

Risks and impacts on governments and the community when planning coal mining projects in urban growth areas

Plus: Case Study, Wallarah 2 coal mine application 2013

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Executive Summary

Planning for population growth is one of the challenges Australia has to face to ensure a good socio-economic future. This means that mismanagement and errors due to bad planning will affect our prosperity both individually and as a nation.

Currently Australia is going through an increase in applications for mining operations. Some of the recent policy of State governments has been to embrace mining and exports to improve royalty revenues. In the face of climate change, Australian states are continuing to give approvals for mining operations to take advantage of carbon-based resources.

This paper will investigate how a population growth area and a coal mining application are in conflict on the Central Coast of New South Wales (NSW). It identifies a range of planning principals for urban growth areas and superimposes a real life proposal for a mining operation within the locality of the growth area on the Central Coast of New South Wales.

The paper looks at planning processes, the potential impacts related to the mine's coal loader and indicates how the risk of these impacts can affect socio-economic factors during construction, operation and after the mining operation has ceased.

The paper attempts to describe through some planning theory how the incompatibilities of urban development and a mining operation plays out. It shows by using as its argument a real life mining proposal within close proximity to proposed urban development in the form of a new green fields city planned for the Central Coast, a plan that has been documented since the publication of the 1975 Central Coast strategic plan.

Within this paper is the case study based on the application for a long wall mining operation by Kores Australia (a company owned by Korean and Japanese investors). It investigates impacts related to a proposed coal loader planned to be located near the intersection of the M1 motorway and the Link Road to Doyalson. The case study gives some analysis to the proposed mine head's proximity to other existing and proposed urban developments, and natural environments in the North Wyong area.

The paper suggests that the externalities associated with the coal loader and transport of the coal to the coal loader at the Port of Newcastle create risks. If these risks are realised through the construction and operation of the mine head works it could create socio-economic repercussions for the local council, the state government and individuals.

The paper attempts to be objective showing an understanding of the economics of mining operations and need to accommodate population growth, but in the final analysis, risks and evidence seems to be weighted towards an incompatibility between mining and urban developments in the same locality.

Risks and impacts on governments and the community when planning coal mining projects in urban growth areas

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Planning in a growth area

Introduction

Over the last few years there has been a flood of application to several state governments in Australia for both coal seam gas and coal mining operations.

This increase comes as the Australian metals commodities market starts to slump. However the worlds need for coal and gas is rising. Both coal and natural gas products are comparatively cheap as energy sources. Even in a world with concerns about excessive amounts of green house gases in the atmosphere, the world's demand for these products is still rising.

As a reaction to this enlarging market, foreign commercial enterprises are becoming increasingly interested in investing in mining operations within Australia. This has meant that some Australian port facilities have had to be expanded to accommodate larger exports of these commodities. Even now in 2014 when looking out to sea from the coast close to these ports used for these export trades, massive ship based bulk carriers can be seen anchored waiting for a time slot in the coal or natural gas ports facility.

One of these ports on the eastern coast of Australia is the port of Newcastle. This is one of only a few large ports on the eastern shores of Australia. And as fortune would have it, this port is in close proximity to large and deep coalfields. The port is also in close proximity to an efficient rail network comprising of several rail spurs to coal fields connected to main lines. Coal trains use the Australian north-south rail line regularly as a means to travel from the coal loaders at the mines to the coal loaders at the Port of Newcastle.

Traditionally, Newcastle has been an industrial city hosting a large steel industry. This was primarily due to the proximity of the coal deposits and the natural assets of the deep waterways of the Hunter River. As a result large port facilities could be built for the export of coal.

Coal fired power stations have sprung up in the region fed by the easily obtainable coal deposits through open cut mining.

With the development of mining technologies deeper deposits up to 600 meters now can be mined in the region. This opens up the potential for new mines to operate under lakes, mountains and ground water aquifers.

Unfortunately, the regions in and around Newcastle have grown in population causing a conflict between population settlement patterns and mining operations.

Planning theory on urban environments.

Aesthetics

This is a simple argument, but one that determines the ambiance of a townscape. Visual amenity should continue to be a consideration when planning streetscapes and for that matter all types of urban environments. It also should be a consideration when approving development in and around a town.

One of the requirements of a development application is visual amenity, so why shouldn't visual amenity be promoted in our landscapes in urban growth areas?

Below, as part of this paper, is a case study of a proposal of a mine development. It is proposed within a population growth area in the northern parts of the Central Coast of New South Wales. Below is a likely scenario for residents and commuters travelling by road in the sub-region.

A commuter coming home to the suburban Central Coast turns into the Link Road from the M1 to Blue Haven or Gwandalan or to a new home at Wyee, and would drive past a pile of coal each day if the proposal were to be developed. Now imagine this pile of coal being there as new developments spring up along the length of the Link Road as the strategic plan for the Central Coast starts to reach and exceed its targets by the year 2031 with an extra 80,000 people in the North Wyong area.

"Revolution, technology and science have overwhelmed man's interest, leaving aesthetics and art as a relic from the past, a weak voice performing as a pathetic Court Jester before the mighty throne of technology and science."¹

And may it be hasten to add, economic rationalism.

The argument is simple. Unsightly industry has no place in urban environments. It is tolerated in places like Kalgoorlie, Morwell and Broken Hill principally because the town grew up around the mine and housing was a necessity for workers at the mine. Most modern planned mine developments have housing and town facilities at a distance from the mine to avoid a range of impacts presented by the presence of the mine, not least aesthetic impacts.

¹ A quote from R.J. Goakes from his book - The Aesthetics of Town Planning, How to design, Published by Boolarong Publications Brooks st. Bowen Hills, Brisbane, Australia, Printed by Poly-Graphics Pty. Ltd. Brisbane, First published 1987.

Three types of planning

The three types of planning models sighted in Alexander's² approach to planning are physical planning or substantive planning, instrumental planning focusing on objectives and outcomes and contextual planning. These can be interpreted as follows.

The Contextual Model

Contextual planning considers not only the environment, but also the society and how a function may fit into the context either planned for or existing. With this prospective we can suggest that within the context of the state needing to extend growth areas into both rural and bushland areas, some conflict will occur between the existing and the desired future.

From a social perspective, as many of the existing interests must be considered and incorporated into a plan for the growth area as possible, political forces can align against or for a position.

If we are settled in the idea that the context is one of providing a growth area for population then this can be the social driver that should drive the planning effort forward.

However, if in the midst of this a sectarian interest from left field that advocates that the region should exploit coal reserves, the position becomes untenable for the original context of planning a growth area.

Now it becomes a fight for the integrity of natural resources of the area, meaning the wildlife and native plants and their continuance, and water security, against an economic exploitation of the natural resources, in this case, coal deposits. All of this is in a context of the need to provide homes for an expanding population in the growth area.

