

INTERNATIONAL RAINY LAKE BOARD OF CONTROL

NEWSLETTER

REVIEW OF THE IJC ORDER FOR RAINY & NAMAKAN LAKES

Number 6

November, 1999

This is the sixth (and last) in a series of periodic newsletters concerning the review of the rule curves used to manage the water levels of Rainy and Namakan lakes. The study was initiated in 1996 at the request of the International Joint Commission (IJC), in response to a proposal for change by the Rainy/Namakan Water Level International Steering Committee (SC).

Comments on the Draft Final Report

The Board's Draft Final Report was issued in April, 1999. The draft recommendations from the report were presented at a public meeting in Fort Frances on April 28th. Public comment was welcomed through to July 30th, and the IJC held a Public Hearing in Fort Frances on July 7th.

The key recommendations in the Draft Final Report called for the adoption of, on Namakan Lake, essentially the Steering Committee proposed rule curves, but with a wider ascending rule curve band during the spring, and on Rainy Lake, essentially the existing IJC rule curves. The bulk of the comments received focussed on these rule curve recommendations and on one other recommendation; that regulation operations within the rule curve bands be at the sole discretion of the dam owners. The proponents of change wanted the original proposed SC curves on Namakan, citing harm to the pike fishery and reduced dock access with the wider ascending rule curve limb. They wanted some fall drawdown on Rainy and, if not the earlier spring refill proposed by the SC, then at least a requirement to be at the upper limit of the existing curves in the spring. Again, adverse impacts to the fishery, and also other environmental impacts, were cited. The proponents were vigorously opposed to the sole discretion recommendation.

The dam owners strongly supported the sole discretion recommendation, citing the current problems it would solve. They agreed with the recommended Rainy rule curves but opposed the recommended Namakan rule curves.

Both a property owners association and a sailing club on Rainy-Namakan supported the recommendations. The recommendations were also consistent with the compromise suggested by the Lake of the Woods Control Board, but some property owners on the Winnipeg River objected to that Board's suggestion and preferred no change.

Additional Analysis

After assessing the comments received, the Board concluded that the bulk of its draft recommendations still had merit. The study mandate from the Commission had not been for a full evaluation of all possible regulation alternatives, but instead was limited primarily to an assessment of the proposed Steering Committee rule curves versus the existing curves. It was understood that the administration of lake regulation would remain essentially unchanged; that is, the IJC would issue a regulation order to be followed by the dam owners, and the Board would continue in a monitoring role. It was further understood that, as with the existing 1970 Order, water level objectives would be sufficiently addressed by the rule curve band itself. Rather than having additional target levels within the bands, this area would be for operational flexibility alone.

In this context the Board found its draft recommendations still to be appropriate. However, it also felt that a better solution was possibly within reach by somewhat expanding the study mandate. The Board thought that some relatively minor revisions might be made to the recommended rule curves that, when combined with appropriate operational policy within the rule curve bands, might better achieve some of the environmental objectives without significantly worsening the negative impacts elsewhere. In addition, if the Commission was prepared to consider an expanded role for its Board, the Board thought that the main objectives of the "sole discretion" recommendation might be met in a more acceptable manner. Consequently, the Board decided to do some additional analysis.

Through limited additional modelling, attention was focussed on what revisions might be made to the previously recommended Rainy Lake rule curves to improve the chances of meeting fish spawn criteria in the spring, and also to introduce limited drawdown in the fall to improve spawning habitat. The constraints were: to keep the Rainy Lake outflow pattern as close as possible to that resulting from the draft recommendations, to limit any increase in flood peaks on Rainy, and to maintain navigation depth on Rainy through most of the navigation season. By a trial and error procedure, revised curves were developed. The main changes involved advancing the upper rule curve in the spring season to the middle of the proposed SC band on May 1st as a typical ice-out date, and providing for limited drawdown in the mid-August to end-November period. Modelling results with these revisions did not show any increase in peak flood levels on Rainy or any significant shift in the spring outflow pattern when targeting for the middle portion of the rule curve band, but did reduce Boise - Abitibi annual generation by a further 0.2% (down 2.3% compared to the existing rule curves). Overall, compared to the draft recommendations, the revised curves create the potential for enhanced fish spawn levels in the spring without necessarily increasing flood risk or impacting on downstream interests, and produce some useful fall drawdown without unduly hampering navigation.

