BRITISH COLUMBIA

Province of British Columbia
WATER ACT

FINAL WATER LICENCE

British Columbia Hydro and Power Authority is hereby authorized to divert and use water as follows:

a) The stream on which the rights are granted is Campbell River.

b) The point of diversion is PD30870 located as shown on the attached plan.

c) The date from which this licence shall have precedence is March 23, 1946.

d) The purpose for which this licence is issued is power, which is to be generated at John Hart Generating Station.

e) The maximum rate at which water may be diverted and used under this licence is 38.45 cubic metres per second.

f) The water may be diverted and used throughout the whole year.

g) This licence is appurtenant to the undertaking of British Columbia Hydro and Power Authority to generate power at the John Hart Generating Station situated on District Lot 1124, Sayward District.

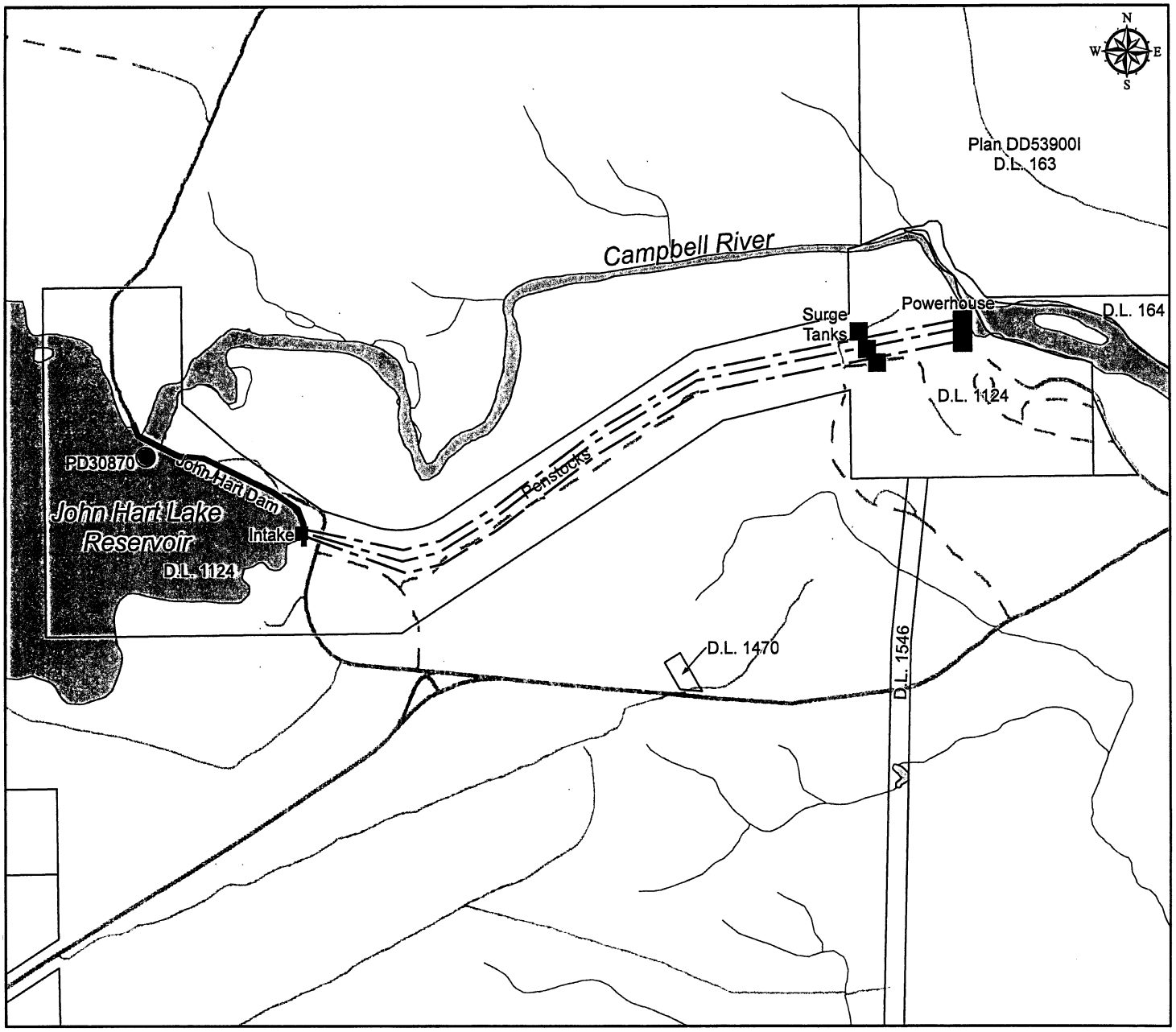
h) The authorized works are the John Hart Dam, intake, penstocks, surge tanks and powerhouse as shown on the attached plan, and ancillary works associated with the operation of the dam and powerhouse.

i) This licence is issued in substitution of Conditional Water Licence 17294, in part.

Pieter J. Bekker
Deputy Comptroller of Water Rights

File No: 0156743 **Date Issued: November 21, 2012** **Final Licence No: 126713**

BRITISH COLUMBIA



WATER DISTRICT: NANAIMO
PRECINCT: COURTENAY
LAND DISTRICT: SAYWARD

Signature: _____

Date: Nov. 21, 2012

LEGEND:

Scale	1:15,000
Point of Diversion	●
BCGS Map Number	92K.004
WR Map Number	92K/3c

F.L. 126713 for C.L. 17294, in part
File 0156743

Attachment A

John Hart Redevelopment Project

Scope of Information and Reports by the Independent Engineer

A. Preamble

BC Hydro and Power Authority (the "Licensee") is proceeding with the construction of the underground John Hart Generating Station ("underground John Hart GS"), a component of John Hart Redevelopment Project. The underground John Hart GS is located on Campbell River and is authorized by Conditional Water Licences 126713, 126721 and 126757 (the "Licences"), which form part of this document. The works of the underground John Hart GS are described under clause (h) of the Licences.

The Licensee is required under clause (k) 1) of the Licences to retain an Independent Engineer who will provide information and reports under the direction of the Comptroller of Water Rights (the "Comptroller") regarding the design and construction of the works. The Licensee is also required to retain an Environmental Monitor as set out in the Licences.

The information and reports to be provided by the Independent Engineer to the Comptroller, and the Independent Engineer's relationship with the Licensee, Design Engineer, Construction Engineer and Environmental Monitor are described in this document.

B. Regulation of the Construction of Works

The Comptroller has the power to regulate the construction of works, which regulation may consider the following:

1) The criteria for the design and construction of works to protect the public and the environment.
2) The criteria for the operation of the works to protect the interests of licensees, riparian owners and owners of land adjacent to the works, and protect the environment from adverse effects.
3) The construction activities that may adversely affect the public, the environment and the interests of licensees, riparian owners and owners of land adjacent to the works.

