Hunter Community Environment Centre
163 Parry Street, Hamilton East NSW 2303

http://www.hcec.org.au

February 1st, 2013

Dear Sir/Madam

Submission to the Senate Committee Inquiry into the Impacts of Air Quality on Health

Thank you for the opportunity to submit to this important inquiry.

The Hunter Community Environment Centre was established in 2004 to encourage and facilitate environmental and social justice advocacy and education in the Hunter region. The HCEC is a resource hub for groups and individuals working towards environmental and social justice.

A preliminary submission follows. We intend to make a supplementary submission closer to the closing date.

We urge the committee to consider conducting a hearing in the Hunter region. Air quality is an issue of intense community concern and debate in our region. We are aware of many organisations that would appreciate the opportunity to communicate their concerns directly to Committee members.

Sincerely

Dr James Whelan
Dust and Health Committee Chair
Coal Terminal Action Group
Hunter Community Environment Centre

Term of reference (a): Particulate matter, its sources and effects

1.No threshold

Kolbe and Gilchrest (2011[1]) provide a concise summary of the international epidemiological and clinical research evidence on the impact of particulate pollution and health. They conclude that the health impacts of exposure to particle pollution include increased rates of respiratory and cardiovascular hospitalisation, lung cancer and mortality, systemic inflammation and oxidative stress, enhanced formation of plaque and progression of atherosclerosis, changes in the regulation of the autonomic nervous system including heart rate variability, increased blood coagulability and the risk of thrombosis. Particle pollution exacerbates asthma, accelerates and exacerbates chronic obstructive pulmonary disease and decreases lung development and function. There is no identified effect threshold for PM pollution and the health effects are considered to be a function of both duration and intensity of exposure. (Kolbe & Gilchrist 2011, pp.1-2).

Despite the absence of a threshold below which particle pollution does not adversely affect health, government regulators interpret monitoring data up to the level set by national standards as acceptable. The NSW EPA routinely states that air quality is 'acceptable' or even 'good' simply because the PM_{10} standard is exceeded fewer than five times per annum in a given location.

Term of reference (b): Those populations most at risk and the causes that put those populations at risk

Coal mining and transportation as a major source of particle pollution

International health research (e.g. literature review by Colagiuri et al 2012[2]) clearly indicates serious health impacts associated with coal mining and coal-fired power stations for people living in surrounding communities. But there is minimal research evidence available on the health impacts of coal mining and combustion on Australian communities.

In the Hunter Valley, many communities are literally surrounded by coal mines. These residents are exposed to elevated levels of particle pollution on an almost constant basis. Air pollution monitoring stations in locations throughout the Valley register regular exceedances of PM_{10}. Our analysis has identified exceedances of the NEPM standard on 114 occasions during 2012.

Location	Number of exceedances	Highest level recorded (μgm^{-3})
Beresfield	1	50.8
Bulga	2	55.1
Camberwell	22	81.6
Maison Dieu	21	87.7
Merriwa	1	50.4
Mt Thorley	28	88.7
Muswellbrook	1	51
Muswellbrook NW	1	55.8
Singleton	7	63.6
Singleton NW	29	85.2
Singleton South	2	52.3
Wybong	1	54.4

In addition, the Muswellbrook station recorded four days of $PM_{2.5}$ levels $25\mu gm^{-3}$ or higher.

This summary of exceedances does not include the many exceedances recorded by industry monitoring stations in the Hunter. Since Orica installed a monitoring station in Stockton, for instance, they have recorded 24 hour PM_{10} levels over 90μgm^{-3}. These data are not reported on the EPA website and do not form part of their analysis or communication about regional air quality.

The NSW EPA's summary of the same data[3] collected by their monitors during 2012 led them to conclude that:

- particle pollution in the Upper Hunter exceeded national reporting standards for PM_{10} on 7 days
- The highest daily average for PM_{10} levels was 63.6μgm^{-3}, recorded at Singleton central on 6/9/12
- The daily average for PM_{10} levels exceeded the national standard of 50μgm^{-3} on 7 days in total in the upper Hunter, but only one day in the lower Hunter
- Singleton central was the only station that did not meet the annual goal of the National Environment Protection Measurement (NEPM) for PM_{10} of no more than 5 days above the daily average as it recorded exceedences of 50μgm^{-3} on 6 days

Committee members will see in this EPA summary just how misleading the regulator's interpretation is. This pattern of misrepresentation and reluctance to actively regulate has eroded community confidence to the extent that the EPA is no longer trusted to report fairly or intervene responsibly. The NSW EPA should be raising concerns about already elevated levels when submissions are invited for proposed coal mines, terminals and other polluting infrastructure. Instead, their submissions assure the NSW Government that air quality has been adequately considered and will not be an issue.

