

**Adopted Regulation Strategy  
Lake of the Woods Control Board  
October 15, 2015**

The Lake of the Woods Control Board held a Regulation Meeting on October 15, 2015 in Kenora and adopted a regulation strategy for the winter period. The strategy was formulated considering basin conditions, hydrological and meteorological forecasts, and the input of the various interests concerned with basin management. Input was provided in written and verbal reports as well as from the Board's Regulation Guide: (<http://www.lwcb.ca/reg-guide/index.html>).

For an update on current conditions, please refer to the Basin Data section of the Board's web site at <http://www.lwcb.ca/waterflowdata.html>. For regulation actions and directives taken under the strategy please see the Regulation Actions at <http://www.lwcb.ca/regulation/index.html>.

### **Lac Seul**

#### ***A) Seasonal Considerations***

Ideal or desirable regulation objectives for the next several months, based on input provided to the Board, include the following:

- Operate Lac Seul primarily as a hydropower reservoir to benefit downstream hydropower plants in Ontario and Manitoba, but with consideration of other interests, such as the fishery.
- To the extent possible, limit winter drawdown on Lac Seul to provide good spring spawning conditions and protect eggs of fall spawning fish (i.e. to minimize whitefish egg exposure and mortality).
- Regulate Lac Seul outflow to assist in providing satisfactory freeze-up conditions on the English and Winnipeg Rivers (for both level concerns and to avert frazil ice problems) as well as on Lac Seul.
- Use Lac Seul storage to offset Lake of the Woods high/low outflow for the benefit of users of the Winnipeg River in Manitoba.
- Avoid closing the Lake St. Joseph diversion with resulting spill down the Albany River.

#### ***B) Adopted Strategy***

The regulation of Lac Seul over the winter should balance drawdown for fishery benefits and hydropower flow requirements and preferences. Preferred hydropower flows on the English system are: 300-370 m<sup>3</sup>/s at Ear Falls through the core winter period and decreasing into March and April; below 550 m<sup>3</sup>/s at Manitou Falls and below 640 m<sup>3</sup>/s at Caribou Falls. These flows should be achievable under normal inflow conditions. Should low inflow conditions develop between now and freeze-up, this outlook could change.

##### **i) Short-term Regulation (up to freeze-up; typically mid to end November)**

- Maintain outflows close to those desirable for winter outflow and gradually adjust in order to meet end-of-winter drawdown targets.

- Maintain outflow no lower than 150 m<sup>3</sup>/s.
- The Lac Seul freeze-up level should preferably be no higher than 356.5 m / 1169.6 ft with outflow no higher than 400 m<sup>3</sup>/s and Winnipeg River flows in Manitoba below 1400 m<sup>3</sup>/s (to avoid frazil ice problems).
- Target an end-of-October level between 356.2 and 356.3 m / 1168.6 ft and 1169.0 ft (approximately 35<sup>th</sup> to 40<sup>th</sup> percentile) to hedge against the potential for a drier than normal winter due to El Niño. Recent years have targeted a level between 356.0 and 356.2 m / 1168.0 ft and 1168.6 ft (25<sup>th</sup> to 35<sup>th</sup> percentile). The slightly higher target level was adopted in order to supply water for the preferred winter flows due to potentially lower than normal inflow.
- If inflow increases and the lake level rises above median, increase outflow as appropriate to provide a reasonable balance between increased outflow and higher lake level, with due consideration of required winter outflow and spring target levels.

#### ii) End-of-winter Levels (typically mid-April)

- For fishery interests, the preferred minimum end-of-winter level is no lower than 354.8 m / 1164 ft (approximately 45<sup>th</sup> percentile) and the preferred drawdown is about 1.5 m / 4.9 ft after November 1.
- For the hydropower utilities, the flow available for generation is more important than target water levels. For hydropower operations, water in storage down to 353.6 m / 1160.1 ft, the bottom of the defined “normal operating range”, would be regarded as available to supply winter generation flows to the extent needed to augment inflow. During a drought, some or all of the defined drought reserve (down to 352.4 m / 1156.17 ft) would be regarded as available. The actual end-of-winter level will vary depending on the winter inflow received and the balances made between the interests, as noted in sections iii) to v) below.
- Due to the potential for drier conditions over the winter, and the potential for less than normal snow melt, the Lac Seul end-of-winter level target range is between 354.6 m / 1163.4 ft and 354.7 m / 1163.7 ft (approximately 35<sup>th</sup> to 40<sup>th</sup> percentile). This remains consistent with target levels in use since 2009, but could result in an overwinter drawdown between 1.5 m and 1.7 m / 4.9 ft and 5.6 ft, which is slightly more than usual. By drawing the lake level down more, the Board would be favouring flood control over whitefish interests; the former has been a greater concern over the last several years. Overwinter drawdown in 2014-15 was 1.51m / 5.0 ft from November 1, 2014 to April 15, 2015.
- The end-of-winter target level for Lac Seul will be re-evaluated in March at the LWCB Regulation meeting to take into account conditions and forecasts at that time.

