

Date 16.6.13

216 Yarramalong Rd  
Wyong Creek NSW 2259  
Ph 43531510

Director, Mining Projects  
Development Assessment Systems and Approvals  
Department of Planning and Infrastructure  
GPO Box 39  
Sydney 2001

Re Wallarah 2 Coal Project (Application SSD-4974)

Dear Sir,

I wish to register my conditional support for the Wallarah 2 coal mine on the Central Coast of NSW subject to the conditions listed and argued below.

Some 15 years ago, Brad Mullard, a senior member of the DMR assured me that the floor of the valleys would not be undermined due to increased flooding caused by subsidence. I hold Mr. Mullard to his assurance and fully expect that mining will not proceed under the Dooralong Valley floor.

The conditions I believe must be complied with prior to the mine proceeding are as follows.

1. There is no subsidence under the valley floor or any area under or within 300m of the 1:100 year flood contour.
2. There is no negative impact on the drinking water supply for the Central Coast.
3. That every effort is made to ensure affected residents do not suffer stress or any related negative psychological or health impacts from the development.
4. The coal stockpile and rail loading facility is covered and that no dust escapes into residential or rural residential areas.
5. The coal wagons are covered so no dust escapes into residential or rural residential areas.

I believe all of these conditions are reasonable and that the mine can still proceed while complying with them.

**1. There is no subsidence under the valley floor or any area under or adjacent to the 1:100 year flood contour.**

I believe there is no need to subside the valley floors or the 1:100 year flood areas and therefore damage or destroy any homes or infrastructure. There is ample evidence in the EIS to suggest that the coal resource is large enough in areas not under the 1:100 year flood to allow the mine to operate for the 28 year lease period. Of the 46 longwalls, it appears 34 are either partly or wholly outside the 1:100 year flood level. It appears LW1N, 2N and 3N can proceed but with reduced width to minimize subsidence and LW5N,6N and 7N shortened and the width reduced, again to minimize subsidence. No more longwalls until LW15N or 16N and all longwalls, shortened to avoid Little Jilliby valley. In the south, allow LW6S to 10S slightly shortened again to avoid Little Jilliby valley subsidence and all of LW 1SW to LW 10SW shortened again to protect Little Jilliby valley (refer marked up mine plan). This leaves the bulk of the resource available for mining while protecting the majority of homes and farms from the risk of additional flooding and damage to property. In total, the three North longwalls may be able to be constructed fully with the remaining 29 slightly shortened. Therefore some 60% of the resource is still available to mine giving 25 years life for the mine, just short of the lease term. With the exception of the North longwalls, those remaining are the widest with the thickest seam and therefore the most lucrative to mine.

This proposal will protect roads, homes, and other infrastructure from subsidence, with considerable savings to the Mine Subsidence Board.

From my reading of the EIS these options have not been explored.

**2. There is no negative impact on the drinking water supply for the Central Coast.**

The Central Coast has just endured some 10 years of heavy water restrictions due to drought. No one would wish to go through the experience again. While Jilliby Creek does not supply a significant quantity of water into the system in low flow times, its flood flows can now be harvested via the Mardi to Mangrove Link. Therefore the Jilliby system assumes new importance to the system.

There is ample evidence that the aquifers will be negatively impacted by mining, however keeping the subsidence away from the valley floors has to help mitigate against this problem.

**3. That every effort is made to ensure affected residents do not suffer stress or any related negative psychological or health impacts from the development.**

Assuming the stockpile, rail loading and rail wagons are covered, there should be only minor impact from coal dust. However I believe there is a significant health risk due to the stress residents may suffer over the mine life. Eliminating or significantly reducing the subsidence of homes and farms by not subsidising the 1:100 year flood affected and adjacent lands would mitigate against stress. The knowledge that your home is not going to be damaged or destroyed or your farm is not to be rendered flood prone or useless or your farm business is not going to be ruined would go a long way toward maintaining the sanity of the residents. The impact of stress on the community and individuals has not been assessed in the EIS.

Should my recommendation 1 not be followed and homes and farms are significantly subsidised then I believe the mental health of many affected residents would be in jeopardy and may result in deaths by suicide, heart attack or other stress related illnesses. The stress in the community is already palpable.