Coupled with this, a strategy was developed for regulation operations within the rule curve bands. This would call for operations to normally target the middle portion of the band, but would permit targets close to the band limits, subject to Board authority, to meet certain objectives. Normally targeting the middle portion of the band would maximize the dam owners' ability to respond to hydrologic events. Flexibility would be available for how the level is returned to the middle portion after a hydrologic event has caused the level to move close to either rule curve. At the same time, other parties need not be concerned that the level will continually be operated at one extreme or the other of the band. The middle of the band on Namakan Lake during the springtime rising limb meets levels sought by the Steering Committee for the fish spawn, while the middle of the revised band on Rainy Lake during the fall would provide no lower navigation depths than those that could occur with the existing 1970 rule curves. At the same time, with Board approval, it would be possible to target elsewhere in the band for

specific purposes. The level could be drawn down within the band in anticipation of heavy runoff. The level could be allowed to rise higher within the band in the spring if the runoff is favourable and the flood risk not deemed to be high. This would mean that, on Rainy Lake, levels in the middle of the Steering Committee's preferred range for the spring spawn would be possible. However, if runoff was low or delayed, the level could be allowed to slip lower in the band, thereby not unduly penalizing downstream interests. The levels and outflows sought by any particular interest would not be met in every year. They would not be in a state of nature either. Nevertheless, the desires of most interests could be met in a number of years, when the hydrology makes it possible and appropriate.

Final Report

The Board's Final Report was issued to the IJC on October 26, 1999. It contains all the information in the Draft Final Report, plus: a summary of all comments received and the Board's response, detail on the additional analysis conducted, and two sets of recommendations, Option A and Option B. Option A is the draft set of recommendations, with minor revisions, in response to the original study mandate. Option B is the result of the additional work. It is the Board's preferred option, but is only viable if the Commission agrees with the expanded terms of reference, the altered mode of operation and the additional role for the Board. These two options were presented to the Commission for its consideration on November 2nd.

The Board's work on this study is now complete. The two options presented to the IJC follow:

Option A

A1. The recommended rule curves shown on Figure 1 should be adopted. On Namakan Lake, these are essentially the proposed International Steering Committee rule curves but with a wider band (time-delayed lower rule curve) during the spring refill period. On Rainy Lake, these are essentially the existing IJC rule curves.

A2. The minimum outflow criteria for Namakan Lake should be expressed in terms of the total Namakan Chain of Lakes outflow rather than in terms of the Kettle Falls outflow, so that the

