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Health impacts of air pollution

Senate Community Affairs Committee
Chair: Senator Rachael Siewert

The Committee's terms of reference are to examine the impacts on health of air quality in Australia, including:
(a) particulate matter, its sources and effects;
(b) those populations most at risk and the causes that put those populations at risk;
(c) the standards, monitoring and regulation of air quality at all levels of government; and
(d) any other related matters.

(1) Planning processes

The Queensland government is failing to take into account the impacts of hazardous fine coal dust on community and individual health. The costs of pollution are also not being assessed in EISs. While a few PM10 particulate monitors are in place near mines and communities at some mine sites, and coal export ports I have not heard of instances of the more hazardous PM2.5 particulates monitoring. Locals also question the location of some of these monitoring stations in terms of being effective to capture most emissions.

We are particularly concerned about the health of people in the township of Collinsville now surrounded by coal mines and an aging coal-fired power plant. They have no data on their exposure levels to fine coal dust. Larger particles coat buildings and are found in water tanks.

Moranbah in the northern Bowen Coal Basin is another mining town surrounded by more and more large coal mines greater than 10 Mtpa.

Health data is reported as regional averages and masks any disease clusters related to coal dust exposure. Collinsville is facing coal seam gas mining in the future as are many other land owners and communities within Central and northern Queensland.

85% of the Fitzroy River Basin and 95% of the Burdekin River Basin are covered with coal exploration permits from the Queensland government.

A railway corridor planned by Aurizon (formerly Queensland National Rail) will have six to eight rail line tracks to carry coal from a new coal basin the Galilee Basin in the desert

Uplands of central Queensland. Massive mines mining up to 60 Million tonnes a year of coal are proceeding through the planning process. Biodiversity offset hubs to offset the clearing of hundreds of thousands of hectares of woodlands are planned but these hubs sit adjacent to these mega mines, so fine coal dust will rain down on these hubs from the mining operations, affecting the environmental integrity of the offsets and the health of wildlife and landowners in them.

(2) Heath effects

There is no safe health threshold for exposure to coal dust.

There is no method to continuously measure hazardous fine coal dust.

There is a lack of health impact studies for the Queensland coal ports and how these are necessary now because of the huge expansions taking place (Fig.1). Health impact studies should be a part of all coal-related EISs, not just plans to install PM10 monitoring programs.

It is impossible for coal port management to maintain background levels to the baseline level of 5 micrograms per cubic metre above which harm to human health has been found, especially for more hazardous fine coal dust of less than PM2.5 particulates.

