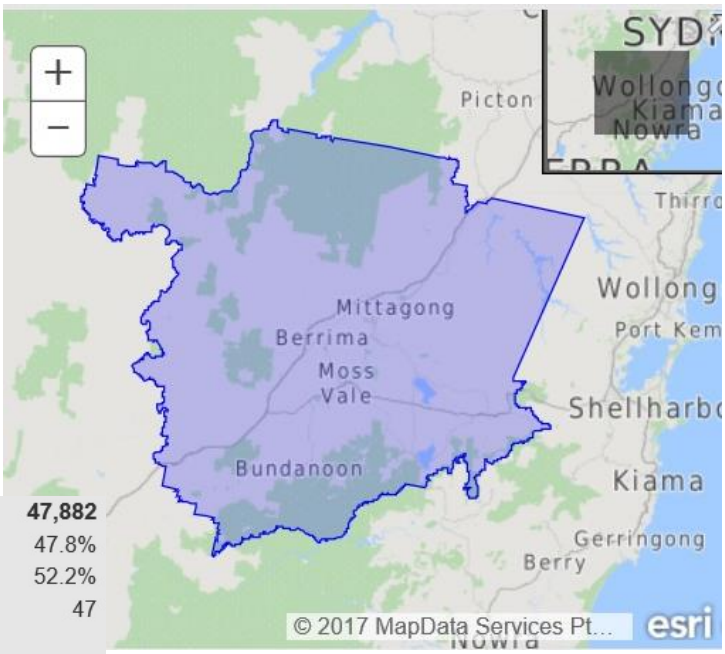
EIS Submission

Hume Coal Project

Assessment Type SSD. Project Type Mining, Petroleum & Extraction > Mining
Application No: SSD 15_7172. DGRS Issued: 20/08/2015. Exhib.Start 31/03. End 30/06/2017
Location details Street Hume Highway, Sutton Forest NSW.
Local Government Wingecarribee Shire Council



2016 census data

People	**47,882**
Male	47.8%
Female	52.2%
Median age	47
Families	**13,053**
Average children per family	
for families with children	1.9
for all families	0.7
All private dwellings	**21,615**
Average people per household	2.4
Median weekly household income	$1,335
Median monthly mortgage repayments	$1,842
Median weekly rent	$350
Average motor vehicles per dwelling	1.9

Gordon Markwart
Resident and Wingecarribee Shire Councillor
June 2017

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1 Introduction

My name is Gordon Markwart, male, aged 62. I live in Robertson which lies to the east of the Southern Highlands.

I spent my youth here before moving to Sydney, then interstate and overseas for some time, returning to Robertson about 7 years ago. I've held a few local jobs and am currently a local councillor. I also belong to the local NSW Greens group, the Southern Highlands Greens, and the Robertson Environmental Protection Society.

This submission is made on my behalf and mine alone.

2 Recommendation

I request the NSW Government to reject both the application for the proposed coal mine and the application of the associated railway development. Neither have adequate merit to outweigh the disadvantages locally, nationally or globally to justify approval.

3 My relationship to the development.

I grew up locally, attending Robertson Public School and subsequently Moss Vale High School. My parents owned and operated the General Store in Robertson for about 10 years.

Times were simpler then.

Robertson was regularly reported on the evening news as having the highest recorded rainfall in NSW, the foggy days were legendary as were the potatoes. Our local acre of temperate rainforest reserve, the Robertson Nature Reserve was a shadowy place thick with Yarrawa Brush. One could barely see the sky from under the canopy. For me and my brothers, as English immigrants, it was a place of wonder and mystery.

The Historic Yarrawa Brush

Behind a rustic fence, just a short distance from the town centre of Robertson, is Robertson Nature Reserve.

The unassuming entrance hides one of the natural treasures of the Southern Highlands, a remnant of the famous 'Yarrawa Brush'.

The Yarrawa Brush was a combination of dense impenetrable warm and cool temperate rainforests which once covered 2500 hectares of the eastern part of the Highlands from the Wingecarribee Swamp to the escarpment overlooking the coast.

('Brush' was a name given by the early explorers to forests covered with a dense understorey, unlike the more open forests near the coast.)

The Yarrawa Brush was first mentioned by the earliest explorers, notably Dr. Charles Throsby (1818), who was forced to skirt around it in his quest for an overland route from Bong Bong (the original settlement near Moss Vale) to the South Coast.

One day I was climbing a huge old conifer just within the Reserve and an old lady of about 70 looked up and saw me. She said she also used to climb the very same tree as a child. One day soon I hope to walk under what remains of that tree and, look up and see a child climbing high in its branches.

But things are different now.

My love of nature and the environment began from living in Robertson within the Southern Highlands.

I'm no longer a child and I have seen first-hand mining and deforestation destroying our environment within Australia. All for short term gain. Destroying the very fabric of our local communities so big corporations can make huge profits, often paying minimal taxes within Australia.

The Robertson Nature Reserve is no longer dense Yarrawa Brush. The canopy has thinned and while to the casual visitor it may seem archetypical. I can categorically state that it is a pale copy of what it once was. Why? I believe it's because Robertson's climate has changed. It's warmer, weather is more extreme, foggy days are less frequent, rain is less frequent but more intense, hot days are hotter and more frequent, all causing the number and variety of animal and plant species to struggle and often decline.

The local farmers know it too. Compared with 50 years ago when I first lived here, they are now forced to explore new crops to adapt and financially survive. Some years ago our hugely successful Bowral tulip festival was put forward two weeks because the winters are now warmer and the tulips were blossoming early. The wildlife is changing, the trees in my backyard are changing.

It's climate change. We are feeling the effects today from our **fossil fuel emissions of 20 to 30 years ago.**

Today's fossil fuel emissions will hugely influence the climate of 2040 to 2060. Nothing can be done to reduce climate change over the next 2 or 3 decades but we can have an impact in the second half of this century – only if we act now.

Today's fossil fuel emissions anywhere in the world will hugely influence the future climate globally and of course in the Southern Highlands of Australia.

The climate of our children and their children.

Do you have children?

4 Climate change

Climate change is insidious because of its decades' long time lag. We are currently experiencing the impacts of fossil fuel consumption about 20 years ago. What is done today in terms of burning fossil fuels impacts our future climate 20 years from now.

