



Centennial Coal



Response to Submissions

Mannering Colliery – Extension of Mine Project

Section 75W Modification to Project Approval PA 06_0311

September 2012

TABLE OF CONTENTS

1. Introduction	1
2. Scope.....	3
3. Overview of Submissions	4
4. Response To Submissions.....	10
4.1. Subsidence	10
4.2. Surface Water / Site Water Management	12
4.3. Groundwater / Underground Water Management.....	14
4.4. Terrestrial Ecology	14
4.5. Aquatic Ecology	15
4.6. Aboriginal Cultural Heritage	17
4.7. Non-Indigenous Heritage	19
4.8. Air Quality	20
4.9. Noise.....	21
4.10. Greenhouse Gas Emissions	22
4.11. Traffic and Transport	22
4.12. Socio-Economic.....	23
4.13. Rehabilitation.....	23
4.14. State Conservation Area.....	24
4.15. Monitoring.....	24
5. Statement of Commitments	26

TABLES

Table 1 - Summary of Issues Raised in Submissions

Table 2 - Revised Statement of Commitments

APPENDICES

Appendix 1 - Revised Figure showing Proposed Project Site

Appendix 2 - Revised Subsidence Report

Appendix 3 - Letter from Centennial to DP&I dated 27 February 2012

1. INTRODUCTION

Manning Colliery is an existing underground coal mine located on the southern side of Lake Macquarie approximately 40 kilometres south of Newcastle in New South Wales (NSW). Manning Colliery is operated by Centennial Manning Pty Limited (Centennial Manning), which is a wholly owned subsidiary of Centennial Coal Company (Centennial). Centennial is a wholly owned subsidiary of Banpu Public Company Limited (Banpu), who purchased Centennial in 2010.

As a result of the mine planning and review process at Manning Colliery, Centennial Manning has lodged an application to modify the Project Approval PA 06_0311 to allow for the Extension of Mine Project. An Environmental Assessment was prepared by GSS Environmental on behalf of Centennial Manning to support the Extension of Mine Project application. The Environmental Assessment was placed on public exhibition from 24 January to 24 February 2012.

The primary components of the Project as described in the Environmental Assessment were:

- An extension of underground mining operations within the Fassifern Seam beyond the 2008 Project Approval boundary using bord-and-pillar mining methods to recover approximately 3.2 million tonnes of ROM coal;
- An extension of underground mining operations into the Great Northern Seam using bord-and-pillar mining methods to recover approximately 1.4 million tonnes of ROM coal; and
- The provision of an additional 40 full-time employment positions.

Further investigations have been undertaken by Centennial Manning since the application was lodged and it has been determined that Centennial Manning will not be seeking approval to mine within the Great Northern Seam as part of the application. Centennial Manning hereby amend the application under S75W by the withdrawal of the proposed mining within the Great Northern Seam from the Extension of Mine Project application. As such Centennial Manning is now only seeking a modification to Project Approval PA 06_0311 to allow:

- An extension of underground mining operations within the Fassifern Seam beyond the 2008 Project Approval boundary using bord-and-pillar mining methods to recover approximately 3.2 million tonnes of ROM coal (as described within the Environmental Assessment); and
- The provision of an additional 40 full-time employment positions (as described within the Environmental Assessment).

The decision to withdraw the proposed mining in the Great Northern Seam has been undertaken to address the issues raised in correspondence with NSW Department of Planning and Infrastructure (DP&I) relating to the subsidence predictions, and to ensure that mining will result in less than 20 millimetres of subsidence on the surface. The following documentation has been provided to address the change in proposed mining:

- A revised figure (Appendix 1) showing the Proposed Project Site boundary which supersedes the Figure 10 presented in the Environmental Assessment;

- A revised Statement of Commitments (Section 5.0) which supersedes the Statement of Commitments presented in Section 8 of the Environmental Assessment; and
- A new subsidence report (Appendix 2) reflecting the proposed mining in the Fassifern Seam only (Seedsman Geotechnics Pty Ltd, 25 July 2012) which supersedes the previous subsidence report (Seedsman Geotechnics, August 2011).

The proposed mining in the Fassifern Seam will not exceed the 1.1 Mtpa of coal recovery previously assessed and approved under Project Approval PA 06_0311. No changes to the current approved hours of operation, methods of coal mining, handling and transport, surface infrastructure, site servicing or waste management are required. Furthermore, the proposal will not extend the life of Mannering Colliery beyond the existing approved 2018 life of the mine.

The approved method of mining is a form of bord-and-pillar mining where coal recovery is limited to first workings only. This mining method, combined with the mine design, will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface.

2. SCOPE

This report has been prepared in accordance with section 75H(6) of the EP&A Act and considers the matters raised in submissions during the public exhibition of the Environmental Assessment.

This report also addresses the outstanding issues raised in the correspondence received from the DP&I during February 2012. It is noted that the letter from Centennial to DP&I dated 27 February 2012 (Appendix 3) addressed the majority of the issues raised in the email correspondence from DP&I on 7 February 2012 and 10 February 2012.

This report builds on information presented in the Environmental Assessment and is to be read in conjunction with the Environmental Assessment.

3. OVERVIEW OF SUBMISSIONS

23 submissions were received by the DP&I following public exhibition of the Environmental Assessment. Submissions were received from:

- Individuals (13);
- Wyong Shire Council (WSC);
- Lake Macquarie City Council (LMCC);
- NSW Office of Environment and Heritage (OEH), Heritage Branch;
- NSW Roads and Maritime Services (RMS);
- NSW Department of Trade & Investment, Regional Infrastructure & Service (DTIRIS), Division of Resources and Energy (DRE);
- Department of Primary Industries, Agriculture NSW;
- Department of Primary Industries, NSW Office of Water (NOW);
- NSW Environment Protection Authority (EPA);
- Mine Subsidence Board; and
- Construction Forestry Mining and Energy Union, (CFMEU), Mining and Energy Division.

Centennial also received email correspondence from the DP&I in February 2012.

Table 1 provides a summary of the issues raised in the submissions received by the DP&I, and identifies the section within this report which addresses these concerns. The outstanding issues from the correspondence exchanged between Centennial and the DP&I is also summarised in Table 1.

Table 1 – Summary of Issues Raised in Submissions

Concern	Raised By	Summary of Concern	Where Addressed
Subsidence	Individuals	<p>Mining under the Lake has caused major subsidence in the past. Past incidents have not been resolved.</p> <p>Subsidence causing structural damage to property. All houses under mined to have survey pegs.</p> <p>Survey points given to council to carry out independent surveys.</p> <p>The mine should be responsible for damage caused to public infrastructure.</p> <p>The mine plan does not detail the past workings in other seams in the area under Manning park that may impact on the structural integrity of the pillars formed in this proposal.</p> <p>What surveying will be undertaken before mining occurs under Manning park.</p>	Section 4.1
	LMCC	Monitoring should be under taken in the foreshore area to ensure less than 20mm predicted subsidence is adhered to.	
	WSC	WSC is concerned about the impact of subsidence on residences and public infrastructure at Manning Park and recommend the implementation of an extended subsidence monitoring program for the area affected by the extension of the Fassifern seam extraction. The results to be reported annually to WSC Infrastructure Management Directorate.	
	DPI, Agriculture NSW	The main concern for the DPI is damage to intensive agriculture infrastructure through subsidence. Infrastructure damaged by subsidence should be covered through subsidence mitigation funding.	
	DRE	It is important that subsidence management measures continue at the site, particularly in relation to sensitive features	
	DP&I	is information contained in the Appendix I subsidence assessment consistent with predictions that subsidence will not exceed 20 mm	

Surface Water / Site Water Management	Individual	What is happening with the mine water from this mine. Is this mine water entering Lake Macquarie via the same creek as Lake Coal uses. Has any testing been done higher up this natural watercourse to see what contaminants have been deposited before reaching the discharge point of Lake Coal.	Section 4.2
	LMCC	DP&I requirements identified that consideration should be given to the importance that Chain Valley colliery discharge mine water into the same creek as Mannering colliery. The Water Management Assessment (Appendix J) has identified that the proposed mine extension is expected to increase water discharge in the unnamed creek, however, the report does not provide an assessment of what that impact will be.	
	LMCC	The Environmental Assessment does not appear to address the potential impact of the project on creeks and watercourses and does not propose any monitoring strategies. In particular, subsidence and dewatering impacts should be monitored in sensitive environments such as creek lines and ground water dependant ecosystems.	
	NOW	Recommends a review of the approved surface water monitoring and response plans.	
Groundwater / Underground Water Management	NOW	Recommends a review of the approved ground water monitoring and response plans. Recommends ongoing monitoring of ingress volumes and sources in conjunction with verification of subsidence predictions. Reporting of ground water ingress to be included in the monitoring regime.	Section 4.3
Terrestrial Ecology	Individual	What will be done about the infestation of pine trees that is now out of control in sensitive area's that has originated from the main entrance drive of a large row of pines. This is now infesting an area of endangered Charmhaven Apple Gum that has now been identified near this mine entry.	Section 4.4
	LMCC	There is a risk of significant impacts on Endangered Ecological Communities (EEC's) associated with even small levels of subsidence. Subsidence of lake fore shores wetland, saltmarsh and floodplain areas that support native vegetation (EEC) should be avoided.	

