

# International Kootenay Lake Board of Control

## ANNUAL MEETING MINUTES

September 22, 2011

Nelson, BC

	<b>United States</b>	<b>Canada</b>
Chair	Col. Bruce Estok	Kirk Johnstone (host)
Members	Steve Lipscomb	Glen Davidson
Secretary	Amy Reese	Daniel Millar
Guests	Dr. Mark Colosimo (IJC), Tom McAuley (IJC), Marko Aaltomaa (FortisBC), Amy Stevenson (BC Hydro), Peter Brooks (USACE), Gwyn Graham (Environment Canada), Joel Fenolio (USACE), Danielle Royer (FortisBC), Jamie King (FortisBC).	



Number 1 tunnel in Duncan Dam releasing water at near-full throttle

## 1. Welcome and introductions

Canadian Co-Chair and meeting host, Kirk Johnstone, welcomed participants and led introductions of the Board members and guests.

## 2. Review of the agenda

After reviewing the agenda, the Chair moved item 4.2 ahead of 3.1 due to the common reference to the Kootenay Lake hydrograph. The agenda was then approved.

## 3. Business from previous meeting

### 4.2 Compliance with the Kootenay Lake Order in 2011

Daniel Millar presented the Kootenay Lake water level hydrograph for 2011. The Kootenay Order calls for FortisBC, the Order's Applicant and operator of Corra Linn Dam, to manage the dam in a manner that keeps lake levels below a set upper limit throughout the year. If the level rises above this limit, the dam must be operated (i.e., the forebay drawn down) to cause the control of lake outflow to move upstream to the constriction at Grohman Narrows. About mid-February, the operators of the upstream dams Libby and Duncan realized that snowpack was accumulating well above the normal rate. To avoid spring flooding downstream, these dams began drafting in preparation for the anticipated runoff. These releases caused Kootenay Lake to rise above the set upper limit for the period from March 14<sup>th</sup> until spring rise was declared on May 3<sup>rd</sup>. During that period, FortisBC duly lowered the forebay of Corra Linn.

### 3.1 Identifying control: Corra Linn vs. Grohman Narrows

Several years ago, FortisBC provided the Board with a set of curves (dated 1991) that define the relation among Kootenay Lake outflow, the water level in the Corra Linn Forebay, and the water level of the main body of Kootenay Lake at Queens Bay. Using these curves, and the actual values of the three variables, one can establish whether the control of lake outflow is at Corra Linn Dam, or upstream at Grohman Narrows. Last year, the Secretaries developed a rudimentary method of graphically displaying the control point on the annual hydrograph. Board members asked the Secretaries to refine this display to demonstrate the extent to which the control point rested at either location. The proposed solution was a graph that represented this in the context of how much higher or lower the water level at Queens Bay would have to be to move the control from one point to the other.

**Action:** Board members agreed to review this new control point display and advise the Secretaries of any further refinement they would like to see.

**Action:** Mr. Aaltomaa agreed to review the validity of the control calculation.

## 4. New Business

### 4.1 Is Grohman Narrows aggrading?

For several years at the Board's public meeting, local residents have raised concern about the perceived aggradation of Grohman Narrows and the potential to exacerbate lake level extremes. Some people have asked for more dredging. The Board questioned whether there was any evidence of aggradation in information readily available. Stage-discharge curves were established by Waananen and Patterson around the time of the 1948 high water extreme. Using these curves together with water level and flow data for subsequent years, the Board found that, in each succeeding year, periods during which the outlet control was at Grohman Narrows plotted consistently on the old curves. This study suggests that Grohman is not aggrading, but the issue remains open to debate. For example, Steve Lipscomb suggested that there could be some aggradation but it might push through at high water. FortisBC and BC Hydro, referring to their own studies, believe the stage-discharge curve for Grohman Narrows is holding steady.

