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

SPRING 2005 REPORT

Submitted to

The International Joint Commission

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

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1 INTRODUCTION

The International Rainy Lake Board of Control (IRLBC) and the International Rainy River Water Pollution Board (IRRWPB) 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 as well include sections on specific topics under review by the Boards. In addition, the spring reports provide a summary of the regulation of Rainy and Namakan lakes over the past calendar year, while the fall reports address environmental quality and related issues. The fall reports include information on agency monitoring on the Rainy River and Rainy Lake, point source inputs to the Rainy River from municipal and industrial sources, and fish consumption advisories that are in effect.

Section 2 of this report summarizes the regulation of Rainy and Namakan lakes during 2004, which was a relatively normal year after two years (2001-02) of high water conditions and one low water year (2003). Except for one small deviation above the IJC rule curve band on Namakan lake in early November, Rainy and Namakan lakes remained within their bands the entirety of 2004.

Section 3 presents the Boards' review of hydropower peaking impacts on the Rainy River. The IJC requested the Boards to conduct this review in 2002.

The remaining sections of this report cover Board coordination and public relations efforts (Section 4) and other business (Section 5). A map of the basin (Figure 1), a graph of basin precipitation and graphs of levels, inflows and outflows for Rainy and Namakan lakes can be found in the Appendix.

2 REGULATION SUMMARY

Conditions in the Rainy-Namakan basin were relatively normal in 2004, compared to the wet conditions of 2001 and 2002 and the dry conditions of 2003. The only excursion outside of the rule curve bands occurred when Namakan rose slightly above its operating band from November 1 through 5 with a maximum deviation of 2 cm (1 in). This followed the largest rainfall event of the year on October 29-30, which dumped more than 50 mm (2 in) of rain over the basin. Total precipitation for the year was 48 percentile for the Lac la Croix basin and 77 percentile for the Rainy-Namakan basin. The total annual inflow to Namakan Lake was 39 percentile, while the annual inflow to Rainy was 66 percentile.

The 2004 quarter-monthly precipitation for the Lac la Croix and Rainy-Namakan subbasins is shown in Figure 2. Water levels, net inflows and outflows for 2004 are shown on Figures 3 and 4, respectively, for Namakan and Rainy lakes. Figure 5 provides a legend for these figures.

In January, Boise Cascade proposed a water management plan for a February 15 – March 15 shutdown of the International Falls powerhouse to accommodate the replacement of obsolete electrical switchgear. The plan, coordinated with Abitibi-Consolidated, included drawing Namakan and Rainy Lake levels down to the lower 25 percent of their operating bands prior to the work period, and then managing levels to no more than 75 percent of the bands as outflows were reduced during the work. The IRLBC found this plan to be in compliance with the January 2001 Consolidated Order. After consulting area resource managers, the IRLBC approved the water management plan. During the work period, the lake levels were managed in accordance with the approved plan and the work was completed ahead of schedule.

Inflows to both lakes rose strongly in early April due to an early start to spring runoff and above normal winter precipitation. Although inflows to Rainy declined in the latter half of April, significant rainfall in May again increased inflows to Rainy and sustained Namakan inflows. The May rainfall of 125 mm (4.9 in) for the Rainy-Namakan basin was the 4th highest since 1900. The levels of both lakes were kept within their operating bands with 7 of the 10 sluices fully opened and 2 more partially opened at Kettle Falls and 10 of 15 sluices fully opened at Fort Frances – International Falls. Namakan Lake was kept within the middle portion of its rule curve band during the refill period while Rainy Lake climbed to a high of 86 % of band in early June.

In the latter part of August inflows declined to below normal. To maintain the lake levels within their bands, outflows were decreased by Abitibi and Boise through this period with Rainy Lake outflow reduced to its normal IJC-specified minimum for most of August. Several minor rainfall events in September provided moderate increases in inflow to both lakes.

Inflow to both lakes rose strongly in late October due to heavy rainfall in the basin. Total rainfall for October was the 6th highest in 99 years of record. Much of this rainfall fell during a major storm on October 29-30. To control the lake levels, outflows from both lakes were moderately increased by Abitibi and Boise. The level of Rainy Lake was kept within its operating band, reaching 96 % of its band on November 9, but Namakan Lake rose above its upper rule curve for 5 days, with a maximum deviation of 2 cm (1 in). Following the late October storm, both lakes experienced declining inflow and lake levels through the end of the year and outflows were reduced.

3 REVIEW OF HYDROPOWER PEAKING IMPACTS ON THE RAINY RIVER

3.1 Definitions

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.

3.2 Background

Concerns about water levels and flow rates on the Rainy River were raised at public meetings held by the IJC on March 6 and November 28, 2001. The concerns included the effects of peaking and ponding on navigation, ice conditions and aquatic ecosystem health. In a December 10, 2001 letter to the Chairs of both Boards, the IJC directed the 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”.

Given their resource constraints (both financial and personnel), and also to avoid duplication of effort, the Boards decided to piggyback onto the efforts of an independent work group established by the Ontario/Minnesota Fisheries Committee in December 2002. This group, named the “Committee on Environmental Effects of Peaking on Rainy River”, defined its purpose as being “to examine the environmental effects of peaking on the aquatic resources and habitat of the Rainy River”. It is

comprised of representatives from: Boise Cascade Corporation, Abitibi-Consolidated Incorporated 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.

