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## **Submission: Inquiry into the impacts of air quality on health**

We thank the Committee for undertaking this important inquiry into the impacts of air quality on health.

The terms of reference are broad, and there are many aspects of air quality that impact on human health. Greenpeace's focus in this submission will be on particulate pollution from coal mining, transport and handling activities. We are also, however, concerned about the health impacts of other air pollutants, including nitrous oxide, which occurs after coal mine blasting, and particulate and other pollution from coal fired power stations.

### **Introduction**

There has been little research in Australia that has quantified the impact of coal mining, transport, handling and burning on human health. More broadly, there are no Australian studies on the long-term health impacts of air pollution. Research from other countries indicates that it may be significant, and people and health professionals living in coal-affected communities are increasingly voicing their stories about the impact of coal on their lives. In the absence of specific and targeted research, and of health considerations having statutory standing in the development approval processes for coal mines, rail lines and export terminals, communities are funding their own investigations, and anecdotal evidence is driving doctors and even government health agencies, to engage in advocacy against new coal projects.

We are aware of communities in several locations in NSW and Queensland that are funding and designing their own studies into the health effects of coal dust and its small particulate pollution because of a systemic failure of legislation, regulation, processes and Government agencies to address these issues.

Such studies are being undertaken or planned in Newcastle, Gloucester and Maules Creek in NSW, and communities in the Bowen Basin and Mackay in Queensland have expressed interest in launching similar work, due to the failure of Governments to do so.

The impacts of particulate pollution from coal mining and handling are localised to the communities that live alongside the industry, and little known in capital cities – with the exception of Brisbane.

Hearing stories from the regions and witnessing the extent of particulate pollution from coal will help inform the Committee – many of whom may not be familiar with coal operations – understand the impact this problem is having on human health in affected regions.

This submission outlines Greenpeace's observations of the impact of coal dust on health in coal affected communities, and the standard of monitoring and enforcement of existing air quality policies in NSW and Queensland, and makes some recommendations for actions to begin addressing this silent problem.

## **Summary of recommendations**

1. That the committee travel to coal-affected regions, particularly the Hunter Valley and Bowen Basin, where there is a high concentration of very large open-cut coal mines, and significant anecdotal evidence of the impact of particulate pollution on nearby communities.
2. That the Committee examine pollution data from the following sources: open cut coal mines in the Hunter Valley, NSW; open cut coal mines in the Bowen Basin, Queensland; Bayswater, Liddell, Eraring and Mount Piper power stations in NSW; Collinsville and Gladstone power stations in Queensland; Hazelwood and Loy Yang power stations in Victoria.
3. That the Committee examine the quantity of particulate, nitrous oxide and other air pollutants released by open-cut coal mines and coal-fired power stations in the Hunter Valley and Lake Macquarie in NSW, the La Trobe Valley in Victoria and the Bowen Basin in Queensland, and seek advice from regional medical practitioners, and experts in the field on the impact this pollution is having on the health of surrounding communities.
4. That the Committee's examination of particulate pollution from open-cut coal mines and coal-fired power stations include investigation of the composition of those particulates, and associated health implications. If further research is required, this should be undertaken urgently through the proposed National Clean Air Plan.
5. That the inquiry particularly visit the communities of Singleton, Muswellbrook, Camberwell, Warkworth, Jerry's Plains, and Newcastle (particularly the suburbs of Mayfield, Carrington and Stockton) in NSW, and Collinsville, Clermont, Moranbah, Dysart, Blackwater, Acland and Mackay in Queensland to hold hearings and gather testimony about the impact of particulate pollution.
6. That the approvals processes for new and expanded open cut coal mines and coal export facilities be suspended pending the outcome of the inquiry and full investigation by State and Federal authorities of the health impacts of coal production and handling.
7. That a cumulative assessment of particulate and other air pollution in towns and settlements in the Hunter Valley and the Bowen Basin and its impacts on health in those communities be undertaken by an appropriately independent and expert body, with power to recommend new statutory arrangements to deal with the problem.
8. The National Clean Air Plan should develop a comprehensive set of national standards on air quality to be incorporated into a statutory framework that is capable of enforcing them and

ensures that people in regional communities that live near coal and other polluting industries are protected. The standards should be binding on States, be created for the benefit of all people, no matter where they live, and provide the Federal Government with a compliance role in enforcing them.