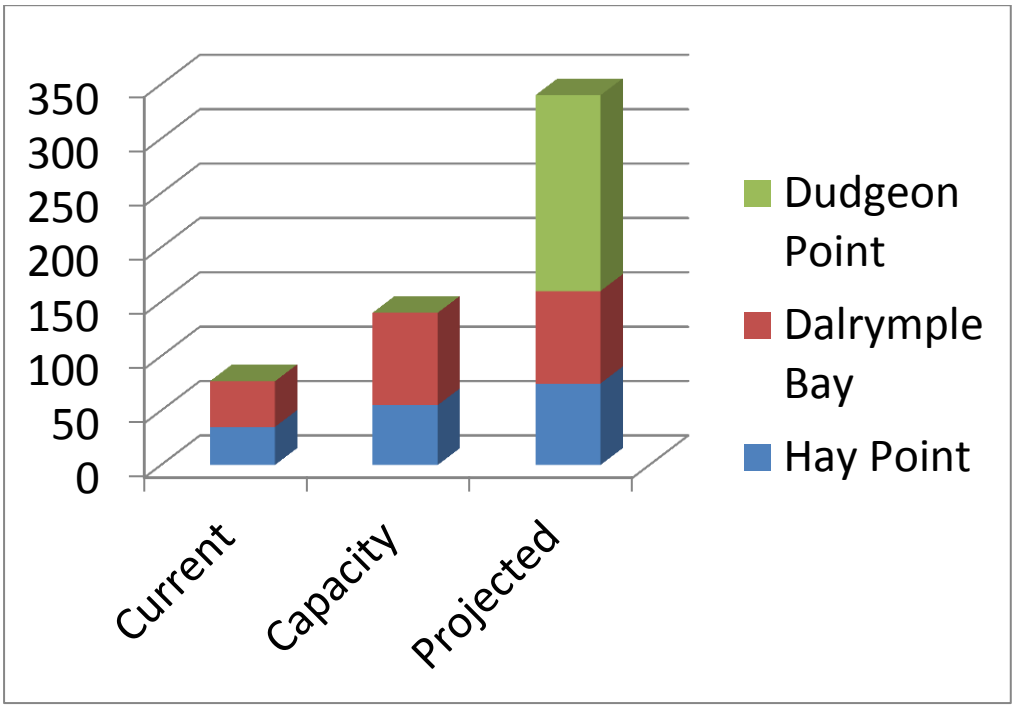

Fig. 1 Growth of coal exports and capacity in the Hay Point coal terminals complex south of Mackay Queensland. Units are Mtpa (Million tonnes per annum)

There is no established system of PM2.5 or less dust monitoring stations around coal ports in Queensland. All that is measured to date in the Mackay and Bowen region (Hay

Point and Abbot Point port land coal terminals) has been Total Suspended Particulates plus the monthly average percentage of coal dust in selected sites of coal dust deposition. So there is no way of knowing what the actual exposure levels to fine coal dust are.

Dust data is presented as daily or monthly averages to the public missing data spikes to which those more susceptible to higher coal dust levels, such as the more vulnerable young, ill and elderly are.

While a 24-hour average PM2.5 standard for fine particulates has been set the number of exposure days of values that exceed that standard has not been. More hazardous particulates, such as heavy metals found in coal dust, are not monitored.

PM2.5 and PM10 measurements still do not separate out coal dust from other forms of dust particulates e.g. mineral and organic matter.

There is no system for longitudinal health studies to follow such affected populations to assess the human, wildlife and agricultural stock costs of coal dust exposure.

Ports expansions in Central and North Queensland call for new coal terminals that will operate for up to 90 years e.g. Adani's exports of coal proposed trough new terminals at Dudgeon Point in the hay Point port lands. Some of these are near large coastal urban populations e.g. Brisbane, Gladstone, Mackay, Bowen and probably Townsville (and possibly Bundaberg in future).

There are no air quality dust standards that cover extended periods of such lengths of exposure to hazardous fine coal dust. Yet the Adani terminal proposed in Dudgeon Point in the Hay Point port lands is just 13 km upwind of downtown Mackay, adjacent to the Louisa Creek coastal community and within 8 km of 13 small townships near the Dudgeon Point coal terminal. As fine particulates can travel hundreds of kilometres, and are invisible, nearby populations will be affected and not be aware of the cause.

Cumulative health, social and economic impacts of multiple coal dust in coal port clusters is not being assessed.

"There may be no safe threshold for fine particulate matter and the effects are linearly related to concentration."

World Health Organisation & Australian National Pollution Inventory

Toxic Fine Coal Dust

Air monitoring at Coal Ports & (4.2) Dust

Toxic Fine Coal Dust

Coal dust particulates are of particular concern because they contain heavy metals which are toxic at low concentrations.

They include lead, mercury, nickel, tin, cadmium, mercury, antimony, and arsenic, as well as radio isotopes of thorium and strontium.

- Total Suspended Particulates monitoring, which is done in the Hay Point port land coal terminals13 m directly southwest of Mackay, includes particles of various sizes. Some proportion of TSP consists of particles too large to enter the human respiratory tract; therefore, TSP is not a good indicator of health-related exposure.[1] It also includes particulates other than coal dust.

- The Australian and Queensland 24-hour standard of 25 $\mu g/m^3$ for PM2.5 particulates meets World Health Organisation (WHO) guidelines but is well above the background level of 3-5 $\mu g/m^3$ at which WHO found health impacts.

