

Coquitlam-Buntzen Water Use Plan

Monitoring Programs and Physical Works Annual Report: 2015

Implementation Period: April 2014 to March 2015

- **COQMON-1 – Assessment of Fisheries Access to Streams Tributary to Coquitlam River**
- **COQMON-2 – Coquitlam Dam Flow Release Interim Ramping Rate Monitoring**
- **COQMON-3 – Lower Coquitlam River Fish Habitat Requirements Study**
- **COQMON-4 – Assessment of Pink Salmon Passage in Lower Coquitlam River**
- **COQMON-5 – Coquitlam River Periphyton and Benthic Invertebrate Monitoring**
- **COQMON-6 – Lower Coquitlam River Temperature Monitoring**
- **COQMON-7 – Lower Coquitlam River Fish Productivity Index**
- **COQMON-8 – Lower Coquitlam River Substrate Quality Assessment**
- **COQWORKS-1 – Modification of Coquitlam Dam Release Facilities (Flow Release Valve)**

For Water Licences 119709, 119710 and 119711

April 30, 2015

BC Hydro Coquitlam-Buntzen Water Use Plan Monitoring Programs and Physical Works Annual Report: 2015

1 Introduction

This document represents a summary of the status and the results of the Coquitlam-Buntzen Water Use Plan (WUP) monitoring programs and physical works to March 31, 2015, as per the Coquitlam-Buntzen Order under the *Water Act*, dated April 21, 2005 and the amendment dated March 8, 2006. There are eight monitoring programs and one physical works.

2 Status

The following table outlines the dates that Terms of Reference (TOR) for the Coquitlam-Buntzen WUP monitoring programs and physical works were submitted to and approved by the CWR.

Table: 2-1: Dates of Coquitlam-Buntzen WUP TOR Submissions and Approvals by the Comptroller of Water Rights

Monitoring Program & Physical Works TOR	Order Clause	Original ToR Submission		Most Recent ToR Resubmission	
		Date Submitted	Date Approved	Date Submitted	Date Approved
COQMON-1 – Assessment of Fisheries Access to Streams Tributary to Coquitlam River	Schedule E.1	Oct 24, 2005	Jan 03, 2006		
COQMON-2 – Coquitlam Dam Flow Release Interim Ramping Rate Monitoring	Schedule E.2	Oct 24, 2005	Jan 03, 2006	Feb 09, 2009	Mar 23, 2009
COQMON-3 – Lower Coquitlam River Fish Habitat Requirements Study	Schedule E.2 portion for COQMON-3 rescinded Mar 13, 2005	Jan 10, 2007	Feb 01, 2007	Feb 09, 2009	Mar 23, 2009
COQMON-4 – Assessment of Pink Salmon Passage in Lower Coquitlam River	Schedule E.2	Oct 24, 2005	Jan 03, 2006	Feb 09, 2009	Mar 23, 2009
COQMON-5 – Coquitlam River Periphyton and Benthic Invertebrate Monitoring	Schedule E.2	Oct 24, 2005	Jan 03, 2006	Feb 09, 2009	Mar 23, 2009
COQMON-6 – Lower Coquitlam River Temperature Monitoring	Schedule E.2	Oct 24, 2005	Jan 03, 2006	Feb 09, 2009	Mar 23, 2009
COQMON-7 – Lower Coquitlam River Fish Productivity Index	Schedule E.2	Feb 08, 2006	Mar 08, 2006	Feb 10, 2012	Sep 19, 2012
COQMON-8 – Lower Coquitlam River Substrate Quality Assessment	Schedule E.2	Oct 24, 2005	Jan 03, 2006	Feb 09, 2009	Mar 23, 2009
COQWORKS-1 – Modification of Coquitlam Dam Release Facilities (Flow Release Valve)	Schedule B	Oct 24, 2005	Dec 02, 2005	Apr 29, 2009	App not required

3 Schedule

The following table outlines the current schedule for the monitoring programs and physical works being delivered for the Coquitlam-Buntzen WUP.

Table 3-1: Status of Coquitlam-Buntzen WUP Monitoring Programs and Physical Works Implementation

