



International Kootenay Lake Board of Control

2006 Annual Report to the International Joint Commission

Libby Dam Treaty Tower



The tower atop Libby Dam in northwestern Montana is truly representative of the cooperation between Canada and the United States. The upstream face of the tower contains this massive sculpture commemorating the Columbia River Treaty between the two countries for the cooperative development of the vast Columbia River Basin water resources.

The man pictured in the center is a Kutenai Indian—the first people on this land. His harnessing of two wild horses represents the harnessing of natural forces by man. Clouds, rain, and sunshine symbolize creation and the ever-present forces of nature at work. The fish and flying geese represent the wildlife that finds sustenance from the waters of the Kootenai River and the environment. In the lower left is a bald eagle representing the United

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States, and opposite that in the lower right is a maple leaf representing Canada. This figure commemorates the two nations working in cooperation in the construction of Libby Dam.

The sculptor, Albert Wein of Encino, California, was selected by international competition. The giant bas-relief sculpture measures 27x30 feet and weighs 75 tons.

Kootenay Lake 2006 Summary

Throughout 2006, FortisBC has regulated the level of Kootenay Lake below the maximum limits prescribed by the 1938 Kootenay Lake Order. The maximum instantaneous water level for the lake at Queens Bay was observed at 11:25 PST on June 20th at elevation 533.866 metres¹ (1751.53 feet). The minimum instantaneous water level was observed at 05:10 PST on April 5th at elevation 530.128 metres (1739.27 feet). Kootenay Lake discharged 26.1 cubic kilometres (21.1 million acre-feet) of water in 2006, with an average flow of 827 cubic metres per second (29,200 cubic feet per second).

The Board and the Applicant jointly determined the date of the commencement of the spring rise as April 9th.

2006 Annual Report

This Annual Report covers the operations of FortisBC 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. [FortisBC cooperates with BC Hydro, which also manages a lake level control structure—the Kootenay Canal Plant—at the lake's outlet.]

Board Membership

The Board members during 2006 were as follows:

for the United States,

Colonel Debra M. Lewis, District Engineer, Seattle District, United States Army, Corps of Engineers, Seattle, Washington (to June 1);

Colonel Michael McCormick, District Engineer, Seattle District, United States Army, Corps of Engineers, Seattle, Washington (from July 27);

Ms. Kathy Peter, Director, USGS Idaho Science Center, United States Geological Survey, Boise, Idaho;

and for Canada,

Mr. Kirk Johnstone, Chief, Pacific Prediction Centre, Environment Canada, Vancouver, British Columbia;

Mr. Glen Davidson, Director, Water Stewardship, BC Ministry of Environment, Victoria, British Columbia.

Mr. Larry Merkle and Mr. Daniel Millar provide secretariat support to the US and Canadian sections, respectively.



Col. Michael McCormick

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

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



Corra Linn Dam

Lake Regulation

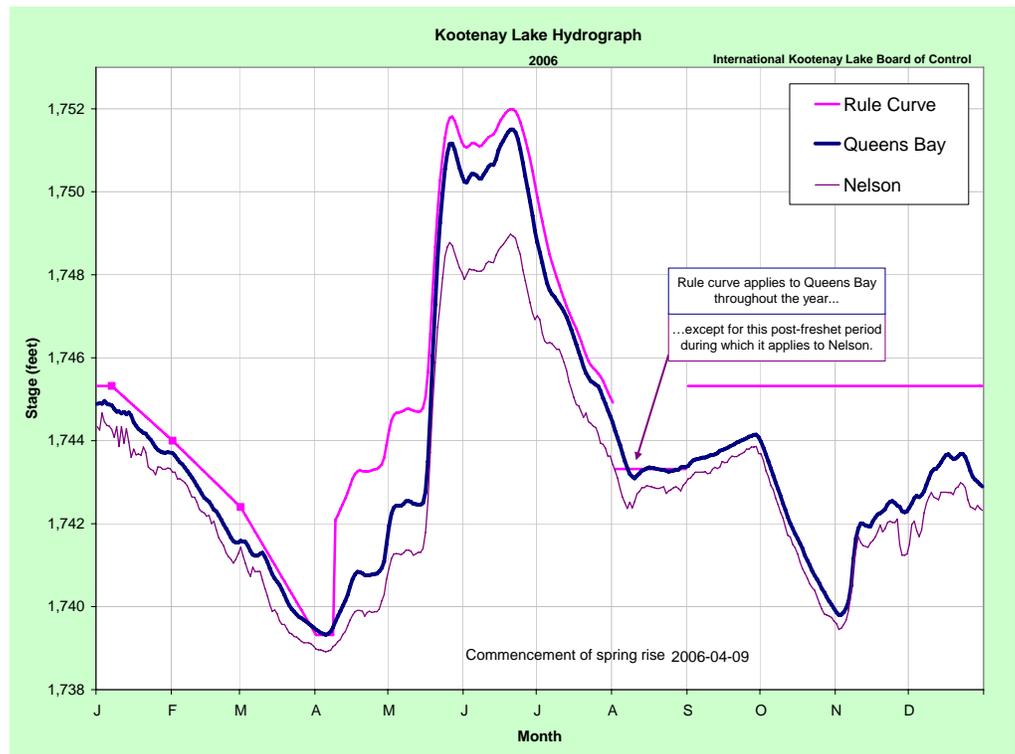
FortisBC regulated the level of Kootenay Lake in accordance with the 1938 Order throughout 2006.