A progress report on activities of the Peaking Committee was provided to the IJC by the IRLBC in the fall of 2002. Subsequently, the IRLBC requested the Committee to also look at the non-environmental impacts of peaking, but the Committee declined, stating it did not have the expertise to undertake a broader mandate. The IRLBC then requested staff of the U.S. Army Corps of Engineers (USACE) to prepare a "Scope of Work" to define the work required to fully assess peaking impacts on the Rainy River. The resulting plan, completed in late December, 2002, addressed assessment of impacts on the hydrologic regime, on aquatic life, on bank erosion, on cultural resources, on recreational boating, on aquatic vegetation, and on economic and social factors. With a final report, the project was estimated to cost $US 415,000 and require about 43 months of work. This plan was reviewed by the Peaking Committee, which provided comments on a number of the components, suggested two additional components (water quality and ice stability), agreed that this type of detailed analysis would help to answer many of the questions associated with peaking and that these answers could in turn help the decision makers to resolve the issues regarding peaking, and finally, encouraged the Boards to continue to develop the study plan and especially hydraulic modelling.

At the January 2003 meeting of the Peaking Committee, Boise Cascade announced it had not been peaking for a year and had no plans to resume. Abitibi-Consolidated stated it had not been peaking much and might consider discontinuing the practice. The IRLBC subsequently asked the Companies to provide written statements detailing their peaking operations. The Board received responses from the Companies in late March 2003. Boise's response stated that the Company had not used peaking since October 10, 2001 at their International Falls hydropower facilities and that they had no short or intermediate-term intentions to do so, but reserved the option should it become necessary. The response further noted that peaking has occurred on every river in North America with hydropower generation and nothing precludes this mode of operation. The Abitibi Consolidated response stated that peaking at the Fort Frances hydropower facility had been dramatically reduced over the past two years (especially the weekend-weekday cycle), such that it now resulted in negligible environmental impacts on the Rainy River. The Abitibi response further stated that peaking is a very important tool to offset high power costs and that, if the cost structure of power changed negatively in the future, the Company would reconsider the opportunity to effectively utilize peaking to offset increased power costs.

The Peaking Committee continued with its work through 2003 and 2004, and the Boards maintained contact with the Committee Co-Chairs. At the Spring 2003 IJC meetings, the Boards presented graphs showing the effects of then-recent peaking operations on the levels of the Rainy River. Information on the positions taken regarding peaking by the Companies was provided, as well as on the USACE Scope of Work for a full peaking study. Further updates were provided in the Boards' spring 2004 report and presentation to the IJC, and in their fall 2004 report. Unfortunately, it appeared that progress by the Committee became slower as time elapsed, in large part due to the inability to reach consensus among all the parties making up the Committee. IJC staff and Commissioner Olson learned of these difficulties first-hand, through several separate discussions with Committee members, when in the basin in August 2004 for the Boards' annual public meetings. It was suggested to the Committee that, if consensus could not be reached, the Committee's report should cover both the agreed upon and the dissenting positions. Given the Boards' lack of resources to investigate peaking independently, especially in light of the large cost estimated by the USACE, the Boards awaited the outcome of the Committee's deliberations.

In the interim, in response to the IJC's request for suitable projects under its International Watersheds Initiative, the Boards defined in more detail the hydraulic/hydrologic modelling needed for the Rainy River. This modelling capability would support not only a detailed assessment of peaking impacts but also would be useful for other needed work, such as flood level determination. The cost to collect river cross-section data, develop the models and produce flow-frequency and flow-duration statistics was estimated to be $US295,000. This project was addressed, along with several other potential projects, in the Boards' letter to the IJC on watershed initiatives dated September 23, 2004.

Subsequent to the Boards submitting their fall 2004 report to the IJC, but prior to the Boards appearance before the IJC on October 21, 2004, the Boards received the Peaking Committee's draft report dated September 29, 2004. While the Boards did not have time to assess the report prior to their appearance before the Commission, they did summarize its conclusions as part of their presentation to the IJC in Ottawa. The presentation noted in particular the lack of consensus and the differing positions on a number of the recommendations.

As noted previously, the position of Boise provided to the Boards on peaking in March 2003 was that they had not conducted peaking operations since October 2001, they currently had no short or intermediate-term intentions to do so, but they reserved the option should it become necessary. In early February 2005, the US Co-chair of the IRLBC received a letter (dated February 7) from Boise announcing plans to conduct a "limited trial in peaking" at their International Falls generating station. Boise stated that the trial was necessary due to the continued rise in energy costs for their mill, that it wasn't a full return to peaking but a trial to test equipment and operating guidelines for a possible return to peaking, and that the Boards would be notified before a full return to peaking. As of early March, 2005, Boise had completed the trial, was evaluating the results, and had no immediate plans to resume peaking pending their analysis of the trial.

The final report of the Peaking Committee, dated January 26, 2005, was received by both the Boards and the IJC in mid-February 2005. Differences between the draft and the final are minor, with no significant differences in information provided, positions taken or recommendations made. With this final report of the Peaking Committee in hand, the Boards can now respond to the IJC as requested regarding the impacts of peaking operations on the Rainy River. As noted above, the costs to fully and independently assess the peaking impacts are significant and well beyond the resources of the Boards. Thus the Boards' response must be limited to an assessment of the work done by others and recommendations regarding future steps. The resources needed to be able to proceed have already been defined.

3.3 General Comments on the Peaking Committee Report

The members of the Peaking Committee are to be commended for their efforts to review and resolve the issues related to the impacts of peaking operations on the Rainy River. It clearly has not been an easy process. Consensus on most key issues has been elusive due to the widely differing and polarized views of the parties involved. Nevertheless, it has been a useful process in that the concerns have become clearly defined, the parties have learned more about each other's positions, it is obvious to all involved that peaking poses a contentious problem with no simple solution, and some relevant information has been provided.