NSW Health, in contrast, has expressed concerns about proposed infrastructure. The Hunter New England office of NSW Health submission in relation to the proposed fourth coal terminal in Newcastle expressed concern that local particle pollution levels already exceed the NEPM standard, that these exceedances will increase in frequency and level with a fourth coal terminal bringing an additional 120 million tonnes of coal per annum through the city and expressing reservations about the air quality modeling.

A copy of the NSW Health submission is attached for your information.

Residents in Stockton and other Newcastle suburbs live within hundreds of metres of uncovered coal stockpiles covering hundreds of hectares. In response to sustained community concern, the EPA compelled the Australian Rail Track Corporation to monitor particle pollution in residential areas alongside the coal corridor (ARTC 2012[4]). This monitoring was conducted during February and March 2012, the wettest period of the year. The report on this monitoring concluded that elevated particle pollution levels are associated with proximity to the coal corridor and that coal trains are responsible for higher levels of particle pollution than freight or passenger trains.

> "The statistical technique shows that all trains are a source of TSP and PM_{10} and that only passenger and freight trains are a source of $PM_{2.5}$ on the rail network at Mayfield… loaded coal trains increase the concentration in the rail corridor on average by 3.3µg/m3 for TSP, 2.2µg/m3 for PM_{10} and 0.5 μgm^{-3} for $PM_{2.5}$."
> "The statistical technique shows that all trains are a source of TSP, PM_{10} and $PM_{2.5}$ on the rail network at Metford… loaded coal trains increase the concentration in the rail corridor by 7.1μgm^{-3} for TSP, 4.8μgm^{-3} for PM_{10} and 1.2μgm^{-3} for $PM_{2.5}$."
>
> ARTC 2012, p.58

This is a verbatim quotation from the ARTC report. The chair of the NSW EPA Mr Barry Buffier reported the precise opposite of these conclusions in his media commentary on the report.

We would be pleased to provide the Committee with our critique of the ARTC coal corridor monitoring report. We have communicated our concerns about the ARTC study to the NSW Premier and relevant NSW ministers.

The Hunter Community Environment Centre, as one of eighteen community groups aligned with the Coal Terminal Action Group, raised funds to commission our own monitoring study along the coal corridor. We deployed three monitors for one month. The data are now being analysed. We will have results soon and would appreciate the opportunity to share them with the Senate Committee.

In 2005, Morgan et al estimated the cost of health impacts associated with air pollution in the Hunter at $1,766 million ($368M to $3,163M). Using Morgan et al's methodology, Newcastle epidemiologist Dr Ben Ewald (Ewald 2012) estimated the economic impact of each tonne of additional PM10 pollution at $63,000 (low-high estimates of $13,000-$112,000). With T4 increasing coal exports by 120 million tonnes per annum, Ewald estimated the additional health burden will add $29M for Newcastle alone.

Term of reference (c): The standards, monitoring and regulation of air quality at all levels of government

1. Monitoring and regulation of air quality by the NSW EPA

Access to monitoring data is often difficult as state environmental agencies are slow to report air quality monitoring data, report data on multiple websites, provide minimal interpretive information and do not integrate their data with data collected by industry monitoring. Clearer guidelines for the reporting arrangements for ambient air monitoring are important, and measures to ensure state regulators comply with these reporting guidelines.

The Coal Terminal Action Group recently published an appraisal of current arrangements to monitor, regulate and improve air quality in the Hunter Valley. This report is attached and raises several substantive concerns of direct relevance to this inquiry. In short, the NSW EPA is:

- Failing to monitor in all necessary locations
- Reporting data in an ad hoc and non-integrated manner and
- Presenting data in a misleading and simplistic manner to provide assurances that air quality is acceptable when – in fact – particle pollution is at levels high enough to adversely affect health.

The NEPM is interpreted differently by regulators in different states. Any review of either the NEPM or (more broadly) of coordinated national action on air pollution should identify major discrepancies between states' interpretation and application of the NEPM. For example, the NSW EPA considers that the NEPM standard only applies to performance monitoring stations. As such, they do not apply this standard when interpreting monitoring data from their other monitoring stations or those operated by industry.

2. Extending the NEPM to include fine particles and short-term peaks

Australia must adopt a standard for $PM_{2.5}$ (particles of up to 2.5 microns in diameter). "When the National Environment Protection Council made the Ambient Air Quality NEPM in 1998, the Ministers comprising the NEPC also agreed to a program of future actions, including a review (commencing by 2001) of the particle standard with a view to incorporating a standard for particles with a mean aerodynamic diameter of 2.5 micrometres or less ($PM_{2.5}$)" (NEPC 2002[5]). A $PM_{2.5}$ 'advisory reporting guideline' of 25μgm^{-3} over 24 hours for was adopted by state and national governments in 2002.

In 2005, the World Health Organisation recommended a set of 'Interim targets' for $PM_{2.5}$. Australia must adopt the most stringent of these (IT3), a 24-hour average $PM_{2.5}$ concentration of $25\mu gm^{-3}$.