Monitoring Programs	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	WLR Yr1	WLR Yr2	WLR Yr3	WLR Yr4	WLR Yr5	WLR Yr6	WLR Yr7	WLR Yr8	WLR Yr9	WLR Yr10	WLR Yr11	WLR Yr12 ³
COQMON-1 – Assessment of Fisheries Access to Streams Tributary to Coquitlam River	✓	✓	✓									
COQMON-2 – Coquitlam Dam Flow Release Interim Ramping Rate Monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	■	■	■
COQMON-3 – Lower Coquitlam River Fish Habitat Requirements Study	DEL ¹	DEL ¹	DEL ¹	✓	✓	✓	✓				■ ³	
COQMON-4 – Assessment of Pink Salmon Passage in Lower Coquitlam River		✓		✓		✓		✓		■		
COQMON-5 – Coquitlam River Periphyton and Benthic Invertebrate Monitoring	✓	DEL ¹	DEL ¹	✓	✓	✓	✓					
COQMON-6 – Lower Coquitlam River Temperature Monitoring	✓	✓	✓	✓	✓	✓	✓					
COQMON-7 – Lower Coquitlam River Fish Productivity Index	Smolt and Fry Outmigration Assessment	✓	✓	✓	✓	✓	✓	✓	✓	■	■	■
	Fry and Juvenile Standing Stock Assessment	✓	✓	✓	✓	✓	✓	✓	✓	■	■	■
	Fall Adult Salmon Escapement Surveys	✓	✓	✓	✓	✓	✓	✓	✓	■	■	■
	Steelhead Redd Surveys	✓	✓	✓	✓	✓	✓	✓	✓	■	■	■
	Recruitment Analysis	✓	✓	✓								■ ³
COQMON-8 – Lower Coquitlam River Substrate Quality Assessment	✓	✓	✓	✓	✓	✓	✓	✓	✓	■	■	■
Physical Works												
COQWORKS-1 – Modification of Coquitlam Dam Release Facilities (Flow Release Valve)	DEL ²	DEL ²	✓	✓								

Legend: ■ = Program to be undertaken/initiated in identified year
 ✓ = Program completed for the year
 DEL = Program is delayed for the year

Footnotes:
 1. Program delayed due to postponement of required flow release structure modification and associated modified flow regime to October 23, 2008.
 2. The installation of the release valve was delayed due to existing dam seismic upgrade repairs.
 3. No field work, data results analysis only.

4 Monitoring Programs and Physical Works Terms of Reference

The monitoring programs and physical works being implemented under the Coquitlam-Buntzen WUP are described in Terms of Reference. These Terms of Reference and the reports for work completed to date can be found here:

http://www.bchydro.com/about/sustainability/conservation/water_use_planning/lower_mainland/coquitlam_buntzen.html

5 Summary of Monitoring Programs

5.1 COQMON-1 – Assessment of Fisheries Access to Streams Tributary to Coquitlam Reservoir

5.1.1 Status

This program is complete.

5.2 COQMON-2 – Coquitlam Dam Flow Release Interim Ramping Rate Monitoring

5.2.1 Status

This monitoring program was initiated in 2006 and will be carried out over 11 years. The Year 9 report (May 1, 2013 to April 30, 2014) is currently under review and will be included in next year's annual report.

5.3 COQMON-3 – Lower Coquitlam River Fish Habitat Requirements Study

5.3.1 Status

This monitoring program was delayed several years due to the inability to provide the required modified flow release from Coquitlam Dam. Based on the provision of the modified flow release in October 2008 this monitoring program was initiated in November 2008 to observe habitat requirements for chum and coho salmon. The two other components: steelhead spawning and juvenile rearing commenced in 2009.

Field work is complete. Data results will be analyzed and summarized in 2016.

5.4 COQMON-4 – Assessment of Pink Salmon Passage in Lower Coquitlam River

5.4.1 Status

This monitoring program was initiated in August 2007 with the onset of pink salmon migration in the Coquitlam River and continued through the low flow September period. This monitoring program will resume in the summer of 2015 for the return of pink salmon.

5.5 COQMON-5 – Coquitlam River Periphyton and Benthic Invertebrate Monitoring

5.5.1 Status

This program is complete.

5.6 COQMON-6 – Lower Coquitlam River Temperature Monitoring

5.6.1 Status

This program is complete.

5.7 COQMON-7 – Lower Coquitlam River Fish Productivity Index

5.7.1 Status

This monitoring program was initiated in 2000 and enhanced in 2003 as part of a commitment to the Coquitlam-Buntzen WUP Consultative Committee to undertake monitoring at the conclusion of the WUP process. All sampling to date has been completed. Attached are the reports for Year 7 (2000 – 2012) dated March, 2014 and for Year 8 (2000 – 2013) dated July, 2014. The Year 9 report (2000-2014) is currently under review and will be included in next year's annual report.

At present, the project is forecast to require more funds than previously approved. Once the forecast is confirmed, a TOR addendum will be submitted by March 22, 2016 if required.

5.8 COQMON-8 – Lower Coquitlam River Substrate Quality Assessment

5.8.1 Status

This monitoring program was initiated in 2006 and will be carried out over 11 years. Attached is the report for Year 6 (2012 – 2013) dated January, 2014. The Year 7 report (2013-2014) is currently under review and will be included in next year's annual report.

As requested by the Coquitlam Monitoring Advisory Committee the Year 5 report included recommendations for refining the study methods. The current TOR describes the methods previously used and found to be ineffective for this study (e.g., photo sampling program), as discussed in the Year 5 report recommendations. As well, it discusses the opportunistic flushing flows that would be released each year from the dam. Due to operational parameters, these flows have not occurred since the inception of the Water Use Plan in April 2005. An addendum is being prepared to clarify that focus will now be on the monitoring of naturally occurring flows in excess of 70 cms. The addendum will also update the study methods in the TOR for this monitoring program and will be submitted by June 30, 2015.