The Instrumental Model

Instrumental planning is largely the way planning is seen to be done in New South Wales, but let us examine this a bit closer. Zoning, which is the basic element that decides what a parcel of land can be used for is ultimately based on a range of factors including the suitability and capability of the land.

For example, if the land is too steep, then it might not be considered appropriate for housing. If the land has a waterway on it, then it may not be considered that building developments can occur on the land. Much of these decisions on the zoning of a piece of land rely on the planner making a decision with reference to an Environmental Study (ES) of the land.

² Ernest R Alexander, *Approaches to Planning, Introducing Current Planning Theories, Concepts and Issues*, 2nd Edition, Gordon and Breach Science Publishers, Philadelphia, Pennsylvania, USA, 1992.

The planner also will look at the locality of the land and its relationship to other land uses in the area. The planner assesses connectivity. In other words a new subdivision will need to have access to the region's road system and may need to be connected to services depending on the policy of the local government.

The third aspect looked at by the planner is whether the local government's political masters can be accommodated. In the case of the Wyong Shire, a local government close to the area of the case study below, the council has encouraged the planners to incorporate an airport zoning in a revision of the local environment Plan (LEP).

Capability and suitability

Planners have been able to accommodate this zoning, presumably on the basis of a study that shows the capability of the land and a surrounding landscape can accommodate such a development. In addition the study would look at the suitability of the land for an airport. This would look at aspects like, its proximity to urban areas, assessing impacts and advantages, and transport links to the airport including how far the arterial roads are from the proposal. It would look at public transport links including rail.

Land zonings

Often land covered with a zoning may have several land uses available to it. If it is an industrial zone then it could have a range of industrial land uses available for a developer, for instance it may have place of worship or fun-park as part of the zoning allowances.

All these uses have a common factor; for instance noise produced within the precinct should be isolated from any residential areas for the comfort of residents.

Zoning under a Local Environmental Plan (LEP) attempts to organise competing impacts, giving appropriate separation to the differing categories of land uses.

However, in a growth area, a series of land use changes would be expected as more land is released for residential development. Most of this land would have been previously zoned rural. A rural zoning may have some land uses incompatible with urban residential areas. One of these could be poultry farming. The smell of the farm close to a new urban residential development may be undesirable, however, under existing use rights and the rural zoning, the farming business could continue.

In a similar way, if an industrial zoning allowed the stockpiling of materials, for example coal, then there would be no impediment for the development to be approved. However, in the light of the firm expectation that a New Town Centre was to be approved and build within a short distance of the stockpile, how can local government planners remove the risk of impacts to the newly zoned new town from the coal mine's stockpile?

This is either a clear failing of the planning instrument approach or the planners who implemented the original LEP in the knowledge of a new town being planned and being identified in the regional strategy forty years earlier. Even if this error was made 40 years ago, in the time ensuing, appropriate alterations to the land use rights of these lands surrounding such a new town should have been considered when these areas were zoned from rural to industrial about 20 years ago.

More recently it seems, planners have been reluctant to change the zonings of the industrial zoned land in the recent revision of the LEP to comply with the new state standard zonings. This reluctance seems due to a proponent's development application. Curiously in the case of the case study detailed below the first refusal of the application for the coalmine development was before the review of the LEP by the council.

It seems that this form of planning model is failing us and a better approach may need to be found.

The Substantive approach

The substantive approach related to the physical planning of an area, transport planning, economic planning and social planning in the sense of preventing conflict and crime.

It is fair to say that this type of planning encapsulates the hoped for basis of instrumental planning. Instrumental planning is an attempt to codify the process of substantive planning.

So the substantive approach means that we need to look at connections and separations. We need to consider juxtaposition and created environments. We need to look at cause and effect. We need to look at economic drivers and detractors. Depending on the combination of land uses and landscapes, impact or opportunities, planning decisions should be made.

In the case study below, one economic detractor relates to the effect a mine head works might have on land and house prices. Another impact relates to lack of separation of the mine to urban areas and how this could affect the health of the community. Another impact of a mine close to urban areas could mean that with a slump in house prices only the poor or non home owners will live in these suburbs and that will have a possible negative impact on society in the form of a climbing crime rate in the region.

Planning Economic Development

It would be interesting to consider the players in planning economic development. In NSW local government, planners seem to have a limited role to play in determining how economic development should unfold in the local economy. However, land use planning is important to the growth of a local government area. One example of this could be seen in the recent alteration to Wyong township building standards.

These alterations were to help encourage investment in the Wyong CBD by relaxing building heights while reducing building footprints to give more community space around any development. This was done to encouraging a much more open landscape within the CBD and encourage more investment in the town centre.

However, the economic benefit to the town is wider than the changing of the building code and a few zonings. Council planners have not been able to effectively address looming competing places for investment in the Shire. With the proposed Warnervale new township planned since the 1975 regional strategic plan was published and the development of the Tuggerah area, investment dollars are expected to find better returns elsewhere in the Shire than the Wyong CBD.³

In addition, the current proposal by the state roads authority to widen the main highway through the town without any regard to real pedestrian and other connections to the Transport precinct including railway station and major bus interchange is fraught with danger for the economic growth of the town. Further, the lack of potential connections from the CBD to the two master plans on the eastern side of the transport precinct will further discourage economic growth by isolating these potential developments.

Subsequent to the several rejected plans put to the community by the state road authority, the road authority has issued a statement that under the latest plan, they will work with council planners to improve pedestrian connections across the transport precinct.

If planners were truly economic developers, they would be making strong cases to the State government to provide appropriate connecting infrastructure.⁴

It seems that the role of economic development in this Shire has fallen to some of the councillors of the local government area, who have championed a zoning for an airport, [a new youth skills training centre](#) and a [theme park](#).

When considering the proposal for a mine head works in the case study below, the local government planners of Wyong Shire in effect endorsed the proposal of the foreign developers by not considering the potential for this kind of inappropriate development in the future growth area.

³ Reference to the NSW Department of Planning document: [Central Coast Regional Strategic Plan 2006](#)

⁴ David Holland, [Wyong Transport Precinct, a proposal for renewal](#), Published by Habitat Association, Wordpress, 11 Feb. 2012, <http://habitatownplanningforum.wordpress.com>, accessed Nov. 2013.

As discussed above, these professionals set the zonings to allow this type of development close to the new town of Warnervale's planned location.

But it is the State and the State planning Authority that is responsible for the approval of this mining development. As a result the question changes to, did the State through its planners determine that mining should be a feature of the landscape in the northern regions of the Wyong Shire? It is these State professionals that both new the content and expectations of the previous Wyong Local Environmental Plan (WLEP) and endorsed the newly amended WLEP.

