IN THE MATTER OF
THE HAZELWOOD MINE FIRE INQUIRY

STATEMENT OF MICHAEL ABRAMSON

I, Michael Abramson of 99 Commercial Road, Melbourne, say as follows:

The Hazelwood Mine Fire Health Study ("the Study")

1. I am a Professor of Clinical Epidemiology and Deputy Head of the Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive Medicine at Monash University ("Monash").

2. On 30 October 2014, Monash was commissioned by the Department of Health and Human Services ("DHHS") to undertake the Study.

3. I am one of two Principal Investigators for the Study.

4. The Study is a long-term health study into the potential health effects of the Hazelwood mine fire in 2014 ("Fire"). Those potential effects include cardiovascular and respiratory disease, low birth weight, psychological impacts and the development of cancer.

5. The Study has been funded through DHHS but is conducted by a team of independent researchers led by Monash University through the School of Public Health and Preventive Medicine and the School of Rural Health. A number of other research organisations are involved.

6. A Community Advisory Committee has been established to ensure that the study hears directly from and works in partnership with Latrobe Valley community members, health and community service providers and local government. Local and national experts will be called upon to contribute to our Clinical Reference Group and Scientific Reference Group during the course of the Study.

7. The general aims of the study are to provide answers to the follow questions:
    a. Is there evidence that people who were heavily exposed to smoke from the Fire are more likely to have developed heart and lung conditions or to develop them in the future, when compared with another similar community with less exposure to the Fire?
    b. Is there evidence of any impact of smoke exposure during pregnancy or infancy on the health and development of children in the Latrobe Valley compared to otherwise similar infants and children with less

exposure to the Fire?

c. Is there evidence that people who were heavily exposed to smoke from the Fire have a higher level of psychological distress than otherwise similar people with less exposure to the Fire and is this associated with particular vulnerable groups?
d. Is there evidence that people who were heavily exposed to smoke from the Fire are more likely to develop cancers over a long period of time than otherwise similar people with less exposure to the Fire?

8. The Study has been divided up into multiple research streams which will commence at different times. Initial pilot work was undertaken in 2014 in respect of a number of streams. The streams are:
   a. Community Wellbeing – mid 2015;
   b. Latrobe ELF (Early Life Followup) Study – mid 2015;
   c. Older People – May 2015;
   d. Schools Study – July 2015;
   e. Adult Survey – late 2015;
   f. Follow up health and psychological assessments – likely 2017;
   g. Linkage to health records including hospital, ambulance and cancer – 2016 onwards.

9. Different streams will cover different towns. For example, the Latrobe ELF Study will cover the entire Latrobe Valley, as will the Schools Study. The Community Wellbeing Study will cover an ever larger area.

10. However, the Adult Survey and associated risk assessments (including respiratory and cardiovascular sub-streams) will focus only on the residents of Morwell. Air pollution modelling provided to us by the CSIRO (**Attachment 1**) shows that Morwell was the town most exposed to fine particulate matter during the Fire.

11. We have requested access to the Victorian Electoral Roll to identify suitable adult participants for the Adult Survey. All adults resident in Morwell at the time of the fire will then be invited to participate. From that group, researchers will recruit a sample of people to participate in the study. It is expected it will take at least a year to recruit all the participants required. We hope to obtain 7,500 participants from Morwell.

12. The Adult Survey will use Sale as the comparison population. Sale has been selected because it is another rural community with a comparable socio-demographic profile to Morwell and a large enough population. Air pollution modelling shows there was minimal if any exposure to smoke from the Fire in Sale which makes it appropriate as a comparison town. We hope to obtain 4,000 participants from Sale.

13. The scope of the Study has been largely set but it would be possible to expand it to include other groups, for example, emergency responders to the fire such as fire fighters and police who were stationed in Morwell during the fire. Currently the Adult Survey does not cover this group unless they were also residents of Morwell during the Fire.

14. From a scientific point of view, it would be of great interest to involve this group, particularly in the respiratory and cardiac parts of the study. If they were included, it would be possible to find a comparison group by recruiting fire fighters and police who were not deployed to the Fire. If the study were to be expanded to include this group, further funding would be required.