The impacts of climate change are being felt by human populations more in the great continents, such as India, the Northern Hemisphere and northern America. In Australia we lag behind the rest of the world not only in adopting new renewable energy technologies ☹ but also we lag the rest of the world by years regarding the impacts of climate change. But climate change is global, what happens north of the equator reaches Australia in time. There is no wall that can be built to keep climate change out of Australia.

I am not alone with seeing climate change as the major consideration regarding any new coal mine. Doctors for the Environment were referring to a different coal mine in their submission extracts below, but the same issues apply to the proposed Hume Coal/POSCO coal mine.

https://www.dea.org.au/images/uploads/submissions/Rocky_Hill_Mine_Project_Submission_10-16.pdf

Doctors for the Environment Australia (DEA) is an independent, self-funded, non-government organisation of medical doctors and students in all Australian States and Territories. Our members work across all specialties in community, hospital and private practices. We work to prevent and address the health risks- local, national and global- caused by damage to our natural environment. We are a public health voice in the sphere of environmental health with a primary focus on the health harms from pollution and climate change.

Global Effects

Climate Change and Combustion of Coal

Climate change is widely regarded as the biggest threat to health in the 21st century and burning coal is one of the major contributors. There are multiple health effects of climate change. For instance, by 2050, it is estimated that climate change will be causing an additional 250,000 deaths each year just from malaria, diarrhoeal disease, heat stress, and under-nutrition.

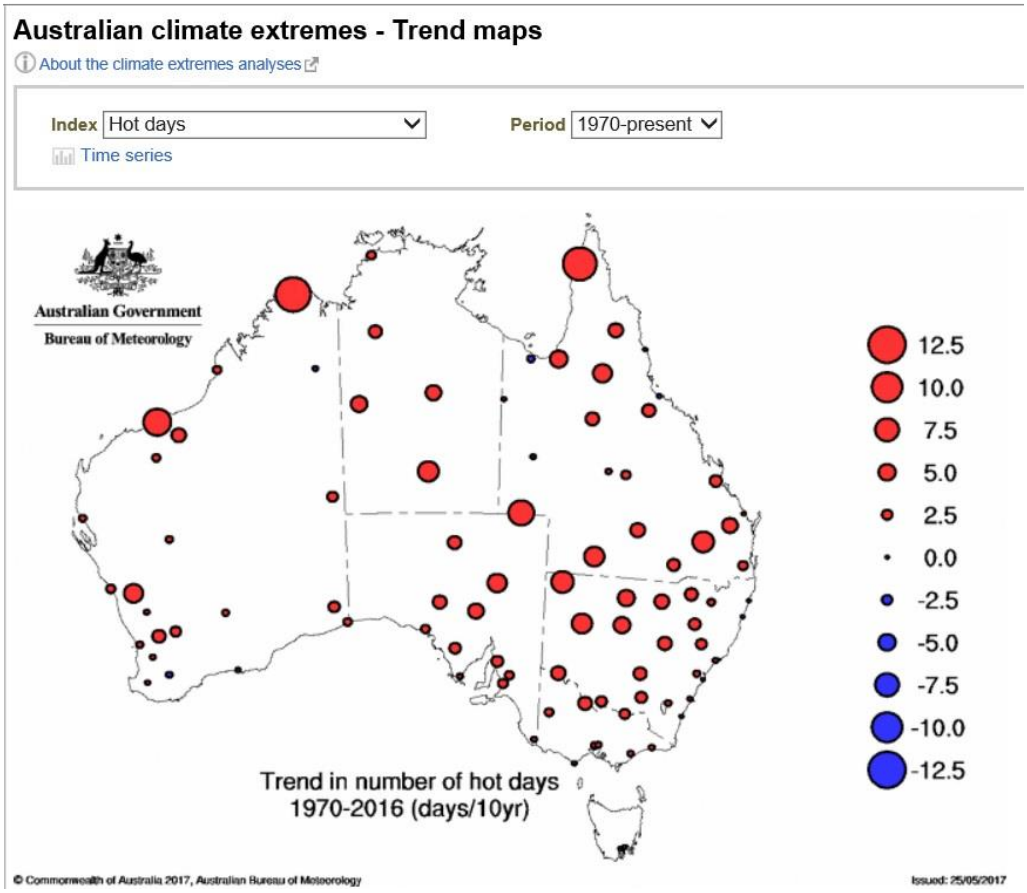
Coal we export, is burnt and comes back to damage us via the air, sea, land and climate.

http://www.dailypioneer.com/columnists/oped/direct-effects-of-climate-change.html

The summer of 2016 broke records of sorts when it was registered as the hottest year since 1901 — in fact, parts of Rajasthan [India] *recorded 51 degrees Celsius on a sustained basis, resulting in the region recording the highest ever temperatures in the country. These grueling heat wave conditions caused more than 1,600 casualties last year. The build-up to a hotter than ever summer for 2017 seems to have already begun, as the month of January has been warmest since 1901. The averaged monthly mean temperature during January*

2017 was significantly above normal with anomalies of 0.67 degree Celsius. This situation is indicative of rapidly changing climate conditions that should sound the alarm bells for the Indian environmental institutions and the Government authorities as well.

Australia is experiencing the same trend of global warming.



But the time lag between cause and effect is getting shorter. Changes in nature are not linear, but exponential. The rate of change is increasing. (The curve is getting steeper.)