If the Comptroller has determined that the construction of works may be hazardous to the public and the environment, or the interests of licensees, riparian owners and owners of land adjacent to the works may be adversely affected, the Comptroller may issue an order that directs the Licensee to change the manner in which the works are constructed to remove the hazard and adverse effect.

C. Information and Reports

The Licensee is required under clause (k) 3) of the Licences to submit to the Comptroller the following:

a) plans that show the general arrangement of the works;
b) criteria for the design of the works;
c) criteria for the operation of the works;
d) a schedule for the construction of the works;
e) an environmental management plan (EMP) for the management and mitigation of construction impacts, including a Drinking Water Protection Plan.

The Licensee is also required under clause (l) to ensure that the design drawings for the works to be constructed are signed and sealed by a professional engineer registered in the province of British Columbia (the "Design Engineer").

These submissions by the licensee are the basis for the regulation of the construction of the works.

The Independent Engineer is directed to review the submissions and provide the Comptroller with reports as follows:

1) Compare the plans showing the general arrangement of the works to the works described by the Licence and describe any differences.
2) Assess the criteria for the design of the works to determine if works constructed to these criteria will be a hazard to the public and the environment.
3) Assess the criteria for the operation of the works to determine if works operated to these criteria will protect the interests of licensees, riparian owners and owners of land adjacent to the works, and protect the environment from adverse impacts.
4) Assess the schedule for the construction of the works to determine if there are any practical matters in relation to the conditions in the Licence and the EMP; and the interests of the public, licensees, riparian owners and owners of land adjacent to the works that the Comptroller should consider in the regulation of the works.
5) Assess the design drawings for the construction of the works to determine if they are in accordance with the criteria for the design and operation of the works, and they are signed and sealed by the Design Engineer.
6) Assess the schedule for the construction of the works and the design drawings for the construction of the works to determine the frequency of the submission by the Licensee of the reports on the progress of construction.

7) Review the reports submitted by the Licensee on the progress of the construction of the works to determine if any of the construction activities should be adjusted to reduce the future hazard posed by the works on the public and the environment.
8) Summarize any outstanding matters that would make the works a hazard to the public and the environment when the Licensee submits a schedule for testing the works.

The Independent Engineer will prepare a recommendation report for the Comptroller on the review of items 1) to 4) above for the issuance of Leaves to Commence Construction.

The Independent Engineer will prepare a recommendation report for the Comptroller, copy to the Licensee, Design Engineer and the Construction Engineer, on the review of items 5) and 6) if the actual construction of a particular component of the project may proceed.

The Comptroller may direct the Independent Engineer to provide additional information and reports as may be required for the regulation of the construction of the works.

The Independent Engineer will discuss and clarify with the Design Engineer and the Construction Engineer any matters that may need further action. If the Independent Engineer is unable to resolve such matters, the Independent Engineer must immediately notify the Comptroller. The Comptroller will contact the Licensee, and resolve the matter.

D. Environmental Monitor

The Licensee is required to retain a person (the "Environmental Monitor") to observe and report on the activities of constructing the works in relation to the requirements under the environmental management plan (the "EMP"). The Independent Engineer will be provided a copy of the report by the Environmental Monitor

The Independent Engineer will review the reports by the Environmental Monitor and advise the Comptroller in a written report if the construction activities are adversely affecting the environment and the interests of licensees, riparian owners and owners of land adjacent to the works.

The Independent Engineer and the Environmental Monitor will communicate with each other during the construction of the works to coordinate their activities to provide information to the Comptroller for proper regulation of the construction of the works.

E. Leave to Commence Construction

The Licensee may divide the construction of the works into phases. Before the Comptroller grants leave to commence construction of any phase of the works, the Comptroller must be satisfied that the Licensee has met the requirements under clause (k) of the licence.

The Independent Engineer will provide the Comptroller with information and reports as set out in section C. above for each phase in the construction of the works. The information and reports are to be provided in a timely manner in accordance with the schedule for the construction of the works.

Based on information submitted by the Independent Engineer, the Comptroller may issue a leave to commence construction for a particular phase of the project, subject to the Independent Engineer reviewing design drawings and giving consent for construction to proceed.

F. Undertaking and Monitoring of Construction

The Independent Engineer will review the design drawings for the construction of the works, and prepare a report as set out in Section C before giving consent that construction may be undertaken. The Independent Engineer will identify in the report to the Comptroller the components within each phase of the construction of the works that are critical for regulating the construction of the works to protect the public and the environment, and the interests of licensees, riparian owners and owners of land adjacent to the works, and protect the environment from adverse effects. A cover letter, with a copy to the Licensee, Design Engineer and the Construction Engineer, would make recommendation if construction of that particular component of works may be undertaken, and this would be sufficient for the Construction Engineer to proceed with construction.

The Independent Engineer will schedule site inspections to verify that the conditions for the construction of the critical components are in accordance with the construction plans, and provide the Comptroller with a report on the outcome of the inspection.

G. Testing the Operation

The Independent Engineer will monitor the testing of the operation of the works to determine if the operation poses a hazard to the public and the environment, and submit to the Comptroller a report on the outcome of the monitoring.

H. Acceptance

The information and reports to be provided by the Independent Engineer to the Comptroller as set out above is acceptable to:

Name: _____ Date: _____

Independent Engineer

AND

The Licensee agrees to retain the Independent Engineer to provide the information and reports to the Comptroller as set out above.

Name: _____ Date: _____

Licensee

Appendix A - Contact List

Comptroller of Water Rights	
Name:	Pieter Bekker
Position Title:	Deputy Comptroller of Water Rights
Office Phone Number:	250 387-9447
Mobile or Alternate Phone Number:	
Mailing Address:	PO Box 9340 Stn Prov Govt, Victoria BC V8W 9M1
Independent Engineer	
Name:	
Position Title:	
Company	
Office Phone Number:	
Mobile or Alternate Phone Number:	
Mailing Address:	
Licensee Representative	
Name:	
Position Title:	
Company	
Office Phone Number:	
Mobile or Alternate Phone Number:	
Mailing Address:	
Design Engineer	
Name:	
Position Title:	
Company	
Office Phone Number:	
Mobile or Alternate Phone Number:	
Mailing Address:	

Construction Engineer	
Name:	
Position Title:	
Company	
Office Phone Number:	
Mobile or Alternate Phone Number:	
Mailing Address:	

Attachment B

John Hart Redevelopment Project

Scope of Information and Reports by the Environmental Monitor

A. Preamble

BC Hydro and Power Authority (the "Licensee") is proceeding with the construction of the underground John Hart Generating Station ("underground John Hart GS"), a component of the John Hart Redevelopment Project. The underground John Hart GS is located on Campbell River and is authorized by Conditional Water Licences 126713, 126721 and 126757 (the "Licences"), which form part of this document. The works of the underground John Hart GS are described under clause (h) of the Licences.

