the PPWB Strategic Plan, approved in 2006. A joint meeting of all three committees, held in September 2007, facilitated understanding of interests and activities among committee members and the Secretariat and potential areas of cooperation. Succession planning for members of all PPWB Committees was seen as a common concern as long-serving members approach retirement age and we enter a time of greater turnover in both the federal and provincial civil service.

During 2007, agreed interprovincial apportionment of flows on all eastward flowing streams was achieved.

The Committee on Hydrology (COH) continued work, begun in 2005, on reassessing its data management and computational infrastructure necessary to determine natural flows. This work will facilitate the transition of computational procedures to a more modern platform. In anticipation of the retirement of long-time Operations Engineer, Jim Chen, a conscious effort was made to transfer his knowledge and experience to Brian Yee and Vir Khanna. Through the support of the Water Survey of Canada – Calgary office, Mr. Khanna assisted with the documentation of natural flow computation procedures for various eastward flowing streams. His assignment to assist in this work has been extended to the end of March 2009. The transfer of knowledge from Jim Chen to Brian Yee was necessarily slowed during the seven month period from May – November, 2007 while Mr. Yee carried out his responsibilities as A/Executive Director.

Other COH activities included studies related to natural flows on the Battle River and the development of a prairie hydrological model with application to effects of land use changes, wetland drainage, and wetland restoration. The last study, led by the University of Saskatchewan, is being conducted in collaboration with other partners, including the Prairie Habitat Joint Venture, Ducks Unlimited Canada, and PFRA of Agriculture and Agri-Food Canada. Consideration was also given to supporting work which would contribute to an understanding of the relationships between water resources in the prairie region, climate change, and drought.

The Committee on Groundwater (COG) met jointly with the Board in October 2007. One of the main topics of discussion was the responsibility of the COG to prepare a new groundwater schedule under the *Master Agreement on Apportionment* (MAA). At the same meeting, the Board approved the report prepared by the Saskatchewan Research Council, entitled “Conceptual Aquifer Management Plan”, as PPWB Report No. 167. This report will contribute to furthering work on sharing of transboundary aquifers. Another COG activity in 2007 included work on a draft groundwater contingency plan.

The Committee on Water Quality (COWQ) also met jointly with the Board in October 2007. Work continued on a comprehensive review of water quality objectives, as required by the *Master Agreement on Apportionment*, and a four step approach to the review was approved by the Board, as recommended by the COWQ. The development of nutrient objectives remained as a priority for the COWQ. Further consideration was also given to developing a biological monitoring program, although it was assigned a

lower priority than either the review of objectives or the development of nutrient objectives

All three committees commenced discussions on input to the PPWB Five Year Workplan.

The Board continued its role in helping to ensure coordination of water management and planning that may have transboundary implications. As an example, through the PPWB Chair and Executive Director, the Board represented the provinces of Saskatchewan and Alberta on the newly formed Federal – Provincial Lake Winnipeg Basin Coordination Committee.

Similarly, the Board continued to provide a forum for sharing information on developments or projects with interprovincial implications, including the proposed Highgate Dam on the North Saskatchewan River in Saskatchewan, the Special Areas Project in Alberta, the Assiniboine River Watershed Plan, and the response to flooding on Fishing Lake in Saskatchewan.

Mike Renouf
Executive Director

SUMMARY OF PERFORMANCE RESULTS

During 2007-2008, apportionment responsibilities of the Board were met through the following activities:

- reviewing and approving the hydrometric and meteorological networks;
- continuing work on a review of the natural flow computation software programs;
- monitoring apportionment of the South Saskatchewan River below the Red Deer River, North Saskatchewan River, Churchill River, Saskatchewan River, Qu'Appelle River, Battle Creek, Lodge Creek, Middle Creek, and Cold Lake;
- undertaking and conducting various studies related to the current and future hydrology of eastward flowing prairie streams, and the impact of irrigation and other water uses on stream flows; and
- monitoring the impact of interprovincial drainage projects.

Apportionment requirements were met on all streams.

Cooperative efforts continued in 2007-2008 to better understand the nature and extent of interprovincial aquifers in support of their sustainable use and management. A draft Groundwater Contingency Plan was prepared, a Conceptual Aquifer Management Framework Study was completed, and initial consideration was given to the development of a groundwater Schedule to the *Master Agreement on Apportionment*.

The Committee on Water Quality (COWQ) continued work on a comprehensive review of water quality objectives, with nutrient objectives being given top priority.

In 2007, water quality objectives were adhered to, on average, 95% of the time.

A revised water quality monitoring program was approved by the Board at its fall meeting, thereby allowing changes to be made at the beginning of the year. The COWQ also completed a report on the North Saskatchewan River Water Quality Sampling Site Re-location.

Through reporting procedures outlined in the PPWB Interprovincial Water Quality Contingency Plan, Board members were informed of one spill on interprovincial streams involving the release of wastewater into the Bow River at Canmore. No other spills were reported under the PPWB Contingency Plan.

During the year, the PPWB discussed issues related to several projects of interest to different jurisdictions. Among the issues discussed were:

- Highgate Dam proposal – North Saskatchewan River;
- Upper Assiniboine River/Shellmouth Reservoir;
- Co-Management of Resources in the Qu'Appelle River Basin;
- Water Management Plan for the South Saskatchewan River Basin;
- Special Areas Water Supply Project;
- Water Quality in Lake Winnipeg; and
- Flooding on Fishing Lake.

The PPWB member agencies were informed about PPWB activities through:

- Board and Committee Minutes, Quarterly and Annual Reports, brochures/fact sheets, technical reports, and the PPWB website;
- Presentations to senior managers of PPWB agencies in conjunction with the regular fall and spring Board meetings; and
- a joint meeting with PPWB Ministers on April 20, 2007.

1. INTRODUCTION

This report summarizes the activities of the Prairie Provinces Water Board (PPWB), its Secretariat, and three standing committees, involved in supporting PPWB activities for the period April 1, 2007 to March 31, 2008.

The PPWB administers the *Master Agreement on Apportionment*, signed on October 30, 1969 by Canada and the provinces of Alberta, Saskatchewan, and Manitoba.

The Board consists of three provincial members, representing the provinces of Alberta, Saskatchewan, and Manitoba and two federal members, representing Environment Canada and the Prairie Farm Rehabilitation Administration (PFRA) of Agriculture and Agri-Food Canada.

PPWB activities are equally funded by the provinces and the federal government, with the provinces each contributing one-sixth and the federal government contributing one-half of the annual budget. The Board approves the annual budget and workplans.

The Agreement provides for an equitable sharing of available waters for all eastward flowing streams, including interprovincial lakes, crossing interprovincial boundaries. It also serves to protect interprovincial aquifers and water quality. Schedules to the Agreement describe the role of the Board, stipulate how the water shall be apportioned, and set water quality objectives for the water passing from Alberta to Saskatchewan and from Saskatchewan to Manitoba.

2. PERFORMANCE RESULTS

GOAL 1: Agreed Interprovincial Apportionment of Water Is Achieved

Monitoring Responsibilities

The 1969 *Master Agreement on Apportionment* directs "…*that the Prairie Provinces Water Board shall monitor and report on the apportionment of waters set out in the provisions of the First and Second Agreements and ratified by the Master Agreement."*

In accordance with the 1969 *Master Agreement on Apportionment*, all eastward flowing streams are subject to apportionment. At present, the Board monitors, on a monthly basis, the apportionment of the South Saskatchewan River below the Red Deer River, the North Saskatchewan River, Churchill River, Saskatchewan River, Qu'Appelle River, Battle Creek, Lodge Creek, Middle Creek, and Cold Lake. In addition, the Board carries out the apportionment monitoring for the Assiniboine River, Pipestone Creek, and the Red Deer River (Sask) on an annual basis. Hydrometric and meteorological stations needed for apportionment computation of these streams are included in the PPWB stations list. Formal apportionment monitoring of an eastward flowing watercourse is generally initiated when water use increases to a level whereby the downstream jurisdiction's entitlement may be threatened.

The 1993 Committee on Hydrology (COH) report "Strategies for Apportionment Monitoring of Small Interprovincial Streams" (PPWB Report No. 122), evaluated and ranked interprovincial streams in terms of their potential for apportionment monitoring.

The categorization of small interprovincial streams for potential apportionment has been based on the following criteria:

- the number of times an apportionment deficit has, or would have, occurred in the past;
- the present level of use and forecasted future demands in both upstream and downstream provinces;
- the existence of storage projects in the upstream province; and
- the perception of basin residents towards the reality of an apportionment problem.

The COH reviews these watercourses from time to time and recommends to the Board whether watercourses are to be monitored for apportionment.

In accordance with Section 7 of the Master Agreement, Canada (Environment Canada) is responsible for conducting monitoring at PPWB stations. This included 87 hydrometric stations and 17 meteorological stations in 2007. Data gathered are used by the PPWB to determine annual natural flows for apportionment purposes. Stations are plotted on the map in Appendix I.

In October 2007, the Board approved the monitoring stations lists for 2008-2009. The hydrometric stations remained unchanged from 2007-2008. Several changes occurred related to the meteorological stations, with a reduction in the number of stations from 17 to 16.

As directed by the Board, the COH continued its review of the existing documentation of natural flow computational programs to ensure that Secretariat staff will be able to

undertake computations in an efficient and effective manner.

The PPWB Secretariat, housed within the Transboundary Waters Unit, Environment Canada, maintains about 50 computer programs which are used for interprovincial natural flow computation. The COH is undertaking a review of the computational programs and data management techniques. In 2006-2007, "Phase 1, Charter and Requirements Documents", was completed under contract. In 2007-2008, work continued on the next phase of the natural flow application renewal process. The COH reviewed proposals submitted in response to a Request for Proposals which was posted December 28, 2007 and a recommendation was made to the Board. It is anticipated that the contract will be awarded early in 2008- 2009. The cost of this contract was factored into the 2008-2009 PPWB budget.

In 2007, Environment Canada, Calgary office, provided PPWB with hydrometric records needed for apportionment balance computations of the South Saskatchewan River. Quarterly reports on apportionable flows, consumptive uses, and storage changes for the South Saskatchewan River basin in Alberta were prepared and distributed.

The total annual apportionable flow for the South Saskatchewan River, at the point below its junction with the Red Deer River near the Alberta-Saskatchewan boundary, was 9,017,000 cubic decametres (dam^3). This compared with the total annual recorded flow of 7,773,000 dam^3. Recorded flow represented close to 86% of natural flow. Both the accumulative and natural flow volumes were above their respective median values.[1]

The combined daily recorded flows for the South Saskatchewan and Red Deer Rivers at the Alberta-Saskatchewan boundary exceeded the minimum flow criterion of 42.5 m^3/sec (1,500 cfs) during January 1 – December 31, 2007. A summary of recorded and natural flow volumes for 2007 at this apportionment point is shown in table and graph form in Appendix II. Figure 1 illustrates the percentage of annual natural flow, passed to Saskatchewan, for the period 1980 to 2007.

The natural flow of the Qu'Appelle River at the Saskatchewan-Manitoba boundary, between January 1, 2007 and December 31, 2007, was 265,000 dam^3. Recorded flow, augmented by releases of 79,000 dam^3 from Lake Diefenbaker, was 436,000 dam^3. Recorded and natural flows for the year 2007 are shown in Appendix II.

Natural flows for the South Saskatchewan River basin were calculated using the Project Depletion Method (PDM), while natural flows for the Qu'Appelle River basin were determined using the Annual Water Balance Method (AWBM). Both methods have been approved by the Board.

Environment Canada continued to provide the Board with hydrometric

[1] Schedule A of the *Master Agreement on Apportionment* defines natural flow as "the quantity of water which would naturally flow in any watercourse had the flow not been affected by human interference or human intervention, excluding any water which is part of the natural flow in Alberta but is not available for the use of Alberta because of the provisions of any international treaty which is binding on Alberta." In particular, this applies to provisions under the *Boundary Waters Treaty* for U.S. diversions from the St. Mary's River.

information needed for computing natural flows of Lodge and Middle Creeks for apportionment purposes. Apportionment balance reports, providing the month-end apportionment balance of these two streams for the months of March through October, were prepared and distributed to PPWB agencies eight times during 2007.

In accordance with Article 6, Schedule A of the *Master Agreement on Apportionment*, Alberta is required to pass 75% of the annual natural flow of the Battle, Lodge, and Middle Creeks to Saskatchewan, which in turn passes 50% to the United States. During 2007, Alberta passed greater than 83% of the annual natural flow on Lodge Creek and greater than 78% of natural flow on Middle Creek to Saskatchewan. The 2007 flow data for Battle, Lodge, and Middle Creeks are shown in Appendix II.

The Board, at its March 1994 meeting, reviewed a COH report entitled "Interprovincial Lakes Apportionment Study". Use of the Rational Method, and accompanying provisions provided within the study, were approved for apportioning Cold Lake basin. In accordance with the Rational Method, the computed percentage of Cold Lake's natural outflow to which each province is entitled is 31.6% for Alberta, 43.4% for Saskatchewan, and 25% for Manitoba.

Natural flow at the outlet of Cold Lake was computed periodically during 2007 to determine if Saskatchewan had received its share of natural flow from Cold Lake. Based on the information provided by Environment Canada, Imperial Oil, and the City of Cold Lake, the natural outflow from Cold Lake was 598,000 dam^3 for the period January to December 2007. Recorded outflow for the same period was 589,000 dam^3 (98 % of natural flow). Figure 2 illustrates the percentage of annual natural flow passed to Saskatchewan for the period 1993 to 2007**.**

Natural flows (or apportionment flows) were also calculated for the North Saskatchewan, Saskatchewan, and Churchill Rivers at the provincial boundaries. Monthly recorded and natural flows (or apportionment flows) at these sites, as well as recorded flows at four additional boundary sites, are shown in Appendix II. Apportionment was met at all boundary crossings for all interprovincial water courses.

In addition to the apportionment monitoring activities, PPWB also computed the apportionment balance of Pipestone Creek and the Assiniboine River. The 2007 annual natural flow on Pipestone Creek was 61,100 dam^3 compared with recorded flows of 61,500 dam^3 (101% of natural flow). The annual natural flow on the Assiniboine River was 650,700 dam^3 compared with recorded flows of 646,000 dam^3 (99% of natural flow).

In 2007, Saskatchewan met the apportionment requirements by passing more than 50% of the natural flow to Manitoba on each watercourse.

