

INTERNATIONAL RAINY RIVER WATER POLLUTION BOARD
■
INTERNATIONAL RAINY LAKE BOARD OF CONTROL

FALL 2008 REPORT

**Submitted to
The International Joint Commission
November 13, 2008**

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BOARD MEMBERS AND STAFF

	Canada	USA
IRLBC Members	Rick Walden ¹ PEng Glenn Witherspoon	Jon Christensen COL Leland Grim
IRRWPB Members	Melanie Neilson William Darby PhD	Jeffrey Stoner PG Nolan Baratono
IRLBC Engineering Advisors	Rick Cousins ¹ PEng	Edward Eaton PE
Joint Board Secretary		Kari Layman PE

¹ Interim appointment

1.0 INTRODUCTION

The International Rainy River Water Pollution Board (IRRWPB) and the International Rainy Lake Board of Control (IRLBC) report jointly to the International Joint Commission (IJC) in the spring and the fall of each year. Both reports address activities and basin issues of interest occurring since the previous report and may include sections on specific topics under review by the Boards. The fall reports address environmental quality and related issues, while the spring reports address regulation of Rainy and Namakan lakes over the past calendar year.

The two Boards continued to work closely together, holding joint conference calls throughout the year and hosting a joint public meeting in the basin. The public meeting was held August 26, 2008 in Fort Frances. The Boards also met then with the resource agencies and with representatives from the two pulp and paper companies. Commissioners Pierre Trepanier and Allen Olson, with IJC staff members Charles Lawson, Paul Pilon and Mark Colosimo, attended the meetings along with Board members and staff.

High inflows, due to persistent rainfall, again led to high water levels in 2008. Namakan and Rainy lakes were above their Upper Rule Curves for 56 and 72 days, respectively. While details of the high water event can be found in Section 4.7, a full report on basin conditions in 2008, complete with graphs, will be provided in the spring 2009 joint report of the Boards.

2.0 AMBIENT ENVIRONMENTAL MONITORING

2.1 Water Quality Monitoring (MPCA)

The Minnesota Pollution Control Agency (MPCA) monitors water quality on the main stem of the Rainy River at two long term sampling stations and on four tributaries to the Rainy River (Figure 1). All of these monitoring stations are part of the Minnesota Milestone sampling program, a program that includes fixed station stream monitoring sites throughout the state of Minnesota.

In keeping with the sampling schedule for the Minnesota Milestone program, these sites were last monitored in 2005 and reported on in the Fall 2006 Report. The MPCA Milestone sites are sampled monthly for ten months of two non-consecutive years in a five-year period. The next scheduled sampling year is 2008. Data from the 2008 sampling will be reported in the 2009 Fall Report.

Water samples collected from main stem Rainy River stations and tributaries are analyzed for temperature, dissolved oxygen, turbidity, pH, conductivity, total phosphorus, biological oxygen demand (BOD), nitrate + nitrite, ammonia, chlorophyll a, total suspended solids, volatile solids, *E. coli*, and fecal coliform.

The following sites in Table 1 are the current long-term water quality sampling stations on the main stem of the Rainy River and its tributaries. Data results from the monitoring program can be seen on the MPCA website at <http://www.pca.state.mn.us/data/eda/index.cfm#monitoring>.