- Fine coal dust and other particulate levels could increase up to three times current export levels if a proposal for two coal terminals to export up to 180 Mtpa of coal annually from Dudgeon Point within the Hay Point coal port land complex proceeds.

- The PM2.5 standard was not established to deal with the health impacts of long-term exposure to increasing amounts of hazardous fine coal dust immediately upwind of a fast-growing urban area i.e. the greater Mackay region under Mackay Regional Council in north Queensland, and nationally and state significant wetlands. Prevailing south-easterly winds for most of the year quickly blow coal dust (invisible fine and visible larger particles) the 13 km to downtown Mackay and farther. Because Adani intends to operate its proposed coal port terminal at Dudgeon Point for 90+ years exposure to fine coal dust will be continuous and very long-term for communities in the greater Mackay region, and especially high for adjacent rural communities such as Louisa Creek, Timberlands, McEwens Beach and Fenechvale. (Figs.2 & 3)

[1] http://www1.ifc.org/wps/wcm/connect/59cfb38048855493b35cf36a6515bb18/HandbookAirborneParticularMatter.pdf?MOD=AJPERES&CACHEID=59cfb38048855493b35cf36a6515bb18

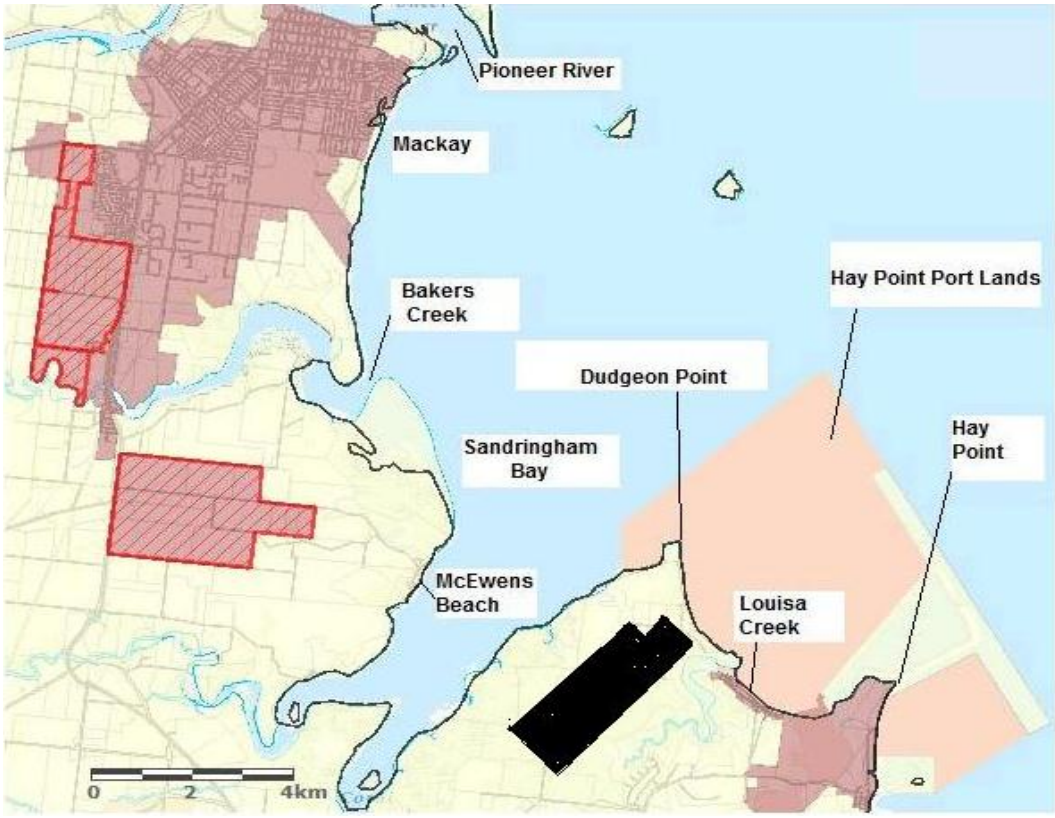

Fig.2 Location and size of proposed Dudgeon Point coal stockpiles (black area) in relation to urban Mackay and proposed urban expansion areas (Mackay regional Plan)

There are already a high enough number of cancer cases for these small rural communities to support a cancer care group. But they are too small for statistically significant epidemiology studies to be done by Queensland Health. In that case the precautionary principle should apply until health and environmental impacts are known.

