



bulkley valley - lakes district
airshed management society

COMMUNITY ACTION PLAN *for* CLEAN AIR

A five-year strategy

4



BEEHIVE BURNERS

For full report, see www.cleanairplan.ca

LAST UPDATE: JUNE 1, 2006

Beehive Burners

The five operating **beehive burners** (burners) in the BVL D **airshed** are outlined below (a sixth non-operating **Tier 2** burner is located in Carnaby, west of Hazelton). **Tier 1** burners are those in close proximity to a community, (5 km or less from a populated area of 500 or more people) while Tier 2 burners are located farther from area communities.

Table 4-1 Beehive Burners Operating in the BVL D

Location	Mill	Classification	Status
Smithers	Pacific Inland Resources (West Fraser)	Tier 1	Closed July 2005
Houston	CanFor	Tier 1	Scheduled to close by Dec 31, 2007
	Houston Forest Products	Tier 1	
Decker Lake	Decker Lake Forest Products	Tier 2	
Burns Lake	Babine Forest Products	Tier 2	
North Shore of Ootsa Lake	Cheslatta Forest Products	Tier 2	

4.1 Background

Communities in the BVL D airshed were in part built around, and continue to depend in large part on the forest industry. Over time, the sawmill industry changed from mainly a bush sawmill concept to a more centralized processing concept, leading also to a more centralized generation of wood residue by-products. The beehive burner was developed to provide a contained method to dispose of the large quantities of wood residue generated in the fewer locations used under the centralized processing model in use today.

Large sawmills such as those listed above provide employment, helping to stimulate regional economic activity and thereby supporting community infrastructure. They also provide a significant portion of the provincial government's overall revenue, and as such contribute to the provincial and regional standard of living and social net. At the same time, due to their close proximity to area communities, the potential for health impacts from **fine particulates** emitted by these operations is increased.

At its inception, the beehive burner was a simple, cost-effective solution for managing wood waste. Few alternative uses for bark, sawdust or shavings existed and mill technology of the day did not allow for efficient recovery of wood chips. As outlined below under 'Emission Reduction Efforts to Date' advancements in technology and changes to regulations have improved the performance of Tier 1 beehive burners in terms of smoke emissions, while technological improvements in the sawmilling process have reduced the quantity of non-recoverable fibre, thus reducing the amount of wood residue needing disposal.

4.2 Significance of Source to Ambient Air Quality

Emissions of fine particulates from beehive burners are significant and **modelling** being done as part of this plan will attempt to quantify their contribution (and the contribution of all other sources) to **ambient** air quality. Considerable effort is being expended in this regard, as it is difficult to determine the relationship between emissions from sources and their effects on ambient levels of fine particulates. This difficulty holds true for all sources including beehive burners. Some of the issues which must be overcome include:

- Emissions must be estimated, since direct emissions measurements are not feasible.
- Other sources including road dust, residential and commercial space heating, slash burning (forestry, agriculture, land development, small sawmills), other regulated industrial sources and backyard burning also have the potential to significantly affect ambient air quality
- **Meteorology** and **topography** further complicate the issue.

Two case studies exist regarding the effect of phasing out beehive burners on ambient air quality in the communities of Prince George and Williams Lake. These cases highlight the difficulties associated with trying to determine the relationship between emissions from specific sources and local air quality, particularly when ambient data is from a combination of continuous and non-continuous monitors, and when both **PM10** and **PM2.5** data is not available for the entire period.

The Prince George case shows that although a number of burners in the airshed were shut down over 1993-2000, ambient data could not conclusively show a related improvement in air quality from 1991 to 2003. It should be noted however that waste from burners shut down early in the phase out period was typically diverted to other still operating burners, and towards the end of the phase out period, wood diverted from burners was and is still used to produce hog fuel for power boilers at the pulp mills in Prince George. The power boiler emissions are considerably closer to residential areas and some monitors than were the burners (Dennis Fudge, Air quality Meteorologist, MOE, Prince George, personal communication).