**Action:** The Board asked Amy Stevenson and Marko Aaltomaa to peer review the Board's study prior to posting it publicly on the IJC web site.

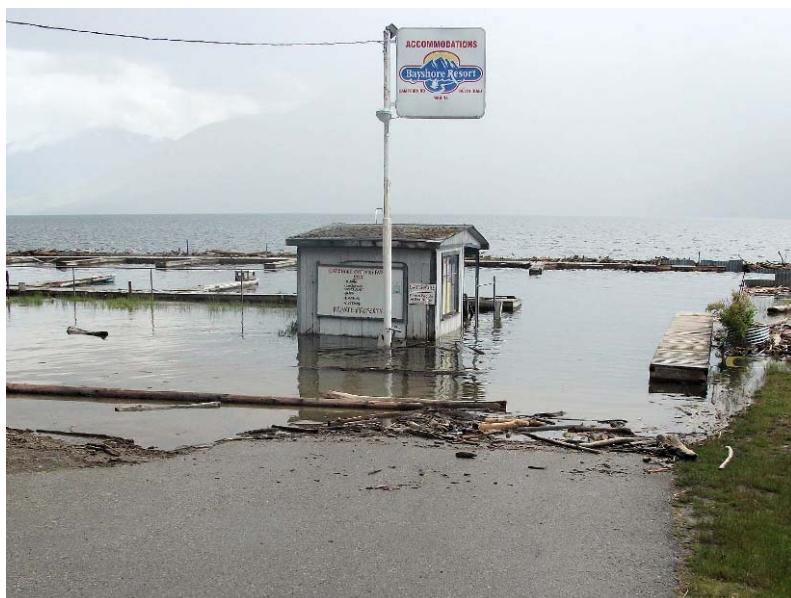
#### 4.3 Fortis BC operations in 2011

Marko Aaltomaa of FortisBC gave a presentation on his company's operations that were significant to the Board. He made the following points:

- Mid-September 2010, Kootenay Lake began filling in order to preserve outflows at Brilliant.
- Dry conditions caused lake to recede slightly in mid-October.
- By mid-November the lake began to fill as Libby discharge increased.
- Kootenay Lake began free fall at Corra Linn in late February with the control of lake level at Grohman Narrows.
- Due to high inflows in March, April and May, Kootenay Lake failed to lower below 1739.32 ft, as per the IJC order.
- The lowest lake level was 1740.49 ft. on April 23, 2011.
- Spring rise was declared May 3, 2011.
- Kootenay Lake peaked at 1751.71 ft. on June 15th. It then dropped and rose again, reaching a second peak of 1751.56 ft. on June 24<sup>th</sup>.
- Lake receded quickly and went to Nelson control on July 12<sup>th</sup>.
- Corra Linn spillgate refurbishment
  - Included in the Long Term Capital Plan as part of FortisBC's 2012 Integrated System Plan, filed with the British Columbia Utilities Commission in June 2011.
  - A consultant was hired to perform a preliminary analysis which covered different load cases and failure probabilities.
  - Review this year included a wet and dry visual gate inspection allowing engineers to assess the current condition of the gates.
  - FortisBC is waiting for the report from the consultant to make final decisions on spillway gate maintenance.
- Preventive maintenance on the water gauges is being done twice annually.
- Preventative maintenance completed in December 2010 and June 2011.
- Currently negotiating with local landowner for firm access rights to Queen's Bay water gauge.
- Payments to State of Idaho per the Order have been made for 2010 and 2011.

Mr. Aaltomaa followed his presentation with a short slide show of photos taken around the lake during the June high water period. He noted that at 1751.7 feet, the lake level is just shy of causing damage to lakeside structures and properties.