These same cohorts of the state planning authority are the planners who also approved the 1975 and the 2006 Central Coast Region Strategy and who determined and confirmed the location of a range of factors in the plans including the growth area and planned town centres.

It must be recognised that these strategic plans are a reflection of the community's expectations for the future growth of the region. Although the planners put these strategic plans together, much of the detail was given through the community consultation processes.

With this perspective in mind you may consider that the real architect of the economic development of the region is the community.

On another level both State and Federal governments have taken an interest in mining developments. The enunciation by State politicians from both major parties during the last State election made promises to not allowing coal mining in the Shire. These actions by the politicians were the result of a community movement on their economic development preferences for the region. This sentiment was also reflected at the federal level by comments and partitions to parliament made by federal politicians.

These policies were formulated to gain the popular vote. Due to this it could be implied that the voting community spoke loudly as to the direction they wishes to go in economic development in the region and to be clear, this community influence was shown with the case study cited below.

The conflict between land uses

Let us look at why the land use related to residential uses is located in this growth area around North Wyong and in particular at the location of the new town of Warnervale.

As discussed above, the state planning authority has designated that a proportion of Sydney's growth must be placed on the Central Coast. Much of the southern parts of the Central Coast around the City of Gosford have no more ability to create green fields development. As a result much of this growth will need to be in the northern parts of the

Wyong Shire. This concentration of residential development in the north of the Shire is due to a policy that no new green fields development will extend west of the M1 motorway.

The 2006 Regional Strategy Plan indicates that most of the Green fields development will be around the new town of Warnervale and to a lesser degree around Wadalba to the east.

The economics of the growth area

Some of the advantages of these areas relate to the potential for fast transport links to other regions through the M1 and the north south main railway line.

With the upgrade of the rail service infrastructure, a new railway station will be built at Warnervale on the main rail line north of Sydney providing more capacity for commuters to travel by train quickly and conveniently from the new Warnervale town centre.

So from a land economy point of view, once the land is released in the area, individuals will see a benefit through these links to settle in and around the new towns. In addition, additional shopping and municipal facilities will be placed in the Warnervale Town centre, complementing a suite of other large shopping centres in the region.

The economics of a mine proposal

From the view point of the developers of the coalmine, placing the mine head at the intersection of the M1 and the Link Road between the old highway and the M1, is one of economics. The mine head is not far from the mine workings in the valleys and not far from large roads like the M1. The most important transport link for the mine is the proposed rail spur from the main railway line that goes directly to the Port of Newcastle coal loader. This will facilitate the efficient loading of the coal onto bulk carrier ships for the overseas market.

This economic advantage of the proximity of the rail link for this coalmine is probably the main financial driver for the project providing relatively cheap transport of the coal.

However, due to the already well used rail corridor for both passenger and freight services on this main line, further trains from the coal mine operation may present scheduling challenges to the state rail operator.

Economic arguments

This paper will argue that the physical space for both residential living and coal handling facilities cannot operate in the same locality.

Whilst the coal operation can exist and operate in the environment of residential housing and may have some advantages to workers at the mine, residential housing and population centres cannot operate in the same physical space as a coal mine head works and an intensive coal transport system without suffering a range of externalities from the coal operation.

The conflict should not be an economic argument, but a political one. It is not a question of how much the coal company will lose against its potential aspired gain by mining the coal, but an assessment of how many lives will be affected or benefited in our country.

It may sound like a parochial agreement, but planning is about people and their prosperity. It is about providing amenity in the places we occupy to ensure some level of stability and prosperity.

The economics of impact for the community

If we were to assume that the mine was to go ahead we would need to explore the potential impacts as identified in the case study below.

Distortion in the property and residential housing market

The case study makes an argument that because of the negative sentiment, real or perceived, buyers will be dissuaded from purchasing property in the extended locality of the mine. The reasons for this are given in the case study.

The local council and the potential for an economic impact

The local council ultimately makes the decision when and what land to release to new residential development. This decision is not done without some self-interest for the council budget.

Depending on the rate at which the land is rated and the unimproved value of the land, revenues are paid to the council. To optimise land values, Councils ensure that land is released in a measured way preventing a flood of new land onto the market.

If the supply of land in an area were too great, the price of the land would fall and the local council would expect to have a reduction in revenue over a period of time.

However, if the land were released in the growth area with the expectation that large populations were to move to the area and then a distortion in the market became apparent, the price of land could plummet.

Some other factors that may impact the bottom line of a council's revenue

Let us assume that the mine affected the market in a negative way and land prices were suppressed. One outcome would be that fewer houses would be built in the area, continuing to put pressure on the rental market. But even more costly to council would be an influx of low-income earners now occupying these remaining houses. In the case of the Wyong Shire, places around the mine like, Blue Haven and Wyee that currently has a majority of homeowners will have more renters after the mine operations are approved and

in operation. Low-income families and the jobless would own a higher percentage of houses in these suburbs requiring a higher level of social services.

In addition this demographic would create a range of social problems that council will continue to pay for over a long period through repair of equipment from vandalism.

Risks of economic impact for Community

1. Cost of living

There is a range of risks for added costs to the household due to coal dust particles falling on washing and residential buildings. These costs could be itemised as follows:

- (a) A new dryer may be needed to dry cloths, where no dryer was necessary previously. With the mine in operation, there is a potential for washed cloths drying on an outdoor clothesline to be soiled by coal dust.
- (b) As a result of operating a clothes dryer there will be an increase of power costs for the household.
- (c) Due to the pollution settling on the clothes and the need to tumble dry the clothes more often it is likely that clothes will tend to wear out more quickly and new clothes will need to be bought more frequently.
- (d) Due to the potential for coal dust to form on the walls, roof and windows of a dwelling, it is likely that these surfaces will require cleaning more frequently. If professional cleaners did the cleaning, the household budget would have added costs. In addition, responsible cleaners would need to take extra care by using protective clothing when cleaning these surfaces, due to work health safety issues. This would in turn add extra cost to the service.
- (e) Loss of water quality related to rainwater tanks. ie. The expense related to cleaning tanks. Additional risks related to workers cleaning the tanks will cause increased cost associated with the cleaning. This would be due to more expensive equipment needed to reduce the potential of health dangers when handling coal dust fine particles.
- (f) There is likely to be a loss of sunlight shining on solar panels on rooves thereby reducing electric power available to the grid or the home. This would reduce the returns on the investment in the panels for the homeowner.

2. Health costs for the community

The costs to the community and the State through the health system could be considerable.

There are several possible ways these costs could affect health budgets and the liveability of the towns and suburbs close to a mine head works and transport link to the Ports.

