



International
Joint
Commission

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International Kootenay Lake Board of Control

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March 7, 2003

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Gentlemen:

We hereby submit the 64th Annual Report of the International Kootenay Lake Board of Control covering the calendar year 2002.

This report sets forth the operation of the control works on Kootenay Lake under the terms of the Order of Approval dated November 11, 1938, and the operation of Duck Lake under the terms of the Orders of Approval dated October 12, 1950, April 3, 1956 and March 31, 1970.

Respectfully submitted,

Colonel Ralph Graves
Chair, United States Section

Mr. Kirk Johnstone
Chair, Canadian Section

*International Kootenay Lake
Board of Control*

*2002
Annual Report*

*to the
International Joint Commission*

Summary

Throughout 2002, the Applicant, Aquila Networks Canada, regulated the level of Kootenay Lake below the maximum prescribed limits according to the 1938 Kootenay Lake Order. The maximum instantaneous water level for the lake at Queens Bay was observed on June 30th at 15:30 PST elevation 533.784 metres (1751.26 feet)¹. The minimum daily water level was observed on April 1st elevation 529.754 metres (1738.04 feet). Kootenay Lake discharged 26.6 cubic kilometers (21.5 million acre-feet) of water this year, with an average flow of 844 cubic metres per second (29,800 cubic feet per second).

The Board and the Applicant jointly determined the commencement of the spring rise to be 00:00 PST on April 14, 2002.

The discharge control works at the outlet of Duck Lake were operated during the year in accordance with the terms and conditions of the 1950, 1956 and 1970 Orders of Approval of the International Joint Commission.

The Board held its annual meeting and a public meeting in Bonners Ferry, Idaho, on September 26th. The minutes of those meetings have been forwarded to IJC headquarters and are posted on the Kootenay Board web page. The key issue of concern to those attending the public meeting was the winter and spring water level on Duck Lake and the potential effect on bass in the lake.

¹ All elevations are referred to G.S.C. 1928 datum.

2002 Annual Report

This Annual Report covers the operations of Aquila Networks Canada with respect to their management of the water level of Kootenay Lake by controlling discharge through and around Corra Linn Dam in accordance with requirements of the Order of the International Joint Commission dated November 11, 1938. [Aquila cooperates with BC Hydro, which also manages a control structure—the Canal Plant—at the lake's outlet.] It also covers the operations of Creston Valley Wildlife Management Authority in controlling flow through the outlet works of Duck Lake in accordance with the Orders of the International Joint Commission dated October 12, 1950, April 3, 1956 and March 31, 1970.

Details leading up to the appointment of the Board by Order of the Commission dated November 11, 1938, are fully covered in the First Annual Report.

Board Membership

The Board members during 2002 were as follows:

for the United States,

Colonel Ralph Graves, District Engineer, Seattle District,
United States Army, Corps of Engineers, Seattle, Washington;

Mr. Stephen Lipscomb, Acting District Chief,
United States Geological Survey, Boise, Idaho;
Acting Board Member for Mr. Derrill Cowing, retired;
January 1 through July 4

Ms. Kathy Peter, District Chief,
United States Geological Survey, Boise, Idaho;
July 5 onward;

and for Canada,

Mr. Kirk Johnstone, Manager, Aquatic and Atmospheric Science,
Environment Canada, Vancouver, British Columbia;

Mr. James Mattison, Director, Water Management Branch,
Ministry of Sustainable Resource Management, Victoria, British Columbia.

1938 Kootenay Lake Order Sections 2(4) 2(5) and 2(6)

2(4) ...the Applicant shall be permitted to store water in the main body of Kootenay Lake to a maximum elevation of 1745.32, Geodetic Survey of Canada datum, 1928 adjustment (i.e. six feet above zero of the Nelson gauge), in accordance with the rule curve detailed in Sub-section (5).

(5) That after the high water of the spring and early summer flood and when the lake level at Nelson on its falling stage recedes to elevation 1743.32, Geodetic Survey of Canada datum, 1928 adjustment, the gates of the dam may be so operated as to retain it at said level until August 31st, and after said date, the level of the main body of the lake may be raised to elevation 1745.32, which shall be the maximum storage level until January 7, and thereafter it shall be lowered so that it shall not exceed elevation 1744 on February 1, elevation 1742.4 on March 1, and elevation 1739.32 (i.e. zero of the Nelson gauge) on or about April 1, except under extraordinary natural high inflow conditions, when sufficient gates shall be opened and remain open throughout such period of excess so as to lower the level of the main body of Kootenay Lake to the storage level at that time obtaining as above defined.