Australia's national standards for particle pollution should also include standards for short-term exposure. Research indicates adverse health impacts from short-term exposure to elevated levels of particle pollution. There is no obligation for regulators or industry to respond to elevated one-hour, ten-minute or one-minute particle concentrations.[6]

3. Ultrafine particles

There is a strong argument for adopting standards for particle pollution expressed in terms of the number of particles to complement standards defined by mass. "There is an indication that the acute effects of the number of ultrafine particles on respiratory health are stronger than those of the mass of the fine particles" (Morawska et al 2004[7], p.4).

Term of reference (d): Any other related matters

Inadequacies with the state planning process

There are established methods to estimate the health impacts associated with community exposure to pollution (e.g. Morgan et al 2005[8], Simpson & London 1995[9]) but these assessments are not conducted (Colagiuri R, Cochrane J, & Girgis S. 2012). Similarly, the field of health impact assessment (HIA) has developed apace, and is highly applicable to development applications for potentially polluting projects[10], but HIA is not required. As a consequence, planning decisions such as whether to approve coal mines or other pollution sources are made without an adequate assessment of social and economic costs and benefits.

Environmental regulators (EPAs in most states) are reluctant to require world's best practice dust mitigation. In NSW, the proponents of the Drayton South coal mine extension recently described in the environmental assessment 70 available strategies to mitigate dust emissions and committed to implementing just 17 of these. Despite the NSW EPA's Hunter Valley monitoring network identifying 114 exceedances of the PM10 standard during 2012, the EPA nonetheless endorses proposals for new and expanded coal mines.

Attachments

1. Coal Terminal Action Group, 2012, Appraisal of current arrangements to monitor, regulate and improve air quality.
2. Ewald, B. 2012, Health Costs of Air Pollution in Newcastle from the proposed T4.
3. NSW Health Hunter New England Submission on PWCS Proposed Fourth Coal Terminal

References

[1] Kolbe, T. & Gilchrist, K., 2011, 'Particulate matter air pollution in a NSW regional centre: A review of the literature and opportunities for action', Centre for Inland Health, Charles Sturt University, Wagga Wagga.

[2] Colagiuri R, Cochrane J, & Girgis S., 2012, 'Health and Social Harms of Coal Mining in Local Communities: Spotlight on the Hunter Region', Beyond Zero Emissions, Melbourne.

[3] http://www.environment.nsw.gov.au/epamedia/EPAMedia13011801.htm

[4] Australian Rail Track Corporation, 2012, Pollution Reduction Program No.4: Particulate Emissions from Coal Trains, Environ Australia.

[5] National Environment Protection Council, 2002, 'Impact Statement for $PM_{2.5}$ Variation', NEPC, Canberra.

[6] American Heart Association, June, 2010, 'Particulate matter air pollution and cardiovascular disease: An update to the scientific statement from the AHA'. *Circulation.* No.121, pp.2331-2378. (R.D. Brook, et al.). Or Weinmayr, G., et al., 2010, 'Short-term effects of PM_{10} and NO_2 on respiratory health among children with asthma or asthma-like symptoms: A systematic review and meta-analysis', *Environmental Health Perspectives*, 118(4), pp.449-457.

[7] Morawska, L., Moore. M.R. & Ristovski, Z.D., 2004, 'Health Impacts of Ultrafine Particles: Desktop Literature Review and Analysis', Department of the Environment and Heritage.

[8] Morgan, G., Jalaludin, B. & Sheppeard, V., 2005, 'Air Pollution Economics: Health Costs of Air Pollution in the Greater Sydney Metropolitan Region', NSW Department of Environment and Conservation.

[9] Simpson, R. & London, J. 1995, 'An economic evaluation of the health impacts of air pollution in the Brisbane area', Griffith University.

[10] Harris, P. & Harris-Roxas, B. 2010, Assessment of human health and wellbeing in project environmental assessment. In Project environmental clearance: Engineering and management aspects. Wide Publishing, 357-379.

Coal Terminal Action Group Dust and Health Study

Appraisal of current arrangements to monitor, regulate and improve air quality

This appraisal was undertaken in August 2012 by the Coal Terminal Action Group (CTAG), an alliance of 16 community groups in Newcastle and the Hunter. CTAG recently initiated a community-led Dust and Health Study. The terms of reference for the study include:

- Assess the current reporting arrangements and recommend arrangements to ensure monitoring results are communicated in an accessible and timely manner; and
- Assess the adequacy of the current monitoring network and develop recommendations for improving the network's coverage and integration.

For further information, contact Zoe Rogers (Secretary) 0425 316 496 / zoetiarerogers@gmail.com

Location of monitoring stations

When the Ambient Air NEPM was adopted, in 1998 community groups were critical of the guidelines for locating monitoring stations. The NEPM emphasised 'neighbourhood' stations rather than 'peak' monitoring sites close to point sources such as power stations, chemical facilities, motorways and coal train corridors. In the Hunter, community concerns have led to studies being commissioned in these peak pollution locations, but these studies have not been openly or actively communicated. In 2012, The ARTC claims to have monitored fine particle pollution along the Hunter coal corridor. ARTC's report on this monitoring was given to the EPA in early July and has not yet been shared with the community, despite many requests.