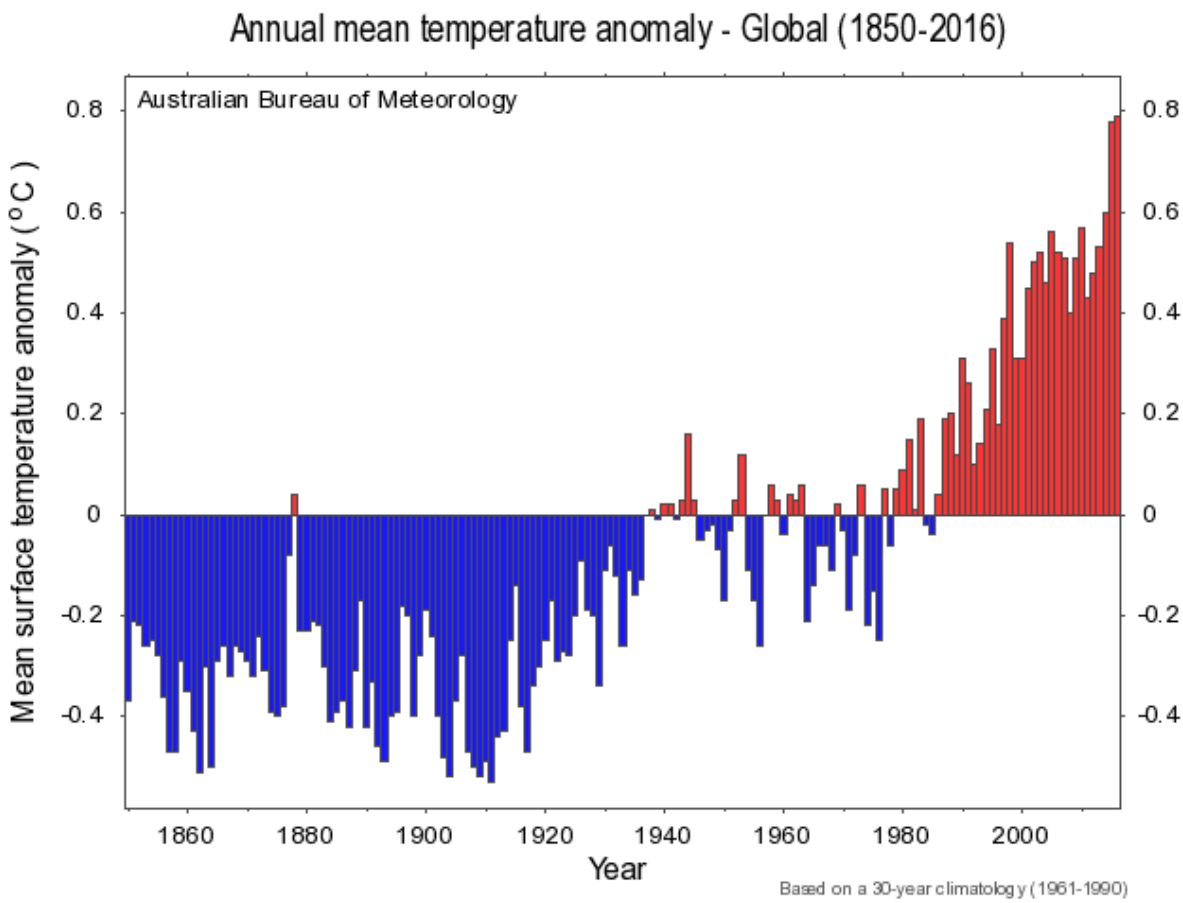
Many scientists believe there are critical “tipping points”, which once exceeded, there is no way to halt climate change. It will become self-progressing. Some scientists believe these tipping points have already been passed.

Either way, it’s essential for humanity globally, nationally and locally to take every opportunity to reduce greenhouse gas emissions.

No new coal mines is a very significant step in the right direction.

Not approving the Hume Coal application for a coal mine in the Southern Highlands is ethically the right thing to do for humanity today and for our future.

http://www.bom.gov.au/cgi-bin/climate/change/global/timeseries.cgi



It is also worth pointing out that the baseline shown above is approx. 1940. In reality the baseline should be pre-human-industrial times, i.e. pre-1900 clearly. The graph shown implies sit was “too cold” generally before 1940, when in fact, that time was the “normal” temperature. And the more accurate baseline for comparison is the average from 1850 to 1920.

If we use the 1900 baseline one can see average global temperatures have risen by greater than 1C to date. And the impacts of extreme weather, climate change, rising seas has been catastrophic in many locations even for 1C. The world of politicians has more or less agreed on an “acceptable” target of 2C average global increase. “Acceptable” politically but not to the survival of many species, or acceptable to many people being displaced from their traditional homelands due to drought, flooding and extreme weather events.

Climate change will continue unabated for the next 20 or 30 years at least due to the lag between changes to our atmosphere and climate change. If there is to be a future we must stop all new coal mines and transition urgently to renewable energy.

5 Australia's greenhouse gas emissions trends and targets

Australian greenhouse gas emissions fell from the high of 2006 almost entirely due to a decline in economic activity. Emissions peaked in 2006. That's why the Australian Government demanded 2005 be the baseline for their future emission targets at the Paris Agreement COP22 meetings in 2015.

The relatively low emissions in 2015, made the 2020 target easily achievable. Under the agreement "rules" Australia has actually been able to increase emissions and still look likely to claim to meet the 2020 emission target! Of course, increased emissions worsens climate change globally, nationally and locally. Australia's 2020 target has no benefit as such to the world, but benefitted financially those emitters of greenhouse gases in Australia.

The 2020 target did nothing to substantially discourage emissions, and it's clear from the available data that no future decrease looks likely. Meeting the 2030 target look unlikely unless there is an unprecedented and surprising reduction in emissions. Perhaps a carbon tax would help?

Today and in the foreseeable future, Australia's greenhouse gas emissions are increasing and the contribution by Australia to global climate change has been increasing correspondingly since 2014.

https://www.environment.gov.au/system/files/resources/9437fe27-64f4-4d16-b3f1-4e03c2f7b0d7/files/aust-emissions-projections-2016.pdf

Australia's 2030 target (26–28 per cent below 2005 levels)

- Emissions in 2030 are projected to be 592 Mt CO_2-e.
- Taking account of sensitivity analyses, the range for annual emissions in 2030 is 571 to 616 Mt CO_2-e.
- The 2030 target will require:
  - 990–1055 Mt CO_2-e in cumulative emissions reductions between 2021 and 2030 under the baseline projection
  - 842–1202 Mt CO_2-e when taking account of the sensitivity analyses.
- These estimates do not take account of the National Energy Productivity Plan, vehicle efficiency standards, the phase-down of hydrofluorocarbons, or policy changes that might flow from the 2017 review of climate policies or work of the Council of Australian Government's (COAG) Energy Council.
- The key drivers of emissions to 2030 are:
  - increased electricity demand linked to rising economic activity
  - increases in transport activity linked to population growth
  - increased herd numbers in agriculture linked to international demand.