Figure 1

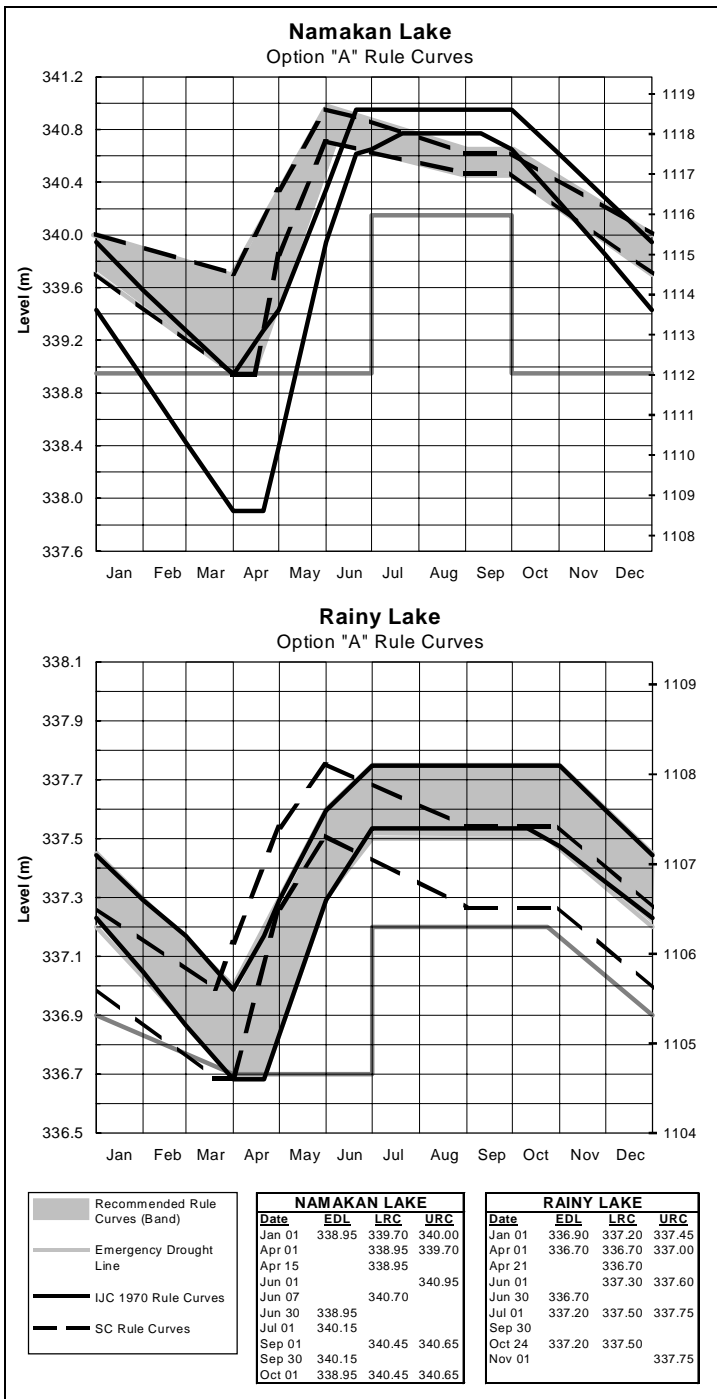
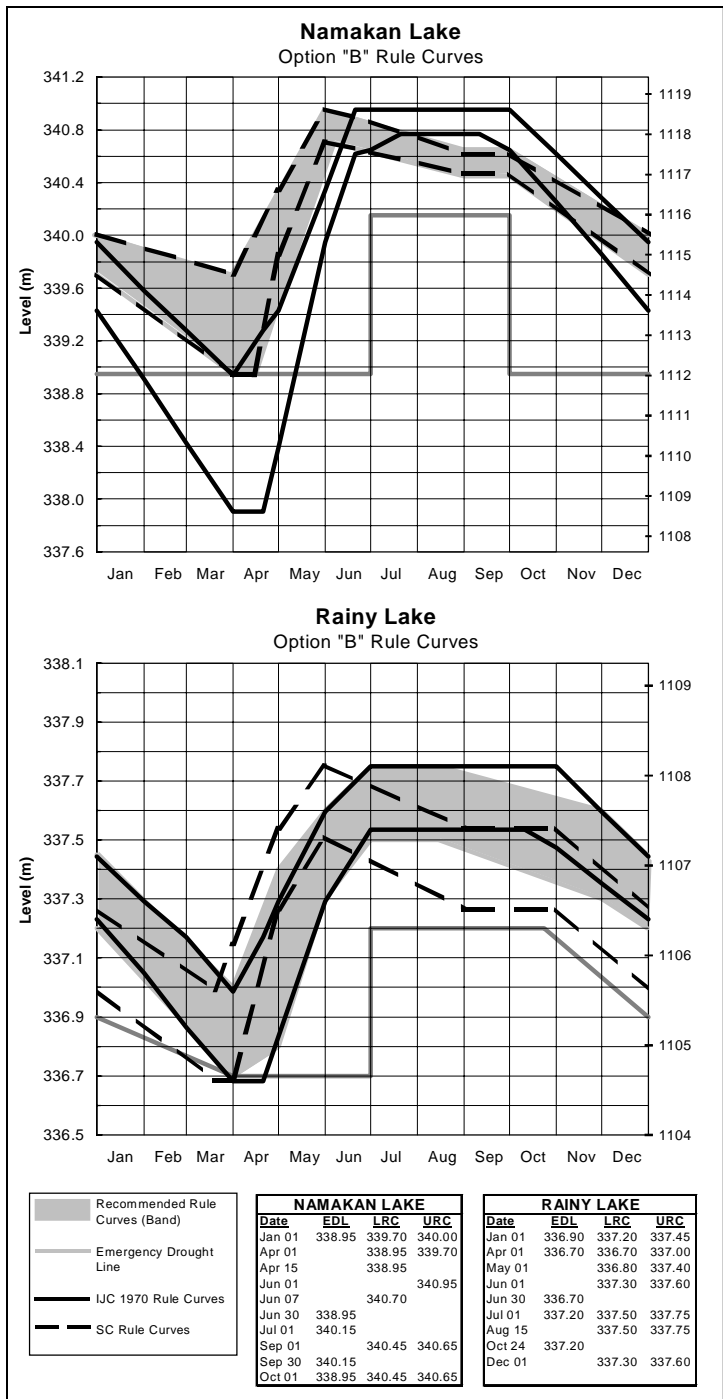


Figure 2



overflows from Gold and Bear Portage are accounted for.