9. That a national standard for PM<sub>2.5</sub> be adopted of 24 hour average concentration of 25µgm<sup>3</sup>.
10. The Committee should investigate the lack of transparency, consistency and precaution in the Queensland system for establishing, reporting and enforcing conditions and standards for particulate pollution in Environmental Authorities for open cut coal mines.
11. That the Committee seek information from the Queensland Department of Environment and Heritage Protection and Department of Natural Resources and Mines, and from coal companies operating in the Bowen Basin to determine the degree of compliance with Environmental Authorities and enforcement of conditions by government agencies.

### **Sources and effects of particulate matter**

The Centre for Inland Health at Charles Sturt University undertook a literature review for the Riverina Air Quality group in 2011, which summarised research into the health effects of particulate pollution. They found that “While early studies focused on the acute respiratory effects, more recent studies have examined the long term and chronic effects of air pollution on the cardiovascular and respiratory systems. An increasing body of evidence suggests that air pollution also has an adverse effect on pregnancy outcomes.” More than one study reviewed by the Centre concluded that there is a causal link between exposure to PM<sub>2.5</sub> and cardiovascular morbidity and mortality. They also concluded that there is no identified effect threshold for particulate pollution: health effects are considered to be a function of both duration and intensity of exposure.<sup>1</sup>

It seems very likely that the duration and intensity of exposure to particulate pollution is uneven, but there is little data on the health impacts that exposure to continual, repeated and high levels of particulate pollution has had on communities living close to coal mining, transport and handling facilities. Implementation of the *National Environment Protection (Ambient Air Quality) Measure* (Air Quality NEPM) does not appear to extend to regional areas with low population densities and, as such, those people may be being exposed to harmful levels of particulate pollution without the Air Quality NEPM being able to protect them. The first recommendation of the review of the Air Quality NEPM was that the desired environmental outcome be amended to “minimise the risk from adverse health impacts from exposure to air pollution for *all people wherever they may live*.”<sup>2</sup>

Some of these communities live not only with coal mining, but with coal fired power stations in close proximity. Burning coal for heat or power is known to be a chief source of particulate pollution, and the particulate pollution from these facilities poses a compounded health risk for surrounding

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<sup>1</sup> Centre for Inland Health. 2011. *Particulate matter air pollution in a NSW regional centre: A review of the literature and opportunities for action*. Wagga Wagga: Charles Sturt University

<sup>2</sup> *National Environment Protection (Ambient Air Quality) Measure Review Report*. May 2011. Prepared for the National Environment Protection Council. <http://www.scew.gov.au/publications/pubs/aaq-nepm/aaq-review-report-2011.pdf>

residents as it can also contain selenium, mercury and other metals. A report by Physicians for Social Responsibility on *Coal's Assault on Human Health* in the United States outlines the health impacts that have been associated with the air pollutants produced by coal-fired power stations. In addition to the well-known respiratory illness, they write that "Recent research suggests that nitrogen oxides and Pm2.5, along with other pollutants, are associated with hospital admissions for potentially fatal cardiac rhythm disturbances. The concentration of Pm2.5 in ambient air also increases the probability of hospital admission for acute myocardial infarction"<sup>3</sup>

Two of the recommendations of the review of the Air Quality NEPM were to conduct research into the composition of particles and associated health impacts, and to initiate health research on the impact of air pollution (in particular, particles) in regional areas.<sup>4</sup> COAG has since announced that "the review's recommendations will be prioritised and responded to through the development of the National Plan for Clean Air" which is to be delivered in 2014<sup>5</sup>.

We believe that understanding the composition of particulate pollution from coal is a high priority as potentially damaging substances like mercury, selenium and lead, can be present in coal particulates.