Historically Williams Lake had as many as 9 beehive and silo burners operating within its airshed, with the number reduced to 5 by 1990. The remaining 5 burners were gradually phased out from late 1992 to late 1995. Wood waste is now used at an electrical generation facility, with much lower emissions of fine particulates. The ambient data for this community clearly shows a trend of improving air quality in the airshed from 1991 through 1999. A local bylaw prohibiting backyard burning introduced in 1998 may have also contributed to this trend in later years.¹

Forest companies have worked together with MOE and local communities to set-up and maintain ambient air quality monitoring stations as well as to develop source emission inventories to help better define the relationship between individual sources and ambient air quality.

¹ The Effect of Wood Waste Burner Phase Out on Air Quality in Williams lake BC, Earle Plain, Ministry of Water, Land and Air Protection, Cariboo Region, February 2000.

4.3 Emission Reduction Efforts to Date

Tier 1 beehive burner operations have undergone numerous developments in recent years either through voluntary efforts made by the mills or as a result of an Environmental Appeal Board Decision² in April 2002. Changes have focussed on minimizing days where the burners are operated as well as on maintaining optimum combustion conditions (such as temperature, air and fuel supply). Both of these goals reduce emissions of fine particulates to the airshed from these sources.

In addition, as part of the permitting process, the WLAP Regional Waste Manager can require Tier 1 burners to shut down and stockpile waste from their mill operations during periods of degraded air quality.

Canfor, Weldwood and West Fraser have been working with independent power producers to develop a **cogeneration** project that will bring about an alternative to the beehive burner concept and create local employment while generating 'green' electricity and heat. For more information on this topic please refer to the semi-annual reports on this process available at both the Smithers and Houston libraries.

Summary of industry efforts to reduce emissions from burners

- For Tier 1 burners, systems have been installed for bypassing and stockpiling wood residue to allow for shutdown of the burner during air quality episodes, while continuing to allow the mill to operate (waste from mill is stockpiled). Tier 1 burners are now also started up (cold start) and shut down once per week (instead of daily as was the previous practice for Tier 1 burners, and continues to be the practice for some Tier 2 burners in the plan area) thereby minimizing smoke emissions that typically occur during start-up and cool down.
- Continuous temperature monitoring-fuel supply can be augmented to maintain efficient combustion
- **Programmable Logic Controller (PLC)** technology is used to control air flow and dampers, further contributing to maintenance of optimum temperature.
- Dry wood is used to assist with cold starts, which helps to ensure a rapid start up meaning efficient combustion is reached as soon as possible.
- Thorough maintenance is performed to ensure operating efficiency.
- Warning devices (i.e. lights) are in place to advise when the temperature begins to drop, ensuring rapid response to eliminate increased smoke.
- Burner performance is reviewed on a daily basis by plant management.
- Current and forecast weather conditions are monitored with additional surveillance of burner performance during conditions that have the potential to lead to increased emissions and/or impacts of existing emissions.

² For the complete ruling, see Resources under www.bvldamp.ca.

- Fibre recovery on a "per log" basis has been improved.
- PIR installed a Hog System allowing them to ship some brown wood previously destined for their burner, to Eurocan Pulp and Paper in Kitimat. As of June 2004, they have now issued a purchase order for an \$8.5m Hot Oil Energy System, which will displace the beehive burner. This system will heat the seven lumber drying kilns, which presently utilize natural gas to dry lumber. The system will consume 60% of PIR's brown wood residue, with the balance being shipped to Eurocan. Start-up of this new system is scheduled for March 2005. The beehive burner will remain in place for emergency use only.
- Canfor and HFP continue to explore cogeneration, and are actively investigating alternatives in the case that the large scale cogeneration proposal does not go through.

