Adopted Regulation Strategy
Lake of the Woods Control Board
October 26, 2022

The Lake of the Woods Control Board held a Regulation Meeting in Kenora and via teleconference on October 26, 2022, when it adopted a Regulation Strategy to guide operations through the end of March 2023. 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/regguide/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.

At the time of the Regulation Meeting, flows and levels across the Winnipeg River basin had recovered from the unprecedented flooding that occurred during the spring and summer of 2022. The basin experienced average precipitation in August and September. By the end of September, bulk precipitation for the period of January 1 to September 30 varied from the 50th percentile range in the Lac Seul basin to over 95th percentile for the Lake of the Woods and downstream local Winnipeg River basins. Inflows to all major basins for January 1 to September 30 were above 90th percentile, except for the Lac Seul basin which ranked at 84th percentile. Ahead of freeze-up, outflow is in the normal range at Lac Seul and in the high-normal range for Lake of the Woods. Levels along the English River and the Winnipeg River in Manitoba have returned to the mid-normal range, whereas levels along the Winnipeg River near Kenora are in the upper-normal range.

The strategy covers the period to the end of March 2023. It specifies key aims and how the Board intends to balance these under a range of possible flow conditions should they develop during the strategy period. The goal of balancing conditions across the entire basin is a complex task given the diverse nature of the different, and sometimes conflicting, interests and the largely unpredictable nature of the hydrology that drives the system.

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. Although inflows to Lac Seul were very high in early summer, they gradually dropped to the normal range through July and August. By early fall both the level and inflow were well within the normal range. Preferred hydropower flows on the English system are: 300-400 m^3/s at Ear Falls through the core winter period and decreasing into March and April; below 550 m^3/s at Manitou Falls and below 640 m^3/s at Caribou Falls. Manitoba Hydro would prefer flows between 675 and 960 m^3/s at Slave Falls between December 1 and February 15. These flows should be achievable under normal inflow conditions. Should low inflow conditions develop before 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^3/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^3/s and Winnipeg River flows in Manitoba below 1400 m^3/s (to avoid frazil ice problems).
- The usual end-of-October target level between 356.0 m (1168.0 ft) and 356.2 m (1168.6 ft) (25^{th} to 35^{th} percentile) is realistic and should be reasonably attainable under expected conditions. Target closer to 356.0 m (1168.0 ft) due to the potential for higher than normal spring inflows.
- If inflow rises, 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.
- Should high inflow conditions develop, Lac Seul should be regulated to target for an end of October water level below 356.35 m (1169.1 ft) with outflow at or below 600 m^3 /s. The Lake St. Joseph diversion should be reduced to the extent necessary before Lac Seul outflow is increased above 500 m^3 /s. (The Lake St Joseph Diversion falls under LWCB authority when Lac Seul level is above 356.62 m (1170 ft) during the period of July through December.)

ii) Early March Level

- Regulate the level of Lac Seul so that the level on March 1^{st} is below 355.5 m (1166.3 ft), and preferably be no higher than 355.15 m (1165.2 ft).
- The end-of-winter (April 15) target level for Lac Seul should be evaluated in March at the LWCB Regulation meeting to account for conditions and forecasts at that time.

iii) Low Inflow Conditions

- Winter outflow should be no lower than 150 m^3/s, with a core winter flow no lower than 230 m^3/s.

- Communicate with First Nation communities on Lac Seul and the English River, and with Grand Council Treaty #3 to keep communities informed of the low water conditions and to assist in the determination of an appropriate balance of upstream and downstream interests.
- Combined with Lake of the Woods regulation, winter core period flows on the Winnipeg River in Manitoba should be no lower than 625 m^3/s to meet minimum winter peak power demands with a March 1st elevation preferably no lower than 354.5 m (1163.1 ft).
- If flows are greater than 675 m^3/s on the Winnipeg River in Manitoba, the March 1st elevation should be allowed to decline to no lower than 354.5 m (1163.1 ft).
- 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 Conditions

