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

FALL 2005 REPORT

Submitted to
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1. Introduction

This report presents a summary of activities for the International Rainy River Water Pollution Board (IRRWPB) and the International Rainy Lake Board of Control (IRLBC) for the current reporting period extending from the Spring 2005 Report to present.

The two Boards continued to work closely together holding joint conference calls throughout the year and hosting public meetings in the basin during the month of July. Public meetings were held in International Falls, Minnesota on July 21, 2005 and on the Canadian side at the Rainy River First Nations on July 22, 2005. Along with Board Members, Commissioners Jack Blaney and Allan Olson, and IJC staff members Rudy Koop and Mark Colosimo, attended the meetings.

2. 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 three long term sampling stations and on five 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 2003 and reported on in the Fall 2004 Report. The MPCA Milestone sites are sampled monthly for ten months of two non-consecutive years in a five-year period. The Milestone sites were sampled in 2005 (data will be available for the Fall 2006 Report). The next scheduled sampling year is 2008.

Water samples collected from main stem Rainy River stations and tributaries are analyzed for temperature, dissolved oxygen, turbidity, pH, conductivity, total phosphorus, BOD, nitrate + nitrite, ammonia, chlorophyll a, total suspended solids, volatile solids, *E. coli*, and fecal coliform. During 2003, a total of 8 samples were collected at each site.

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 viewed on the MPCA website at:
http://www.pca.state.mn.us/data/eda/index.cfm#monitoring

Table 1. MPCA Sampling Locations

Sampling Agency	STORET Station #	STORET Description
MPCA	RA - 12	Rainy River @ Baudette, MN
MPCA	RA – 81*	Rainy River @ Int'l Falls, below dam
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)

* RA – 81 was not sampled during 2003 or 2004

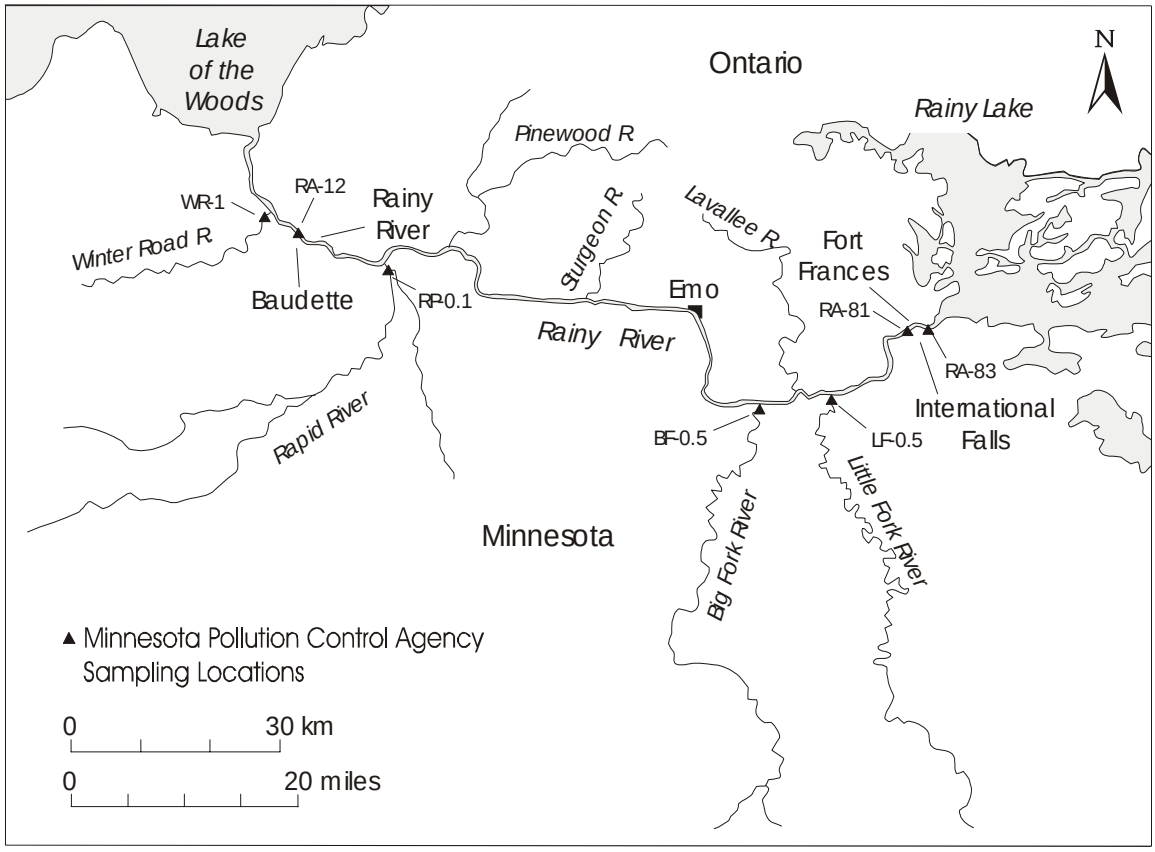


Figure 1. Rainy River Sampling Locations.

2.2 Water Quality Monitoring (USGS)

The United States Geological Survey (USGS) sampled four small interior lakes in Voyageurs National Park for mercury, methylmercury, major ions, nutrients, and field parameters in water year 2004 (October 2003 through September 2004). Initial plans were to sample Ryan, Brown, and Peary lakes three times (May, August, and September). A fourth lake, Shoepack Lake, was added mid-summer in response to the fire in the Shoepack Lake watershed. Sampling of all four lakes continued in 2005. The purpose of the sampling, in which the U.S. National Park Service provided funding, is to establish "ambient" conditions of mercury and nutrients in water in these high-quality headwaters. Some of the results will be used to assess effects of controlled burns or natural fires on lake quality. Results from water year 2004 substantiate the high-quality ambient conditions of these lakes. Specific conductance for all samples collected near the water surface was less than 32 micro Siemens per centimeter (@ 25 deg. C) and pH ranged from 6.0 to 7.4. Concentrations of major ions were low, most of the detectable nitrogen was in the form of organic nitrogen and was less than 0.665 milligrams per liter (mg/L), total mercury ranged from 0.31 to 3.43 nanograms per liter (ng/L) and total methylmercury ranged from <0.04 to 0.20 ng/l. Total mercury concentrations were less than Minnesota's 6.9 ng/L water-quality standard, but some samples exceeded the more protective standard of 1.3 ng/L, which applies in the Lake Superior basin.

