Adopted Regulation Strategy – LWCB Regulation Meeting – October 27, 2005

Overview

Basin conditions at the time of the meeting in Kenora were generally normal to somewhat below normal in the English River basin and generally below normal in the boundary waters basin. Conditions were driest in the southeast portion of the basin, with Basswood Lake flows at only lower decile. Lac Seul level was median while its inflows were 45th percentile. Lake of the Woods level was 45th percentile while its inflow was 40th percentile.

The short-term strategy in the sections that follow deals primarily with conditions from now until freeze up. The long-term strategy applies to regulation through to the end of winter. In setting an operational strategy for the coming months, it is vital to consider level and outflow targets together, as well as the interrelationships between the various interests. The impact of the combined operation of Lac Seul and Lake of the Woods on the Winnipeg River in Manitoba is also an important factor.

Lac Seul

a) Objectives & Seasonal Considerations

The points below set out a number of regulation objectives as well as special considerations for the season ahead. Some of these are conflicting and, while others may be mutually satisfied under certain hydrologic conditions, trade-offs will often be necessary. Many factors need to be considered when balancing one interest against another, including the consequences of not achieving the target and how frequently the target has been met (or violated) in the past.

- Plan winter drawdown to provide the appropriate balance between the various interests.
- Regulate Lac Seul level and outflow to reduce the risk or the impacts of high water on the lake and downstream in Ontario and Manitoba.
- Regulate Lac Seul outflow to assist in providing satisfactory freeze-up conditions on the English and Winnipeg Rivers to avert frazil ice problems.
- Supply water requested by Ontario Power Generation and Manitoba Hydro for hydroelectric energy generation; try to ensure that at least their minimum requirements are met.
- 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.
- Use Lac Seul storage to offset Lake of the Woods high/low flows for the benefit of users of the Winnipeg River in Manitoba.
- With the current lake level, an inflow of at least median for the winter period will be required for both fishery interests (end-of-winter minimum level) and hydropower interests (winter flows) to be satisfied. The preferred end-of-winter level for fishery interests is no lower than 354.79 m (1164 ft) while the preferred winter outflow for the hydropower interests is 400-450 m^3/s for the English River and 960 m^3/s for the combined flow in the Winnipeg River in Manitoba.
- Lac Seul end-of-winter level was below lower quartile (354.42 m / 1162.8 ft) as recently as 2003 but has not been down to lower decile (354.26 m / 1162.3 ft) since 1981.

b) Strategy

i) Short-Term Regulation

- The Lac Seul freeze-up level (mid to end November) should preferably be no higher than 356.5 m (1169.6 ft) with outflows no higher than 400 m^3/s and Winnipeg River flows in Manitoba below 1400 m^3/s. If higher inflows preclude these criteria all being met, adjust both Lac Seul outflow and the freeze-up level as necessary, and as circumstances dictate, while deviating from the ideal as little as possible.
- If the level rises to 356.62 m (1170 ft), the level at which the Board has authority over the Lake St. Joseph diversion, the diversion should then be closed by the amount necessary to hold the lake level without increasing Lac Seul outflow above 500 m^3/s.
- If the lake level increases to 356.9 m (1171 ft), increase outflows as necessary to keep the lake level from rising further.
- Combined with Lake of the Woods 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.

ii) End-of-winter Level

- The preferred end-of-winter level range, based on factors other than winter inflow, is 1164 ft (354.79 m, the preferred fishery minimum, which is the 65th %ile level) to upper quartile (354.88 m / 1164.3 ft). However, the actual end-of-winter level will vary depending on the winter inflows received, as noted in sections iii) to v) below.

iii) Low Inflow Winter Conditions

- Winter outflow should be between 100 and 400 m^3/s with a core winter flow between 300 and 400 m^3/s.
- The end-of-winter elevation should be balanced with Lac Seul outflow with a goal of having end-of-winter levels greater than lower decile (354.26 m / 1162.3 ft) while having winter core period flows on the Winnipeg River in Manitoba no lower than 675 m^3/s.

iv) Moderate Inflow Winter Conditions

- Winter outflow should be between 200 and 450 m^3/s with a core winter flow between 350 and 450 m^3/s.
- As long as inflows are median or greater, strive for an end-of-winter level no lower than 354.79 m (1164 ft).
- With lower than median inflows, the end-of-winter elevation should be balanced with Lac Seul outflow with a goal of having end-of-winter levels higher than lower quartile (354.42 m / 1162.8 ft) while having winter core period flows on the Winnipeg River in Manitoba between 800 and 960 m^3/s.

v) High Inflow Winter Conditions

- Regulate Lac Seul outflow to as high as 500 m^3/s to prevent the lake exceeding an end-of-winter level of 355.3 m (1165.7 ft). If 500 m^3/s is insufficient outflow to stay below the target level, request OPG or Manitoba to restrict diversion flow before increasing outflow further. (The Board would only have authority to restrict diversion flow if Lac Seul end-of-winter level reached 356.0 m / 1168 ft; Manitoba can restrict diversion flow when Winnipeg River flows in Manitoba exceed 963 m^3/s.)

