



**Province of British Columbia**  
***WATER SUSTAINABILITY ACT***

**ORDER**

**Section 93**

Site C Clean Energy Project File Number: 7001837

**WHEREAS:**

1. On 26 February 2016 the Deputy Comptroller of Water Rights (the “DCWR”) issued to British Columbia Hydro and Power Authority (BC Hydro) Conditional Water Licences C132990 (the “Power Licence”) and C132991 (the “Storage Licence”) for the construction of the dam and reservoir that are components of the Site C Clean Energy Project (the “Project”);
2. Clause h) of the Power Licence authorizes the construction of works that include an approach channel, an intake, a dam, spillways, a powerhouse and tailrace, and an access road;
3. Clause j) 5) of the Power Licence requires BC Hydro to obtain a leave to commence construction (LCC) in writing from the Engineer under the *Water Sustainability Act* (the “WSA Engineer”) before commencing the construction of the works authorized by clause h). LCCs for Phases 1 to 10 of the Project have been granted and construction activities are ongoing;
4. On 29 June 2016 the WSA Engineer granted LCC No. 2 to BC Hydro for the construction of five Relocated Surplus Excavation Material (RSEM) areas, RSEM R5a, R5b, R6, L5 and L6, including the construction and operation of associated sediment ponds;
5. Included in the LCC No. 2 submission was **Appendix C – MCW Contract Technical Specifications 13 40 00 Relocated Surplus Excavation Materials and Water Management**, which commits that water management infrastructure shall be designed in accordance with the following surface drainage design criteria:

Structure	Short-term Structure Return Event	Permanent Structure Return Event
Non-Contact Water Diversion	1 in 10 year – 24 hour peak flow	1 in 200 year – 24 hour peak flow
Contact Water Collection Ditch	1 in 10 year – 24 hour peak flow	1 in 100 year – 24 hour peak flow

6. Clause j) 3) e. of the Power Licence requires BC Hydro to submit a construction environmental management plan (CEMP) for the management and mitigation of construction impacts that is to the satisfaction of the Comptroller of Water Rights (the “CWR”);
7. Appendix E – **Acid Rock Drainage and Metal Leachate Management Plan**, revised on 26 July 2016 and added to the CEMP, specifies the construction procedures that will be followed to minimize the amount of acid rock drainage (ARD) and metal leachate (ML) produced by the Project, the water quality objectives that are to be met, the monitoring that is to occur to verify that the objectives are being met, and the documentation required for any non-compliance with those objectives;
8. Appendix E of the CEMP specifies sediment pond and respective Peace River initial dilution zone (IDZ) compliance points, as well as water quality threshold concentrations for RSEM sediment pond end-of-pipe discharges of potentially acid generating (PAG) bedrock contact water. Appendix E further specifies that the effluent must be not acutely lethal to aquatic life at the point of discharge into the environment, to be confirmed through 96-hr Rainbow Trout acute toxicity testing;
9. On 08 September 2018 heavy runoff over exposed PAG shale bedrock in the Approach Channel washed soluble ARD/ML products, including Cadmium, Copper, Zinc, Aluminum and acidic (low pH) water into the Peace River via RSEM sediment pond R5b;
10. From 09 to 20 September 2018 over 22,000 cubic metres of PAG contact water was discharged from RSEM sediment pond R5b into the Peace River, which daily exceeded either pH or metal CEMP Appendix E concentration thresholds at the point of discharge. This exceedance included over 4,000 cubic metres of PAG contact water below pH 6.0 (down to pH 4.7) from 09 to 10 September 2018, as well as a failed acute toxicity test;
11. Where feasible mitigation measures were undertaken onsite in response to the event; however, they were ultimately unsuccessful in preventing the release of a significant amount of potentially environmentally harmful effluent into the aquatic environment;
12. On 02 November 2018 the CWR issued an Order pursuant to Section 93 of the *Water Sustainability Act*, amended 30 November 2018, directing BC Hydro to submit plans to assess the water management structures within the RSEM R5b catchment area, as well as the existing Peace River IDZ sampling and sediment pond acute toxicity testing program, and to recommend measures to be taken to minimize the reoccurrence of a discharged water quality exceedance;
13. BC Hydro has completed their submission in response to the 02 November 2018 Order, including consultant reports which have been reviewed and form the basis for the direction outlined in this Order. Submission reports and other relevant documents reviewed for this decision are listed in Appendix A attached.