Should my recommendations 3 and 4 not be followed then the coal dust generated from the rail wagons and coal stockpile and rail facilities would have to be added to the already significant pollution from the coal fired power stations and the cumulative impact assessed in the EIS. I understand the incidence of asthma and other respiratory diseases in the Wyong area are well above state norms without the impact of dust being heaped on the residents of Blue Haven and every suburb on the rail route between Wyong and the coal loaders in Newcastle.

**4. The coal stockpile and rail loading facility is covered and that no dust escapes into residential or rural residential areas.**

It is possible to keep the stockpile under cover. The stockpile may have to be reduced in size to keep the cost down, however stockpiles of various minerals and grains are kept under cover at ports and inland facilities throughout the country. This would virtually eliminate a major and I believe justified concern with the mine.

**5. The coal wagons are covered so no dust escapes into residential or rural residential areas.**

Covering the coal rail wagons as is required when all vehicles transport loads on the roads would eliminate another I believe justified concern of the Wallarah 2 mine. The coal trains will run through mainly residential and rural residential areas that experience little if any airborne contamination now. Rail trucks with fixed slide back covers as is used by trucks carrying dusty materials would be practical and low cost to implement.

**BHP Billiton precedent**

BHP Billiton through COAL sold the Wallarah lease to KORES for good reason. I believe BHP were not prepared to subsidise the valley floors, the 1:100 flood affected areas, or adversely impact on the water supply for the Central Coast. I further believe that KORES purchased the lease on spec, on a slim chance that the mine would be allowed to proceed.

BHP is now developing the Caroon mine on the Liverpool plains and have undertaken to not longwall mine under the flood plain. (refer attached BHP Caroon Coal Project Community Information Paper) The



amendments to the Exploration License also prevent BHP from “longwall mining underneath the deep alluvial irrigation aquifers” and “longwall mining underneath the flood plain”.

These very reasonable protections are what I request for the flood plains of the Wyong water supply valleys for all the reasons listed in the BHP Community Information Paper.

I request that my suggested variations to protect the water supply, infrastructure, homes, farms and lives be considered in the EIS.

Yours sincerely



Laurie Eyes



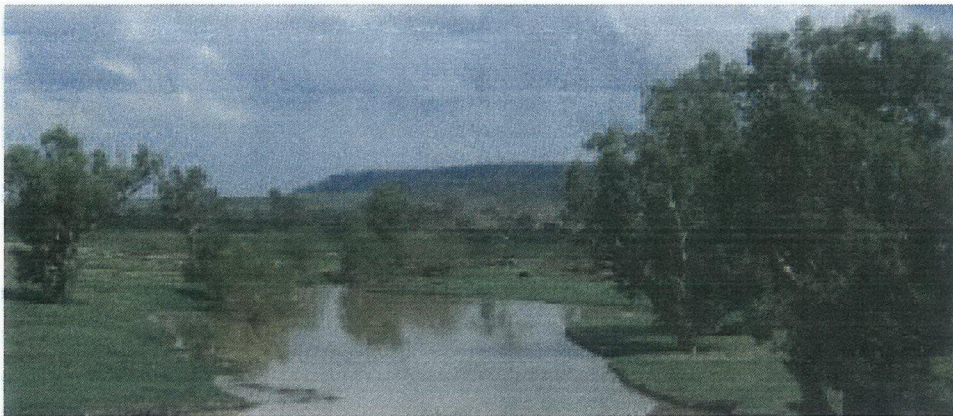
Figure 6.1 Predicted Subsidence Contours

Suggested longwalls  
? possible longwall.



# Community Information Paper

## Flood and Surface Water Modelling



### Introduction

The Caroona Exploration Licence (EL) Area covers approximately 350 square kilometres.

The terrain within the EL Area varies from the near flat Liverpool Plains floodplain to elevated grazed and timbered ridge country.

The floodplain sustains highly productive agriculture including irrigated and dryland cropping and livestock production. During large and/or prolonged rainfall events, flooding has the potential to affect large areas of the alluvial floodplains.

Flooding also has the potential to affect public and private infrastructure such as roads and buildings including dwellings.

BHP Billiton is undertaking extensive work to identify possible impacts of mining on flooding, including developing a flood model.