15. In the long-term, we expect the Study will contribute to answering the question as to whether the Fire contributed to an increase in deaths in those exposed to the smoke.

16. There are a number of published studies which show an association between deaths and exposure to fine particulate matter ($PM_{2.5}$). 'Association' in this context means that the two things vary together – but not necessarily that one causes the other. For example, there are studies which show a small increase in the risk of cardiovascular deaths after $PM_{2.5}$ exposure.

17. However, none of these studies have examined the health effects of exposure as a result of an open cut brown coal mine fire – let alone one with a similar size, duration and proximity to a town to the Fire. Most have looked at urban air pollution and some at smoke from bush fires.

18. As far as we are aware, there has been no comparable fire in a brown coal mine overseas or in Australia. In this sense, the Study will be the first of its kind in terms of the data obtained regarding health effects including any association with an increase in deaths over time.

19. We have recently become aware of some unpublished research completed on the health effects from a black coal mine fire in the United States. We have requested copies of this research but not yet received it. It is unclear at this stage whether it will be directly comparable with the Fire or not.

20. One key way in which the Study is designed to provide, in the future, information about whether the Fire leads to an increase in deaths, is through the planned linking to the National Death Index. This will occur at some point in the future.

21. The National Death Index is a compilation of data from various State based registries which includes information regarding cause of death. Having access to this (along with the data we have ourselves obtained in the Adult Survey) would allow us to exclude accidental deaths, for example, from a car accident and focus on cases where chronic disease is identified as the cause of death. This would permit an examination over a longer period of specific causes of death among residents of Morwell.

22. We are developing exposure metrics to assess individual exposures to smoke from the Fire. It will then be possible to conduct an analysis to determine whether there is any association between smoke exposure and causes of death such as cardiovascular, respiratory diseases or cancer. It will also be possible to adjust for confounding factors such as sex, age, socioeconomic status,

tobacco smoking and occupational exposures.

23. Because we will be drawing from the data obtained from the Adult Survey, which is limited to Morwell residents, the Study will not provide information as to whether or not there was an increase in deaths in surrounding areas or in persons who worked in Morwell during the Fire but did not reside there.

24. The Study's current scope also will not look backwards to analyse deaths or other health impacts which have occurred during or after the Fire and the commencement of the various study streams. One reason for this is because it is not possible for us to exclude other confounders, such as cigarette smoke or adverse effects from the work environment, in the absence of a person completing the Adult Survey. In particular, we consider that the effects of cigarette smoke must be allowed for in order to detect any effects of the Fire.

25. Unfortunately, the data linkage and statistical analysis cannot take place during the timeframe of the Inquiry. This work will take a number of years to complete.

The Rapid Health Risk Assessment and the Literature Review on Mortality and Morbidity associated with Environmental Smoke Events

26. On 5 February 2015, Monash University was asked to conduct a literature review as part of an updated Rapid Health Risk Assessment. I was one of the joint authors of that review.

27. On 5 May 2015, we provided DHHS with a review titled "Updated Literature Review on Mortality and Morbidity associated with Environmental Smoke Events". A copy of the review is **Attachment 2**.

28. Mortality refers to deaths; morbidity refers to symptoms or disease including hospital admissions, emergency department and outpatient visits**.**

29. We were asked to review the literature available domestically and internationally to determine whether increased mortality could be attributed to an environmental smoke event in the absence of any observed increase in morbidity.

30. As outlined above, there is no study which deals with a comparable environmental smoke event to the Fire. The studies we reviewed dealt with the mortality and morbidity associated with wildfires (bushfires).

31. In relation to morbidity, we searched for studies which looked at hospital admissions, emergency department visits and outpatient visits to a physician.

32. We concluded that while it was not possible to definitively answer the question, in large part because of the limits of the studies we reviewed, it was unlikely that increased mortality could be observed without a detectable increase in morbidity.

33. We were not asked to undertake any statistical analysis and at that time were not provided with any data showing numbers of deaths in the Latrobe Valley during the Fire. Nor were we provided with any data showing numbers of hospital admissions, emergency department visits, outpatient visits to a physicians or visits to ‘pop-up clinics’ in the Latrobe Valley during the Fire.