4.4 Relevant Regulations and Community Plans

The operation of each beehive burner is governed by a permit issued by the MOE Regional Waste Manager under the Environmental Management Act (formerly Waste Management Act). The current legislated last phase-out deadline for Tier 1 burners is December 31, 2007.

4.5 Community Consultation

The operation of beehive burners has attracted much attention from local residents concerned about air quality and local employment opportunities. The goals, indicators and strategies outlined below have been developed and endorsed by WLAP and local forest companies - Canfor, Weldwood, West Fraser and Cheslatta Forest Products.

Efforts to reduce dependence on burners necessarily involve partnerships and consensus building with local residents, community groups and businesses. BVL DAMP has stressed the importance of having a "Plan B" for phasing out the burners, should the Houston co-generation proposal not proceed by the legislated deadline.

4.6 Goals, Indicators, and Strategies

The overall goals for managing this source of fine particulates:

- To reduce emissions from all beehive burners.
- To eliminate Tier 1 beehive burners and reduce or eliminate Tier 2 beehive burners in the BVL D airshed plan area.

A summary of indicators and strategies for these goals is provided in Table 4.2. The implementation plan is presented in Table 4.3.

Table 4-2 Goals, Indicators, Strategies

<i>Goals</i>	<i>Indicators</i>	<i>Strategies</i>
To eliminate Tier 1 beehive burners and reduce or eliminate Tier 2 beehive burners in the BVLD airshed plan area.	Number of operating Tier 1 and Tier 2 beehive burners in the airshed plan area.	Support Green Energy and Value-added Proposals. Help develop "Plan B" in cooperation with industry and government, should the cogeneration proposal not go forward by the legislated deadline. Focus on "value added" approach. Help develop plans to divert wood debris from existing beehive burners to "value added" alternatives.
To reduce emissions from all beehive burners.	Number of beehive burner operating days in the airshed plan area.	Same as above, plus continuance of existing efforts, including shut down of Tier 1 burners during air quality episodes, as required by the MOE Regional Waste Manager

Table 4-3 Implementation Plan

Strategy	Description	Feasibility	Partners	Timeline	Monitoring and Evaluation
Energy system and pellet manufacturing plant.	See press release issued by CANFOR.	Economic review of this project has demonstrated the viability of this initiative. This solution will generate increased local economic activity without significant financial damage to the forest companies.	CANFOR Pinnacle Pellet Inc. Morictown Band	Broke ground April 2006; burner will be shut down by Dec 31, 2007.	Semi-annual reports to MOE and the community
Plan B: Alternatives to Cogeneration	Alternative uses of the waste material will be explored if cogeneration plan does not materialize by the legislated deadline. Suggested alternatives include incineration and biofuels production and use.	Current cogeneration proposal relies on finding adequate fiber supply in the vicinity of Houston. If competing projects are developed now, competition for fiber supply may impede finalizing the proposal.			
Exploring increased capacity for the Eurocan steam plant	Investigations of alternatives for disposal of wood residue is underway in the event that cogeneration does not proceed by the legislated deadline	Economic review has demonstrated the feasibility of this initiative when certain conditions are met	PIR/West Fraser		
Installation of an energy system at PIR	Onsite disposal of a substantive or complete volume of wood residue	A purchase order has been issued to cover this installation	PIR/West Fraser	July 2005	completed

4.7 Tools and Resources

- PIR closed circuit television for onsite use
- Cogen Europe – Website
<http://www.cogen.org/publications.htm>
- Skeena Region Beehive Burner Phaseout Backgrounder
<http://wlapwww.gov.bc.ca/ske/skeair/reports/SRBHBPObckgrnd.pdf>
- MOE Skeena Region Air Quality Website-Case Study: Beehive Burner Phase Out in the Bulkley Valley
http://wlapwww.gov.bc.ca/ske/skeair/pm_case.html
- Environmental Appeal Board Decision 1999
http://www.eab.gov.bc.ca/waste/99was06_08_10-13.htm