(a) Risk of Cancer in the population

These costs could be substantial. In his book, Joseph Rodericks⁵ suggests that unburnt coal tars cause a carcinogenic health risk. He describes them as polycyclic aromatic hydrocarbons (PAHs).

He suggests, just like burnt hydrocarbon, the unburnt natural occurring coal tars have a similar risk of causing a carcinogenic reaction. He continues, and recounts two British scientists, Kennaway and Heiger in 1920 who on the skin of a shaved mouse, place some of this PAH material and found the skin to show signs of a carcinogenic reaction.⁶

Roderick in an earlier part of his book explains how vapours and dust particles can move into and penetrate pulmonary regions in a variety of ways. He goes on to say that cells can engulf particles of less than one-micrometre. These cells are called phagocytes. He outlines that these Phagocytes then carry the dust particles into various lymph nodes whereby they can enter the blood stream.

It must be said that it is unlikely that a coal dust particles could reach the size that a cell called a phagocyte could engulf, because most are between 2.5 and 10 micrometres in diameter. But there still remains a risk of this process happening.

On the other hand, diesel emanating from coal train locomotive engines along the rail line close to urban areas presents a real potential risk from these smaller particles. The type of particles that could affect health include nitrogen oxide, nitrogen dioxide and sulphur dioxide.

⁵ Joseph Rodericks,.; Calculated Risks, Understanding the toxicity and human health risks of chemicals in our environment, Environmental Corporation council in Health and Environmental Science, Cambridge University Press, Cambridge, New York, Melbourne, Printed Great Britain, 1992, paper back ed. 1994, pp. 111

⁶ Natures Review, Cancer 5, 113-125 (February 2005), doi:10.1038/nrc1546, http://www.nature.com/nrc/journal/v5/n3/fig_tab/nrc1546_F1.html, accessed November 2013

(b) Risk associated with Respiratory complaints

[Coal Dust could be a bigger problem than asbestos, Vaughan Johnson says LNP MP Queensland parliament.](#)⁷

Is this an overstatement or could there be a truth within it. With the increase of the volume of coal being extracted and transported to various coal loaders at Australian ports, and the increased number of head works and coal stock piles, there could be a case to answer by the State Government in relation to an increased in health costs related to respiratory diseases.

A community action group commenting on the coal industry in Alaska identified that they have evidence that the passive breathing of coal dust from stockpiles and passing coal trains have increased hospital admissions, respiratory disease and heart attack in parts of the USA.⁸

If these assertions are true then the cost on the health budget for the State Government, the cost to the individual and the social cost will be incalculably large over time.

Impacts on the ecology

The New South Wales legislation

The Threatened Species State legislation is to protect the environment by ensuring that specific species in the natural world are ensured survival. This protection is reinforced through the Environment Planning and Assessment Act 1979.

Vulnerable ecological communities are also given protection if they have been identified; however wide scale landscapes have little to no protection against the impacts of development.

These State Acts give some protection to land that is the subject of a development application to develop that parcel of land but gives no protection to adjacent land except through the community consultation process.

The community consultation process is for many development applications just a formality that the applicant needs to address. This means that this community consultation in most

⁷ Article by Tuck Thompson and Kate McKenna, LMP MP Vaughan Johnson warned Queensland Parliament coal dust could be bigger health problem than asbestos, the Queensland courier mail newspaper, 22nd December 2012.

⁸ Sarah, Beyond Coal, Alaska Community Action on Toxics, Coal Development/Coal Mining Transportation and Health, Article from [Community Health impact of coal Mining and Transportation, www.akaction.org](http://www.akaction.org).

cases cannot bring enough weight to bare under this process to stop a development on environmental grounds aside from things covered under the environmental assessment provision as noted above.

So if the community and even neighbouring land owners were concerned about a range of impacts, council may order the proponent to give some consideration to these perceived impacts in the form of a design change of the development.

These design changes may look to address what is reasonable to reduce certain impacts, but the development would continue to proceed because no legislation has been clearly preached by the development design.

If council were to challenge environmental factors not specifically under the legislative framework, the developer would appeal to a refusal of the application by council to the Land and Environmental Court and win.

Specifics about impacts not covered by legislation

In June 1987 Victoria produced a conservation strategy called 'Protecting the Environment'. It was an initiative to curb the wholesale clearing of land and to reinstate forest, rehabilitate stream and river catchments and intelligently plan the built or urban environment into the natural environment.⁹

Years later, when visiting some of the areas left by the urban sprawl of Melbourne, one can see a definite improvement to the integrity of the remaining natural environments. Victoria has made weed infested areas into areas that birds, animals and plants inhabit. Some of these areas now provide amenity through access to the public.

Other areas would have more restricted access to the public, but all in all a good outcome for both the community and the natural environment, considering where the urban planning policies of the past were heading the state.

The proposed natural corridor system in Wyong Shire

The State government has made a considerable effort and spent considerable amounts of public money to produce a forward planning document called the "North Wyong Structure

⁹ State of Victoria, Australia; Protecting the Environment, A conservation Strategy for Victoria, June 1987.

Plan". This document is a strategic document that sits just below the "Central Coast Strategy Plan" as mentioned above.¹⁰

The North Wyong Structure Plan has adopted some of the recommendations of a conservation plan for the area that took 5 years to complete in the late 1990s by the Wyong Shire Council. Subsequently however Council, due to political ideologies among the councillors, did not adopt the conservation plan.

Within the State's North Wyong Structure Plan, many of the natural corridors identified in the Wyong conservation plan were remodelled into the State plan. These corridors, as yet not defined by the local council, are strong features of the State plan.

With this structure of natural areas around the urban and industrial areas planned for this region, the outlook for the region could be similar to the Melbourne experience, provided the following provisions area attended to:

- (a) The State planned corridor system is recognised and defined by the local council.
- (b) Suitable protections are given to the corridors fauna and flora and any surrounding land that supports the ecosystems of the corridors.

Potential Impacts on Flora in the area of the mine head works and rail spur

There is a risk that coal dust could affect the ecology of natural areas around the mine. Since a large part of the proposed corridor system runs in an east – west direction just to the north of the proposed development, it is conceivable that coal dust could affect the following:

- (a) Coal dust over a period of time could coat the leaves of a range of flora species. This could affect the health of these species with a potential for many of the plants to die in the area.

This die off will affect the species composition of the bushland and change the integrity of the original ecology.

¹⁰ Department of Planning and Infrastructure NSW, North Wyong Shire Structure Plan, October 2012, www.wyong.nsw.gov.au/DownloadDocument.ashx?DocumentID=5204, Accessed November 2013.