Figure 1. Rainy River Sampling Locations

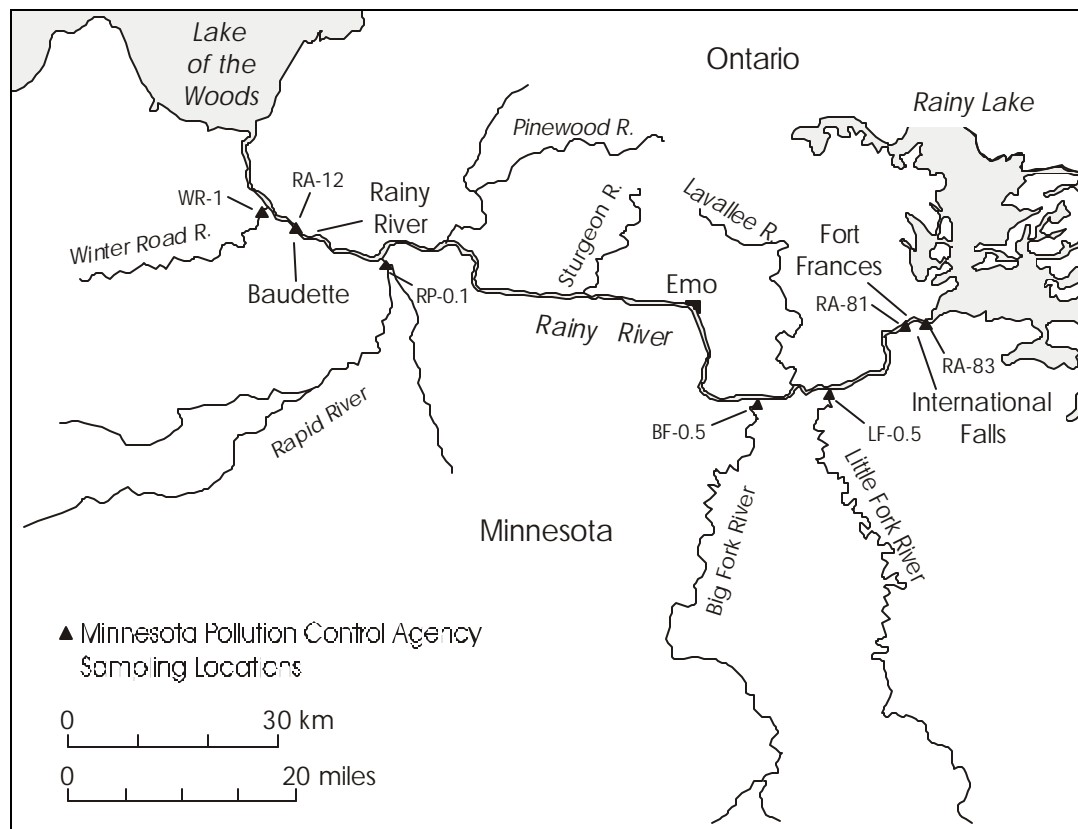


Table 1. MPCA Sampling Locations

Sampling Agency	STORET Station #	STORET Description
MPCA	RA - 12	Rainy River @ Baudette, MN
MPCA	RA - 83	Rainy River @ Int'l Falls, above dam
MPCA	BF - 0.5	Big Fork River @ bridge on MN 11 (4 mi. E of Loman, MN)
MPCA	LF - 0.5	Little Fork River @ bridge on MN 11 (0.5 mi. W of Pelland, MN)
MPCA	RP - 0.1	Rapid River @ Clementson, MN
MPCA	WR - 1	Winter Road River @ bridge on MN 11 (4 mi. W of Baudette, MN)

2.2 Water Quality Monitoring (USGS)

In water year 2007 (October 2006 through September 2007), the United States Geological Survey (USGS) sampled for suspended sediment at the streamflow gage near the mouth of the Little Fork River, a primary Minnesota tributary to Rainy River. The purpose of this sampling, conducted in cooperation with the Minnesota Pollution Control Agency, was to begin to establish a statewide monitoring program for one of the most common problems for river impairment in the state, suspended sediment. This monitoring also will provide information about the comparison of sampling methods (such as cross-sectional integrated sampling compared to single-point depth integrated sampling) and analytical methods, such as for suspended sediment concentrations, total and volatile suspended solids concentrations, turbidity, and transparency tube measurements for various stream environments. Because this was the start of the monitoring, only 5 samples were collected across flows ranging from about 40 to 1,910 cubic feet per second (1.1 to 54.1 cubic metres per second) during the summer. Concentrations of sediment ranged from 26 to 41 mg/L (milligrams per liter).

2.3 Rainy Basin Condition Monitoring

Little Fork River Watershed (HUC #09030005):

The lower reach of the Little Fork mainstem was added to the United States Federal Impaired Waters List [303(d) Report to Congress] for turbidity in 2006. The Total Maximum Daily Load study and report development is scheduled to begin in 2011.

In 2006, the MPCA began the Little Fork/Big Fork Paired Watershed Study designed to provide resource managers with information that will explain why the Little Fork has high sediment concentrations causing the turbidity. 2006 field work included a sediment loading study during spring runoff and gathering additional morphologic data from both watersheds. 2007 field work included a continuation of the spring runoff sediment loading study, as well as an on-the-ground reconnaissance and characterization of a 12-mile section of the river (with assistance from the MDNR). This trip was a precursor to several other similar trips currently being planning by the MPCA, to be completed in 2009 and 2010.

The MPCA also began intensive biological monitoring of the Little Fork River and tributaries. Sites were sampled to assess fish community structure, physical habitat, and water chemistry in the months of June - August. Invertebrate sampling at these sites took place in the month of September. For more information on the MPCA's biological monitoring go to:

<http://www.pca.state.mn.us/water/biomonitoring/bio-about.html>

For a PDF map of monitoring locations on the Little Fork go to:

<http://www.pca.state.mn.us/publications/maps/biomonitoring-littleforkphase1.pdf>

Rainy River Headwaters Watershed (HUC #09030001):

The White Iron Chain of Lakes Association, in cooperation with stakeholders and numerous state and federal agencies, is leading a volunteer-based, long term, condition monitoring project for the Kawishiwi River Watershed. The Kawishiwi is a sub-watershed of the Rainy River Headwaters Watershed. This effort was continued in 2007.

2.4 Fish Consumption Advisories

Fish consumption advisories are issued based on fish tissue monitoring carried out by provincial and state agencies in Ontario and Minnesota. In Minnesota, it is a shared program between the Minnesota Department of Natural Resources (MDNR) and the Minnesota Department of Health (MDH), while in Ontario it is a shared program with the Ministry of Natural Resources (OMNR) and the Ministry of Environment (OMOE).

Minnesota

Each year, the MDNR collects fish from lakes and rivers for testing. Fish fillets are tested for mercury and in some cases polychlorinated biphenyls (PCBs). The MDNR, the MPCA, and the MDH collaborate to select sites where fish are tested. The MPCA also screens fish for other chemical contaminants that may be of concern. The MDH issues fish consumption advice based on the concentrations of chemicals measured in fish fillets. The concentrations that trigger fish consumption advice are listed in Tables 2 and 3.

Table 2. Consumption Advice - Mercury

Meal Advice	Women not planning to become pregnant and men (ppm mercury)	Pregnant women, women who may become pregnant, and children under age 15 (ppm mercury)
Unlimited consumption	≤ 0.16	≤ 0.05
1 meal / week	$> 0.16 - 0.65$	$> 0.05 - 0.2$
1 meal / month	$> 0.65 - 2.8$	$> 0.2 - 0.95$
Do not eat	> 2.8	> 0.95

Table 3. Consumption Advice - PCBs

Meal Advice	(ppm PCB)
Unlimited consumption	≤ 0.05
1 meal / week	$> 0.05 - 0.22$
1 meal / month	$> 0.22 - 0.95$
1 meal / two months	$> 0.95 - 1.89$
Do not eat	> 1.89

Currently MDH issues consumption advisories based on mercury for Rainy Lake, Rainy River, Little Fork River, Big Fork River, Vermilion River and Lake of the Woods. Minor changes to consumption guidelines were included in the Fall 2007 report. Detailed information can be found at <http://www.health.state.mn.us/divs/eh/fish/index.html>.