August 2010

### Facts On This Sheet

**P.1** Key Points

**P.1** Introduction

**P.2** BHP Billiton regulatory restrictions and commitments restrict likely flooding impacts

**P.3** Development of a flood model

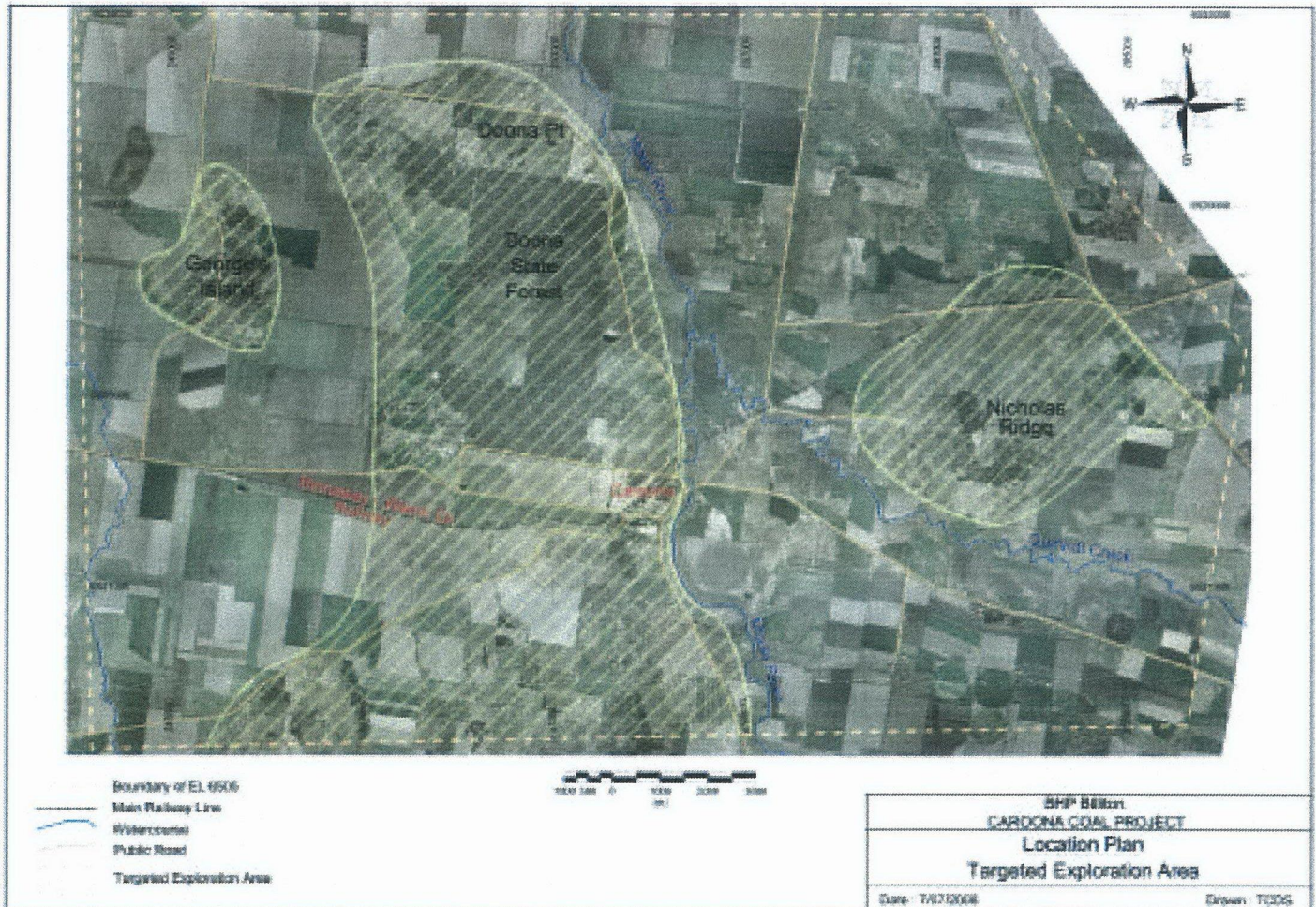
**P.3** Assessing the impact of mining on flooding