[Sustainable aggregates](#) have identified this process as a possible occurrence in the vicinity of coal loaders and mines.¹¹

One of [Sustainable aggregates](#) key areas of research is on the effects related to dust on environments. Its research concludes that coal dust could stress native plants through shading and exacerbate already stressed plants under natural stresses from drought.

(b) Coal Dust over a period could affect creek aggregates

Sustainable Aggregates also have considered the effects of coal dust being deposited on natural areas and being concentrated by watercourses into sediments. They believe that the long-term results of this could change the soil chemistry, thereby affecting the native plants growing in that locality. This type of soil change over time can change the type of species growing in that locality.

It is conceivable that over a long period of time, the ecology of the designated corridor and the surrounding area could change, having affects on fauna and insect species in the locality.

There is no way to quantify how the disturbance of the ecosystem will react over time. This dilemma is best described by this quote:

“While ecologists have developed a number of useful concepts (e.g. resistance to disturbance, resilience in recovering from disturbance) and associated measures for describing the observed behaviour of disturbed ecosystems, they still have a very limited ability to predict quantitatively, in terms of species numbers, the consequences of particular disturbances for particular ecosystems.”¹²

So the result of the dust could be a subtle or a dramatic decline in species diversity in the ecology of the preserved forests. Any decline will depend on a range of variables or contributing factors, but the question remains, what would have the natural areas been like without the impacts of coal dust?

¹¹ Sustainable Aggregates is a fund based in England to provide research on the impacts and use of sands, rocks and other developed resources.

¹² Doug Cocks, Handle with Care, Managing Australia’s natural resources in the Twenty First Century

Risks and impacts on governments and the community when planning a coal mining project in an urban growth area, by David Holland.

Conclusion

Although there always will be a plausible argument to extract a resource through mining, and perhaps sound economics to partner this argument to advocate for the mining of available resources, a series of questions have to be answered if mining operations are to be planned in the region of human habitation or a population growth area.

If mining infrastructure exists in a region and housing development is subsequently planned, these plans will have to allow for a range of impacts as defined in the case study below. These impacts can render the residential development unviable for the developer due to conditions, penalties and contributions required by council to ameliorate the impacts. It may be that council will run an argument that the development will create such an undesirable place to live that only low socio-economic residents will be attracted to the development, thus creating social problems that are costly to the public purse.

But if the case is that a residential growth area has been planned prior to any potential for mining interests were realised, it is a highly risky policy to allow a mining development to proceed. It is evident that there are considerable risks associated with mining developments when ignoring facts related to impacts on human health and litigation associated with economic disadvantage. Considerable litigations could occur against the mining developer, the state government and the local government if these impacts are realised during the development and mining operations.

This litigation is not simple to prove, but if won by residents, could render a considerable payout.

When considering the potential for impacts on the natural environment and the ethical questions related to Australian sovereignty it is an imperative argument to consider and the outcome of the consideration should be that the development not be allowed to ensure no disadvantage to the local society.

If to accommodate our increase in population, we as a nation need to access resources for energy, then there is an argument to mine. But there is still no sound argument to mine in an area that will adversely affect the health of the population, even if the mining is providing energy for the population growth.

In the same vein of argument, if the mining operation were to compromise water resources to be provided as an essential support for population growth, again there is no sound argument to put this resource at risk through any mining operation similar to the long wall mining operation proposed in the case study considered in this paper.

The current New South Wales environmental legislation attempts to protect endangered and vulnerable species and ecologies from risk of destruction through development. But there is an argument that the integrity of landscapes can be affected by a mining

development. If these environments are close to growth areas, the resultant aesthetic and environmental impact are still not justified.

But if we consider that increasingly these mining operations are not only for export to other countries, but are owned and operated by foreign concerns and as a result much of the profit and benefit for the operation will be offshore, then the ethical question of whether Australia should allow this short sited approach to the balancing of our balance of payments is a question to be pondered more seriously. This paper does not extend its scope to thoroughly explore this question, but to continue to allow mining operations in the localities of urban growth areas for these reasons seems unwise.

Resources need to be obtained and made available to our population, but not at the expense of Australian society and its integrity: Not at the expense of Australia's environment and not at the expense of Australia's future for appropriate population growth.

A Case Study:

The impacts of a Coal Mine & Coal Loader planned in an urban growth area.

Proposed Wallarah 2 coal Mine on the Central Coast of NSW.

This paper was presented as a submission to the NSW Department of Planning for the proposal to develop the Wallarah 2 coal mine and coal loader facility at Wallarah. The submission was submitted in March 2014.

Walarah 2 Coal Mine Application Location

Proposed location approximately 5 Km northwest of Wyong township on the Central Coast of New South Wales

History of the Wallarah 2 Project

The Wyong Area Coal Joint Venture project gained an exploration license in 1995. Coal Operations Ltd. (COAL) was the major shareholder. It was a partnership that included as a minority investors Kores Australia, which comprises of several Korean and Japanese investors.

BHP subsequently bought Coal Operations Australia in 2002 and sold its interest in this project to Kores Australia in 2005. As a result Kores' interest in the project was raised to just over 82%.^{13 14}

In the years since the Wyong Areas Coal Joint Venture Project has undertaken extensive exploration in the area and produced geological maps for a large area under Yarramalong, Jillaby, Dooralong and the areas in the vicinity of the proposed mine. The area is on the eastern or coastal side of the Watagan ranges. The area is part of a water supply catchment

¹³ Wallarah 2 Coal Project; History, Web address: <http://www.walarah.com.au/history-of-the-walarah-2-project>, accessed July 2013.

¹⁴ Wallarah 2 Coal Project; Kores and joint venture partners: web address: <http://www.walarah.com.au/kores-and-the-joint-venture-partners>, accessed Nov. 2013.

for the Wyong River that supplies water to the northern region of the Central Coast. The Wyong River and smaller watercourses wind up the Yarramalong and Dooralong Valleys.¹⁵

The Joint Venture has undertaken an environmental monitoring program to enable scientific arguments to be mounted that can demonstrate there will be no significant impacts when the mine is built. Most of this data collected would be in relation to the extraction of the coal and not the impacts of the operation of the mine ancillary operations including the Coal loader and supporting infrastructure.¹⁶

The Joint Venture has been seeking approval to mine under these valleys from the New South Wales (NSW) Government. It has sought approval in 2011 under the NSW Labor government. The application was subsequently rejected.¹⁷ Now under the NSW Liberal Government, it is seeking approval again in 2013.

In 2011 the community objected to the mine and on the eve of the State election. The project was disapproved on environmental grounds relating to a range of criteria not compliant with the EPA Act and other legislation available at the time. The process involved referring the case for determination to a tribunal or panel (Planning Assessment Commission), which took into consideration many community submissions both written and presented in person to the panel.

