

**INTERNATIONAL JOINT COMMISSION
IN THE MATTER OF THE REGULATION
OF LAKE ONTARIO OUTFLOWS
AND LEVELS**

SUPPLEMENTARY ORDER OF APPROVAL

December 8 2016

WHEREAS:

On October 29, 1952, the International Joint Commission issued an Order of Approval (1952 Order), pursuant to the Boundary Waters Treaty of 1909 (the "Treaty"), to the Government of Canada and the Government of the United States of America for the construction, maintenance and operation of certain structures for the development of power in the International Rapids Section of the St. Lawrence River. This Order was amended by a Supplementary Order dated July 2, 1956 (1956 Order);

The Commission retained jurisdiction in the 1952 Order, as supplemented by the 1956 Order, to make further Order or Orders regarding the subject matter of the governments' applications, after giving notice and an appropriate opportunity to all interested parties to make representations to the Commission;

A 1993 Commission Great Lakes Levels Reference Study recommended that the Orders of Approval for the regulation of Lake Ontario be revised to better reflect the current needs of the users and interests of the system. In letters dated April 15, 1999, the Commission informed the Governments of Canada and the United States that it was becoming increasingly urgent to review the regulation of Lake Ontario levels and outflows. In response the Governments funded a five-year Lake Ontario-St. Lawrence River Study (2001-2006). The study focused on impacts of water level regulation, water supply conditions including potential climate change scenarios, a wide range of alternative regulation plans and the 1956 Order. The Study found that water supplies to Lake Ontario since regulation began under the 1956 Order have been significantly above and below those experienced during the 1860-1954 period of record;

The Commission has now completed a review of the 1956 Order. This review of the regulation of Lake Ontario and the St. Lawrence River culminated in a proposal to modify the existing Orders of Approval and presentation of a new regulation plan. Technical hearings, which were open to the public and featured expert testimony from invited experts, and public hearings on this proposal were held by the Commission in order to provide all interested parties with a convenient opportunity to be heard, in accordance with the Treaty. The following hearings were held: Lockport, New York on July 14, 2013; Toronto and Jordan, Ontario on July 15, 2013; Rochester and Williamson, New York on July 16, 2013; Oswego and Alexandria Bay, New York

on July 17, 2013; Montreal, Quebec on July 18, 2013; and Cornwall, Ontario on July 19, 2013; and a public hearing by teleconference on August 27, 2013. The Commission accepted comments on the recommended modifications to the operating conditions and criteria of the Order of Approval through August 30, 2013. Transcripts of the hearings and written submissions are available for public view on the Commission's website and at the Section offices in Washington, D.C., and Ottawa, Ontario;

The Commission has considered the views of the public, as expressed through testimony at the public hearings, and through other submissions, the advice of its International St. Lawrence Board of Control, and the views and comments of the Governments;

In June of 2014 the Commission submitted "Lake Ontario-St. Lawrence River Plan 2014: Protecting against extreme water levels, restoring wetlands, and preparing for climate change" to the Governments of the United States and Canada. In this report the Commission sought the concurrence of the Governments of Canada and the United States on revising the 1956 Order to consider ecosystem health with respect to all other interests and uses of the Lake Ontario-St. Lawrence River system;

The Commission sought the concurrence of the two governments to issue this Supplementary Order and such concurrence was provided with the understanding that changes to the 1952 Order, as supplemented by the 1956 Order, must comply with the terms set out in Article VIII of the Treaty;

The Commission finds that regulation under the 1956 Order is designed for past conditions and interests known at the time the 1956 Order was implemented and that the four-foot target range of elevations in the 1956 Order creates an unrealistic expectation that Lake Ontario water levels can be regulated within a four-foot range (approximately 1.2 meters). Under extreme water supply conditions, such as those experienced on several occasions since regulation began, the Commission finds it is not possible to keep the lake within the four-foot target range. Regulation as practiced under the 1956 Order has harmed the near shore Lake Ontario and upper St. Lawrence River environments by compressing water level fluctuations to much less than they would have been under unregulated conditions. Current regulation does not accurately reflect the full range of experienced conditions or anticipate future changes; and it is now necessary to also consider environmental issues and recreational boating upstream and downstream of the project;