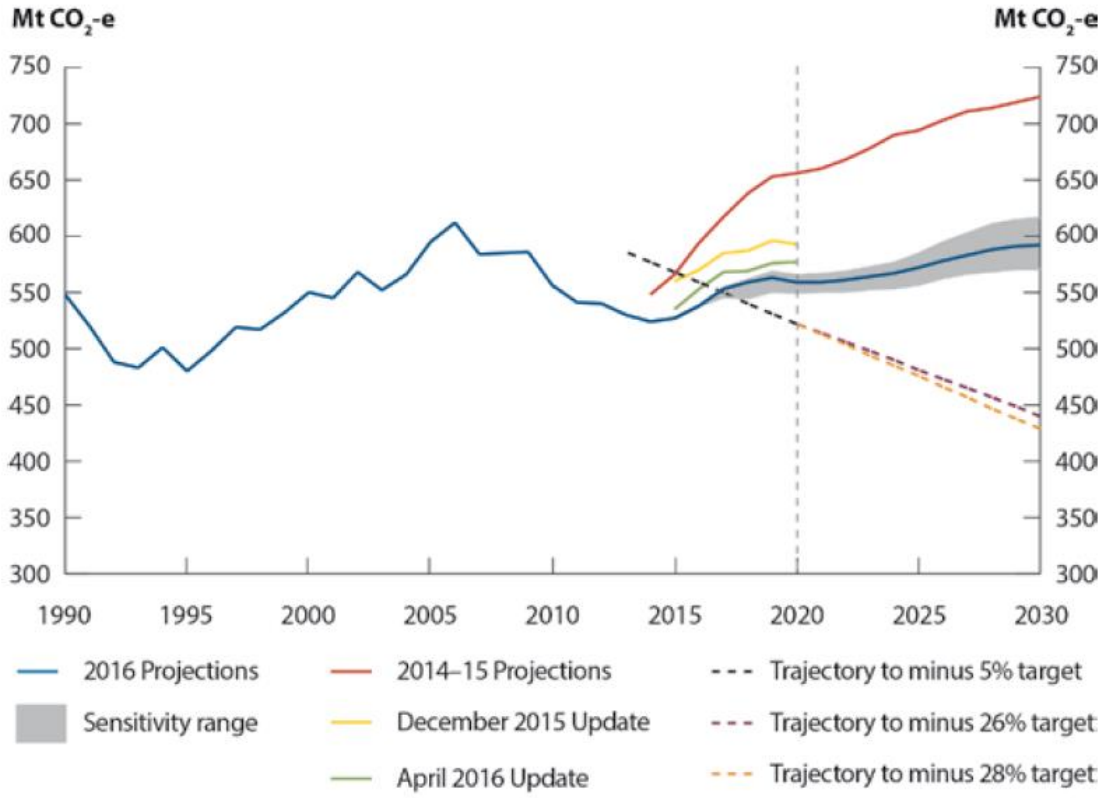
https://www.environment.gov.au/system/files/resources/9437fe27-64f4-4d16-b3f1-4e03c2f7b0d7/files/aust-emissions-projections-2016.pdf

Emissions projections to 2030

Emissions in 2030 are projected to be 592 Mt CO_2-e, which is 0.5 per cent below 2005 levels (595 Mt CO_2-e). This is a reduction of 132 Mt CO_2-e, or 18 per cent, from the estimate of 724 Mt CO_2-e given in the 2014–15 projections.

Emissions projections are inherently uncertain, and this uncertainty increases the further into the future emissions are projected. Taking account of sensitivity analyses prepared for this report suggests Australia's emissions in 2030 could range from 571 Mt CO_2-e and to 616 Mt CO_2-e.

Figure 3 Australia's emissions trends, 1990 to 2030



Source: Department of the Environment and Energy 2016; Department of the Environment and Energy analysis

Note: The historical emissions from 1990 to 2015 have been revised since the release of *Australia's emissions projections 2014–15*, published in March 2015. It is important to note that year to year figures are different in these publications and not directly comparable as the underlying assumptions, accounting systems and policy measures differ.

Most of the projected growth in emissions to 2030 is in the electricity, transport and agriculture sectors. This is driven by increased electricity demand linked to economic activity, increases in transport activity linked to population, and increased stocking numbers in agriculture driven by overseas demand. Emissions in other sectors are projected to stabilise and grow only slightly after 2020 (Figure 4).

I would point out that the 2014 to 15 projections above were clearly totally implausible and appears to have been included to give an impression that a significant step forward has been achieved. In fact if the 2014 to 15 projections had been based on economic growth estimates, the projection and actuals would be very close.

Every new coal mine increases local emissions, fugitive or from burning coal directly within Australia. Any coal mined in Australia and burnt elsewhere impacts climate change globally, in Australia and in the Southern Highlands.

Exporting coal and refusing to acknowledge the impact of burning that coal on climate change globally, across Australia and locally, is just a sleight of hand which will seriously impact humanity everywhere in 20-30 years.

For that reason alone, the proposed Hume Coal mine, like any new coal mine should not be approved.

6 The impacts of the development.

6.1 Local impacts

There are many local & regional negative impacts of the proposed coal mine and railway.

Mining is the first step in the dirty life cycle of coal. Mines are quick to dig up and destroy forests, soils and native habitats. But once the coal is gone, the problems they leave behind, like acid mine drainage, environmental damage, aquifer damage, habitat destruction persists for decades. The Hume Coal EIS confirms as much, probably understating the impacts.

My submission recognises, acknowledges and lists some of the local issues below.

- The local aquifers and bores will be seriously and adversely impacted for a period much longer than the proposed coal mine life. This creates a significant risk in terms of long term impact to productive farmland and food production.
- The proposed reinjection of mine waste has a huge risk of impacting the aquifer and ground water quality for the local community.
- Extreme weather events will occur and will cause waste water from the mine operations to disperse across local farmland or overflow into nearby water courses, with the resultant pollution of creeks and rivers.
- Property values nearby to the mine and those who have their water bores impacted, will be lower than if no mine were present. This property devaluation will last beyond the life of the mine, as do the mine impacts.
- The village of Berrima is of historic significance and a source of sustainable economic activity from tourism. This town and surrounds will have reduced appeal with a coal mine – noise, dust, air pollution, increased industrial traffic – on its doorstep.
- Miners can and do and have contract black lung disease. Australian miners were once believed to be safe but recently are being found with from this disease. Tens of thousands of miners have died from back lung disease in the USA. Anyone exposed

to the coal dust is a potential victim. All fine coal dust once it enters the lungs, remains and cannot be treated. The quality of life declines steadily. Only the symptoms can be treated.

