Tabled @ Hearing
11/11/2015 - ECan

BEFORE THE INDEPENDENT COMMISSIONERS

UNDER the Resource Management Act 1991

IN THE MATTER of the Public Hearings on the Proposed Canterbury Air Regional Plan

MEMORANDUM OF COUNSEL FOR THE CANTERBURY REGIONAL COUNCIL

10 November 2015

WYNN WILLIAMS
LAWYERS
CHRISTCHURCH

Solicitor: P A C Maw / M A Mehlhopt
(philip.maw@wynnwilliams.co.nz /
michelle.mehlhopt@wynnwilliams.co.nz)

Canterbury Regional Council's Solicitor
Level 5, Wynn Williams House,
47 Hereford Street,
P O Box 4341, DX WX11179,
CHRISTCHURCH 8140
Tel 0064 3 3797622
Fax 0064 3 3792467

MAY IT PLEASE THE PANEL

Introduction

1 This Memorandum of Counsel is provided in response to questions from the Hearing Panel during the opening presentation of the section 42A report by the Canterbury Regional Council on 27 October 2015.

2 The matters addressed in this Memorandum are:

(a) Further information on emission testing requirements for condensable and filterable particulate matter; and

(b) Further information on the uptake of financial assistance for home heating.

Condensable and filterable particulate matter

3 During the Council's opening presentation on 27 October 2015, Mr Iseli provided a response to a question of the Panel about whether there was an unintended consequence of the inclusion of the reference to "total PM_{10}" in Rules 7.15 and 7.16 that the smaller combustion sources would need to measure condensable particulate emissions (not just filterable emissions as envisaged in Schedule 6) in order to demonstrate compliance with the rules.[1]

4 During questions from the Panel, Mr Iseli referred to a draft written response that he had prepared on emission testing requirements for condensable and filterable particulate matter. The Panel has asked Mr Iseli to provide this written response to the Panel prior to the presentation by Mr Keer-Keer on Thursday, 12 November 2015.

5 The technical memorandum produced by Mr Iseli is attached to this Memorandum as **Attachment 1**.

Financial assistance for home heating

6 During the Council's opening presentation, Ms Dommisse provided further information in response to a question from the Panel about the

---

[1] Responses to Questions of the Panel, Question 7 at page 6.

non-regulatory measures to mitigate the potential effects of reduced household heating.[2]

7 The Panel has asked Ms Dommisse to provide further information on the amount of financial assistance available over the last two years in each Clean Air Zone and the uptake of this assistance.

8 This further information is provided in **Attachment 2** to this Memorandum.

Dated this 10th day of November 2015

.....

P A C Maw / M A Mehlhopt
Counsel for Canterbury Regional Council

[2] Responses to questions of the Panel, Question 11, page 7.

ATTACHMENT 1

PROPOSED CANTERBURY AIR REGIONAL PLAN HEARINGS

TECHNICAL MEMORANDUM

Emission Testing Requirements for Condensable and Filterable Particulate Matter

1. The operative NRRP requires emission testing of only filterable particulate matter (PM) for industrial emission sources such as solid fuel fired boilers. The PCARP as notified requires testing of both filterable and condensable PM for the larger solid fuel fired industrial emission sources (net output more than 2MW within a Clean Air Zone or 5MW outside a Clean Air Zone).

2. Filterable PM is solid or liquid at stack temperatures (typically 200-250 degrees Celsius for boilers). Condensable PM is vapour or gas at stack temperatures, condensing to liquid or solid state at or subsequent to the point of discharge. If the condensable PM is stable in the atmosphere it will contribute to PM_{10} concentrations and can be measured by ambient sampling methods. Condensable PM falls within the $PM_{2.5}$ size fraction.

3. The current state of knowledge regarding the condensable PM fraction in discharges from industrial sources is subject to significant limitations. The appropriate test method is EPA Method 202, but it is reported that historic testing under this method was often conducted incorrectly. This was particularly so when the method was conducted without nitrogen purge, with potential to form "artefacts" (particularly relating to the reaction of SO2 trapped in water) that could exceed the amount of condensable PM present in the sample. However Method 202 was updated in 2010 to include a nitrogen purge and it is expected that the results of more recent testing are likely to be more reliable, particularly where SO_2 is a significant component in the discharge.

4. Bearing in mind the significant uncertainty associated with historic condensable PM testing results, the USEPA emission factors indicate the following proportions of condensable PM to total (filterable plus condensable) PM_{10} discharged from industrial combustion sources common to the Canterbury Region:

Combustion Source	Date Emission Factor Last Updated	Filterable PM_{10} Emission Rate	Condensable PM Emission Rate (lb/ton)	% Condensable PM of Total PM_{10} (Condensable PM/ Condensable PM + Filterable PM_{10})
Coal fired boiler (underfeed stoker, sub-bituminous)	1998	6.2lb/ton	0.8lb/ton	11%
Wood fired boiler	2003	0.27lb/MMBtu	0.017lb/MMBtu	6%
Diesel fired boiler	1999	$2lb/10^3gal$ [1]	$1.3lb/10^3gal$	39%
Diesel internal combustion (large engines)	1996	0.0496lb/MMBtu	0.0077lb/MMBtu	13%
LPG combustion	2008	$0.2lb/10^3gal$ [1]	$0.54lb/10^3gal$ [1]	73%

[1] Assumes all filterable PM is PM_{10}.