In an effort to curb the potential for environmental impacts caused by these operations outside the scope of individual state legislation, the Federal Government has sought to strengthen the Environmental Protection and Biodiversity Conservation (EPBC) Act 1999 by passing amendments in June 2013. This became necessary due to the large amount of applications for mining gas and coal throughout Australia.^{18 19}

¹⁵ Wallarah 2 Coal Project, Map of mining license, web site address: <http://www.wallarah.com.au/pdf/Indicative%20Mine%20Layout.pdf>, accessed Nov. 2013.

¹⁶ Wallarah 2 Coal Project, description, <http://www.wallarah.com.au/project-description>; accessed Nov. 2013.

¹⁷ Tony Kelly, Minister for Planning, Department of Planning NSW, Summary of submission received by Department of Planning, http://www.wallarah.com.au/files/doc_file/PACAppendicesA-H.pdf, 2012, web accessed Nov. 2013.

¹⁸ Department of Environment, Australian Government, purpose of the legislation, <http://www.environment.gov.au/topics/about-us/legislation/environment-protection-and-biodiversity-conservation-act-1999/about-epbc>, Copyright Commonwealth of Australia, web accessed Nov. 2013.

As part of its forward planning program, the Wallarah 2 venture has done economic analysis of the project to assess the viability of extraction related to profitability.²⁰ In addition it has undertaken several community consultation programs over the period of its planning phase and an amount of public relations programs including donating sums of money to local non-profit organisations.

Current to this paper being published, an outcome for approval for the mining operation has been determined by NSW State Government's Department of Planning for the Wallarah 2 Venture's application to mine. However the matter was forwarded to the Planning Assessment Commission for final determination in February 2014.

Introduction:

Concerns arisen in relation to the coal loader for the mine

The planned building of a coal loader facility near Toohey's Road Wallarah, within the proximity of extensive urban areas and the natural environments of Wallarah Creek, present concerns to the community.

"There is a high potential for many existing urban areas to be affected by impacts from the proposed coal loader facility. In addition there is a high level of potential for impacts on future urban and large lot developments planned in relatively close proximity to the proposed site."²¹

Following are some of the main points expressed by the submission relating to noise and air particulates as potential impacts to the surrounding environments:

- The Coal Loader as part of the Wallarah 2 Coal project is far too close to residential areas. One example is Blue Haven, which is situated less than 3 kilometres from the proposed coal loader and head works facility.

¹⁹ Department of Environment, Australian Government, Amendments 2012 for coal mining, <http://www.comlaw.gov.au/Details/C2012B00048>, accessed Nov. 2013.

²⁰ Guidelines for using cost benefit analysis in mining and gas seam projects, http://www.planning.nsw.gov.au/Portals/0/DevelopmentAssessments/OnExhibition/cba_guideline.pdf, November 2012, web accessed Nov. 2013.

²¹ Quote from the submission sent to the Department of Environment NSW on the application by the Wallarah 2 project proposal for the mine.

- There is an overall hazard for airborne particulates in the form of coal dust pollution with the potential to cause health issues in the general population living, working and transiting the proximity of the proposed facility.
- The western end of Blue Haven is less than 1 kilometre from the proposed rail spur and less than 1.5 Kilometres from the spur junction with the main northern line. The proximity of the Coal Loader's rail spur junction is too close to residences in the Western end of Blue Haven. Its proximity will cause interference with the ambiance of the locality by heightening noise levels.

The details of the concerns related to the impacts of the coal loader are as follows:

1. The coal stockpiles and any open-air movement of coal would tend to create emissions of coal dust.

Even if this coal dust can be controlled most of the time, there is a likelihood that emissions from the site stockpiles and the material being loaded onto and transported by the coal trains will be carried by prevailing winds to urban areas and surrounding sensitive natural environments.

This coal dust has a potential to cause breathing problems, especially with the young and the elderly. It has the potential to cause underlying respiratory complaints not detected until latter in life. It has the potential to cause carcinogenic reactions in the future for individuals plus a range of other affects as described below.

- a. Due to the potential for risk of coal dust, it is considered that the property market of the area will be affected if the mine becomes operational. Whether coal loader impacts are a perceived degradation of the living environment or an actual degradation, the same result of an affected property market will occur. The coal stockpile and coal loader facility in the area will have a negative influence on house and land prices. This will mean that prices will tend to fall below a level that otherwise would have existed without the building of the coal loader facility.

This will mean that all those owners potentially affected by the coal loader's proximity will have a devalued capital asset. As a consequence, borrowing against that asset will be at a lower value to what otherwise would have been expected without the presence of the proposed coal loader.

Blue Haven will not be affected alone, with the township of Wyee and the proposed town centre at Warnervale within the proximity of the loader facility

impacts will be more widespread. In addition new developments planned west of the freeway will be affected by these price distortions.

- b. The urban interfaces around the proposed facility are set to expand. Blue Haven may have finished expanding to the west but with Wyee Station just over 3 kilometres from the proposed facility, and Warnervale's proposed town centre only 1500 meters to the south of the facility, the potential for coal dust impacts are as real in Wyee and Warnervale as they are in Blue Haven. Wyee is set to expand its residential areas around the station by around 5000 homes, while Warnervale is expected to be the hub of very many new housing estates. Even with a light southerly or northerly wind, coal dust would be expected in these areas.
- c. With likely development at Bushell's Ridge, an industrial area to the north, the main northern railway to the east, the suburban areas of Blue Haven close by and an expectation that the population growth for the locality will stretch from Warnervale to Gwandalan, a real possibility exists for a bus and train interchange at Blue Haven not far from the proposed coal loader facility.

Considering the real potential for airborne particulates to be in the area, greater numbers of people could be affected with health issues caused by the inhalation of coal dust. In time it would be expected to see more bicycle use for commuting to railway stations like this proposed one at Blue Haven and the proposed new railway station at Warnervale. These developments would widen the potential impacts of coal dust on the population.²²

- d. Currently many residents of Blue Haven have installed rainwater tanks. With the potential of particulates of coal dust landing on rooves, it is expected that tanks will tend to fill up with this fine coal dust necessitating more clean-outs of these tanks and causing new risks to the health of tank cleaners. Not only would Blue Haven be affected, but also all the new subdivisions at Wyee, Warnervale and any proposed urban development areas close by, where rainwater storage units are compulsory for new homes.
- e. Over the last year or so, many residents have installed solar panels on the roof hoping to save power and reduce electricity power costs. With fine coal dust falling on the panels it is expected that the available sunlight to these panels will be reduced unless cleaned regularly. In addition any savings made by the solar

²² David Holland, [Blue Haven Rail and Bus Interchange Proposal](#), 3rd edition, Habitat Association, Habitat Town Planning Forum, WordPress, 2012, web accessed Nov. 2013.

panels to residents would be far less, squandered by coal dust, thus frustrating their small effort to reducing carbon emissions, and reduce their power bills.