- North Queensland Bulk Ports modelled PM2.5 and PM10 particulates levels and distribution from the Hay Point port lands in 2009. This included 120 Mtpa from the proposed Dudgeon Point coal terminals, at that time considered the terminals' capacity.

  All levels were reported below the PM2.5 and PM10 threshold values, but as noted above this modelling included all particulates, not just those from hazardous fine coal dust and other hydrocarbons from the port operations, and these values tell us nothing about health impacts on affected communities.(Fig.3)

- The amount of coal dust in Total Suspended Particulates (TSP) emissions will increase as coal exports from the Hay Point port lands increase and so will their toxic emission levels and risks to human health.

- Under NQBP's air quality monitoring program there is no separation of average monthly dust deposition samples into the proportion present of fine PM2.5 and coarser PM10 coal dust particulates. Data is reported as average monthly percentage present of "dark particulate particulates."

Consequently affected communities have no continuous monitoring data available on their exposure levels for coal dust.

- There are no baseline or longitudinal studies being done on the impacts to human, wildlife and stock health. Nor are any planned at this time despite the fact that the proposed coal terminal expansions would make the Hay Point coal export terminals complex the biggest or second biggest in the world.

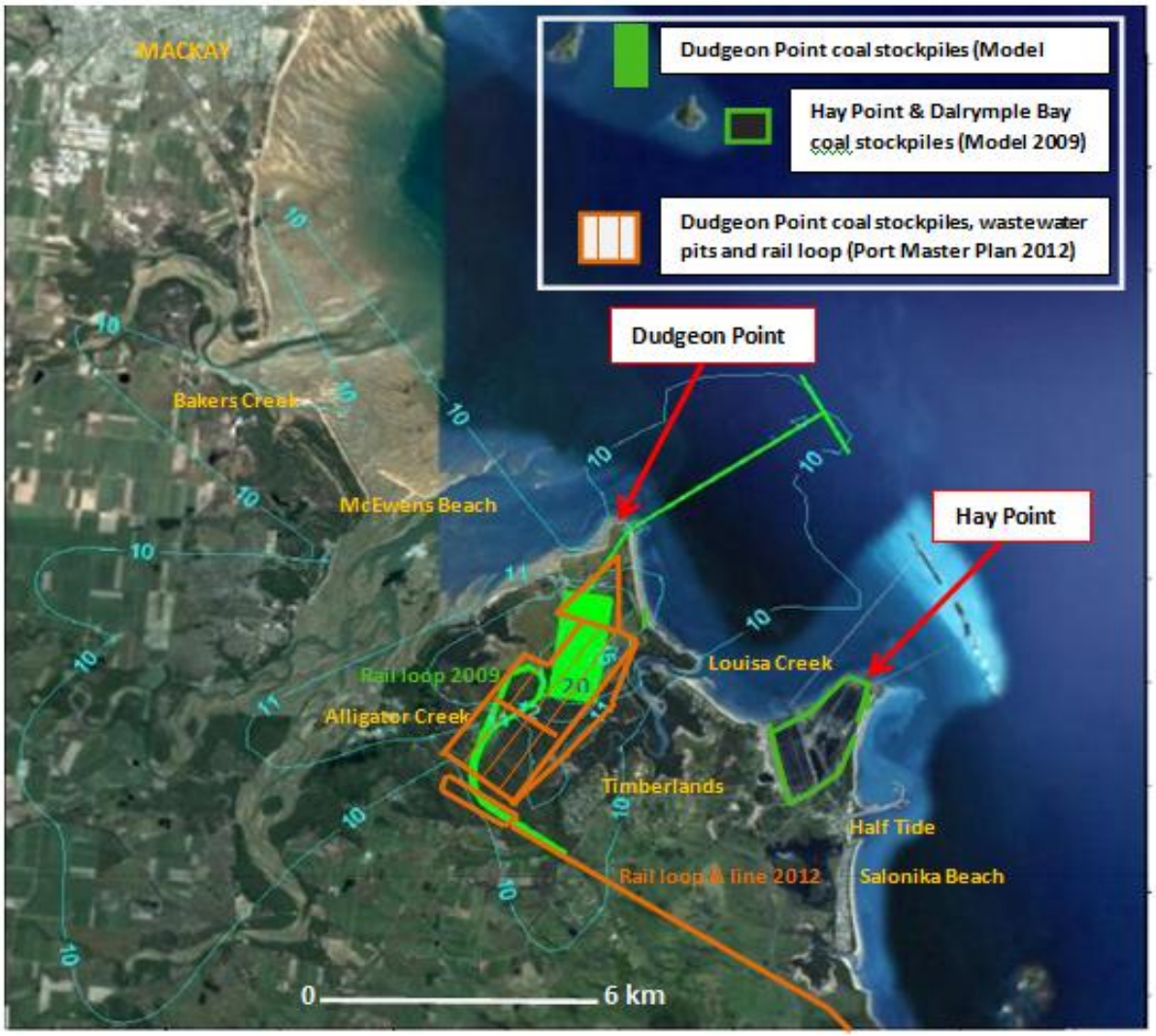

Fig.3. Modelled 24-hour average PM2.5 particulate emissions from Hay Point coal terminals at 253 Mtpa capacity, i.e. 74% of what is now proposed .

We need to know this!

1. Impacts from the most harmful particulates such as fine coal dust and other hydrocarbons used in the Hay Point coal complex port operations which are borne by prevailing winds to the greater Mackay region.
2. Concentrations of PM2.5 particulates that are hazardous fine coal dust & other hydrocarbons (burnt diesel) and their impact on human health, which are monitored continuously in a comprehensive monitoring network throughout the greater Mackay region.
3. Concentrations of PM10 coal dust particulates and their economic impact on greater Mackay communities e.g. Cleaning costs, damage to infrastructure e.g. buildings,