In 2010, the CSRIO undertook work examining the selenium, lead, molybdenum, nickel and mercury content of Australian exported thermal coal, but it does not appear that action was taken to study the effects of burning this coal in Australia, or if there is any release of these substances from the mining and handling of the coal before it is exported. The National Pollution Inventory reveals that coal mines are releasing selenium and its compounds into the air and sometimes water in their vicinity. As for other pollutants, the quantity of selenium being released by coal mines varies hugely. The NPI reveals that in 2011, the Newlands, Coppabella, Ravensworth and Collinsville mines all released more than 50kg of selenium. For mercury, nine of the top ten highest mercury-polluting coal mines are in Queensland's Bowen Basin. The top ten, according to the NPI, are the Dawson Mines (Moura, Qld), Goonyella Riverside Broadmeadow (Moranbah, Qld), Foxleigh (Middlemount, Qld), Hunter Valley Operations (Singleton, NSW), Ensham (Emerald, Qld), Blackwater (Blackwater, Qld), Peak Downs (Moranbah, Qld), German Creek Coal Mine (Middlemount) and Saraji (Dysart, Qld). It is not clear to us that there is adequate understanding of the health implications of this for the communities that live near these mines.

There seems to be significant variation in the degree of particulate pollution from open cut coal mines, and so we encourage the Committee to investigate the data available through the National Pollution Inventory to focus on not just the towns affected by several mines, but the towns nearest the mines that produce the greatest quantities of small particulate pollution.

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<sup>3</sup> Physicians for Social Responsibility. 2009. *Coal's Assault on Human Health*.  
<http://www.psr.org/assets/pdfs/coals-assault-executive.pdf>

<sup>4</sup> *National Environment Protection (Ambient Air Quality) Measure Review Report* May 2011. Prepared for the National Environment Protection Council. <http://www.scew.gov.au/publications/pubs/aaq-nepm/aaq-review-report-2011.pdf>

<sup>5</sup> "Public Statement on the Development of the National Plan for Clean Air." May 2012.  
<http://www.scew.gov.au/publications/pubs/air/national-plan-for-clean-air-public-statement.pdf>

Table 1 shows the coal mining operations that produced more than 100 tonnes of PM<sub>2.5</sub> pollution in 2011, according to the NPI. Of the Queensland towns that are nearest these mines, only one, Moranbah, is subject to pollution monitoring under the Air Quality NEPM.

**Table 1: Coal mines that produced more than 100 tonnes PM<sub>2.5</sub> in 2011 (source: NPI 2011)**

Mine	Nearest town	State	PM <sub>2.5</sub> (kg)
Bulga Coal Mine	Singleton	NSW	367,787
Glendell and Ravensworth East	Ravensworth	NSW	215,453
Mt Owen Mine	Ravensworth	NSW	195,928
Curragh Mine	Blackwater	Qld	193,348
Newlands Coal	Glenden	Qld	172,000
Liddell Coal Operations	Muswellbrook	NSW	161,217
Goonyella Riverside Broadmeadow Mine	Moranbah	Qld	160,609
Rix's Creek	Singleton	NSW	144,126
Wambo Mine	Warkworth	NSW	136,965
Lake Vermont	Dysart	Qld	131,111
Rolleston Coal Mine	Rolleston	Qld	130,473
Peak Downs Mine	Moranbah	Qld	128,454
North Goonyella/Eaglefield Coal Mine	Glenden	Qld	120,760
Saraji Mine [Dysart-QLD]	Dysart	Qld	116,781
Mt Arthur Coal Mine	Muswellbrook	NSW	114,399
Yarrabee Mine	Blackwater	Qld	110,357
Collinsville Coal Mine	Collinsville	Qld	110,140
Coppabella Coal Mine	Nebo	Qld	102,549
Blackwater Mine	Blackwater	Qld	101,599

A review of the NPI records for PM<sub>10</sub> reveals that many of the mines with the highest volumes of particulate pollution are in Queensland. Indeed, as Table 3 shows, the eleven most heavily polluting coal mines, by tonnage of PM<sub>10</sub> released in 2011, are in Queensland. Again, of the near towns, only Moranbah is subject to air quality monitoring under the Air Quality NEPM.