Ontario

The Guide to Eating Sport Fish in Ontario is published every other year by the Ministry of the Environment in cooperation with the Ministry of Natural Resources. Skin-off fillets are analyzed for a variety of contaminants that may include mercury and other metals, DDT, PCBs, PCB congeners, mirex/photomirex, pesticides, chlorinated phenols, chlorinated benzenes, polycyclic aromatic hydrocarbons (PAHs), dioxins/furans and dioxin-like PCBs. Results are used to develop tables in the Guide, which give size-specific consumption advice for each species tested at each location. Consumption advice is based on health protection guidelines developed by Health Canada. The 2007-2008 Guide contains important information on consumption of sport fish for both the general population and the sensitive population of women of child-bearing age and children under 15. Examples of chemical concentrations that trigger consumption restrictions are as follows:

Table 4. Examples of Ontario Consumption Advice Restrictions

Contaminant	Restrictions Begin	Total Restriction
Mercury (ug/g)	0.61	1.84
Mercury (ug/g) ¹	0.26	0.52
Total PCBs (ug/g)	0.153	1.22
Dioxin-like PCBs (pg/g) TEQ ²	1.62	12.96
Dioxins/Furans (pg/g) TEQ ²	1.62	12.96

1. Concentrations for women of child-bearing age and children under 15 years of age

2. TEQ is the toxic equivalent of 2,3,7,8-TCDD

Advisories restricting fish consumption remain in effect for Rainy Lake, Rainy River, and Lake of the Woods. These advisories are mainly a result of mercury concentrations in fish tissue, but depending on location they may also be based on concentrations of PCBs, mirex/photomirex, pesticides, dioxans/furans or chlorinated phenols and chlorinated benzenes. Fish consumers should consult the “2007-2008 Guide to Eating Ontario Sport Fish” for more detailed information. The Guide can be accessed at www.ene.gov.on.ca/envision/guide/index.htm.

2.5 Environmental Effects Monitoring (EEM)

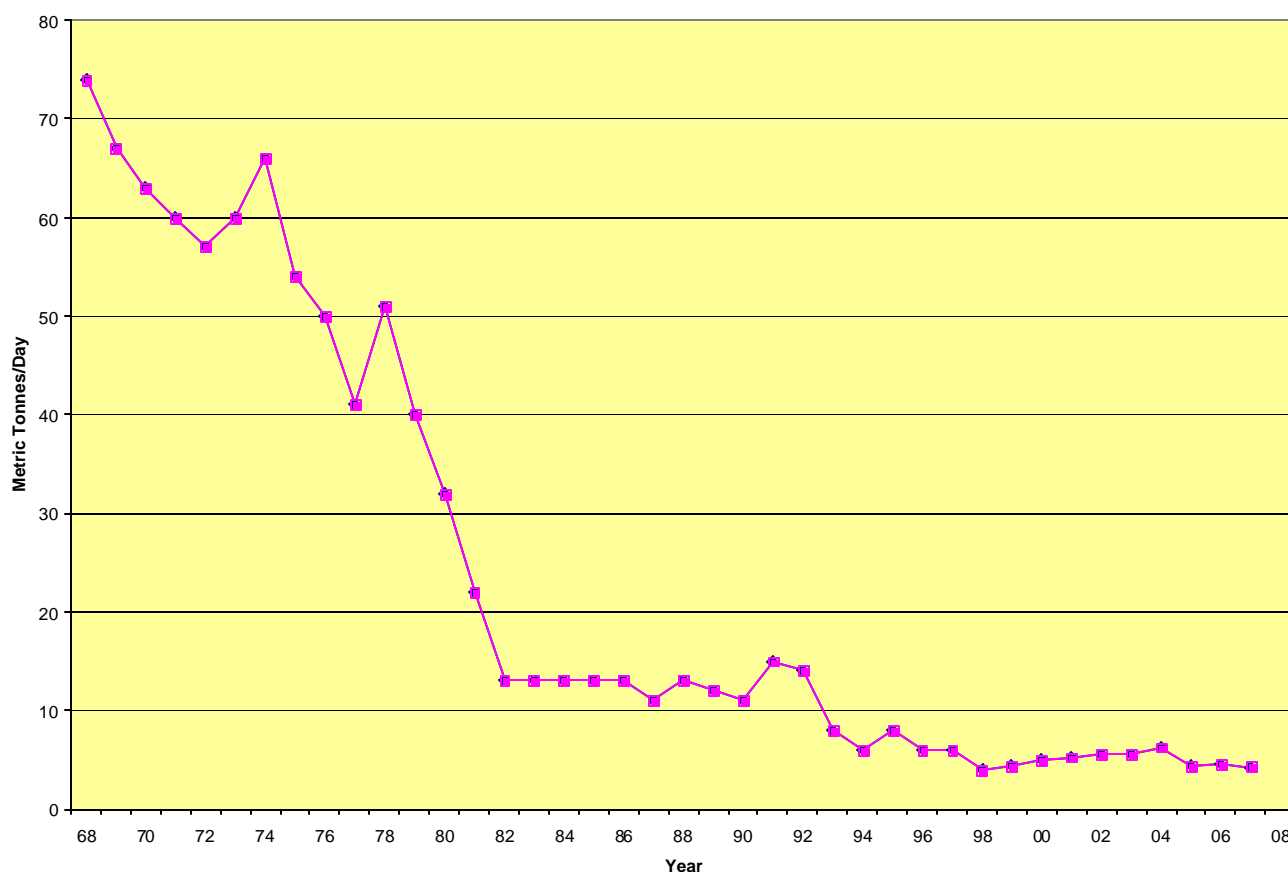
Through federal legislation, the Environmental Effects Monitoring program requires pulp and paper mills in Canada to monitor the effects of pulp and paper mill discharges in receiving waters. Study components include an adult fish survey, a benthic invertebrate survey, and toxicological testing of final effluent. The EEM program consists of a 3-year cycle of monitoring and interpretation that build on the findings from previous cycles. The latest report from the Fort Frances mill (April 2007) was based on Cycle 4 results, which are the most recent results.