cars etc. which are monitored continuously in a comprehensive monitoring network throughout the greater Mackay region.

4. Baseline and longitudinal health studies in the greater Mackay region which provides affected communities with information on the impacts of coal dust on their health and properties. The longitudinal studies should last as long as the coal terminals do i.e. 90+ years, as long as any population is exposed to coal dust from the terminal sites.

(4) Other matters: personal and community anxieties

Over the past decade Mackay Conservation Group has received continuing complaints about coal dust pollution from affected landowners and communities in northern Central Queensland and north Queensland. Mackay and nearby communities such as Louisa Creek and McEwens Beach already report a rain of visible coal dust they have to constantly clean off. Vacuumed dirt from communities close to Hay Point coal terminals is much blacker than in towns west of Mackay such as Walkertson.

We now face the huge expansion of coal ports at Hay Point and Abbot Point to become the largest coal export ports in the world. They will affect larger coastal populations more than in the past when they were much smaller.

We conducted a community survey on community concerns about the proposed expansion. People closer to the Hay Point port land coal terminals reported a higher percentage of respiratory health problems than the national average. They do not believe the North Queensland Bulk Ports (Hay Point) claim that Total Suspended Solids emissions will only increase by 4 per cent!

Few to no studies exist on the health impacts on communities, wildlife and agricultural stock located downwind of coal mines, rail lines and coal ports. No longitudinal studies are being done that we are aware of to follow the health of people who have worked in the mines. The current Fly-In Fly-Out work schedules help to make following workers' health more difficult. Are we facing another asbestos type debacle?

Both coal and health monitoring standards and other requirements need to improve to prevent long-term social and natural capital losses and landscape scale pollution that will be permanent.

Sincerely,

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