While not attempting to provide a full line-by-line assessment of the report, some general comments are offered as follows:

- this report concludes that "peaking" operations can have negative impacts on the ecosystem and makes a strong case for a ban during the spring spawn, but does not appear to provide the information needed by the Boards or the IJC to support decisions about year-round peaking. To support year-round peaking decisions, sufficient information is needed either to show that no amount of peaking is acceptable at any time or to help define what degree of peaking may be acceptable and when. Information is required on how much suitable habitat is available along the river at different water levels and flows for the spawning periods in particular and also for other periods during the year. This information needs to be evaluated with other information, such as spawning depths and substrate type to determine the acceptable range of water level and velocity and the acceptable amount of fluctuation along the river. This is presumably the work of the fisheries biologists. Hydrologists can help by trying to show what average river levels and flows, and degree of fluctuation, would have occurred in a state of nature, and with what frequency and duration, so that a base case can be established. The hydrologists would also need to model the peaking operations to describe the range of water levels and flow fluctuation that would occur with different peaking scenarios. The Boards don't now have the river modelling capability they need to do the hydrologist work noted above, but they have defined these needs to the IJC. The Committee report doesn't appear to provide the detailed water level versus habitat information that is needed either. Overall, what is needed to address all concerns and points of view is information and tools such that the negatives and positives of various modes of operation can be defined for the river year-round and then a compromise sought.

- the report makes clear the official position of the Minnesota Department of Natural Resources (MDNR) on peaking: "Commissioner Sando called for a run-of-river mode of operation for the International Falls hydropower project and said peaking is contrary to the MDNR's position on all other hydropower facilities in the state" (page 2, 2nd paragraph). The report then states: "During the course of the Committee's deliberations, a two year study by the MDNR (O'Shea, 2005. Unpublished draft report) demonstrated that peaking on Rainy River does have an adverse impact on aquatic habitat" (page 6, 1st paragraph). To allow objective assessment and to support the conclusions reached in the Committee's report, the relevant data must be presented in sufficient detail. This level of detail is not provided. The Boards believe that study of the O'Shea report is necessary.

- in the "Fish and Aquatic Invertebrates" section (page 7, last paragraph of section), in "Supporting Rationale" and Table 1 (page 11), and in "Supporting Rationale" and Table 2 (pages 15-16), the report needs to provide the detailed results that statements in these sections are based on. Also, much of what is provided here is not necessarily clear to the reader (what is "normal background level of fluctuation", how was it set at 3%, the flow fluctuations were around what mean flows, what is "instream flow incremental methodology", what species-specific criteria were used, what were the hydraulic conditions that were estimated, how was the water level estimated to be 1 foot above the deposition zone at spawning, etc?)

- under "Rule Curve" (page 9), the 2nd paragraph says the Companies claim the new rule curves worsen flow fluctuations in the Rainy River. This claim is not true. Any such fluctuations are not the result of the new rule curves per se but instead are the result of the Companies deciding themselves to try to follow the exact middle of the rule curve band. The IRLBC specifically recommended a loosely defined "middle-portion" of the band as the target, and has repeatedly stressed to the Companies that there is no reason to try to stay exactly in the middle. Allowing flexibility in outflow management is the whole purpose in having a rule curve band, instead of a single rule curve. The

IRLBC has been seeking to dispel this misperception for some time now. The claim about impacts due to reduced winter storage is also without merit.

- under "Supporting Rationale" (page 11, just above Table 1), spawning periods given for sturgeon are taken from papers dated 1973 and 1983. Is this still valid, or should it be updated?

3.4 Assessment of Peaking Committee Recommendations

The recommendations of the Peaking Committee are presented below, along with information provided by the Committee on consensus for the recommendation (both in italics), followed by the Boards' assessment of the recommendation:

A. *No peaking shall occur during the spring fish-spawning season. The spring spawning season is the time period from April 15 to June 30, under typical conditions.*

   No consensus was reached. Rainy River First Nations (RRFN) and the natural resource agencies supported the recommendation, while Abitibi believed limited peaking should be allowed during the spawning period and Boise supported the recommendation if the period was shortened to April 15 to June 15.

   Given the critical significance of water levels during the spring spawn, the Boards support this recommendation. Preferably, the actual period during which peaking is restricted should be verified by updated field observations. The Boards note that an agreement not to peak during the spring spawning period often seems to be reached on a co-operative and voluntary basis in other areas.

B. *The practice of ponding for extended periods (i.e. weekends) of time has been discontinued and should not be resumed.*

   No consensus was reached. All committee members supported the recommendation except Abitibi, but Boise reserved the right to resume peaking in the future.

   The Boards believe that more information and hydraulic modeling is required to define an appropriate compromise (what degree of level fluctuation, with what frequency and duration, over what level range, in what periods).

C. *Outside the spring spawning season, water level fluctuations as the result of peaking should be minimized.*

   No consensus was reached. The report stated that, from an environmental perspective, a 3% fluctuation would be "acceptable". From the perspective of the Companies, constraints which had financial impacts were not acceptable. The Committee noted that it did not have the tools needed to assess the costs to the ecosystem versus the benefits to the Companies.

   As with B above, the Boards believe that more information and modeling is required to define an appropriate compromise (what degree of level fluctuation, with what frequency, over what level range, in what periods).

D. *Companies should communicate peaking operations and intent to the IRLBC. The IRLBC should in turn provide notification to the appropriate agencies and public.*

No consensus was reached. All parties agreed except Abitibi. Abitibi agreed with advising the IRLBC of "significant" peaking but felt that the same notification requirements should apply to all generation facilities under IJC jurisdiction.