As part of the USGS Benchmark Program, the Kawishiwi River near Ely, Minnesota was sampled 19 times in water year 2004 to evaluate natural loading conditions in a relatively pristine forested basin. Grab samples are conducted mostly by students at Vermilion Community College in Ely, Minnesota under USGS guidance with a few additional samples collected by USGS hydrographers. Samples were analyzed for major inorganic ions, nutrients, and aluminum. Results from the 2004 water year indicated nothing unusual for this setting. Specific conductance was less than 33 micro Siemens per centimeter (@ 25 deg. C) and pH ranged from 6.5 to 7.0 for all samples. Concentrations of major ions were all less than 3.5 mg/L, dissolved (filtered) nitrate as nitrogen ranged from <0.03 to 0.10 mg/L, dissolved ammonia as nitrogen ranged from <0.028 to 0.066 mg/L and aluminum ranged from <0.027 to 0.224 mg/L.

Water-quality data from both of these areas are published in the USGS Water Resources Data in Minnesota, Water Year 2004 Annual Report, by G.B. Mitton, K.G. Guttormson, G.W. Stratton, and E.S. Wakeman, Water-Data Report MN-04-1
http://pubs.usgs.gov/wdr/2004/wdr-mn-04-1/

2.3 Fish Consumption Advisories

Fish tissue monitoring is carried out by provincial and state agencies in Ontario and Minnesota that result in issuing of fish consumption advisories. 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 (MNR) and the Ministry of Environment (MOE).

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 a 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	General Population (ug/g mercury)	Women of Child-bearing Age and children under 15 years (ug/g mercury)
Unlimited consumption	< 0.16	< 0.05
1 meal / week	0.16 - 0.65	0.06 - 0.2
1 meal / month	0.66 - 2.8	0.21 - 1.0
Do not eat	> 2.8	> 1.0

Table 3. Consumption Advice - PCBs

Meal Advice	(ug/g PCB)
Unlimited consumption	< 0.05
1 meal / week	0.06 - 0.2
1 meal / month	0.21 - 1.0
1 meal / two months	1.1 - 1.9
Do not eat	> 1.9

Currently MDH issues consumption advisories based on mercury for Rainy Lake, Rainy River, Little Fork River, Big Fork River, and Lake of the Woods. Consumption advice for the Vermillion River is based on levels of PCBs and mercury. There have been no changes to consumption guidelines that were reported in last year's 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 can include mercury, DDT, PCBs, and dioxins/furans. 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 2005-2006 Guide is substantially different from previous editions in that it contains important information on consumption of sport fish for both the general population and the more sensitive population of women of child-bearing age and children under 15. Chemical concentrations that trigger consumption restrictions are as follows:

Table 4. 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. The advisories in effect for Rainy Lake and Lake of the Woods are the result of mercury concentrations in fish tissue. Consumption restrictions in Rainy River below the dam in Fort Frances are based on PCB concentrations in sturgeon and mercury in the other fish species. There are more restrictive advisories for women of childbearing age and children under 15years of age for Mercury. Fish consumers should consult the "*2005-2006 Guide to Eating Ontario Sport Fish"* for more detailed information. The Guide can be accessed at: http://www.ene.gov.on.ca/envision/guide/index.htm .

2.4 Environmental Effects Monitoring (EEM)

The Environmental Effects Monitoring program requires pulp and paper mills in Canada through federal legislation 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 series of monitoring and interpretation cycles that build on the findings from previous cycles.

Since the regulations came into effect, the Fort Frances mill has completed 3 cycles of the program. They carried out their Cycle 3 EEM study in September 2002. The study design as approved by Environment Canada included a fish survey, a benthic invertebrate survey, and toxicological testing of final effluent. A summary of Cycle 3 results was presented in the 2004 Fall Report. Environment Canada has reviewed the Cycle 3 results and has provided detailed comments to Abitibi. It is expected that these comments will be taken into account in the design of Cycle 4.

3. 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 the conventional parameters such as BOD and TSS from the 1960's to the early 1980's are the direct result of remedial measures undertaken by industry and municipalities. The following graph 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.