There are reports that some monitoring stations in the Hunter are inappropriately located because of over-hanging vegetation, wind direction or other factors. The EPA's 'network' of monitoring stations has been under review for some time and a reconfiguration (new sites with additional pollutants monitored) is expected in coming months. The delays in this network review have frustrated community members.

Recommendations:

1. That the location of monitoring stations should address and respond to community concerns about current and potential exposure. Given the high level of concern about fine particle pollution from coal wagons, it is important to locate $PM_{2.5}$ monitoring equipment at various distances within 500m of the Hunter Valley coal corridor and close to coal stockpiles, coal handling infrastructure and other point sources.
2. That the EPA review the location of air quality monitoring stations (including those owned and operated by industry) to ensure they accurately record community exposure to air pollution (e.g. in residential areas close to coal and industry). Accuracy requires correct location, operation and calibration.

Pollutants monitored & methods (including time period of monitoring)

There is an extensive literature on the significant health impacts of fine particle pollution. Several of the Hunter's air quality monitoring stations have been monitoring $PM_{2.5}$ for several years, but others do not. It is in the public interest to ensure all stations monitor $PM_{2.5}$.

To comply with their EPA licence Orica monitors PM10 in Stockton. This monitoring site records some of the highest levels of PM10 in the region, with PM_{10} levels exceeding the national standard five times since August 2011, on 24/8/11 (55μgm^{-3}), 5/10/11 (61μgm^{-3}), 9/3/12 (50μgm^{-3}), 8/4/12 (61μgm^{-3}) and 20/4

(64μgm^{-3}). Orica's PM10 monitoring is conducted for 24 hours every 6 days rather than continuously. This only provides a very partial impression of ambient PM10 concentrations in Stockton. Particle pollution levels are likely to exceed national standards much more frequently than is reported.

Orica has plans to install a new monitoring station very soon (possibly October 2012) that will monitor PM_{10} and $PM_{2.5}$ continuously, with results reported on their website.

PWCS is less forthcoming than Orica. Community members regularly email PWCS' environment Officer to request data.

Short term spikes in particulates are increasingly identified as health damaging to vulnerable individuals; it is essential to show hourly readings of $PM_{2.5}$/PM_{10} levels on a continuous basis.

Recommendations:

3. That all monitoring stations monitor fine particles ($PM_{2.5}$ as well as PM_{10}) and that all monitoring sites operate continuously and report hourly.

4. That an evaluation of exposure to PM_1 particles in Hunter communities be undertaken, with community involvement and transparency.

Interpretation of results

The EPA's 'Air quality index values' website includes an air quality index, colour-coded from blue (very good) to red (hazardous). A rolling 24 hour average PM_{10} reading of 65ugm^{-3} recorded at Beresfield at 11am on 23/8/12 was presented as 'good', despite being well above the national standard of 50ugm^{-3}. Likewise, on 27/8/12, the rolling 24 hour average PM10 level in Singleton was 57ugm^{-3} (well over the national standard) and was presented as 'good'.

Hover your cursor over data that is shaded blue (very good) or green (good) and the legend explains that, "no health impacts are expected when air quality is in this range". This is factually inaccurate and misleading. The World Health Organisation advises that, "there is little evidence to suggest a threshold below which no adverse health effects would be anticipated. In fact, the low end of the range of concentrations at which adverse health effects has been demonstrated is not greatly above the background concentration, which for particles smaller than 2.5μm ($PM_{2.5}$) has been estimated to be 5μgm^{-3} in both the United States and western Europe."[i]

"For 2008, the estimated mortality attributable to outdoor air pollution in cities amounts to 1.34 million premature deaths. If the WHO guidelines had been universally met, an estimated 1.09 million deaths could have been prevented in 2008. In both developed and developing countries, the largest contributors to urban outdoor air pollution include motor transport, small-scale manufacturers and other industries, burning of biomass and coal for cooking and heating, as well as coal-fired power plants" (Source: World Health Organisation, 2011; http://www.who.int/mediacentre/news/releases/2011/air_pollution_20110926/en/index.html#)

The existence of different standards makes interpretation difficult. In New South Wales, air quality monitoring data is variously interpreted against NEPM standards and (in the case of $PM_{2.5}$) a NSW-specific 'reporting guideline'. The World Health Organisation provides a third set of standards. It is important to increase consistency and to adopt world's best practice rather than the lowest standard in practice.

Recommendations:

5. That the EPA's air quality index be urgently reviewed to avoid presenting a misleading impression. Elevated levels of particle pollution (PM_{10} and $PM_{2.5}$) must not be presented as 'very good', 'good' or 'no health impacts are expected when air quality is in this range'.