Figure 1

Percent Of Natural Flow Passed To Saskatchewan
South Saskatchewan River Below Red Deer River

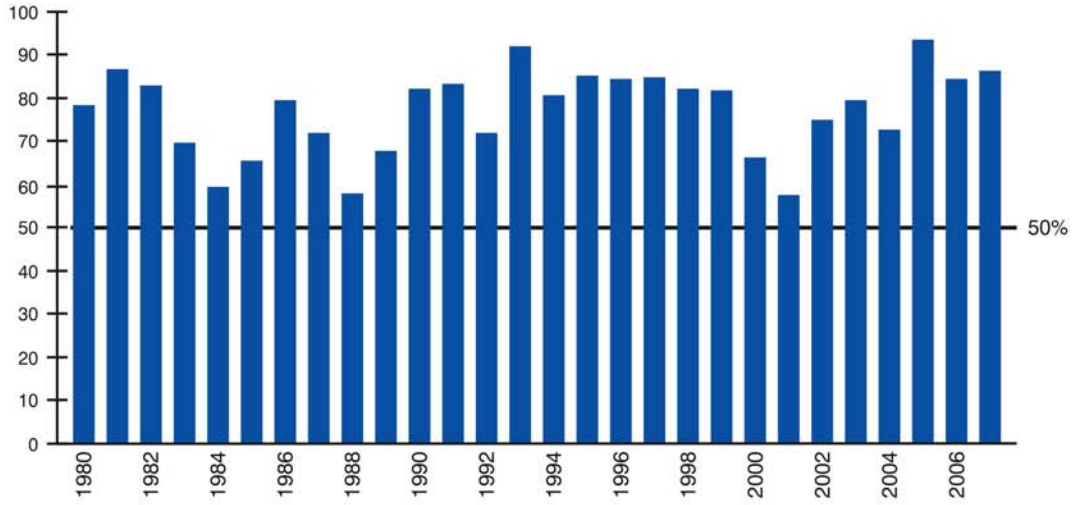
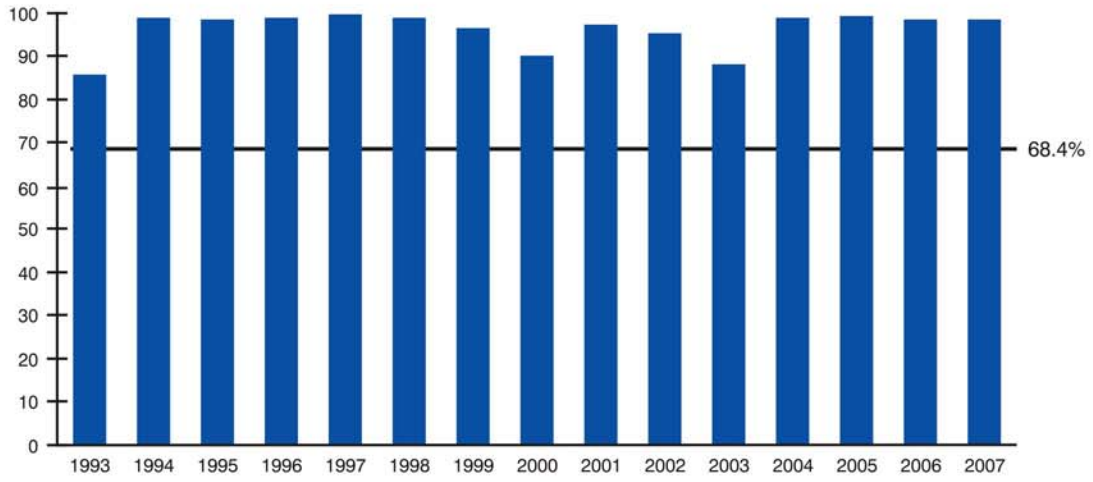


Figure 2

Percent Of Natural Flow Passed To Saskatchewan
Cold Lake Basin



STUDIES

Battle River Natural Flow Study

In the spring of 2005, the COH identified the need for a Battle River Natural Flow Study, to be undertaken to determine if formal apportionment monitoring was required.

In support of this requirement, the Saskatchewan Watershed Authority conducted studies to:

- determine the historic (1980-2004) level of water use within the Battle River upstream of the Alberta-Saskatchewan boundary;
- naturalize historical flows for the Battle River at the Alberta-Saskatchewan boundary by adding the water uses to the recorded flows;
- determine if an apportionment deficit would have occurred at the Alberta-Saskatchewan boundary from 1912 to 2004, based on historic (1912-2004) and current (2004) levels of water use within the Battle River basin; and
- determine if formal apportionment is required.

The final report, completed in 2007-2008, guided the COH in its March 2008 recommendation to the Board that formal apportionment of the Battle River not be undertaken at this time.

In undertaking the Battle River Watershed Management Plan for the Alberta portion of the basin, Alberta has accounted for the need to meet apportionment in its water management plan. Alberta will report to the Board on water use in the effective drainage basin every five years, beginning in 2010.

The Board approved the report, entitled "Battle River at Saskatchewan-Alberta Boundary Natural Flow Update 1980 to 2004", as PPWB Report No. 168 at its March 2008 meeting.

Prairie Drainage Impacts Modelling Study

The PPWB, through the COH, entered into a multi-year collaborative research study with the University of Saskatchewan. Alberta Environment contributed funding through the PPWB. Other funding partners included, but were not limited to, PFRA, Agriculture and Agri-Food Canada, as well as the provinces of Saskatchewan and Manitoba.

The study will lead to the development of a "Prairie Hydrological Model with Application to Effects of Land Use Changes, Wetland Drainage and Wetland Restoration". Phase 1 of the study, a field monitoring program, began during the summer of 2007.

Other agencies collaborating in the study include the Prairie Habitat Joint Venture and Ducks Unlimited Canada.

South Saskatchewan River Irrigation Return Flows Study

Phase 1 of an interim report entitled "South Saskatchewan River Natural Flow and Apportionment: Irrigation Return Flows 2001-2005" was prepared for the COH by Environment Canada's Water Survey of Canada – Calgary Office. The report reviews the impact of irrigation return flow in the natural flow determinations for the South Saskatchewan River Basin. The report also reviews return flow data from the

thirteen irrigation districts of southern Alberta, as well as the Water Survey of Canada, with respect to the adequacy of the data's accuracy and timeliness. Overall, return flow from all the sources comprises approximately 10 percent of the South Saskatchewan River natural flow at the Alberta-Saskatchewan boundary.

The COH will make recommendations based on Phase 1 of the study to the Board in 2008-2009.

Qu'Appelle River Natural Flow Study

The need for ongoing monitoring and apportionment of the Qu'Appelle River was discussed by the Committee on Hydrology (COH). It was proposed that the current levels of monitoring and apportionment be maintained. A short status report was prepared by the Secretariat in February 2008 describing the need for and reasoning behind monitoring the apportionment of the Qu'Appelle River.

The Application of Paleoclimate Data for Frequency Analysis of Droughts and Floods

Following a presentation from Dr. David Sauchyn, Prairie Adaptation Research Collaborative (PARC), in 2006, the Board and the COH initiated discussions on the potential application of paleoclimate data, derived from tree rings, to frequency analysis of floods and droughts. Discussions continued in 2007-2008 with a view to gaining greater understanding of the potential contribution of paleoclimate data to planning for future droughts and floods in the Prairie region. COH members, representing their respective agencies, presented a paper at a PARC workshop held in Canmore, Alberta March 16-18, 2008. The paper addressed the application of past and future hydroclimatic variability to water resource management on the prairies. Following the workshop, COH reviewed potential application of paleoclimate data to transboundary water issues and apportionment.

Annual Water Use Report Boxelder Creek Basin

Boxelder Creek is part of an internal drainage basin straddling the Alberta-Saskatchewan boundary, midway between Maple Creek, Saskatchewan and Medicine Hat, Alberta. Because of the complexity of the basin, including numerous diversions and the high percentage of natural flow allocated for water use, the PPWB has agreed that Boxelder Creek be treated as a special interprovincial basin. Available flow in this basin is to be jointly managed by Alberta and Saskatchewan.

Alberta and Saskatchewan annually collect sufficient water use data to provide an estimate of total consumption in the Boxelder Creek Basin. This data is reported to the COH.

In 2007, a total of 804 dam^3 was diverted for irrigation purposes in the Alberta portion of the Boxelder Creek Basin. Based on the responses of the 2007 water use survey, conducted by the Saskatchewan Watershed Authority, 270 dam^3 was diverted for irrigation purposes in the Saskatchewan portion of the Boxelder Creek basin.

Annual Report on Interprovincial Drainage Projects

The COH prepares an annual report on drainage projects approved in Saskatchewan that could have downstream impacts in Manitoba.

The Board agreed that Alberta only needs to provide the PPWB with drainage project information if there is a specific project that could have an impact on Saskatchewan.

In 2007, Saskatchewan licensed four new drainage projects which drain to Manitoba. Manitoba reported no projects with the potential to affect streams crossing interprovincial boundaries.

WATER USE DATA

In 2007-2008, the COH continued work to address procedures related to water use and new allocations. As directed by the Board, the COH will report new allocations of water use annually to the Board so that they can be considered in the calculation of natural flows.

To help develop procedures for reporting of new allocations, the COH began a pilot project for the South Saskatchewan River Basin in 2006-2007.

Further work was carried out in 2007-2008 to categorize water allocations, establish criteria and threshold amounts, and develop general rules for inclusion or exclusion of uses in natural flow computations. Allocations that are currently included in computations and how water use is accounted for in computations will be documented.

GOAL 2: Interprovincial Groundwater Aquifers are Protected and Used Sustainably

Groundwater Schedule

The Board and the Committee on Groundwater (COG) met jointly in October 2007 to discuss transboundary groundwater issues and priorities for the Committee. The Board directed the COG to focus on the development of a groundwater schedule to the *Master Agreement on Apportionment.* Work on this will continue in 2008.

Conceptual Aquifer Management Framework Study

In October 2005, the COG proposed that a conceptual aquifer plan project be undertaken. The project would provide a better understanding of information needed to allocate, or apportion, surface and groundwater within a complete hydrological balance at transboundary locations.

As suggested by the COG, in March 2006 the Board entered into a contract with the SRC for a transboundary aquifer management framework study. The final report, completed in August 2007, was approved by the Board in October 2007 as PPWB Report No. 167.

Reporting of Large Withdrawals

The COG, in dealing with guidelines for reporting projects with large groundwater withdrawals near the interprovincial boundary, agreed that the types of projects for which the neighbouring provinces should be notified include:

1) projects with the cone of depression potentially extending into the neighbouring province; and

2) controversial projects with high withdrawals where the cone of depression from the project may not be expected to extend into the neighbouring province.

Provincial COG members have contacted their respective water rights offices to inform them of the need to report groundwater projects with significant withdrawals to the neighbouring province. No such projects were reported in 2007-2008.

GOAL 3: Agreed Interprovincial Water Quality Objectives Are Achieved

Schedule E of the *Master Agreement on Apportionment* includes a list of water quality objectives that were established for a number of key watercourses at the Alberta-Saskatchewan and Saskatchewan-Manitoba boundary locations. The water quality monitoring locations are shown in Appendix I.

Each fall a water quality monitoring program is approved by the PPWB and the results compared with the objectives to determine if any excursions to the objectives occurred. If there are any, the Committee on Water Quality (COWQ) will prepare a work plan to assess the cause and the potential to mitigate. The workplan is then carried out by the member agencies.

Water Quality Monitoring Program

In accordance with the process changes implemented in 2005-2006, the Committee reviewed and approved the PPWB Water Quality Monitoring Program for the 2008 calendar year in the fall of 2007. The site rotational pesticide sampling will be continued in 2008, with sampling at the Saskatchewan and Qu'Appelle River sites on the Saskatchewan/Manitoba border. Rotational pesticide sampling in 2007 was conducted for the Battle and Red Deer River sites on the Alberta/Saskatchewan border.

In addition to the site specific changes outlined above, the COWQ agreed that, as the sampling location on the Beaver River is currently upstream of a municipal effluent discharge, it does not necessarily capture the water quality in the Beaver River at the Alberta-Saskatchewan border. The COWQ recommended that the site be re-located to a more appropriate site closer to the border, downstream of the discharge point. Concurrent sampling for both sites commenced in 2007. A decision regarding the location of the ongoing sampling site is expected in 2009.

The PPWB Water Quality Monitoring Parameter List is included in Appendix III.

Review of Water Quality Objectives

Work proceeded in 2007-2008 on the comprehensive review of water quality objectives. A framework for the approach to water quality objectives review was developed by the COWQ and approved by the Board in March 2008.

The COWQ will continue with the review in 2008-2009.

Development of Nutrient Objectives

The development of nutrient objectives is a priority for the COWQ and the Board. In 2007-2008, progress was made in applying the background approach to the development of phosphorus objectives. Work will continue in 2008-2009.

North Saskatchewan River Water Quality Sampling Site Re-location

The COWQ reviewed the water quality results from the sampling site on the North Saskatchewan River at the Alberta/Saskatchewan border in 2007. The site has been re-located twice over the past 30 years. No reports or studies previously existed which examined the effect of station relocations on the water quality characteristics at this site.

The COWQ recommends, as a result, that concurrent sampling be undertaken for a period of 1-2 years whenever sampling sites are re-located in the future.

The Board approved the report, "North Saskatchewan River Water Quality Sampling Site Re-location: Effects on Selected Water Quality Parameters" as PPWB Report No. 169 in October 2007.

Water Quality Objectives

Schedule E of the *Master Agreement on Apportionment* includes a list of water quality objectives established for a number of key watercourses at Alberta-Saskatchewan and Saskatchewan-Manitoba boundary locations.

Monitoring results are compared with the objectives to determine if any excursions to the objectives occurred The PPWB Water Quality Excursion Report for 2007, accepted by the COWQ and approved by the Board in October 2008, is appended to the Annual Report (Appendix IV). A summary of this report follows.

All PPWB water quality sites were sampled by Environment Canada at the approved frequency with the exception of the Saskatchewan River which was sampled during 10 of 12 months due to unsafe ice conditions in April and November. In addition, although site specific objectives have yet to be developed for the Cold River, four water quality samples per year were obtained for this site. A total of 132 sampling events were conducted in 2007.

A comparison of more than 2755 water chemistry results with objectives showed that water quality objectives were adhered to an average of 95% of the time in 2007 (Figure 3).

Most sites showed little year to year variability in adherence rates during the preceding five year period

Compared with 2006, 2007 adherence rates improved for all but three sites. Of the three sites which exhibited reduced adherence rates, the Carrot and Qu'Appelle Rivers were only slightly below the 2006 adherence rates, although the distribution of excursions changed. For the Red Deer River at the Alberta -Saskatchewan border, however, the adherence rate decreased by nearly 3%. This decrease was due to more excursions in total metals (copper, lead and zinc) associated with increased sediment loads in the river.

Excursions by parameter and protective use are summarized in Table 3 of Appendix IV. In 2007, of the 11 parameters which exhibited excursions to the PPWB site specific objectives, five accounted for more than 80% of all excursions. Similar to previous years, these parameters included, in descending order of overall exceedence, total phosphorus (31%), dissolved manganese (23 %), dissolved sodium (14 %), copper (9%) and total dissolved solids (5%). Overall dissolved oxygen excursions for 2007 (3%) were reduced compared to 2006 (14%).

Of the 11 parameters with exceedences, a large majority exceeded site specific objectives at more than one site. Phosphorus and total dissolved solids exceeded objectives more than 50% of the time.