The current IJC Order already requires the Companies to inform the IRLBC of planned operations, so nothing further is needed. As to agency and public information, the onus should be on the Companies, not the IRLBC, as peaking is to their benefit and no-one else. The Boards do not support making any process more complex or have it involve more people than needed.

E. *The existing collection gauge system should be maintained and infrastructure expanded where needed.*

All committee members agreed.

The Boards agree as well, but question who should define and pay for any expansions, or pay for the current network.

F. *Spawning and habitat characteristics immediately below the dam should be evaluated to determine the magnitude of impact at this location.*

All committee members agreed. However, the Companies felt that this work was necessary to accept the operational recommendations, while RRFN and the natural resource agencies felt there was currently enough information to support implementation of the recommendations in the report.

The Boards agree that more study is needed in order to define specific limits, if any, to be placed on peaking operations year-round.

G. *Current and historic discharge data for Rainy River should be made readily available on the IJC website. These should include total discharge and tailrace stage below the Fort Frances / International Falls dam and total stage and discharge at Manitou Rapids, and at Rainy River, Ontario.*

All committee members agreed. The Committee also noted that hourly or half-hourly data is required, not just daily means.

The Boards note that daily data is already generally available on the web from the official agencies in both countries that collect and archive it. Some data is available on related Company, Board and USACE sites as well, and there are links to these from the IJC site. The Boards support web links to the data where necessary but question the need for more duplication of data sources. As to the call for hourly or half-hourly data rather than daily, the Boards agree that this is necessary to evaluate the impacts of peaking. However, the enormous increase in data volume (and error checking requirements) that this implies must be considered carefully in determining how best to make available and disseminate such data.

H. *A hydrologic model of the Rainy River, and other downstream tributaries, should be developed to improve understanding of flows and water levels within the system.*

All committee members agreed. However, the Companies felt that this work was necessary to accept the operational recommendations, while RRFN and the natural resource agencies felt there was currently enough information to support implementation of the recommendations in the report.

The Boards have already defined this need in their submission to the IJC under the Watersheds Initiative. Unless a field trial peaking program, with water level monitoring, is to be established, such a model is needed if the impacts of various modes of peaking are to be quantified and a compromise reached.

3.5 Board Conclusions and Recommendations

While commending the Peaking Committee for their efforts and finding that their report makes a strong case for a ban on peaking during the spring spawn, the Boards still find that there is insufficient information available to define the compromises required among the pro and anti peaking interests with respect to year-round peaking on the Rainy River. The Boards fully appreciate that the Committee has done the best it can with the resources available, especially given the polarization of the parties involved. Given the Boards' own resourcing constraints, they could not have done as much. Cost estimates prepared for the Boards, as described in Section 5.1, indicate that a full assessment of the peaking impacts that would result from various degrees of peaking operations, sufficient to define a compromise position amongst the parties, would be quite expensive and time consuming.

Given the above conclusions, the Boards offer the following recommendations to the Commission if the peaking issue is to be pursued further:

- the IJC should clarify its intent relative to regulating peaking operations (the Boards currently do not have this authority).

- if the IJC intends to regulate peaking operations, it should consider the expectation of those being regulated that any policies developed will be applied in an equitable manner in all regions.

- if the IJC wishes to pursue the peaking issue, the Commission should review the unpublished O'Shea report which provides more detail on peaking impacts on the Rainy River. The unpublished draft of the report has just recently been made available to the Boards.

- the Boards support the Committee's recommendation for a ban on peaking operations during the spring spawning period, based upon a precautionary principle. Spawning and habitat characteristics immediately below the dam should be evaluated to determine the magnitude of impact at this location. The Boards recommend that the peaking ban dates be verified periodically by field observations. If the IJC intends to pursue regulation of peaking operations on the Rainy River, the Boards recommend that the IJC first attempt to facilitate a cooperative and voluntary agreement amongst the parties, holding any imposed regulation as a last resort.

- regarding other times of the year, the Boards believe that no specific restrictions should be placed on peaking operations until such time as the studies noted previously are completed or the required information otherwise becomes available to justify further action.

- while a spring spawning period ban (imposed or voluntary) on peaking will certainly not address all the concerns raised, the Boards believe it will address the most critical concern, thereby reducing the

overall priority of the peaking issue (versus other issues/initiatives for the Boards and the IJC in the basin). This should create time for the IJC to find the resources for the studies needed to properly reach a year-round compromise on the peaking issue on the Rainy River, if the issue is to be pursued further.

- current and historic discharge data for Rainy River should be made readily available on the IJC website. These should include total discharge and tailrace stage below the Fort Frances / International Falls dam, and stage and discharge at Manitou Rapids and at Rainy River (Town of). Hourly or half-hourly data should be available upon request e.g. for modeling purposes.

4 COORDINATION AND PUBLIC RELATIONS

4.1 Overview

Over the past year, the Boards have endeavored to maintain a high level of coordination and communication with each other, the Commission, the Companies and stakeholders in the Rainy-Namakan basin regarding lake regulation activities and other issues of public interest. This was accomplished through meetings, conference calls, quarterly newsletters, reports and information posted to the Boards' web sites and to web sites maintained by the agencies supporting the work of the Board and also to the Companies' web sites. More frequent individual contacts with basin stakeholders by the Boards' local membership has added a distinctly positive improvement to the Boards' communications ability. There was very good communication between the Companies and the Boards concerning routine regulation activities and Boise Cascade's February 15 – March 15 water management plan for the shutdown of the International Falls powerhouse to accommodate the replacement of obsolete electrical switchgear.