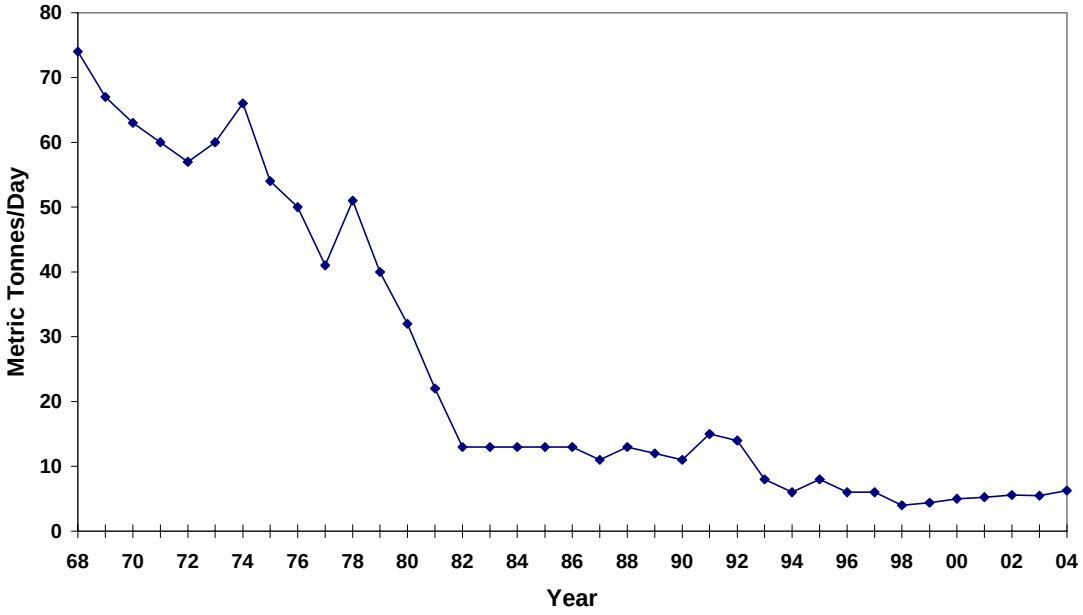


Figure 2. Total BOD Load from Continuous Discharges (mt/d) 1968-2004

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 2004. Discharge data from this facility are shown in Table 5 for the years 1996 through 2004.

Table 5. North Koochiching Sanitary Sewer Average Annual Discharge Summary

Year	Flow (m3/d)	BOD (kg/d)	TSS (kg/d)
1996	6813	89.7	50.4
1997	4921	77.4	38.6
1998	5349	77.1	32.4
1999	5149	89.5	51.7
2000	NA	54.6	26.6
2001	4920	64.3	35.4
2002	4538	70.9	35.2
2003	3191	47.1	20.2
2004	4397	53.7	24.7

Baudette

The Baudette wastewater treatment facility has a lagoon system that discharges seasonally to the Rainy River. There were no exceedances of the permit limits (128 kg/d for BOD and 230.3 kg/d for TSS) for discharges from this facility during calendar year 2004. The facility discharged during May, June, September, October and November. The total discharge during that period was 375,012 m^3. Monthly discharges are shown below in Table 7.

Table 6. Baudette Waste Water Treatment Facility Monthly Discharge in m^3

Year	April	May	June	July	Aug	Sept	Oct	Nov
2004	0	144,235	28,847	0	0	96,157	67,310	38,463

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 seven years of secondary treatment. The plant operated throughout 2004 within the Ministry of Environment guidelines of 25 mg/L for both BOD and TSS. Average concentrations in 2004 were 7.61 mg/L BOD and 11.42 mg/L TSS, both well within the 25 mg/L limit. There was one bypass event of 1070 m^3 over a 24 hour period.

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

Year	Flow (m^3/d)	BOD (kg/d)	TSS (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

Emo

The Town of Emo has a seasonal discharge from its sewage lagoon to the Rainy River. During 2004, a total of 147,705 m^3 was discharged to the river over 41 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 8.59 mg/L and 16.06 mg/L.

Manitou Rapids

The sewage lagoon operated by Rainy River First Nations at Manitou Rapids was discharged over two periods in the spring and fall of 2004. Discharge records detailing the exact dates of discharge to the Rainy River are not available for 2004. Prior to discharge, Health Canada collected samples on May 4 and September 8, 2004. The results indicate a slight exceedance for total suspended solids for both test results.

Table 8. Manitou Rapids Lagoon Test Results 2004 (mg/L)

Parameter	May 4, 2004	September 8, 2004	Federal Guidelines
Total Phosphorus	0.698	0.954	1.0
BOD	12	7	20
Phenols	<0.002	<0.002	20
TKN	4.15	3.09	None
TSS	32	32	25

Barwick

There were 2 discharge days from the sewage lagoon at Barwick during 2004, with 21,464 m^3 of effluent discharge to the Rainy River. During this discharge period BOD averaged 2.0 mg/L and TSS averaged 8.0 mg/L.

Rainy River

The Town of Rainy River discharged a total of 190,219 m^3 over 57 days from its lagoon to the Rainy River during 2004. During the discharge period, BOD averaged 3.0 mg/L and TSS averaged 9.3 mg/L, both below the provincial guidelines of 40 mg/L and 30 mg/L respectively.

3.3 Minnesota Industrial Sources

Boise Paper Solutions - International Falls

Discharge data from 1996 to 2004 including effluent flow, BOD, TSS, and AOX for the Boise Paper Solutions mill in International Falls is provided below in Table 9. There were no National Pollutant Discharge Elimination System permit violations in calendar year 2004. Dioxins and furans in mill effluent samples were below the detection limit of 10 parts per quadrillion (ppq) in 2004.

The permit for this facility expired in 1996. The MPCA placed the Draft National Pollutant Discharge Elimination System and State Disposal System Permits on public

notice in August 2004. Following the public review period, the MPCA issued new 5-year permits for the Boise Paper Solutions facility on October 26, 2004.

Table 9. Boise Paper Solutions Annual Average Discharge Data

	Flow (m3/d)	BOD (kg/d)	TSS (kg/d)	AOX (kg/d)
Compliance Limit	N/A	4,720	7,940	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
2001	135,768	645	1,079	NA
2002	160,484	747	1,584	NA
2003	143,164	956	2,094	NA
2004	150,496	1,884	3,978	NA

3.4 Ontario Industrial Sources

Abitibi-Consolidated Inc. - Fort Frances

Data on flow, BOD, TSS, and AOX are provided in Table 10 for the years 1996 through 2004. The decreased levels indicated for 1998 are the result of a labour dispute that shut down mill operations for approximately 5 months. The average annual daily loads for BOD, TSS and AOX in 2004 continue to be well below compliance levels.

The Ontario Ministry of the Environment reported that Abitibi had no spills for 2004. There were 2 daily exceedances for toluene in final effluent on June 22 and July 13. The Kraft mill bypass (non-process cooling water) failed toxicity testing in September for rainbow trout and *daphnia* and in October for *daphnia.*

Environment Canada laid charges under the Fisheries Act as a result of investigations surrounding the May 2001 spill at Abitibi. After several re-scheduled court dates, Abitibi-Consolidated pleaded guilty on October 31, 2005 to one charge of depositing a deleterious substance and was fined $5,000 and assessed a penalty of $45,000.