3.0 POINT SOURCE DISCHARGES

As indicated in the recent Board reports, point source discharges to the Rainy River from municipal and industrial sources have remained relatively constant from a loadings perspective and will probably remain fairly steady at current levels in the foreseeable future. The dramatic decreases in loading for

conventional parameters, such as biological oxygen demand (BOD) and total suspended solids (TSS), from the 1960's to the early 1980's are the direct result of remedial measures undertaken by industry and municipalities. Figure 2 documents this historical downtrend of BOD from municipal and industrial sources. With no other significant remedial measures planned, BOD loads to the Rainy River will likely continue at or around the current levels. Given the nuisance algal bloom and elevated nutrient issues faced in waterbodies downstream of Rainy River (Lake of the Woods, Lake Winnipeg), the Boards have decided to include information on point sources loadings of total phosphorus (where available) in this report.

Figure 2. Total BOD Load from Continuous Discharges (mt/d) 1968-2007



3.1 Minnesota Municipal Sources

North Koochiching Sanitary Sewer District:

The District, which includes International Falls, discharges to the Rainy River downstream of International Falls. The District reported no violations to its discharge permit for the calendar year 2007. Discharge data from this facility are shown in Table 5 for the years 1996 through 2007. Note

that data in Table 5 now include average daily phosphorus loads. The National Pollutant Discharge Elimination System (NPDES) Permit for the District does not have a limit for total phosphorus.

Table 5. North Koochiching Sanitary Sewer Average Annual Discharge Summary

Year	Flow (m3/d)	BOD (kg/d)	TSS (kg/d)	TP (kg/d)
1996	6813	89.7	50.4	-
1997	4921	77.4	38.6	-
1998	5349	77.1	32.4	-
1999	5149	70.0	35.0	-
2000	4245	54.6	26.7	-
2001	4920	64.3	35.4	-
2002	4538	71.0	35.2	11.4
2003	3191	47.1	20.2	10.2
2004	4397	43.4	19.0	10.6
2005	4781	51.6	24.6	12.0
2006	3794	46.2	18.6	12.5
2007	3780	41.1	24.6	11.7

“-” = Data unavailable at the time this report was generated

Baudette

The Baudette wastewater treatment facility has a lagoon system that discharges seasonally to the Rainy River. The facility discharged during May, October, and November of 2007. The total discharge during that period was 211,529 m³. Monthly discharges are shown below in Table 6. During discharge periods, BOD and TSS were well within the NPDES Permit limits of 25 mg/L and 45 mg/L, respectively. Average BOD and TSS concentrations during discharge were 5.7 mg/L and 14.3 mg/L. The NPDES Permit for the Baudette facility does not have a limit for total phosphorus. Average total phosphorus concentration during discharge was 2.65 mg/L.

Table 6. Baudette Waste Water Treatment Facility Monthly Discharge in m³

Year	April	May	June	July	Aug	Sept	Oct	Nov
2004	0	144,235	28,847	0	0	96,157	67,310	38,463
2005	57,690	0	96,150	0	0	38,460	57,690	67,305
2006	0	69,150	67,305	0	0	0	48,075	0
2007		76,920					96,149	38,460

3.2 Ontario Municipal Sources

Fort Frances

A rebuild and upgrade of the Fort Frances wastewater treatment plant was completed in January 1998 to include secondary treatment and phosphorus removal. The result of improved treatment is indicated in the 1998 discharge data in Table 7 which includes two years of pre-secondary treatment and ten

years of secondary treatment. The plant operated throughout 2007 within the Ministry of Environment guidelines of 25 mg/L for both BOD and TSS. Average concentrations in 2007 were 3.19 mg/L BOD and 9.98 mg/L TSS, both well within the 25 mg/L limit. There was a single chlorinated bypass event in 2007. The average total phosphorus concentration in the discharge was 0.26 mg/L, resulting in an average loading of 1.75 kg/day.

Table 7. Fort Frances Wastewater Treatment Plant Average Annual Discharge Summary

Year	Flow (m³/d)	BOD (kg/d)	TSS (kg/d)	TP (kg/d)
1996	8940	211	449	-
1997	7240	323	447	-
1998	6500	52	76	-
1999	8280	48	56	-
2000	6973	48	55	-
2001	8144	46	90	-
2002	7549	52	88	-
2003	6281	44	71	-
2004	7791	59	89	-
2005	8684	30	80	2.37
2006	7249	27	74	1.86
2007	6724	21	67	1.75

“-” = Data unavailable at the time this report was generated

Emo

The Town of Emo has a seasonal discharge from its sewage lagoon to the Rainy River. During 2007, a total of 536,064 m³ was discharged to the river over 128 discharge days for the year. BOD and TSS were within the provincial discharge guidelines of 40 mg/L and 30 mg/L, respectively, during discharge periods. Average BOD and TSS concentrations during discharge were 8.4 mg/L and 17.6 mg/L. Total phosphorus concentrations averaged 1.15 mg/L.

Manitou Rapids

The sewage lagoon operated by Rainy River First Nations at Manitou Rapids was sampled by Health Canada during spring and fall in 2007. Table 8 indicates that the suggested Federal guidelines were exceeded for various parameters on both occasions. During the spring sampling, however, the gate valve between the two cells of the lagoon was not closed and, thus, there was mixing between the two cells. Once the test results came back and the cause discovered, it was closed. The tested cell was not discharged at this time. Even though the fall results indicated slight exceedances of Guidelines, due to the high effluent/water level in the cell, a partial release of the cell was recommended by Health Canada in order to protect the integrity of the lagoon system. Operators at Manitou Rapids adhered to partial release procedures to ensure minimum impact to the environment.