The Licensee is required under clause (k) 3) e) of the Licences to prepare an environmental management plan (the "EMP") for the management and mitigation of construction impacts, including a Drinking Water Protection Plan, which plan is to be to the satisfaction of the Comptroller of Water Rights (the "Comptroller").

The Licensee is required under clause (k) 2) of the Licences to retain a person with professional qualifications (the "Environmental Monitor") who will monitor environmental impacts from the construction of works. The monitor will also provide information and reports under the direction of the Comptroller on compliance of the construction with the EMP. The Licensee is also required to retain an Independent Engineer as set out in the Licences.

The EMP is the provisions that meet the collective requirements of the Comptroller and the municipal, provincial and federal agencies that contributed to the development of the EMP to mitigate the effects of the construction activities.

The information and reports by the Environmental Monitor will be provided to the Comptroller and the municipal, provincial and federal agencies that contributed to the development of the EMP. Each agency will take action on the information and reports provided by the Environmental Monitor in accordance with the jurisdiction of the agency.

B. Regulation of the Construction of Works

The Comptroller has the power to regulate the construction of works, which regulation may consider the construction activities that may adversely affect the public, the environment and the interests of licensees, riparian owners and owners of land adjacent to the works.

If the Comptroller has determined that the construction activities may be hazardous to the interests of licensees, riparian owners and owners of land adjacent to the works and the environment, the Comptroller may issue an order that directs the Licensee to change the manner in which the works are constructed to remove the hazardous condition.

C. Information and Reports

The Environmental Monitor is responsible for observing the methods of construction and preparing information and reports on the compliance of the construction activities with the EMP.

The information and the reports to be provided by the Environmental Monitor to the Comptroller and the municipal, provincial and federal agencies that contributed to the development of the EMP must include the following:

1. Review the EMP and develop a work plan that sets out the following:
   - The frequency of inspecting the construction activities.
   - The manner in which notice is to be given to the parties for a construction activity that is not in compliance with the EMP.
   - A process for escalating enforcement of compliance of construction activities with the EMP.
   - The format and frequency for the preparation of reports on the compliance of the construction activities with the EMP.
2. Reports on meetings with the Licensee and the Construction Engineer to develop a strategy to communicate to the workers on the construction site the following:
   - the requirements of the EMP,
   - the potential environmental impacts, and
   - the authority of the Environmental Monitor.
3. Reports on matters that arise during the construction and testing of the works that are not described in the EMP. If cannot be resolved by discussion with the licensee and the Construction Engineer, obtain direction from the Comptroller and the municipal, provincial and federal agencies that contributed to the development of the EMP for the mitigation of these matters.
4. Provide any other information or advice required by the Comptroller and the municipal, provincial and federal agencies that contributed to the development of the EMP that is required to ensure that the construction and commissioning of the works is in accordance with the EMP.

D. Independent Engineer

The Licensee is required under clause (k) 1) of the Licence to retain an Independent Engineer who will provide information and reports under the direction of the Comptroller regarding the design and construction of the works.

The Independent Engineer and the Environmental Monitor will communicate with each other during the construction of the works to coordinate their activities to provide information to the Comptroller for proper regulation of the construction of the works.

E. Delegation of Duties of Environmental Monitor

When the Environmental Monitor is unable to personally observe and report on the construction activities, the persons who have the same authority as the Environmental Monitor to observe and report on construction activities are:

1. Name 1
2. Name 2

F. Testing the Operation

When the Licensee submits a schedule for testing the operation of the works, the Environmental Monitor will inspect the site and report to the municipal, provincial and federal agencies that contributed to the development of the EMP, and to the Comptroller on any matters that would make the works a hazard to the public and the environment.
The Environmental Monitor will observe the testing of the operation of the works to determine if the operation poses a hazard to the public and the environment, and submit to the Comptroller a report on the outcome of the monitoring.

G. Authority to Stop Construction Activities

The plan prepared by the Environmental Monitor for escalating the enforcement of compliance of construction activities with the EMP includes a provision that the Environmental Monitor may direct the Construction Engineer to stop a construction activity.

The authority of the Environmental Monitor to stop a construction activity pertains only to those matters under the jurisdiction of the municipal, provincial and federal agencies that contributed to the development of the EMP.

An order to stop a construction activity that affects the interests of licensees, riparian owners and owners of land adjacent to the works may only be given by the Comptroller.

H. Acceptance

The information and reports to be provided by the Environmental Monitor to the Comptroller as set out above is acceptable to:

Name: _____ Date: _____

Environmental Monitor

AND

The Licensee agrees to retain the Environmental Monitor to provide the information and reports to the Comptroller set out above.

Name: _____ Date: _____

Licensee

Appendix A - Contact List

Comptroller of Water Rights	
Name:	Pieter Bekker
Position Title:	Deputy Comptroller of Water Rights
Office Phone Number:	250 387-9447
Mobile or Alternate Phone Number:	
Mailing Address:	PO Box 9340 Stn Prov Govt Victoria BC V8W 9M1
Independent Engineer	
Name:	
Position Title:	
Company	
Office Phone Number:	
Mobile or Alternate Phone Number:	
Mailing Address:	
Licensee Representative	
Name:	
Position Title:	
Company	
Office Phone Number:	
Mobile or Alternate Phone Number:	
Mailing Address:	
Design Engineer	
Name:	
Position Title:	
Company	
Office Phone Number:	
Mobile or Alternate Phone Number:	
Mailing Address:	

Construction Engineer	
Name:	
Position Title:	
Company	
Office Phone Number:	
Mobile or Alternate Phone Number:	
Mailing Address:	

Province of British Columbia
WATER ACT

ORDER

Sections 87 and 88

File No. 0277417, 0210420, 0206232, 0156743, 0189364, 0207076, 1002912, 1002913, 0210707, 0211521, 0211222 and 0211522

WHEREAS British Columbia Hydro and Power Authority (BC Hydro) is the operator of the Campbell River hydroelectric system (the "System") which comprises the Strathcona, Ladore and John Hart Generating Stations, the Strathcona, Ladore and John Hart Dams, the Upper Campbell Lake and Buttle Lake, Campbell Lake, John Hart Lake and Wokas Lake and Upper Quinsam Lake Reservoirs, and the Heber, Crest, Salmon, and Quinsam Diversion Dams and Quinsam Storage Dam, in respect of which it holds Final Water Licences 126726, 126725, 126722, 126724, 126713, 126721, 126751, 126727, 126757, 126764, 126759, 126765, 126761 and Conditional Water Licence 23265;

WHEREAS BC Hydro has engaged in public consultation to determine parameters and procedures for the operation of the System which may provide benefits as described below;

