



# CONTINUING THE JOURNEY TOWARDS SUSTAINABLE WATER MANAGEMENT



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Update to Alberta's Forest Sector Water CEP Plan

Prepared by Alberta Forest Products Association

# Continuing the Journey Towards Sustainable Water Management

## INTRODUCTION

In 2011, the Alberta Forest Products Association as part of Alberta's *Water for Life* strategy, produced a water conservation, efficiency and productivity (CEP) plan.<sup>1</sup> This plan was produced according to guidelines developed by the Alberta Water Council<sup>2</sup>. Within the Forestry sector, the pulp and paper industry is the only area requiring licensed water withdrawals. Hence, Alberta's seven pulp and paper mills, listed in the table below, were the focus of the plan.

The plan vision is *Alberta's pulp and paper mills are world leaders in water-use reduction technologies and process operations, have further reduced their water consumption and improved their efficiency and productivity. As stewards of Alberta's water resources, they are actively working with partnerships to ensure aquatic ecosystems are healthy.* The plan also included three goals as follows:

- To keep water withdrawals and returns from Alberta's seven pulp and paper mills at current (2009) or improved levels;
- To utilize research and technology to improve productivity by a further 5% over the next decade; and
- To continue to work with partnerships to improve water quality and to ensure aquatic ecosystems are healthy.

Facility	River/Basin
Alberta Pacific Forest Industries Inc. (Boyle)	Athabasca
Alberta Newsprint Company (Whitcourt)	Athabasca
Daishowa-Marubeni International Ltd. (Peace River)	Peace
Hinton Pulp (A division of West Fraser Mills Ltd.)	Athabasca
Millar Western Forest Products Ltd (Whitcourt)	McLeod/Athabasca
Slave Lake Pulp (A wholly owned subsidiary of West Fraser Mills Ltd.)	Lesser Slave /Athabasca
Weyerhaeuser Company Limited (Grande Prairie Operations)	Wapiti/Peace



<sup>1</sup> For more on the Alberta Forest Products Association, see their website at <http://www.albertaforestproducts.ca/>.

<sup>2</sup> For more on the work of the Alberta Water Council on water CEP, see <http://www.albertawatercouncil.ca/Projects/WaterConservationEfficiencyandProductivity/tabid/115/Default.aspx>.

## 2010-11 UPDATE

The original 2011 report provided water CEP information for the period 2000 to 2009. This document provides an update to the plan, providing information for the period 2010-11.

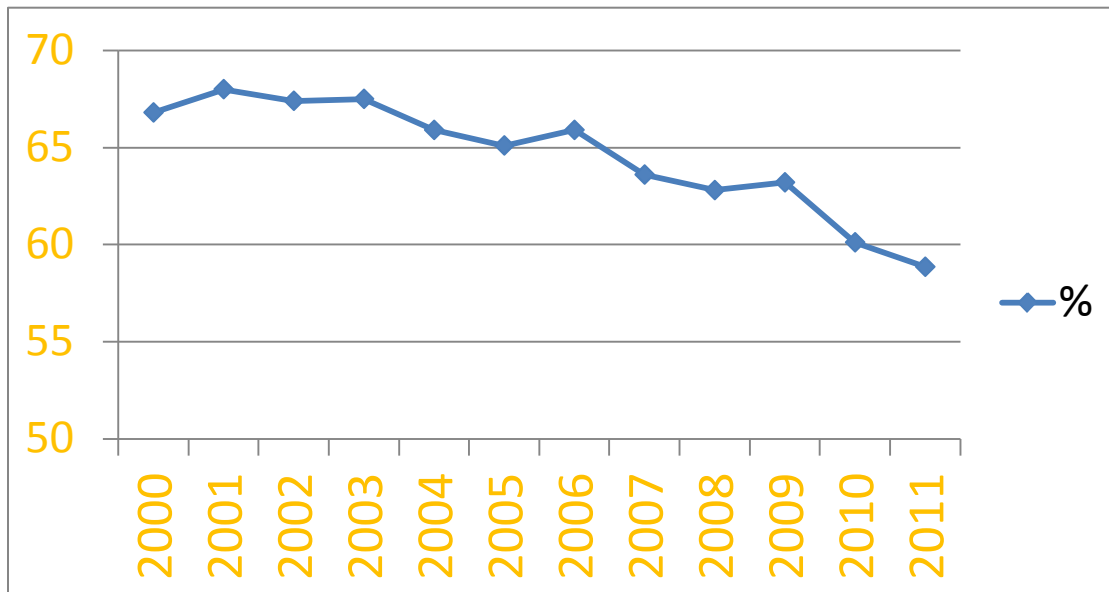
### Water Use Continues to Decline



Alberta's seven pulp and paper mills are all located in the Peace and Athabasca watersheds where they are licensed to withdraw less than 1% of annual river discharge. In 2010 and 2011, water allocations for these mills remained the same (no new licences were issued).