- f. With the existing and proposed urban areas situated in relatively close proximity to the stock piling facility and the potential for prevailing winds to carry the finer particles of the coal dust several kilometres, it is likely that all out door surfaces will be affected by the dust. This will include washing hung out to dry. As a response to coal dust on washed clothing, it is expected that householders will react by installing electric clothes dryers, thus artificially increasing the amount of electricity used and the cost of the household power bill.
- g. There are concerns about the unknown impacts of coal dust on the natural environment. It would be expect that after rain, much of the dust will wash off the leaves of vegetation, however some will tend to build up and persist on the leaves. Any impacts of the fine dust on insects and other larger fauna in the local areas of bushland adjacent to the proposed facility would be unknown without extensive studies. However, under longer dry spells it would be expected that coal dust coatings on leaves would adversely impact on bushland flora species. In a wet spell, rainwater would wash the fine coal dust into the creek system, causing unseen damage to the benthic biota in Wallarah and Spring Creeks.

These are all hypothetical if the proponents guarantee that there will be no dust emissions from the site. But no emissions from the operation would be unlikely with coal moving constantly on the site? Wetting the top layers of coal will tend to dampen the coal dust in the stock pile until the sun dries it out again, but the loading process as mentioned above should generate large amounts of coal dust. In addition the transportation of the coal has an additional potential to produce dust emissions. Thus the adjacent bushland and creeks must suffer from this potential impact in some way and all the other impacts itemised above are open to occur.

The two articles referenced in the footnotes below give documentary evidence of some of the impacts related to coal dust emission:

1. An NBN television article on a recent study made in the Hunter Valley on coal dust emissions related to coal loaders and coal being transported by rail highlight concerns about coal dust emission.²³

²³ NBN TV, <http://www.nbnnews.com.au/index.php/2013/03/08/dust-data-sparks-fears-over-fourth-coal-loader/>

2. A paper from the Hunter Community Environment Centre (HCEC) making some serious connections with the potential problems of coal dust in the environment and health risk.²⁴

2. Noise emissions related to the operation of the coal loader facility.

When considering the rail spur's proximity to the lower parts of Blue Haven and other urban areas close to the proposed development, the noise generated by the rail trucks crossing the points as the coal train enters the main northern line will have a negative impact on residences in local streets. There is a potential for this impact to be felt throughout the night as well as in the daytime.

- a. Noise from the locomotives shunting between the rail line and the rail spur, where trucks are banging against each other as they couple, will impact Blue Haven residents. Currently as the rail line is about 500 meters from houses, freight trains can be heard on many occasions. With the operations of the coal facility and the proposed rail spur trains, residents would expect to hear bangs rather than a sound of a train slowly rising in volume and then fading away again as is the case with trains on the main line currently. Residents would expect these bangs to not only affect their sleep patterns day or night but arouse many of the neighbourhood dogs, thus causing a great deal of anxiety for both dogs and owners.
- b. Although the noise generated by the loading of each rail truck as the coal falls into the bottom of the truck is probably too far from Blue Haven residents to hear, unless under extraordinary wind conditions, it is likely that the urban and semi rural areas of Warnervale will be disturbed by this noise. This noise would be happening almost constantly. With the right wind conditions the noise would be exacerbated and again continue to bother the neighbourhood dogs in any suburb within a range of the loading facility.

All of the above will affect the current ambiance of the neighbourhoods around the proposed plant. We recognise that the land is zoned industrial, but many industrial sites in Wyong Shire do not have an intensity of open-air activity that will produce noise to this level both day and night.

²⁴ Hunter Community Environment Centre, Global coal study highlights serious health risks in the Hunter, <http://www.hcec.org.au/20130417/global-coal-study-highlights-serious-health-risks-hunter>, Website accessed Nov. 2013.

3. Risk factors related to the Toohey's Road site and coal loader site.

There are two assertions made by persons opposed to the development:

1. That the risks related to the impacts associated with the development are too high for urban areas.
2. That if the development were not to proceed, the level of any additional risk would be zero.

The potential impacts related to the issues mentioned above present a level of risk to the people living in surrounding urban areas that would not be present if the development did not go ahead.

a. The level of risk related to additional financial costs due to potential externalities from the site could be considerable.

Following is a list of the potential financial impacts that residences may have to accommodate if the site is developed as planned.

- (i) Loss of capital value to a property
- (ii) Additional cost related to laundry. ie. New dryer, extra power costs, buying new clothes more frequently.
- (iii) Health costs - ie. More medication for children and others. More medical practitioner and specialist expenses.
- (iv) Expenses related to cleaning house external walls and rooves.
- (v) Loss of water quality related to rainwater tanks. ie. The expense related to cleaning tanks. Additional risks related to workers cleaning the tanks. These risks include increased costs associated with cleaning due to more expensive equipment needed and risks due to potential health dangers of handling coal dust fine particles.
- (vi) Loss of sunlight shining on solar panels on rooves thereby reducing returns on the investment in the panels.

b. Risk and how it relates to coal dust in urban areas

The proponent will attempt to control the dust from the development so that it is below the standard set by the EPA. It seems that the most dangerous size of particle material from coal dust is between PM 10 or 10 micrometres in diameter down to PM 2.5 or 2.5 micrometres in diameter. Particles below this size are often produced from the burning of material including hydrocarbons. For instance diesel fuels and flare emissions.

However, it seems that the majority of these PM 10 to PM 2.5 diameter particles likely to be produced by the facility are the coal dust produced by the stockpiling and transportation of coal. Recently a study was done in the Hunter Valley Coal fields of NSW that related to the measurement of particle material close to coal transport facilities. Over the 7 days monitoring period, readings exceeded the preferred standard set by the EPA for the whole time of the monitoring.

There are academic papers that indicate that some of these particles can penetrate human tissue particularly through the lung wall. It is also asserted by some experts that such particles of coal can cause free radicals in the human body. If these particles are small enough to penetrate the tissue and organs of a human body, what damage could be had if these particles of coal dust are in fact a potential cause of the production of free radicals in the human body? What risk of cancer would someone run who was in constant contact with coal dust within a coal dust affected area?

c. What level of coal Dust emissions will cause cancer?

Since we measure the development of cancer as a risk factor to the concentration of a pollutant, it is hard to quantify whom the coal dust will affect. The only result we can perhaps glean from a study of a population in an affected area is the number of cancers formed in a sample of the population. Through this we would get an approximate risk factor.