5. The USEPA emission factors (albeit somewhat dated) indicate that the proportion of condensable PM in total PM_{10} emissions from solid fuel fired boilers in Canterbury is relatively small, in the order of 6-11%. These boilers comprise the large majority of combustion sources having a net output of more than 2MW and are the most significant industrial contributors to PM_{10} emissions in the region. Consequently emission testing requirements in the PCARP focus on these wood and coal fired boilers. The USEPA factors indicate that proportional condensable PM emissions from LPG and diesel fired boilers are more significant at approximately 73% and 39% of total PM_{10} respectively. However total PM_{10} emissions from gas and diesel fired combustion are small compared to solid fuel fired boilers and these relatively minor sources are not routinely subjected to emission testing.

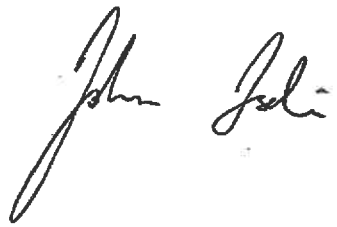
6. The submission from K2 Environmental indicates larger proportional condensable PM emission rates from boilers recently tested in NZ using the improved (since 2010) USEPA Method 202. Mr Keer-Keer has verbally noted that results for 10-15 sites (including some coal fired boilers) indicate at least 50% increase to the measured filterable PM_{10} emission rate when condensables are included. The tests occurred primarily in the Otago region and I have not had an opportunity to examine the test reports or associated data. I do not know if there has been any peer review of this emission testing information.

7. The costs of PM emission testing are somewhat variable, depending on the method used, site access and other factors. Measurement of filterable PM (total suspended

particulate) is relatively cost effective for smaller sources at approximately $2000+GST per test. Testing specifically for PM_{10} costs in the order of an additional $500-800+GST. K2 Environmental indicates that measurement of condensable PM would typically cost a further $1000-1500+GST.

8. The approach taken to PM emission testing requirements in the PCARP is pragmatic and takes into account the significant additional cost that could be incurred by operators of smaller combustion sources if condensable PM testing was to be required in all cases. It is recommended that testing of condensables be required for the larger solid fuel fired boilers (net output more than 2MW within a Clean Air Zone or 5MW outside a Clean Air Zone). These boilers are the most significant contributors to PM_{10} emissions from the industrial sector and are therefore the focus of more rigorous testing.

9. For reasons of cost, under the NRRP smaller solid fuel fired boilers in Christchurch are typically tested for total suspended particulate emissions and the results conservatively assumed to be PM_{10} for compliance purposes. In light of the current verifiable information available regarding the proportion of condensable PM discharged from such sources I consider that such an approach is appropriate. Furthermore, given the relatively small total PM_{10} emission rates from gas and diesel fired combustion sources, I don't consider it necessary to require emission testing of condensable PM in those discharges.



John Iseli
Senior Air Quality Consultant

Dated 12th October 2015

ATTACHMENT 2

Further question received from the Air Plan Hearing Panel in relation to the answer provided on Question 11:

Can the Council provide information on the amount of financial assistance available over the last two years in each Clean Air Zone and the uptake of this assistance?

Table 2: amended to include information on financial assistance available in 2014 and 2015 in Clean Air Zones for appliance replacements, home heating assessments and community advice and wood burner training

	Christchurch	Ashburton	Kaiapoi	Rangiora	Timaru	Geraldine	Waimate
2014	$100,000	$26,000	$29,750	$26,000	$115,000	0	0
2015	$200,000	$40,000	$40,000	$40,000	$200,000	$20,000	$20,000
2016	$200,000	$40,000	$40,000	$40,000	$200,000	$20,000	$20,000
2017	$204,680	$40,936	$40,936	$40,936	$204,680	$20,468	$20,468
2018	$209,674	$41,935	$41,935	$41,935	$209,674	$20,967	$20,967
2019	$215,063	$43,013	$43,013	$43,013	$215,063	$21,506	$21,506
2020	$220,891	$44,178	$44,178	$44,178	$220,891	$22,089	$22,089
2021	$227,186	$45,437	$45,437	$45,437	$227,186	$45,437	$22,719

Uptake of the assistance available is provided in tables 3, 4, 5 and 6 below.