#### iii) Low Inflow Winter Conditions

- Winter outflow should be no lower than 150 m<sup>3</sup>/s, with a core winter flow no lower than 230 m<sup>3</sup>/s.
- Combined with Lake of the Woods regulation, winter core period flows on the Winnipeg River in Manitoba should be no lower than 450 m<sup>3</sup>/s to meet minimum winter peak power demands with an end-of-winter elevation no lower than 354.6 m / 1160.1 ft.

- If flows are greater than 675 m<sup>3</sup>/s on the Winnipeg River in Manitoba, the end-of-winter elevation should be allowed to decline to no lower than 354.35 m / 1162.6 ft (lower decile).
- Core winter minimum outflow requirements for the Winnipeg River in Manitoba should not prevent accomplishing drawdown targets in the spring under this scenario.

iv) Moderate Inflow Winter Conditions

- Winter outflow should be between 200 and 450 m<sup>3</sup>/s with a core winter flow of between 300 and 400 m<sup>3</sup>/s.
- The end-of-winter elevation should be allowed to decline to no lower than 354.5 m / 1163.1 ft (lower quartile) to meet Winnipeg River flow targets.
- Combined with Lake of the Woods regulation, winter core period flows on the Winnipeg River in Manitoba should be between 800 and 960 m<sup>3</sup>/s.
- If there is excess water downstream, water should be stored in Lac Seul subject to targeting for an end-of-winter level no higher than 355.2 m / 1165.3 ft, and preferably no higher than 355.0 m / 1164.7 ft, subject to flood risk constraints.

v) High Inflow Winter Conditions

- Regulate Lac Seul outflow to as high as 500 m<sup>3</sup>/s to prevent the lake exceeding an end-of-winter level of 355.2 m / 1165.3 ft.
- If 500 m<sup>3</sup>/s is insufficient outflow to stay below 355.2 m / 1165.3 ft, aim to limit or close the diversion into Lac Seul whether or not the Lake St. Joseph diversion is under LWCB authority. (Note: The Board only has authority to restrict diversion flow when Lac Seul exceeds certain levels as defined in the Lake of the Woods Control Board Act. However, Manitoba can restrict diversion flow when Winnipeg River flows in Manitoba exceed 963 m<sup>3</sup>/s and OPG can also be requested to restrict diversion flow voluntarily.)
- Once the diversion is closed, increase outflow to the extent necessary to ensure that the end-of-winter lake level is no higher than 355.3 m / 1165.7 ft.
- Combined with Lake of the Woods regulation, strive to keep Winnipeg River flows in Manitoba below 1600 m<sup>3</sup>/s through the winter.

## Lake of the Woods

### A) Seasonal Considerations

The points below set out a number of ideal or desirable regulation objectives. As with Lac Seul, some objectives are incompatible and trade-offs may be necessary.

Ideal or desirable regulation objectives for the next several months, based on input provided to the Board, include the following:

- Adjust lake level and outflow to achieve a balance between upstream and downstream interests, as inflow dictates. Plan winter drawdown to provide the appropriate balance between the various interests.
- Regulate Lake of the Woods outflow to assist in providing satisfactory freeze-up conditions on the Winnipeg River to avoid frazil ice problems and a high freeze-up level.

- Limit winter drawdown on the lake to provide good spring spawning conditions and to protect the eggs of fall spawning fish.
- Limit winter drawdown to the extent possible to reduce damage from ice.
- Within the regulation parameters for Lake of the Woods, regulate outflow to assist in meeting targets/preferences for the Winnipeg River in Manitoba.