Table 8. Manitou Rapids Lagoon Test Results 2007 (mg/L)

Parameter	May 8, 2007	October 2, 2007	Federal Guidelines
Total Phosphorus	2.24	1.62	1.0
BOD	39	11	20
Phenols	0.009	0.011	20
TKN	13.2	3.61	None
TSS	87	20	25

Note: Flow discharge data are not available due to lack of a flow meter.

Barwick

There were 10,791 m³ of effluent discharged from the lagoon to the Rainy River over a 47-hour period in 2007. During this discharge period, BOD averaged 6.5 mg/L and TSS averaged 22 mg/L.

Rainy River

The Town of Rainy River discharged a total of 216,662 m³ from its lagoon to the Rainy River during 2007. During the discharge period, BOD averaged 2.8 mg/L and TSS averaged 5.9 mg/L, both below the provincial guidelines of 40 mg/L and 30 mg/L, respectively. Total phosphorus concentrations averaged 0.37 mg/L in the discharge.

3.3 Minnesota Industrial Sources

Boise Paper Solutions - International Falls

Discharge data from 1996 to 2007 including effluent flow, BOD, TSS, adsorbable organic halogens (AOX), and total phosphorus (TP) for the Boise Paper Solutions mill in International Falls is provided below in Table 9. Note that average total phosphorus concentrations are now included in the table. There were no National Pollutant Discharge Elimination System permit violations in calendar year 2007. Dioxins and furans in bleach plant effluent samples were below the regulatory threshold (pursuant to 40 CFR Sec. 430.01) of 10 parts per quadrillion (ppq) in 2007.

The current NPDES Permit for the Boise Paper Solutions facility will expire in 2009.

Table 9. Boise Paper Solutions Annual Average Discharge Data

	Flow (m3/d)	BOD (kg/d)	TSS (kg/d)	AOX (kg/d)	TP (kg/d)
Permit Limit	N/A	4,720	7,935	567	N/A
1996	120,363	1,500	3,750	762	-
1997	114,686	1,150	2,230	615	-
1998	158,242	1,129	2,156	611	-
1999	149,368	1,537	2,105	506	-
2000	158,837	789	1,183	805	125.5
2001	135,768	645	1,079	N/A	72.0
2002	160,484	747	1,584	N/A	133.2
2003	143,164	956	2,094	N/A	153.2
2004	150,496	1,884	3,978	N/A	102.3
2005	150,325	1,134	1,810	267	78.2
2006	151,358	561	1,161	232	221.0
2007	148,076	695	1,191	225	131.8

“-” = Data unavailable at the time this report was generated

“N/A” = Not analyzed

3.4 Ontario Industrial Sources

Abitibi-Consolidated Inc. -Fort Frances

Data on flow, BOD, TSS, AOX and TP are provided in Table 10 for the years 1996 through 2007. The average annual daily loads for BOD, TSS and AOX in 2007 continue to be well below compliance levels, although the mill had one toluene exceedance in 2007. Abitibi had no reported spills or uncontrolled discharges at the Abitibi lagoons throughout the year.

Table 10. Abitibi-Consolidated Inc. Average Annual Discharge Data

	Flow (m3/d)	BOD (kg/d)	TSS (kg/d)	AOX (kg/d)	TP (kg/d)
Compliance Limit	N/A	5990	9420	956	
1996	84800	3330	4790	271	-
1997	84900	3350	5320	284	-
1998	59700	2290	3150	140	-
1999	86469	2700	5300	272	-
2000	91129	4139	6563	274	-
2001	88184	4484	6216	234	-
2002	87954	4701	6635	233	-
2003	88899	4429	5362	212	-
2004	80068	4279	5152	221	-
2005	79966	3199	4204	187	116.3
2006	78470	3936	4435	179	136.4
2007	78098	3492	4311	164	140.9

“-” = Data unavailable at the time this report was generated

4.0 BASIN ACTIVITY UPDATE

Background information on other activities occurring in the basin is summarized below. Some of the activities involve members of the IRRWPB and IRLBC in their agency roles, while others are summarized to provide an overview of the types of initiatives that are currently taking place by other agencies and/or interest groups.

4.1 Hydropower Peaking

Hydropower facilities often vary their outflows over the course of each day, in response to the fluctuating demand for electricity or in response to differing electrical costs for peak and off-peak time periods. This daily fluctuation of outflow is called “peaking”. In addition, outflows may be reduced on weekends (and the water stored), if electrical demand or cost is less, thereby making more water available for peaking during the work week. This process is called “ponding”. Both processes are often lumped together simply as “peaking”, and both processes have been conducted in varying degrees for many years at Fort Frances - International Falls, although ponding has been discontinued in recent years.

Public concerns about water levels and flow rates on the Rainy River include the effects of peaking on navigation, ice conditions, fish spawning and aquatic ecosystem health. Since 2001, at the direction of the IJC, the Boards worked with the Companies and Resource Agencies to study the environmental effects of peaking on the aquatic resources and habitat of Rainy River and to explore strategies and make recommendations to minimize environmental impacts.

In response to recommendations from the Boards, the IJC formally requested in writing on April 14, 2005 that the Companies, Boise Paper Solutions and Abitibi (now AbitibiBowater), voluntarily suspend peaking operations during the spring spawning season from April 15 through June 30. In the fall of 2006, the Boards convened an informal work group with representatives from Abitibi, Boise, the Canadian Department of Fisheries and Oceans (DFO) and the Minnesota Department of Natural Resources (MDNR) to develop a means to address the spring peaking concerns. This “Peaking Work Group” was to design and establish an informal process to provide for an annual balancing of hydropower needs with fish spawning needs during the spring spawning period on a two-year trial basis. The Work Group agreed to establish an annual 2½ month spring spawning window during which no hydropower peaking would take place for 2007 and 2008. The general start and end dates for this window were April 15th to June 30th, but the process allows for adjustment of the start date to reflect for the actual start of the walleye spawn and adjustment of the end date when an extended sturgeon spawning and incubation period is anticipated. The process calls for a review of spawning and hydropower conditions at least 15 days before the end date of the window and allows for adjustments to address emergency conditions at any time during the window.