Table 10. Abitibi-Consolidated Average Annual Discharge Data

	Flow (m3/d)	BOD (kg/d)	TSS (kg/d)	AOX (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

4. 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 Rainy River Basin Planning and Management (MPCA)

The Rainy River Basin Information Document (BID) contains summary water management information for the Rainy River Basin. The Rainy River Basin Water Management Plan includes goals, objectives, strategies and indicators designed to maintain or improve the waters of the Rainy River Basin. Copies of the BID and Plan may be accessed at libraries throughout the Rainy River Basin or on the internet at http://www.pca.state.mn.us/water/basins/rainy/index.html .

The Rainy River Basin Committee is responsible for coordination of the implementation of the plan's Strategies and Projects. The following brief summaries of current projects provide an overview of current basin management activities:

- Development of the Rainy River Basin Water Resources Center

  Rainy River Community College, the lead agency for development of the water resources center, established a work group to develop a detailed plan of action for formation of the center and to begin implementation of center programs.

  The work group expects to have the plan completed by the spring of 2006. In the past year the work group conducted the 2004 International Lake of the Woods Water Quality Forum, participated in training and coordination for volunteer monitors, launched the Rainy River Basin Water Resources Center Website (http://rainybasinwater.org) and hosted the Rainy Boards at their annual meeting.

- Development of the Rainy River Basin Condition Monitoring Program

  The monitoring program began in 2005 with the implementation of the Kawishiwi Watershed Monitoring Program under the sponsorship of the White Iron Chain of Lakes Association. Current plans call for expanding the Kawishiwi Program and startup of additional watershed monitoring programs in 2006.

- Little Fork River Turbidity and Sediment Study

  The Little Fork River will be placed on the U.S. 303d Report to Congress (Impaired Waters List) in 2006 for turbidity exceedance. The turbidity and sediment loading studies continued in 2005 with a final report expected in spring 2006.

The Basin Committee continues to support the efforts of the Rainy Lake and Namakan Reservoir Environmental Monitoring Working Group.

4.2 Hydropower Peaking

Hydropower facilities often vary their daytime and night-time outflows to maximize efficiency when responding to fluctuating demand for electricity. This diurnal fluctuation in flow is called 'peaking'.

Concerns about water levels and flow rates on the Rainy River were raised at public meetings of the IRLBC and IJC on March 6 and November 28, 2001. The concerns were about the effects of peaking on navigation, ice conditions and aquatic ecosystem health. In a news release dated December 6, 2001, the IJC directed its Rainy Boards to "jointly examine the other issues raised during the public hearing related to the use of water in Rainy River and Rainy Lake, including peaking operations, and report to the Commission by September 2002".

In examining the issue, the Boards determined it would be appropriate to wait for the results of evaluations of peaking effects on the aquatic environment that had been started by two groups. The first group was the “Committee on the Environmental Effects of Peaking on the Rainy River”, comprised of representatives from: Boise Paper, Abitibi-Consolidated Company of Canada, Canadian Department of Fisheries and Oceans, Ontario Ministry of Natural Resources, Rainy River First Nations, Minnesota Pollution Control Agency, Koochiching County Environmental Services and the Minnesota Department of Natural Resources. This Committee examined the environmental effects of peaking on the aquatic resources and habitat of Rainy River during the period 2002 through 2004 and produced a final report on January 26, 2005.

The second group was comprised of Minnesota Department of Natural Resources staff led by Mr. Daniel O’Shea. This group mapped the bathymetry and aquatic habitat of the Manitou and Long Sault Rapids on Rainy River, and used a computer model to evaluate possible impacts of peaking on fish and benthic invertebrates. Mr. O’Shea produced a

final report on August 4, 2005, and his preliminary findings were referenced in the Peaking Committee report.

The Rainy Boards assessed the Peaking Committee report and the O'Shea report on behalf of the Commission. The Commission subsequently asked the Companies to voluntarily refrain from peaking during the spring fish spawning period.

4.3 Rainy Lake and Namakan Reservoir Environmental Monitoring Work Group

An IJC Supplementary Order of January 6, 2000, implemented new "rule curves" for regulating water levels on Rainy Lake and Namakan Reservoir. In response to recommendations of the IRLBC, resource management agencies on both sides of the border began a cooperative monitoring program in 2002 to identify impacts of the new rule curves on the biological and aquatic communities, and to provide an adequate source of information for future reviews. The monitoring program is intended to span a 10-year period, so that a range of events and adaptations of the biological community can be identified.

In 2002, a Monitoring Working Group was established to coordinate these efforts. The Working Group consists of representatives from the U.S. National Park Service (NPS), U. S. Geological Survey (USGS), Ontario Ministry of Natural Resources (OMNR), Canada Department of Fisheries and Oceans, Minnesota Department of Natural Resources (MDNR), Minnesota Pollution Control Agency, and First Nations.

Monitoring work to date has included:

- Workshops and meetings to identify the "best bets" for investigation.
- Coordination of routine agency (OMNR, MNDNR, NPS, USGS) fisheries inventories and assessments (routine monitoring of fish populations was continued for the 23rd consecutive year in 2005).
- Studies of the effects of water level fluctuations on aquatic vegetation, trophic-state indicators and mercury uptake in prey fish. The NPS and USGS are supporting these studies. Two of these studies have already been completed and published (wetland monitoring, and water quality/trophic-state indicators), and a manuscript covering the mercury uptake study is in review. Additional studies are underway or planned.
- NPS/USGS-funded studies from 2004 to 2006 to assess effects of the 2000 rule curves on loons, furbearers, wetland vegetation, fish, and benthos. Teams for each of these subjects have been developed with members coming from academia, government agencies, and Non-Government Organizations. The teams developed study plans in 2003 and commenced fieldwork in 2004. Data collection for wetland vegetation and sample collection for benthic invertebrates has been completed (collections were made during two summers 2004 and 2005). The

summer of 2006 will be the third and final field season of data collection for the loon, furbearer, and fish research under current funding.