- There will be significant impacts to road and rail traffic across the Wingecarribee Shore. There are a significant number of rail crossing using boom gates. These will close for the increased coal transport slowing through traffic and potentially causing some queues at peak periods.
- The Wingecarribee Shire is mainly a rural and service industry shire. Manufacturing and past mining activities has been relatively remote from rural and town centres. The proposed mine is significantly larger manyfold from previous mines and proposed to be located in a position that best meets the financial considerations of Hume Coal, at the expense of local communities.
- The influx and housing of non-workers in a region opposed to coal mining will result in increased social disruption and stresses upon workers and residents alike.

The main focus of this submission is upon the global impacts of a new coal mine.

http://www.abc.net.au/news/2017-05-04/after-the-mining-whats-next-for-the-landscape/8489422

"That's one of the things that I always worry about, is what will be the long-term environmental outcomes in say 50 years' time. And I guess that's an open question." Gavin Mudd, an associate professor of environmental engineering at RMIT

It is well known that there is no need for new coal mines, as recognised by several counties announcing a shift away from coal to renewable energy sources. The only imperative for this proposed coal mine in the Southern Highlands is financial, and that is financial for Hume Coal/POSCO. There are more financially and environmentally attractive options within the Southern Highlands for the community and all levels of Government which do not involve a new coal mine.

The largest coal mining company in the world has announced it will close 37 mines because they are no longer economically viable. This mine when benchmarked against industry metrics, is also no longer economically viable. The risk to Australia is significant that this mine will either never get off the ground or be placed into care and maintenance. This mine's future depends on the global economy which only tells us one thing, risk. High risk which may well fall on the local community.

http://www.independent.co.uk/news/world/asia/coal-india-closes-37-mines-solar-power-sustainable-energy-market-influence-pollution-a7800631.html

Coal India, which produces around 82 per cent of India's coal, said the mines would be decommissioned by March 2018. … A report in February by Delhi-based research group, The Energy and Resources Institute (TERI), found that if the cost of renewable energy continued to fall at the same rate, India could phase out coal completely by 2050.

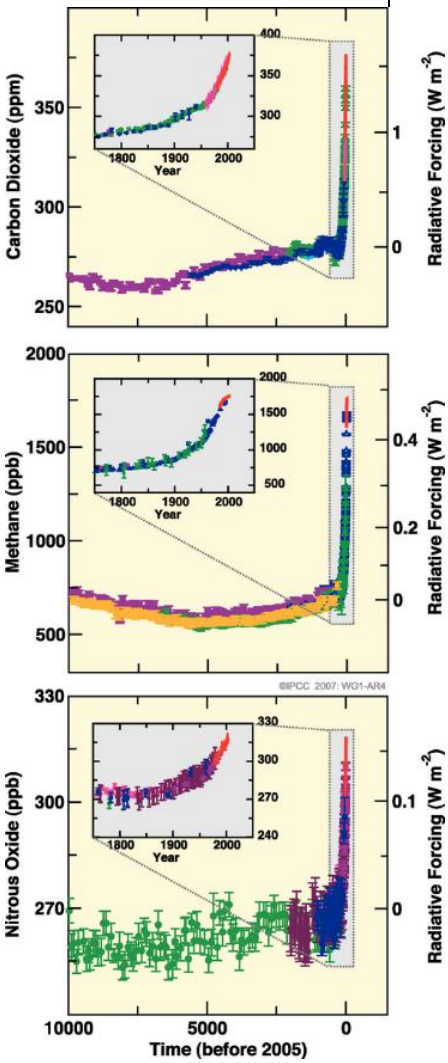
https://www.qt.com.au/news/world-walking-away-coal-according-report/3157761/

Boom and Bust 2017, compiled by US environmental group the Sierra Club, Greenpeace and research group CoalSwarm, reported a 62 per cent fall in the number of new coal-fired power stations being built worldwide in 2016 and a 48 per cent drop in "pre-construction activity".

6.2 Global impacts

6.2.1 Climate change

Source: Climate Change 2007: Working Group I: The Physical Science Basis



"Changes in the atmospheric abundance of greenhouse gases and aerosols, in solar radiation and in land surface properties alter the energy balance of the climate system. These changes are expressed in terms of radiative forcing, which is used to compare how a range of human and natural factors drive warming or cooling influences on global climate. Since the TAR, new observations and related modelling of greenhouse gases, solar activity, land surface properties and some aspects of aerosols have led to improvements in the quantitative estimates of radiative forcing.

Global atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years (see Figure). The global increases in carbon dioxide concentration are due primarily to fossil fuel use and land use change, while those of methane and nitrous oxide are primarily due to agriculture."

In 2015 there was 7,861 million tonnes produced globally. A small reduction <1% was reported last year but was offset by increased oil and gas consumption. No trend is yet apparent in the coal consumption figures.

Burning fossil fuel, and huge amounts of coal are major contributors to global warming and climate change and replacing coal with renewable energy sources is one of several key actions required to slow and stop climate change in 20-30 years.

Not granting a mining licence to Hume Coal/POSCO is a step in that direction. A step for the future of our planet and children.

Burning coal is a major contributor to climate change. No new coal mines.

6.2.2 Extreme weather and global warming

http://www.abc.net.au/news/2017-03-08/summer-heat-part-of-ongoing-extreme-weather-climate-council-says/8332740

Summer heat broke 205 records and more extreme weather is to come, Climate Council of Australia reports. AM By Penny Timms. Updated 8 Mar 2017, 5:08pm

"If you thought the weather over this past summer was off the charts, you weren't imagining things.

Key findings:
•More than 205 temperature records were broken around Australia in 90 days
•The extreme heat in NSW was at least 50 times more likely to occur due to climate change
•Australia's ageing energy system is inefficient and incapable of handling rising temperatures

The summer of 2016/17 has been dubbed the 'angry summer' by climate scientists who've been investigating just how extreme things got. They've found that during a 90-day period, 205 weather records were broken.

Professor Will Steffen is a scientist with the Climate Council of Australia, and the lead author of the report Angry Summer 2016/17: Climate Change Supercharging Extreme Weather, released today.

"If you look at the east of Australia, particularly New South Wales and Queensland, the records that have really been tumbling there are high temperatures, heatwave type records," Professor Steffen said.