6. Due consideration be given to stricter WHO standard of 20 ugm^{-3} for annual average PM_{10}.

Accessibility and communication of results

The collection of monitoring stations in the Upper and Lower Hunter are referred to as 'networks'. The current arrangements for communicating monitoring results, however, do not resemble a network. There is minimal integration and it is unlikely that community members with an interest in air quality are able to locate all the information they need to form an accurate understanding of ambient air quality in the region.

As a condition of licences for some polluting industries, the EPA requires air quality monitoring. Companies including Orica, NCIG and PWCS routinely conduct air quality monitoring. This data is reported in an ad hoc manner including through community newsletters and their own websites. Orica's monitoring results are currently reported in a community newsletter and will soon be posted on the company's website. http://www.oricaki.com.au This adds to the overall lack of integration. This information should be considered to be in the public domain. There is no good reason that it should not be incorporated into an integrated 'network' and reported along with local and state government monitoring data.

Newcastle City Council's website presents TSP and PM_{10} monitoring results from Stockton and Mayfield http://www.newcastle.nsw.gov.au/laws_and_permits/pollution/air_monitoring
The data presented is monthly and annual averages. There are no 24 hour averages.
NCC's website also presents results from the $PM_{2.5}$ monitoring conducted by ANSTO. This data is provided to NCC only every 6 months and can be up to 8 months old (there is not yet data for 2012). There is no link on NCC's website to the ANSTO website where they communicate results of $PM_{2.5}$ monitoring in Mayfield: http://www.ansto.gov.au/discovering_ansto/what_does_ansto_do/live_weather_and_pollution_data/aerosol_sampling_program
There is minimal information on NCC's website to assist interpretation of this data beyond the unintelligible Aerosol Sampling Program Summary sheet:
http://www.newcastle.nsw.gov.au/__data/assets/pdf_file/0013/171202/ASP8mss1011_2.pdf

Professor David Cohen of ANSTO advised (18/7/12) that "ANSTO has a commercial arrangement with the Newcastle City Council to provide $PM_{2.5}$ data twice a year. Consequently they own this data and it is not up to ANSTO to release it publicly. The Council has given us permission to post their data on our web page each year AFTER they have received it. There is currently over 10 years of data on this web page. This is unique for PM2.5 data! Our next batch of data covering the period Jan12 to Jul 12 will be sent to the Council in September when it has been appropriately analysed and quality assured. If you require extra data I suggest you contact the Council directly who own this data. ANSTO cannot provide data belonging to the Council other than what we have permission to list on our web page."

The EPA has several websites that present some monitoring data along with some advice to interpret it.

Air quality index (AQI) values – updated hourly http://www.environment.nsw.gov.au/AQMS/aqi.htm
This site presents the highest recorded pollutant results for all NSW regions. It is not straightforward to access, from the site, data for other pollutants.

The data reported on this web page is updated hourly. To search for other data, it is necessary to scroll hour by hour backwards or forwards. It would be helpful to be able to specify the period for which you want data.
This site only reports monitoring results from the five EPA stations: Newcastle, Wallsend, Beresfield, Singleton and Muswellbrook. The EPA's SMS alerts for PM_{10} in Singleton are not from the EPA station shown on this webpage (they are derived from data recorded at the Singleton NW site). The tab to subscribe for alerts was inactive on this page on 23/8/12.

The Upper Hunter Air Quality Monitoring Network map
http://www.environment.nsw.gov.au/aqms/uhunteraqmap.htm
provides a useful interface to view rolling 24 hour average results for PM_{10} and $PM_{2.5}$ from the 13 Upper Hunter monitoring stations. The button to subscribe for alerts was inactive on this page on 23/8/12.

Air quality alerts http://www.environment.nsw.gov.au/aqms/aqialerts.htm
The subscribe function for alerts was inactive on this page on 23/8/12.

Search air quality data http://www.environment.nsw.gov.au/AQMS/search.htm
This site provides access to monitoring data, It is only possible to download Lower Hunter data from the three EPA monitoring sites, not for the other monitoring sites.

Air quality data readings – updated hourly
http://www.environment.nsw.gov.au/aqms/hourlydata.htm

Recommendations:

7. That all air quality monitoring data be collated and communicated in an accessible and timely manner in a 'one stop shop', ideally within 24 hours. This must include data collected by local and state government, and by polluting corporations licenced by the EPA, including wind speed and direction and relevant climatic information. (Note: A monthly report was recently requested by the NCCCE. No response has been forthcoming from the EPA. Professor Howard Bridgman provided a quote for the University of Newcastle to provide this service. The 'one stop shop' would effectively provide this continuously.)

8. That air quality studies (e.g. the ARTC corridor study, the NSW Health / CSIRO / ANSTO study of PM1) be made available to the community in an accessible and timely manner.