- A USGS/MNDNR-funded study on the effects of rule curve changes on limitations to fish habitat has commenced. Fish sampling continued on Rainy Lake and the Namakan Reservoir, and two additional lakes in north central Minnesota were sampled for comparison.

- OMNR acquired Ikonos satellite imagery of reservoir wetlands in 2003.

- The USGS, NPS, MNDNR and OMNR, in conjunction with North Dakota State University, are engaged in a three-year radio-tracking project in Rainy Lake to assess the population characteristics and movements of lake sturgeon. Sturgeon were captured, marked and equipped with transmitters in 2003 and 2004. Study results were written up in a Master's Degree thesis and in two subsequent journal articles.

- Paleolimnological study was initiated on Rainy, Namakan, and Kabetogama lakes and Lac la Croix. Sediment cores were collected that will provide information on lake trophic state going back at least 200 years, or well prior to the construction of the local dams.

Provincial, state and federal agencies will continue their attempts to apply financial and personnel resources to the need for monitoring. However, it is clear from discussions with representatives of the resource management agencies that competing priorities may interfere with fulfillment of the IRLBC recommendations over the long term.

4.4 Early Summer High Water Event

The full regulation summary for 2005 will appear in the Boards' spring 2006 report to the IJC. However, as the basin experienced high inflows in 2005 which caused both Namakan and Rainy lakes to exceed their upper rule curves, that event will be addressed here. Graphs of lake levels, inflows and outflows can be found at the end of the report.

Both the Namakan and Rainy basins received strong freshet inflows in April, in excess of 90%ile. However, by late April to early May, inflows to both lakes had declined into the normal range and outflows were reduced in order to keep the lake levels rising. In the case of Rainy Lake, the level would have actually declined in early May without a significant outflow reduction.

Very heavy rainfall was received in late May and significant amounts continued through June. For the May 25 through June 30 period, the Rainy-Namakan basin precipitation was 83%ile (rank 16 in 100 years). As a result, inflows to both lakes rose strongly and were above 95%ile for 3 days on Namakan Lake and for 7 days on Rainy Lake. For the whole spring period, April 1 through June 30, inflows to Namakan and Rainy were 82%ile and 95%ile respectively.

The Companies responded quickly to open sluices in the dams but, with inflows exceeding outflow capacity, lake levels rose rapidly and exceeded the upper rule curves. In total, the level of Namakan Lake was above its upper rule curve for 9 days, from May 26 through June 3. The peak level reached was 340.98 m (1118.7 ft) on May 30, which was 7 cm (3 in) above the upper rule curve on that date and 3 cm (1 in) above the maximum upper rule curve level (June 1). This peak level was rank 52 over the past 93 years of record and was 1.2 m (4 ft) below the peak level reached in 1950. Namakan Lake did not reach its All-Gates-Open requirement level (341.1 m or 1119.1 ft). The water level situation was more severe on Rainy Lake, with the lake level being above its upper rule curve for 41 days, from May 25 through July 4. The peak level reached was 337.95 m (1108.8 ft) on June 15, which was 28 cm (11 in) above the upper rule curve on that date and 20 cm (8 in) above the maximum upper rule curve level (July 1 to August 15). This peak level was rank 27 over the past 94 years of record and was 1.3 m (4 ft) below the peak level reached in 1950. Rainy Lake was above its All-Gates-Open requirement level (337.9 m or 1108.6 ft) for 17 days (June 5-21); the gates were fully open for 24 days (May 31 through June 23).

Compared to recent past events, the Boards heard relatively little from the public in response to the 2005 event, but there was some criticism regarding the regulation of Rainy Lake. Of the six spring seasons since the new rule curves were adopted, this was the third year in which the level of Rainy Lake rose above its upper rule curve (in 2001, 2002 and 2005; the level remained within its operating band in 2000 and 2004, and fell well below the band in 2003). The main points of criticism were that Rainy Lake should have been held lower in its operating band prior to the event and that more water should have been stored on Namakan Lake to provide relief to Rainy. Upon the request of the IJC, these points were assessed by the Boards. Based on simulation modeling, the Board determined that holding Namakan Lake at its full summer level would have reduced the peak on Rainy Lake by only 2 cm (1 in), while holding the level of Rainy Lake to mid-band prior to the event would have reduced its peak level by 8 cm (3 in). If the level of Rainy Lake had been kept at its lower rule curve, the peak level would have been 15 cm (6 in) lower. The Boards noted that such savings were relatively minor and suggested that, if appropriate shoreline development standards were observed, the peak level that occurred, being only 20 cm (8 in) above the permitted summer maximum, should not cause any problems. The Boards noted that the operating bands were not selected to minimize flood risk but were a compromise selected to address a number of objectives. There were potential environmental benefits from operating higher in the band; the additional risk of resultant higher water had quite reasonably not appeared to be excessive given the inflow conditions prior to the late May rains.