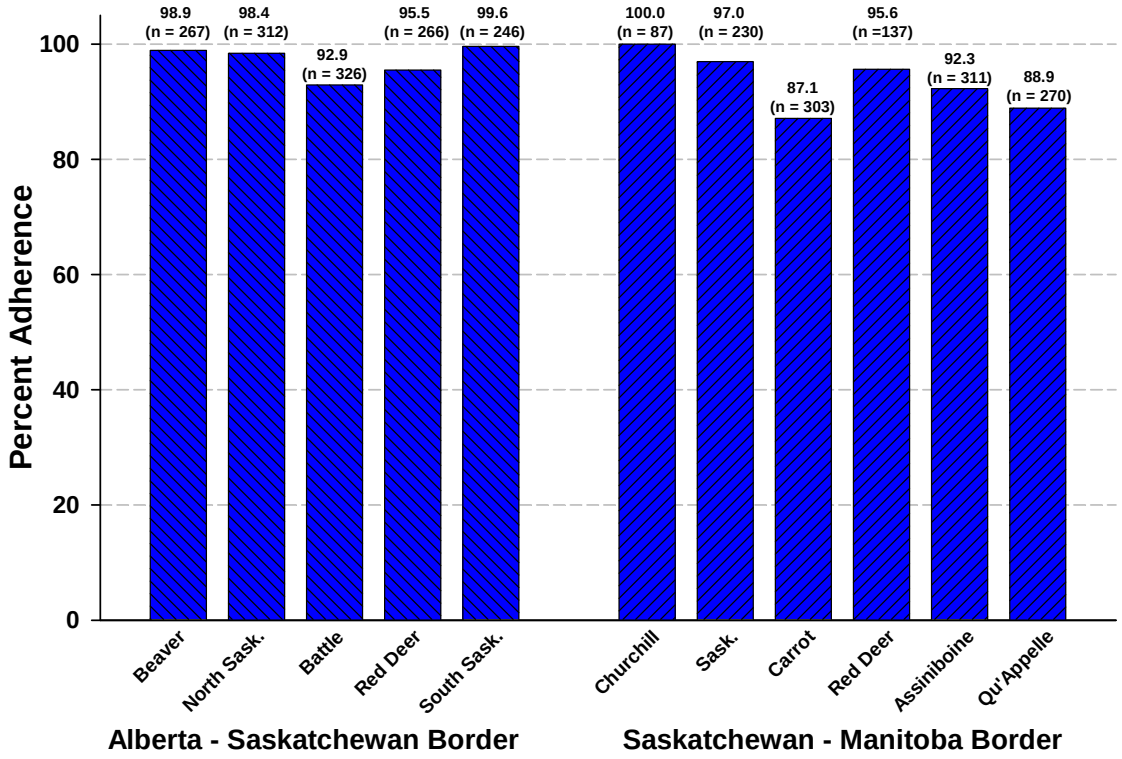


Figure 3: 2007 PERCENT ADHERENCE TO PPWB OJBJECTIVES

In 2007, all of the water uses for which PPWB site specific objectives are set to protect, experienced exceedences.

Four parameters with objectives for protecting fisheries/aquatic life displayed exceedences, including total copper, lead, zinc, and dissolved oxygen. The total metal excursions were associated with naturally high seasonal suspended sediment loads and are not an immediate concern to the functioning of aquatic ecosystems in these rivers. Of the lowered dissolved oxygen concentrations only one, taken early in the day on July 24, 2007 at the Carrot River, might be considered a concern for aquatic life. The dissolved oxygen concentrations at the Carrot River site in 2007 were, however, significantly improved compared with excursion rates for 2005 and 2006. The dissolved oxygen results are being examined by the COWQ to determine if relationships exist between oxygen in this river and changes in other parameters.

In summary, for the protection of aquatic life/fisheries, dissolved oxygen appears to be the only consistent parameter of concern.

Four parameters with objectives for protecting irrigation and/or livestock water had excursions, including dissolved manganese, chloride, sodium, and fecal coliforms. As the dissolved ions have previously been identified as arising from natural sources, the time of year and sites at which these excursions are occurring will be reviewed during the review of objectives. Fecal coliforms showed exceedences for both the irrigation/livestock and recreation water uses. Timely reporting of these results to respective jurisdictions is under review.

Site specific objectives for protecting drinking water were exceeded at several sites in 2007 for dissolved iron, manganese and total dissolved solids. Similar to the dissolved ions for irrigation/livestock, these dissolved ions often exceed the drinking water objective due to natural water chemistry conditions and will be examined as priorities under the review of objectives

GOAL 4: Jurisdictions Are Informed About Emergency and Unusual Water Quality Conditions

PPWB Contingency Plan

The PPWB Interprovincial Water Quality Contingency Plan is an effective method of informing Board agencies of spills or unusual water quality conditions in interprovincial streams. The plan was updated in October 2005 with member agencies reporting any spills or unusual water quality conditions with the potential to affect downstream water quality or create possible media coverage. A spill notification form was drafted for use by Board agencies.

One spill was reported in 2007, involving the release of wastewater into the Bow River by the town of Canmore, Alberta on June 9, 2007. A measurable change in bacterial quality was not expected to occur at the Alberta/Saskatchewan border, however.

GOAL 5: Conflicts over Interjurisdictional Water Issues are Avoided

During the year, the PPWB discussed issues related to several existing or proposed projects of interest to different jurisdictions.

Fishing Lake

During the spring of 2007, significant flooding occurred on Fishing Lake in east central Saskatchewan. The lake is located in the Assiniboine River gross drainage basin and, under extreme high water conditions, drains into the Assiniboine River. Due to the potential for transboundary issues to arise in the Assiniboine Basin, the Saskatchewan member of PPWB provided regular updates on the project to Board members and encouraged the Manitoba Board member to advise him directly of any concerns by Manitoba.

The Premier of Saskatchewan committed to getting the cottages out of the water by freeze-up and to implementing a long-term flood reduction program.

One of the options considered was to construct a ditch to drain to the east. Bilateral discussions were held by Saskatchewan with Manitoba. Due to concerns expressed by Manitoba and the Fishing Lake First Nation, it was agreed that the ditch would only be operated for one year and would be decommissioned in 2008. Discussions were held with Manitoba, and Saskatchewan agreed to compensate Manitoba landowners in the event that the ditch caused flooding over and above what would have otherwise occurred. A letter of understanding was exchanged with Manitoba.

Based on further concerns by the Fishing Lake First Nation, it was agreed to not construct the ditch and to focus on construction of dykes to contain flooded areas. Areas behind the dykes were subsequently dewatered. The federal Department of Fisheries and Oceans issued a permit for the construction of the dykes and in March 2008 were evaluating the impact to fish habitat to determine which dykes might be able to remain and which would have to be decommissioned.

In response to the flooding on Fishing Lake and nearby Waldsea Lake, the Saskatchewan Watershed Authority initiated a study to determine the drainage patterns within the affected watersheds and determine the impact of man-made drainage on the high water levels. The study is expected to be completed during the summer of 2008. In the interim, a moratorium on drainage was implemented in the summer of 2007.

Highgate Dam Proposal – North Saskatchewan River

The North Saskatchewan River Water Resources Committee (NSRWRC), a local non-profit group in the North Battleford area of Saskatchewan, is promoting the construction of a dam on the North Saskatchewan River about 16 km upstream of North Battleford. The proposed dam would create a reservoir which would extend upstream approximately 240 km, of which 77 kilometres would be located in Alberta.

Funding for a pre-feasibility study was approved, under the Canada-Saskatchewan Water Supply Expansion Program (CSWSEP), administered by Agriculture and Agri-Food Canada. A technical steering committee was set up to help administer the study. A contract was awarded in December 2006 to

Golder Associates Ltd. for the pre-feasibility study which was completed in June 2007. The Phase I study presented three options, including a large scale dam across the river, offsite storage sites; and structural investments with no storage (pipelines).

In September 2007, the consultant presented their work at three public meetings in communities located near the proposed project site.

The Committee received an extension from CSWSEP to further pursue the options for a large scale dam project and a series of smaller weirs. The Phase II report was completed in January 2008 and presented at a public meeting February 27, 2008 in Maidstone, Saskatchewan. There was general opposition to the large scale dam. The most positive Benefit/Cost ratio would be to construct a weir to pump water into an oxbow in the river. The Committee will determine their next steps early in 2008.

Co-Management of Resources in the Qu'Appelle River Basin

Water management agreements on the Qu'Appelle River are being sought by various First Nations and the Province of Saskatchewan, but co-management is in its infancy. Co-management discussions with the various First Nations are at different stages. Considerable work is still needed in the development of co-management agreements.

As a result of good progress on negotiations with the Pasqua and Muscowpetung First Nations on Pasqua Lake, the Echo Lake control structure was operated in 2007 and it is expected that structure operation can continue in 2008.

An interim operating agreement for 2007 was negotiated with the Sakimay and Cowessess First Nations on Crooked Lake. Efforts are being made towards a long term resolution of the claim.

Due to a legal action on the part of the Ochapowace First Nation on Round Lake, no progress on negotiations was made in 2007 and, as a result, the Round Lake structure was not operated in 2007. It is expected that the Round Lake structure will not be operated for a sixth consecutive year in 2008.

Transboundary implications for Manitoba will likely be minimal but there could be minor water quality impacts.

Water Management Plan for the South Saskatchewan River Basin

The province of Alberta approved the Water Management Plan for the South Saskatchewan River Basin in Alberta in August 2006. The plan provides broad direction for more efficient and effective use of water and improved management of aquatic ecosystems.

Flows in the South Saskatchewan River basin are apportioned between Alberta and Saskatchewan. As a result of the Plan, Alberta has decided to hold allocations on the Bow and Oldman Rivers at current levels and allow a modest increase in allocations on the Red Deer River, so as to ensure that its apportionment obligations with Saskatchewan will be met.

In 2007, the following progress was made on the implementation of the plan.

- The Crown Reservation was signed by the Minister on August 3, 2007. The Order does not restrict First Nations applications, licenses for instream flows identified as Water Conservation Objectives,

or storage where the storage proposed is meant to reduce the risk for existing licenses.

- The SSRB Water Allocation Regulation (1991) was repealed on August 1, 2007.

- An Interbasin Water Coordinating Committee was established with the primary objective of advising Alberta Environment on how best to meet apportionment by managing the Red Deer, Bow, and Oldman in concert during water shortages.

- Twenty-seven license transfers were completed and 15 transfers were in progress by March 2008.

- Work started on developing a website to display all licenses in the SSRB.

Shirley McClellan Regional Water Services Commission and the Highway 12-21 Water Services Commission

The Shirley McClellan Regional Water Services Commission is composed of municipalities along Highway 12 from Stettler to Compeer on the Saskatchewan border and the County of Camrose. They are working closely with the Highway 12/21 Commission comprised of communities in the Counties of Lacombe and Camrose. The Commission proposes to supply municipal water from the Town of Stettler to communities and rural residents in the Counties of Lacombe, Stettler, Camrose, and Paintearth as well as Special Area 4.

The Commission predicts it will require 13,263 dam^3 annually from the Red Deer River. To meet this volume, 7,860 dam^3 of new interbasin transfer is required from the Red Deer River. As a municipal allocation, about 80% of this volume is considered to be return flows primarily to the Battle River. This allocation is not expected to have any impact on Alberta's ability to meet its apportionment obligations in the South Saskatchewan River and will likely have a net benefit in the delivery of Saskatchewan's entitlements on the Battle River

The intention is to begin construction in 2008.

GOAL 6: Jurisdictions Are Informed About PPWB Activities

The PPWB member agencies were informed about PPWB activities through various means, including the ongoing distribution of Board and Committee Minutes and Quarterly and Annual Reports, as well as through brochures and fact sheets, technical reports, and the PPWB website housed on Environment Canada's website at http://www.pnr-rpn.ec.gc.ca/water/fa01/index.en.html

On April 20, 2007, at the invitation of Minister John Nilson, Ministers met with the Board in Regina. A desire was expressed to meet again in 2008.

In 2007-2008, the Board took the opportunity during its regular meetings in October 2007 and March 2008 to invite senior officials of respectively, PFRA, Agriculture and Agri-Food Canada and Alberta Environment to meet with them. This approach to increasing awareness of senior officials within PPWB agencies will continue in 2008-2009 and beyond. In 2007-2008, Board members recognized that the introduction of numerous new senior officials in all agencies, along with internal organizational restructuring, necessitated greater efforts to increase general awareness of the PPWB and agency responsibilities related to implementation of the *Master Agreement on Apportionment*.

GOAL 7: Information, Knowledge and Research Are Shared Among Jurisdictions

Lake Winnipeg Nutrient Issues

Concern over nutrient loading in Lake Winnipeg has risen in recent years, with reports of increased frequency, duration, and intensity of algal blooms. Managing nutrients within the lake's watershed, comprising four provinces and two states, poses a complex challenge. Provincial and federal agencies have responded to the challenge through the initiation of interagency, multidisciplinary research programs.

The provinces of Alberta and Saskatchewan agreed to have the PPWB represent their interests with respect to input to the Federal-Provincial Lake Winnipeg Action Plan Coordination Committee. The PPWB A/Chair represented the Board at the first meeting of the Committee on November 20, 2007; the second meeting on January 31, 2008 was attended by both the A/Chair and the A/Executive Director.

The A/Executive Director reported to the Board on the first meeting of the Science Sub-committee which he attended February 14, 2008.

The Board was also informed about the approval on February 14, 2008 of the Treasury Board Submission for "Implementation of the Freshwater Initiatives: Great Lakes, Lake Winnipeg Basin and Lake Simcoe, of the National Water Strategy in Budget 2007".

Prairie Hydrological Model Study

The Board is one of several partners which have committed to support work on a "Prairie Hydrological Model Study", being undertaken by the Centre for Hydrology, University of Saskatchewan, under the leadership of Dr. John Pomeroy. The PPWB Executive Director is a member of the Science Advisory Committee.

During 2007, work focused on three major research topics and on outreach to the Smith Creek community in east central Saskatchewan. The three research topics included:

- model simulation of the hydrology of prairie wetland basins and changes due to drainage;
- improved instrumentation and programming of the Smith Creek meteorological station and network; and
- measurement of fall wetland water levels, fall soil moisture, and winter snow water equivalent for varying land cover types.

3 . ADMINISTRATIVE AND FINANCIAL MANAGEMENT

The Board consists of senior officials engaged in the administration of water resources in each province of Alberta, Saskatchewan, and Manitoba and senior officials from Environment Canada and Agriculture and Agri-Food Canada – PFRA (Appendix V). As illustrated by the organization chart in Appendix VI, the Board operates through its Executive Director and three Standing Committees (Committee on Hydrology, Committee on Groundwater, and Committee on Water Quality). The Board is chaired by Environment Canada. Fiscal year 2007-2008 was a year with considerable change in the membership of the Board and Committees as members either retired or assumed new positions. The Secretariat prepared and distributed several updated versions of the PPWB Directory to members and alternates as a result.

Secretariat support is provided to the PPWB through the Transboundary Waters Unit, Environment Canada at Room 300, 2365 Albert St., Regina, Saskatchewan. The portion of time each Secretariat staff person spends on PPWB activities is charged to the PPWB and cost-shared by the members. In addition, technical support is provided, as required, by other staff of Environment Canada.