4.2 Boise Cascade and Abitibi-Consolidated Initiatives

The Companies continue to be actively responsive to public information needs. Flow changes and gate openings at Rainy and Namakan lakes are announced on radio stations CFOB in Fort Frances and KGHS in International Falls. Large flow changes on the Seine River are announced on radio station CKDR in Dryden, ON. A toll-free telephone information line is maintained from May 01 to October 31 to provide the public with information on water levels for Rainy and Namakan Lakes. This lake level information line includes daily-recorded messages with information on lake elevations and outflows for Rainy and Namakan Lakes, precipitation levels and spillway gate operations for the dams at International Falls/Fort Frances and Kettle Falls. This information can be accessed by calling 1-800-274-LAKE (1-800-274-5253). In addition to the toll-free number, lake level graphs for Rainy and Namakan Lakes, through the courtesy of the Lake of the Woods Control board web site (http://www.lwcb.ca) are published weekly in the *Fort Frances Times* and *International Falls Daily Journal* from early spring to late fall. Lake level information is also printed in the *Atikokan Progress*. In addition, Boise Cascade provides this information on its website (http://lakes.bc.com). Lake level and flow data for the Seine River tributary to Rainy Lake is provided on a website (http://www.seineriverwmp.com/) operated by Abitibi-Consolidated and the Valerie Falls Limited Partnership (VFLP). VFLP is owned by the Great Lakes Power Incorporated (Brascan Power Corporation).

4.3 Meetings

This section contains brief summaries of key meetings and functions attended by the Boards and their staff.

Board Conference Calls and Meetings

The Boards held four joint conference calls and one joint meeting during this reporting period. The conference calls were conducted on October 13, 2004, February 11, 2005, March 7, 2005, and March 29, 2005. Key topics of discussion included work on the Boards' Fall 2004 and Spring 2005 Reports to the IJC, preparations for the Fall and Spring semi-annual meetings of the IJC, Rainy River hydropower peaking, improvements to the Boards' web sites, preparation of the 3rd and 4th Quarter Newsletters, Lake of the Woods Water Quality Forum, Man-O-Min Conference, and membership of the IRLBC and IRRWPB. The Boards also met on October 21, 2004 in Ottawa to finalize their presentation for the fall semi-annual meeting of the International Joint Commission.

IJC Fall Semi-Annual Meeting – October 21, 2004

IRLBC and IRRWPB members and staff attended the fall semi-annual meeting of the IJC in Ottawa on October 21, 2004. The boards presented their Fall 2004 Report to the Commission along with an update on basin hydrologic conditions and suggestions to improve the usability of the Boards' web sites. 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. The primary topics of discussion from the Boards' Fall 2004 Report to the IJC included results of 2003 water quality monitoring on the Rainy River and an update on the Boards' examination of hydropower peaking on the Rainy River. Commissioners also expressed interest in Lake of the Woods water quality concerns that have been voiced recently by public groups in that basin.

5 OTHER BUSINESS

Colonel Robert L. Ball completed his three-year tour as District Engineer of the St. Paul District, Corps of Engineers on June 25, 2004 and assumed the duties of Deputy Commander of US Army Alaska at Fort Wainwright, Alaska. Effective on the same day, he also resigned his appointment to the IRLBC. Colonel Michael F. Pfenning assumed command of the St. Paul District on July 30, 2004 and was appointed by the IJC to replace Colonel Ball as Co-Chairman of the IRLBC, effective August 1, 2004. During the interim between Colonel Ball's resignation and Colonel Pfenning's appointment to the IRLBC, the Board seat was vacant.

Steven Richardson resigned his appointment to the IRLBC, effective on October 12, 2004. Mr Richardson had served as a Canadian local member of the Board, since his appointment by the Commission on December 9, 2003. At this time, the IJC has not named a successor to fill the vacant seat on the board.

Kathy Svanda submitted a letter of resignation from the IRRWPB in October 2004. Subsequently, the IJC accepted her resignation. Effective April 16, 2005, Nolan Baratono, Rainy River Basin Coordinator for the Minnesota Pollution Control Agency (MPCA) will succeed Ms. Svanda as the IRRWPB State representative.

Jeff Stoner of the United States Geological Survey was appointed to the IRRWPB, effective March 18, 2005. Mr. Stoner succeeds Jo-Lynn Traub as the IRRWPB Federal representative for the United States.

APPENDIX

NOTE

All precipitation, water level and flow data used in the text and figures of this report were taken from the database of the Secretariat of the Lake of the Woods Control Board. At the time of preparation of this report, this data was still provisional and subject to revision.