At its April 7, 2008 meeting the Peaking Work Group set the 2008 spring spawning window to commence April 22nd with a tentative end date of July 7th. The Work Group scheduled a mid-window review for June 12th.

At the June 7th meeting the Work Group determined that there was no need to decrease or increase the duration of the spawning window and affirmed the July 7th end date.

The Work Group will meet over the fall and winter of 08/09 to review the efficacy of the informal agreement and determine whether to continue this into the future.

The departure of Peter Williams from the IRLBC created a vacancy on the Peaking Work Group. At their August 28th meeting in Fort Frances, the Rainy Boards appointed Glenn Witherspoon as the IRLBC representative to the Work Group.

4.2 Pine Island Peat Mining Project

In accordance with the IRRWPB's response to the Minnesota Pollution Control Agency (dated March 28, 2008), the Pollution Board outlined a step-wise approach that would include an annual review of the mercury discharge data from this facility (once operational) under its US National Pollutant Discharge Elimination System (NPDES) permit and a comparison of effluent loadings with in-stream concentrations of total mercury. At this writing the permittee has not commenced operations at the site. The NPDES permit does not require monitoring until operations commence, so there are no data to report at this time.

The NPDES permit for the Pine Island facility expired on March 31, 2008. The permittee has applied for a permit renewal. The re-issuance is in progress.

4.3 Proposed Namakan River Hydropower Developments

On January 4, 2006, the Ontario Government announced its intent to expand the province's supply of renewable energy by soliciting proposals for new development of waterpower sites on Crown land. Ojibway Power and Energy Group Ltd. submitted proposals for three sites on the Namakan River: Hay Rapids, High Falls and Myrtle Falls. Namakan River lies wholly within Ontario and is the northernmost of two rivers that flow water westward from Lac La Croix to Namakan Lake. The southern river is Loon River which forms the Canada-U.S. boundary. There is no proposal to develop hydropower or change water levels on the boundary waters. Ojibway Power and Energy Group is a partnership between Chant Construction of Aurora, Ontario, and the Lac La Croix First Nation located at the head of the Namakan River in Ontario.

The three proposals are currently in the data collection stage of an environmental screening process pursuant to Ontario's Electricity Projects Regulation 116 administered by the Ontario Ministry of the Environment. Canadian federal environmental processes are being integrated with the provincial process. Data being collected are from studies on hydrology, geology, fisheries, aquatic environment and water quality.

Public consultation is occurring in several steps. The first step involved information sessions held in the communities of Lac La Croix, Atikokan and Fort Frances in December 2007 and February 2008. The second consultation period will involve public meetings and review of the Draft Environmental

Screening Report. The third step will involve review of the Final Environmental Screening Report. For information on timelines or to submit comments, the public should refer to the proponent's website (www.opeg.ca).

The proposed hydropower developments on Namakan River were a topic of keen interest at the Boards' public meeting in International Falls, Minnesota on Aug. 21, 2007. The issue was raised again at the August 26, 2008 public meeting in Fort Frances, Ontario, where concern focused on the movement of lake sturgeon to and from Namakan Lake. In response to public concerns, the IJC sent a letter in autumn 2007 to both federal Governments alerting them that the Namakan hydropower proposals were of concern to many citizens in the basin. Persons attending the 2007 public meeting were informed that the IJC has no authority to act on the matter unless the issue is referred to the IJC by the governments of the U.S.A. and Canada.

4.4 Rainy Lake and Namakan Reservoir Environmental Monitoring Workgroup

The Rainy Lake and Namakan Reservoir Environmental Monitoring Workgroup is a committee of resource agency representatives in the Rainy basin that was established by the Ontario-Minnesota Fisheries Committee in 2001 in response to the IJC's expectation of long-term monitoring of effects of the 2000 rule curve changes, in preparation for a 2015 review of those changes.

The Boards most recently met with representatives of the resource agencies on the morning of August 28, 2008 in Fort Frances. There are two new Co-Chairs for the Monitoring Workgroup: Michael Ward, Superintendent of Voyageurs National Park and Jeff Wieme, Fort Frances Area Supervisor with the Ontario Ministry of Natural Resources. Updates on monitoring activities were provided by representatives of each of the agencies.

Voyageurs National Park (VNP) studies in the final report stage are:

- (1) Determining effects of the 2000 rule curves on five "best bet" ecological indicators: macro-invertebrates, wetland vegetation, fish, common loons and furbearers.
- (2) Historical reconstruction of water level impacts on ecology using paleo-limnology.

VNP studies that are underway or commencing are:

- (1) Lake sturgeon populations, movements and habitat use.
- (2) Nutrient cycling and regulation for Kabetogama Lake.
- (3) Effects of water level fluctuation on bio-indicators using analytical models.

VNP staff also proposed a new project assessing shifts in the abundance and composition of aquatic plant communities, namely partitioning variance associated with climate change and lake level management.

The Minnesota Department of Natural Resources and the Ontario Ministry of Natural Resources provided updates on their long-term fisheries monitoring programs on Rainy Lake, Kabetogama Lake and Rainy River. In addition, the OMNR is participating in an environmental assessment of sturgeon on the Namakan River that should complement the VNP sturgeon study on Namakan Lake.

All resource agency representatives continued to express concern, as they did last year, that continued funding for these monitoring studies is uncertain. For example, the National Park Service and US Geological Survey monitoring of water quality on the reservoirs is an annual decision. Continued funding for the MNDNR and OMNR fisheries monitoring is uncertain, and the proposed Minnesota Pollution Control Agency remote sensing study on water transparency and chlorophyll-a, is unfunded.