A process to staff the Executive Director's position began in 2007. It is expected that the new Executive Director will assume his duties early in the 2008-2009 fiscal year.

Four Board and ten Committee meetings were held throughout the year. The Board continued its practice of meeting with at least one Committee each year for the purpose of improving communication and understanding between the Board and its Standing Committees.

PPWB

- Meeting No. 81, May 18, 2007 – Conference Call
- Meeting No. 82, October 10-11, 2007 – Regina (jointly with COG and COWQ)
- Meeting No. 83, December 13, 2007 – Conference Call
- Meeting No. 84, March 12-13, 2008 – Edmonton

COH

- Meeting No. 102, September 19-20, 2007 - Calgary
- Meeting No. 103, March 3-4, 2008 – Regina

COG

- Meeting No. 43, April 25-26, 2007 – Regina
- Meeting No. 44, October 10, 2007 – Regina
- Meeting No. 45, March 19-20, 2008 - Regina

COWQ

- Meeting No. 85, April 25, 2007 – conference call
- Meeting No. 86, September 24, 2007 – conference call
- Meeting No. 87, December 14, 2007 – conference call
- Meeting No. 88, January 9-10, 2008 – Edmonton
- Meeting No. 89, February 25, 2008 – conference call

In addition to the above noted meetings, the Secretariat organized an All Committee Meeting September 11, 2007 in Regina, Saskatchewan to improve collaboration and communication among the three Standing Committees. One of the issues raised was the need for succession planning and orientation of new members, in response to the

anticipated higher turnover in Committee membership in the years to come.

During 2007-2008, the PPWB Secretariat completed and distributed the audit and final apportionment balance reports for the South Saskatchewan River, Lodge, Middle, and Battle Creeks at the Alberta-Saskatchewan boundary.

To ensure the terms of the 1969 *Master Agreement on Apportionment* were met, the staff computed the natural flow or apportionment flow (i.e., flow volume that is subject to apportionment) at the interprovincial boundary for the North Saskatchewan, Churchill, Qu'Appelle, and Saskatchewan Rivers. The apportionment balance of Cold Lake was also computed for 2007.

The Board determines the annual budget. The approved budget for 2007-2008 was $458,805; final expenditures were $329, 264. The Statement of Final Expenditures for 2007-2008 is shown in Appendix VII. Final expenditures were below the approved budget due to contracts not being completed. Contract work will continue in 2008-2009.

The Board agreed at its regular meeting in March 2007 that, in the future, the Board's budget planning cycle must begin earlier in the year, with substantial discussion being held on the Board's budget during the regular October meeting. This will facilitate earlier input from the Board into the budget process for the respective PPWB agencies.

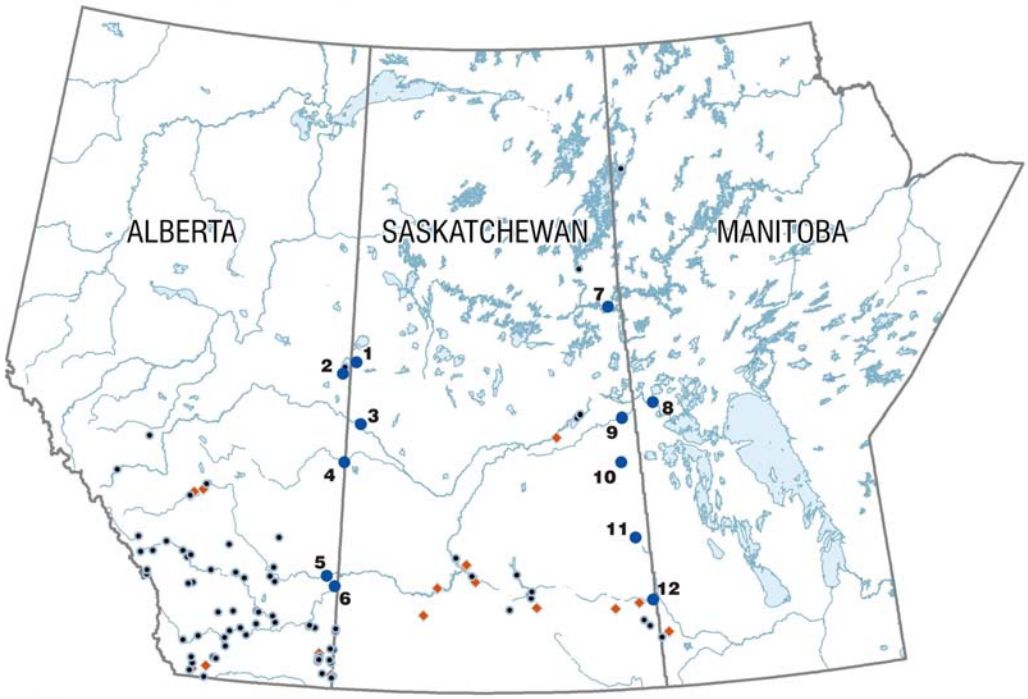
To position the Board to better anticipate and plan for future work priorities and resource requirements, a multi-year work planning process was initiated in 2007-2008. A special meeting of the Board will be held May 15-16, 2008 which will move this process forward. The results of this exercise will:

- guide the Board in its work over the next few years;
- feed into multi-year work plans for the three Standing Committees and the Secretariat;
- and provide the foundation for communication with Ministers and senior officials within each agency.

Further information on the history and administration of the PPWB can be found in Appendix VIII.

APPENDIX I

PPWB Monitoring Locations Map



PPWB Water Quantity and Quality Monitoring Locations

1 Cold River
2 Beaver River
3 North Saskatchewan River
4 Battle River
5 Red Deer River (Alta./Sask.)
6 South Saskatchewan River
7 Churchill River
8 Saskatchewan River
9 Carrot River
10 Red Deer River (Sask./Man.)
11 Assiniboine River
12 Qu'Appelle River

Hydrometric Sites used for apportionment monitoring

Meteorological Sites used for apportionment monitoring

APPENDIX II

2007 Flow Data

RECORDED AND NATURAL FLOWS, CONSUMPTIVE USE, DIVERSION, AND STORAGE
(in Cubic Decametres) FOR THE 2007 APPORTIONMENT PERIOD

SOUTH SASKATCHEWAN RIVER – ALBERTA-SASKATCHEWAN BOUNDARY

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED DISCHARGE	235 280	206 190	334 330	435 810	731 880	1 329 210	425 650	196 330	269 260	288 100	264 490	198 050	4 896 580
CONSUMPTIVE USE	550	530	610	24 950	164 050	250 020	561 930	355 760	162 810	8 350	880	280	1 530 720
CHANGE IN RESERVOIR STORAGE	-82 310	-73 430	-24 870	-18 340	112 520	312 470	-49 030	-198 570	-144 650	-39 460	-46 390	-70 410	-322 470
DIVERSION FROM BASIN	0	0	0	11 700	26 540	30 480	19 230	20 330	16 830	10 610	0	0	135 720
NATURAL FLOW ALTA. – SASK. BOUNDARY	169 680	133 460	301 310	425 040	1 016 880	1 888 190	963 540	425 830	314 050	274 560	215 640	130 400	6 258 580

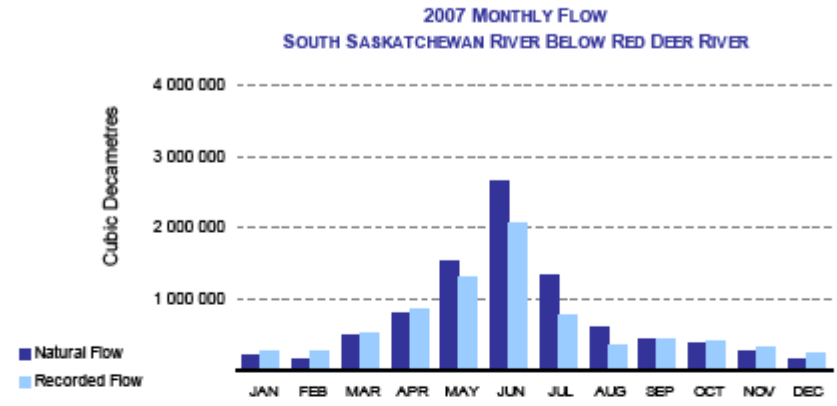
RED DEER RIVER – ALBERTA-SASKATCHEWAN BOUNDARY

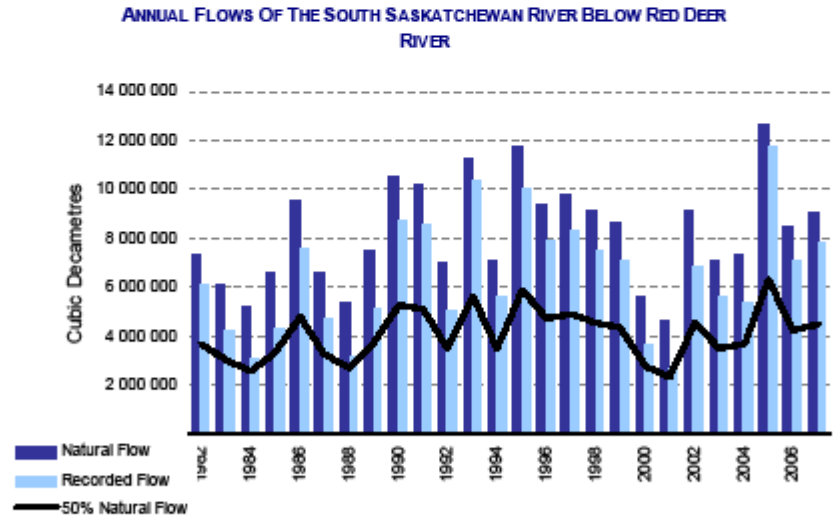
	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED DISCHARGE	45 706	37 627	180 351	414 426	575 891	727 488	363 770	159 805	147 960	119 318	70 010	33 912	2 876 264
CONSUMPTIVE USE	0	0	0	-5 050	-1 670	2 930	5 620	6 000	3 390	50	0	0	11 270
CHANGE IN RESERVOIR STORAGE	-17 120	-17 070	-12 820	-50 530	2 980	58 330	19 480	18 130	50	1 180	-6 140	-18 710	3 400
DIVERSION INTO BASIN	0	0	0	-11 700	-26 540	-30 480	-19 230	-20 330	-16 830	-10 610	0	0	-135 720
NATURAL FLOW ALTA. – SASK. BOUNDARY	32 136	21 037	184 831	371 976	528 821	757 708	365 430	168 555	135 540	109 808	67 800	15 632	2 759 274

SOUTH SASKATCHEWAN RIVER – BELOW JUNCTION WITH RED DEER RIVER

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED DISCHARGE	281 000	244 000	515 000	850 000	1 308 000	2 057 000	789 000	356 000	417 000	407 000	317 000	232 000	7 773 000
NATURAL FLOW	202 000	154 000	486 000	797 000	1 546 000	2 646 000	1 329 000	594 000	450 000	384 000	283 000	146 000	9 017 000
50 PERCENT OF NATURAL FLOW	101 000	77 000	243 000	398 500	773 000	1 323 000	664 500	297 500	225 000	192 000	141 500	73 000	4 508 500
EXCESS (+) OR DEFICIT (-) DELIVERY	180 000	167 000	272 000	451 500	535 000	734 000	124 500	59 000	192 000	215 000	175 500	159 000	3 264 500
CUMULATIVE EXCESS OR DEFICIT DELIVERY	180 000	347 000	619 000	1 070 500	1 605 500	2 339 500	2 464 000	2 523 000	2 715 000	2 930 000	3 105 500	3 264 500	3 264 500

NOTES:
(A) All data is rounded to significant figures.
(B) Natural flow calculations are based on the methodology described in the report entitled “South Saskatchewan River Below Red Deer River – Natural Flow”, April 1985 (PPWB Report No. 45).
(C) Apportionment of natural flow in the South Saskatchewan River is as specified in Article 4, Schedule A of the *Master Agreement on Apportionment*.
(D) Flows have been routed and, as a result, the values presented in the table cannot be exactly balanced on a monthly basis.
(E) Natural flow is defined in Article 1(a), Schedule A of the *Master Agreement on Apportionment* as “the quantity of water which would naturally flow in any watercourse had the flow not been affected by human interference or human intervention, excluding any water which is part of the natural flow in Alberta but is not available for the use of Alberta because of the provisions of any international treaty which is binding on Alberta”.


2007 Monthly Flow
South Saskatchewan River Below Red Deer River
Cubic Decametres
4 000 000
3 000 000
2 000 000
1 000 000
Natural Flow
Recorded Flow
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC


Annual Flows Of The South Saskatchewan River Below Red Deer River
Cubic Decametres
14 000 000
12 000 000
10 000 000
8 000 000
6 000 000
4 000 000
2 000 000
Natural Flow
Recorded Flow
50% Natural Flow
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006

RECORDED AND NATURAL FLOWS – SUMMARY OF SELECTED STREAMS CROSSING THE SASKATCHEWAN-MANITOBA BOUNDARY (in Cubic Decametres) FOR THE 2007 APPORTIONMENT PERIOD*

CHURCHILL RIVER – SASKATCHEWAN-MANITOBA BOUNDARY (AT SANDY BAY)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	1 888 000	1 706 000	1 896 000	2 092 000	2 946 000	2 773 000	2 341 000	1 982 000	1 895 000	1 993 000	1 954 000	1 939 000	25 405 000
NATURAL FLOW	2 032 000	1 769 000	1 874 000	1 949 000	2 808 000	2 797 000	2 596 000	2 241 000	2 112 000	2 339 000	2 253 000	2 169 000	26 939 000

SASKATCHEWAN RIVER – SASKATCHEWAN-MANITOBA BOUNDARY

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
ESTIMATED ** FLOW	979 000	994 000	1 477 000	2 954 000	3 680 000	3 367 000	3 086 000	1 790 000	1 392 000	1 224 000	1 167 000	1 079 000	23 189 000
APPORTION-MENT FLOW	625 000	611 000	1 249 000	3 280 000	4 078 000	4 187 000	3 438 000	1 836 000	1 408 000	1 279 000	906 000	736 000	23 633 000

CARROT RIVER – SASKATCHEWAN-MANITOBA BOUNDARY (NEAR TURNBERRY)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	34 000	17 200	23 300	199 000	443 000	260 000	180 000	64 400	41 700	32 600	23 600	17 000	1 340 000

QU'APPELLE RIVER – SASKATCHEWAN-MANITOBA BOUNDARY (NEAR WELBY)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	12 000	7 300	35 100	106 100	71 300	68 900	48 400	17 800	12 100	15 300	25 800	15 700	436 000
NATURAL FLOW	–	–	–	–	–	–	–	–	–	–	–	–	264 959

RED DEER RIVER – SASKATCHEWAN-MANITOBA BOUNDARY (NEAR ERWOOD)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	17 200	11 100	20 000	655 000	444 000	263 000	92 600	12 800	8 570	11 800	8 240	7 830	1 550 000
NATURAL FLOW	18 500	11 700	21 500	713 000	482 000	285 000	99 500	13 600	9 210	12 700	8 900	8 450	1 684 060

ASSINIBOINE RIVER – SASKATCHEWAN-MANITOBA BOUNDARY (AT KAMSACK)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	3 440	2 710	4 640	306 000	156 000	109 000	32 400	10 200	4 030	8 340	5 750	3 950	646 000
NATURAL FLOW	3 480	2 740	4 610	308 000	156 000	109 000	33 200	11 000	4 410	8 540	5 780	3 960	650 720

PIPESTONE CREEK – SASKATCHEWAN-MANITOBA BOUNDARY

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	14	0	13 900	9 950	5 530	24 800	6 380	270	42	337	241	44	61 500
NATURAL FLOW	285	271	15 500	8 600	5 710	25 000	5 340	186	0	109	8	82	61 083

*Apportionment period for streams crossing the Saskatchewan-Manitoba boundary was changed from water year to calendar year.
** For the Saskatchewan River, estimated flow at the Saskatchewan-Manitoba boundary is computed using recorded flow of the Saskatchewan River at The Pas minus 1.31 times the recorded flow of Carrot River near Turnberry.
Apportionment flow is the volume of flow subject to apportionment.