In assessing the benefits provided by regulation under this Supplementary Order, the Commission finds that the terms, conditions and other requirements of this Supplementary Order take into account the high and low water supplies since 1954 and other new information not available when the 1956 Order was developed;

The Commission finds that regulation under this Supplementary Order in combination with improved governance of the system and less frequent deviations from a regulation plan that encompasses a more extensive range of possible conditions will provide long-term benefits, upstream and downstream, including those identified in the 1956 Order with greater security and predictability;

The Commission finds that, in the long term, regulation under this Supplementary Order will help to restore the ecosystem health of Lake Ontario and the Upper St. Lawrence River, continue to provide benefits on the lake and upper river, and maintain the current benefits downstream;

The Commission finds that the terms, conditions and other requirements of this Supplementary Order respond to the requests made by the Governments of Canada and the United States in the joint references dated June 25, 1952, and joint applications dated June 29, 1952, as clarified in the joint letter of December 6, 2016;

The Commission finds that the laws in Canada, and the Constitution and laws in the United States of America, together with the provisions of this Supplementary Order, satisfy the requirements of Article VIII of the Treaty;

The Commission finds that an adaptive management approach would enable the effects of regulation in the Lake Ontario - St. Lawrence River System to be assessed and would provide a valuable source of information for future reviews. Monitoring, data collection, and assessment are necessary to validate the models upon which the regulation plan was built, to evaluate the effectiveness of regulation, to analyze the effects of other changes impacting the system (such as climate change), and to consider possible future improvements in system regulation. Any changes to this Order arising from adaptive management, as well as any changes to the regulation plan or the levels referenced in H14, would be made in accordance with Condition H.

The Commission finds that amendments to Appendix A of the 1952 Order, as supplemented by the 1956 Order, are necessary in order to include definitions and a revision to the description of the power house structures. Changes to the specifications of the works described in the 1952 Order, as supplemented by the 1956 Order, must be submitted for approval by both Governments. Per correspondence from the United States and Canadian Governments received June 17, 2014, and October 15, 2012, both Governments approve or have no objection to the replacement of six ice sluice gates on the Moses-Saunders dam with a concrete structure, as proposed by the power companies. The International St. Lawrence River Board of Control in 2011 recommended that the proposal to replace the ice sluice gates be approved, foreseeing no significant changes to the operation of the project.

NOW THEREFORE THIS COMMISSION ORDERS AND DIRECTS:

The conditions herein provided are to be implemented in accordance with Article VIII and all other relevant provisions of the Treaty.

The conditions of the 1952 Order, as supplemented by the 1956 Order, are revised and supplemented by this Supplementary Order so as to read in their entirety as follows:

CONDITIONS

A. In accordance with the requirements of Article VIII of the Treaty, interests on either side of the International Boundary which are injured by reason of the construction, maintenance and operation of the works shall be given suitable and adequate protection and indemnity as provided by the laws in Canada, or the Constitution and laws in the United States respectively.

B. The works shall be so planned, located, constructed, maintained and operated as not to conflict with or restrain uses of the waters of the St. Lawrence River for purposes given preference over uses of water for power purposes by the Treaty, namely, uses for domestic and sanitary purposes and uses for navigation, including the service of canals for the purpose of navigation, and shall be so planned, located, constructed, maintained and operated as to give effect to the provisions of this Order.

C. The works shall be constructed, maintained and operated in such manner as to safeguard the rights and lawful interests of others engaged or to be engaged in the development of power in the St. Lawrence River below the International Rapids Section.

D. The works shall be so designed, constructed, maintained and operated as to safeguard so far as possible the rights of all interests affected by the levels of the St. Lawrence River upstream from the Iroquois regulatory structure and by the levels of Lake Ontario and the lower Niagara River; and any change in levels resulting from the works which injuriously affects such rights shall be subject to the requirements of paragraph A relating to protection and indemnification.