**P.4** Next steps to address flood and surface water issues

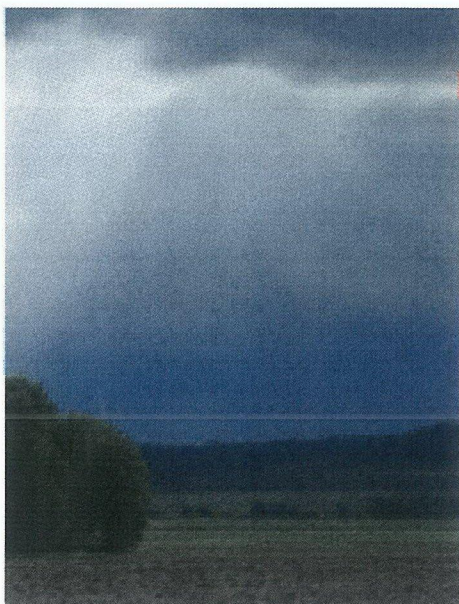
### Key Points

- BHP Billiton is undertaking extensive work to identify possible impacts of mining on flooding, including developing a flood model.
- Following the development of a detailed flood model, impacts from different mine designs, layout and the location and scale of mining and its related infrastructure can be predicted by inputting terrain and localised surface runoff changes into the flood model.
- The likely impacts of any potential mine in the EL Area on flooding have been minimised due to the commitments made by BHP Billiton and restrictions included in the EL.





## BHP Billiton regulatory restrictions and commitments restrict likely flooding impacts



The likely impacts of any potential mine in the EL Area have been minimised due to the commitments made by BHP Billiton and restrictions included in the EL.

BHP Billiton has committed that there will be no open cut mining anywhere in the EL Area. These commitments are captured by NSW Government amendments to the Special Conditions of the Caroona Exploration Licence. The amendments prevent BHP Billiton from applying for a mining lease that includes any of the following activities:

- longwall mining underneath the deep alluvial irrigation aquifers;
- longwall mining underneath the floodplain; and
- open cut mining on the floodplain.

These restrictions are consistent with BHP Billiton's commitments.

These commitments and EL restrictions mean that any flooding impacts from mining activities would be minimised for the following reasons:

- Avoiding subsidence on the floodplains will mean that flood flow patterns across the floodplains remain unaffected. The potential for damming and increased water logging in subsided ground on the black soil plains is eliminated.
- Underground mining involves less surface disturbance than open cut mining. For the Caroona EL this means that the likely implications for surface are significantly less than they may be in relation to an equivalent open cut operation.



## Development of a flood model

Understanding the existing surface flow regime is critical to understand what impacts underground mining and its related infrastructure might have on flooding in the Caroona area.

BHP Billiton has commissioned Umwelt (Australia) Pty Limited (Umwelt) to develop a detailed two-dimensional flood model of the Caroona region and to investigate flood behaviours within the Caroona EL and surrounding areas. The flood model will be developed using a series of processes, including:

- In 2006, the EL and surrounding areas was extensively surveyed using Light Detection and Ranging (LIDAR) and Falcon™ airborne sensing equipment. This survey data, in combination with NSW Government Land and Property Information (LPI) survey data, has provided detailed terrain data of the EL and surrounding area.
- Data collected from stream gauging stations located in and around the EL Area provide information on historical flood levels and durations at these locations following various rainfall events in the region.
- Detailed information on rainfall events including rainfall depth and intensity is obtained from Bureau of Meteorology rainfall gauges and stream gauges in the catchment.

- Historical rainfall and stream gauging data are reviewed to gain an understanding of rainfall patterns and historical flood responses.
- Hydrology models of the catchment areas upslope of the EL are developed based on historical data.
- A flood model of the floodplain in and around the Caroona EL Area is then developed using the historical flooding and rainfall data, the detailed topography data and information collected during site inspections.
- The flood model will also consider information that is relevant to flood behaviour including various terrain and soil types and factors such as vegetation type, crops and coverage.
- The accuracy of the flood model is then considered by reviewing the sensitivity of the flood model to various parameters and reviewing the flood model outputs against past known rainfall events, flood levels and flood pathways.

## Assessing the impact of mining on flooding

Mining and its related infrastructure has the potential to affect surface water flows in the following ways:

- exposed soils areas associated with mining activities may increase run-off;
- site water management controls may intercept water that may otherwise have contributed to surface water flows;

- subsidence from longwall mining can affect surface flow patterns; and
- works on floodplains can affect surface flow patterns which can cause scouring and/or affect the extent and duration of flooding in surrounding areas.

