Adopted Regulation Strategy
Lake of the Woods Control Board
October 29, 2021

The Lake of the Woods Control Board held a Regulation Meeting via teleconference on October 29, 2021, when it adopted a Regulation Strategy to guide operations through the end of March 2022. 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, all the Winnipeg River Drainage basin was in severe or extreme drought on Canadian and American drought indices. Cumulative precipitation for 2021 has been near a 20-year low, and inflows to all major lakes have been below normal. Since September 1, inflows to both Lake of the Woods and Lac Seul have increased but remain relatively low for autumn. Outflow from both lakes has been set to strike a balance of interests between the lakes and the rivers and regions downstream.

The strategy covers the period to the end of March, 2022. 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. Regulation decisions must carefully consider the limited storage of water in Lake of the Woods and Lac Seul and upstream areas, the core winter river flow demands for hydropower and river users, and the extent of lake drawdown over the winter given the very dry antecedent conditions. Given current conditions, and assuming there is not extreme precipitation prior to freeze-up, there should be little risk securing sufficient storage room for freshet inflow in either Lake of the Woods or Lac Seul. However, should drought conditions continue or worsen over the winter, there is an increased risk of insufficient flows in the basin to refill the lakes in the spring and by extension, insufficient flows for the English and Winnipeg Rivers during the early spring and into summer, as was the experience in 2021.

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.

The Board agreed to hold a Regulation Consultation meeting in January 2022 to review basin conditions and to confirm, or revise, the various target levels and flow rates laid out in this strategy.

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 feasible given core winter flow demand needs and the prevailing dry conditions across the broader watershed, 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 be focused primarily on ensuring the supply of water for core winter flow requirements along the English River and Winnipeg River in Manitoba given the persistent drought conditions. With limited outflow throughout the summer, storage in Lac Seul has been achieved so that, combined with Lake St. Joseph diversion flows, higher flows through the core winter period can be maintained without drawing Lac Seul down below normal by April under most inflow scenarios. Preferred hydropower flows on the English system are: 300-365 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 above 675 m^3/s at Slave Falls between December 1 and February 15. These flows should be achievable under normal inflow conditions (i.e. 25th percentile inflow or higher). However, should conditions remain very dry, supplying the preferred winter flows could draw the lake level considerably lower than has been done in recent years.

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

- Maintain outflows to preserve storage to provide desirable winter outflows.
- Maintain outflow no lower than 75 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).
- Combined with Lake of the Woods regulation, Winnipeg River minimum flow at Slave Falls in Manitoba is 170 m^3/s up to November 15, and 340 m^3/s from November 16 to 30.
- The usual end-of-October target level between 356.0 and 356.2 m / 1168.0 ft and 1168.6 ft (25th to 35th percentile) is not realistic this year. Targeting a level as close to 356.0 m / 1168.0 ft (or higher) before November 15 will help provide storage for winter outflows.

- Should conditions become quite wet, Lac Seul should be regulated to target for a freeze-up 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.)
- 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) Early March Level

- Regulate the level of Lac Seul so that the level on March 1st is limited to a maximum of 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 Winter 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 the March 1st elevation is less than 354.5 m / 1163.1 ft to meet minimum winter peak power demands, reduce outflow to as low as 75 m^3/s once the demand period ends to assist with meeting early spring target levels for fishery interests.
- 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.

iv) Moderate Inflow Winter 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 while meeting Winnipeg River in Manitoba minimum winter peak power requirements
- 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 Winter 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.

B) Adopted Strategy

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

- If dry conditions persist, conserve water in storage, while balancing the low lake level with the supply of water to the river.
- Target for a Lake of the Woods level at freeze-up above 322.5 m / 1058.1 ft, without exceeding 322.8 m / 1059.1 ft. Outflow should be between 100 and 450 m^3/s.

- 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, if inflow conditions improve, avoid setting Lake of the Woods outflow below 250 m^3/s. Should drought conditions continue, providing higher flow would compromise the limited storage in the lake for future river supply throughout the winter. In this case, manage outflow to preserve storage for future river flows.

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

- The Board's standard 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. Given the long-standing drought conditions, target a March 31 level between 322.30 m / 1056.4 ft and 322.50 m / 1058.0 ft based on developing snowpack, the likelihood of a normal or above normal freshet response, and the objective of meeting core winter flow requirements.
- 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. If Lake of the Woods level is projected to fall below 322.34 m / 1057.5 ft before March 1 with outflow at or greater than 125 m^3/s, convene a Regulation Consultation to determine appropriate balance of drawdown and river supply before reducing outflow below 125 m^3/s.
- 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 low water conditions and to assist in the determination of an appropriate balance of upstream and downstream interests.
- 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.
- If inflow allows, and combined with Lac Seul regulation, increase outflows to achieve a flow of 675 to 960 m^3/s at Slave Falls with an end-of-winter level no lower than 322.38 m / 1057.7 ft.

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

- While targeting an end-of-winter level no higher than 322.6 m / 1058.4 ft, 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 322.4 m / 1057.7 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.