Table 3: Uptake of Financial Assistance in Timaru

Year	No of subsidies	$ Spent	Value of the subsidies (exclu GST)
2014-2015	73	93,043.56	$869.57 for a wood burner and $1739.13 for a heat pump
2015-2016	27 (applications)		
	8 (claimed)	12,350.00	$869.57 for a wood burner and $1739.13 for a heat pump

Table 4: Uptake of Financial Assistance in Greater Christchurch October 2014 to June 2015 (October 2014 is when the assistance programme framework changed)

Analysis of Spend $'s and # completed	Oct 14 - Jun 15	
Christchurch		
Home Heating Improvement		
HEC	$ 22,500.00	90
Wood Burner Training	$ 1,275.00	17
Financial Help & Assistance	$ 49,700.76	36
Home Heating Improvement Firewood Provision	$ 1,991.33	5
Total - Christchurch	$ 75,467.09	148
Budget not spent	$ 24,532.91	
Kaiapoi		
Home Heating Improvement		
HEC	$ 2,750.00	11
Wood Burner Training	$ -	
Financial Help & Assistance	$ 4,695.70	3
Total Kaiapoi	$ 7,445.70	14
Budget not spent	$ 22,304.30	
Rangiora		
Home Heating Improvement		
HEC	$ 1,000.00	4
Wood Burner Training	$ -	0
Financial Help & Assistance	$ 5,695.71	5
Total - Rangiora	$ 6,695.71	9
Budget not spent	$ 19,304.29	
Ashburton		
Home Heating Improvement		
HEC	$ 2,000.00	8
Wood Burner Training	$ 150.00	2
Financial Help & Assistance	$ 1,739.14	2
Total - Ashburton	$ 3,889.14	12
Budget not spent	$ 22,110.86	
Total $ spent in Christchurch, Kaiapoi, Rangiora, Ashburton	$ 93,497.64	183

Table 5: Uptake of Financial Assistance in Greater Christchurch July 2015 to September 2015

Analysis of Spend $'s and # completed	Funds spent plus forecast	#'s completed to date plus forecast
Christchurch		
Home Heating Improvement (Christchurch)		
HEC	$ 5,500.00	22
Wood Burner Training	$ 1,950.00	26
Financial Help & Assistance (Christchurch)	$ 14,782.62	12
Home Heating Improvement (Christchurch) Firewood Provision	$ -	0
Total YTD - Christchurch	$ 22,232.62	60
Budget remaining	$177,767.38	
Kaiapoi		
Home Heating Improvement (Kaiapoi)		
HEC	$ 250.00	1
Wood Burner Training	$ 225.00	3
Financial Help & Assistance (Kaiapoi)	$ -	0
Total YTD - Kaiapoi	$ 475.00	4
Budget remaining	$ 39,525.00	
Rangiora		
Home Heating Improvement (Rangiora)		
HEC	$ -	0
Wood Burner Training	$ 225.00	3
Financial Help & Assistance (Rangiora)	$ 3,913.07	3
Total YTD - Rangiora	$ 4,138.07	6
Budget remaining	$ 35,861.93	
Ashburton		
Home Heating Improvement (Ashburton)		
HEC	$ 750.00	3
Wood Burner Training	$ 75.00	1
Financial Help & Assistance (Ashburton)	$ 3,570.83	1
Total YTD - Ashburton	$ 4,395.83	5
Budget remaining	$ 35,604.17	
Total - Christchurch, Kaiapoi, Rangiora, Ashburton	$ 31,241.52	75

Assistance provided in Greater Christchurch prior to October 2014:

- Ashburton – energy efficiency advice was available through regular information sessions held in the Ashburton library. No financial assistance to individual domestic households was available.
- Kaiapoi – 3 subsidies granted between 1 July – October 2014.
- Christchurch – no subsidy applied for or granted between 1 July – October 2014. One of the conditions of the programme available at the time was that funding was available only for replacements of non-compliant wood burners with heat pumps. The feedback from the community was that households who met the criteria for the financial assistance available under the programme at the time, did not want to remove the wood burner.
- Rangiora, Geraldine and Waimate – no financial assistance was available.

Table 6: Uptake of Financial Assistance in Geraldine

Year	Assistance	$ Spent	No.
2014-2015	No funding available in 2014	-	-
2015-2016	Pre-winter programme planned:	-	-
	Home energy Checks @ $TBC	0	0
	Wood Burner Training @ $TBC	0	0
	Wood Burner Maintenance (value varies)	0	0
	Total spent:	**0**	**0**
	Total budget remaining:	**20,000.00**	

Table 7: Uptake of Financial Assistance in Waimate

Year	Assistance	$ Spent	No.
2014-2015	No funding available in 2014	-	-
2015-2016	Pre-winter programme planned:	-	-
	Home energy Checks @ $	0	0
	Wood Burner Training @ $	0	0
	Wood Burner Maintenance (value varies)	0	0
	Total spent:	**0**	**0**
	Total budget remaining:	**20,000.00**	