E. The hydro-electric plants approved by this Order shall not be subjected to operating rules and procedures more rigorous than are necessary to comply with the provisions of the foregoing paragraphs B, C and D.

F. Before Ontario Power Generation or any successor make any changes to any part of the works, which would fall within the scope of Article III of the Treaty, it shall submit to the Government of Canada, and before the New York Power Authority makes any changes to any part of the works, which would fall within the scope of Article III of the Treaty, it shall submit to

the Government of the United States, for approval in writing, detailed plans and specifications of that part of the works located in their respective countries and details of the program of construction thereof or such details of such plans and specifications or programs of construction relating thereto as the respective Governments may require. Following the approval of any plan, specification or program, if Ontario Power Generation or the New York Power Authority wishes to make any change therein, it shall first submit the changed plan, specification or program for approval in a like manner.

G. A Board to be known as the International Lake Ontario-St. Lawrence River Board (hereinafter referred to as the "Board") consisting of an equal number of members from Canada and the United States, to include representatives of the Canadian and United States federal governments, shall be established by the Commission. The Board shall include, but is not limited to, at least one member each nominated by the State of New York, the Province of Quebec, and the Province of Ontario. The duties of the Board shall be to give effect to the instructions of the Commission as issued from time to time in accordance with this Order. The duties of the Board shall be to ensure that the provisions of the Order relating to water levels and the regulation of the discharge of water from Lake Ontario as herein set out are complied with, and Ontario Power Generation and the New York Power Authority shall duly observe any direction given them by the Board for the purpose of ensuring such compliance. The Board shall report to the Commission at such times as the Commission may determine. In the event of any disagreement among the members of the Board which they are unable to resolve, the matter shall be referred by them to the Commission. The Board may, at any time, make representations to the Commission in regard to any matter affecting or arising out of the terms of the Order with respect to water levels and the regulation of discharges and flows.

H. The discharge of water from Lake Ontario shall be regulated by the Board (following the Commission's directives) to meet the requirements of conditions B, C, and D hereof and shall be regulated within a range of levels as specified in the below listed criteria, as nearly as may be. The project works shall be operated in such a manner as to provide no less protection for navigation and riparian interests downstream than would have occurred under pre-project conditions and with the 1900 to 2008 adjusted supplies and conditions specified in the basis of comparison. The Commission shall adopt a regulation plan, subject to the concurrence of Canada and the United States, and associated operational guides for the discharge of water from Lake Ontario and its flow through the International Rapids Section of the St. Lawrence River that satisfy the criteria and conditions of this Order, with criterion "H14" governing principles of relief should specified high or low levels be experienced. The flow of water through the International Rapids Section of the St. Lawrence River in any period shall equal the discharge of water from Lake Ontario as determined for that period. The Commission may adopt new regulation plans from time to time provided they are in accordance with this Order, and subject to the concurrence of Canada and the United States.

Criteria

H1. The regulated outflow from Lake Ontario shall be such as not to increase the frequency of low levels or reduce the minimum level of Montreal Harbour below those listed in the table below which would have occurred with the 1900 to 2008 adjusted supplies and conditions (hereinafter called the “supplies of the past as adjusted”) that are defined in the document “Basis of Comparison Conditions for Lake Ontario – St. Lawrence River Regulation” .

Note: All elevations use the 1985 International Great Lakes Datum and metric system of measurement.

Montreal Jetty #1 Level IGLD 1985

Meters Feet Number of quarter-months in 1900-2008 below level

5.55	18.21	811
5.50	18.21	679
5.40	17.72	366
5.30	17.39	153
5.20	17.06	83
5.10	16.73	45
5.00	16.40	15
4.90	16.08	1
4.80	15.75	1
4.70	15.42	minimum

H2. The regulated outflow from Lake Ontario shall be such as not to increase the frequency of low levels or reduce the minimum level of Lake St. Louis below those listed in the table below which would have occurred with the supplies of the past as adjusted.