In addition, the Boards noted that during periods of higher inflows to the upper end of the Namakan Chain of lakes, the level of Crane Lake can be significantly higher than the mean level of Namakan and Kabetogama lakes, which is the level used for regulation purposes. In 2005, the Namakan-Kabetogama level peaked at 3 cm (1 in) above the maximum level of the upper rule curve for Namakan Lake, whereas Crane Lake peaked at 22 cm (9 in) higher (see attached Namakan Lake graph). Further, while the Namakan-Kabetogama level was above the maximum upper rule curve level for 7 days, the Crane

lake level was above this point for 27 days. Delaying the summer draw down of Namakan, or maintaining Namakan levels at the top of the 1970 rule curve band to help Rainy, as suggested by the Border Lakes Association, would have extended the duration of relatively higher water levels on Crane Lake. Overall, the Boards noted that Rainy Lake had peaked higher (than in 2005) in 26 of the last 94 years of recorded data, that a number of these peak levels had been significantly higher, and that 24 of these peaks had occurred prior to the adoption of the new year 2000 rule curves. The Boards acknowledged that, to date in the new millennium, the basin had experienced greater variability and extremes in rainfall and inflows than was typically seen during the 1980s and 90s. However, the Boards reported that the recent variability and extremes had not been greater than experienced in the basin historically. The Boards concluded that events such as that of 2005 would not cause undue concern if the public was more aware of, and better prepared for, the much higher levels that have occurred in the past and will inevitably occur again. Further detail on the 2005 assessment is available in the Boards' letter response to the IJC request, while full assessments of the larger 2001 and 2002 events are available in separate Board reports.

4.5 Meetings and Tours

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 held one joint conference call and two joint meetings during this reporting period. The conference call was conducted on August 11. Key topics of discussion included funding for hydraulic modeling of the Rainy River, review of the O'Shea report on Rainy River hydropower peaking and preparation of comments to the IJC, response to an IJC request for comments on a letter to the Commission from the Border Lakes Association concerning 2005 regulation of Rainy and Namakan lakes (see Section 4.4 of this report), coordination of contact information with the Rainy River First Nation (RRFN) and the Fort Frances Area Chiefs Council, preparation of the 2rd Quarter Newsletter, preparations for the Fall semi-annual meeting of the IJC and work on the Boards' Fall 2005 Report to the Commission. Separately, Board and IJC staff held a conference call on June 23, 2005 to discuss and finalize arrangements for the Rainy public meetings and tour scheduled for July 21 & 22. A joint Board meeting was held on July 22 in International Falls in connection with the annual joint public meetings in the basin. The key topics of discussion included improving Board communications with First Nations in the basin, the IJC response to the Border Lakes Association letter and the Boards' review of the O'Shea report on Rainy River hydropower peaking for the IJC. The Boards also met on October 20 in Ottawa to finalize their presentation for the fall semi-annual meeting of the International Joint Commission.

IJC Spring Semi-Annual Meeting – April 13, 2005

Board Members and staff attended the spring semi-annual meeting of the IJC in Washington, D.C. on April 13. The Boards presented their Spring 2005 Report to the Commission along with an update on basin hydrologic conditions. It was noted that 2004 basin hydrologic conditions were in the normal range, as contrasted to the high water event of 2002 and the low water event of 2003. Other topics of discussion included increased funding requirements of the Boards in working in a more integrated manner and likely future funding needs in support of the IJC Watersheds Initiative. The primary topic of discussion centered on a presentation of the Boards' examination of hydropower peaking operations on the Rainy River. This topic is discussed more fully in Section 4.2 of this report.

IRLBC/IRRWPB Annual Joint Public Meetings – July 21-22, 2005

The Boards held their fourth annual joint public meetings, on July 21 in International Falls, Minnesota at the Rainy River Community College and on July 22 in Stratton, Ontario at the RRFN Kay-Nah-Chi-Wah-Nung Visitors Centre to discuss water issues in the Rainy Lake and Rainy River basin. On July 21 the Boards also met separately with representatives of the RRFN in Stratton to discuss basin water issues and with dam operators (Boise Paper Solutions and Abitibi-Consolidated Incorporated) in International Falls to discuss dam operations and maintenance. IJC Commissioners Allen Olson and Jack Blaney along with several IJC staff were in attendance at all of the aforementioned meetings.

At the public meeting in International Falls, the key topic of discussion centered around regulation of Rainy and Namakan lakes since implementation of the 2000 rule curves. As discussed in Section 4,4 of this report, there was some criticism regarding the regulation of Rainy Lake in the 2005 high water event. The main points of criticism were that Rainy Lake should have been held lower in its operating band prior to the event and that more water should have been stored on Namakan Lake to provide relief to Rainy. The Boards also received comments from Namakan Lake interests supporting the new rule curves. As mentioned in Section 4.4, an assessment of the 2005 event is available in the Boards' letter response to an IJC request.

At the public meeting in Stratton, discussions focused less on the 2005 high water event and more on broader ranging issues. A representative from Crane Lake pointed out the negative impacts of the various choke points (connecting narrows between lakes in the Namakan chain of lakes) on high water levels on Crane Lake during periods of high inflow, and was pleased that a model study of the Namakan chain had been recommended by the Boards under the Watersheds Initiative. Additionally, a sewer board with tax levy powers has been established for Crane Lake to improve the current gravity sewer system which is polluting the lake. Representatives of the RRFN raised concerns about involuntary sanitary sewer bypass flow from the Town of Fort Frances during high water events and the need for improved communication with the RRFN in these situations. The IRRWPB will look into guidelines used during instances of sewer

bypass. The May 2001 ACI untreated effluent spill to the Rainy River was noted in particular, because it occurred at a time when the RRFN was about to release Sturgeon fry into the river. The Chief of the RRFN provided information on a Corps of Engineers permit for horticultural draining for the Pine Island bog, issued in late 2004 to the Red Lake Band of Chippewa, and the Lake of the Woods water supply alternative in the "Draft Report on Red River Valley Water Needs and Options" by the United States Bureau of Reclamation. The RRFN is supportive of opportunities for the Red Lake Band, but is opposed to the Pine Island bog project, citing issues of runoff and damage to the ecosystem. The RRFN is concerned and opposed to the Lake of the Woods alternative proposed in the draft BUREC report. The Chief expressed his view that the First Nations are seen as just another stakeholder in these matters, but that they must be dealt with as sovereign nations. Regarding the Rainy River peaking review, the RRFN requested that they be kept abreast of developments at an early stage and be included as an advisor to the review. Commissioner Blaney expressed the IJC's commitment to keeping the RRFN informed on the matter.