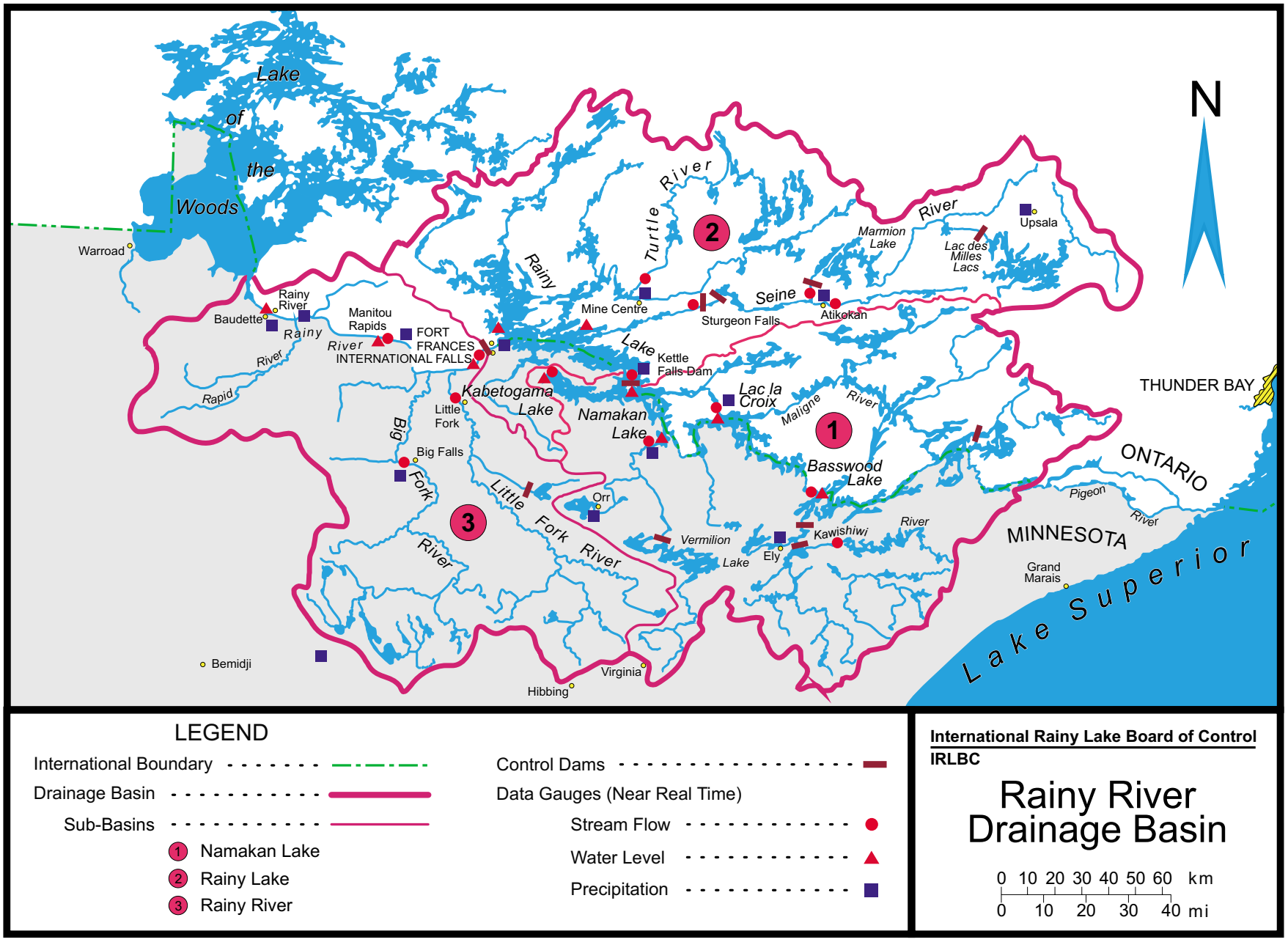
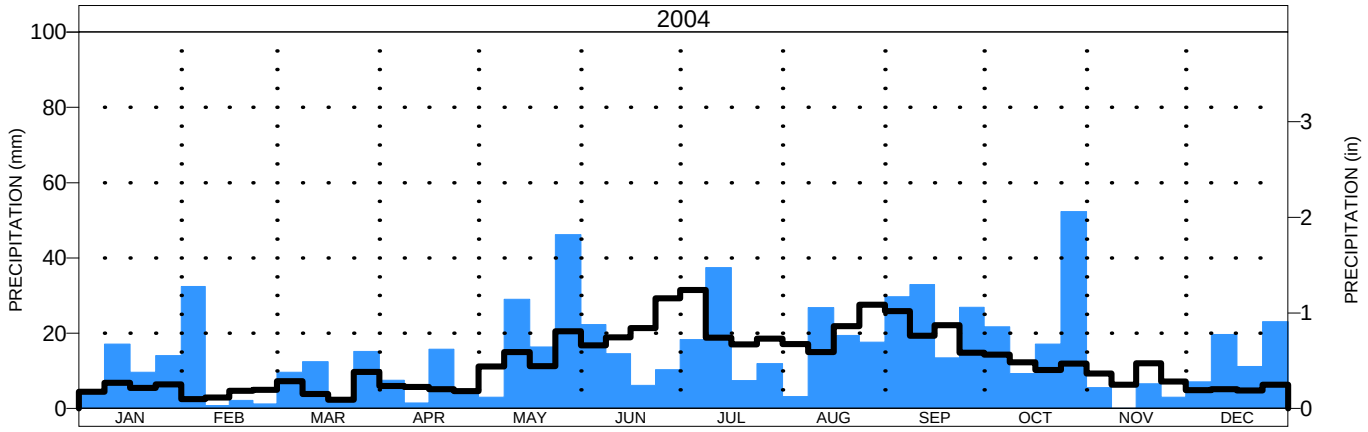

Lake of the Woods
Warroad
Baudette
Rainy River
Rainy River
Rapid River
Manitou Rapids
FORT FRANCES
INTERNATIONAL FALLS
Rainy Lake
Kabetogama Lake
Little Fork
Big Fork River
Big Falls
Namakan Lake
Kettle Falls Dam
Mine Centre
Turtle River
Sturgeon Falls
Seine River
Atikokan
Marmion Lake
Lac des Milles Lacs
Upsala
Lac la Croix
Maligne River
Basswood Lake
Orr
Little Fork River
Vermilion Lake
Ely
Kawishiwi River
Pigeon River
ONTARIO
MINNESOTA
THUNDER BAY
Grand Marais
Lake Superior
Bemidji
Hibbing
Virginia
1
2
3
N
LEGEND
International Boundary
Drainage Basin
Sub-Basins
1 Namakan Lake
2 Rainy Lake
3 Rainy River
Control Dams
Data Gauges (Near Real Time)
Stream Flow
Water Level
Precipitation
International Rainy Lake Board of Control
IRLBC
Rainy River Drainage Basin
0 10 20 30 40 50 60 km
0 10 20 30 40 mi