- Winter outflow should be between 200 and 450 m^3/s with a core winter flow of between 300 and 400 m^3/s.
- The March 1st elevation should be no lower than 354.87 m (1164.4 ft) 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 675 and 960 m^3/s.
- If flows on the Winnipeg River in Manitoba are greater than 960 m^3/s, 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 a March 1st level no higher than 355.6 m (1166.7 ft), and preferably no higher than 355.5 m (1166.3 ft), subject to flood risk constraints.

v) High Inflow Conditions

- Regulate Lac Seul outflow to as high as 500 m^3/s to prevent the lake exceeding a March 1st level of 355.6 m (1166.7 ft).
- Communicate with First Nation communities on Lac Seul and the English River, and with Grand Council Treaty #3 to keep communities informed of the potential for flooding and to assist in the determination of an appropriate balance of upstream and downstream interests.
- If 500 m^3/s is insufficient outflow to stay below 355.6 m (1166.7 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^3/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 March 1st lake level is no higher than 355.8 m (1167.3 ft).
- Combined with Lake of the Woods regulation, strive to keep Winnipeg River flows in Manitoba below 1600 m^3/s through the winter.

Lake of the Woods

A) Seasonal Considerations

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 potential 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.
- Generally target lower seasonal level throughout the regulation period to reduce risk of further shoreline damage following the 2022 flooding.

B) Adopted Strategy

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

- If dry conditions arise, 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 m (1058.4 ft) and 322.8 m (1059.1 ft), with outflow preferably between 150 and 450 m^3/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.
- Combined with Lac Seul regulation, adjust Lake of the Woods outflow to meet Winnipeg River minimum flow at Slave Falls in Manitoba; 170 m^3/s up to November 15, and 340 m^3/s from November 16 to 30.
- Combined with Lac Seul regulation, target to keep Winnipeg River flows in Manitoba below 1400 m^3/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, avoid setting Lake of the Woods outflow below 250 m^3/s, if feasible, before an insulating layer of ice and snow forms on the river late in the year.

ii) Core Winter Period and End-of-winter Levels (typically end-March)

- The Board's end-of-winter target level, based on factors other than winter inflow, has typically been 322.38 m (1057.7 ft) and preferably no higher than 322.5 m (1058.0 ft). 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 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 to 450 m^3/s at the Lake of the Woods outlet. OPG would prefer flows closer to 575 m^3/s at Whitedog Falls and Manitoba Hydro's flow preference for the Winnipeg River at Slave Falls is 675 to 960 m^3/s.
- The end-of-winter target level should be adjusted upward, no higher than 322.6 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.
- Aim to adjust Lake of the Woods outflow to set a stable core winter flow by freeze-up and to avoid large shifts in river level that could affect ice cover and shorelines.

iii) Low Inflow Conditions

- Winter outflow should be no lower than 125 m^3/s and preferably no lower than 200 m^3/s to assist with winter heating of hydropower stations.
- If outflow is greater than 125 m^3/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 flows on the Winnipeg River in Manitoba no lower than 625 m^3/s between December 1 and February 15 to meet minimum winter peak period power demands. Lake of the Woods end-of-winter level should be no lower than 322.30 m (1057.4 ft) to achieve this.

iv) Moderate Inflow Conditions

- Winter outflow should be between 300 and 700 m^3/s with a preferred end-of-winter level of 322.38 m (1057.7 ft), but not above 322.5 m (1058.0 ft).
- Combined with Lac Seul regulation, winter core period flows on the Winnipeg River at Slave Falls in Manitoba should be between 675 and 960 m^3/s.

v) High Inflow Conditions

- Under high inflow conditions, balance higher water levels on the lake against the impact of increased outflow downstream, both in Ontario and Manitoba.
- If winter conditions indicate above normal risk of high spring inflow, aim for end-of-winter level no higher than 322.40 m (1057.7 ft) with outflow no higher than 700-800 m^3/s,
- Adjust outflow as necessary to target an end-of-winter level no higher than 322.60 m (1058.4 ft)

- Communicate with First Nation communities on Lake of the Woods and the Winnipeg River, and with Grand Council Treaty #3 to keep communities informed of the potential for flooding and to assist in the determination of an appropriate balance of upstream and downstream interests.
- Combined with Lac Seul regulation, strive to keep Winnipeg River flows in Manitoba below 1600 m^3/s through the winter.