Rainy River First Nation and Dam Operators Meetings – July 21, 2005

Prior to the two public meetings, the Boards met separately on July 21 with the RRFN at the Kay-Nah-Chi-Wah-Nung Visitors Centre and with the dam operators at the Boise mill in International Falls. At the RRFN meeting, topics discussed in addition to those mentioned in the preceding paragraph included a history and background of the RRFN Watershed Sustainability Program, concerns over the negative impact of the dam at International Falls / Fort Frances on the free migration of Sturgeon to/from Rainy Lake and the reduction of genetic diversity in Sturgeon from overfishing.

At the meeting with the dam operators, Boise and ACI presented a summary of their regulation activities and dam operations during the preceding twelve months as well as an update on dam maintenance activities, data collection and public information efforts. There were no concerns expressed regarding regulation or dam operations. Maintenance activities during the past year included:

- Base preparation of a new 115 KV transformer at the Sturgeon Falls dam at the lower end of the Seine River
- Repairs to the Raft Lake dam (Seine River) stop log lifter
- Inspections of the canal wall and tailrace at the Rainy Lake dam (possible dam failure mode analysis at International Falls with FERC)
- Coffer dam installation at Calm Lake dam (Seine River) for civil work to bays 6-10 (ongoing pier replacement program)
- Planned repairs to GS-1 (ACI mill) trash rack support framework
- Planned inspection of Canadian portion on Rainy Lake dam

During the past twelve months there were no changes to the data collection and transmission network. However, in the interest of improved public information, ACI and the Valerie Falls Limited Partnership developed a web site to provide level and flow data for the Seine River. (http://www.seineriverwmp.com/index.html) The site was

operational on February 14, 2005. This complements the existing public information tools utilized by the companies.

Basin Tour – July 21, 2005

In connection with the annual joint public meetings in the basin, Board Members, Commissioners, and staff toured the Rainy River for several miles below the control dam at International Falls and Fort Frances to gain a better understanding of the possible impacts of hydropower peaking on the ecosystem. Impacts to the river fishery were stressed during the tour.

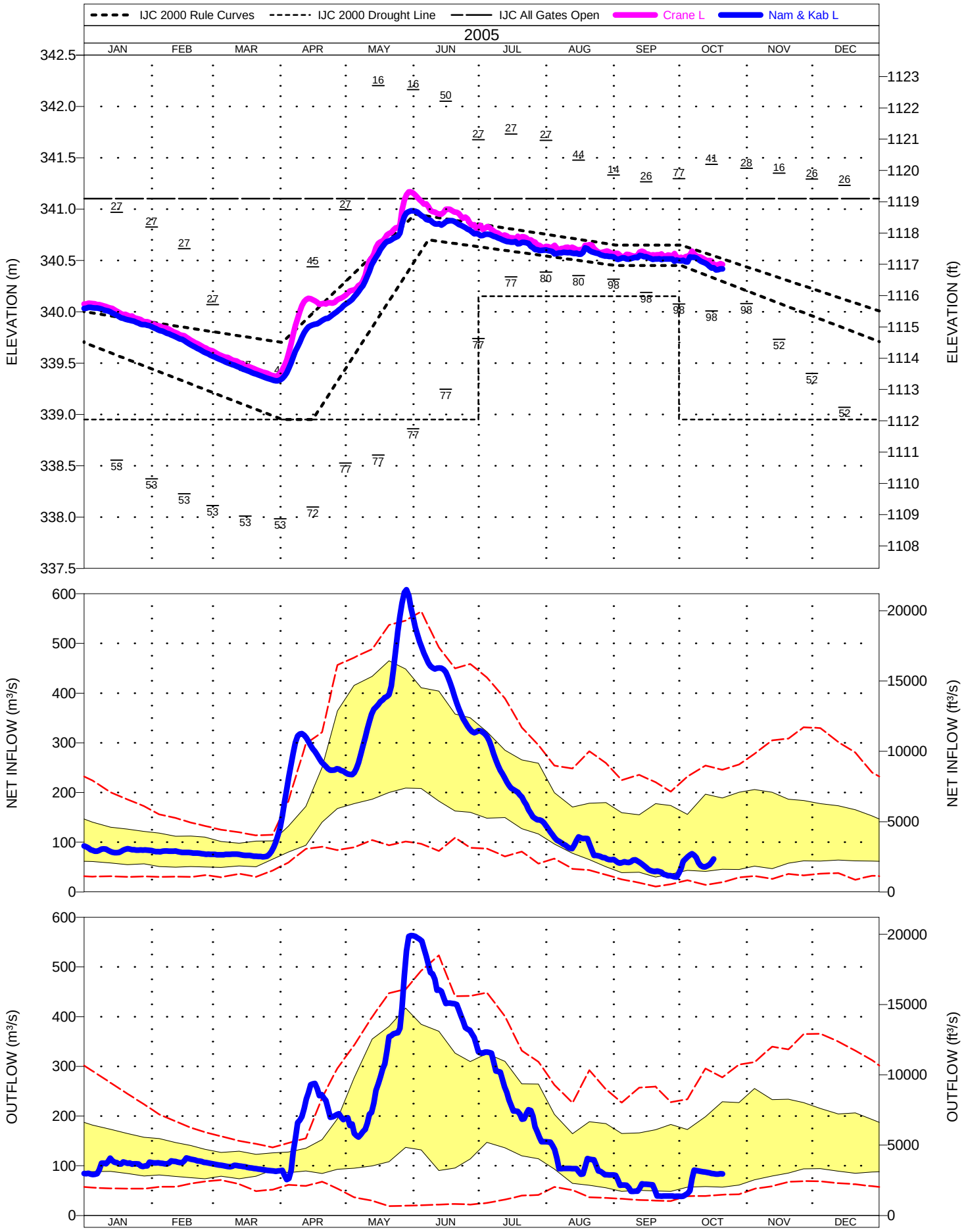
Waste Water Treatment Facilities Tour – September 21-22, 2005

On September 21 and 22 some Board Members toured the waste water treatment facilities operated by the Town of Fort Frances and the Abitibi Mill, as well as the plant operated by the RRFN. This tour was in connection with discussions at the Boards' July 22 public meeting in Stratton, Ontario regarding the May 2001 ACI mill untreated effluent spill flow into the Rainy River and an IRRWPB promise made at that meeting to look into the Fort Frances mill permit and guidelines used during instances of sewer bypass. The tour provided a first-hand opportunity for Board Members to better understand the situation.