(6) ...throughout the period of flood flow in each and every year, (i.e. from the commencement of the spring rise in March or April until the level of the lake at Nelson returns to elevation 1743.32, Geodetic Survey of Canada, 1928 adjustment, on the falling stage), a sufficient number of gates and sluiceways of the dam shall be opened to provide, in conjunction with the flow through the turbines, for the lowering of the main body of Kootenay Lake ... by at least the amounts ... as follows:

Discharge from Kootenay Lake under original conditions (in second feet) [vs.] Amount of lowering to be affected on the main body of Kootenay Lake (in feet)

10,000.....	1.0
25,000.....	1.3
50,000.....	1.7
75,000.....	2.1
100,000.....	2.6
125,000.....	3.0
150,000.....	3.2
175,000.....	3.5
200,000.....	3.8
225,000.....	4.0

Aquila regulated the level of Kootenay Lake below the upper limits prescribed by the Order throughout 2002. The maximum instantaneous water level of 533.784 metres (1751.26 feet) for the lake at Queens Bay was reached on June 30th at 15:30 PST. The minimum daily water level was observed on April 1st, elevation 529.754 metres (1738.04 feet). Kootenay Lake discharged 26.6 cubic kilometers (21.5 million acre-feet) of water this year through Corra Linn Dam and the Canal Plant, with an average flow of 844 m³/s (29,800 cfs). The maximum daily mean outflow was 2,294 m³/s (81,000 cfs) on June 30; the minimum was 275 m³/s (9,700 cfs) on April 4.

Relative to the 72-year period of record (1931 to 2002), this year's maximum ranked 39th highest, and the minimum ranked the seventh lowest. Water levels in the lake have ranged from a high of 537.042 metres (1761.95 feet) in 1961 to a low of 529.563 metres (1737.41 feet) in 1944. A graph showing Kootenay Lake water level extremes over the period of record was attached to last year's annual report.

The Board and the Applicant jointly determined the commencement of the spring rise to be 00:00 PST on April 14, 2002.

Aquila has continued to supply the Board with complete records of the regulation of Kootenay Lake as affected by the operations of Corra Linn Dam and the Kootenay Canal Plant.

Attached hereto is a hydrograph showing observed water levels on Kootenay Lake and allowable elevations specified in the November 11, 1938 Order.

Duck Lake Orders

7. In years of low local spring supply to Duck Lake and when the level of the northerly portion of that Lake is not raised thereby to elevation 1745.0 or is not maintained at or above that elevation during the period when Kootenay Lake is discharging its flood waters, the Applicant or its successor shall, while Kootenay Lake is approaching elevation 1745.0 on its falling stage, open the gates in the Duck Lake outlet structure sufficiently to permit Duck Lake to rise to maximum of elevation 1745.0 and thereafter the gates may be closed until commencement of the storage drawdown period on or about January 7 of the following year.

8. The discharge control works at the outlet of Duck Lake shall be opened by the Applicant or its successor by the 7th day of January of each year and shall remain open during the Kootenay Lake storage drawdown period to permit the level of Duck Lake to recede with that of Kootenay Lake.

The gates of the Duck Lake outlet works were operated as follows during the year:

Duck Lake Gates --Open Periods		Duck Lake Pumps --On Periods	
<u>First Day</u>	<u>Last Day</u>	<u>First Day</u>	<u>Last Day</u>
January 7	May 20	May 27	June 09
December 18	December 20	June 20	June 30

The elevation of Duck Lake was higher than that of Kootenay Lake at Queens Bay except during the approximate periods May 22 to August 7. The gates were opened on January 7 for the drawdown period, then closed after the commencement of spring rise as the elevation of Kootenay Lake surpassed that of Duck Lake on the rising limb of the freshet. Since local inflow raised the level of Duck Lake above 531.876 metres (1745 feet), the gates were not opened on the falling limb of the Kootenay freshet. This operation complied with sections 7 and 8 of the Order. The pumps were operated for periods in May and June.

A staff gauge was maintained in Duck Lake and gauge readings were obtained by the Creston Valley Wildlife Management Authority during the year in accordance with the IJC Order of Approval dated March 31, 1970. Water Survey of Canada monitored gauge readings.

Attached hereto is a hydrograph depicting the water levels observed on Duck Lake along with a visual representation of the operation of the Duck Lake outlet works.