FortisBC photo



#### 4.4

#### Columbia River Treaty Operating Committee studies involving potential changes on operation of upstream dams

On behalf of the Columbia River Treaty Operating Committee, Peter Brooks gave a presentation to the Board evaluating a study of Libby Dam and Duncan Dam flood risk management operations on Kootenay Lake. From that presentation:

- The 1938 IJC Order for Kootenay Lake specifies maximum lake elevations, to be administered by the Kootenay Lake Board of Control.
- This study was performed because the past practice of restricting flow at the upstream projects to meet the Kootenay Lake maximum elevations (commonly referred to as IJC logic) may cause incomplete flood storage evacuation at Libby and Duncan Dams.
- This incomplete flood storage evacuation, or “trapped storage”, may adversely impact both system and local flood risk management.
- The 2008 annual report by the KLBC confirmed that neither Duncan nor Libby Dam operations are constrained by the Kootenay Lake maximum lake elevations. [ed. The 2008 Board report states “With regard to the upstream dams, the Board has concluded that it has no authority to direct their operations, whether through the 1938 Order or the Columbia River Treaty. The Commission supported this conclusion stating that the 1938 Order is directed solely to the Applicant, and operation of the upstream dams is a matter for the two federal governments to determine.”]
- The analysis was structured to compare the proposed Libby and Duncan operations against the previous method of restricting Libby and Duncan Dam’s flow to meet the IJC rule curve maximum elevations.
  - Tier 1 Pre-dam – Baseline to simulate Kootenay Lake response before Libby and Duncan were constructed.
  - Tier 2 Current – Regulate Libby and Duncan to attempt to meet the Kootenay Lake IJC maximum elevations.
  - Tier 3 Proposed – Reflects recent IJC ruling in which neither Libby Dam nor Duncan Dam operations are limited to meet the Kootenay Lake IJC maximum elevations.
- There is a significant reduction in peak elevations at downstream projects and river reaches with Libby and Duncan Dams in place.
- There is a barely perceptible difference on Kootenay Lake’s pre-freshet peaks if Libby and Duncan Dams follow the Tier 3 strategy.
- The Tier 3 Libby Dam and Duncan Dam operations often decreased post-freshet peaks at Kootenay Lake but never increased peaks.
- Next Steps – Finalize proposed operations report this fall for CRTOC approval. Evaluate the Tier 3 operations (proposed operations) for implications to the FCOP, AOP, and DOP and other studies. Plan to utilize the Tier 3 proposal in operations.

After the presentation, Amy Stevenson advised that BCHydro would not operate Duncan Dam in a manner that would raise Kootenay Lake above 1749.5 feet, other than to hold the reservoir at a steady state keeping outflow equal to inflow.

FortisBC representatives expressed concern that under the proposed operation regime, they will often not be able to draw down to 1739.32 feet pre-freshet. It appears that the CRTOC needs to maintain closer contact with FortisBC to address such operations.

Kirk Johnstone noted that the trade-off of this proposed regime is flood control versus gravity drainage of upstream farms. The studies need to show the frequency and length of time the April lake level will drop below 1739.32 feet.

Daniel Millar asked how this proposed operational regime balances against the Columbia River Treaty Article XII, 6, “The operation of the storage by the United States of America shall be consistent with any order of approval which may be in force from time to time relating to the levels of Kootenay Lake made by the International Joint Commission under the Boundary Waters Treaty, 1909”. This will need to be answered as part of the study in order to explain to those who need low spring water why they may not get it. It should be a reasonable exception, not the rule.

Mr. Brooks agreed to redraft the report to make it more understandable, to compare elevation changes within modeled years for both winter and spring elevations, and to better describe future water level potential for the lake.

5. Preparation for public meeting

5.1 Review of agenda

The Board reviewed the upcoming public meeting agenda. Members opined on issues likely to be brought up at the meeting, including mosquitoes, the failure to reach low water levels in April, the operations of upstream dams, and Grohman aggradation.

6. Adjourn

Daniel Millar advised that this would be his last meeting as the Board's Canadian Secretary in anticipation of a December retirement date.

Kirk Johnstone thanked participants and adjourned the meeting.