	EPA	<p>Recommends that the proponent regularly monitors the health and extent of EEC vegetation above the modification footprint, particularly by remote sensing data, and also monitors the health of freshwater wetlands around Mannering Bay and the lower reaches of Wyee Creek to ensure that threatened species habitat is maintained.</p> <p>EPA is concerned about activities that may facilitate the spread of 'myrtle rust' and recommends that the monitoring program should also include regular monitoring for myrtle rust.</p>	
Aquatic Ecology	LMCC	<p>The Aquatic Ecology Assessment is based on a literature review. Given the scale of the proposed project and area of foreshore potentially impacted an up to date survey of the aquatic environment should be conducted.</p> <p>Both an up to date aquatic survey and subsidence monitoring will provide assurance and a means of checking that the proposal is not impacting upon the aquatic environment. Without these measures there is no way of adequately monitoring the potential impacts of the proposal or identifying appropriate remediation strategies should an impact occur.</p> <p>12-20mm subsidence will exacerbate the impact of predicted sea level rises of 30-50mm on areas that include lake foreshore, wetlands, tidal waterways. The combined effect on ecological communities may be significant. Mining below these areas should be avoided. If the proposed mine extension is allowed under these areas the potential changes in ecosystems due to subsidence and sea level rise should be identified, with potential retreat areas identified and protected.</p>	Section 4.5
Aboriginal Cultural Heritage	EPA	<p>Consultation with the local Aboriginal community has not been undertaken in accordance with the 'Aboriginal cultural heritage consultation requirements for proponents 2010' as registered groups were excluded from surveys and groups attended surveys that were not registered. Equitable access to opportunity to participate and inform the assessment process or acknowledgement of the uniqueness of the two Countries has not been acknowledged or addressed.</p> <p>It appears that the groups excluded all identify with the Darkinjung Country</p> <p>Possibility that currently undetected Aboriginal cultural material may be present within the project area in those unsurveyed or low visibility areas. EPA therefore recommends that the</p>	Section 4.6

		<p>proponent provide additional appropriate management strategies developed in consultation with the registered Aboriginal parties to the project to address this possibility.</p> <p>EPA recommends that the proponent detail a more robust method of future assessment, evaluation and monitoring program, in consultation with register Aboriginal parties.</p>	
Non-Indigenous Heritage	Heritage Branch	<p>Request addition commitment. "Where intact archaeological relics of State or local significance, not identified in the Environmental Assessment are unexpectedly discovered during works, work must cease in the affected area and the Heritage Council must be notified in writing in accordance with section 146 of the Heritage Act, 1977. Depending on the nature of the discovery, additional assessment may be required prior to the recommencement of excavation in the affected area".</p>	Section 4.7
Air Quality	Individuals	<p>Mines present hazards in the form of particle dust.</p> <p>Increase in coal dust.</p> <p>With the increase complaints of coal dust from residents of Mannering Park, who owns the coal dust. Delta, Lake Coal or Mannering colliery.</p>	Section 4.8
Noise	Individual LMCC	<p>Mines present hazards in the form of noise.</p> <p>DP&I requirements identified that the EA should consider if all reasonable and feasible noise mitigation measures are being employed by the colliery. The EA considers whether an increase in noise in relation to the mine extension is likely. The EA reports on current noise levels but does not make any assessment or provide a review of current mitigation measures and any further mitigation measures that may be required.</p>	Section 4.9
Greenhouse Gas Emissions	WSC	<p>A condition be included which requires the offsetting of direct greenhouse gas emissions from mining operations.</p>	Section 4.10
Traffic and Transport	Individual WSC	<p>Mines present hazards in the form of increased traffic.</p> <p>No coal, waste, tailings, etc. is to be trucked onto public roads from the site.</p> <p>The intersection construction to include the provision of a CHR intersection in accordance with the engineering plans and specifications.</p>	Section 4.11

	RMS	Section 117 (2) direction 3.4 under the Environmental Planning and Assessment Act 1979, should be taken into account in relation to the provision of adequate access to public transport.	
Socio-Economic	Individuals	A contribution per tonne of coal to be put into a community trust fund.	Section 4.12
	WSC	The Community Enhancement Program be extended to include the coal produced under the proposed expansion.	
Rehabilitation	DRE	Recommends approval with the inclusion of the conditional requirements to amend the Mining Operations Plan and review the Annual Environmental Management Report, including integrated rehabilitation and environmental management.	Section 4.13
State Conservation Area	DP&I	Provision of a plan showing the State Conservation Area and identification of the depth limit associated with the State Conservation Area.	Section 4.14
Monitoring	LMCC	DP&I requirements include consideration of outcomes of environmental monitoring since project approval for the mine was granted. The EA does not appear to include any such report on the monitoring outcomes. The EA did not refer to any report of these outcomes and states that the intent is to continue with the existing monitoring.	Section 4.15

4. RESPONSE TO SUBMISSIONS

Centennial Mannering provides the following responses to the submissions and key issues summarised in Section 3.

4.1. Subsidence

Mining under the Lake has caused major subsidence in the past. Past incidents have not been resolved. (Individual)

In the mid 1980's the foreshore of Chain Valley Bay was impacted by subsidence. The subsidence was approximately 900mm, and occurred as a result of secondary extraction (pillar extraction) conducted within the High Water Level Subsidence Control Zone at the adjacent Newvale Colliery.

Centennial Mannering is not seeking approval to undertake any secondary extraction. Centennial Mannering is proposing underground mining operations using bord-and-pillar mining where coal recovery is limited to first workings only. This mining method, combined with the mine design, will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface. Subsidence predictions have been undertaken by Seedsman Geotechnics Pty Ltd and have been documented within the specialist subsidence report (Appendix 2). The project is expected to have negligible surface impacts.

Mannering Colliery has been mining using bord-and-pillar mining methods for close to 50 years and the bord-and-pillar mining has not resulted in any 'major' subsidence in this period. Seedsman Geotechnics Pty Ltd (Appendix 2) states that "*Since mining recommenced in the Fassifern Seam at Mannering in 2004 there has been no failure of pillars.*" Monitoring conducted over the past 7 years above similar mining areas to that proposed (first workings only) indicates that the subsidence predictions are valid.

Subsidence causing structural damage to property. All houses under mined to have survey pegs. (Individual)

Survey points given to council to carry out independent surveys. (Individual)

Centennial Mannering is proposing underground mining operations using bord-and-pillar mining where coal recovery is limited to first workings only. This mining method, combined with the mine design, will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface. Subsidence predictions have been undertaken by Seedsman Geotechnics Pty Ltd and have been documented within the specialist subsidence report (Appendix 2). The project is expected to have negligible surface impacts, and the predicted subsidence levels are not of a sufficient magnitude to cause structural damage to houses.

Mannering Colliery has been mining using bord-and-pillar mining methods for close to 50 years and the bord-and-pillar mining has not resulted in any 'major' subsidence in this period. Monitoring conducted over the past 7 years above similar mining areas to that proposed (first workings only) indicates the subsidence predictions are valid. If required, survey information relating to subsidence monitoring can be provided to Wyong Shire Council or Lake Macquarie City Council to carry out independent surveys.

Subsidence monitoring marks will be installed at locations above the proposed workings to measure the subsidence and verify that subsidence is within the predicted levels.

The mine should be responsible for damage caused to public infrastructure. (Individual)

The main concern for the DPI is damage to intensive agriculture infrastructure through subsidence. Infrastructure damaged by subsidence should be covered through subsidence mitigation funding. (DPI, Agriculture NSW)

Centennial Mannering is proposing underground mining operations using bord-and-pillar mining where coal recovery is limited to first workings only. This mining method, combined with the mine design, will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface. Subsidence predictions have been undertaken by Seedsman Geotechnics Pty Ltd and have been documented within the specialist subsidence report (Appendix 2). The project is expected to have negligible surface impacts, and the predicted subsidence levels are not of a sufficient magnitude to cause structural damage to any identified infrastructure.

Mannering Colliery has been mining using bord-and-pillar mining methods for close to 50 years and the bord-and-pillar mining has not resulted in any 'major' subsidence in this period. Monitoring conducted over the past 7 years above similar mining areas to that proposed (first workings only) indicates that the subsidence predictions are valid.

The Mine Subsidence Board is responsible for assessing and rectifying subsidence damage under the Mine Subsidence Compensation Act 1961. Mannering Colliery pays an annual levy to the Mine Subsidence Board to ensure that funds are available for this task.

The mine plan does not detail the past workings in other seams in the area under Mannering Park that may impact on the structural integrity of the pillars formed in this proposal. (Individual)

The subsidence predictions provided by Seedsman Geotechnics Pty Ltd (Appendix 2) have taken existing workings into consideration. The proposed mining method will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface.

What surveying will be undertaken before mining occurs under Mannering Park. (Individual)

Monitoring should be under taken in the foreshore area to ensure less than 20mm predicted subsidence is adhered to. (LMCC)

WSC is concerned about the impact of subsidence on residence and public infrastructure at Mannering Park and recommend the implementation of an extended subsidence monitoring program for the area affected by the extension of the Fassifern seam extraction. The results to be reported annually to WSC Infrastructure Management Directorate. (WSC)

It is important that subsidence management measures continue at the site, particularly in relation to sensitive features (DRE)

Subsidence monitoring marks have already been installed in various locations within the Mannering lease area including foreshore areas, residential areas and public infrastructure. Figure 9 of the Environmental Assessment illustrates the current subsidence monitoring locations. Monitoring conducted over the past 7 years above similar mining areas to that proposed (first workings only) indicates that the subsidence predictions are valid.

Monitoring of the existing marks will continue and additional subsidence monitoring marks will be installed above the proposed mining areas to measure the subsidence and verify that subsidence is within the predicted levels.

If required, Centennial Mannering will report the results of this monitoring to Wyong Shire Council annually.