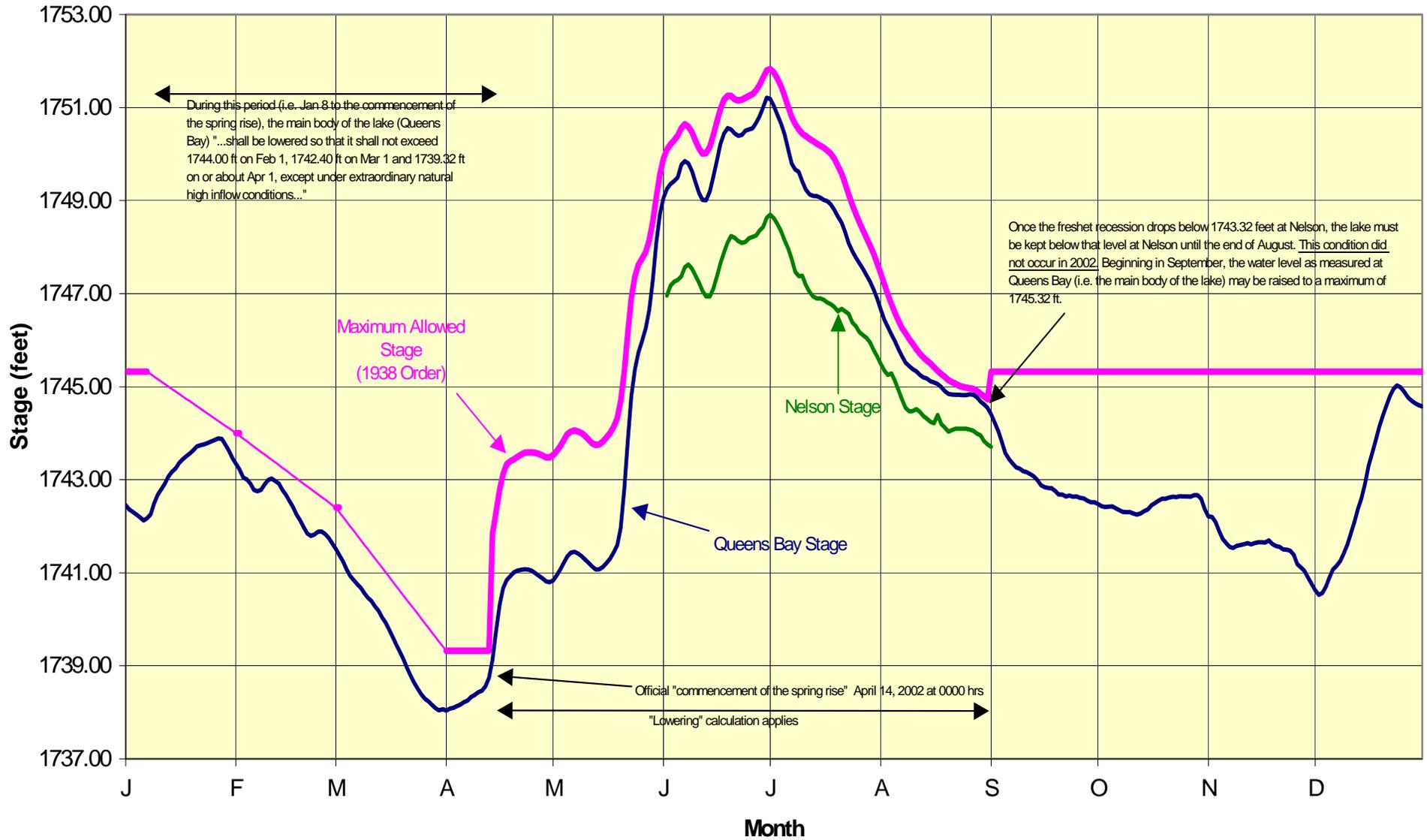
During the annual public Board meeting, the Board heard complaints from Duck Lake's bass fishing interests about overly-low lake levels during the winter months. Commissioner Schornack, who was in attendance, advised the meeting that the Commission would discuss the issue and convene an Order review if necessary. Accordingly, the Commission decided, on October 7, to review the Order during 2003.

1970 Order, Section 1(d)

Two additional pumps shall be installed at the North end of Duck Lake, adjacent to the two existing pumps formerly owned by the Duck Lake Dyking District, each having a capacity of not less than 30,000 United States gallons per minute and discharging through a 36 inch diameter pipe with an invert elevation of 1750.0.

During a visit to Duck Lake, the Manager of the Creston Valley Wildlife Management Area informed the Board that the original pumps at the north end of Duck Lake had been removed several years earlier with the intention of refurbishing them, but, due to severe deterioration and high materiel costs, the pumps have not been replaced. The Board is aware that the 1970 Order called for new pumps in addition to the existing ones. The Board's US Section advised the Commission Secretariat of this matter in early December. In light of the Commission's decision to review the Order, the Board plans no further action regarding the pumps at this time. (To date, the new pumps have satisfactorily controlled the lake level during periods of operation.)

Kootenay Lake Hydrograph 2002



Duck Lake and Kootenay Lake Hydrographs 2002