WHEREAS the operation of the works has been regulated by an order dated October 3, 1997 on the Campbell River, order dated December 22, 1998 on the Heber River, order dated December 22, 1998 on the Salmon River, order dated May 23, 1963 on Quinsam River and order dated May 23, 1963 on Wokas Lake and Upper Quinsam Lake Reservoir;

WHEREAS BC Hydro has submitted the Campbell River Project Water Use Plan dated November 21, 2012:

WHEREAS the Campbell River Water Use Plan recommends operational changes to the System, and additional works in the area influenced by the System with the intent of providing benefits to fisheries and wildlife habitat, shoreline conditions, flood mitigation and recreation;

WHEREAS the Campbell River Water Use Plan recommends a monitoring programme to determine whether the recommended operational changes to the System and recommended additional works in the area influenced by the System will provide the expected benefits;

WHEREAS the Campbell River Water Use Plan recommends decommissioning of the Heber Dam and pipeline that are part of the works authorized for the diversion of water from Heber River into the Campbell River basin;

WHEREAS the Heber Dam and pipeline are being decommissioned following procedures set out in section 9 of the *Water Act* BRITISH COLUMBIA DAM SAFETY REGULATION, which process is separate from the implementation of the remainder of the recommendations of the Campbell River Water Use Plan;

WHEREAS I have accepted the Campbell River Project Water Use Plan dated November 21, 2012;

I HEREBY ORDER THAT:

1. The following orders are revoked:
   a) The order dated October 3, 1997 regulating the various works on the Campbell River;
   b) The order dated December 22, 1998 on the Heber River;
   c) The order dated December 22, 1998 on the Salmon River;
   d) The order dated May 23, 1963 on the Quinsam River; and
   e) The order dated May 23, 1963 on Wokas Lake Reservoir.

Strathcona

2. The maximum and minimum operating levels for the Upper Campbell Lake and Buttle Lake Reservoir (the "Upper Reservoir") to meet fisheries, recreation, shoreline and flood mitigation interests are as set out in the following table and measured at Strathcona Dam using Geodetic Survey of Canada (GSC) datum:

Period	Maximum Operating Level (m)[a]	Minimum Operating Level (m)
Jan 1 to Dec 31	220.5	212.0

[a] metres

3. Within the range of operating levels specified in clause 2 is a Preferred Zone, shown in Figure 1 of Schedule A. Specifically for summer recreation, the upper and lower bounds of the Preferred Zone for the Upper Reservoir are:

Period	Preferred Zone	
	Maximum (m)	Minimum (m)
Jun 21 to Sep 10	220.5	217.0

4. Guidelines for the operation of the System to manage the levels of the Upper Reservoir to the Preferred Zone are set out in Schedule B.

5. The operation of the Upper Reservoir to the Preferred Zone in accordance with Schedule B replaces the drafting requirement for the Upper Reservoir specified in clause e) v) of Final Water Licence 126751.

6. The discharge from the Strathcona Dam spillway shall be changed to meet fishery interests at rates not exceeding those in the following table:

Spillway Discharge(m^3/s)[a]	Maximum Ramp Down ($m^3/s/hr$)[b]	Maximum Ramp Up ($m^3/s/hr$)
> 5.0	no constraint	no constraint
0.0 to 5.0	2.5	no constraint

[a] cubic metres per second
[b] cubic metres per second per hour

Ladore

7. The maximum and minimum operating levels for the Campbell Lake Reservoir (the "Lower Reservoir") to meet fisheries, recreation, shoreline and flood mitigation interests are as set out in the following table and measured at Ladore Dam using GSC datum:

Period	Maximum Operating Level (m)	Minimum Operating Level (m)
Jan 1 to Dec 31	178.3	174.0

8. Within the range of operating levels specified in clause 7 is a Preferred Zone, shown in Figure 2 of Schedule A. Specifically for summer recreation, the upper and lower bounds of the Lower Reservoir Preferred Zone are:

Period	Preferred Zone	
	Maximum (m)	Minimum (m)
Jun 21 to Sep 10	177.5	176.5

9. Guidelines for the operation of the System to manage the levels of the Lower Reservoir within the Preferred Zone are set out in Schedule B.

10. The discharge from the Ladore Dam spillway shall be changed to meet fisheries interests at rates not exceeding those in the following table:

Spillway Discharge m^3/s	Maximum Ramp Down ($m^3/s/hr$)	Maximum Ramp Up ($m^3/s/hr$)
> 8.0 m^3/s	no constraint	no constraint
0.0 to 8.0	2.0	no constraint

John Hart

11. The minimum discharge from the John Hart Dam Spillway to Elk Falls Canyon, which is the portion of Campbell River from John Hart Dam to the confluence with the tailrace of the John Hart Generating Station, measured in the vicinity of Water Survey of Canada Station (WSC) 08HD029, to meet fisheries interests shall be as set out in the following table:

Period	Minimum Discharge (m^3/s)
Apr 16 to Mar 31	4.0 (habitat)
Apr 1 to Apr 15	7.0 (habitat and spawning)

The minimum discharge may be included as part of the requirements for pulses of water discharged to Elk Falls Canyon as set out in clause 12.

12. Pulses of water shall be discharged from the John Hart Dam Spillway to Elk Falls Canyon to meet fisheries interests as set out in the following table:

Period	Minimum Discharge (m^3/s)	Pulse Duration	Pulses per Period	Time Between Pulses
Feb 15 to Apr 15	10.0	48 hrs	5	5 to 12 days
Sep 15 to Nov 15	7.0	48 hrs	9	3 to 5 days

13. The John Hart Generating Station and John Hart Dam Spillway shall be operated jointly to provide a combined discharge to meet fisheries interests in Lower Campbell River, below the confluence of Elk Falls Canyon and tailrace of John Hart Generating Station measured in the vicinity of WSC 08HD003, as set out in the following table:

Period	Preferred Minimum (m^3/s)	Fisheries Target (m^3/s)	Preferred Maximum (m^3/s)
January 1 to February 15	80	122	124
February 16 to February 28	80	106	124
March 1 to April 14	60	100	104
April 15 to April 30	80	80	124
May 1 to June 30	100	100	124
July 1 to July 19	28	40	124
July 20 to September 14	28	40	124
September 15 to September 21	28	40	124
September 22 to October 14	28	100	104
October 15 to November 15	80	122	124
November 16 to December 31	80	106	124

The range in flow from minimum to maximum shown in the above table is the Preferred Zone for flow in the Lower Campbell River as shown in Figure 3 of Schedule A.

14. The minimum discharge to Elk Falls Canyon in clause 11 and the pulse flow requirements of clause 12 may be in addition to the maximum flow in Lower Campbell River in clause 13.

15. Guidelines for the operation of the System to manage the flow of the Lower Campbell River to the Preferred Zone are set out in Schedule B.

