

**Adopted Regulation Strategy
Lake of the Woods Control Board Regulation Meeting
October 17, 2013**

The Lake of the Woods Control Board held a Regulation Meeting on October 17, 2013 in Kenora. 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, adequate navigation levels at the start of the walleye fishing season and protection of 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 for Lac Seul

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 -330 m³/s capacity at Ear Falls until March, 500-550 m³/s at Manitou Falls and 560-600 m³/s at Caribou Falls – should be achievable under normal inflow conditions. Should low inflow conditions develop between October 17, 2013 and freeze-up, this outlook could change.

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

- Gradually adjust outflows to those desirable for winter outflow and end-of-winter drawdown targets.
- Maintain outflow no lower than 150 m³/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 m³/s and Winnipeg River flows in Manitoba below 1400 m³/s (to avoid frazil ice problems).
- If the lake level remains 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.
- Through management of the Manitou Falls forebay, maintain Pakwash Lake level no higher than 346.4 m / 1136.5 ft for normal flows, and below 346.6 m / 1137.1 ft, if possible, under higher flow conditions.

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, a 55th percentile level and the preferred drawdown limit 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 recent high water events and the persistent, high inflow this fall, it is recommended that Lac Seul end-of-winter level be limited to a maximum of 355.0 m / 1164.7 ft, and preferably be no higher than 354.7 m / 1163.7 ft consistent with targets since 2009. Overwinter drawdown in 2012-13 was from 356.15 m / 1168.5 ft to 354.64 m / 1163.52 ft, a decline of 1.51 m / 5.0 ft. A summary of over-winter drawdown criteria is presented graphically in Figure 1.

