

## **Columbia River Water Use Plan**

### **Arrow Lakes Reservoir Wildlife Management Plan Physical Works**

**Annual Report: 2013**

**Implementation Period: March 2012 to February 2013**

- **CLBWORKS-29A Arrow Lakes Reservoir: Wildlife Physical Works Feasibility Study**
- **CLBWORKS-29B Arrow Lakes Reservoir: Study of High-Value Wildlife Habitat for Potential Enhancement and Protection**
- **CLBWORKS-30 Arrow Lakes Reservoir: Implementation of Wildlife Physical Works**

**Conditional Water Licences for Kinbasket storage (27068 and 39432), Mica diversion (39431), Revelstoke diversion and storage (47215), and Arrow storage (27066)**

**March 31, 2013**

## **BC Hydro Columbia River Project Water Use Plan Arrow Lakes Reservoir Wildlife Management Plan Physical Works Annual Report: 2013**

### **1 Introduction**

This document represents a summary of the status and the results of the Arrow Lakes Reservoir Wildlife Management Plan Water Use Plan (WUP) physical works to February 2013, as per the Columbia River WUP Order under the *Water Act*, dated January 26, 2007 and the Amended Order dated August 23, 2007. There are two studies and one physical works.

### **2 Status**

The following table outlines the dates that TOR for the Arrow Lakes Reservoir Wildlife Management Plan WUP studies and physical works were submitted to and approved by the CWR.

**Table 2-1: Dates of Arrow Lakes Reservoir Wildlife Management Plan WUP TOR Submissions and Approvals by the Comptroller of Water Rights**

Monitoring Program & Physical Works TOR	Order Clause (optional)	Original ToR Submission		Most Recent ToR Resubmission	
		Date Submitted	Date Approved	Date Submitted	Date Approved
CLBWORKS-29A Arrow Lakes Reservoir Wildlife Physical Works Feasibility Study	Schedule C, Clause 6.a Schedule D, Clause 6.a	Jan 24, 2008	Feb 20, 2008	Apr 30, 2009	Aug 05, 2009
CLBWORKS-29B Arrow Lakes Reservoir Study of High-Value Wildlife Habitat for Potential Enhancement and Protection	Schedule C, Clause 5.h Schedule D, Clause 5.c	Jan 24, 2008	Feb 20, 2008	Apr 15, 2009	May 11, 2009
CLBWORKS-30 Arrow Lakes Reservoir Wildlife Physical Works	Condition List, Clause 4.a Clause 7.a	Jun 27, 2011	Aug 02, 2011	Mar 25, 2013	Mar 27, 2013

### **3 Schedule**

The following table (Table 3-1) outlines the current schedule for the WUP studies and physical works being delivered for the Arrow Lakes Reservoir Wildlife Management Plan WUP.

**Table 3-1: Table of WUP Schedule**

Physical Works	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
	WLR YR1	WLR YR2	WLR YR3	WLR YR4	WLR YR5	WLR YR6 Interim Review	WLR YR7	WLR YR8	WLR YR9	WLR YR10	WLR YR11	WLR YR12	WLR YR13	
CLBWORKS - 29A Arrow Lakes Reservoir Wildlife Physical Works Feasibility Study	✓	✓												
CLBWORKS - 29B Arrow Lakes Reservoir Study of High-Value Wildlife Habitat for Potential Enhancement and Protection				✓										
CLBWORKS - 30 Arrow Lakes Reservoir Wildlife Physical Works						u/w	■	■						
Legend:	■	= Program to be undertaken/initiated in identified year												
	u/w	= Project is underway												
	✓	= Program completed for the year												
	*	= Program started, but encountered operational or hydrological delays												

#### **4 Physical Works Terms of Reference**

The Physical Works being implemented under the Arrow Lakes Reservoir Wildlife Management Plan 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/southern\\_interior/columbia\\_river/arrow-wildlife.html](http://www.bchydro.com/about/sustainability/conservation/water_use_planning/southern_interior/columbia_river/arrow-wildlife.html)

#### **5 Summary of Physical Works**

##### **5.1 CLBWORKS-29A Arrow Lakes Reservoir: Wildlife Physical Works Feasibility Study**

###### **5.1.1 Status**

This feasibility study was initiated in 2008 and completed in 2009.

##### **5.2 CLBWORKS-29B Arrow Lakes Reservoir: Study of High-Value Wildlife Habitat for Potential Enhancement and Protection**

###### **5.2.1 Status**

This study was initiated and completed in 2011.

##### **5.3 CLBWORKS-30 Arrow Lakes Reservoir: Implementation of Wildlife Physical Works**

###### **5.3.1 Status**

This physical works project was initiated in 2013 and the first phase of this project will be carried out over the next 2 years dependent on reservoir conditions.

In 2013, work is planned to implement the Archaeological Impact Assessment and the physical works project at Site 6A (construction of a riprap mattress to halt the erosion of the east arm of the outflow channel located near Airport Marsh and Machete Island) and construct and deploy wildlife enhancement structures.

In 2014, work is planned to implement the physical works project at Site 14 in Cartier Bay (filling in the breach in the old CP railway grade to retain water behind the grade and create seasonal shallow open water habitat) and to implement the physical works project at Site 15A in Cartier Bay (removal of an old collapsed wooden box culvert and reconstruction of the dike to be 1 metre higher than the present elevation).

#### **6 Studies and Physical Works Costs**

The following table summarizes the Arrow Lakes Reservoir Wildlife Management Plan WUP studies and physical works costs approved by the Comptroller and the Actual Costs to February 28, 2013.

**Table 6-1: Arrow Lakes Reservoir Wildlife Management Plan WUP Physical Works Costs**

Monitoring Programs	Activity	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
Arrow Reservoir Wildlife Operations Management Plan Annual Report	OR	\$4,889	\$286	\$3,303	\$3,589	\$1,300	Efficiencies found during project implementation	No corrective action
CLBWORKS#29a ARROW FEASIBILITY STUDY OF WILDLIFE PHYSICAL WORKS	OR	\$242,054	\$243,085		\$243,085	(\$1,031)	Project complete	No corrective action.
CLBWORKS#29a Direct Management 001	OR	\$34,038	\$36,617		\$36,617	(\$2,579)		
CLBWORKS#29a Implementation 002	OR	\$208,016	\$206,468		\$206,468	\$1,548		
CLBWORKS#29b ARROW STUDY OF HIGH VALUE HABITAT	OR	\$81,045	\$61,078		\$61,078	\$19,967	Project complete	Remissions adjustment in 2013 required to JV funds from CLBMON 11B1 to CLBWORKS 29B.
CLBWORKS#29b Direct Management 001	OR	\$15,387	\$1,078		\$1,078	\$14,309		
CLBWORKS#29b Implementation 002	OR	\$65,658	\$60,000		\$60,000	\$5,658		
CLBWORKS#30 ARR WILDLIFE PHYSICAL WORKS IN LIEU - PHASE 1	OR	\$891,500	\$208,385	\$824,115	\$1,032,500	(\$141,000)	Approval in February 2013 did not include life-to-date expenditure.	Approval for \$1.03M was received from CWR on Mar 27, 2013.
CLBWORKS#30 Direct Management 001	OR	\$138,050	\$138,050		\$138,050	\$0		
CLBWORKS#30 Implementation 002	OR	\$753,450	\$70,335	\$824,115	\$894,450	(\$141,000)		
OR - Ordered Remissible								
ONR - Ordered Non-Remissible								

\* Red values in parentheses denote overage.