Lake St. Louis at Pointe Claire Level IGLD 1985

Meters Feet Number of quarter-months in 1900-2008 below level

20.70	67.01	735
20.60	67.58	161
20.50	67.26	87
20.40	66.93	21
20.30	66.6	2
20.20	66.27	1
20.10	65.94	0
20.10	65.94	minimum

H3. The regulated outflow from Lake Ontario shall be such that the frequencies of occurrence of high water levels on Lake St. Louis as measured at the Pointe Claire gauge are not greater than those listed below with supplies of the past as adjusted.

Lake St. Louis at Pointe Claire Level IGLD 1985

Meters	Feet	Number of quarter-months in 1900-2008 above level
22.50	73.82	0
22.40	73.49	9
22.33	73.26	15
22.20	72.83	51
22.10	72.51	97
22.00	72.18	221
22.48	73.75	maximum

H4. The regulated monthly mean level of Lake Ontario shall not exceed the following elevations (IGLD85) in the corresponding months with the supplies of the past as adjusted.

Lake Ontario Level IGLD 1985

Month	Meters	Feet
January	75.26	246.92
February	75.37	247.28
March	75.33	247.15
April	75.60	248.03
May	75.73	248.46
June	75.69	248.33
July	75.63	248.13
August	75.49	247.67
September	75.24	246.85
October	75.25	246.88
November	75.18	246.65
December	75.23	246.82

H5. The regulated winter outflows from Lake Ontario shall be maintained so that the difficulties of river ice management for winter power operation are minimized in the International Rapids Section of the St. Lawrence River and the outlet of Lake St. Francis.

H6. Under regulation, the frequency of occurrences of monthly mean elevations of approximately 75.07 meters (m), 246.3 feet (ft) IGLD 1985 and higher on Lake Ontario

shall not be greater than would have occurred with supplies of the past as adjusted and with pre-project conditions.

H7. The regulated monthly mean water levels of Lake Ontario, with supplies of the past as adjusted shall not be less than the following elevations (IGLD 1985) in the corresponding months.

Lake Ontario Level IGLD 1985

Month	Meters	Feet
January	73.56	241.34
February	73.62	241.54
March	73.78	242.06
April	73.97	242.68
May	74.22	243.50
June	74.27	243.67
July	74.26	243.64
August	74.15	243.27
September	74.04	242.91
October	73.83	242.22
November	73.67	241.70
December	73.57	241.37

H8. Consistent with other requirements, the outflow from Lake Ontario shall be regulated so as to maintain levels necessary for navigation in the Montreal to Lake Ontario section of the St. Lawrence River.

H9. Consistent with other requirements, the maximum regulated outflow from Lake Ontario shall provide safe velocities for Seaway navigation and minimize spill at the hydropower facilities in the St. Lawrence River.

H10. Consistent with other requirements, the minimum regulated monthly outflow from Lake Ontario shall be such as to secure the maximum dependable flow for power.

H11. Consistent with other requirements, the levels of Lake Ontario shall be regulated for the benefit of property owners on the shores of Lake Ontario in the United States and Canada so as to reduce extremes of stage which have occurred under pre-project conditions and supplies of the past as adjusted on Lake Ontario.

H12. Consistent with other requirements, the outflow from Lake Ontario shall be regulated to help restore ecosystem health by providing for more natural variations of water levels on Lake Ontario and on the St. Lawrence River.

H13. Consistent with other requirements, the outflow from Lake Ontario shall be regulated so as to benefit recreational boating on Lake Ontario and on the St. Lawrence River.

H14. In the event that Lake Ontario water levels reach or exceed high levels, the works in the International Rapids Section shall be operated to provide all possible relief to the riparian owners upstream and downstream. In the event that Lake Ontario levels reach or fall below low levels the works in the International Rapids Section shall be operated to provide all possible relief to municipal water intakes, navigation and power purposes, upstream and downstream. The high and low water levels at which this criterion applies, and any revisions to these levels, shall be subject to the concurrence of Canada and the United States and shall be set out in a Commission directive to the Board.