### *C) Adopted Strategy*

#### i) Short-term Regulation (up to freeze-up; typically mid to end November)

- If dry conditions persist, conserve water to the extent possible, while balancing upstream and downstream interests.
- Target for a Lake of the Woods level at freeze-up between 322.6 and 322.8 m / 1058.4 to 1059.1 ft with outflow preferably between 150 and 420 m<sup>3</sup>/s and Winnipeg River flows in Manitoba no higher than 960 m<sup>3</sup>/s. If high or low inflow precludes the preferred conditions, then adjust both level and outflow without deviating from the target range more than necessary.
- Due to the potential for drier conditions over the winter due to El Niño, the freeze-up level should be closer to the upper end of the range cited above in order to provide the preferred flows over the winter.
- Combined with Lac Seul regulation, strive to keep Winnipeg River flows in Manitoba below 1400 m<sup>3</sup>/s during the critical ice cover formation period to prevent frazil ice problems.
- Due to concerns over freezing of domestic water lines along the Winnipeg River during some recent years, avoid setting Lake of the Woods outflow below 250 m<sup>3</sup>/s, if feasible, before an insulating layer of ice and snow forms on the river late in the year.

#### ii) End-of-winter Levels (typically end-March)

- The Board's approach in recent years has been to aim for somewhat lower summer levels. To achieve this in the long term, the overall level range should be moved downward. The end-of-winter level, based on factors other than winter inflow, is ideally 322.38 m / 1057.7 ft (lower quartile) and preferably no higher than 322.49 m / 1058.0 ft (median). However, the actual end-of-winter level will vary depending on the winter inflow received, as noted in sections iii) to v) below.
- The preferred end-of-winter level for fishery interests as defined by the OMNRF is no lower than 322.5 m / 1058.0 ft, subject to consideration of potential negative impacts downstream. In addition, for fall spawning fish, the preferred maximum drawdown during the winter is no more than 30 cm / 1.0 ft. However, for south shore property owners, who would like to see lower summer levels, lower end-of-winter levels would be preferable. The Minnesota DNR supports this position and has stated that lower water levels do not negatively impact the fishery in their portion of the lake.
- Due to the potential for drier than normal conditions over the winter, and the potential for less than normal snow melt, the end-of-winter target level should be slightly higher than the ideal cited above at 322.42 m / 1057.8 ft, or 30<sup>th</sup> percentile. This target should be re-evaluated at the March 2016 regulation meeting based on snowpack conditions and forecasts.
- The preferred winter flow for H2O Power LP, to maximize their hydropower production, is 400 to 420 m<sup>3</sup>/s at the Lake of the Woods outlet. OPG would prefer flows closer to

385 m<sup>3</sup>/s at Whitedog Falls and Manitoba Hydro's flow preference for the Winnipeg River in Manitoba is 960 m<sup>3</sup>/s.

- The end-of-winter target level should be adjusted upward (no higher than upper quartile, 322.60 m / 1058.4 ft) to relieve high flows on the Winnipeg River downstream in Ontario and Manitoba by storing water in the lake. In contrast to this, avoid storing more water than is necessary if seasonal snowpack accumulation is high. Although the refill of Lake of the Woods is more dependent on spring rainfall than on snowpack, higher snowpack does increase the risk of high early spring freshet runoff.

iii) Low Inflow Conditions

- Winter outflow should be no lower than 125 m<sup>3</sup>/s and preferably no lower than 200 m<sup>3</sup>/s.
- If outflow is greater than 125 m<sup>3</sup>/s, the end-of-winter elevation should be no lower than 322.34 m / 1057.5 ft (lower decile).
- Combined with Lac Seul regulation, try to achieve winter core period flows on the Winnipeg River in Manitoba no lower than 450 m<sup>3</sup>/s to meet winter peak period power demands, with Lake of the Woods drawn no lower than lower decile (322.34 m / 1057.5 ft) to achieve this. Likewise, augment flows to achieve 675 m<sup>3</sup>/s with an end-of-winter level no lower than lower quartile (322.38 m / 1057.7 ft).

iv) Moderate Inflow Conditions

- Winter outflow should be between 300 and 700 m<sup>3</sup>/s with a preferred end-of-winter level of lower quartile (322.38 m / 1057.7 ft), but not above median (322.49 m / 1058.0 ft).
- Combined with Lac Seul regulation, winter core period flows on the Winnipeg River in Manitoba should be between 800 and 960 m<sup>3</sup>/s.

v) High Inflow Conditions

- While trying to target for an end-of-winter level no higher than upper quartile (322.60 m / 1058.4 ft), balance higher water levels on the lake with the impact of increased outflow downstream, both in Ontario and Manitoba.
- Combined with Lac Seul regulation, strive to keep Winnipeg River flows in Manitoba below 1600 m<sup>3</sup>/s through the winter.