4.5 2000 Rule Curve Assessment Workgroup

As a separate initiative, complementary to the monitoring referred to in Section 4.4, the IJC approved a Terms of Reference in October 2007, that established the 2000 Rule Curve Assessment Workgroup. This six-member IJC Workgroup was asked to conduct a gap analysis of monitoring efforts to date and a Plan of Study (POS) to fill those gaps. The Commission also charged the Workgroup with outlining the studies and analyses required to lead to a scientifically defensible review of the 2000 Order by the year 2015. The Co-Chairs are Mr. Larry Kallemeyn (U.S.) and Dr. Bill Darby (Canada).

The 2000 Rule Curve Assessment Workgroup held a series of meetings through 2008, and a gap analysis workshop of government and academic experts in March 2008 in Fort Frances, Ontario. A draft POS, and draft proceedings of the workshop, were submitted to the IJC in June 2008. The final POS and proceedings are expected to be submitted to the Commission in late fall 2008.

4.6 IJC International Watersheds Initiative - Rainy River Modeling

Under the IJC's International Watersheds Initiative (IWI), the US Section of the IJC has been funding work since 2006 to develop a computer-based hydraulic model of the lower Rainy River (from the International Falls – Fort Frances dam to Lake of the Woods). This was first addressed in the Boards' fall 2006 report, with updates in the 2007 reports and spring 2008 report. While work on the model was essentially completed in late 2007, completion of an independent technical review and completion of a final report remain to be done. This work is expected to be completed before the end of the 2008 calendar year.

4.7 Meetings

This section contains brief summaries of key meetings and tours attended by the Boards and their staff during the reporting period.

Board Conference Calls and Meetings

The Boards met in Washington D.C. on April 16, with the main focus being the presentation to the IJC, but also to discuss next steps in responding to the IJC about IWI planning. The Boards' presentation included their response to the IJC re potential merger of the Boards and expansion of the water quality function to include Rainy and Namakan lakes and Lake of the Woods. Following the direction of the Commissioners, the Boards subsequently held a conference call on May 28 with four IJC staff members to discuss the proposed Board merger and related issues. Emails were exchanged towards drafting a letter to the Commission addressing what the Boards feel is an appropriate expansion of the

geographic area and water quality mandate of any future merger of the Boards. The Boards held another conference call on July 22 to further discuss this letter and the proposed Board merger, and to prepare for the upcoming basin meetings (including basin conditions, advertising of the public meeting, the tour of Namakan basin, and arrangements for the public, Companies and resources agencies meetings). Board meetings also occurred in Fort Frances (August 26 and 28) in order to finalize preparations for the upcoming meetings and to plan for submissions to an IWI Request for Proposals, and preparation of the Fall report to the IJC.

IJC Spring Semi-Annual Meeting – April 16, 2008

IRLBC and IRRWPB members and staff attended the spring semi-annual meeting of the IJC in Washington DC. The Boards' presentation to the IJC addressed lake regulation, ongoing and emerging basin issues, projects under the IJC's "Watersheds Initiative" program, Rainy Boards' initial response to the IJC request for input about merger of the Rainy Boards, and planned summer meetings. The basin issues component addressed hydropower peaking and rule curve monitoring, and emerging issues included status of plans for hydropower on the Namakan River and planned workshops related to rule-curve monitoring.

IRLBC/IRRWPB Joint Annual Basin Meetings – August 26-28, 2008

The Boards held their eighth joint annual meetings in the Rainy-Namakan basin to discuss water issues in the Rainy-Namakan and Rainy River basins. The meetings consisted of an afternoon meeting with the dam operators (Boise and AbitibiBowater) followed by an evening public meeting on the 26th in Fort Frances, ON. As with the past two years, the Boards decided to have only one public meeting to maximize Board availability for other meetings. A water tour to learn more about the hydrology, biology and geology of the basins upstream of Namakan and Rainy Lakes was led by representatives of the U.S. National Park Service and Members of the two Rainy Boards on August 27. A meeting with resource agencies in the basin occurred the following morning, on August 28. The meetings were held Fort Frances, Ontario at the Adventure Inn Hotel (meetings with dam operators and resource agencies) and at La Place Rendez-Vous Motel (public meeting). IJC Commissioners Pierre Trépanier (Canada for all meetings) and Allen Olson (United States for August 27-28 meetings) as well as IJC staff (Paul Pilon, Mark Colosimo and Charles Lawson) were in attendance at the aforementioned meetings.

Dam Operators Meeting

At the meeting with the dam operators on the afternoon of August 26, Boise and AbitibiBowater representatives presented a summary of their regulation activities and dam operations during the preceding twelve months as well as an update on dam maintenance and safety activities, data collection and public information efforts. There was some discussion about the location of the fire-water intake pump at the AbitibiBowater mill; in its present location, there are limits as to when, and for how long, gates can be open. When all gates are open (as has been required more frequently in recent years), the headpond level falls, causing trouble with the pump suction. The Boards have committed to sending a letter to AbitibiBowater identifying this as a challenge to regulating water levels. The Boards reported few public comments on water levels on either Rainy Lake or the Namakan Chain of lakes. The

companies, however, reported questions from the public with respect to the gates being closed when levels were still above the upper rule curve.

The Boards acknowledged the cooperation received from the companies in participating in the six-member dialog group responsible for working collaboratively toward a common goal of limiting hydropower peaking during the spring spawning periods on the Rainy River.

Public Meeting

The public meeting began at approximately 7:00 PM on August 26. Attendance included many residents from both the US and Canada, First Nations, resource managers from both countries and some media representatives. Following introductions, the Boards gave a brief presentation that included an update on some of the water quantity and quality issues discussed earlier in this report, and a review of basin conditions (both lakes were in their respective rule curve bands, with the exception of highs in May and June caused by intense rains and limitations to control levels downstream).