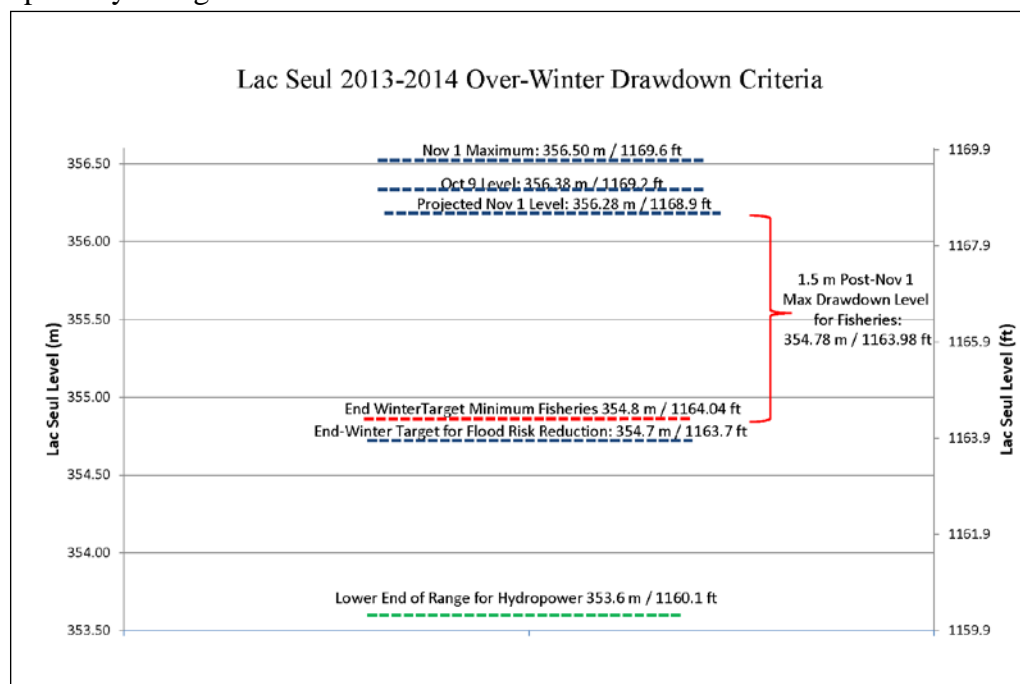


Figure 1. Lac Seul Drawdown Criteria

- The end-of-winter target level for Lac Seul should 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 m³/s, with a core winter flow no lower than 230 m³/s.
- Combined with Lake of the Woods regulation, winter core period flows on the Winnipeg River in Manitoba should be no lower than 450 m³/s to meet minimum winter peak power demands with an end-of-winter elevation no lower than 353.6 m / 1160.1 ft.
- If flows are greater than 675 m³/s on the Winnipeg River in Manitoba, the end-of-winter elevation should be allowed to decline to no lower than 354.3 m / 1162.3 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 m³/s with a core winter flow of between 300 and 400 m³/s.
- The end-of-winter elevation should be allowed to decline to no lower than 354.4 m / 1162.8 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 m³/s.
- If flows are greater than 960 m³/s on the Winnipeg River in Manitoba, the end-of-winter elevation should be allowed to decline no lower than the fisheries spring target level of 354.8 m / 1164.0 ft or a maximum drawdown of 1.5 m / 4.9 ft, whichever is higher, subject to flood risk constraints.
- 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 m³/s to prevent the lake exceeding an end-of-winter level of 355.2 m / 1165.3 ft.
- If 500 m³/s is insufficient outflow to stay below the target level, 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 m³/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 m³/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 avert frazil ice problems and high level freeze-up.
- Limit winter drawdown on the lake to provide good spring spawning conditions and for the protection of 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.

B) Adopted Lake of the Woods 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 of between 322.6 - 322.8 m / 1058.4 - 1059.1 ft with outflow preferably between 150 and 420 m³/s and Winnipeg River flows in Manitoba no higher than 960 m³/s. If high or low inflow precludes the preferred conditions, then adjust both levels and outflows without deviating from the target range more than necessary.
- Combined with Lac Seul regulation, target to keep Winnipeg River flows in Manitoba below 1400 m³/s during the critical ice cover formation period to prevent frazil ice problems.

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

- The end-of-winter level, based on factors other than winter inflow, is ideally 322.35 m / 1057.6 ft (about lower quartile) and preferably no higher than 322.5 m / 1058.0 ft (about median). 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. However, the actual end-of-winter level will vary depending on the winter inflow received, as noted in sections iii) to v) below.
- With the current lake level, average inflow for the winter period of about median should allow regulation operations to satisfy the many interests for Lake of the Woods levels and outflow. The end-of-winter level target range should be attainable under all proposed scenarios. The preferred end-of-winter level for fishery interests as defined by the OMNR 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. The preferred winter flow for H2O Power LP, to maximize their hydropower production, is 400-420 m³/s at the Lake of the Woods outlet. OPG would prefer flows close to 575 m³/s at Whitedog Falls and Manitoba Hydro's flow preference is 960 m³/s for the Winnipeg River in Manitoba.

- The end-of-winter target level should be adjusted upward, to store more water (to no more than 322.60 m / 1058.4 ft) to relieve high flows on the Winnipeg River downstream in Ontario and Manitoba. 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 m³/s and preferably no lower than 200 m³/s.
- If outflow is greater than 125 m³/s, the end-of-winter elevation should be no lower than 322.21 / 1057.1 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 m³/s to meet winter peak period power demands, with Lake of the Woods drawn no lower than lower decile (322.21 / 1057.1 ft) to achieve this. Likewise, augment flows to achieve 675 m³/s with an end-of-winter Lake of the Woods level no lower than lower quartile (322.36 m / 1057.6 ft).

iv) Moderate Inflow Conditions

- Winter outflow should be between 300 and 700 m³/s with a preferred end-of-winter level of lower quartile, but not above median.
- Combined with Lac Seul regulation, winter core period flows on the Winnipeg River in Manitoba should be between 800 and 960 m³/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 m³/s through the winter.