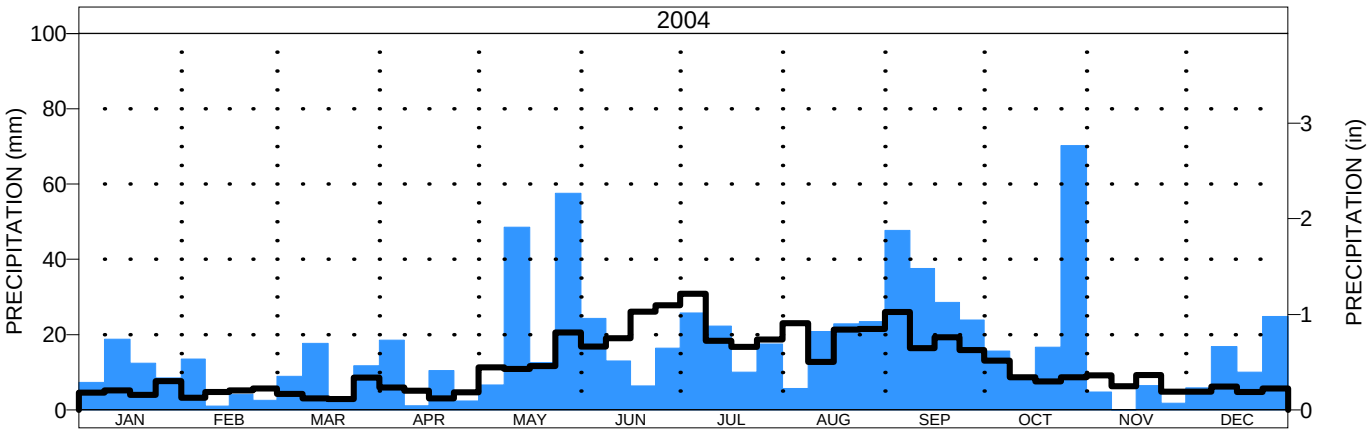
Figure 1

LWCB
Lake of the Woods
Control Board

LAC LA CROIX PRECIPITATION



RAINY-NAMAKAN PRECIPITATION



*A legend is displayed in Figure 5.