**Table 1: Highest PM<sub>10</sub> emitting coal mines in 2011 (source: NPI 2011)**

Mine	PM <sub>10</sub> (kg)	Nearest town
Goonyella Riverside Broadmeadow Mine	14,945,855	Moranbah
The Dawson Mines	14,017,467	Moura
Blackwater Mine	11,781,101	Blackwater
Foxleigh Mine	11,190,574	Middlemount
Peak Downs Mine	10,177,790	Moranbah
Burton Coal Mine	9,851,000	Nebo
Ensham Coal Mine	9,416,950	Emerald
Newlands Coal	9,200,000	Glenden
North Goonyella/Eaglefield Coal Mine	9,036,900	Glenden

Comparing these emissions quantities to the conditions set in Environmental Authorities provided by the Queensland Department of Environment and Heritage Protection is not simple, as the EA

conditions, and the Air Quality NEPM standard are expressed as volume and area limits (micrograms per cubic metre and milligrams per square metre deposition). The Environmental Authority for the Peak Downs mine, as once example, has a PM<sub>10</sub> emission limit three times the Air Quality NEPM standard (see comments below on standards for more detail) and the report from the NPI indicates that this mine could be producing an average of over 27,000kg of PM<sub>10</sub> per day. This is not to say that there are not significant PM<sub>10</sub> problems from NSW coal mines, but it appears, from the available data, that there may be serious consequences of unregulated and uncontrolled particulate pollution from Bowen Basin coal mines.

Given the above, we urge the Committee examine pollution data from the following sources: open cut coal mines in the Hunter Valley, NSW; open cut coal mines in the Bowen Basin, Queensland; Bayswater, Liddell, and Eraring power stations in NSW; Collinsville and Gladstone power stations in Queensland; Hazelwood and Loy Yang power stations in Victoria. We encourage the Committee to also seek information about the composition of particulate pollution from these sources, and any associated health impacts.

### **Populations most at risk and causes putting them at risk**

Greenpeace is aware of several regional communities that are living in close proximity to coal mining, transport and handling, and may be, therefore disproportionately impacted by particulate pollution.

#### **NSW**

In the Hunter Valley, standards for PM<sub>10</sub> are regularly exceeded, and high levels of pollution are particularly concentrated in areas that are surrounded by coal mines.

According to the air quality monitoring report from the NSW EPA, there were 22 days in Camberwell village when the average daily measurement of PM<sub>10</sub> exceeded the 50µg/m<sup>3</sup>, and the highest measured concentration of PM<sub>10</sub> last year in Camberwell was 81.6µg/m<sup>3</sup>. Another new coal mine is slated to be dug in close proximity to Camberwell, and objections to this from the NSW Department of Health are on the record. The residential growth area outside Singleton called Maison Dieu is surrounded on three sides by open-cut coal mines, as close as two kilometres from residents and had an even higher maximum reading. There are several towns and settlements in the Hunter Valley in this situation, with coal mining in close proximity on more than one side of the settlement, such as Jerry's Plains, Warkworth and Camberwell, and we encourage the Committee to focus some attention on these areas.

In Newcastle, there are populous suburbs within hundreds of metres of coal rail lines that service the six coal loaders currently operating in the port and their stockpiles. Intense community concern about the health effects of coal dust from the rail and the coal piles led to a study by the Australian Rail Track Corporation last year, which found that coal trains are significantly increasing the total suspended particulates, and the fine particle pollution in the adjacent suburbs. The Hunter Community Environment Centre (HCEC) has surveyed residents in suburbs adjacent to the coal rail line and the coal terminal and published the results. They found that 68% of residents in those suburbs feel "very" or "somewhat" affected by the three existing coal terminals in Carrington and Kooragang Island and that 69% of residents were "very" (46%) or "somewhat" (23%) concerned

about the impact of coal trains passing through Newcastle suburbs. Over a third (39%) of respondents said that they or a member of their household suffered from a respiratory ailment and one-third of these people consider that the ailment is caused by coal<sup>6</sup>. After this survey, the HCEC installed dust monitoring stations around the affected suburbs. The results from this investigation are due to be released in time to make a submission to this inquiry.