Is information contained in the Appendix I subsidence assessment consistent with predictions that subsidence will not exceed 20 mm. (DP&I)

Further investigations have been undertaken by Centennial Mannering since the application was lodged and it has been determined that Centennial Mannering will not be seeking approval to mine within the Great Northern Seam as part of the application. As such Centennial Mannering is now only seeking a modification to Project Approval PA 06_0311 to allow for the extension of underground mining operations within the Fassifern Seam as described within Environmental Assessment. The following documentation has been prepared to address the change in proposed mining:

- A revised figure (Appendix 1) showing the Proposed Project Site boundary which supersedes the Figure 10 presented in the Environmental Assessment;
- A revised Statement of Commitments (Section 5.0) which supersedes the Statement of Commitments presented in Section 8.0 of the Environmental Assessment; and
- A new subsidence report (Appendix 2) reflecting the proposed mining in the Fassifern Seam only (Seedsman Geotechnics Pty Ltd, 25 July 2012) which supersedes the previous subsidence report (Seedsman Geotechnics, August 2011).

The proposed mining within the Fassifern Seam will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface.

4.2. Surface Water / Site Water Management

What is happening with the mine water from this mine. Is this mine water entering Lake Macquarie via the same creek as Lake Coal uses. Has any testing been done higher up this natural watercourse to see what contaminants have been deposited before reaching the discharge point of Lake Coal. (Individual)

Mannering Colliery discharges through a licensed discharge point into an unnamed creek. This unnamed creek flows into Lake Macquarie (Chain Valley Bay) approximately 1500 m downstream from the licensed discharge point. Chain Valley Colliery (Lake Coal) also discharges into the unnamed creek through a licensed discharge point which is about 1300 m downstream from Mannering Colliery.

Mannering Colliery's Environment Protection Licence (EPL), which includes both volumetric and concentration limits, permits the discharge of water from the site via two licensed discharge points (LDP001 and LDP002) into the unnamed creek. Centennial Mannering has undertaken water quality monitoring at the two LDPs and within the unnamed creek. The monitoring location within the unnamed creek is approximately 450 m downstream of Mannering Colliery.

A summary of the water quality results for the two LDPs and the unnamed creek is presented in the Water Management Assessment (GHD, 2011a) contained in Appendix J of the Environmental Assessment. The Water Management Assessment stated that "*water quality data at 'Downstream', LDP001 and LDP002 indicated that the quality of water leaving the site*

was generally below ANZECC/ARMCANZ (2000) trigger values and/or better than the water quality within Lake Macquarie”.

Centennial Manning will continue to undertake water quality monitoring in accordance with EPL 191 and the monitoring program outlined in Section 6.3 of the Water Management Assessment (GHD, 2011a) contained in Appendix J of the Environmental Assessment. Water quality monitoring is reported quarterly on Centennial's website and annually in the Annual Environmental Management Report (AEMR).

DP&I requirements identified that consideration should be given to the importance that CV colliery discharge mine water into the same creek as Manning colliery. The Water Management Assessment (Appendix J) has identified that the proposed mine extension is expected to increase water discharge in the unnamed creek, however, the report does not provide an assessment of what that impact will be. (LMCC)

The potential impact on the unnamed creek was presented in the Water Management Assessment (GHD, 2011a) contained in Appendix J of the Environmental Assessment. This information is summarised below.

Under current operating conditions, the average discharge from Manning Colliery into the unnamed creek is 1.05ML/day, however, the volume of underground mine water discharged on any given day can vary from 0 to a maximum of 2.7ML. Typically the underground discharge pump operates at full capacity on weekdays and is shut down on weekends. When the pump is operational at full capacity the pump discharge rate is 30L/s.

The project is expected to increase the volume of underground mine water discharged from LDP01, resulting in an average discharge of 2.0ML/day. The rate of pumping and the maximum daily discharge is not predicted to exceed the current operating conditions.

The discharge rates are in compliance with the approved volumetric limit in the Environment Protection Licence, which is 4ML/day at LDP01.

The discharges into the unnamed creek are in excess of the flows that would occur as a result of runoff generated from the contributing catchment, however, these discharges have been occurring for the life of the mine and as such, the existing environment within the unnamed creek has adapted to these flows. The Water Management Assessment did not predict any hydrologic or geomorphic impact on the unnamed creek, however, Centennial Manning has committed to undertaking a visual assessment of the unnamed creek every 6 months to monitor stability and erosion.

The Environmental Assessment does not appear to address the potential impact of the project on creeks and watercourses and does not propose any monitoring strategies. In particular, subsidence and dewatering impacts should be monitored in sensitive environments such as creek lines and ground water dependant ecosystems, (LMCC)

The potential impact on creeks and watercourses was presented in the Water Management Assessment (GHD, 2011a) contained in Appendix J of the Environmental Assessment. The potential impact was assessed on the basis that the proposed mining will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface which does not cause cracking or hydraulic connection to the surface.

The Water Management Assessment concluded that *“there will be no changes to the existing surface water behaviour”* and that *“impact on the geomorphology of surface waterways as a result of the Project is expected to be negligible”*

Recommends a review of the approved surface water monitoring and response plans. (NOW)

In 2011 an independent environmental audit was conducted on the Environmental Management System, which included review of the site Water Management Plan. Following approval of the S75W application Centennial Manning will review the existing management plans to ensure they meet requirements of the Project Approval.

4.3. Groundwater / Underground Water Management

Recommends a review of the approved ground water monitoring and response plans. (NOW)

Recommends ongoing monitoring of ingress volumes and sources occur in conjunction with verification of subsidence predictions. (NOW)

Reporting of ground water ingress to be included in the monitoring regime. (NOW)

In 2011 an independent environmental audit was conducted on the Environmental Management System, which included review of the site Water Management Plan. Following approval of the S75W application Centennial Manning will review the existing management plans to ensure they meet requirements of the Project Approval. Groundwater inflow volumes will continue to be monitored in accordance with the monitoring described within the existing Water Management Plan.

4.4. Terrestrial Ecology

What will be done about the infestation of pine trees that is now out of control in sensitive area's that has originated from the main entrance drive of a large row of pines. This is now infesting an area of endangered Charmhaven Apple Gum that has now been identified near this mine entry. (Individual)

The scope of the Terrestrial Flora and Fauna Impact Assessment (RPS 2011a) contained in Appendix J of the Environmental Assessment was limited to the areas potentially impacted by the proposed extension of mining, and does not include the mine entrance drive or the surrounding area.

The Manning Colliery entrance has a row of large pines which have been on the site for approximately 50 years which provides an effective visual screen between the Manning Colliery Surface Facilities area and Rutleys Road. Manning Colliery has an approved Landscape Management Plan which states that *"This vegetative screen will be maintained for the life of the mine, final land use following mine closure is to be determined, however at this time it is planned to return the site to native vegetation as Power Station buffer zone"*.

Centennial Manning is intending to progressively remove the pine trees on-site and undertake replacement planting of native vegetation (including *allocasuarina* species). Works will proceed in a progressive manner to ensure that the visual screen provided by the existing trees is maintained. No works are proposed outside the boundary of the Manning Colliery Surface Facilities area as this area is not owned or under the control of Centennial Manning.

There is a risk of significant impacts on Endangered Ecological Communities associated with even small levels of subsidence. Subsidence of lake fore shores wetland, saltmarsh and floodplain areas that support native vegetation (EEC) should be avoided. (LMCC)

Recommends that the proponent regularly monitors the health and extent of EEC vegetation above the modification footprint, particularly by remote sensing data, and also monitors the health of freshwater wetlands around Manning Bay and the lower reaches of Wyee Creek to ensure that threatened species habitat is maintained. (EPA)

Centennial Manning is proposing underground mining operations using bord-and-pillar mining where coal recovery is limited to first workings only. This mining method, combined with the mine design, will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface. The project is expected to have negligible surface impacts.

The potential impact on Endangered Ecological Communities was assessed within the Terrestrial Flora and Fauna Impact Assessment (RPS 2011a) contained in Appendix K of the Environmental Assessment. The Terrestrial Flora and Fauna Impact Assessment concludes that *“Due to negligible surface impacts, the proposed Project is unlikely to significantly impact on any species, population or ecological community listed under the TSC Act, Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) or SEPP44.”*

Subsidence monitoring marks have been installed in various locations as shown in Figure 9 of the Environmental Assessment. Monitoring of the existing marks will continue and additional subsidence monitoring marks will be installed above the proposed mining areas to measure the subsidence and verify that subsidence is within the predicted levels.

The Statement of Commitments includes the commitment that *“If monitoring indicates that mine-induced subsidence levels exceed 20 millimetres, a review will be undertaken to identify any potential impacts to terrestrial ecology.”*

EPA is concerned about activities that may facilitate the spread of ‘myrtle rust’ and recommends that the monitoring program should also include regular monitoring for myrtle rust. (EPA)

Centennial Manning is proposing underground mining operations using bord-and-pillar mining where coal recovery is limited to first workings only. This mining method, combined with the mine design, will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface. The project is expected to have negligible surface impacts. There are no activities proposed that would facilitate the spread of ‘myrtle rust’ and a program to specifically monitor ‘myrtle rust’ is not proposed.

4.5. Aquatic Ecology

The Aquatic Ecology Assessment is based on a literature review. Given the scale of the proposed project and area of foreshore potentially impacted an up to date survey of the aquatic environment should be conducted. (LMCC)

Centennial Manning is proposing underground mining operations using bord-and-pillar mining where coal recovery is limited to first workings only. This mining method, combined with the mine design, will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface. The project is expected to have negligible surface impacts.

Due to the scale of the predicted subsidence, the Aquatic Ecology Assessment was based on available existing information on the aquatic habitats, biota and fisheries of south-western

Lake Macquarie. Field surveys to collect additional data on the aquatic environment are unnecessary given the scale of the subsidence predictions.

Both an up to date aquatic survey and subsidence monitoring will provide assurance and a means of checking that the proposal is not impacting upon the aquatic environment. With out these measures there is no way of adequately monitoring the potential impacts of the proposal or identifying appropriate remediation strategies should an impact occur. (LMCC)

Centennial Manning is proposing underground mining operations using bord-and-pillar mining where coal recovery is limited to first workings only. This mining method, combined with the mine design, will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface. The project is expected to have negligible surface impacts.