A3. The minimum outflow criteria should be revised as follows for both lakes. On Namakan Lake, the outflow should be reduced to 30 m³/s instantaneous whenever the lake level is below the Lower Rule Curve, and should be further reducible, at the discretion of the IRLBC but no lower than 15

m³/s, whenever the lake level is below the Emergency Drought Line (EDL) shown on Figure 1. On Rainy Lake, the outflow should be reduced to 100 m³/s instantaneous whenever the lake level is below the LRC, and should be further reducible, at the discretion of the IRLBC but no lower than 65 m³/s, whenever the lake level is below the EDL shown on Figure 1. Before reducing the outflow further at the EDL, the Board should consult with the

resource agencies and affected municipalities. (The current seasonal and diurnal criteria would be eliminated.)

A4. Any new rule curves adopted should be implemented on a trial basis. The length of the trial could be for a defined period, or linked to certain hydrological extremes occurring during the trial period, but in any case should not be shorter than 10 years so that a range of events can be experienced and adaptations of the biological community can begin to be identified.

A5. Monitoring programs should be implemented by the resource management agencies in accordance with the recommendations of the fisheries and environmental resources experts to enable the impacts of new rule curves on the biological and aquatic communities to be identified, and to provide an adequate source of information for future reviews.

A6. The Order should state that, within the rule curve operating bands, regulation operations are to be solely at the discretion of the dam owners in accordance with basin conditions. The flexibility intended to be offered by these bands for responding to basin conditions and local needs should not be constrained by any additional rules. (The requirement of the existing Order that high and low inflows be anticipated insofar as possible, and outflows thus be set to avoid as far as possible the occurrence of emergency conditions, should be continued.)

Option B

B1. The recommended rule curves shown on Figure 2 should be adopted. On Namakan Lake, these are essentially the proposed International Steering Committee rule curves but with a wider band (time-delayed lower rule curve) during the spring refill period. On Rainy Lake, these are essentially the existing International Joint Commission 1970 rule curves, but with a slightly wider band during the refill period (time-advanced upper rule curve), and with a modest amount of drawdown in the late summer and fall period.

B2. Within the rule curve operating bands, the dam owners should regulate so as to normally target for levels in the middle portion of the band. Level targets set elsewhere within the band should be

subject to the approval of, or at the request of, the International Rainy Lake Board of Control, on behalf of the International Joint Commission. (This does not mean that the lake level should always be in the middle of the band. In fact, due to variable inflows and operational needs, much of the time it will not be. However, the middle area is a more desirable target than the rule curve extremes on a long term basis because of the buffer it provides. Targeting elsewhere in the band, or operating elsewhere in the band, may be desirable from time to time in response to hydrologic conditions or to meet certain short term objectives, but all such deviations should be at the discretion of the Board.)

B3-B6. Identical to Recommendations A2-A5.

In Option B, the recommendations have been re-ordered to stress the importance of treating B1 and B2 as a pair. If B1 was implemented without B2 (or equivalent) so that additional requirements might subsequently be imposed directing the companies to always operate at the upper rule curve in the spring period, both the flood risk on Rainy Lake and the negative impacts (including environmental) on the downstream areas would definitely be increased. The revised springtime rule curve makes it possible to achieve more desirable fishery conditions in years when the hydrology favours such action, but the operating policy ensures that this is not a requirement in every year, to the detriment of other objectives.

*The Final Report can be found on the Board's Web page:
www.mvp-wc.usace.army.mil/ijc/rainylake.html*

Questions? Contact the Board's Engineering Advisors:

*Rick Walden
Environment Canada
4th Floor, 351 St. Joseph Boulevard
Hull, Quebec K1A 0H3
Phone: 819 997-2529
Fax: 819 953-4666
E-mail: rwalden@lwcb.ca*

*Ed Eaton
U.S. Army Corps of Engineers, St. Paul District
190 Fifth Street East
St. Paul, Minnesota 55101 - 1638
Phone: 651 290-5617
Fax: 651 290-5841
E-mail: edward.g.eaton@usace.army.mil*