Figure 2

LWCB
Lake of the Woods
Control Board

NAMAKAN LAKE

** Provisional Data **

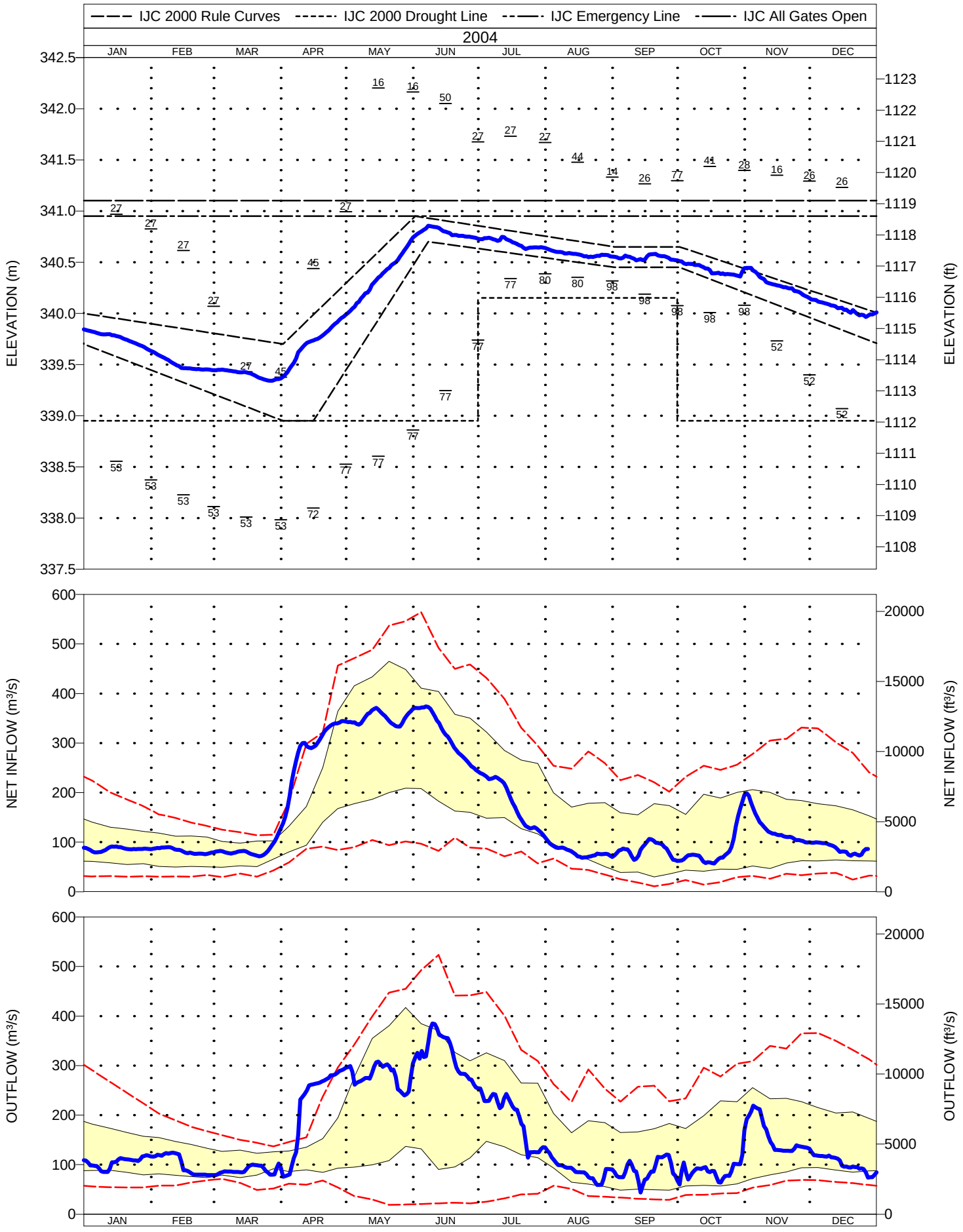


Figure 3

LWCB
Lake of the Woods
Control Board

RAINY LAKE

** Provisional Data **

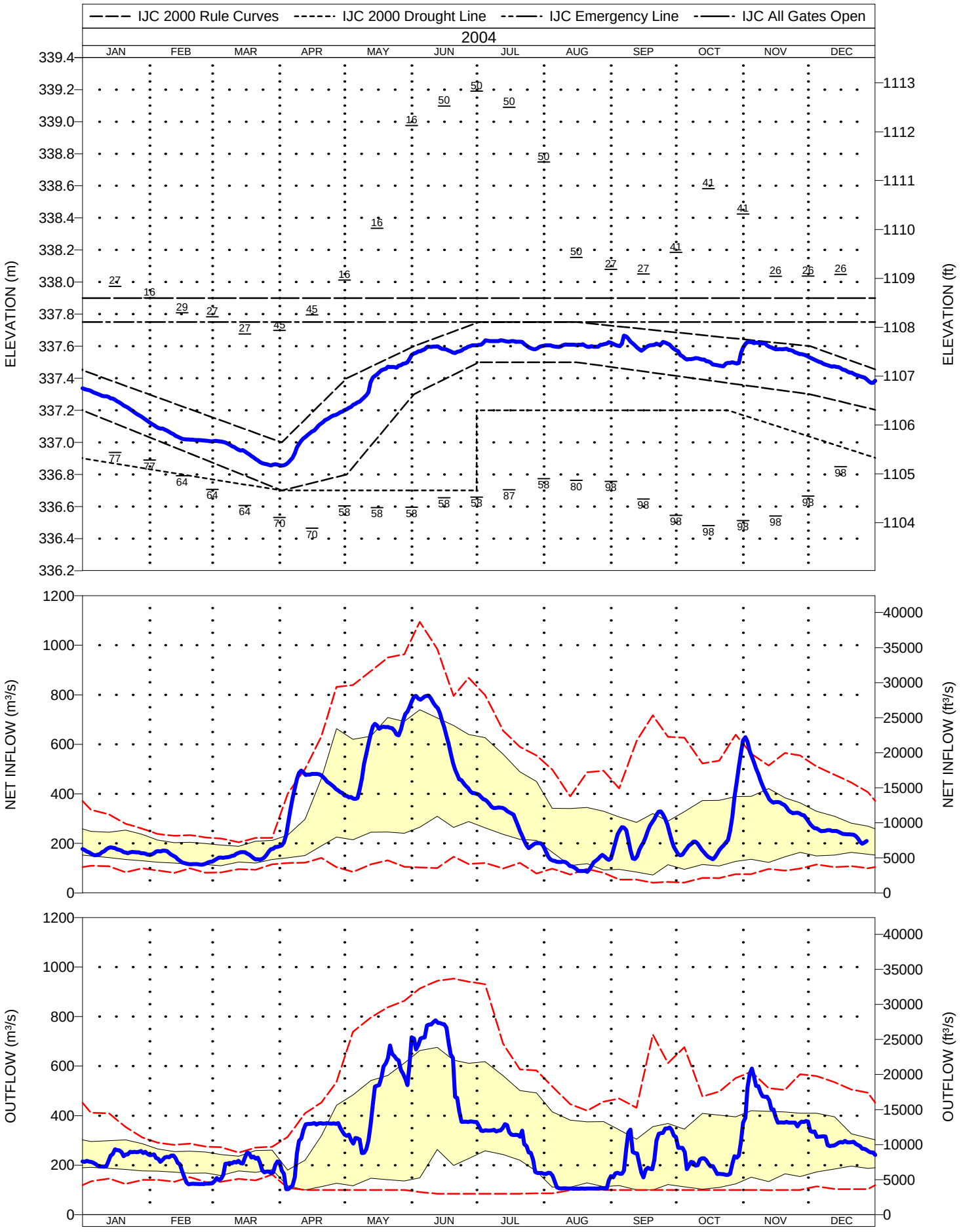


Figure 4

LWCB
Lake of the Woods
Control Board

LEGEND - LAKE AND RIVER GRAPHS

PRECIPITATION

Actual data for year shown, plotted as quarter-month totals
(last quarter-month is usually incomplete)

Statistical Median - precipitation has been below this line 50% of the time

WATER LEVELS & FLOWS

Actual Data

Actual data for year shown
- levels are 1-day main lake means plotted daily
- inflows are 7-day means
- outflows are daily values

Rule Curves (Namakan & Rainy Lakes)

IJC 2000 Upper & Lower Rule Curves

IJC 2000 Drought Line

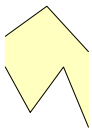
IJC Upper Emergency Level

IJC "All Gates Open" Level

Statistical Data

50 — Maximum level recorded and its year of occurrence

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

77 — Minimum level recorded and its year of occurrence

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

All statistical flows are based on quarter-monthly means.

Percent data is based on the period 1970-1999.

Datums for water levels are:
- Namakan Lake - USC&GS (1912) datum
- Rainy Lake - USC&GS (1912) datum

Figure 5