16. The turbine discharge from the John Hart Generating Station shall be changed to meet fisheries interests at the rates not exceeding the following:

Turbine Discharge (m^3/s)	**Maximum Turbine Ramp Down ($m^3/s/hr$)**	**Minimum # Approximately Equal Changes per Hour**
> 76.0	42.0	4
76.0 to 60.0	7.0	2
< 60.0	2.0[a]	1

[a] Maximum 6.0 $m^3/s/day$

Turbine Discharge (m^3/s)	**Maximum Turbine Ramp Up ($m^3/s/hr$)**	**Minimum # Approximately Equal Changes per Hour**
> 76.0	42.0	4
≤ 76.0	14.0	2

17. The restrictions in clause 16 are not applied to the turbine discharge from the John Hart Generating Station from January 1 to February 15 provided that minimum flow in Lower Campbell River exceeds 80 m^3/s.

18. The discharge from the John Hart Dam spillway to Elk Falls Canyon shall be changed to meet fisheries interests at rates not exceeding those in the following table:

Discharge to Elk Falls Canyon (m^3/s)	Ramp Rates
> 100.0	No Ramp Up Constraint
4.0 to 100.0	Increase at 20.0 $m^3/s/hr$
≥ 8.0	No Ramp Down Constraint
8.0 to 4.0	Decrease at 1 $m^3/s/hr$

The discharge to Elk Falls Canyon shall be changed according to the rates set out in clause 16 when the flow required under clause 13 is provided in full by discharge to Elk Falls Canyon.

Salmon River and Salmon Diversion

19. When flows are naturally available, the Salmon Diversion Dam shall be operated to discharge a minimum of 4.0 m^3/s into the Salmon River measured in the vicinity of the WSC 08HD032.

20. The maximum diversion into the canal at the Salmon Diversion Dam, as measured in the vicinity of WSC 08HD020, shall be as follows:

Period	Maximum Diversion (m^3/s)	Operation of Fish Screen
Jan1 to Mar 31	43.0	Not required
April 1 to Dec 31	15.0 [a]	Required

[a]Maximum diversion may be increased from 15 to 30 m^3/s if fish screen operation is improved in accordance with Schedule F.

21. The discharge into the canal at the Salmon Diversion Dam may be decreased at a maximum rate of 10.0 $m^3/s/hr$ with 4 discrete and approximately equal changes per hour.

22. For diverting water into the canal at the Salmon Diversion Dam, the flow in the Salmon River below the dam shall be decreased at rates not exceeding those set out in the following table:

Salmon River Flow (m^3/s)	Maximum Ramp Down ($m^3/s/hr$)	Minimum # of Approximately Equal Changes per Hour
> 10.0	10.0	4
10.0 to 8.0	2.0	4
< 8.0	1.0	4

23. The rates for changing the flow in the Salmon River as set out in clause 21 and 22 are not applied during the flushing operation to clean the Salmon Diversion Dam trash rack.

Quinsam River, Quinsam Diversion and Quinsam Storage Dam

24. When flows are naturally available at Quinsam Diversion Dam and Quinsam Storage Dam, the Quinsam Diversion Dam shall be operated to discharge to the Quinsam River, for fisheries interests, the following minimum flow set as measured in the vicinity of WSC 08HD021:

Period	Minimum Discharge to Quinsam River (m^3/s)
Jan1 to Apr 30	2.0
May 1 to Oct 31	1.0
Nov 1 to Dec 31	0.6

25. The minimum discharge to Quinsam River for the period May 1 to October 31 may be reduced from 1.0 m^3/s upon consultation with federal and provincial fishery agencies and as approved by the Comptroller of Water Rights to ensure flow continuity for fishery interests.

26. The diversion into the canal at the Quinsam Diversion Dam shall be decreased at rates not exceeding those in the following table:

Diversion from Quinsam River (m^3/s)	Maximum Decrease (m^3/s/hour)	Minimum # of Approximately Equal Changes per Hour
>2.0	No constraint	n/a
≤ 2.0	1.0	4

27. The diversion into the canal at the Quinsam Diversion Dam shall not decrease the flow in the Quinsam River below the diversion dam at rates exceeding those set out in the following table:

Quinsam River Flow (m^3/s)	Maximum Decrease ($m^3/s/hr$)	Minimum # of Approximately Equal Changes per Hour
>4.0	8.5	4
≤ 4.0	1.0	4

Priorities

28. BC Hydro shall implement the above clauses:

    a) using the following priorities, from highest to lowest:

        i) dam safety requirements defined in the Operation, Maintenance and Surveillance Manuals for Strathcona, Ladore and John Hart Dams, Salmon River, Crest Creek and Quinsam River Diversion Dams and Quinsam Storage Dam;

        ii) maintain minimum flows in the Salmon River, Quinsam River and Elk Falls Canyon, when naturally available;

        iii) manage high inflow and reservoir routing criteria according to the guidelines in Schedule B;

        iv) operate Strathcona, Ladore and John Hart Generating Stations to manage the flow in Lower Campbell River to the Preferred Zone shown in Figure 3, Schedule A according to the guidelines of Schedule B;

        v) maintain all specified ramping rates;

        vi) operate Strathcona, Ladore and John Hart Generating Stations to manage the level of the Upper Reservoir to the Preferred Zone shown in Figure 1, Schedule A; and

        vii) operate Strathcona, Ladore and John Hart Generating Stations to manage the level of the Lower Reservoir to the Preferred Zone shown in Figure 2, Schedule A.

    b) following Schedule B for operations beyond the Preferred Zones.

Works and Monitoring

29. BC Hydro shall submit for approval by the Comptroller, terms of reference for works, feasibility and monitoring studies for:

    a) Upper Campbell Lake and Buttle Lake Reservoir as described in Schedule C;

    b) Campbell Lake Reservoir as described in Schedule D;

    c) John Hart Lake Reservoir and Campbell River as described in Schedule E; and

    d) Salmon and Quinsam Diversions as described in Schedule F.

30. BC Hydro shall submit, within 6 months of the date of this Order, for approval by the Comptroller, terms of reference for assessing any deficiencies in the existing water release facilities with regard to meeting ramping rate criteria specified in this Order.

31. Upon receiving, from the Comptroller, approval of the above terms of reference and leave to commence, BC Hydro shall:

a) implement the works, feasibility studies, and effectiveness monitoring programs in accordance with approved terms of reference; and

b) submit annual reports in February of each year to the Comptroller of Water Rights on the results of the approved works, studies, plans and monitoring until the conclusion of the programmes as specified in each terms of reference.