Following the development of a detailed flood model, impacts from different mine designs, layout and the location and scale of mining and its related infrastructure can be predicted by inputting terrain and localised surface runoff changes into the flood model.

The key aspects of any potential mining operation in the Caroona EL Area that may have an impact on flooding in the area are:

- the location and layout of surface mine infrastructure;
- terrain changes due to subsidence from longwall mining;
- road upgrades;
- rail upgrades; and
- additional utility and support infrastructure such as power lines and gas drainage.

## Managing potential flood impacts caused by mine infrastructure

The location and scale of surface works, particularly the size of disturbed areas, will affect the amount of infiltration and runoff from the site. While this may have significant localised impacts, this is unlikely to have a significant effect on flood levels and flow patterns on the plains as the main surface





infrastructure will need to be located above historical flood levels to avoid damage and disruption to operations.

### **Managing potential flood impacts caused by subsidence**

Subsidence induced terrain changes can cause localised flooding impacts and alter flood flow patterns if the subsidence occurs within a floodplain. As longwall mining will be limited to the ridge country there will be no subsidence of the floodplains.

The design of longwall layout can reduce the magnitude of any adverse impacts associated with subsidence on the slopes and ridges.

Subsidence on the slopes and ridges is likely to affect localised surface water runoff patterns. The extent of any impacts will be identified by the flood model being developed. The flood model will assist in understanding where adverse impacts may arise from particular mine designs and allow the mine plan to be designed to minimise these impacts. Individual property subsidence management plans will be prepared as part of the subsidence management process to ensure that any subsidence impacts are appropriately managed to address the specific land management requirements of each property owner.

The flood model will also assess whether localised changes to surface water runoff on the slopes will have any impact on flood patterns on the plains, however any such impact is expected to be negligible.

### **Managing potential flood impacts caused by road, rail and infrastructure upgrades**

There are a number of roads and railway lines that cross the plains in and around the Caroona EL Area. These roads and railway lines already act as flood barriers, having a damming effect on floodwaters moving downstream. Should BHP Billiton seek and gain approval for an underground mine in the

Caroona EL Area or other mines be approved in the region, both rail and road infrastructure will require upgrading. Any increases in the height of roads that are currently inundated during large rainfall events will potentially have impacts on flood flow patterns. Changes in the dimensions of bridges and the length of culverts, causeways and floodways can also affect flood heights and flood flow patterns. The detailed flood model being developed by Umwelt will enable any infrastructure upgrades associated with an underground mine in the Caroona EL Area to be designed to minimise any adverse impacts on flooding flow and behaviour.

Utility infrastructure such as pipelines and powerlines can also alter flood flows where they are located within a floodplain. As with road and rail infrastructure upgrades, the detailed flood model being developed by Umwelt can be utilised to assess the impact, if any, that such infrastructure can have on flood flows and behaviours. Where necessary, design options can be assessed to minimise any adverse impacts.

## **Next steps to address flood and surface water issues**

- Complete the detailed model of the existing surface water and flooding regime.
- Conduct detailed sensitivity analyses and ground truth the model to ensure appropriate accuracy. This process will include consultation with key stakeholders (including landowners and relevant agencies).
- When BHP Billiton commences detailed consideration of project design options, model various scenarios to assist in designing the project in a manner which minimises impacts on surface water flow and flooding regimes.
- If BHP Billiton decides to proceed with seeking project approval, use the detailed modelling as part of a comprehensive water resources assessment to be included in the Environmental Assessment. Such assessment will consider local and regional considerations, including any outcomes of the regional water study and any cumulative effects.

### **BHP Billiton Caroona Coal Project**

Corner Hawker and Nowland Sts  
Quirindi NSW 2343

Phone +61 2 6746 4600

Fax +61 2 6746 4601

Email [CaroonaCoalProject@BHPBilliton.com](mailto:CaroonaCoalProject@BHPBilliton.com)

Web [www.caroonacoal.bhpbilliton.com](http://www.caroonacoal.bhpbilliton.com)

**HOTLINE: 1800 216 266**