"Over in the west in Perth and up in the Kimberley in the north-west, they've been setting extreme rainfall records, so we've seen extremes of all types across the continent in the past three months.

Sydney had its hottest summer on record, and the regional NSW town of Moree had more than 50 consecutive days of temperatures of 35 degrees Celsius or above.

Be prepared for the heat

Heatwaves kill far more people than other natural disasters. ABC Emergency has a checklist of things you can do to be ready.

In Brisbane, the city recorded its hottest summer on record, in terms of mean temperature, while the town of Maryborough had a record 23 summer days of at least 35C.

Even the nation's capital didn't escape the heat, with the mercury hitting 35C on 12 days.

Professor Steffen said it's all being driven by climate change, and it's a trend that is likely to continue for years to come.

"We'll see even more records set in five or 10 years' time and that's because of the momentum in the climate system," he said. "Even if we could magically reduce emissions to zero tomorrow, we would still have another decade or two where the climate system plays out its built-in momentum."

Extreme weather increases the risk of fiercer and more frequent bushfires, flash flooding and water damage that cannot be handled by existing infrastructure. This all leads to injuries, loss of life and increased economic costs. Adaption is only a temporary measure because until extreme weather is halted, any adaption simply becomes obsolete and ineffective within a few years.

Burning coal is a major contributor to climate change. No new coal mines.

6.2.3 Sea level rises

http://oceanservice.noaa.gov/facts/sealevel.html

"Global sea level has been rising over the past century, and the rate has increased in recent decades. In 2014, global sea level was 2.6 inches above the 1993 average—the highest annual average in the satellite record (1993-present). Sea level continues to rise at a rate of about one-eighth of an inch per year.

Higher sea levels mean that deadly and destructive storm surges push farther inland than they once did, which also means more frequent nuisance flooding. Disruptive and expensive, nuisance flooding is estimated to be from 300 percent to 900 percent more frequent within U.S. coastal communities than it was just 50 years ago.

The two major causes of global sea level rise are thermal expansion caused by warming of the ocean (since water expands as it warms) and increased melting of land-based ice, such as glaciers and ice sheets. The oceans are absorbing more than 90 percent of the increased atmospheric heat associated with emissions from human activity."

https://www.scientificamerican.com/article/sea-level-rise-swallows-5-whole-pacific-islands/

"Recently at least five reef islands in the remote Solomon Islands have been lost completely to sea-level rise and coastal erosion, and a further six islands have been severely eroded.

These islands lost to the sea range in size from one to five hectares. They supported dense tropical vegetation that was at least 300 years old. Nuatambu Island, home to 25 families, has lost more than half of its habitable area, with 11 houses washed into the sea since 2011.

This is the first scientific evidence, published in Environmental Research Letters, that confirms the numerous anecdotal accounts from across the Pacific of the dramatic impacts of climate change on coastlines and people."

The combination of more extreme weather and rising sea levels simply scrubs everything from low lying islands. And it's also happening to many ocean facing land in all land masses. This causes the dislocation of people, and animals from existing land creating more refugees. Climate change refugees.

This places increased pressure on remaining land, and national borders.

Burning coal is a major contributor to climate change. No new coal mines.

6.2.4 Agriculture

Farmers traditionally are conservative but now the impacts of changing long term weather patterns is making farmers acknowledge climate change is a significant risk to their operations.

http://www.abc.net.au/news/rural/2016-11-29/climate-change-farmer-survey/8075542

"My father-in-law had half as much land but could run twice as many sheep, and the stats support that," she said.

"In the south-west of WA, we've had a 19 per cent reduction in winter rainfall — May, June, July rainfall — since the 1970s, and everyone can see that.

"Also, fire conditions are worsening. Our community emergency services people are saying that the season's longer. For example, in the last seven days in Goomalling, everyone wants to get their crops off, everyone's been fighting fires on three of those days, and two of the days have been harvest bans. They're exhausted." …

"Five or six years ago, I would have said maybe 10 per cent of farmers were supportive of climate change and the rest agnostic or whatever you'd like to call it. Now it's up around 60 per cent," he said.

https://www.climatecouncil.org.au/farmers-on-the-frontline

Peter Holding. Wheat and canola farmer, NSW

Peter is a third-generation farmer on his family property in Harden, southeast NSW. As well as growing crops such as canola and wheat, Peter runs sheep for wool, and has witnessed first-hand the impacts of a changing climate on his land.

"There is no doubt the weather is changing. It's becoming more extreme."

"Rainfall used to be spread evenly throughout the year but the consistency has disappeared. We experienced an unprecedented dry spell from 2001 to 2009, instead of the 12 or 18 month drought we would usually get in this area. Since then we've had two wet harvests that destroyed crop quality, then 3 years of very low spring rainfall followed by a hot finish that destroyed yield. This year it's been so wet that some crop is already dead. It is very difficult to exist in this environment of extremes."

Farmers in the Southern Highlands face different challenges for the same cause, climate change.

It is not simply about changing crops or installing solar power. As climate change progresses over the next few decades, what can be farmed efficiently today may not be suitable next season. Reducing coal mining and fossil fuel consumption is key to limiting future climate change.

Burning coal is a major contributor to climate change. No new coal mines.

6.2.5 Flora and fauna migration

https://www.ncbi.nlm.nih.gov/books/NBK219279/

Chapter 51The Effect of Global Climatic Change on Natural Communities. ROBERT L. PETERS Research Associate, World Wildlife Fund-Conservation Foundation, Washington, D.C.

Current human population and development pressures are breaking wild biological communities into fragments surrounded by human-dominated urban or agricultural lands. The result is that many wild species, perhaps hundreds of thousands by the end of this century, will be lost because of habitat disturbance (Lovejoy, 1980; Myers, 1979). Recent advances in conservation biology have demonstrated that even some species we thought would be protected within reserves may still be lost because the reserves are too small to maintain viable populations of all the species within them (Frankel and Soulé, 1981; Schonewald-Cox et al., 1983; Soulé, 1986; Soulé and Wilcox, 1980).

To this daunting picture must be added a newly recognized threat, one with potentially disastrous consequences for biological diversity. ***This threat is global warming****, commonly called the greenhouse effect.*

As global climate change continues, the local climate will change with the result that plants and animals once ideally adapted to the local region, are no longer. Temperature, rainfall, humidity, soil acidity, predators, sources of food all are changing with the climate.