The potential impact on aquatic ecology was assessed within the Aquatic Ecology Assessment (Cardno Ecology Lab 2011) contained in Appendix L of the Environmental Assessment. The Aquatic Ecology Assessment concludes that *“Given the limited extent of where the proposed extension of mining would overlap with sensitive habitats and the minimal amount of predicted subsidence (< 20 millimetres), the direct impacts to these habitats is considered to be negligible. Any indirect impacts on fisheries resources and threatened species, populations and ecological communities (including matters of NES), would also be unlikely and as such, no significant impact on these species would be expected.”* No specific mitigation or monitoring of the aquatic environment is recommended for the proposed extension of mining at Manning Colliery.

Subsidence monitoring marks have been installed in various locations as shown in Figure 9 of the Environmental Assessment. Monitoring of the existing marks will continue and additional subsidence monitoring marks will be installed above the proposed mining areas to measure the subsidence and verify that subsidence is within the predicted levels.

The Statement of Commitments includes the commitment that *“If monitoring indicates that mine-induced subsidence levels exceed 20 millimetres, a review will be undertaken to identify any potential impacts to aquatic ecology.”*

12-20mm subsidence will exacerbate the impact of predicted sea level rises of 30-50mm on areas that include lake foreshore, wetlands, tidal waterways. The combined effect on ecological communities may be significant. Mining below these areas should be avoided. If the proposed mine extension is allowed under these areas the potential changes in ecosystems due to subsidence and sea level rise should be identified, with potential retreat areas identified and protected. (LMCC)

The NSW Sea Level Rise Policy Statement (OEH, 2009) (The Statement) outlines the Government’s objectives and commitments with regard to sea level rise adaptation. The Statement discusses the impacts of sea level rise as well as identifies objectives and benchmarks to support communities and local councils to adapt to sea level rise in a way that minimises the resulting social disruption, economic costs and environmental impacts.

To assist in meeting the objectives of The Statement, the Government commits to supporting local councils and the community in adapting to sea level rise by:

- Promoting an adaptive risk-based approach to managing the impacts of sea level rise;
- Providing guidance to local councils to support their sea level rise adaptation planning;

- Encouraging appropriate development on land projected to be at risk from sea level rise;
- Continuing to provide emergency management support to coastal communities during times of floods and storms; and
- Continuing to provide up-to-date information to the public about sea level rise and its impacts.

Sea level rise along the NSW coast is predicted to rise 40 centimetres relative to 1990 mean sea levels by 2050 and 90 centimetres by 2100. The environment of Lake Macquarie would be expected to undergo changes of varying magnitudes over this period including to chemical composition, abundance and distribution of aquatic species, and relative lake depth. In addition to these natural changes, cumulative impacts may be expected with other developments that impact on the lake including residential, commercial and industrial developments.

The NSW Government Sea Level Rise Policy has been considered in Section 7.4.6 of the Environmental Assessment. While direct impacts to aquatic ecology are considered to be negligible, the Aquatic Ecology Assessment has identified several impacts that may cumulatively affect the ecological values of the aquatic environment which include climate change and sea level rise. The impacts of these broader issues are difficult to predict, however, Centennial Manning currently manages and monitors for potential impacts in relation to the existing Manning Colliery operations within Lake Macquarie. Any cumulative impacts outside of the management of Centennial Manning would require management at the catchment level. On this basis, no specific mitigation or monitoring of the aquatic environment is recommended as necessary for the proposed extension of mining at Manning Colliery. It is noted that the proposal will not extend the life of Manning Colliery beyond the existing approved 2018 life of the mine.

Subsidence monitoring marks have been installed in various locations as shown in Figure 9 of the Environmental Assessment. Monitoring of the existing marks will continue and additional subsidence monitoring marks will be installed above the proposed mining areas to measure the subsidence and verify that subsidence is within the predicted levels. The Statement of Commitments includes the commitment that *“If monitoring indicates that mine-induced subsidence levels exceed 20 millimetres, a review will be undertaken to identify any potential impacts to aquatic ecology.”*

4.6. Aboriginal Cultural Heritage

Consultation with the local Aboriginal community has not been undertaken in accordance with the ‘Aboriginal cultural heritage consultation requirements for proponents 2010’ as registered groups were excluded from surveys and groups attended surveys that were not registered. Equitable access to opportunity to participate and inform the assessment process or acknowledgement of the uniqueness of the two Countries has not been acknowledged or addressed. (EPA)

It appears that the groups excluded all identify with the Darkinjung Country. (EPA)

Consultation has been described within the Cultural Heritage Assessment (RPS 2011b) contained in Appendix F of the Environmental Assessment. The consultation has been undertaken in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010) and equitable access to opportunity to participate and inform the assessment process was acknowledged and addressed. All of the registered parties were provided opportunity to have input into the methodology, strategy for collecting information

and the draft report. The Aboriginal Cultural Heritage Consultation Requirements do not require all registered parties to attend the surveys, and accordingly, not all of the registered parties were invited to attend the surveys. The Awabakal Local Aboriginal Land Council (LALC), Bahtabah LALC and the Darkinjung LALC, as the lead organisations representing Aboriginal people in their respective areas, were invited to participate regardless of whether they were registered parties or not. It should be noted that Darkinjung LALC declined to attend the survey, stating that they required 6 weeks prior notice for participation in survey. Darkinjung LALC were also provided with the opportunity to review the draft report and did provide comment on the draft report.

Possibility that currently undetected Aboriginal cultural material may be present within the project area in those unsurveyed or low visibility areas. EPA therefore recommends that the proponent provide additional appropriate management strategies developed in consultation with the registered Aboriginal parties to the project to address this possibility. (EPA)

Centennial Manning is proposing underground mining operations using bord-and-pillar mining where coal recovery is limited to first workings only. This mining method, combined with the mine design, will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface. The project is expected to have negligible surface impacts.

The potential impact on cultural heritage was assessed within the Cultural Heritage Assessment (RPS 2011b) contained in Appendix F of the Environmental Assessment. The Cultural Heritage Assessment concludes that *“Due to the negligible surface subsidence impacts predicted as a result of the proposed Project, no impacts to identified Aboriginal cultural heritage sites or any potential Aboriginal cultural heritage or non-indigenous heritage sites are anticipated.”*

Subsidence monitoring marks have been installed in various locations as shown in Figure 9 of the Environmental Assessment. Monitoring of the existing marks will continue and additional subsidence monitoring marks will be installed above the proposed mining areas to measure the subsidence and verify that subsidence is within the predicted levels.

The revised Statement of Commitments includes the following commitments:

- *“If monitoring indicates that mine-induced subsidence levels exceed 20 millimetres, a review will be undertaken to identify any potential impacts to cultural heritage in consultation with OEHL.”*
- *“All relevant Centennial Manning staff and contractors will be made aware of their statutory obligations for Aboriginal cultural heritage under the NP&W Act as part of the existing mine induction process.”*
- *“An Aboriginal Cultural Heritage Management Plan (ACHMP) will be developed for the identified Aboriginal heritage items within the Project Site in consultation with the relevant Aboriginal stakeholders. If additional sites are identified they will be assessed for cultural significance and be incorporated into the ACHMP.”*
- *“In the unlikely event that skeletal remains are identified, the NSW Police Coroner will be contacted to determine if the material is of Aboriginal origin. If determined to be Aboriginal, contact will be made with the OEHL, a suitably qualified archaeologist and representatives of the relevant Aboriginal stakeholder groups to determine an action plan for the management of the skeletal remains and formulate management recommendations if required.”*

Centennial has recently completed the development of the AHCMP and this was submitted to DP&I for approval on 17 August 2012. The AHCMP sets out protocols for the identification, monitoring and management of Aboriginal material culture, and provides a consistent approach to consultation between Centennial and the Aboriginal community for Centennials Northern Holdings. The ACHMP was prepared in consultation with various Aboriginal parties including those who registered an interest in this project.

The project is expected to have negligible surface impacts and Centennial Manning considers that the existing commitments and ACHMP adequately address the potential impact to cultural heritage. The ACHMP will be updated where required to address any specific conditions of approval should the project be approved.

EPA recommends that the proponent detail a more robust method of future assessment, evaluation and monitoring program, in consultation with register Aboriginal parties. (EPA)

Centennial has recently completed the development of the AHCMP and this was submitted to DP&I for approval on 17 August 2012. The AHCMP sets out protocols for the identification, monitoring and management of Aboriginal material culture, and provides a consistent approach to consultation between Centennial and the Aboriginal community for Centennials Northern Holdings. The ACHMP was prepared in consultation with various Aboriginal parties including those who registered an interest in this project.

4.7. Non-Indigenous Heritage

The Heritage Council is concerned that unidentified non-indigenous heritage may be impacted. The Heritage Branch requests the addition of a fourth Commitment as a precaution, the cessation of work in the affected area upon identification of significant items and written notification of such discoveries. (Heritage Branch)

Centennial Manning is proposing underground mining operations using bord-and-pillar mining where coal recovery is limited to first workings only. This mining method, combined with the mine design, will achieve long-term stable pillars resulting in less than 20 millimetres of subsidence on the surface. The project is expected to have negligible surface impacts.

The potential impact on heritage was assessed within the Cultural Heritage Assessment (RPS 2011b) contained in Appendix F of the Environmental Assessment. The Cultural Heritage Assessment concludes that *“Due to the negligible surface subsidence impacts predicted as a result of the proposed Project, no impacts to identified Aboriginal cultural heritage sites or any potential Aboriginal cultural heritage or non-indigenous heritage sites are anticipated.”*

Subsidence monitoring marks have been installed in various locations as shown in Figure 9 of the Environmental Assessment. Monitoring of the existing marks will continue and additional subsidence monitoring marks will be installed above the proposed mining areas to measure the subsidence and verify that subsidence is within the predicted levels.