- Combined with Lake of the Woods regulation, strive to keep Winnipeg River flows in Manitoba below upper decile (1400-1600 m^3/s) through the winter.
- If the Lake St. Joseph diversion is under LWCB authority, limit or close the diversion into Lac Seul before increasing Lac Seul outflow above 500 m^3/s to achieve regulation objectives.

Lake of the Woods

a) Objectives & Seasonal Considerations

The points below set out a number of regulation objectives as well as special considerations for the season ahead. Some of these are conflicting and, while others may be mutually satisfied under certain hydrologic conditions, trade-offs will often be necessary. Many factors need to be considered when balancing one interest against another, including the consequences of not achieving the target and how frequently the target has been met (or violated) in the past.

- Plan winter drawdown to provide the appropriate balance between the various interests.
- Regulate Lake of the Woods level and outflow to reduce the risk or the impacts of high water on the lake and downstream in Ontario and Manitoba.
- Regulate Lake of the Woods outflow to assist in providing satisfactory freeze-up conditions on the Winnipeg River to avert frazil ice problems.
- 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.
- Maintain sufficient winter outflows for station heating requirements at the Norman and Kenora powerhouses.
- Within the regulation parameters for Lake of the Woods, regulate outflows to assist in meeting targets/criteria for the Winnipeg River in Manitoba (as noted in the Lac Seul section).
- With the current lake level, an inflow of approximately median for the winter period would best allow the many interests for Lake of the Woods levels and outflows to be satisfied. For example, the preferred end-of-winter level for fishery interests as defined by the OMNR is no lower than 322.48 m (1058 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 (12 in). 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 the hydropower interests is 420 m^3/s at the Lake of the Woods outlet, 575 m^3/s at Whitedog Falls and 960 m^3/s in the Winnipeg River in Manitoba.
- Lake of the Woods end-of-winter level has not been below lower quartile (322.36 m / 1057.6 ft) since 1988 and has not been below lower decile (322.19 / 1057.1 ft) since 1981.

b) Strategy

i) Short-Term Regulation

- The preferred freeze-up (mid to end November) condition would be a Lake of the Woods level no higher than 322.78 m (1059 ft) with outflow no greater than 420 m^3/s. If high

inflows preclude this, then aim for both higher levels and outflows without deviating from the ideal more than necessary.

- Set outflows as high as necessary to keep the lake from exceeding a freeze-up level greater than 323.3 m / 1060.7 ft).
- 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.

ii) End-of-winter Level

- The end-of-winter level, based on factors other than winter inflow, is ideally lower quartile (322.36 m / 1057.6 ft) and certainly no higher than median (322.42 m / 1057.8 ft). However, the actual end-of-winter level will vary depending on the winter inflows received, as noted in sections iii) to v) below.
- The above end-of-winter level range is based on a number of factors. The Lake of the Woods basin has been experiencing more variable weather in recent years, with high water years in 2001, 2002 and 2005. In general, Lake of the Woods levels have been edging higher. The Board's strategy for the past few 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.

iii) Low Inflow Conditions

- Winter outflow should be between 200 and 420 m^3/s with a core winter flow above 250 m^3/s.
- Allow the end-of-winter elevation to be as low as lower decile (322.19 / 1057.1 ft) to assist in meeting Winnipeg River flow targets in Manitoba.
- Combined with Lac Seul regulation, winter core period flows on the Winnipeg River in Manitoba should be no lower than 675 m^3/s.

iv) Moderate Inflow Conditions

- Winter outflow should be between 300 and 700 m^3/s with the preferred end-of-winter level range, as stated above, at or below median (i.e. at or below 322.46 m / 1057.9 ft).
- Combined with Lac Seul regulation, winter core period flows on the Winnipeg River in Manitoba should be between 800 and 960 m^3/s.

v) High Inflow Conditions

- Balance higher water levels on the lake with the impact of increased outflows downstream, both in Ontario and Manitoba.
- Allow an end-of-winter elevation as high as upper quartile (322.62 m / 1058.5 ft) to assist in reducing flows on the Winnipeg River in Ontario and Manitoba.
- Combined with Lac Seul regulation, strive to keep Winnipeg River flows in Manitoba below upper decile (1400-1600 m^3/s) through the winter.