RECORDED AND NATURAL FLOWS – SUMMARY OF SELECTED STREAMS AND LAKE CROSSING
THE ALBERTA-SASKATCHEWAN BOUNDARY (in Cubic Decametres) FOR THE 2007 APPORTIONMENT PERIOD

NORTH SASKATCHEWAN RIVER - ALBERTA-SASKATCHEWAN BOUNDARY (NEAR DEER CREEK)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	319 000	283 000	340 000	920 000	1 208 000	1 379 000	849 000	603 000	498 000	466 000	386 000	370 000	7 620 000
NATURAL FLOW	179 000	88 000	118 000	712 000	1 092 000	1 652 000	1 326 000	1 027 000	690 000	468 000	266 000	162 000	7 780 000

BATTLE CREEK – ALBERTA-SASKATCHEWAN BOUNDARY

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	0	235	1 358	1 415	1 207	1 069	719	490	563	517	0	0	7 574
NATURAL FLOW	0	245	1 403	1 427	1 222	1 076	719	490	590	523	0	0	7 695

LODGE CREEK – ALBERTA-SASKATCHEWAN BOUNDARY

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	0	0	1 404	2 330	515	260	0	0	0	0	0	0	4 509
NATURAL FLOW	0	0	1 995	2 660	515	255	0	0	0	0	0	0	5 425

MIDDLE CREEK – ALBERTA-SASKATCHEWAN BOUNDARY

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	0	1	144	694	51	8	4	3	2	3	0	0	911
NATURAL FLOW	0	4	273	772	59	37	12	3	2	3	0	0	1 165

COLD LAKE – ALBERTA-SASKATCHEWAN BOUNDARY (AT OUTLET OF COLD LAKE)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	24 938	22 634	25670	26902	49 144	65 284	91 541	64 653	64 212	59 659	47 762	46 371	588 770
NATURAL FLOW	28 891	23 265	26 154	27 379	49 519	65 618	92 084	65 209	64 748	60 193	48 249	46 880	598 190

APPENDIX III

PPWB Water Quality Monitoring 2007 Parameter List

Water is collected monthly at all sites with the exception of Red Deer (Sask/Man) (6x/yr), Churchill, and Cold Rivers (4x/yr)

ALKALINITY, phenol & total
ALUMINUM, diss. & total$^{\theta}$
AMMONIA, diss$^{\theta}$.
ANTIMONY, diss. & total
ARSENIC, diss.$^{\theta}$ & total
BARIUM, diss. & total$^{\theta}$
BERYLLIUM, diss. & total
BICARBONATE, calc.
BISMUTH, diss. & total
BORON, diss.$^{\theta}$ & total
CADMIUM, diss. & total$^{\theta}$
CALCIUM, diss.
CARBON, diss organic
CARBON, part. organic
CARBON, total organic, calcd.
CARBONATE, calcd.
CHLORIDE, diss$^{\theta}$
CHROMIUM, diss. & total$^{\theta}$
COBALT, diss. & total$^{\theta}$
COLIFORMS FECAL$^{\theta}$ ♦
COLOUR TRUE
COPPER, diss. & total$^{\theta}$
E. COLI ♦
FLUORIDE, diss$^{\theta}$
FREE CO_2, calcd.
GALLIUM, diss. & total
HARDNESS NON-CARB. (CALCD.)
HARDNESS TOTAL (CALCD.) CACO3
IRON, diss.$^{\theta}$ & total
LANTHANUM, diss. & total
LEAD, diss. & total$^{\theta}$
LITHIUM, diss. & total
MAGNESIUM, diss.
MANGANESE, diss.$^{\theta}$ & total
MOLYBDENUM, diss. & total
NICKEL diss. & total$^{\theta}$
NITROGEN NO_3 & NO_2, diss$^{\theta}$.
NITROGEN. part.
NITROGEN, total calcd.
NITROGEN, diss.
OXYGEN, diss.$^{\theta}$
Ph$^{\theta}$
PHOSPHOROUS ortho, diss
PHOSPHOROUS, part. calcd.
PHOSPHOROUS, total$^{\theta}$
PHOSPHOROUS, diss.
POTASSIUM, diss.
RESIDUE FIXED NONFILTRABLE
RESIDUE NONFILTRABLE
RUBIDIUM, diss. & total
SELENIUM, diss.$^{\theta}$ & total
SILVER, diss. & total
SILICA,
SODIUM ADSORPTION RATIO, calcd.$^{\theta}$
SODIUM, diss.$^{\theta}$
SODIUM PERCENTAGE, calcd.
SPECIFIC CONDUCTANCE
STRONTIUM, diss. & total
SULPHATE, diss.$^{\theta}$
TEMPERATURE WATER
THALLIUM, diss. & total
TOTAL DISSOLVED SOLIDS, calcd.$^{\theta}$
TURBIDITY
URANIUM, diss. & total$^{\theta}$
VANADIUM, diss. & total$^{\theta}$
ZINC diss. & total$^{\theta}$

ACID HERBICIDES*$^{\theta}$
NEUTRAL HERBICIDES*
ORGANOCHLORINE INSECTICIDES*

θ Parameters with PPWB site-specific objectives

* Collected from the Battle, Red Deer (Alta/Sask), Assiniboine, and Carrot Rivers in 2007

♦ Collected between 6 -12 X/year at all sites but the Churchill and Cold Rivers

APPENDIX IV

COWQ 2007 Excursion Report to the Board
Approved October 16, 2008

PPWB EXCURSION REPORT

JANUARY – DECEMBER 2007

NANCY E. GLOZIER
PN WATER QUALITY MONITORING
ENVIRONMENT CANADA
SEPTEMBER 2008

Introduction

Environment Canada and all members of the COWQ annually review the results of the PPWB Water Quality Monitoring Program with particular attention to comparisons to PPWB Water Quality Objectives. This report summarizes the steps and analyses undertaken in this process.

For all sites, raw data with all excursions (i.e., concentrations which exceed the objective) identified were distributed to the COWQ members on September 4, 2008 for their review and internal quality control/quality assurance protocols. All sites were sampled at the approved frequency (Table 1) with the exception of the Saskatchewan River which was sampled during 10 of 12 months as unsafe ice conditions in April and November prohibited sampling. In addition, although site specific objectives have yet to be developed for the Cold River, four water quality samples per year were obtained for this site. Finally, at the Beaver River a second site is concurrently being sampled which will continue for at least 2 years, after which the COWQ will conduct comparative analyses. A decision regarding the location of the ongoing sampling site is expected in 2009. For consistency with previous work, the historic site was used in these analyses. Therefore, a total of 132 sampling events were conducted by Environment Canada's technical and scientific staff in 2007.

Results and Discussion

Patterns in Overall Adherence to Objectives

In 2007, the PPWB reach-specific water quality objectives were adhered to, on average, 95% of the time over a total of 2755 comparisons of water chemistry results to objectives (Figure 1). Similar to previous years (Table 2), all but two sites (the Carrot and Qu'Appelle rivers) had adherence rates greater than 90%. When we compare adherence rates over the previous five years (Table 2), most sites show little year to year variability in adherence rates (ranges 3%). The Battle, Red Deer (A/S) and the Qu'Appelle rivers showed more fluctuations in adherence rates with ranges of 4.6, 9.1 and 6.7 %, respectively.

In direct comparisons to the 2007 adherence rates of the previous reporting period (2006), all but three sites exhibited improved adherence rates (Table 2). In fact, the Battle and Churchill rivers exhibited improvements near to 3%. In the Battle River, this improvement was due to a combination of fewer excursions for sodium and total dissolved solids during spring and early summer (April-July), and no fecal coliform excursions throughout the year. In the Churchill River, dissolved oxygen concentration was not observed below the 6.5mg/L objective in 2007. Of the three sites which exhibited reduced adherence rates two, the Carrot and Qu'Appelle rivers, were only 0.4% below the 2006 adherence rate. These minimal changes to overall adherence rates were due to the addition of a single excursion in 2007. However, when these sites are examined in more detail the distribution of excursions has changed. At the Carrot River, fewer dissolved oxygen but more chloride and sodium excursions were observed. In the Qu'Appelle River, fewer dissolved manganese but greater oxygen and fecal coliform excursions occurred. For the Red Deer River at the Alberta Saskatchewan border, adherence rate decreased by nearly 3%. This decrease is due to the 11 excursions in total metals (copper, lead and zinc) in 2007, compared to 3 in 2006; all associated with increased sediment loads in the river. This phenomenon of total metal excursions associated with variations in suspended sediments is largely responsible for the high yearly variability in adherence rates observed at this site.

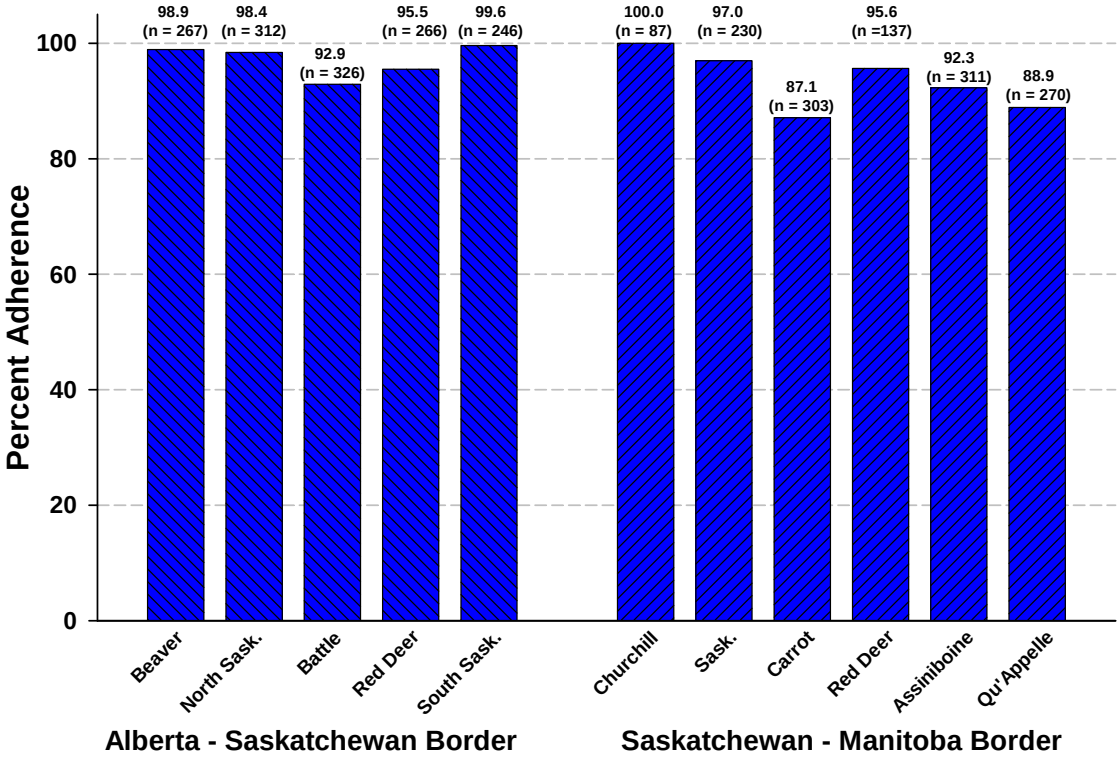


Figure 1: 2007 PERCENT ADHERENCE TO PPWB OJBJECTIVES

Parameter Specific Patterns

Excursions by parameter and protective use are summarized in Table 3. In 2007, a total of 11 parameters exhibited excursions to the PPWB site specific objectives, five of which accounted for over 80% of all excursions. Similar to previous years these parameters included, in descending order of overall exceedence (i.e., number of exceedences for parameter x /total number of exceedences for all parameters); total phosphorus (31%), dissolved manganese (23 %), dissolved sodium (14 %), copper (9%) and total dissolved solids (5%). Overall dissolved oxygen excursions for 2007 (3%) were reduced compared to 2006 (14%). We also summarized parameter specific excursions based on the number of tests for a specific parameter to determine which parameters are exceeding the site specific objectives most frequently. The order of parameters for this comparison does not differ from the overall exceedence rates with phosphorus, manganese and sodium all showing exceedences in 18-40% of samples (Table 3). We also summarized the percentage of sites for which parameters were exceeding objectives. Interestingly of the 11 parameters with exceedences most (82%) exceeded site specific objectives at more than 1 site. Two parameters, phosphorus and total dissolved solids exceeded consistently (> 50%) at PPWB sites with the objectives. These parameter and site summaries will aid in prioritizing efforts during the upcoming review of PPWB objectives.

Protective Use Specific Patterns

Of the water uses for which the PPWB site specific objectives are set to protect, all those uses tested in 2007 had some exceedences. Four parameters with objectives for protecting fisheries/aquatic life displayed exceedences; total copper, lead, and zinc and dissolved oxygen. The total metal excursions were associated with high suspended sediment loads and as this is a natural, seasonal event is not an immediate concern to the functioning of aquatic ecosystems in these rivers. Of the four lowered dissolved oxygen concentrations three were at or within the meter specifications (0.4mg/L) of the objective. Only one (4.4 mg/L), on July 24, 2007 at the Carrot River would be considered a concern for aquatic life and was taken early in the day (08:00) closer to the expected diel minimum than most samples at this site. This is a significant improvement for dissolve oxygen at this site for 2007. As reported previously for this site, the excursion rate during open water for 2005 and 2006 had been greater than 85%. These results are currently being examined in more detail by the COWQ to determine if relationships exist between oxygen in this river and changes in other parameters. In summary, for the protection of aquatic life/fisheries, dissolved oxygen appears to be the only consistent parameter of concern. How to evaluate this parameter most appropriately will be discussed within the COWQ over the course of the objective review exercise.

Four parameters for which objectives are set for the protection of irrigation and/or livestock water had excursions; dissolved manganese, chloride and sodium and fecal coliforms. As the dissolved ions have previously been indicated as arising from natural sources, the time of year and sites at which these excursions are occurring will be reviewed during the review of objectives. Fecal coliform showed exceedences for both the irrigation/livestock and recreation water uses. Timely reporting of these results to respective jurisdictions is under review.