The revised Statement of Commitments includes the following commitments:

- *“If monitoring indicates that mine-induced subsidence levels exceed 20 millimetres, a review will be undertaken to identify any potential impacts to non-indigenous heritage.”*
- *“All relevant Centennial Manning staff and contractors will be made aware of their statutory obligations for European cultural heritage under the Heritage Act 1977 as part of the existing mine induction process.”*

- *“If, during the course of development works, significant non-indigenous cultural heritage material is uncovered within the Project Site, the Heritage Branch of OEH will be notified and any required monitoring or management strategies instigated.”*

Centennial Manning considers that the inclusion of a fourth commitment requiring the cessation of work is not warranted given that the project is expected to have negligible surface impacts. The existing commitments adequately address the potential impact to non-indigenous heritage.

4.8. Air Quality

Mines present hazards in the form of particle dust. (Individual)

Increase in coal dust. (Individual)

With the increase complaints of coal dust from residents of Manning Park, who owns the coal dust. Delta, Lake Coal or Manning colliery. (Individual)

The potential impact on air quality was assessed within Section 7.7 of the Environmental Assessment. Under the proposed modification there shall be no increase in coal production and no changes to the methods of coal mining, handling and transport, mine ventilation and gas management, or involve any additional surface infrastructure. On this basis, dust emissions are not expected to increase or alter noticeably from those previously assessed and approved under Project Approval PA 06_0311.

Manning Colliery operates a network of 5 dust depositional gauges within the project site (Figure 9 of the Environmental Assessment) in accordance with the approved Air Quality Management Plan (2008). The mitigation measures at Manning Colliery include:

- Road sweeping of hardstand areas;
- Water sprays on conveyor;
- Enclosed conveyors;
- Water cart spraying of unsealed areas; and
- Stockpile maintained at minimum level.

The dust depositional monitoring results for the period from 2005 to 2010 (as presented in Section 7.7 of the Environmental Assessment) demonstrate that the management strategies and mitigation measures effectively control the potential dust impacts from Manning Colliery.

The Statement of Commitments includes the commitment that *“A review of dust management strategies and mitigation measures will be undertaken against the best practice dust mitigation measures identified in the NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining (Katestone Environmental Pty Ltd 2011), which was prepared for OEH. The review will identify any additional dust management practices that are reasonable and feasible for implementation at Manning Colliery and will be undertaken generally in accordance with any requirements of a pollution reduction program that may be imposed by the OEH on the Manning Colliery EPL in the future.”*

As reported in the Manning Colliery AEMR for 2011, there were no community or environmental complaints received during the reporting period, which was January 2011 to December 2011. Manning Colliery has not received any community or environmental complaints in 2012.

4.9. Noise

Mines present hazards in the form of noise. (Individual)

DP&I requirements identified that the EA should consider if all reasonable and feasible noise mitigation measures are being employed by the colliery. The EA considers whether an increase in noise in relation to the mine extension is likely. The EA reports on current noise levels but does not make any assessment or provide a review of current mitigation measures and any further mitigation measures that may be required. (LMCC)

The potential noise impact was assessed within Section 7.8 of the Environmental Assessment. Existing noise mitigation and management methods currently implemented at Manning Colliery include:

- Standard work procedures and maintenance tasks to minimise noise emissions;
- All conveyors on-site are fully enclosed; and
- CHP and rotary breaker are partially enclosed (including noise attenuation curtain).

An Independent Environmental Audit was conducted in 2011 by URS. The summary of the noise monitoring program adequacy review stated *“During the site inspection, local sensitive receiver locations were attended by the auditors and it was found that no audible noise could be distinguished as to be coming from the colliery. Generally, it was found that the Noise Monitoring Program sufficiently addresses the requirements of Condition 3 of Schedule 3 of the Project Approval.”*

Quarterly operator attended noise surveys have been conducted by SLR during 2009, 2010 and 2011. SLR concluded for each of the surveys that *“noise emissions from colliery operation were considered to be in compliance with the noise criteria set out by the Department of Planning at all receiver locations.”*

Under the proposed modification there will be no changes to the methods of coal mining, handling and transport, mine ventilation and gas management, or involve any additional surface infrastructure. The additional mining equipment required to support the Extension of Mine Project and any additional staff traffic movements is unlikely to noticeably increase noise emissions. The Environmental Assessment identified that noise emissions are not expected to increase or alter noticeably from the current levels and that all noise surveys conducted have complied with the set criteria.

Centennial Manning will continue to employ the management strategies and mitigation measures that are currently in place to minimise noise emissions. Centennial Manning considers that further mitigation measures are not required.

4.10. Greenhouse Gas Emissions

A condition be included which requires the offsetting of direct greenhouse gas emissions from mining operations. (WSC)

For the period 1 July 2012 to 30 June 2015 (referred to as the “fixed price period”), a tax will be applied to liable entities for emissions of CO₂-e, commencing at \$23/tonne CO₂-e and indexed at 2.5% real per year. Centennial will be required to pay the relevant \$/t CO₂-e depending on the year the liability is incurred.

The proposed modification does not result in any increases in coal volume productions beyond what has already been assessed and approved under Project Approval PA 06_0311. The Environmental Assessment stated that *“greenhouse gas emissions are not expected to increase or alter noticeably from those previously assessed and approved under PA 06_0311. The additional mining equipment required to support the Extension of Mine Project is unlikely to have any significant impact upon greenhouse gas emissions.”*

Centennial Manning implemented an Energy Savings Action Plan in accordance with Condition 22, Schedule 3 of Project Approval PA 06_0311 (which was approved by the Department of Planning on the 20th October 2008) and has implemented an Energy Efficiency Opportunity program in accordance with the requirements of the Energy Efficiency Opportunity Act 2006. The implementation of the energy saving opportunities has provided Centennial Manning with annual net energy savings of 5557 GJ. Centennial Manning is committed to monitoring and reducing emissions and energy use through the ongoing implementation of the Energy Savings Action Plan.

4.11. Traffic and Transport

Mines present hazards in the form of increased traffic. (Individual)

The potential impact on traffic was assessed within the Traffic Impact Assessment (Parsons Brinkerhoff 2011) contained in Appendix M of the Environmental Assessment. The Traffic Impact Assessment has identified that impacts associated with the additional employment proposed as part of the Extension of Mine Project will be negligible. The additional employees will have minimal to no impact on performance of the existing road network and intersection in terms of capacity and operation.

No coal, waste, tailings, etc. is to be trucked onto public roads from the site. (WSC)

There is no coal production waste or reject material generated on-site and there will be no coal transported on public roads. In accordance with the Condition 7 of Project Approval PA 06_0311 all coal produced on the site is transported by overland conveyor to Vales Point Power Station.

The intersection construction to include the provision of a CHR intersection in accordance with the engineering plans and specifications. (WSC)

The Rutleys Road – Manning Colliery Access Road intersection has been designed in consultation with Wyong Shire Council and includes the provision of a CHR intersection. The design has been recently approved in construction certificate No. SCC/69/2011.

Section 117 (2) direction 3.4 under the Environmental Planning and Assessment Act 1979, should be taken into account in relation to the provision of adequate access to public transport. (RMS)

The Mannering Colliery surface facilities are serviced by public transport. Wyee Railway Station, which is on the main Sydney to Newcastle railway line, is approximately 8 km's from Mannering Colliery and would allow employees from the Newcastle and Central Coast areas to utilise this public transport service if required. Busways runs regular bus routes along Rutleys Road which connects to surrounding areas and to the train stations at Wyee and Morisset. The closest bus stop is located near the Rutleys Road – Pacific Highway intersection, located approximately one kilometre from the Mannering Colliery entrance. There does not appear to be any current utilisation of public transport services to access the site. Private transport is used by employees which is considered to be acceptable due to the remote location of the site in relation to major townships, the dispersed location of employees throughout the region, and the shift work schedules utilised on site

As noted within the Traffic Impact Assessment, the remote location in relation to major townships does not encourage cycling or walking trips as a travel mode to work. Due to its rural location, there are no dedicated cycling or pedestrian facilities; such as bike lanes, off-road shared paths or footpaths in the vicinity. This means that pedestrians and cyclists accessing the site would need to share the travel lanes on Rutleys Road. This is not considered a particular safe environment and would discourage the use of these transport modes to access the site.

4.12. Socio-Economic

A contribution per tonne of coal to be put into a community trust fund (Individuals)

The Community Enhancement Program be extended to include the coal produced under the proposed expansion. (WSC)

In compliance with Condition 12 of Schedule 2 of the Project Approval PA 06_0311, Mannering Colliery operates under a Community Enhancement Program, whereby Centennial Mannering pays the affected local councils \$0.02 (subject to consumer price index) for each tonne of ROM coal produced. This contribution is shared equally between Lake Macquarie City Council and Wyong Shire Council.

The Community Enhancement Program contribution shall continue for coal extracted from areas of mining proposed as a part of this modification.

4.13. Rehabilitation

DRE recommends approval with the inclusion of the conditional requirements to amend the Mining Operations Plan and review the Annual Environmental Management Report, including integrated rehabilitation and environmental management. (DRE)

Mannering Colliery has a current Mining Operations Plan that is valid until December 2012. The Mining Operations Plan will be amended to reflect the proposed modification and will include integrated rehabilitation and environmental management.

The most recent AEMR for Mannering Colliery was produced for the period of January 2011 to December 2011. Mannering Colliery will continue to produce AEMR for each calendar year, which will include integrated rehabilitation and environmental management.