For a unique species of flora or fauna to survive, it must find a suitable habitat. A simple example is that as it gets warmer, some plants do better at cooler higher altitudes so in effect migrate up hills and mountains. This only works of course if the soil and water are suitable and there aren't destructive insects or animals which will feast on these migrating plants.

Animals can seemingly migrate much more easily, but again, many animals live in very limited areas. Always breeding in the same location or searching for food in the same area. Koala's have specific feeding trees. Not a species of tree, but specific individual trees and will not survive if placed in a new tree of identical species some kilometres distant. Usually, the koala will try to return "home", and if the home is gone then it finds only death.

So as climate changes, the traditionally native plants and animals must move. Often there are barriers to new suitable habitats. Can be humanities developments, can be farms, commercial forests, mine sites, lakes or oceans. The point is that for a species of animal or plant to migrate is very risky. And if one species fails then often a whole food chain is disrupted and not only does one species become extinct, but all the other species which rely on the original species for food will suffer too.

Nature is a complex interwoven mesh with incomprehensible number of links between all organisms. From bacteria to elephants. As climate change punches holes in the biological mesh, these holes can get larger and result in further extinctions.

http://austhrutime.com/climate_change_science_plant_animal_migration_extinction.htm

Australia: The Land Where Time Began - A biography of the Australian continent

Climate Change Science - Plant and Animal Migration

It has been found that as the climate changes plants and animals have been migrating to higher latitudes and altitudes to find the environmental conditions to which they are adapted. A study reported in the journal Science in 2011 that examined about 2,000 species found that plants and animals are moving 15 ft per day, or about 1 mile per year away from the Equator at a rate that is much higher than has been reported from previous decades. It is being observed that species migrated more rapidly from areas that have been more heavily impacted by climate change. Species distributions have recently moved to higher elevations at a median rate of 11.0/decade, and a median rate of 16.9 km/decade to higher latitudes.

https://www.theguardian.com/environment/2016/jun/29/climate-change-is-disrupting-seasonal-behaviour-of-britains-wildlife

The result could be widespread "desynchronisation" between species and their phenological events – seasonal biological cycles such as breeding and migration – that could affect the functioning of entire ecosystems, according to the large-scale study published this week in the journal Nature.

It also warns of changes in the key seasonal interactions between species that could disrupt relationships between predators and prey and affect their breeding success and survival.

https://soe.environment.gov.au/sites/g/files/net806/f/soe2016-biodiversity-launch-version2-24feb17.pdf?v=1488792935

Evidence is building that changes in phenology of Australian organisms are attributable to climate change.

Phenology describes the timing of lifecycle events such as flowering and fruiting in plants, the onset of breeding in animals, the timing of migration, and the emergence date for arthropods. Shifts in phenology can affect ecosystems through changes in ecological interactions, such as plant–pollinator and predator–prey dynamics. These shifts have important consequences for agricultural production, human health, societies and economies. Shifts in phenology in Australian organisms have been documented in many long-term datasets, which show an average earlier phenology for plants of 9.7 days per decade …… and for birds of 2.6 days per decade (Chambers et al. 2013

[GM Note: the rate of phenology is extrapolated over a relatively short period of time and expressed in a "linear" figure. It should be understood that climate change is changing not in a linear manner but closer to exponential. The rate of change is increasing.]

Burning coal is a major contributor to climate change. No new coal mines.

6.2.6 Human migration & refugees

https://www.theguardian.com/environment/2016/dec/01/climate-change-trigger-unimaginable-refugee-crisis-senior-military

Climate change is set to cause a refugee crisis of "unimaginable scale", according to senior military figures, who warn that global warming is the greatest security threat of the 21st century and that mass migration will become the "new normal".

The generals said the impacts of climate change were already factors in the conflicts driving a current crisis of migration into Europe, having been linked to the Arab Spring, the war in Syria and the Boko Haram terrorist insurgency.

"Climate change is the greatest security threat of the 21st century," said Maj Gen Munir Muniruzzaman, chairman of the Global Military Advisory Council on climate change and a former military adviser to the president of Bangladesh. He said one metre of sea level rise will flood 20% of his nation. "We're going to see refugee problems on an unimaginable scale, potentially above 30 million people."

http://www.independent.co.uk/environment/barack-obama-climate-change-refugee-crisis-human-history-unprecedented-global-warming-paris-a7727881.html

Barack Obama warns climate change could create refugee crisis 'unprecedented in human history'

Climate change could produce a refugee crisis that is "unprecedented in human history", Barack Obama has warned as he stressed global warming was the most pressing issue of the age. …. Speaking at an international food conference in Milan, the former US President said rising temperatures were already making it more difficult to grow crops and rising food prices were "leading to political instability".

Failing to do this, Mr Obama warned, increased the risk of "catastrophic" effects in the future, "not only real threats to food security, but also increases in conflict as a consequence of scarcity and greater refugee and migration patterns".

https://www.theguardian.com/environment/2016/dec/01/climate-change-trigger-unimaginable-refugee-crisis-senior-military

"Climate change impacts are also acting as an accelerant of instability in parts of the world on Europe's doorstep, including the Middle East and Africa," Cheney said. "There are direct links to climate change in the Arab Spring, the war in Syria, and the Boko Haram terrorist insurgency in sub-Saharan Africa."

Burning coal is a major contributor to climate change. No new coal mines.

6.2.7 Health

https://www.theguardian.com/environment/2017/jun/22/australian-health-groups-urge-coal-phase-out-and-strong-emissions-reduction?CMP=share_btn_link

A world-first National Climate and Health Strategy framework launched after 12 months of consultation and development by the Public Health Association of Australia, the Royal Australian College of General Practice and the Australian College of Nursing, today launched their framework, which they say is needed to avert a health emergency which threatens to undermine 50 years of gains in development and health. …

To save hundreds of lives and billions of dollars, Australia should rapidly phase out coal power stations and establish strong emissions reduction targets, according to a coalition of 30 major health and medical groups. …

It also points out the use of coal is contributing to 4,000 deaths each year, mostly by exacerbating existing chronic cardiac and respiratory illnesses.

Mining coal has significant health risks and impacts on the local population. Burning Australian coal overseas has significant impacts on the populations overseas and via global climate change, on Australia as well.