I. The Commission's directives to the Board shall make provision for peaking and ponding operations and for deviations from the plan of regulation to address such matters as navigation needs, hydropower plant maintenance, winter operations, emergencies and other special short-term situations, any of such deviations being subject to review by the Commission upon its request.

J. Subject to the requirements of conditions B, C, D and H hereof, the Board, after obtaining the approval of the Commission, may temporarily make minor modifications or changes to the regulated outflows from Lake Ontario for the purpose of determining modifications or changes in the regulation plan that may be advisable. The Board shall report to the Commission the results of such temporary changes or modifications, together with any recommendations arising from such, and the Commission may accept or reject any such recommendations. Any changes or modifications that arise from such recommendations shall be made in accordance with Condition H.

K. The works shall be operated so that the forebay water level at the power houses does not exceed a maximum instantaneous elevation of 74.48 m (244.36 feet).

L. Ontario Power Generation and the New York Power Authority, and any successor entities, shall maintain and supply for the information of the Board accurate records relating to water levels and the discharge of water through the works and the regulation of the flow of water through the International Rapids Section as the Board may determine to be suitable and

necessary, and shall install and maintain such gauges, carry out such measurements, and perform such other services as the Board may deem necessary for these purposes.

M. The installation, maintenance, operation and removal of the ice booms in the St. Lawrence River by Ontario Power Generation and the New York Power Authority, and any successor entities, are subject to the following:

1. Any significant modifications in the design or location of the booms shall require the approval of the Commission;
2. The placement and removal of ice booms shall be timed so as not to interfere with the requirements of navigation; and
3. The St. Lawrence Seaway Management Corporation and the St. Lawrence Seaway Development Corporation, and any successor entities, shall be kept informed of all such operations.

N. The Board shall report to the Commission as of 31 December each year on the effect, if any, of the operation of the downstream hydro-electric power plants and related structures on the tail-water elevations at the hydro-electric power plants approved by this Order.

O. No later than 15 years after the effective date of this Order, and periodically thereafter in consultation with the governments, the Commission will conduct a review of the results of regulation under this Order and report to Canada and the United States its findings. This review will include an assessment of the extent to which the results predicted by the research and models used to develop any approved regulation plan occurred as expected, consistent with adaptive management. The review may provide the basis for possible changes to the regulation of water levels and flows to be submitted to the Governments in accordance with condition H.

APPENDIX A to the October 29, 1952, Order is amended by the addition of the below text:

“DEFINITIONS

1. St. Lawrence River – the section of the St. Lawrence River that is affected by flow regulation, which stretches from Lake Ontario to the outlet of Lake St. Pierre.
2. International Rapids Section - the section of the St. Lawrence River that prior to the project was characterized by series of rapids from Ogdensburg, NY- Prescott, ON to Cornwall, ON – Massena, NY.
3. Pre-project conditions – the hydraulic channel characteristics that existed in the Galops Rapids Section of the St. Lawrence River as of March 1955 that formed the control section for Lake Ontario outflows prior to the project. This is defined by a stage-discharge capacity relationship for this condition that also accounts for the effects of glacial isostatic adjustment.

APPENDIX A to the October 29, 1952, Order is amended by the deletion of the text
"with provision for ice handling and discharge sluices." under (c) Power House Structures under
FEATURES OF THE WORKS APPROVED BY THIS ORDER.

Signed this 8th day of December 2016



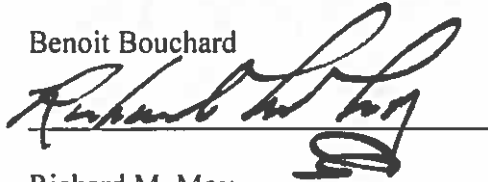
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