4.14. State Conservation Area

Provision of a plan showing the State Conservation Area and identification of the depth limit associated with the State Conservation Area (DP&I)

It is noted that the letter from Centennial to DP&I dated 27 February 2012 (Appendix 3) included the plan PC4016 which shows the extent of the State Conservation Area within the Proposed Project Area. Since the submission of this letter, Centennial has reviewed the NSW Gazette notices and legislative instruments that define the State Conservation Area boundaries. The depth restriction for the Lake Macquarie State Conservation Area is from the surface to 40 metres below surface. Centennial Manning is proposing underground mining operations within the Fassifern Seam which lies at around 150 to 205 metres deep. Subsequently, landholder consent is not required for the proposed mine workings below the Lake Macquarie State Conservation Area.

4.15. Monitoring

DP&I requirements include consideration of outcomes of environmental monitoring since project approval for the mine was granted. The EA does not appear to include any such report on the monitoring outcomes. The EA did not refer to any report of these outcomes and states that the intent is to continue with the existing monitoring. (LMCC)

The NSW DP&I stated (15/09/11) that Centennial Manning “*should prepare the EA in the manner proposed in the briefing paper*” and that “*The EA should also consider the outcomes of environmental monitoring undertaken since project approval was granted for the mine.*”

Centennial Manning undertakes an Environmental Monitoring Program which meets the requirements of the Project Approval PA 06_0311 and Environment Protection Licence 191. The environmental monitoring network includes monitoring of dust, noise, surface water and subsidence. The various monitoring sites are identified on Figure 9 of the Environmental Assessment. Monitoring results are reported quarterly on Centennial’s website and annually in the AEMR. The AEMR is provided to relevant state government agencies and is available for download from the Centennial web site (www.centennialcoal.com.au). The AEMR:

- provides a summary of the monitoring results for the past year;
- provides an analysis of results against previous years;
- provides an analysis against predictions in the Environmental Assessment; and
- identifies trends in monitoring results over the life of the project.

The Environmental Assessment was prepared with detailed consideration of previous monitoring outcomes. AEMR is referenced throughout the Environmental Assessment including in Sections 4.7 (Subsidence Monitoring), 4.10 (Water Management), 4.14 (Environmental Management and Monitoring), 4.15 (Environmental Compliance), 5.6 (Environmental Management and Monitoring), 7.1 (Subsidence), 7.2 (Water Management), 7.7 (Air Quality) and 7.8 (Noise).

The environmental monitoring of dust, noise, surface water and subsidence was considered and reported on within the Environmental Assessment. In particular:

- Section 4.7 (Subsidence Monitoring) of the Environmental Assessment shows consideration of the outcomes of environmental monitoring undertaken since project approval was granted and supports the prediction of negligible impact;
- Section 7.7 (Air Quality) of the Environmental Assessment shows a consideration of the outcomes of environmental monitoring undertaken since project approval was granted and supports the prediction of negligible impact;
- Section 7.8 (Noise) of the Environmental Assessment shows a consideration of the outcomes of environmental monitoring undertaken since project and states that *"Noise emissions from colliery operation were considered to be in compliance with the noise criteria set out by the Department of Planning at all receiver locations."*; and
- Appendix J (Water Management Assessment) of the Environmental Assessment shows a consideration of the outcomes of environmental monitoring undertaken since project approval was granted. Water quality data taken from January 2007 to June 2011 was reviewed for the Water Quality Assessment.

As stated in Section 8.0 (Statement of Commitments) of the Environmental Assessment the monitoring program will be reviewed and updated, as required, to incorporate the Extension of Mine Project, commitments made in this EA and any additional consent conditions.

5. STATEMENT OF COMMITMENTS

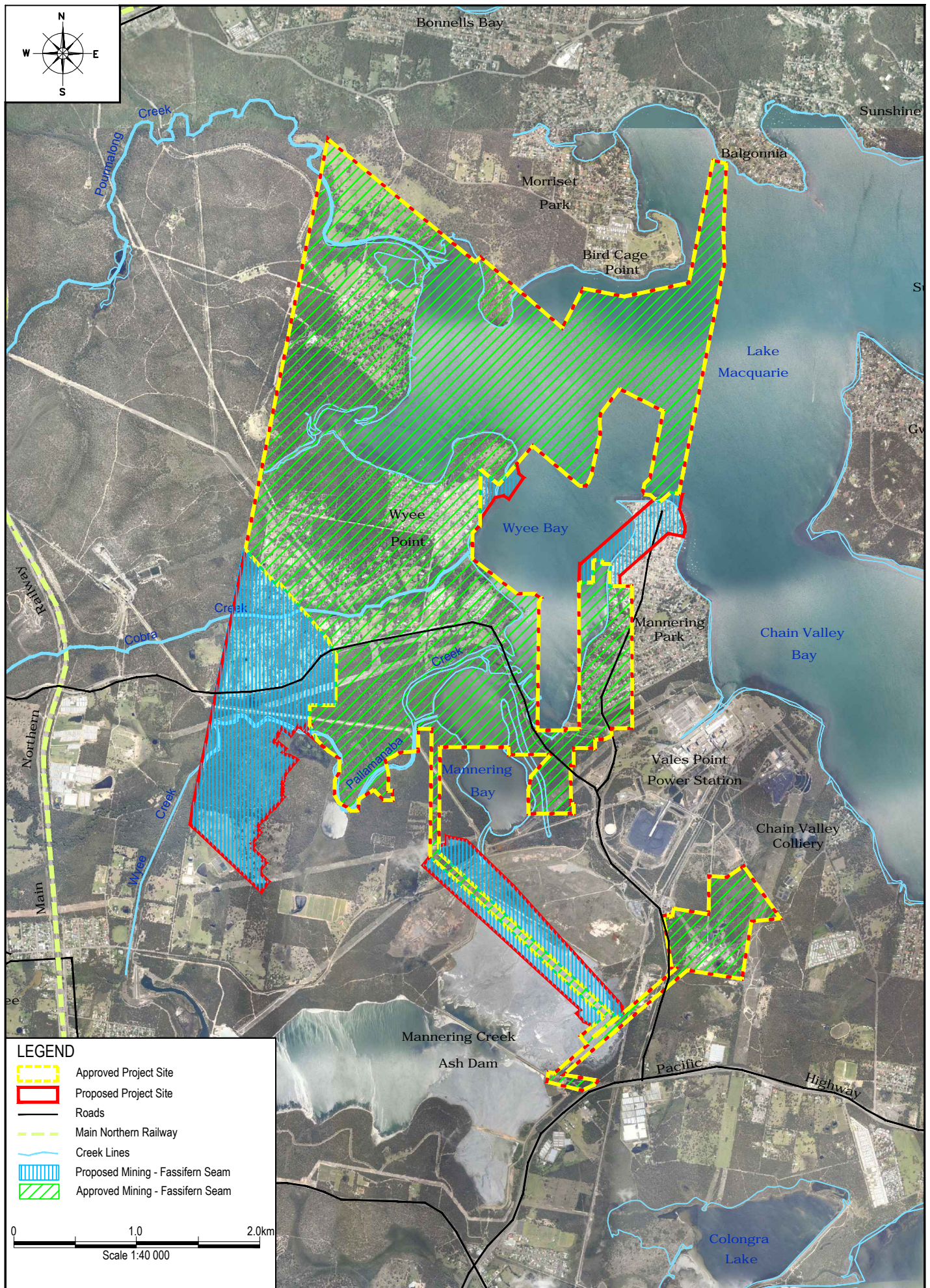
A revised Statement of Commitments for the project has been provided in Table 2.

Table 2 – Revised Statement of Commitments

Subsidence
Mining to be limited to the approved bord-and-pillar method where coal recovery is limited to first workings only.
Monitoring of the existing subsidence monitoring marks will continue and additional subsidence monitoring marks will be installed above the proposed mining areas to measure the subsidence and verify that subsidence is within the predicted levels.
If it is identified that subsidence levels are greater than the predicted maximum of 20 millimetres, the DTIRIS Minerals Division will be consulted to determine appropriate management and mitigation actions.
Water Management
The water level within the sediment pond system will be monitored and kept at a relatively low operating level, such that the ponds can provide a detention function in a significant rainfall event.
A visual assessment of the unnamed creek will be undertaken every 6 months to monitor stability and erosion.
Where practicable, underground water levels will be recorded to monitor changes in the level of water stored in underground depressions and to verify that the rate of extraction is sufficient.
The extraction of underground water from the mine workings will be undertaken in accordance with the Bore License (20BL172016) issued under the Water Act 1912.
To enable on-going assessment of the quality of water discharged, the existing monitoring program will be maintained for the life of the Project with the following enhancements: <ul style="list-style-type: none"> • An assessment of the surrounding catchments summarising land uses and other background information to characterise an appropriate water quality; and • Annual monitoring of heavy metals at the monitoring location identified as 'Downstream'.
Terrestrial Ecology
If monitoring indicates that mine-induced subsidence levels exceed 20 millimetres, a review will be undertaken to identify any potential impacts to terrestrial ecology.
Aquatic Ecology
If monitoring indicates that mine-induced subsidence levels exceed 20 millimetres, a review will be undertaken to identify any potential impacts to aquatic ecology.
Aboriginal Heritage
If monitoring indicates that mine-induced subsidence levels exceed 20 millimetres, a review will be undertaken to identify any potential impacts to cultural heritage in consultation with OEH.
All relevant Centennial Manning staff and contractors will be made aware of their statutory obligations for Aboriginal cultural heritage under the NP&W Act as part of the existing mine induction process.