Pulp mills only withdraw water as it is needed and actual water use is even less than that licensed. Over the last decade, an investment of \$5 billion in new capital expenditures and upgrades has contributed to a decline in total water use in the pulp and paper industry. The 2011 report showed a 5% reduction in the annual amount of water withdrawn between 2000 and 2009. In 2009, approximately 63% of licensed volume was withdrawn. In 2011, this amount decreased even further to about 59% of licensed volume.

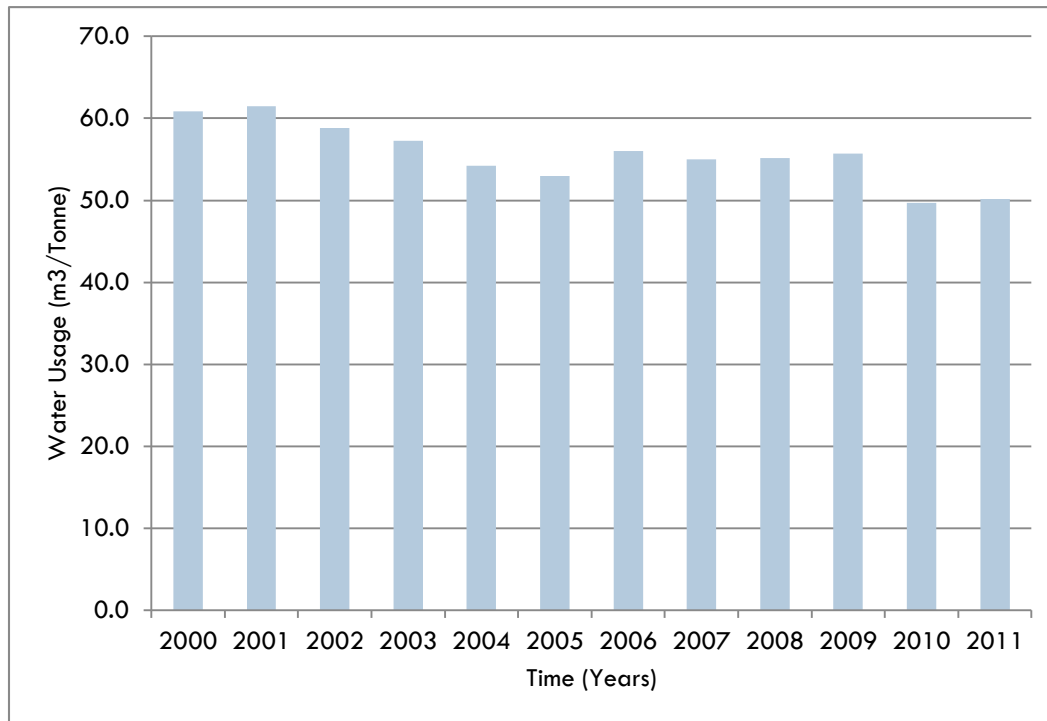
Additionally, most of the water withdrawn is returned to the river. Return flow was 92% of water withdrawn in 2009 and improved further to almost 95% in 2011. That is, the total amount of water actually consumed in the production of pulp and paper continues to decline, leaving more water in the river for instream flow and other needs.



**Figure 1. Actual Water Diverted by Alberta's Pulp and Paper Mills as a Percent of Licensed Volume from 2000 to 2011.**

## Water Efficiency Continues to Improve

While water conservation is important, improving efficiency is also a goal of CEP planning. The 2011 report showed an 8% improvement in efficiency (measured as the number of cubic metres of water required to produce one dry metric tonne of pulp) for the period 2000 (60.8 m<sup>3</sup>) to 2009 (55.7 m<sup>3</sup>). Although the 2011 report indicated that further reductions in water use may be technologically and economically challenging, efficiency continued to improve dramatically from 55.7 m<sup>3</sup> in 2009 to 50.2 m<sup>3</sup> in 2011.



**Figure 2. Average Water Efficiency (m<sup>3</sup>/Tonne) for Alberta's pulp and paper mills, 2000-2011.**

## Technology Continues to Play an Important Role

Technology has continued to play a big part in achieving the above improvements. The 2009 CEP plan listed a number of technological improvements that Alberta's pulp and paper mills had, or were planning to implement. An update on some of these initiatives is provided as follows:

- The Slave Lake Pulp Mill is currently implementing a bio-methanation project with power generation. This will provide water recovery of cooling water back to the process into hot water make-up; less water required for cooling 3 blowers (anticipated to drop to two); and water reduction as polymer make down requirements for sludge dewatering will be reduced.