When standards are established, it is based on a loose correlation between cancer in the community and the level of pollutant of a particular type. This same conundrum was realised when assessing the level of lead and arsenic in an orchid being studied by myself as a student. The fact that we found arsenic and lead in the orchid from pest control sprays at or below the EPA guidelines did not mean that there was no risk to the workmen in the orchid.

Similarly, risk is apparent in the proximity of the coal loader related to the health affects of coal dust inhalation or imbibition, but cannot be quantified. Perhaps this pollutant in the environment will not affect many people. Maybe many will not show symptoms of effects for some years and the correlation between the coal dust and other environmental pollutants may be blurred. But rest assure that if a pollutant is introduced such as coal dust or arsenic into an environment, risk of health issues will be present.

As mentioned before, if the coal loader is not developed no risk factor from the development will be present for the population of the towns of northern Wyong.

4. The proximity of urban areas closer to the site than Wyong Township.

In the introduction to the Environmental Impact Statement (EIS) for the Wallarah 2 project it states that Wyong is the closest town to the development with a distance of about 5 kilometres. This may be true to the closest part of the mine proposal, but the coal loader facility has several towns closer to it than the Wyong Township.

Below is a list of townships and suburban areas closer to the proposed development than the small township of Wyong.

Town Centres

(A township by definition has a shopping centre)

Lakehaven

Charmhaven

Kanwal

Warnervale (Proposed New Centre)

Wadalba

Wadalba East (Proposed Town Centre)

Gorokan

Wyee

Watanobbi

San Remo

Suburban Areas

Blue Haven

Woongarra

Hamlyn Terrace

Warnervale

Halloran (Industrial Area)

Bushell's Ridge (Proposed Industrial Area)

Jillaby Rural estates

Bruce Crescent Rural estates

Doyalson

In the introduction to the EIS section of the development application, it reads as if Wyong Township were a small town having little impact from the development at a distance of 5 kilometres.

However the above lists of townships and suburban areas shows that a large slice of the population in the northern parts of the Wyong Shire has a greater potential for impacts from the proposed development than the township of Wyong.

5. The EPBC Act 1999 amendments

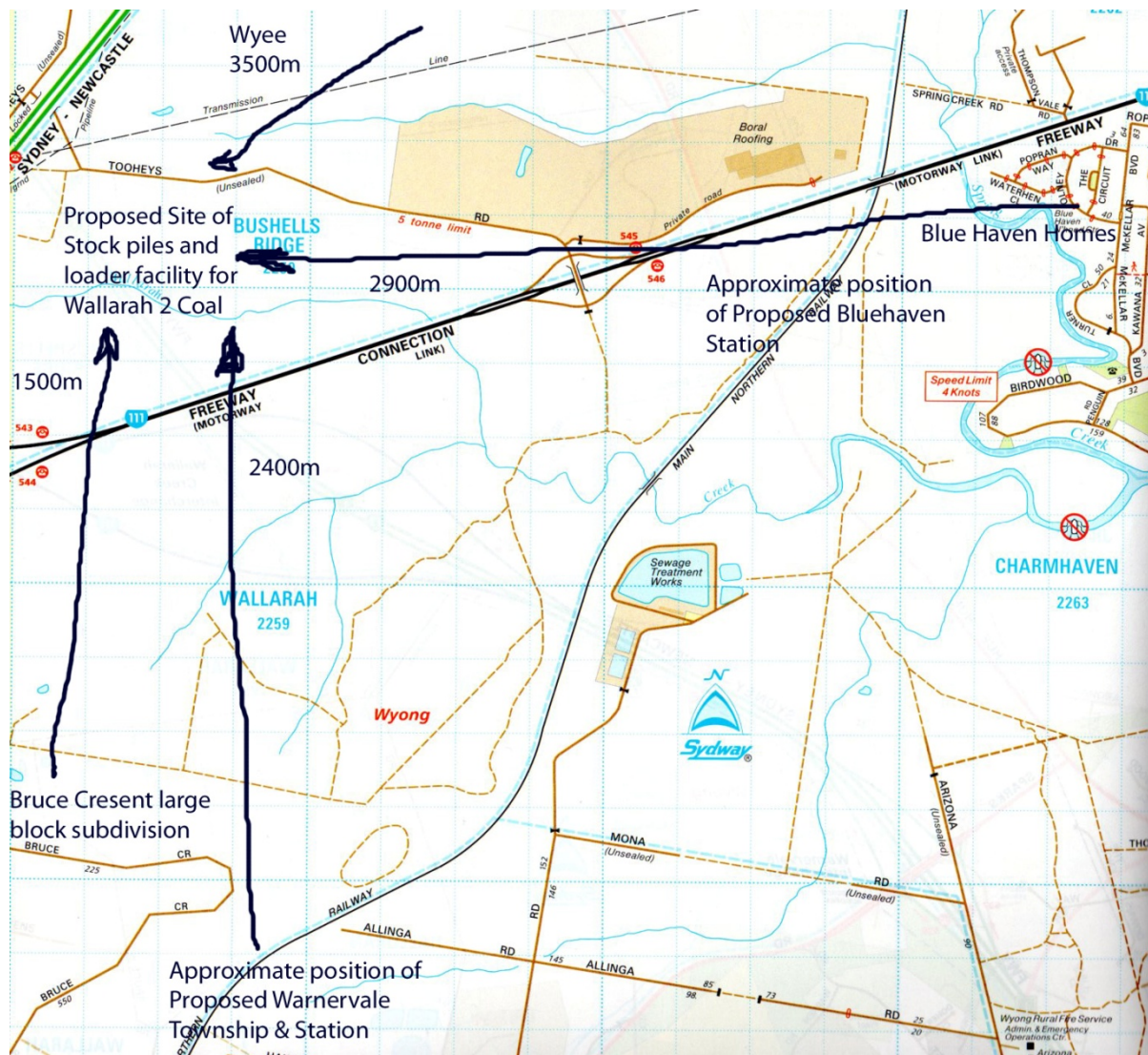
Recently a bill has been passed by the federal parliament's house of representatives to strengthen this act to consider water security related to mining activities. Once passed by the Senate, the amendments will be applied to applications that have not been determined by a regional planning committee at the time of its passing.

When assessing this project, it is expect that the Director General of the Department of Planning will consult the Commonwealth Environmental Protection and Biodiversity (EPBC) Act 1999.

The Director General of the Department of Planning is responsible for good planning outcomes in NSW and should consider the risk of impacts related to urban areas, populations and public infrastructure in the light of the proposed development of the coal loader facility.

Risks and impacts on governments and the community when planning a coal mining project in an urban growth area, by David Holland.

Map of the locality around the Coal Loader Facility



Picture showing the distance from the Coal Loader Facility to Blue Haven and other proposed and existing urban areas.

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