Records

32. With respect to the maintenance and provision of records BC Hydro shall:

a) Keep records of:

i) elevations of the Upper Campbell and Buttle Lake Reservoir, Campbell Lake Reservoir and John Hart Lake Reservoir;

ii) discharge from the spillways at Strathcona Dam, Ladore Dam and John Hart Dam;

iii) discharge from the turbines at Strathcona, Ladore and John Hart Generating Stations;

iv) the combined flow in the Lower Campbell River measured downstream of the confluence of the discharge from John Hart spillway and the John Hart Generating Station in the vicinity of WSC 08HD003;

v) flow released to the Salmon River below Salmon Diversion in the vicinity of WSC 08HD032 and flow diverted at the Salmon Diversion into the canal measured in the vicinity of WSC 08HD020;

vi) flow in Quinsam River below the Quinsam diversion in the vicinity of WSC 08HD021 and flow diverted at the Quinsam diversion measured in the vicinity of WSC 08HD026; and

vii) flow in the Campbell River downstream of the confluence of the Quinsam River.

b) Provide a written report to the Comptroller of Water Rights in February of each year summarizing the records from the previous calendar year; and

c) Provide on request of the Comptroller of Water Rights records collected under clause 32 a).

Emergency Operation

33. BC Hydro may operate the System in a manner other than set out above or in Schedule B in the event of an emergency, dam safety matter, or an extreme hydrological event.

Notice

34. Any emergency or dam safety matter that causes deviations from operations ordered above shall be reported to the Comptroller of Water Rights in a timely manner.

35. The Comptroller of Water Rights shall be notified:

    a) When the level of the Upper Reservoir or Lower Reservoir is forecast to fall outside the Preferred Zones referred to in clause 3 and clause 8; and

    b) When the flow in the Lower Campbell River is forecast to fall outside the Preferred Zone in any period as set in clause 13.

Dated at Victoria, B.C., this 21st day of November, 2012.

Pieter Bekker
Deputy Comptroller of Water Rights

Schedule A

Figure 1
Upper Campbell Lake and Buttle Lake Reservoir (Upper Reservoir)

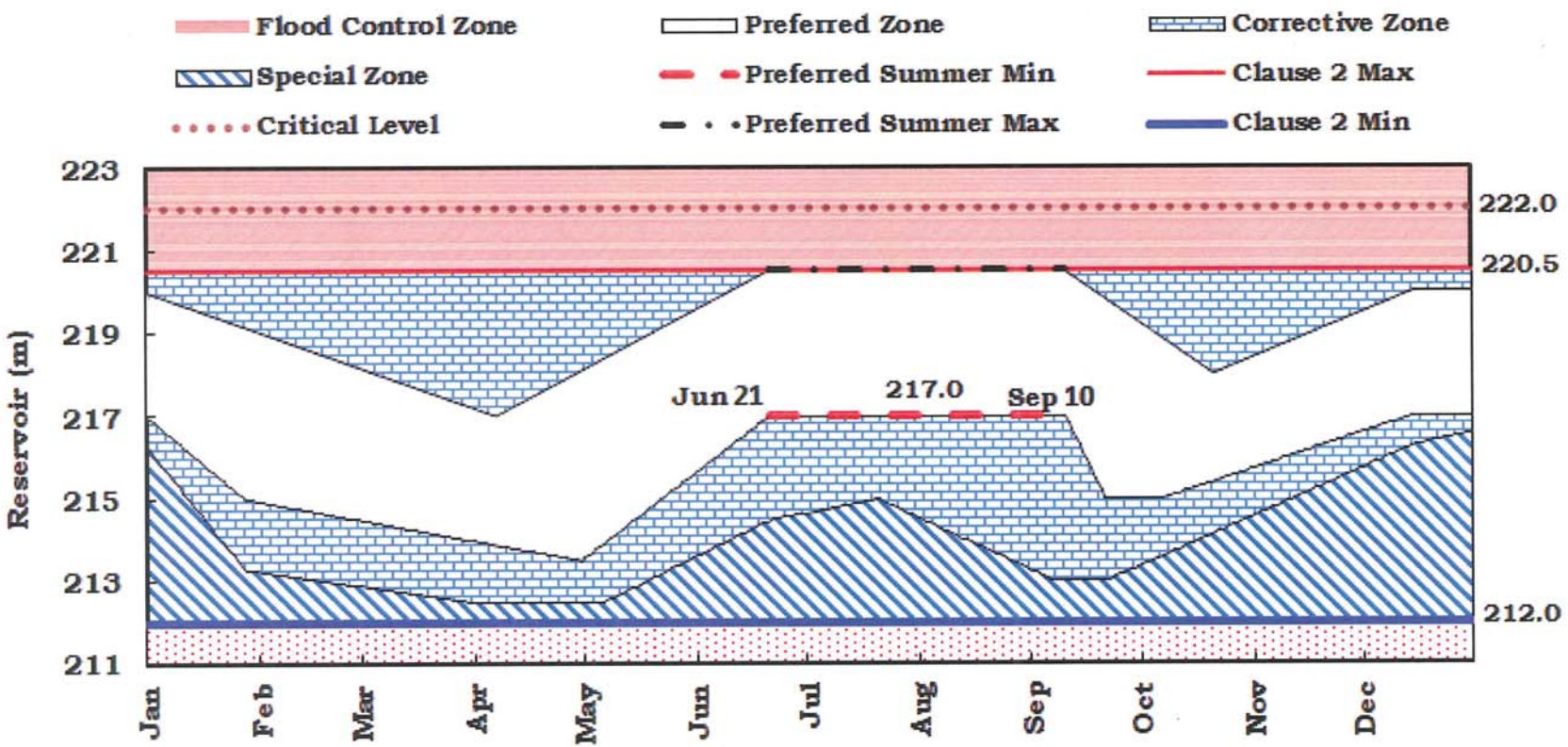


Figure 2
Campbell Lake Reservoir (Lower Reservoir)