Regulatory action to improve air quality

Air quality regularly exceeds concentrations considered harmful to human health by national and international authorities. Between July 8-9, $PM_{2.5}$ levels recorded at the Muswellbrook monitoring station registered a rolling 24-hour average of 28.2ugm^{-3}, above the advisory reporting standard of 25ugm^{-3}. CTAG wrote to EPA Regional Manager Gary Davey to ask what action/s were taken by the EPA in response, and whether the EPA could provide an explanation for why the exceedance occurred and what can be done to address it? Mr Davey replied, "Currently there is no NEPM goal and standard for $PM_{2.5}$. Monitoring $PM_{2.5}$ will provide useful information over time to assess trends in air quality in the Upper Hunter. The EPA, in collaboration with NSW Health, CSIRO and ANSTO, is currently conducting a project to assess the source(s) of fine particles. This work will provide valuable information on the source(s) of $PM_{2.5}$ particles."

This response reflects a disregard for public health. The EPA is reluctant to do anything to reduce air pollution. Community groups are not currently involved in the study to which Mr Davey refers.

Recommendations:

9. That the EPA report publicly each time air quality exceeds national standards (including the reporting guideline and WHO guideline for $PM_{2.5}$ of 25ugm^{-3}) to explain the source of the pollution and the action they have taken to address it.

Other comments

Hunter valley air quality monitoring stations are funding by industry. This arrangement lapses later this year and there is concern that community members will have reduced access to air quality monitoring data and information if funding is interrupted or reduced.

[i] WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide: Global update, 2005, Summary of Risk Assessment
http://whqlibdoc.who.int/hq/2006/WHO_SDE_PHE_OEH_06.02_eng.pdf p.11 of this report indicates the WHO interim targets of successively lower level of PM10 and PM2.5

Health costs of air pollution in Newcastle and from the proposed T4.

Dr Ben Ewald, University of Newcastle.

There is strong evidence that commonly occurring levels of ambient air pollution have effects on health, although this is not well understood by the public at large or by health professionals. Research has been through time series analysis comparing morbidity and mortality on days with good and bad air quality[1], experimental exposure of humans in metabolic chambers[2] and by ecological comparisons between cities [1]. The pollution exposures examined are particulate matter with aerodynamic diameter of 10 um or 2.5um (pm10 or pm2.5), ozone, nitrous oxides, sulpur dioxide and carbon monoxide.

Individuals in good health are generally not susceptible to acute health problems from air pollution within the accepted Australian air quality standards however people with chronic heart or lung disease, with active respiratory infection, asthmatics, infants and the elderly are susceptible to health effects from lower levels of exposure, so at the population level there is probably a health effect from air pollution without a lower threshold. Measuring the health effect of low level exposure is difficult or impossible, but may be explained by analogy to cigarette smoking. It is probably impossible to prove that smoking one cigarette a day causes disease because the effect would be very small, but from what we know of the toxicity of tobacco smoke there is no reason to expect that one cigarette a day is safe.

Particulate matter Pm10 air pollution has been shown to increase mortality, mostly in the elderly, in those with cardiopulmonary disease, and in infants and to cause increased hospitalisations in these groups. Days with high PM10 also cause respiratory symptoms and decreases in lung function in those with asthma, leading to sick days and missed school days[3].

The health costs of air pollution in Greater Sydney metropolitan area have been studied in a 2005 report for the NSW Dept of Environment and Conservation by Morgan[4] by applying the dose-response curves derived from the world literature to the observed levels of air pollution. For example, they found the increased risk of hospital admission with respiratory disease to be between 0.5% and 1.1%, central estimate 0.8% per 10ug/m3 of PM10. There were 56 064 admissions per year with respiratory disease in Sydney, so the increase per 10ug/m3 increase in PM10 would be 359 to 784 admissions. The average cost of a respiratory admission in Sydney is between $3884 and $4660 so the cost of respiratory admissions per 10ug/PM10 would be between $1.4 million and $3.56 million. By repeating this for each health endpoint a sum of health costs was derived.

The total health cost from air pollution for the Hunter was $1,766 million (low-high estimates 368m to 3,163m). When the more conservative assumption of no health impact from pollution below a threshold of 7.5ug/m3 was used, the cost decreased to $996m (226m -1,765m).

Dividing this by the known anthropogenic emissions of PM10 gives a value for the Hunter of $63,000 ($13,000 to $112,000) per tonne of PM10. All dollar values are for 2003.

This value can be applied to projected emissions from proposed expansions of the coal handling facilities in Newcastle.

How much dust in the PM10 size category would be released by T4?

The EIS for the 4th coal loader predicts annual emissions from running stage 1 of 86.2 tonnes, and from stage 3 of 150.2 tonnes of PM10.

Additional fugitive dust from coal trains is estimated at 8.57 g per Km per wagon, of which half is Pm10. As the wagons carry 75t it would take 1.6 million wagons to transport 120mt of coal. Counting only the 31 Km of track east of Rutherford, these wagons would release 212.5 t of PM10. This estimate is conservative as it does not count any dust from returning empty wagons, or exposure of people living west of Rutherford, including new residential areas adjacent to the railway near Branxton. Adding the stage3 and the railway dust emissions gives 363 tonnes annually of PM10 emissions when the loader is handling 120mt per year.