6 Summary of Physical Works

6.1 COQWORKS-1 – Modification of Coquitlam Dam Release Facilities (Flow Release Valve)

6.1.1 Status

This program is complete.

7 Monitoring Programs and Physical Works Costs

The following table summarizes the Coquitlam-Buntzen WUP monitoring programs and physical works costs approved by the Comptroller and the Actual Costs to March 31, 2015.

Table 7-1: Coquitlam - Buntzen WUP Monitoring Programs and Physical Works Costs

Monitoring Programs	Costs approved by CWR	Life to Date Actuals (LTD)	Estimated to Complete (Forecast)	Total Forecast (LTD and Forecast)	Variance Total to Approved	Explanation	Corrective Action
COQ Prepare Annual Report	\$32,353	\$16,004	\$5,078	\$21,082	\$11,271	Efficiencies found with Annual Report writing	
COQM01A Access to Streams	\$26,582	\$20,615	\$0	\$20,615	\$5,967	Efficiencies found during project implementation	
COQM01A Access to Streams - OR DM	\$16,322	\$8,434	\$0	\$8,434	\$7,888		
COQM01A Access to Streams - OR Imp	\$10,260	\$12,181	\$0	\$12,181	(\$1,921)		
COQM02A Dam Flow Release R	\$160,791	\$99,381	\$44,478	\$143,859	\$16,932	Efficiencies found during project implementation	
COQM02A Dam Flow Release R - OR DM	\$55,353	\$24,644	\$14,647	\$39,290	\$16,063		
COQM02A Dam Flow Release R - OR Imp	\$105,438	\$74,738	\$29,831	\$104,569	\$869		
COQM03A Fish Habitat Suitabil	\$115,374	\$45,239	\$18,992	\$64,231	\$51,143	Efficiencies found during project implementation	
COQM03A Fish Habitat Suitabil - OR DM	\$31,018	\$12,560	\$3,992	\$16,552	\$14,466		
COQM03A Fish Habitat Suitabil - OR Imp	\$84,356	\$32,679	\$15,000	\$47,679	\$36,677		
COQM04A Pink Salmon Passage	\$70,698	\$40,037	\$12,128	\$52,165	\$18,533	Efficiencies found during project implementation	
COQM04A Pink Salmon Passage - OR DM	\$32,947	\$10,916	\$3,528	\$14,444	\$18,503		
COQM04A Pink Salmon Passage - OR Imp	\$37,751	\$29,121	\$8,600	\$37,721	\$30		
COQM05A Periphyton & Benthic	\$268,770	\$238,560	\$0	\$238,560	\$30,210	Project Completed	
COQM05A Periphyton & Benthic - OR DM	\$29,883	\$14,087	\$0	\$14,087	\$15,796		
COQM05A Periphyton & Benthic - OR Imp	\$238,887	\$224,473	\$0	\$224,473	\$14,414		
COQM06A Lower COQ River Temp	\$62,539	\$62,128	\$0	\$62,128	\$411	Project Completed	
COQM06A Lower COQ River Temp - OR DM	\$12,969	\$12,547	\$0	\$12,547	\$422		
COQM06A Lower COQ River Temp - OR Imp	\$49,570	\$49,580	\$0	\$49,580	(\$10)		
COQM07A Fish Productivity Ind	\$2,870,711	\$2,133,216	\$743,336	\$2,876,551	(\$5,840)	Currently forecast to require additional funds	Resubmit TOR by March 22, 2016
COQM07A Fish Productivity Ind - OR DM	\$116,638	\$100,451	\$17,055	\$117,505	(\$867)		
COQM07A Fish Productivity Ind - OR Imp	\$2,754,073	\$2,032,765	\$726,281	\$2,759,046	(\$4,973)		
COQM08A Substrate Quality Ass	\$416,664	\$266,336	\$74,014	\$340,350	\$76,314	Efficiencies found during project implementation	
COQM08A Substrate Quality Ass - OR DM	\$80,392	\$31,489	\$9,282	\$40,771	\$39,621		
COQM08A Substrate Quality Ass - OR Imp	\$336,272	\$234,847	\$64,732	\$299,579	\$36,693		
COQW01A Mod COQ Dam Release - OR	\$867,977	\$867,979	\$0	\$867,979	(\$2)	Project Completed	
COQW01A Mod COQ Dam Release - OR DM	\$9,279	\$57,185	\$0	\$57,185	(\$47,906)		
COQW01A Mod COQ Dam Release - OR Imp	\$858,698	\$810,794	\$0	\$810,794	\$47,904		
COQW01A Mod COQ Dam Release - ONR		\$212		\$212	(\$212)	Project Completed	
COQW01A Mod COQ Dam Release - ONR DM		\$212		\$212	(\$212)		

OR - Ordered Remissible
ONR - Ordered Non-Remissible

* Red values in parentheses denote overage.