The Hunter New England office of NSW Health made a submission in relation to the proposed fourth coal terminal in Newcastle raising concern that local particle pollution levels already exceed the NEPM standard, and questioning the adequacy of the air quality modelling undertaken for the environmental assessment of the project, which claimed that there would be no additional 24 hour average PM<sub>10</sub> concentration exceedances. The office noted that they already receive complaints from residents in Carrington, Mayfield and Stockton about the deposition of coal dust and the impact of particulate pollution.

### **Queensland**

The Bowen Basin, like the Hunter Valley, has reached saturation point with open-cut coal mines, and yet both areas have proposals for extensive new mining activities—either extensions of existing mines or new mines entirely.

As shown above, open cut coal mines in the Bowen Basin in Queensland populate the list of the facilities releasing the highest volumes of PM<sub>10</sub> in Australia, and high volumes of other pollutants, including PM<sub>2.5</sub>, mercury and selenium. Six of the top ten point sources of PM<sub>10</sub> in the country in 2011 were Queensland coal mines.

Some results from the air quality monitoring station at Moranbah are available from Queensland's annual reports on the Air Quality NEPM and in more frequent *Air Quality Bulletins*. The January 2012 bulletin reveals that for four months between October 2011 and January 2012, the monthly maximum 24 hour average PM<sub>10</sub> concentrations at Moranbah exceeded the Air Quality NEPM limit of 50µg/m<sup>3</sup>.<sup>7</sup>

We believe that the communities living amongst open cut coal mining in the Bowen Basin may be being exposed to significant concentrations of particulate pollution but that systematic research and investigation is needed to determine if this is the case, and the impact it is having on health. This is likely to be compounded for those communities where coal-fired power stations are also situated, like Collinsville.

### **Standards, monitoring and regulation of air quality at all levels of government**

Current air pollution standards in Australia are implemented by the Air Quality NEPM, an agreement under the Council of Australian Governments (COAG). Under this scheme, the States are responsible

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<sup>6</sup> Hunter Community Environment Centre. 2012. "Sick of Coal" <http://www.hcec.org.au/content/household-survey-reveals-newcastle-community-rejects-coal-terminal>

<sup>7</sup> *Air quality bulletin: Central Queensland January 2012*. <http://www.ehp.qld.gov.au/air/documents/air-bulletins/cq12jan.pdf>

for implementing measures to regulate six different air pollutants, but only in a limited number of places.

We believe that the standards set under the Air Quality NEPM for small particulate pollution are inadequate to protect the health of communities living with particulate pollution. In addition, implementation of the national standards is the responsibility of the States and there is no way of enforcing compliance at the national level. In the Hunter Valley, air quality standards are regularly exceeded due to coal mining without any penalties being imposed. In Queensland, there is no uniform dust monitoring and reporting requirements applied to coal mines.

There is an urgent need for a PM<sub>2.5</sub> limit to be implemented across the country, and applied consistently to areas affected by coal mining operations. The World Health Organisation has recommended a set of “interim targets” for particulate pollution with a diameter of 2.5 micrometres or less (PM<sub>2.5</sub>), the most stringent of which is a 24 hour average concentration of 25µgm<sup>3</sup>. This is the limit inscribed in Queensland’s *Environmental Protection (Air) Policy 2008* but we cannot find evidence that this target or measure is being applied to towns located near coal mines in Queensland.