- Weyerhaeuser at Grande Prairie has new evaporators and a cooling tower coming on line this fall.
- ALPAC will be starting a bio-methanol production process in 2012. They are also looking at reducing seal water use for pumps and agitators.
- Alberta Newsprint Company at Whitecourt has installed and is operating a dispersed aeration system. This technology was developed in conjunction with FP Innovations with assistance from NSERC as well as the Provincial and Federal Governments. The dispersed air floatation system selectively removes contaminants from wastewater streams from the paper machine, allowing reuse of these streams in the process, thereby decreasing water usage.
- Millar Western at Whitecourt has all the approvals in place and will begin construction this fall (2012) on a \$32M Bio-energy project utilizing whitewater to generate biogas using an anaerobic hybrid digester to pre-treat waste water in advance of existing aerobic treatment system, generating power and steam. Recovered organic material will be converted to a biogas that will be cleaned of H<sub>2</sub>S, and then used to fuel reciprocating engines, to generate green electricity. Benefits include water savings of approximately 700,000 m<sup>3</sup>/yr. This will reduce fresh water usage by 10% and will reduce organic content in final effluent discharges to the Athabasca River by 65%.

### Re-thinking Water Use at Spray Lake Sawmills

While Alberta's pulp and paper mills are the only major water licence-holders in the Forest Sector, other operations utilize water through municipal or other agreements. Located in the Town of Cochrane, the Spray Lake Sawmills (SLS) harvests and processes raw timber for dimensional lumber and fence posts. The Town draws their water from the Bow River and implemented a conservation program in 1992 to reduce water consumption by 25%. Prior to 2010, SLS purchased all their water (15,000 m<sup>3</sup> annually) from the Town. Additionally, treated wastewater (not including water generated in the wood treatment plant - a closed loop system) was discharged into the Town's sewer line.

Starting in 2002, improvements to water use at SLS were looked at. To begin with, a pump and treat system was installed which initially collected groundwater into tanks and treated the reclaimed water for discharge to the Town's sewer line. Today, this source provides water for operations year round. Second, studies in 2007-08 showed that savings could be made if water was re-used in the plant and not discharged to the sewer. Several plant modifications were completed in August, 2011 to accommodate this re-use. And finally, in 2008-09, Alberta Environment required SLS to install a lined retention pond to collect the surface water runoff from the Treated Wood Storage Yard. Heavy precipitation in 2010 and 2011 caused the company to do something with the water in the retention pond or have it potentially flow offsite. Hoses were hooked up and the water was brought to the plant for use. Today, water from the Retention Pond is utilized by the plant from mid-April to November.

With the above changes, water use from the Town of Cochrane decreased 27% in 2011 and is expected to decrease 63% in 2012. Additionally, water discharge to the sanitary sewer was decreased by 96% in 2011. These changes support the Town of Cochrane's Water Consumption By-law. The changes also support the Provincial *Water for Life* strategy to maintain healthy aquatic ecosystems by reducing discharges to the river.

## Research for Healthy Aquatic Ecosystems

As important as reducing water use is, it is only one consideration. The health of water bodies that supply and receive waters is equally important. The 2009 CEP report identified a number of research initiatives being carried out by the Forest Sector. Currently, the AFPA is coordinating a synthesis of water research reports completed by the University of Alberta on behalf of the pulp sector over the past several years. The report entitled “A combined summary report for the Dissolved Oxygen in Ice-Covered Rivers: Modelling and Remediation Study” (NSERC-CRD Project Grant 349546-06) will be made available to the Water Council members upon its completion.

AFPA members are also investigating further water research opportunities related to the effects of harvesting on higher order streams. This research will be considered after discussions with Alberta Environment and Sustainable Resource Development on water research priorities for the sector.



## CONCLUSION: ACHIEVING PLAN GOALS



From this update, it is clear that the Forest Sector continues to contribute to the province’s *Water for Life* strategy by meeting the goals of its Water CEP plan. That is, since 2009, the Forest sector has:

- Kept water withdrawals and returns from Alberta’s seven pulp and paper mills at 2009 or improved levels (water withdrawals were further reduced in 2011);
- Utilized research and technology to improve productivity by a further 5% over the next decade (productivity was improved by 9% since 2009); and
- Continued to work with partnerships to improve water quality and to ensure aquatic ecosystems are healthy.

## ACKNOWLEDGEMENTS

Alberta Forest Products Association thanks Alberta’s pulp and paper mills for participating in this initiative (supplying data and reviewing drafts) including Alberta Pacific Forest Industries Inc., Alberta Newsprint Company, Daishowa-Marubeni International Ltd., Hinton Pulp (A division of West Fraser Mills Ltd.), Millar Western Forest Products Ltd, Slave Lake Pulp (A wholly owned subsidiary of West Fraser Mills Ltd.) and Weyerhaeuser Company Limited.