An Aboriginal Cultural Heritage Management Plan (ACHMP) will be developed and implemented for the identified Aboriginal heritage items within the Project Site in consultation with the relevant Aboriginal stakeholders. If additional sites are identified they will be assessed for cultural significance and be incorporated into the ACHMP.
In the unlikely event that skeletal remains are identified, the NSW Police Coroner will be contacted to determine if the material is of Aboriginal origin. If determined to be Aboriginal, contact will be made with the OEH, a suitably qualified archaeologist and representatives of the relevant Aboriginal stakeholder groups to determine an action plan for the management of the skeletal remains and formulate management recommendations if required.
European Heritage
If monitoring indicates that mine-induced subsidence levels exceed 20 millimetres, a review will be undertaken to identify any potential impacts to non-indigenous heritage.
All relevant Centennial Mannering staff and contractors will be made aware of their statutory obligations for European cultural heritage under the Heritage Act 1977 as part of the existing mine induction process.
If, during the course of development works, significant non-indigenous cultural heritage material is uncovered within the Project Site, the Heritage Branch of OEH will be notified and any required monitoring or management strategies instigated.
Air Quality
A review of dust management strategies and mitigation measures will be undertaken against the best practice dust mitigation measures identified in the NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining (Katestone Environmental Pty Ltd 2011), which was prepared for OEH. The review will identify any additional dust management practices that are reasonable and feasible for implementation at Mannering Colliery and will be undertaken generally in accordance with any requirements of a pollution reduction program that may be imposed by the OEH on the Manning Colliery EPL in the future.
Traffic
Centennial Mannering will upgrade the Rutleys Road - Mannering Colliery Access Road intersection to improve safety and operational efficiency.
Socio-Economic
Centennial Mannering is committed to on-going community consultation and will continue to engage the community for the purposes of providing information relating to on-going operations and the Extension of Mine Project.
Rehabilitation
The Mining Operations Plan will be amended to reflect the proposed modification and will include integrated rehabilitation and environmental management.
Monitoring
The Environmental Monitoring Program will be reviewed and updated, as required, to incorporate the commitments made in the Environmental Assessment and any additional consent conditions.

Appendix 1 – Revised Figure showing Proposed Project Site



To be printed A4

Appendix 2 – Revised Subsidence Report



Wednesday, 25 July 2012

REF: Mannering 73.docx

Mr A Klein
Manager of Mining Engineering
Centennial Mannering Pty Ltd
PO Box 1000
Toronto NSW

Dear Alan,

Re: Mannering Colliery, Section 75W Modification to Project Approval 06 0311

1 INTRODUCTION

It is understood you are preparing a Section 75W submission to extend the area of Fassifern Seam workings. This report is provided to complement a more detailed submission on the environmental impacts being prepared by Centennial Coal. The report provides a justification for the mine plan from a subsidence deformation perspective and should be considered as a necessary but not sufficient treatment of all the requirements for a Section 75 variation. The report supersedes our earlier report (Mannering65) which addressed mining in other seams as well as the Fassifern Seam.

It is understood the pillars in the Fassifern Seam are to be formed on 30m centres in panels of 6 headings with inter-panel pillars of 54.5m. This is basically the same layout as has been used over the last few years. Figure 1 shows the location of the proposed additional workings to existing workings (end 2011) in the Fassifern Seam.

In terms of ply thicknesses, it is understood Fassifern Seam is similar to that which has been mined recently. Mining in the Fassifern Seam is based on a 3.2m section of coal beneath the B ply – about 1.0m - 1.2m of inferior coal is left in the roof. The depth of cover (160-200m) is in a similar range as has been encountered recently (Figure 1).

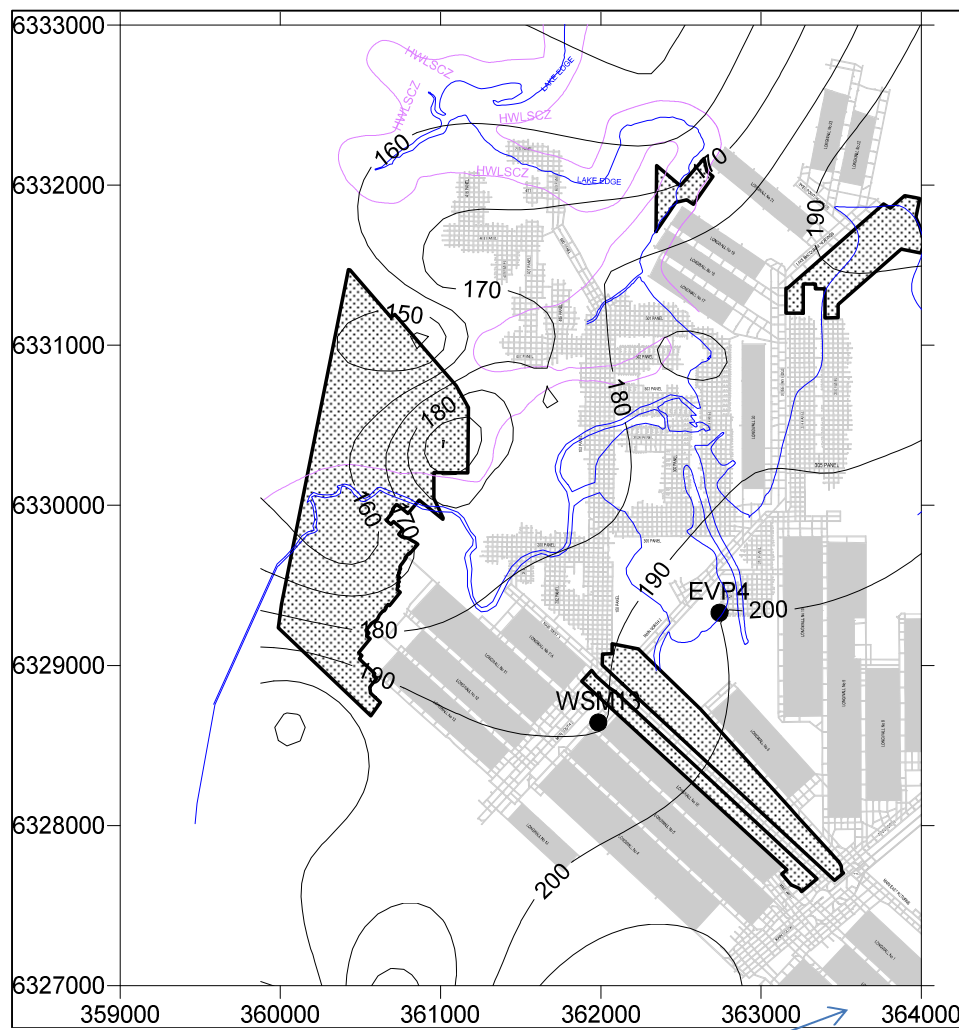


Figure 1 Proposed Fassifern areas with respect to existing Fassifern mining and also depth of cover

2 PREVIOUS SUBSIDENCE

Since mining recommenced in the Fassifern Seam at Mannering in 2004 there has been no failure of pillars. There is some slowly developing outbye floor heave but this is not associated with damage to the pillar ribs and hence does not impact on pillar stability.

Subsidence surveys have been conducted along the conveyor, Vales Road, Rutleys Road and at some of the transmission towers. The patterns of greater movements above the pillar panels as compared to the inter-panel pillars indicate that there are certainly mining-induced movements at the surface, albeit of very small magnitude. Table 1 lists the maximum subsidence values along the various lines as of early 2010 or May 2012. Along the Rutleys Road survey line in particular there is evidence of shrink/swell movements of in excess of 40mm.

Table 1 indicates the maximum subsidence induced by the recent Fassifern Seam first workings is between 8mm and 15mm, with an average of 12mm. In this table the mining-



induced values represent the vertical movements that are in excess of the survey precision that is revealed by the resurvey of pegs that are located distant from the mining. Survey precision is controlled by the sensitivity of the survey tools that are used, and this is separate from impacts of shrink/swell that are discussed later.

Table 1 Summary of maximum vertical subsidence recorded above the Fassifern workings at Mannering

Survey line	Subsidence Peg	Subsidence (mm)	Precision Peg	Precision (mm)	Mining induced (mm)
Vales Road	V11	3	V6	3	
Vales Road	V12	4	V6	3	
Towers (8/5/2012)	TG/26/92/9	22	VP50002-A	7	15
Towers (8/5/2012)	VP50000-a	19	VP50002-A	7	12
Towers	95TL62-a	4	estimate	4	
Conveyor	FC10	12	estimate	3	9
Rutleys Road (8/5/2012)	RR20	18	estimate	5	13

From what is known of the Fassifern Seam, there is no reason to indicate these subsidence outcomes will not continue – the depths, the seam and the pillar and roadway dimensions are all similar to those encountered or adopted to date.

3 ASSESSMENT

The pillars within the panels are on 30m centres with width to height ratios in excess of 8:1. The inter-panel pillars have width to height ratios of 17. The assessment of pillar stability is based on an international database of pillar collapse and in which there has been no recorded collapse of coal pillars (where failure has been within the coal itself) with width to height ratios greater than 5.0. Even if/when the coal roof collapses, the width to height ratios of the proposed pillars are greater than 5.0. On this basis the proposed pillars are assessed to be long-term stable.

The same layout at similar depths is being proposed in the same seam – it is valid to assume the engineering outcomes will be the same. The Fassifern Seam has induced an average of 12mm of maximum subsidence and it is predicted that this behaviour will continue.

It is also important to note that the subsidence movements under consideration in this report approach the limits of precision of the survey methods (circa 5mm) and are well within the usual shrink/swell range for the district. Delaney et al (2005)¹ state: *“The observed reactive soil ground surface movements in open ground areas across the region range between 7 mm and 58 mm with an average of 29 mm. Using the approach suggested by AS2870, on average these movements can be reasonably reliably predicted, although the average error between predictions and observations is up to 11 mm and in individual cases the errors may be as large as 30 mm.”*

¹ Field monitoring of expansive soil behaviour in the Newcastle-Hunter Region. Australian Geomechanics, 40, 2, 3-14.