The first recommendation of the review of the Air Quality NEPM was that the desired environmental outcome be amended to “minimise the risk from adverse health impacts from exposure to air pollution for *all people wherever they may live*” (our emphasis). Two further recommendations were to conduct research into the composition of particles and associated health impacts, and to initiate health research on the impact of air pollution (in particular, particles) in regional areas. COAG has since announced that “the review’s recommendations will be prioritised and responded to through the development of the National Plan for Clean Air” which is to be delivered in 2014.

The proposed Plan is an opportunity to reform our approach to air pollution and ensure that all people are protected from the impact of air pollution, and that overdue research into the health implications of particulate pollution is undertaken.

### **Standard of regulation and transparency in Queensland**

Greenpeace holds profound concerns about the standard of control and measurement of particulate pollution from open cut coal mining, coal transportation and handling in Queensland generally. The standard of transparency for air (and water) pollution regulation and reporting in Queensland needs to be significantly improved. There does not appear to be a consistent approach to establishing, reporting on and enforcing conditions and standards for particulate pollution in Environmental Authorities for open cut coal mines by the Queensland Department of Environment and Heritage Protection or the Department of Natural Resources and Mines.

It is difficult to definitively analyse the standard of conditions and their enforcement as there is no requirement for free public access to Environmental Authorities in Queensland, nor is there a public register of compliance with those Authorities.

Public requests for copies of Environmental Authorities for coal mines are not promptly followed up, and are not fulfilled without payment. As an example, Greenpeace requested a copy of the Environmental Authority for the Rolleston coal mine from the Department of Environment and

Heritage Protection (DEHP) by email to the email address provided for such enquiries in November last year. More than two weeks later, we received an email in reply to the effect that they could email the EA to us for \$37 dollars, mail it for \$40 or fax it for \$45. Given that there are around 40 operating coal mines in Queensland, a not-for-profit organisation could be expected by the Queensland Government to pay over a thousand dollars for access to information that is held by them electronically, and should and could be provided simply and freely to the public to ensure that there is some transparency in Queensland's adherence to national standards of air pollution monitoring and control. This contrasts against the more transparent arrangements in NSW, where there is a public register of Environment Protection Licences that is available online, including all EPLs and their compliance history, and with easy search capacity. In Queensland, *draft* Environmental Authorities are generally published and made freely available because there is a statutory objection mechanism, but there is no online register of in force Environmental Authorities.

We believe in addition that the air quality conditions proposed in Environmental Authorities for coal mines are not sufficient to protect people living in communities near these mines. The draft Environmental Authority for the Sonoma open cut coal mine, for example, states that "When requested by the administering authority or as a result of a complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer), dust and particulate monitoring must be undertaken." The Sonoma EA imposes a PM<sub>10</sub> limit of 50µg/m<sup>3</sup> average daily concentration, but states that in the event that the mine exceeds this limit, the company must "address the complaint including the use of appropriate dispute resolution if required" and "immediately implement dust abatement measures so that emissions of dust from the activity do not result in further environmental nuisance." These conditions are loose, but are starkly contrasted to the conditions for air quality in the new draft Environmental Authority for the Peak Downs mine, which stretches between Moranbah and Dysart. For that mine, the conditions are worded similarly, but the limit imposed for daily average PM<sub>10</sub> concentrations of 150µg/m<sup>3</sup> – three times the Air Quality NEPM standard.

We provide these examples as evidence of the lack of consistency in the application and standards for controlling, monitoring and reporting on particulate pollution from coal mines in Queensland. It is difficult for community groups to access any information about the compliance and enforcement regime for air quality standards for Queensland coal mines, so our remarks have been limited to the standards for pollution limits and monitoring. We encourage the Committee to seek information from the Queensland Department of Environment and Heritage Protection and Department of Natural Resources and Mines, and from coal companies operating in the Bowen Basin to determine the degree of compliance with Environmental Authorities and enforcement of conditions by government agencies. We believe this information should be made more accessible to the public.

## **Conclusion**

Thank you for the opportunity to make a submission to this inquiry. We welcome the Committee's attention to this problem and hope that a combination of expert testimony and local engagement in affected areas will cast some light on the potential health impacts of particulate pollution in coal affected regions.