## **I HEREBY DIRECT BC HYDRO AS FOLLOWS:**

1. Implement recommendations in the consultant reports referenced in Whereas clause 13 and committed by BC Hydro in its letter of 17 December 2018, including:
  - a) Ensure that temporary water management structures associated with the pre-treatment collection pond and mobile water treatment facility (the “MWTF”) located on the right bank are collectively designed and constructed for the 10-year 24-hour design storm event plus two times the 95% confidence limits;
  - b) Construct the pre-treatment collection pond perimeter berm to a crest elevation of El. 463.5 m, as recommended in the Klohn Crippen Berger (KCB) 20 December 2018 report;
  - c) Add Approach Channel water storage sump volume and pumping capacity, as recommended in the KCB 20 December 2018 report, and assess the pumping capacity between Approach Channel sumps to ensure adequate water balance when pumping runoff water from the Approach Channel to MWTF; and
  - d) Re-design and implement the acute toxicity testing program, as recommended in the Ecofish Research Ltd. 16 November 2018 memorandum, and incorporate their recommendations into the CEMP Appendix E acute toxicity monitoring program and reporting requirements.
2. At intervals not exceeding twelve (12) months, remove weathered shale material from the excavation faces of the Approach Channel to a depth that clears all acidified bedrock at surface. The CWR must be notified within two (2) weeks of the completion of each re-excavation event.
3. Confirm as-built conditions for the Area 23 and Approach Channel Diversion ditch (the “ditch”) in comparison to its original design, as depicted in Figure 2.1 of the KCB 20 December 2018 report and specified in Peace River Hydro Partners’ technical drawings 1020-C11-00613, Revision 10 and 1020-C11-00613-00, Revision 1, dated 26 October 2018, and remediate any identified deficiencies, including:
  - a) Re-route the ditch to discharge to the Moberly River as originally designed (instead of to the RSEM R5b sediment pond); and
  - b) Install appropriate erosion control measures and PAG isolation measures to be designed and confirmed to be constructed to design by an appropriately qualified environmental professional for both the new ditch pathway and any abandoned portion.
4. Confirm as-built conditions for the RSEM R5b sediment pond in comparison to its original design, as described in Appendix D – MCW Contract Drawings of BC Hydro’s 08 April 2016 LCC 2 submission, including berm crest elevation, and remediate any identified deficiencies.

5. Complete measures 1. through 7. as delineated in BC Hydro's letter of 17 December 2018, with confirmation communicated to the CWR within two (2) weeks of the completion of each action item.
6. Provide reports every two weeks on the progress of the construction of the works for the management of surface water for the RSEM R5b catchment area, including the Area 23 and Approach Channel Diversion ditch, MWTF and associated pond, sumps and pumps. In addition to the progress of construction and implementation, the reports must include a description of the weather and the flow conditions affecting the structures.
7. The first of the reports referenced in item 6. above is to be submitted Monday, 18 March 2019. The reports are required until the works are completed. The reports are to be sent to the Independent Engineer, Independent Environmental Monitor and WSA Engineer.

Dated at Victoria, B.C., this 27<sup>th</sup> day of February 2019



Ted White, B.Sc.  
Comptroller of Water Rights

## Appendix A – Information for Decision on RSEM Pond Operations

### Items 1 to 14 are documents included in BC Hydro's response submission

1. BC Hydro – *Re: November 2, 2018 Water Sustainability Act Section 93 Order*, letter from G. Scarborough to T. White, 16 November 2018, including supporting documents
2. Klohn Crippen Berger Ltd. – *BC Hydro Site C Clean Energy Project Response to Water Sustainability Act order Dated November 2, 2018 File Reference: 7001837*, report from M-J Piggott to G. Scarborough, 16 November 2018
3. Rowan Williams Davies & Irwin Inc. – *Precipitation Assessment in Response to Nov. 2, 2018 Order Site C Clean Energy Project Fort St. John, BC*, memorandum from C. Reuten to M. Brewis, 08 November 2018
4. Ecofish Research Ltd. – *Evaluation and Recommendations for Site C Toxicity Testing and Peace River Initial Dilution Zone Sampling in Response to the November 2, 2018 Water Sustainability Act Order Requirements*, memorandum from L. Shelley *et al.* to M. Brewis, 16 November 2018
5. BC Hydro – *Re: Update on deliverables required by the November 2, 2018 Water Sustainability Act Section 93 Order*, letter from G. Scarborough to T. White, 23 November 2018, including supporting documents
6. Peace River Hydro Partners – *Site C Clean Energy Project PRHP Section 93 Order Requirements Plan*, report from C. Walmsley to BC Hydro, 12 November 2018
7. Lorax Environmental – *Right Bank ARD Management*, memorandum from B. Mattson and N. Mallen to PRHP, 14 November 2018
8. BC Hydro – *Re: Request for amendment and time extension for responding to Clause 1.5 in the November 2, 2018 Water Sustainability Act Section 93 Order*, letter from G. Scarborough to T. White, 29 November 2018
9. BC Hydro – *Re: November 30, 2018 letter with two Directives and amended Condition 1, 5<sup>th</sup> bullet from the November 2, 2018 WSA Section 93 Order*, letter from G. Scarborough to T. White, 17 December 2018
10. BC Hydro – *Re: Plans required by the November 30, 2018 letter with two Directives and amended Condition 1, 5<sup>th</sup> bullet from the November 2, 2018 WSA Section 93 Order*, letter from G. Scarborough to T. White, 21 December 2018, including supporting documents
11. Klohn Crippen Berger Ltd. – *BC Hydro Site C R5B Water Management*, report from M-J Piggott to G. Scarborough, 20 December 2018
12. Peace River Hydro Partners – *Site C Clean Energy Project PAG Contact Water Sediment Pond Instrumentation Plan*, report from C. Walmsley to BC Hydro, 19 December 2018
13. BC Hydro – *Re: Plans required by the November 30, 2018 letter with two Directives and amended Condition 1, 5<sup>th</sup> bullet from the November 2, 2018 WSA Section 93 Order*, letter from G. Scarborough to T. White, 07 January 2019, including supporting documents (repeat of items 13 and 14 above)
14. Klohn Crippen Berger Ltd. – *Section 13 40 00 Relocated Surplus Excavation Materials and Water Management, Revision 4*, report from M. Piggott to A. Watson, 04 December 2015