What are the health costs from the predicted T4 dust?

Applying the estimate of health costs to this figure gives an added health cost burden of $23 million (low estimate 5 million, high estimate 41 million). This burden would fall on the whole population of Newcastle and must be considered in the planning approval process for the new coal terminal. Converted to 2011 dollars the point estimate is $29 million.

Is the dust value credible?

It is helpful to compare the estimated rail line emissions with other rigorously collected data to see if they are congruous. If coal wagons are releasing 8.57g per wagon per Km we would expect to see higher PM10 readings close to the rail line than background air measured at a distance. This can be checked by comparing air quality monitoring results from Wallsend and Beresfield. The Wallsend monitor is 3.76 Km from the rail line in a west-south-west direction from the closest point, while the Beresfield monitor is 220m from the line in a North-East direction. Examining the monthly average PM10 values for the years 2005 to 2012 shows Beresfield has average PM10 levels of 20.5 compared to Wallsend 17.4. As the prevailing westerly wind in winter would blow rail line dust towards Beresfield and away from Wallsend this difference should be greater in winter than in summer when north east winds would blow rail dust away from the Beresfield monitor. This is in fact the case with winter (May to August) Pm10 of 18.3 vs 13.9 while the summer (Dec-March) values are much closer, 20.0 vs 18.3 for Beresfield and Wallsend respectively.

References:

1. Pope CA, Thun MJ, Namboodiri MM, Dockery DW, Evans JS, Speizer FE, et al. Particulate air pollution as a predictor of mortality in a prospective study of U.S. adults. *American Journal of Respiratory and Critical Care Medicine* 1995;151(3):669-74.
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Hunter New England Local Health District
Hunter New England Population Health
Direct Contact Details

NSW GOVERNMENT Health
Hunter New England
Local Health District

27 April 2012

Ms Rebecca Newman
Planning Officer
NSW Department of Planning & Infrastructure
G P O Box 39
SYDNEY NSW 2001

Dear Ms Newman

PORT WARATAH COAL SERVICES LIMITED
ENVIRONMENTAL ASSESSMENT TERMINAL 4 PROJECT

I refer to the Environmental Assessment exhibited on the NSW Planning & Infrastructure website in relation to the Port Waratah Coal Services project proposal for the construction of the Terminal 4 (T4) Project on Kooragang Island next to existing coal loading infrastructure and on the opposite side of the Hunter River to Mayfield North.

The T4 Project proposes a throughput of 120 Mtpa in addition to Port Waratah Coal Services approved current capacity of 145 Mtpa (120 Mtpa through Kooragang Coal Terminal and 25 Mtpa through Carrington Coal Terminal). The addition of the T4 Project is a significant increase in coal throughput through the port of Newcastle.

This office receives complaints from residents of suburbs in the proximity of the Port of Newcastle such as Carrington, Mayfield, Mayfield North and Stockton with respect to deposition of coal dust and health impacts of Particulate Matter on their families. During the response to the Orica incident in August last year It became evident to Hunter New England Population Health staff that the expansion of coal loading facilities was one of the greatest stated concerns for residents in neighbouring suburbs of the Port of Newcastle. Residents anecdotally report increasing coal dust impacts as coal handling and loading has expanded. PWCS currently report frequent inquiries from the community regarding noise and dust.

Air quality

The Environmental Assessment for the T4 Project suggests little impact on modelled air quality parameters as a result of the operation of T4. The modelled air quality outcomes as a result of the T4 project claims no additional 24-hour average PM_{10} concentration exceedances as a result of Stage 1 Construction, Stage 1 Operations/Stage 2

Hunter New England Local Health District
ABN 63 598 010 203

Hunter New England Population Health
Locked Bag 10
Wallsend NSW 2287
Phone (02) 4924 6477 Fax (02) 4924 6490
Email PHEnquiries@hnehealth.nsw.gov.au
www.hnehealth.nsw.gov.au/hneph

Construction and Stage 3 Operations. The modelling report claims that the T4 Project contribution on the baseline exceedance days for PM_{10} is less than 1 $\mu g/m^3$.

However, the T4 Project Environmental Assessment notes that there are already exceedances of the 24-hour average PM_{10} of 50 $\mu g/m^3$ in the vicinity of the T4 project based on 2010 air monitoring data. Further the Assessment claims that no increase in the number of exceedances of the 24-hour average PM_{10} criterion would be expected due to the project. However, it should be noted that the 24-hour average PM_{10} levels in inner city Newcastle in the years immediately prior to 2010 were much higher. Therefore the Environmental Assessment should include a justification for assuming the PM_{10} levels in 2010 would be a realistic baseline for modelling future particulate levels or alternatively use, as a baseline, average levels over a longer period of time. While the modelling suggests there will only be a minimal increase in PM_{10} due to the T4 project, this needs to be balanced against both a community and public health expectation that particulate levels should be reduced in inner city Newcastle not increased.