The maximum instantaneous water level of 533.866 metres (1751.53 feet) for the lake at Queens Bay was reached on June 20th at 11:25 PST. The minimum instantaneous water level was observed on April 5th at 05:10 PST, elevation 530.128 metres (1739.27 feet). The maximum daily mean outflow was 2,285 m³/s (80,700 cfs) on June 23rd; the minimum was 354 m³/s (12,500 cfs) on November 7th. Relative to the 76-year period of record (1931 to 2006), this year's maximum water level ranked 39th highest, and the minimum ranked the 58th 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.

Kootenay Lake discharged 26.1 cubic kilometres (21.1 million acre-feet) of water this year through Corra Linn Dam and the Kootenay Canal Plant, with an average flow of 827 m³/s (29,200 cfs). Relative to the 69 years of available data, the annual volume of flow out of the lake was 27th highest. Total lake outflow has ranged from a high of 33.8 km³ (27.4 million acre-feet) in 1954 to a low of 13.8 km³ (11.2 million acre-feet) in 1944.

The Board and the Applicant jointly determined the commencement of the spring rise to be 00:00 PST on April 9th, 2006.

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



The apparent exceedance of the rule curve by Queens Bay water levels around the beginning of April is an aberration, but not a violation of the order. During this period, the Applicant held the dam forebay low enough that the lake outlet control was upstream of the dam at Grohman Narrows. On the falling limb, the Order indicates that Queens Bay shall not exceed 1739.32 feet on or about April 1. As it happened, the lake dropped below 1739.32 feet for one day only—April 5. Subsequently the lake started to rise naturally. By April 9, it was apparent that the freshet had started, and the commencement of spring rise was declared.

Board Meetings

The Board held its annual and public meetings in Bonners Ferry, Idaho, on September 14th, the minutes of which were delivered to the Commission shortly thereafter. The public meeting was marked with a much larger than usual turnout. Attendees from both sides of the border were concerned about the high water experienced in the Kootenai River and Kootenay Lake during the spring freshet. Around the lake, more than the water level, residents and politicians were concerned about the long duration of the high water—about a month. Several commented that this caused a disruption for businesses, such as marinas where breakwaters were inundated. The situation may have been exacerbated by the unintentional overfilling, then spill, of Libby reservoir due to the double-peaked snowmelt hydrograph supplemented by rainfall runoff.



Kootenay River system (red)



Libby Dam

Prior to the meetings, Board members along with attending IJC staff visited Libby Dam on the Kootenai River. Libby is situated both upstream and downstream of Canada, and upstream of Kootenay Lake. Its reservoir, Lake Koochanusa (from Kootenai-Canada-USA), stretches 90 miles, and well into British Columbia. The 422 foot structure houses five turbines with a combined capacity of about 25,000 cubic feet per second. The dam was built, and is operated, under the Columbia River Treaty to generate power and provide flood control in both Canada and the US.