Miners themselves in Australia are still contracting and dying from black lung disease.

http://www.abc.net.au/news/2017-03-15/queensland-authorities-failed-to-spot-black-lung/8357772

Black lung in Queensland existed when disease was thought to be eradicated: expert. …

Deputy committee chair and LNP MP Lawrence Springborg asked whether it was true as many as 70,000 former coal workers in the US had black lung listed as contributing to their death on their death certificate. …

"Those numbers were significant underestimates" Dr Cohen replied.

He said that it was likely black lung contributed to the deaths of many Queensland miners.

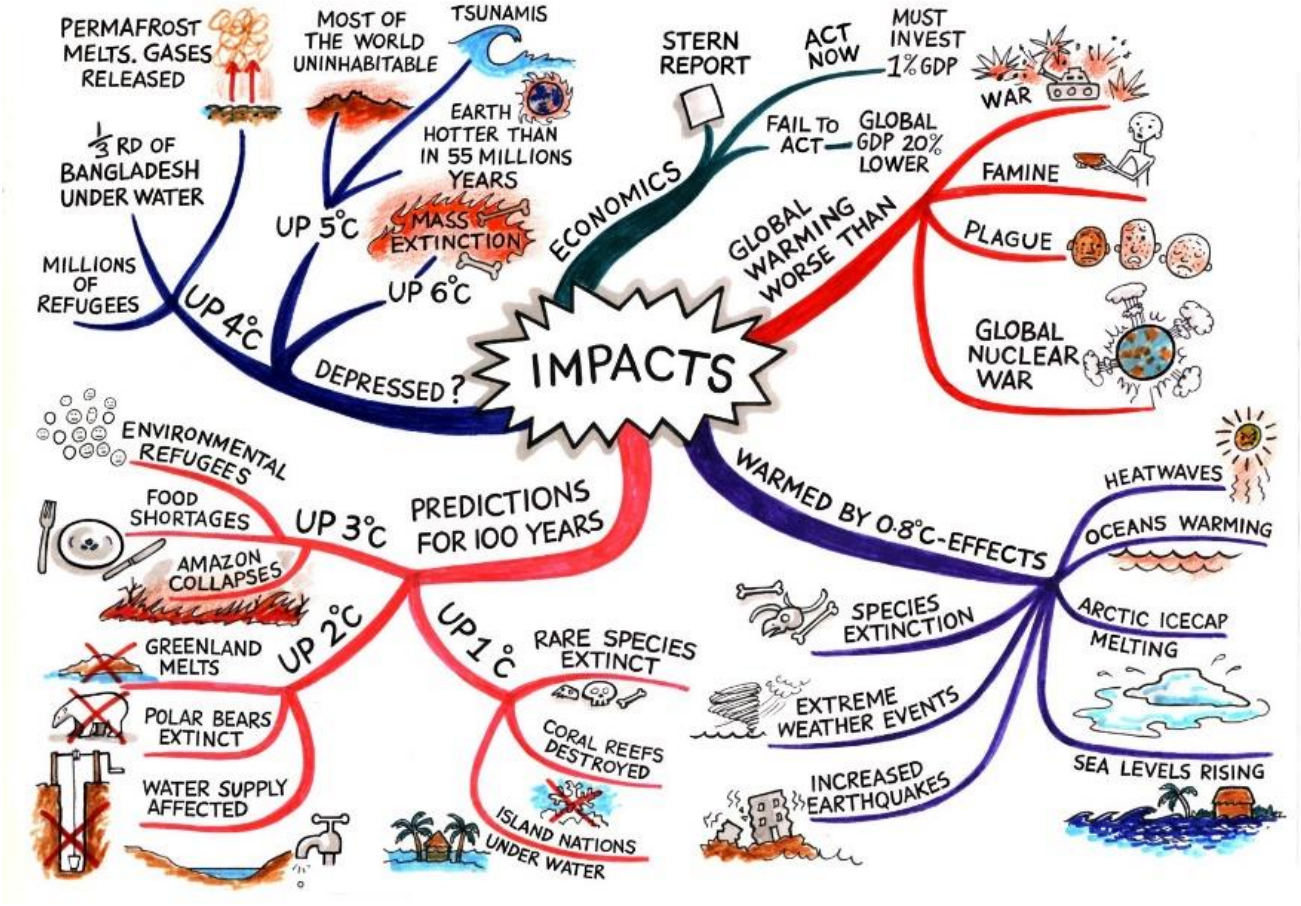
Mr Springborg said the inquiry had heard as many as one in 70 current coal workers have some indicator of black lung in their X-rays. …

Dr Cohen said people working at coal ports were not immune to the threat of the disease. "These workers are exposed to a dust that we know can cause respiratory illness and we need to look at them and see if they are sick or not," he said.

Coal mining is bad for our health. Increased dust, water pollution, noise and stress.

Burning coal is a major contributor to climate change. No new coal mines.

6.3 Impacts of climate change - diagram



Climate change has a diverse number of impacts, many not fully understood.

Burning coal is a major contributor to climate change.

We must move away from fossil fuels such as coal and towards renewables for the future of our children and their children. (and all species).

7 Conclusion

A new coal mine would add significantly to the future impacts of climate change which is already wreaking havoc in the Southern Highlands and across the world.

It would also significantly damage the social and economic fabric of this shire to permit a new coal mine to be located in this area. This is a beautiful shire known for wonderful lifestyles, farming, tourism, services and some local manufacturing. A hole in the ground consuming and poisoning our water, piles of coal and industrial machinery and rail tracks crossing our shire aren't wanted or needed by us.

Science is telling us that we mustn't continue to burn fossil fuels. Science is telling us the future of our children and their children is at risk.

The mining industry and Hume Coal/POSCO is telling us the proposed mine is low impact and sustainable. This is simply untrue. Science speaks truth, money and greed falsely paint utopias.

The Hume Coal EIS refers to this region as the Southern Coal District. To the local community, this is not a coal district but a living, breathing community based on farming, tourism, services and some manufacturing industries. It a place we call home.

This proposed mine has had significant impacts upon this community and upon the environment. If approved, the impacts will worsen.

I, as a local resident, don't need a new coal mine for my future.

The Southern Highlands doesn't need a coal mine for its future.

Humanity doesn't need a new coal mine for the future.

No new coal mines.

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