It is our understanding that the NEPM tolerance of five exceedances per year for natural events such as bushfires is not considered appropriate in the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (DEC 2005). Additionally, the worked examples in the "Approved Methods" relate to situations where predicted project emissions lead to an exceedance of the standard in a setting where the baseline air quality meets the standard. In the EA, Chapter 12, Air Quality, on page 235 it is states as follows:

"The results in Table 12.4 show that for the worst-case day of the year, the baseline 24 hour average PM_{10} concentration exceeds the relevant criterion at all assessment locations, with or without the T4 project. The T4 Project contribution on the baseline exceedance days is less than 1 $\mu g/m^3$ for all assessed scenarios."

In table 12.5 the EA seeks to demonstrate there is no increase in the number of exceedances of the 24 hour average PM_{10} concentration, but this may be of questionable relevance where there are exceedances at baseline and the project exacerbates the exceedances. Additionally, the Approved Methods recommend upper range percentile estimates for modelled impacts and it would appear prudent to seek specific advice from the OEH on whether the appropriate estimates of uncertainty have been built into the predicted particulate impacts.

The T4 Project with 120 Mtpa throughput of coal will result in a substantial increase in coal train traffic to and from the Port of Newcastle. The Environmental Assessment considers air quality issues around rail transport of coal to the Port of Newcastle only briefly. Return of trains to the Upper Hunter Valley is not considered.

The Environmental Assessment considers that the T4 Project will have peak 24-hour PM_{10} concentrations for coal trains travelling to the T4 coal loader within the range of 3 to 13 $\mu g/m^3$ within 20 meters of the rail corridor. Further, that there are some 100 houses within 20 meters of the rail corridor between The Port of Newcastle and Muswellbrook. The Environmental Assessment acknowledges that rail transport and Pollution Reduction Program along the rail corridor is not part of the T4 Project but rather within the realms of the Australian Rail Track Corporation (ARTC). There is also acknowledgement that ARTC is currently studying fugitive coal dust emissions from coal trains.

It is the view of this office that the contribution of coal dust from coal trains beyond 20 meters of the rail corridor needs to be carefully considered as a contribution to the cumulative impact on air quality and necessary mitigation strategies.

A comprehensive environmental assessment could have considered the diesel exhaust emissions from both the extra rail and sea transport associated with this significant expansion of the coal transport chain.

Social impact and stakeholder and community engagement
The Environmental Assessment makes claim to the identification of all relevant stakeholders including state government agencies. It is of concern that neither the NSW Ministry of Health or Hunter New England Local Health District were directly engaged in the stakeholder consultation in relation to the T4 Project.

The social impact of this development is important. Coakes Consulting have conducted an extensive consultation program including over 400 interviews with residents, and consultation with 91 members of stakeholder groups, public meetings and newsletter distribution, however, aspects of the reporting and interpretation of this consultation process should be reviewed.

There appears to be an important error in the stakeholder engagement and social impact assessment relating to the percentage of surveyed residents who supportive of the project "going ahead". In Part B, Chapter 5, Stakeholder Engagement on page 87 it states that "of the 71% of respondents that indicated they were aware of the T4 Project, approximately **61**% were supportive (moderately to highly supportive) of it going ahead.

However, in Appendix R (the last of 60 documents comprising the EA) on page 16 it is stated that " a total of 71% of respondents indicated they were aware of the T4 Project, and of these, approximately **45**% were supportive of the T4 project going ahead. The **45**% figure is repeated again in this section on page 104.

This is a significant difference in reported community support and it should be resolved. Additionally, it is difficult to describe the level of support for the project as displayed in Figure 6.17 as "broadly positive" when four of the five suburbs close to the T4 project have a mean support rating of less than 5.5 out of 10. A positive rating would presumably be greater than a neutral rating of 5.5.

The EA does not provide sufficient information to assess the quality of the community consultation and engagement process. Figure 6.13 – perceived impacts on community engagement suggests a predominantly negative perception and impact on communications and consultation on the part of the council and community resident stakeholders. More information on the level of satisfaction with community and stakeholder consultation would be useful in assessing the outcomes of this project.

Noise
We note the frequency with which noise is raised as an issue by stakeholders in this EA and in past complaints. It is stated that the T4 project will only result in a marginal increase in noise above that of the current coal loader. Given that the current noise levels are not

well tolerated by the community, it calls into question the value of noise modelling that predicts a marginal increase will be acceptable.

In future we would appreciate being included as a stakeholder agency in any developments that involve emissions to air, water, or soil that could have, or could be perceived to have, an impact on public health so that we can contribute to the DGRs and consider the EA from the commencement of the exhibition period.

Yours sincerely

Professor David Durrheim
Service Director - Health Protection
Hunter New England Population Health