Dissolved iron, manganese and total dissolved solids have site specific objectives for the protection of drinking water at 9, 9, and 4 PPWB sites, respectively and all had exceedences at several sites. Similar to the dissolved ions for irrigation/livestock, these dissolved ions often exceed the drinking water objective due to natural water chemistry conditions and will be examined as priorities under the review of objective.

Table 1: Summary of PPWB Excursions 2007

LOCATION		ALBERTA / SASKATCHEWAN BORDER				
SITE		BEAVER RIVER	NORTH SASK. RIVER	BATTLE RIVER	RED DEER RIVER A/S	SOUTH SASK. RIVER
PPWB REPORT SITE NUMBER		2	3	4	5	6
		number exursions (number of tests)				
METALS	**UNITS**					
ALUMINUM (total)	mg/L	---	0	0	---	---
ARSENIC (diss)	mg/L	0	0	0	0	0
BARIUM (total)	mg/L	0	0	0	0	0
BORON (diss)	mg/L	0	0	0	0	0
CADMIUM (total)	mg/L	0	0	0	0	0
CHROMIUM (total)	mg/L	0	0	0	0	0
COBALT	mg/L	---	0	0	0	0
COPPER (total)	mg/L	0	2 (12)	4 (12)	7 (12)	0
CYANIDE (free)	mg/L	ND	ND	ND	ND	ND
IRON (diss)	mg/L	0	0	1 (12)	0	0
LEAD (total)	mg/L	0	0	0	2 (12)	0
MANGANESE (diss)	mg/L	3 (12)	0	4 (12)	0	0
MERCURY (total)	ug/L	---	---	---	---	---
NICKEL (total)	mg/L	0	0	0	0	0
SELENIUM (diss)	mg/L	0	0	0	0	0
SILVER (total)	mg/L	0	---	---	---	---
URANIUM	mg/L	0	0	0	---	---
VANADIUM (TOTAL)	mg/L	---	0	0	0	0
ZINC (total)	mg/L	0	1 (12)	0	2 (12)	0
NUTRIENTS						
AMMONIA (total)	mg/L	0	0	0	0	0
NO2+NO3 (as N)	mg/L	0	0	0	0	0
PHOSPHORUS (total)	mg/L	---	---	---	---	---
MAJOR IONS						
CHLORIDE (diss.)	mg/L	0	0	0	---	---
FLUORIDE (diss)	mg/L	0	0	0	0	0
SODIUM (diss)	mg/L	0	0	7 (12)	---	---
SULPHATE (diss)	mg/L	0	0	0	0	0
TOTAL DISS. SOLIDS	mg/L	---	0	7 (12)	1 (11)	0
BIOTA						
FECAL COLIFORM	NO/dL	0	2 (12)	0	0	1 (7)
PHYSICALS						
pH	pH Units	0	0	0	---	---
OXYGEN (diss)	mg/L	0 (* 4 under ice)	0	0 (*4 under ice)	---	---
SAR	mg/L	---	---	---	0	0
PESTICIDES/CONTAMINANTS						
LINDANE	mg/L	ND	ND	0	0	ND
2,4-D	mg/L	ND	ND	0	0	ND
2,4,5-TP	mg/L	ND	ND	0	0	ND
CHLORINE	mg/L	ND	ND	ND	---	---
CHLOROPHENOLS (total)	mg/L	ND	ND	ND	ND	ND
PCP	mg/L	ND	ND	ND	---	---
MERCURY IN FISH	ug/g MUSCLE TISSUE	ND	ND	ND	ND	ND
PCB IN FISH	ug/g MUSCLE TISSUE	ND	ND	ND	ND	ND
RADIOACTIVE						
CESIUM-137	Bq/L	---	---	---	---	---
IODINE-131	Bq/L	---	---	---	---	---
RADIUM-226	Bq/L	---	---	---	---	---
STRONTIUM-90	Bq/L	---	---	---	---	---
TRITIUM	Bq/L	---	---	---	---	---
No. Excursion Comparisons		**267**	**312**	**326**	**266**	**246**
Total No. Excursions Observed		**3**	**5**	**23**	**12**	**1**
Sampling Frequency (no./year)		**12[+]**	**12**	**12[+]**	**12[+]**	**12[+]**
Overall Adherence Rate		**98.9**	**98.4**	**92.9**	**95.5**	**99.6**

"---" = no objective
ND = no data to compare to objective; PPWB approved monitoring plan for 2007 did not include these parameters
*** Low Dissloved Oxygen conditions recorded under ice cover**
[+] Fecal Coliform and/or Pesticide sampling frequency reduced to 8X per year during open water.

Table 1: Summary of PPWB Excursions 2007 (con't)

LOCATION		SASKATCHEWAN / MANITOBA BORDER					
SITE		CHURCHILL RIVER	SASK. RIVER	CARROT RIVER	RED DEER RIVER S/M	ASSINIBOINE RIVER	QU'APPELLE RIVER
PPWB REPORT SITE NUMBER		7	8	9	10	11	12
		number exursions (number of tests)					
METALS	UNITS						
ALUMINUM (total)	mg/L	---	---	---	---	---	---
ARSENIC (diss)	mg/L	0	0	0	0	0	0
BARIUM (total)	mg/L	0	0	0	0	0	0
BORON (diss)	mg/L	0	0	0	0	0	0
CADMIUM (total)	mg/L	0	0	0	0	0	0
CHROMIUM (total)	mg/L	0	0	0	0	0	0
COBALT	mg/L	---	---	---	---	---	---
COPPER (total)	mg/L	0	0	0	0	0	0
CYANIDE (free)	mg/L	ND	ND	ND	ND	ND	ND
IRON (diss)	mg/L	0	1 (10)	3 (12)	0	2 (12)	0
LEAD (total)	mg/L	0	0	0	0	0	0
MANGANESE (diss)	mg/L	0	0	11 (12)	0	10 (12)	6 (12)
MERCURY (total)	*ug/L*	---	---	---	---	---	ND
NICKEL (total)	mg/L	0	0	0	0	0	0
SELENIUM (diss)	mg/L	0	0	0	0	0	0
SILVER (total)	mg/L	---	---	---	---	---	---
URANIUM	mg/L	0	0	0	0	0	0
VANADIUM (TOTAL)	mg/L	---	---	---	---	---	---
ZINC (total)	mg/L	0	0	0	0	0	0
NUTRIENTS							
AMMONIA (total)	mg/L	0	0	0	0	0	0
NO2+NO3 (as N)	mg/L	0	0	0	0	0	0
PHOSPHORUS (total)	mg/L	0	5 (10)	12 (12)	5 (6)	12 (12)	12 (12)
MAJOR IONS							
CHLORIDE (diss.)	mg/L	0	0	6 (12)	0	0	0
FLUORIDE (diss)	mg/L	0	0	0	0	0	0
SODIUM (diss)	mg/L	0	0	4 (12)	0	0	10 (12)
SULPHATE (diss)	mg/L	0	0	0	0	0	0
TOTAL DISS. SOLIDS	mg/L	---	---	---	---	---	---
BIOTA							
FECAL COLIFORM	*NO/dL*	ND	0	0	1 (6)	0	2 (7)
PHYSICALS							
pH	*pH Units*	0	0	0	0	0	0
OXYGEN (diss)	mg/L	0	1 (10)	3 (6) (* + 3 under ice)	0	0	0
SAR	mg/L	---	---	---	---	---	---
PESTICIDES/CONTAMINANTS							
LINDANE	mg/L	ND	ND	0	ND	0	ND
2,4-D	mg/L	ND	ND	0	ND	0	ND
2,4,5-TP	mg/L	ND	ND	0	ND	0	ND
CHLORINE	mg/L	ND	ND	ND	ND	ND	ND
CHLOROPHENOLS (total)	mg/L	ND	ND	ND	ND	ND	ND
PCP	mg/L	ND	ND	ND	ND	ND	ND
MERCURY IN FISH	*ug/g TISSUE*	ND	ND	ND	ND	ND	ND
PCB IN FISH	*ug/g TISSUE*	ND	ND	ND	ND	ND	ND
RADIOACTIVE							
CESIUM-137	*Bq/L*	ND	ND	ND	ND	ND	ND
IODINE-131	*Bq/L*	ND	ND	ND	ND	ND	ND
RADIUM-226	*Bq/L*	ND	ND	ND	ND	ND	ND
STRONTIUM-90	*Bq/L*	ND	ND	ND	ND	ND	ND
TRITIUM	*Bq/L*	ND	ND	ND	ND	ND	ND
No. Excursion Comparisons		**87**	**230**	**303**	**137**	**311**	**270**
Total No. Excursions Observed		**0**	**7**	**39**	**6**	**24**	**30**
Sampling Frequency (no./year)		**4**	**10**	**12+**	**6**	**12**	**12+**
Overall Adherence Rate		**100.0**	**97**	**87.1**	**95.6**	**92.3**	**88.9**

"---" = no objective
ND = no data to compare to objective; PPWB approved monitoring plan for 2007 did not include these parameters
*** Low Dissloved Oxygen conditions recorded under ice cover**
+ Fecal Coliform and/or Pesticide sampling frequency reduced to 8X per year during open water.

Table 2: PPWB Adherence Results for the five year period 2003-2007 with minimum values at each site identified in italics. Ranges are calculated as the maximum-minimum.

PPWB ADHERENCE SUMMARY 2003-2007

	ALBERTA / SASKATCHEWAN BORDER					SASKATCHEWAN / MANITOBA BORDER					
SITE	BEAVER RIVER	NORTH SASK. RIVER	BATTLE RIVER	RED DEER RIVER A/S	SOUTH SASK. RIVER	CHURCHILL RIVER	SASK. RIVER	CARROT RIVER	RED DEER RIVER S/M	ASSINIBOINE RIVER	QU'APPELLE RIVER
PPWB SITE NUMBER	2	3	4	5	6	7	8	9	10	11	12
YEAR											
2003	98.5	99.6	89.8	93.3	100.0	98.8	97.1	87.4	***94.2***	92.1	84.1
2004	***97.6***	99.3	88.9	97.7	100.0	100.0	97.7	88.9	95.5	***89.6***	***82.6***
2005	100.0	***96.8***	***88.3***	***89.3***	***97.2***	100.0	96.6	***86.6***	94.3	92.6	85.7
2006	98.9	97.9	90.1	98.4	99.6	***97.0***	***95.2***	87.5	95.6	91.3	89.3
2007	98.9	98.4	92.9	95.5	99.6	100.0	97.0	87.1	95.6	92.3	88.9
RANGE	**2.4**	**2.8**	**4.6**	**9.1**	**2.8**	**3**	**2.5**	**2.3**	**1.4**	**3**	**6.7**

Table 3: Summary of PPWB 2007 Excursions by Parameter. Parameters and sites with % excursion > 15 are highlighted in grey. Blank cells were parameters with no excursions in 2007.

		EXCURSION SUMMARY			SITE SUMMARY	
Parameters	**Protective Uses**	TOTAL NUMBER EXCURSIONS (# SAMPLES)	% EXCURSIONS		NUMBER SITES WITH EXCURSIONS (# SITES)	% SITES WITH EXCURSIONS
METALS						
ALUMINUM (total)						
ARSENIC (diss)						
BARIUM (total)						
BORON (diss)						
CADMIUM (total)						
CHROMIUM (total)						
COBALT						
COPPER (total)	**Fisheries**	**13 (118)**	**11.0**		**3 (11)**	**27.3**
CYANIDE (free)						
IRON (diss)	**Drinking**	**7 (118)**	**5.9**		**4 (11)**	**36.4**
LEAD (total)	**Fisheries**	**2 (118)**	**1.7**		**1 (11)**	**9.1**
MANGANESE (diss)	**Drinking/Irr/Livestock**	**34 (118)**	**28.8**		**5 (11)**	**45.5**
MERCURY (total)						
NICKEL (total)						
SELENIUM (diss)						
SILVER (total)						
URANIUM						
VANADIUM (TOTAL)						
ZINC (total)	**Fisheries**	**3 (118)**	**2.5**		**2 (11)**	**18.2**
NUTRIENTS						
AMMONIA (total)						
NO2+NO3 (as N)						
PHOSPHORUS (total)	**Recreation**	**46 (118)**	**39.0**		**5 (6)**	**83.3**
MAJOR IONS						
CHLORIDE (diss.)	**Irrigation/Livestock**	**6 (118)**	**5.1**		**1 (9)**	**11.1**
FLUORIDE (diss)						
SODIUM (diss)	**Irrigation/Livestock**	**21 (118)**	**17.8**		**3 (9)**	**33.3**
SULPHATE (diss)						
TOTAL DISS. SOLIDS	**Drinking**	**8 (118)**	**6.8**		**2 (4)**	**50.0**
BIOTA						
FECAL COLIFORM	**Irrigation/Livestock/Recreation**	**6 (94)**	**6.4**		**4 (11)**	**36.4**
PHYSICALS						
pH						
OXYGEN (diss)	**Fisheries**	**4 (103)**	**3.9**		**2 (8)**	**25.0**
SAR						
PESTICIDES/ CONTAMINANTS						
LINDANE						
2,4-D						
2,4,5-TP						
CHLORINE		*na*	*na*		*na*	*na*
CHLOROPHENOLS (total)		*na*	*na*		*na*	*na*
PCP		*na*	*na*		*na*	*na*
MERCURY IN FISH		*na*	*na*		*na*	*na*
PCB IN FISH		*na*	*na*		*na*	*na*
RADIOACTIVE						
CESIUM-137		*na*	*na*		*na*	*na*
IODINE-131		*na*	*na*		*na*	*na*
RADIUM-226		*na*	*na*		*na*	*na*
STRONTIUM-90		*na*	*na*		*na*	*na*
TRITIUM		*na*	*na*		*na*	*na*