**Items 15 to 33 are other relevant documents reviewed for this decision**

15. BC Hydro – *Site C Dam Documentation to Support Application for Leave to Commence Construction 2 (LCC 2) Appendix D -MCW Contract Drawings*, 08 April 2016
16. BC Hydro – *Situation Update: Heavy Rains in the Peace*, email from S. Mason to provincial and federal regulators of the Site C Clean Energy Project, 9 September 2018
17. BC Hydro – *Update on Situation Update: Heavy Rains in the Peace*, email from G. Scarborough to provincial and federal regulators of the Site C Clean Energy Project, 11 September 2018
18. Lorax Environmental – *PAG Contact Water Exceedance Report – September 9, 2018*, memorandum from B. Mattson to C. Walmsley, 14 September 2018
19. BC Hydro – *RE: RSEM R5B Discharge Exceedance Report (Sept 9, 2018)*, email from M. Brewis to G. Fisher, 21 September 2018, including supporting documents
20. Lorax Environmental – *PAG Contact Water Exceedance Report – September 10-13, 2018*, memorandum from B. Mattson to C. Walmsley, 21 September 2018
21. Lorax Environmental – *PAG Contact Water Exceedance Report – September 14-17, 2018*, memorandum from B. Mattson to C. Walmsley, 25 September 2018
22. Lorax Environmental – *PAG Contact Water Exceedance Report – September 18-20, 2018*, memorandum from B. Mattson to C. Walmsley, 01 October 2018
23. BC Hydro – *BCH Letter to PRHP re: ongoing water treatment facility and Approach Channel care of water deficiencies*, email from M. Brewis to G. Fisher, 03 October 2018, including supporting documents
24. BC Hydro – *Re: Ongoing Water Treatment Facility and Approach Channel Care of Water Deficiencies*, letter from J. Walsh to D. Cuartero Martinez, 02 October 2018
25. BC Hydro – *RE: Follow-up from Sept 25 site visit & info requests related to RSEM R5b sediment pond discharge Sept 9/10*, email from M. Brewis to G. Fisher, 11 October 2018, including supporting documents
26. Ecofish Research Ltd. – *RSEM R5b Monitoring – September 9, 2018 acute toxicity test failure and estimate of extent of BC Water Quality Guideline exceedances in the Peace River from September 9 to 20, 2018*, memorandum from K. Ganshorn *et al.* to M. Brewis, 04 October 2018
27. Peace River Hydro Partners – *Site C Clean Energy Project EIR-OTH-043 (RSEM R5b Sediment Pond pH Exceedance) Environmental Incident Report*, report from C. Walmsley to BC Hydro, 04 October 2018
28. Peace River Hydro Partners – *IFC Drawings 1020-C11-00613, Revision 10 and 1020-C11-00613-00, Revision 1*, 26 October 2018
29. FLNRORD – *Site C Clean Energy Project Conditional Water Licences 132990 and 132991 on Peace River RSEM Pond Discharged Exceedance to Peace River*, letter and *Water Sustainability Act Section 93 Order (“WSA Order”)* from T. White to S. Mason, 02 November 2018
30. FLNRORD – *Site C Clean Energy Project Conditional Water Licences 132990 and 132991 on Peace River RSEM Pond Discharged Exceedance to Peace River*, letter and *WSA Order amendment* from T. White to S. Mason, 30 November 2018

31. BC Hydro – *FW: R5b water management*, email from G. Scarborough to G. Fisher, 17 December 2018, including supporting documents
32. Klohn Crippen Berger Ltd. – *Site C R5B Water Management DRAFT*, report from M-J Piggott to G. Scarborough, 14 December 2018
33. FLNRORD – *Site C Clean Energy Project Conditional Water Licences 132990 and 132991 on Peace River RSEM Pond Discharged Exceedance to Peace River*, letter from T. White to S. Mason, 21 December 2018