Following the presentation, the Boards opened the meeting to hear comments and to answer questions from the public; many comments, concerns, and questions centered on the issue of high water levels in Rainy and Namakan Lakes during the summer 2008. IRLBC engineers attempted to explain the complex hydrology related to those conditions and that Mother Nature is difficult to control at all times. Al Hunter, Rainy River First Nations, brought to the Boards' attention a judicial matter that, in his view, represented a miscarriage of justice; the issue was outside of the Boards' mandate, however, a member of the local public committed to pursuing the matter. The Lake of the Woods Water Sustainability Foundation and a Citizen's group for the Ely, Minnesota area provided information packages for the Boards to consider concerning issues about water pollution concerns of Lake of the Woods and potential impacts of proposed sulphide mining in the headwaters of the Rainy Lake basin, respectively. Board members thanked these groups for their information and the opportunity to review it for future advisements to the IJC.

Resource Agencies Meeting

At the invitation of the boards, a meeting was held on the morning of August 28 with representatives of local resource agencies and other governmental organizations that have responsibility for water resources information and management within the Rainy River basin. In attendance were representatives from the U.S. Voyageurs National Park, U.S. Geological Survey, Ontario Ministry of Natural Resources, Minnesota Department of Natural Resources, Minnesota Pollution Control Agency, Lake of the Woods Soil Water Conservation District, and Rainy River First Nation.

Ryan Maki and Steve Windels, Voyageurs National Park (VNP), briefed the Boards on the Park's research and monitoring projects, including a project that uses five "best bet" ecological indicators to determine effects of implementation of the 2000 Rule Curve. Although they report some biological changes in Namakan Reservoir, Rainy Lake and Lac la Croix, attributing cause will be difficult due to the confounding influence of climate change. Larry Kallemeyn then provided an overview of coring (paleolimnology) studies that are being used to assess ecological impacts of hydromanagement over the last 100 years in the Rainy-Namakan system. Once again, he cautioned that it will be difficult to separate effects due to land use, climate change and damming/water level manipulation. Other VNP

current/upcoming projects that are studying the effects of the 2000 Rule Curve include using transmitters to study lake sturgeon movement (a joint project with OMNR); nutrient enrichment and harmful algal bloom production studies in Kabetogama Lake; and model development to simulate long-term consequences of rule curve alternatives. The Boards requested copies of all final reports for future evaluation of the Rule Curve.

Darryl McLeod, Ontario MNR, and Kevin Peterson, Minnesota DNR, provided brief overviews of their agencies' fisheries monitoring activities (walleye/pike monitoring; fish community index netting; creel surveys; lake sturgeon assessment). Phil Talmage and Kevin Peterson, Minnesota DNR, provided information on fisheries monitoring for the reservoirs, sturgeon harvesting limits on Rainy River, and advised that MDNR is developing a sturgeon fishery management plan for Lake of the Woods and Rainy River. Continued testing for VHS (*Viral Haemorrhagic Septicaemia*, an infectious disease that has been detected in fish of the Great Lakes and their tributaries) has not detected any incidence in fish from either Rainy or Kabetogama Lake. To help in the fight against introduction of aquatic invasive species, the Boards will add links to their websites that promote environmentally-responsible boating and fishing behaviours.

Overall, the meeting with the resource agencies and others was deemed successful. In keeping with the IJC's IWI objective of facilitating and improving transboundary information awareness and sharing, the Boards will continue holding this type of meeting as a regular part of their annual basin meetings.

4.8 Summer High Water Event

Both Rainy and Namakan lakes started April with levels near the middle of their IJC bands and with inflows of only 15 percentile (%ile). Inflows rose sharply in mid-April as a result of two late-season snowfall events and then, after a brief lull, continued to rise due to a series of significant rainfall events. Namakan inflow rose from 10%ile in mid-April to 85%ile at end-April, to greater than 95%ile by May 13 and to a new maximum of record (for the time of year) by May 30. Inflow continued at maximum of record (for the time of year) through June 17 and was still greater than 95%ile through July 5. Over April and May, Namakan inflow rose over eleven-fold, from a low of 59 m³/s to a high of 654 m³/s. On Rainy Lake, inflow rose from less than 5%ile in mid-April to 70%ile at end-April, to 85%ile by May 14, to 95%ile by May 31 and was mostly greater than 95%ile from June 12 through July 22. From April to June, Rainy inflow rose over fourteen-fold, from a low of 84 m³/s to a high of 1184 m³/s.

The Companies responded to these high inflows by increasing outflow through the dams on both lakes. The Namakan dams were nearly fully open by April 28, had their outflow reduced a little in early May during the lull in rising inflow, and then were fully open from May 12 through July 7. Nevertheless, the inflow exceeded the outflow capacity of the dams, resulting in Namakan being above its Upper Rule Curve (URC) from May 13 to July 7. Its peak level was 341.21 m (1119.5 ft) on June 15, while the maximum deviation above its URC was 31 cm (12.2 in) on June 16. Higher levels occurred on Crane Lake. On Rainy Lake, the first sluice was opened on May 5 and all 15 were open from June 6 to July 17. As with Namakan, Rainy Lake rose above its URC due to inflow being greater than the outflow capacity. Rainy was above its URC from May 13 to July 23, reached 39 cm (15.4 in) above its

URC on June 17 and peaked at 338.11 m (1109.3 ft) on June 29. Once back within their operating bands, the levels of both lakes remained there through to the end of the reporting period.

Regarding the fact that the Rainy Lake dam was not fully open until June 6, it should be noted that opening more sluices sooner would not have materially increased the outflow. Due to the constriction in the Rainy River at Ranier Rapids, above the dam, at the outlet of the lake near Pithers Point, it is not possible for the upper river to pass the full capacity of the dam until the lake is near its full summer level. Opening more gates sooner simply draws down the water level in front of the dam, which results in problems in the Canadian powerhouse and mill but no additional water released.

5.0 BOARD MEMBERSHIP

Effective May 5, 2008, Glenn Witherspoon (former Mayor of Fort Frances) was named by the IJC as the new Canadian member of the IRLBC, replacing Peter Williams whose term had expired.