Table 4: Summary of PPWB Objectives

PPWB SITE SPECIFIC OBJECTIVES: MASTER AGREEMENT SCHEDULE E

LOCATION		ALBERTA / SASKATCHEWAN BORDER				
SITE		BEAVER RIVER	NORTH SASK. RIVER	BATTLE RIVER	RED DEER RIVER A/S	SOUTH SASK. RIVER
PPWB REPORT SITE NUMBER		2	3	4	5	6
METALS	**UNITS**					
ALUMINUM (total)	mg/L	---	5	5	---	---
ARSENIC (diss)	mg/L	0.05	0.05	0.05	0.05	0.05
BARIUM (total)	mg/L	1	1	1	1	1
BORON (diss)	mg/L	5	5	5	5	5
CADMIUM (total)	mg/L	0.001	0.001	0.001	0.001	0.001
CHROMIUM (total)	mg/L	0.011	0.011	0.011	0.011	0.011
COBALT	mg/L	---	0.05	0.05	1	1
COPPER (total)	mg/L	0.004	0.004	0.004	0.004	0.01
CYANIDE (free)	mg/L	0.005	0.005	0.005	0.005	0.005
IRON (diss)	mg/L	1	0.3	0.3	0.3	1
LEAD (total)	mg/L	0.007	0.007	0.007	0.007	0.02
MANGANESE (diss)	mg/L	0.2	0.05	0.05	0.05	0.05
MERCURY (total)	*ug/L*	---	---	---	---	---
NICKEL (total)	mg/L	0.1	0.1	0.1	0.025	0.025
SELENIUM (diss)	mg/L	0.001	0.001	0.001	0.001	0.002
SILVER (total)	mg/L	0.0001	---	---	---	---
URANIUM	mg/L	0.02	0.02	0.02	---	---
VANADIUM (TOTAL)	mg/L	---	0.1	0.1	0.1	0.1
ZINC (total)	mg/L	0.03	0.03	0.03	0.03	0.05
NUTRIENTS						
AMMONIA (total)	mg/L	APPENDIX 3	APPENDIX 3	APPENDIX 3	APPENDIX 3	APPENDIX 3
NO2+NO3 (as N)	mg/L	10	10	10	10	10
PHOSPHORUS (total)	mg/L	---	---	---	---	---
MAJOR IONS						
CHLORIDE (diss.)	mg/L	100	100	100	---	---
FLUORIDE (diss)	mg/L	1.5	1.5	1.5	1.5	1.5
SODIUM (diss)	mg/L	100	100	100	---	---
SULPHATE (diss)	mg/L	500	500	500	500	500
TOTAL DISS. SOLIDS	mg/L	---	500	500	500	500
BIOTA						
FECAL COLIFORM	*NO/dL*	100/100ml	100/100ml	100/100ml	100/100ml	100/100ml
PHYSICALS						
pH	*pH Units*	6.5-9.0	6.5-9.0	6.5-9.0	---	---
OXYGEN (diss)	mg/L	OW 6.0	6.5	OW 6.0	---	---
SAR	mg/L	---	---	---	3	3
PESTICIDES/CONTAMI---NTS						
LINDANE	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001
2,4-D	mg/L	0.004	0.004	0.004	0.004	0.004
2,4,5-TP	mg/L	0.01	0.01	0.01	0.01	0.01
CHLORINE	mg/L	0.002	0.002	0.002	---	---
CHLOROPHENOLS (total)	mg/L	0.001	0.001	0.001	0.001	0.001
PCP	mg/L	0.0005	0.0005	0.0005	---	---
MERCURY IN FISH	*ug/g MUSCLE TISSUE*	0.5	0.5	0.5	0.5	0.5
PCB IN FISH	*ug/g MUSCLE TISSUE*	2	2	2	2	2
RADIOACTIVE						
CESIUM-137	*Bq/L*	---	---	---	---	---
IODINE-131	*Bq/L*	---	---	---	---	---
RADIUM-226	*Bq/L*	---	---	---	---	---
STRONTIUM-90	*Bq/L*	---	---	---	---	---
TRITIUM	*Bq/L*	---	---	---	---	---

OW = open water objective only

Table 4: Summary PPWB Objectives (con't)

PPWB SITE SPECIFIC OBJECTIVES: MASTER AGREEMENT SCHEDULE E

LOCATION		SASKATCHEWAN / MANITOBA BORDER					
SITE		CHURCHILL RIVER	SASK. RIVER	CARROT RIVER	RED DEER RIVER S/M	ASSINIBOINE RIVER	QU'APPELLE RIVER
PPWB REPORT SITE NUMBER		7	8	9	10	11	12
METALS	**UNITS**						
ALUMINUM (total)	mg/L	---	---	---	---	---	---
ARSENIC (diss)	mg/L	0.05	0.05	0.05	0.05	0.05	0.05
BARIUM (total)	mg/L	1	1	1	1	1	1
BORON (diss)	mg/L	5	0.5	2	5	2	2
CADMIUM (total)	mg/L	0.00058	0.001	0.001	0.00058	0.001	0.001
CHROMIUM (total)	mg/L	0.011	0.011	0.011	0.011	0.011	0.011
COBALT	mg/L	---	---	---	---	---	---
COPPER (total)	mg/L	0.0057	0.01	0.01	0.01	0.01	0.01
CYANIDE (free)	mg/L	0.005	0.005	0.005	0.005	0.005	0.005
IRON (diss)	mg/L	0.3	0.3	0.3	0.3	0.3	0.3
LEAD (total)	mg/L	0.011	0.0061	0.015	0.0118	0.02	0.02
MANGANESE (diss)	mg/L	0.05	0.05	0.05	0.05	0.05	0.05
MERCURY (total)	*ug/L*	---	---	---	---	---	0.006
NICKEL (total)	mg/L	0.025	0.1	0.1	0.1	0.1	0.1
SELENIUM (diss)	mg/L	0.01	0.01	0.01	0.01	0.01	0.01
SILVER (total)	mg/L	---	---	---	---	---	---
URANIUM	mg/L	0.02	0.02	0.02	0.02	0.02	0.02
VANADIUM (TOTAL)	mg/L	---	---	---	---	---	---
ZINC (total)	mg/L	0.047	0.047	0.047	0.047	0.047	0.047
NUTRIENTS							
AMMONIA (total)	mg/L	APPENDIX 3	APPENDIX 3	APPENDIX 3	APPENDIX 3	APPENDIX 3	APPENDIX 3
NO2+NO3 (as N)	mg/L	10	10	10	10	10	10
PHOSPHORUS (total)	mg/L	0.05	0.05	0.05	0.05	0.05	0.05
MAJOR IONS							
CHLORIDE (diss.)	mg/L	250	68	100	100	100	100
FLUORIDE (diss)	mg/L	1.5	1	1	1	1	1
SODIUM (diss)	mg/L	300	100	100	100	100	100
SULPHATE (diss)	mg/L	500	250	500	500	500	500
TOTAL DISS. SOLIDS	mg/L	---	---	---	---	---	---
BIOTA							
FECAL COLIFORM	*NO/dL*	200/100ml	200/100ml	200/100ml	200/100ml	200/100ml	100/100ml
PHYSICALS							
pH	*pH Units*	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0
OXYGEN (diss)	mg/L	6.5	6.5	OW 6.5	6	6	6
SAR	mg/L	---	---	---	---	---	---
PESTICIDES/CONTAMINANTS							
LINDANE	mg/L	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
2,4-D	mg/L	0.004	0.004	0.004	0.004	0.004	0.004
2,4,5-TP	mg/L	0.01	0.01	0.01	0.01	0.01	0.01
CHLORINE	mg/L	0.002	0.002	0.002	0.002	0.002	0.002
CHLOROPHENOLS (total)	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
PCP	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
MERCURY IN FISH	*ug/g MUSCLE TISSUE*	0.2	0.2	0.5	0.5	0.5	0.5
PCB IN FISH	*ug/g MUSCLE TISSUE*	2	2	2	2	2	2
RADIOACTIVE							
CESIUM-137	*Bq/L*	50	50	50	50	50	50
IODINE-131	*Bq/L*	10	10	10	10	10	10
RADIUM-226	*Bq/L*	1	1	1	1	1	1
STRONTIUM-90	*Bq/L*	10	10	10	10	10	10
TRITIUM	*Bq/L*	40000	40000	40000	40000	40000	40000

OW = open water objective only

Table 4A: Summary PPWB Objectives with protective uses indicated

PPWB SITE SPECIFIC OBJECTIVES: MASTER AGREEMENT SCHEDULE E

LOCATION		ALBERTA / SASKATCHEWAN BORDER				
SITE		BEAVER RIVER	NORTH SASK. RIVER	BATTLE RIVER	RED DEER RIVER A/S	SOUTH SASK. RIVER
PPWB REPORT SITE NUMBER		2	3	4	5	6
METALS	**UNITS**					
ALUMINUM (total)	mg/L	---	5	5	---	---
ARSENIC (diss)	mg/L	0.05	0.05	0.05	0.05	0.05
BARIUM (total)	mg/L	1	1	1	1	1
BORON (diss)	mg/L	5	5	5	5	5
CADMIUM (total)	mg/L	0.001	0.001	0.001	0.001	0.001
CHROMIUM (total)	mg/L	0.011	0.011	0.011	0.011	0.011
COBALT	mg/L	---	0.05	0.05	1	1
COPPER (total)	mg/L	0.004	0.004	0.004	0.004	0.01
CYANIDE (free)	mg/L	0.005	0.005	0.005	0.005	0.005
IRON (diss)	mg/L	1	0.3	0.3	0.3	1
LEAD (total)	mg/L	0.007	0.007	0.007	0.007	0.02
MANGANESE (diss)	mg/L	0.2	0.05	0.05	0.05	0.05
MERCURY (total)	ug/L	---	---	---	---	---
NICKEL (total)	mg/L	0.1	0.1	0.1	0.025	0.025
SELENIUM (diss)	mg/L	0.001	0.001	0.001	0.001	0.002
URANIUM	mg/L	0.02	0.02	0.02	---	---
VANADIUM (TOTAL)	mg/L	---	0.1	0.1	0.1	0.1
ZINC (total)	mg/L	0.03	0.03	0.03	0.03	0.05
NUTRIENTS						
AMMONIA (total)	mg/L	APPENDIX 3	APPENDIX 3	APPENDIX 3	APPENDIX 3	APPENDIX 3
NO2+NO3 (as N)	mg/L	10	10	10	10	10
PHOSPHORUS (total)	mg/L	---	---	---	---	---
MAJOR IONS						
CHLORIDE (diss.)	mg/L	100	100	100	---	---
FLUORIDE (diss)	mg/L	1.5	1.5	1.5	1.5	1.5
SODIUM (diss)	mg/L	100	100	100	---	---
SULPHATE (diss)	mg/L	500	500	500	500	500
TOTAL DISS. SOLIDS	mg/L	---	500	500	500	500
BIOTA						
FECAL COLIFORM	NO/dL	100/100ml	100/100ml	100/100ml	100/100ml	100/100ml
PHYSICALS						
pH	pH Units	6.5-9.0	6.5-9.0	6.5-9.0	---	---
OXYGEN (diss)	mg/L	OW 6.0	6.5	OW 6.0	---	---
SAR	mg/L	---	---	---	3	3
PESTICIDES/CONTAMI---NTS						
LINDANE	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001
2,4-D	mg/L	0.004	0.004	0.004	0.004	0.004
2,4,5-TP	mg/L	0.01	0.01	0.01	0.01	0.01
CHLORINE	mg/L	0.002	0.002	0.002	---	---
CHLOROPHENOLS (total)	mg/L	0.001	0.001	0.001	0.001	0.001
PCP	mg/L	0.0005	0.0005	0.0005	---	---
MERCURY IN FISH	ug/g TISSUE	0.5	0.5	0.5	0.5	0.5
PCB IN FISH	ug/g TISSUE	2	2	2	2	2
RADIOACTIVE						
CESIUM-137	Bq/L	---	---	---	---	---
IODINE-131	Bq/L	---	---	---	---	---
RADIUM-226	Bq/L	---	---	---	---	---
STRONTIUM-90	Bq/L	---	---	---	---	---
TRITIUM	Bq/L	---	---	---	---	---

Fisheries
Drinking
Irrigation/Livestock
Recreation
Fish Consumption

Table 4A: Summary PPWB Objectives with protective uses indicated (con't)

PPWB SITE SPECIFIC OBJECTIVES: MASTER AGREEMENT SCHEDULE E

LOCATION		SASKATCHEWAN / MANITOBA BORDER					
SITE		CHURCHILL RIVER	SASK. RIVER	CARROT RIVER	RED DEER RIVER S/M	ASSINIBOINE RIVER	QU'APPELLE RIVER
PPWB REPORT SITE NUMBER		7	8	9	10	11	12
METALS	**UNITS**						
ALUMINUM (total)	mg/L	---	---	---	---	---	---
ARSENIC (diss)	mg/L	0.05	0.05	0.05	0.05	0.05	0.05
BARIUM (total)	mg/L	1	1	1	1	1	1
BORON (diss)	mg/L	5	0.5	2	5	2	2
CADMIUM (total)	mg/L	0.00058	0.001	0.001	0.00058	0.001	0.001
CHROMIUM (total)	mg/L	0.011	0.011	0.011	0.011	0.011	0.011
COBALT	mg/L	---	---	---	---	---	---
COPPER (total)	mg/L	0.0057	0.01	0.01	0.01	0.01	0.01
CYANIDE (free)	mg/L	0.005	0.005	0.005	0.005	0.005	0.005
IRON (diss)	mg/L	0.3	0.3	0.3	0.3	0.3	0.3
LEAD (total)	mg/L	0.011	0.0061	0.015	0.0118	0.02	0.02
MANGANESE (diss)	mg/L	0.05	0.05	0.05	0.05	0.05	0.05
MERCURY (total)	ug/L	---	---	---	---	---	0.006
NICKEL (total)	mg/L	0.025	0.1	0.1	0.1	0.1	0.1
SELENIUM (diss)	mg/L	0.01	0.01	0.01	0.01	0.01	0.01
URANIUM	mg/L	0.02	0.02	0.02	0.02	0.02	0.02
VANADIUM (TOTAL)	mg/L	---	---	---	---	---	---
ZINC (total)	mg/L	0.047	0.047	0.047	0.047	0.047	0.047
NUTRIENTS							
AMMONIA (total)	mg/L	APPENDIX 3	APPENDIX 3	APPENDIX 3	APPENDIX 3	APPENDIX 3	APPENDIX 3
NO2+NO3 (as N)	mg/L	10	10	10	10	10	10
PHOSPHORUS (total)	mg/L	0.05	0.05	0.05	0.05	0.05	---
MAJOR IONS							
CHLORIDE (diss.)	mg/L	250	68	100	100	100	100
FLUORIDE (diss)	mg/L	1.5	1	1	1	1	1
SODIUM (diss)	mg/L	300	100	100	100	100	100
SULPHATE (diss)	mg/L	500	250	500	500	500	500
TOTAL DISS. SOLIDS	mg/L	---	---	---	---	---	---
BIOTA							
FECAL COLIFORM	NO/dL	200/100ml	200/100ml	200/100ml	200/100ml	200/100ml	100/100ml
PHYSICALS							
pH	pH Units	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0
OXYGEN (diss)	mg/L	6.5	6.5	OW 6.5	6	6	6
SAR	mg/L	---	---	---	---	---	---
PESTICIDES/CONTAMINANTS							
LINDANE	mg/L	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
2,4-D	mg/L	0.004	0.004	0.004	0.004	0.004	0.004
2,4,5-TP	mg/L	0.01	0.01	0.01	0.01	0.01	0.01
CHLORINE	mg/L	0.002	0.002	0.002	0.002	0.002	0.002
CHLOROPHENOLS (total)	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
PCP	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
MERCURY IN FISH	ug/g TISSUE	0.2	0.2	0.5	0.5	0.5	0.5
PCB IN FISH	ug/g TISSUE	2	2	2	2	2	2
RADIOACTIVE							
CESIUM-137	Bq/L	50	50	50	50	50	50
IODINE-131	Bq/L	10	10	10	10	10	10
RADIUM-226	Bq/L	1	1	1	1	1	1
STRONTIUM-90	Bq/L	10	10	10	10	10	10
TRITIUM	Bq/L	40000	40000	40000	40000	40000	40000

Fisheries
Drinking
Irrigation/Livestock
Recreation
Fish Consumption

APPENDIX V

Board / Committee Membership 2007-2008

PRAIRIE PROVINCES WATER BOARD

Manitoba, Saskatchewan, Alberta and Canada agree to establish and there is hereby established a Board to be known as the Prairie Provinces Water Board to consist of five members to be appointed as follows:

(a) two members to be appointed by the Governor General in Council, one of whom shall be Chairman of the Board, on the recommendation of the Minister of Energy, Mines and Resources,

(b) one member to be appointed by the Lieutenant Governor in Council of each of the Provinces of Manitoba, Saskatchewan and Alberta.