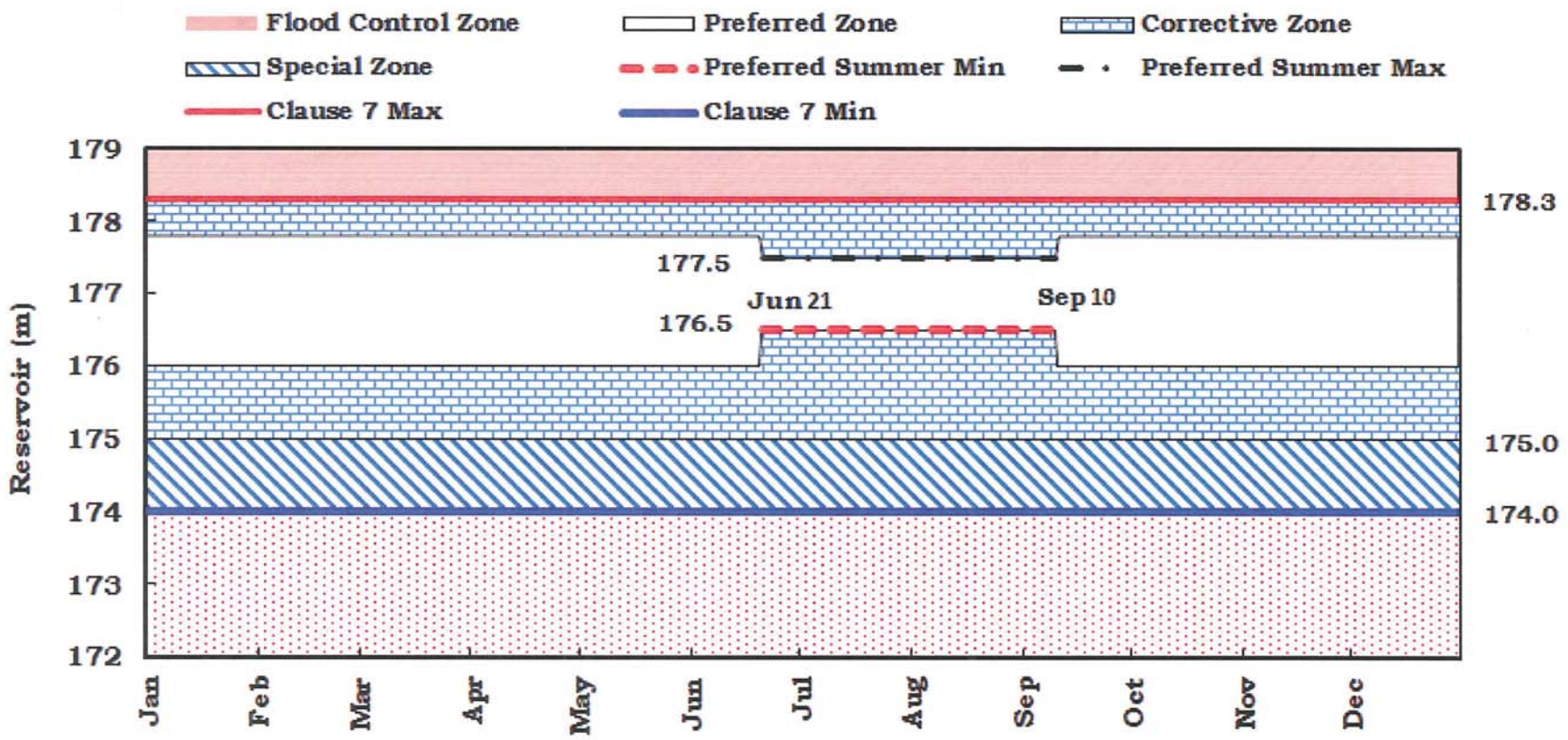
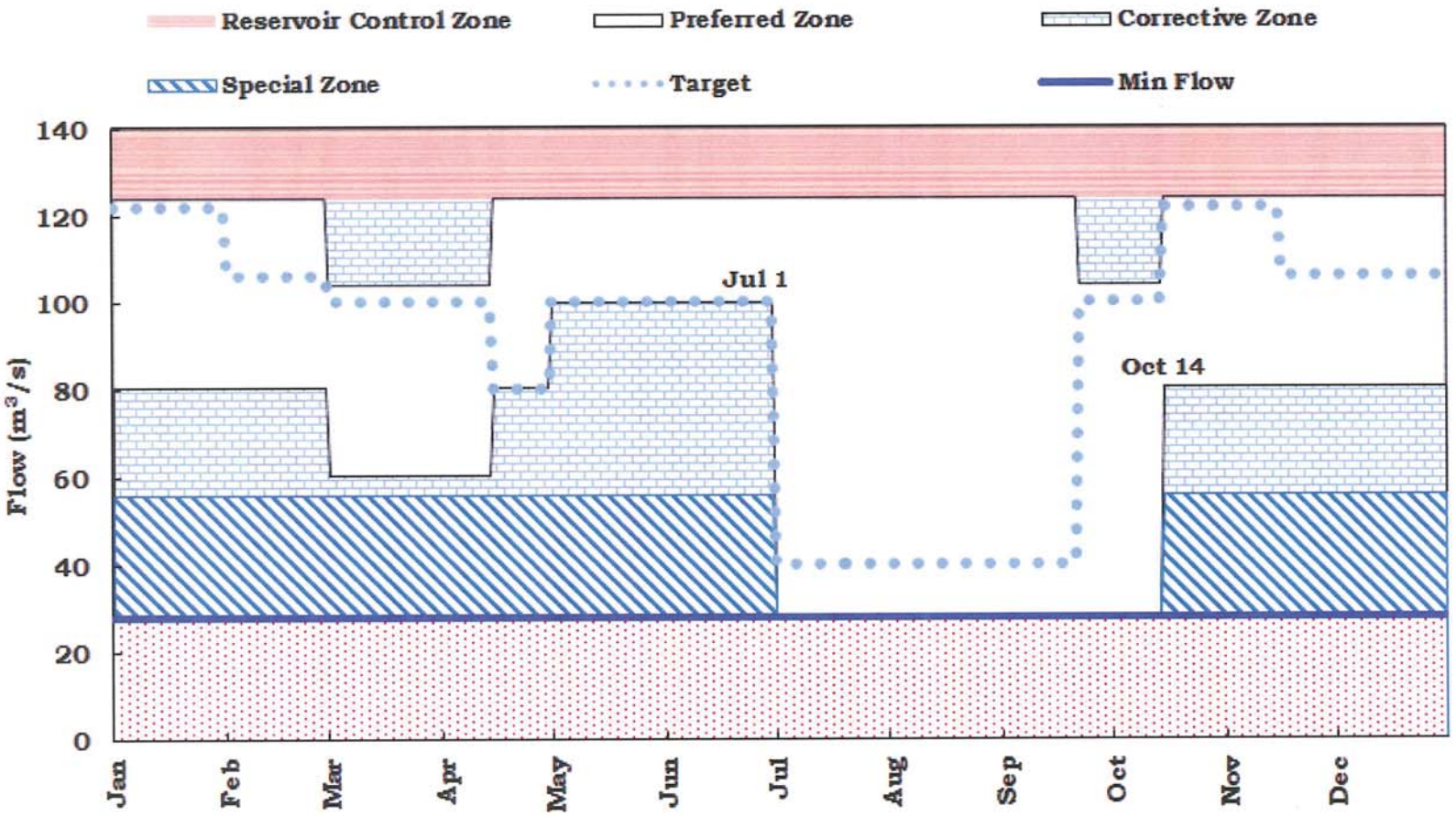


Figure 3
Lower Campbell River



*Min discharge into Elk Canyon under clause 11 and 12 may be in addition to the Prefered Max for Lower Campbell River.

Schedule B

Corrective Procedures

The licensee will operate within the Preferred Zones shown in Figures 1, 2 and 3 of Schedule A to meet the operating priorities stipulated in clause 28 of this Order.