The implication of these anticipated soil movements is it will be very difficult to resolve the predicted mining-induced movements from those naturally occurring on a seasonal basis if the surface is not rock. It is possible that 20mm of combined surface movement (mining and reactive soil) or even more could be recorded in particularly dry times on areas not founded on rock.

For maximum vertical subsidence levels of less than 20mm, any associated maximum tilts or strains are predicted to be less than about 0.5 mm/m.

Yours truly,



Ross Seedsman

Appendix 3 - Letter from Centennial to DP&I dated 27 February 2012



27 February 2012

Mr C. Phillips
Senior Planner
Department of Planning and Infrastructure
GPO Box 39
Sydney NSW 2001

Dear Mr Phillips

Re: Mannering Colliery Extension of Mine Project

Please find below a response to the questions raised in your email dated 7 February 2012 regarding the Mannering Colliery Extension of Mine Project Environmental Assessment.

1. How does continuing operations at Mannering at the same rate and delivering coal only to Vales Point Power Station allow for coal from other Centennial operations to be directed to alternative export markets?

Mannering Colliery is approved to produce up to 1.1 Mtpa of coal which is delivered directly to the Vales Point Power Station under the Mandalong Mine contract. Mannering Colliery has yet to achieve the approved extraction volume of 1.1 Mtpa averaging only 686,335 tonnes per annum over the past five years. The extension areas proposed by the Mannering Colliery modification will provide access to a better quality coal resource, potentially allowing the Mannering Colliery to reach the approved 1.1 Mtpa production rate. The anticipated 60% increase in production at the Mannering Colliery will free up to 410,000 tpa of coal from the Mandalong Mine for transport into the export market.

2. The modification will be difficult to justify unless there are figures provided on the value of the coal to be recovered, wages to be paid, flow on effects etc.

The coal to be recovered from the proposed extension of mining area has an estimated value to Centennial of approximately \$16.6 million a year which will contribute approximately \$1.2 million a year in royalties to the State government. The additional 40 employees required for the project will see approximately 5.8 million paid in wages and on-costs. As is identified in section 7.14 of the Environmental Assessment, the actual multiplier effect of this employment is not known; however it is felt that a factor of four would be a conservative estimate.

3. How many additional workers will the project create?

Centennial Mannering is approved to employ up to 90 full time employees at the Mannering Colliery. Currently 130 full time employees are operating at the Mannering Colliery. The proposed project will create an additional 40 full time employees above the current employment level of 130, resulting in a total full time workforce of 170 employees.

4. A plan is required to show the current approval area, the proposed approval areas and the State Conservation Areas.

Please see plan PC4016 provided as Attachment 1 to this letter. Centennial is currently seeking further advice as to the depth restrictions under the State Conservation Areas. Centennial will provide an amended plan that identifies the correct depth restrictions once this advice has been received.

5. Does the Lake Macquarie Local Environment Plan include an overriding clause that allows underground mining in all zones?

Amendment number 55 to the Lake Macquarie Local Environmental Plan published on 10 June 2011, omitted clause 19 'Development for the purpose of a mine' which had provided permissibility for mining in all zones.

6. What is the amount of subsidence predicted from mining in the eastern area of the Great Northern seam? Does this coincide with mining in the Fassifern seam? Is combined subsidence predicted to be greater than 20 mm in any areas?

Mining within the Great Northern seam is largely restricted to areas of 0.5 metres or less of the soft, low strength tuff layer in the floor (i.e. the western area only). In areas where the soft, low strength floor is less than 0.5 metres in thickness, 8mm of vertical subsidence is predicted. The Fassifern seam has induced an average of 11 mm of maximum subsidence and it is predicted that this level of subsidence from mining within the Fassifern seam will continue. The subsidence assessment indicates that for the proposed pillars on 30 metre centres that there is little likelihood that surface deformations will exceed 20 mm for the combined Fassifern and Great Northern seams. The panel referred to as GS36 is in an area where the Fassifern seam has not been mined and hence there will have been no surface subsidence. Given the thickness of low strength floor in this area (0.7m) the likely vertical subsidence over this panel is 10 mm. No mining proposed as part of this modification is predicted to exceed 20 mm of vertical subsidence.

The subsidence predictions for the Great Northern seam depends on the validity of the subsidence model for the thickness and strength of the low strength tuff layer in the floor. As such, this will be checked during mining using coring under the pillars, geotechnical logging and geotechnical assessment of the results in terms of bearing capacity and deformation.

7. Why is the existing underground inflow indicated at 450ML/year for year 2002 and outflow is only 300 ML/year

The groundwater inflows are an output from the groundwater model developed for the project which identified a constant daily inflow into the underground workings. The groundwater outflows were modelled using observed data from the site for a period of approximately 10 years. Flow out of the underground is limited by the rate of pumping. The pumping rate of the mine varied from year to year and no clear relationship could be determined at the time of modelling. As such, it was determined that the observed data set should be used to better represent the existing condition. Hence, for the year 2002, this produced a volume extracted from the underground of 300.26 ML. As the inflow exceeds the outflow (which was limited by the daily pump rate) then the residual is left to be managed underground within the storages present. More detailed information in regards to this matter is provided in the Water Balance Report located in the Appendix of the Water Management Assessment.

8. Has Centennial Mannering already received approval from Wyong Council for the upgrades to the mine entry road and Rutley's Road intersection?

Approval for the intersection upgrades were granted by Wyong Shire Council on 24 November 2011 (Construction Certificate SCC/69/2011). At the time of writing the Environmental Assessment, discussions were still being held over the final intersection design.

If you have any further questions in regards to this matter, please contact James Wearne on 0407 207 530.

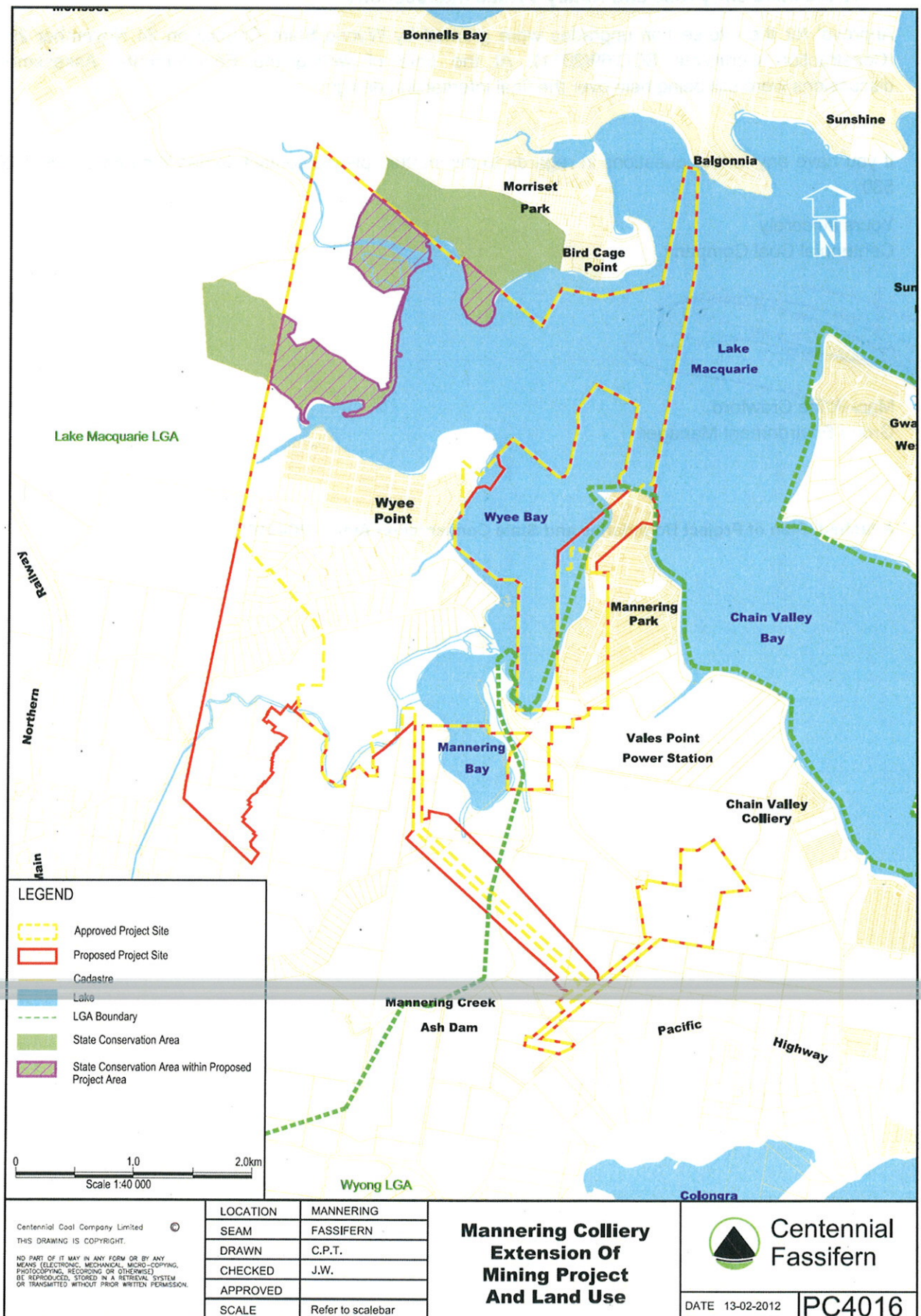
Yours sincerely
Centennial Coal Company



Mary-Anne Crawford
Group Environment Manager

Attached: Plan of Project Boundaries and State Conservation Areas (PC4016)

Attachment 1 – Plan of Project Approval Boundaries and State Conservation Areas





Centennial Coal

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