Schedule C, Section 1
Master Agreement on Apportionment

PPWB MEMBERS

CHAIR	J. Vollmershausen (April – May/07)	Regional Director General Prairie and Northern Region Environment Canada
A/CHAIR	T. Goos (June/07 – Mar/08)	A/Regional Director General Prairie and Northern Region Environment Canada
	H. Olsen (April/07 – Feb/08)	A/Director General Prairie Farm Rehabilitation Administration Agriculture and Agri-Food Canada
	J. Merchant (Feb – Mar/08)	A/Director General Prairie Farm Rehabilitation Administration Agriculture and Agri-Food Canada
	W.S. Macdonald (April – July/07)	Director Science and Standards Division Environmental Assurance Branch Alberta Environment
	R. Harrison (July/07 – Mar/08)	A/Director Environmental Strategies Branch Alberta Environment

	S.D. Topping	Executive Director Regulatory and Operational Services Division Manitoba Water Stewardship
	Vacant	Saskatchewan Watershed Authority
EXECUTIVE DIRECTOR	W. L. Dybvig (April/07)	Transboundary Waters Unit Environment Canada
A/EXECUTIVE DIRECTOR	B. Yee (May – Nov/07)	Transboundary Waters Unit Environment Canada
A/EXECUTIVE DIRECTOR	M. Renouf (Dec/07 – Mar/08)	Transboundary Waters Unit Environment Canada
SECRETARY	E. Kienholz	Transboundary Waters Unit Environment Canada

PPWB ALTERNATE MEMBERS

Vacant	Environment Canada
C. Straub	Manager, Water Supply Infrastructure Development Prairie Farm Rehabilitation Administration Agriculture and Agri-Food Canada
R.P. Harrison (Apr– July/07)	A/Director Environmental Strategies Branch Alberta Environment
S. Figliuzzi (July/07-Mar/08)	Head, Transboundary Water Section Environmental Strategies Branch Alberta Environment
R. Wiebe	A/Director Regional Operations Saskatchewan Watershed Authority
D. Williamson (May/07 – Mar/08)	Director Water Science and Management Branch Manitoba Water Stewardship

COMMITTEE ON HYDROLOGY

Terms of Reference

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

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

PPWB Minute 7-11 (Oct. 17, 1972)

MEMBERS

CHAIR	W.L. Dybvig (Apr/07)	Executive Director Prairie Provinces Water Board
A/CHAIR	B. Yee (May – Nov/07)	A/Executive Director Prairie Provinces Water Board
A/CHAIR	M. Renouf (Dec/07 – Mar/08)	A/Executive Director Prairie Provinces Water Board
	R.G. Boals	Water Survey Division Environment Canada
	F.R.J. Martin	Prairie Farm Rehabilitation Administration Agriculture and Agri-Food Canada
	S. Figliuzzi	Environmental Strategies Branch Alberta Environment
	R.W. Harrison	Water Science and Management Branch Manitoba Water Stewardship
	D. Johnson	Basin Operations Saskatchewan Watershed Authority
	N. Taylor	Meteorological Service of Canada Environment Canada
SECRETARY	A.J. Chen	Transboundary Waters Unit Environment Canada

COMMITTEE ON WATER QUALITY

Terms of Reference

Under the direction of the Prairie Provinces Water Board, the Committee on Water Quality shall investigate, oversee, review, report, recommend and advise the Board on matters pertaining to the water quality of interprovincial waters.

The responsibilities of the committee shall include directing, planning, and coordinating a water quality monitoring and trend assessment program by identifying monitoring requirements and overseeing transboundary monitoring and synoptic surveys. The committee shall promote an ecosystem approach to water quality management and the protection and enhancement of interprovincial waters by ensuring the compatibility of water quality guidelines, objectives, sampling and analytical protocols, monitoring approaches, quality assurance and data bases. It shall interpret data and identify, investigate and define existing and potential interprovincial water quality problems through the application of PPWB Water Quality Objectives, trend assessment and other approaches. The committee shall inform the Board and member agencies, through the PPWB contingency plan, of any spills or unusual water quality conditions that have the potential to adversely affect interprovincial streams. It shall assess the implications of these problems and recommend remedial or preventative measures for avoiding and resolving water quality issues.

The committee shall foster awareness and understanding of the importance of effective water quality management, encourage the use of "state of the art" procedures for evaluating water quality, and identify research needs pertinent to water quality management on the prairies. The committee shall facilitate effective water quality management practices through integration of agency initiatives and the promotion of joint planning on interprovincial streams.

The committee shall also assist the Committee on Groundwater in the development of interprovincial groundwater programs by identifying water quality monitoring needs for interprovincial groundwater aquifers.

PPWB Minute 47-54 (Oct. 17, 1991)

MEMBERS

CHAIR	W.L. Dybvig	Executive Director Prairie Provinces Water Board
A/CHAIR	B. Yee (May – Nov/07)	A/Executive Director Prairie Provinces Water Board
A/CHAIR	M. Renouf (Dec/07 – Mar/08)	A/Executive Director Prairie Provinces Water Board
	D.B. Donald	Water Quality Monitoring Environment Canada

	D. Williamson (April – May/ 07)	Water Science and Management Branch Manitoba Water Stewardship
	N. Armstrong (May /07- Mar/08)	Water Quality Management Section Water Science and Management Branch Manitoba Water Stewardship
	T. Hanley	Watershed Monitoring and Assessment Saskatchewan Watershed Authority
	R. Casey	Environmental Assurance Alberta Environment
	B. Schutzman	Water Quality Unit Prairie Farm Rehabilitation Administration Agriculture and Agri-Food Canada
SECRETARY	N.E. Glozier	Ecological Sciences Division Environment Canada

COMMITTEE ON GROUNDWATER

Terms of Reference

Recognizing the inter-relationship between surface and groundwater, the Committee on Groundwater shall, at the request of, and under the direction of the Prairie Provinces Water Board, investigate, oversee, review, report, and recommend on matters pertaining to quantity and quality of groundwater at or near interprovincial boundaries.

Responsibilities of the committee will include: exchange of information; compilation and interpretation of existing data; recommendations on groundwater information and monitoring requirements; determination of implications of proposed projects which may impact the quantity and/or quality of waters at interprovincial boundaries; and other items of interjurisdictional interest involving groundwater.

PPWB Minute 26-25 (Nov. 18-19, 1981)

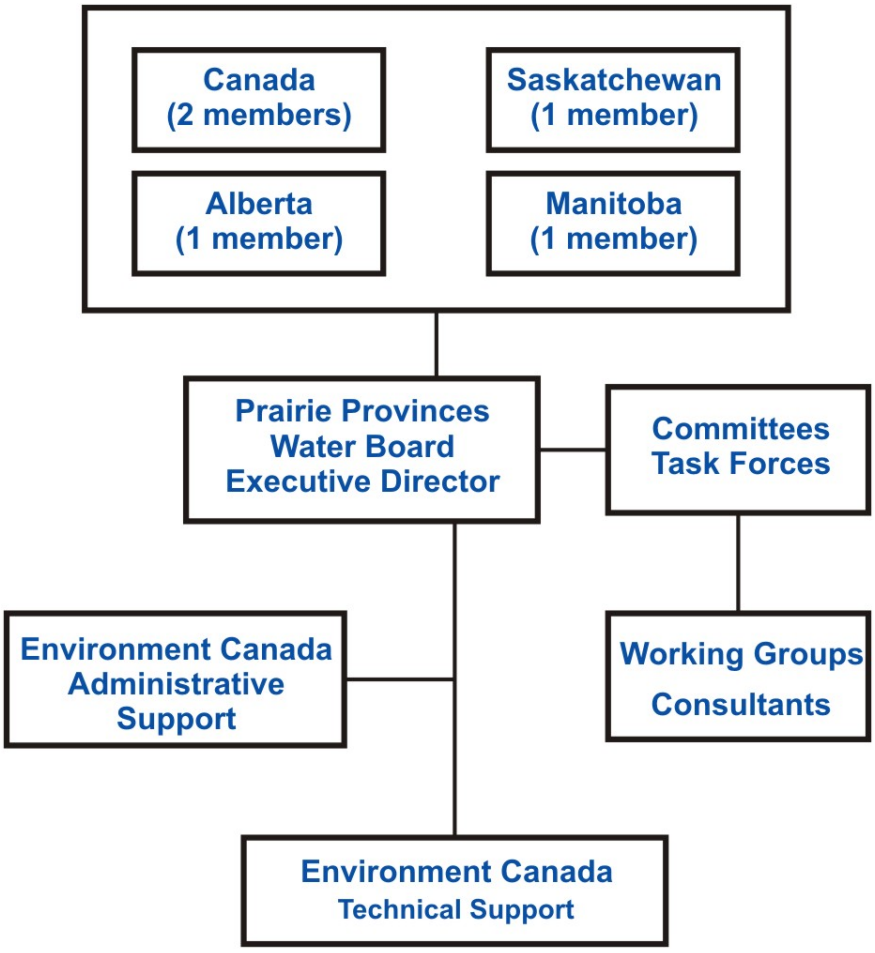
MEMBERS

CHAIR	W.L. Dybvig	Executive Director Prairie Provinces Water Board
A/CHAIR	B. Yee (May – Nov/07)	A/Executive Director Prairie Provinces Water Board
A/CHAIR	M. Renouf (Dec/07 – Mar/08)	A/Executive Director Prairie Provinces Water Board
	G. van der Kamp	Groundwater Hydrology Water Science and Technology Directorate Environment Canada
	A. Cowen	Prairie Farm Rehabilitation Administration Agriculture and Agri-Food Canada
	N. de la Cruz (April – Aug/07)	Science and Innovation Section Environmental Policy Branch Alberta Environment
	H. von Hauff (Sept – Nov/07)	Environmental Assurance Division Alberta Environment
	R. George (Nov/07 – Mar/08)	Groundwater Policy Unit Environmental Assurance Division Alberta Environment

	N. Shaheen	Groundwater Management Saskatchewan Watershed Authority
	R. Betcher	Groundwater Management Section Water Sciences and Management Branch Manitoba Water Stewardship
SECRETARY	A.J. Chen	Transboundary Waters Unit Environment Canada

APPENDIX VI

PPWB Organizational Chart



APPENDIX VII

PRAIRIE PROVINCES WATER BOARD
STATEMENT OF FINAL EXPENDITURES
FOR THE YEAR ENDING MARCH 31, 2008

	2007-2008 Approved Budget	Final Expenditures March 31, 2008
SALARIES:		
SALARIES(1)	$253,307	$264,217
OVERTIME/OTHER	$0	$0
TOTAL SALARIES	**$253,307**	**$264,217**
OPERATING EXPENSES:		
TRAVEL	$12,000	$15,876
POSTAGE	$1,000	$416
TELECOMMUNICATIONS	$6,000	$7,108
PRINTING	$8,000	$2,454
PROFESSIONAL SERVICES	$140,000	$165
TRAINING	$1,000	$2,595
TEMPORARY HELP	$200	$0
OTHER SERVICES	$6,500	$6,334
RENTALS (2)	$500	$184
EQUIPMENT REPAIR	$300	$330
SUPPLIES	$4,500	$2,443
EQUIPMENT PURCHASES	$2,500	$1,692
TOTAL OPERATING EXPENSES	**$182,500**	**$39,597**
TOTAL SALARIES AND O&M	$435,807	$303,814
FRINGE BENEFITS (9% of salaries)	$22,798	$26,450
TOTAL BUDGET	**$458,605**	**$330,264**

NOTE: Funds unspent at the end of the fiscal year were carried forward to 2008-2009 to support multi-year projects.

APPENDIX VIII

History of the PPWB

The Prairie Provinces Water Board was formed on July 28, 1948 when Canada and the provinces of Alberta, Saskatchewan, and Manitoba signed the Prairie Provinces Water Board Agreement. This Agreement established a Board to recommend the best use of interprovincial waters, and to recommend allocations between provinces.

From 1948 to 1969, the Engineering Secretary to the Board was a Prairie Farm Rehabilitation Administration employee. The support staff for studies and office accommodation during these years was provided by the PFRA in Regina at no charge.

After some twenty years, changes in regional water management philosophies resulted in a need to modify the role of the Board. Consequently, the four governments entered into the *Master Agreement on Apportionment* on October 30, 1969. This Agreement provided an apportionment formula for eastward flowing interprovincial streams, gave recognition to the problem of water quality, and reconstituted the Prairie Provinces Water Board.

The *Master Agreement on Apportionment* has five schedules which form part of the Agreement. These Schedules are:

1. Schedule A. An apportionment agreement between Alberta and Saskatchewan.

2. Schedule B. An apportionment agreement between Saskatchewan and Manitoba.

3. Schedule C. the Prairie Provinces Water Board Agreement describing the composition, functions and duties of the Board.

4. Schedule D. A listing of Orders-in-Council for allocations of interprovincial waters made before 1969.

5. Schedule E. A Water Quality Agreement describing the role of the PPWB in interprovincial water quality management and establishing PPWB Water Quality Objectives for 11 interprovincial river reaches. This Schedule became part of the Master Agreement in 1992.

Under Schedule C, the Prairie Provinces Water Board was reconstituted and was given the responsibility of administering the agreement. Schedule C also provided for the necessary board staff, accommodation, and supplies to be jointly financed by the four participating governments. Following the reconstitution of the PPWB, the members also agreed to the establishment of a semi-autonomous Board Secretariat.

The PPWB's change in administration policy was implemented when an Executive Director was appointed on July 1, 1972. The by-laws, rules, and procedures also became effective on this date.

On April 2, 1992, the *Master Agreement on Apportionment* was amended to include a water quality agreement that

became Schedule E to the Master Agreement. The agreement sets water quality objectives at 11 interprovincial river reaches and commits each of the Parties to take reasonable and practical measures to maintain or improve existing water quality.

At the Board's March 1995 meeting, the Board agreed that full time Secretariat staff was no longer necessary and that functional support would be provided by staff of Environment Canada. The process of disbanding the PPWB Secretariat and integrating its functions into Environment Canada was completed during 1995-1996. The portion of time each Environment Canada staff person spends on PPWB activities is charged to the PPWB and cost-shared by the members. The Board now operates through its Executive Director, supported by three standing committees – the Committee on Hydrology, the Committee on Groundwater, and the Committee on Water Quality.

The Board approves an annual budget with one-half the budget being provided by Canada (Environment Canada) and one-sixth by each of the three provinces.

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