In the event that inflows preclude operations in the Preferred Zones, the following Corrective Procedures will guide management under high and low inflows affecting the Upper Reservoir and Lower Reservoir (the "Reservoirs") and downstream discharge in Lower Campbell River from John Hart Spillway and John Hart Generating Station ("John Hart").

Corrective Operations

1. In the event that the elevations of the Reservoirs are expected to enter the upper or lower Corrective Zone (see Figures 1 and 2) within the next 5 days, the licensee will operate John Hart in a manner to avoid this while still maintaining the Lower Campbell River flow regime within the Preferred Zone (see Figure 3).

2. In the event that the elevations of the Reservoirs are in the Corrective Zone the licensee will operate John Hart in such manner to restore the Reservoirs to the Preferred Zone by allowing the Lower Campbell River flow regime to enter the Corrective Zone (see Figure 3).

Low Reservoir Operations

3. In the event that the elevation of the Reservoirs is in the Special Zone (see Figures 1 and 2), the licensee will operate John Hart in such manner as to restore the Reservoirs to the Corrective Zone by allowing the Lower Campbell River flow to enter the Special Zone (see Figure 3).

4. In the event that the Reservoirs are operating below their Minimum operating level (see Figures 1 and 2), the licensee will operate John Hart in such manner as to reduce the flow in Lower Campbell River to less than 28 m^3/s.

5. The licensee will notify the Comptroller of Water Rights in advance of operations in 3 and 4 above.

High Reservoir Operations

6. In the event that the Upper Reservoir is expected to enter the Flood Control Zone shown in Figure 1 within the next 5 days, the licensee will shut off all diversions into storage from Quinsam and Salmon.

7. In the event that the Upper Reservoir enters the Flood Control Zone shown in Figure 1, the licensee will operate John Hart in such manner as to return the Upper Reservoir below the Flood Control Zone in 7 days or less by allowing the flow regime at John Hart to enter the Reservoir Control Zone shown in Figure 3 up to a maximum of 453 m^3/s, as measured in the Campbell River downstream of the confluence of the Quinsam River.

8. In the event that the Upper Reservoir exceeds the Critical Level of 222.0 metres shown in Figure 1, the licensee will increase spill through the system to pass inflows until the maximum spillway capacity is reached.

9. The licensee will notify the Comptroller of Water Rights in advance of operations under 7 and 8 above.

Schedule C

Upper Campbell Lake and Buttle Lake Reservoir Works and Monitoring

Recreation and Erosion

1. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following works and feasibility studies:
   a) identification of sites with erosion concerns at Cedar Creek Subdivision, Strathcona Park Subdivision and Strathcona Park Lodge, and plans to address the erosion concerns;
   b) feasibility of upgrading boat ramps and beaches in Provincial Park sites and Forest recreation sites in the Upper Reservoir, prioritize and implement as ordered by the Comptroller;
   c) identify, prioritise and re-vegetate highly visible reservoir perimeter sites within the drawdown zone; and
   d) assess boating related recreation hazards for the Upper Reservoir.
2. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following effectiveness monitoring programs:
   a) monitor rates of erosion at selected sites on the Upper Reservoir
   b) measure public response to the operation of the System and the additional works constructed within the area influenced by the System through public use and perception surveys.

Reservoir Fish Studies

3. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following effectiveness monitoring programs:
   a) monitor spawning success in tributaries to the Upper Reservoir;
   b) monitor littoral productivity in the reservoir; and
   c) assess fish productivity in relation to littoral and pelagic productivity and residence time.

Wildlife and Riparian Studies

4. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following effectiveness monitoring programs:
   a) assess response of amphibians to the operation of the System; and
   b) monitor shoreline vegetation to validate model used to predict response of vegetation to reservoir operations.

Schedule D

Campbell Lake Reservoir Works and Monitoring

Recreation and Erosion

1. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following works and monitoring studies:
   a) Feasibility of upgrading boat ramps and beaches in Provincial Park sites and Forest recreation sites on Campbell Lake Reservoir, prioritize and upgrade as ordered by the Comptroller;
   b) assess boating related recreation hazards for Campbell Lake Reservoir; and
   c) measure public response to the operation of the System and the additional works constructed within the area influenced by the System through public use and perception surveys.

Reservoir Fish Studies

2. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following effectiveness monitoring programs:
   a) monitor spawning success in tributaries to Campbell Lake Reservoir, and
   b) assess fish productivity in relation to littoral and pelagic productivity and residence time.

Wildlife and Riparian Studies

3. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following effectiveness monitoring programs:
   a) assess response of amphibians to the operation of the System; and
   b) monitor shoreline vegetation to validate model used to predict response of vegetation to reservoir operations.

Schedule E

John Hart Lake Reservoir and Lower Campbell River Works and Monitoring

John Hart Lake Reservoir

1. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following effectiveness monitoring programmes:
   a) monitor littoral productivity in the reservoir; and
   b) assess fish productivity in relation to littoral and pelagic productivity and residence time.

Effectiveness Studies

2. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for measuring public response to the operation of the System with regard to its effect on recreation and tourism in Elk Falls Canyon and Lower Campbell River.

River Fish Studies

3. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following effectiveness monitoring programs:
   a) monitor the correlation between instream flow and fish habitat;
   b) monitor the correlation between flow, rearing habitat and behavioural response in fish;
   c) correlate quantity and quality of spawning and rearing habitat with John Hart ramp rates and tripping events;
   d) measure effects of proposed load factoring on spawning behaviour and spawning success; and
   e) monitor spawner and smolt abundance in Elk Falls Canyon.

Schedule F

Salmon and Quinsam River Diversions Works and Monitoring

Access, Erosion and Fish Screen Studies

4. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following works:
   a) improve access and signage along portage routes on the Salmon River Diversion to reduce public safety risks;
   b) monitor erosion rates at selected sites on the Salmon Diversion portion of the Sayward Canoe route;
   c) install bank protection to address erosion and improve public safety along the Salmon Diversion portion of the Sayward Canoe route; and
   d) upgrade the fish screen at the Salmon Diversion to reduce damage to fish and to improve its fishing efficiency;

River Fish Studies

5. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following effectiveness monitoring studies:
   a) monitor spawner and smolt abundance in each of Quinsam River and Salmon River; and
   b) assess fish production in relation to littoral and pelagic productivity and residence time.

WATER LICENCE DISPOSITION RECORD

File #: 0156743 Water Licence #: F126713

Date of Disposition: Jan 6, 2014

☐ Recorded as Abandoned

☐ Recorded as Cancelled

☑ Superseded by Licence #/s: C130984 _____ _____ _____ _____ _____ _____

Close File? ☐ Yes ◉ No

Noted by: Jen Atkinson *Date:* Sep 9, 2014