LWCB
Lake of the Woods Control Board

NAMAKAN LAKE

Figure 3



LWCB
Lake of the Woods
Control Board

RAINY LAKE

Figure 4

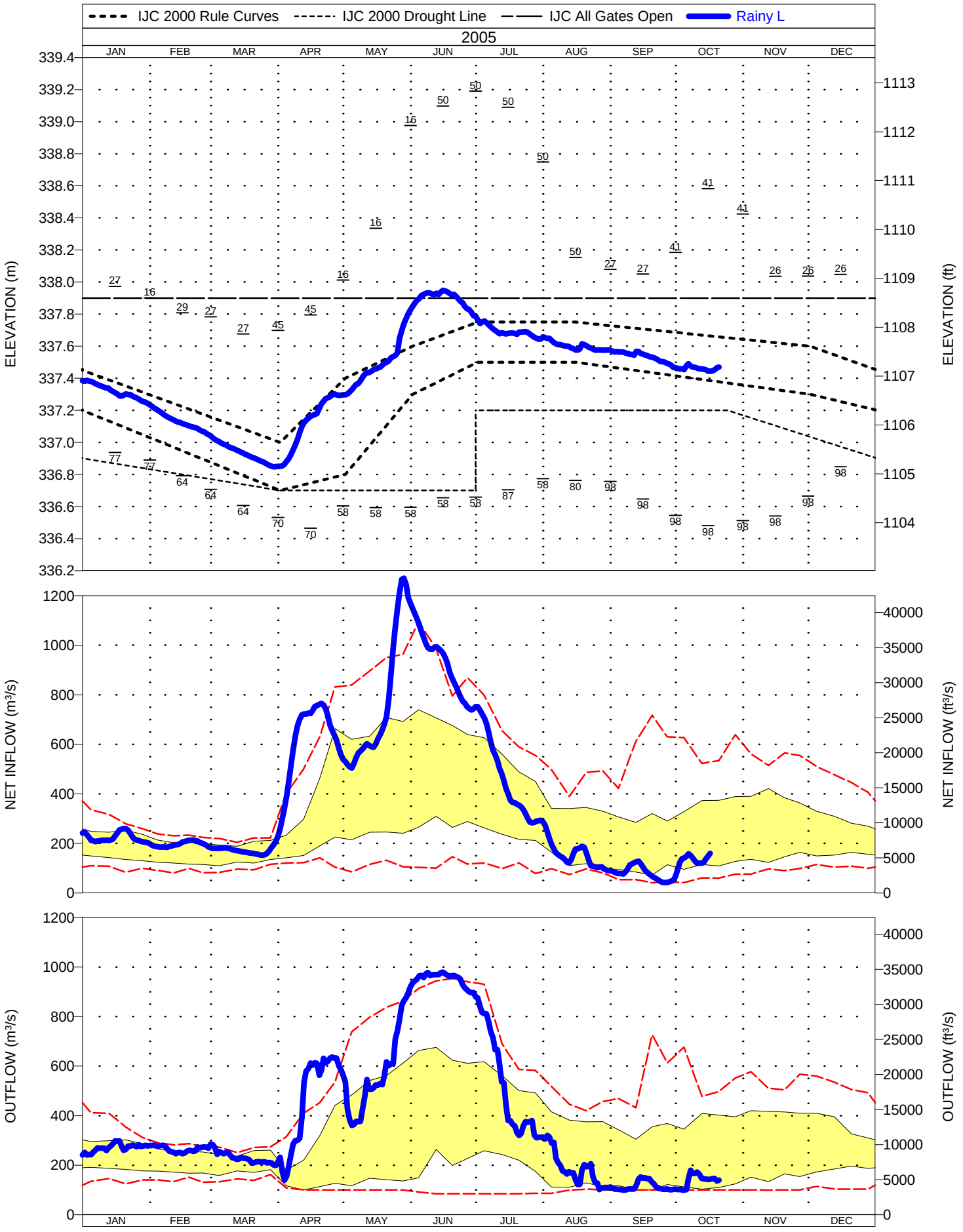


Figure 5

LEGEND - LEVEL AND FLOW

Actual Data

Actual data for year shown
- levels are daily values
- inflows are 7-day means plotted daily at the centre of each 7-day period
- outflows are daily values

Rule Curves (Namakan & Rainy Lakes)

IJC 2000 Upper & Lower Rule Curves

IJC 2000 Drought Line

Statistical Data

50 — Maximum level recorded and its year of occurence:
Namakan Lake - within the period 1912-1999
Rainy Lake - within the period 1911-1999

Level/flow has been above this line 10% of time

Normal level/flow range:
Level/flow has been above this range 25% of time
Level/flow has been within this range 50 % of time
Level/flow has been below this range 25% of time

Level/flow has been below this line 10% of time

$\overline{77}$ — Minimum level recorded and its year of occurrence:
Namakan Lake - within the period 1949-1999
Rainy Lake - within the period 1949-1999

All statistical levels are based on 3-day means at month quarter points.

All statistical flows are based on quarter-monthly means.

Period of record for all percent data is 1970-1999.

Datums for water levels are:
- Namakan Lake - US Coast & Geodetic Survey (1912)
- Rainy Lake - US Coast & Geodetic Survey (1912)