Centennial Coal

Angus Place

Longwalls 900W and 910

Public Safety Management Plan

Angus Place Colliery

November 2013

Centennial Coal

Environment Matters

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Abbreviations

AEMR	Annual Environmental Management Report (now known as Annual Review)
CCL	Consolidated Coal Lease
DECCW	Former NSW Department of Environment, Climate Change and Water
DgS	Ditton Geotechnical Services
DP&I	NSW Department of Planning and Infrastructure
DTIRIS	NSW Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy
EA	Environmental Assessment
EPL	Environmental Protection Licence
FCNSW	Forestry Corporation of NSW
GNSS	Global Navigation Satellite Systems
ML	Mining Lease
Mtpa	Million tonnes per annum
OEH	NSW Office of Environment and Heritage
ROM	Run of mine
SMP	Subsidence Management Plan
TARP	Trigger Action Response Plan

1. INTRODUCTION

Angus Place Colliery (Angus Place) is an underground coal mining operation located approximately five kilometres north of the village of Lidsdale, eight kilometres northeast of the township of Wallerawang and approximately 15 kilometres northwest of the city of Lithgow in the Blue Mountains region of NSW. It is bordered by Springvale Colliery to the south, Ivanhoe Colliery to the northwest and Wolgan Valley and Newnes Plateau to the north and east, respectively. The regional locality of Angus Place is shown on **Figure 1**.

Angus Place has been in operation since 1979 and is operated by Centennial Angus Place Pty Ltd, a joint venture company owned in equal share between the Centennial Coal Company Ltd and SK Kores of Korea. Secondary extraction of coal is currently undertaken at Angus Place utilising the longwall method of mining within Mining Lease (ML) 1424 and Consolidated Coal Lease (CCL) 704.

Project Approval PA 06_0021 was granted by the then NSW Department of Planning (now Department of Planning and Infrastructure (DP&I)) on 13 September 2006. This approval allowed for an extension of underground longwall mining operations (Longwalls 920 – 980) and an increase in run of mine (ROM) coal production to 3.5 million tonnes per annum (Mtpa). PA 06_0021 has been modified on two occasions. Modification 1 (Mod 1) was approved on 29 August 2011 and allowed for the development and extraction of two additional longwall panels (Longwall 900W and 910), as well as an increase in production limit to 4 Mtpa. Modification 2 (Mod 2) was approved in April 2013 and allowed for the development of underground roadways and the construction and operation of a Ventilation Facility (APC-VS2) and supporting infrastructure.

This *Longwalls 900W and 910 Public Safety Management Plan* (Public Safety Management Plan) has been developed in accordance with Schedule 3, Condition 3C(g) of PA 06_0021 (as modified), the *Draft Guidelines for the Preparation of Extraction Plans* (DP&I, 2012), and Section 7.3 of the *Guidelines for Applications for Subsidence Management Approvals* (2003) issued by the NSW Department of Mineral Resources (now the NSW Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy (DTIRIS)). Regulatory requirements applicable to the development of this Plan are outlined in **Section 4**.

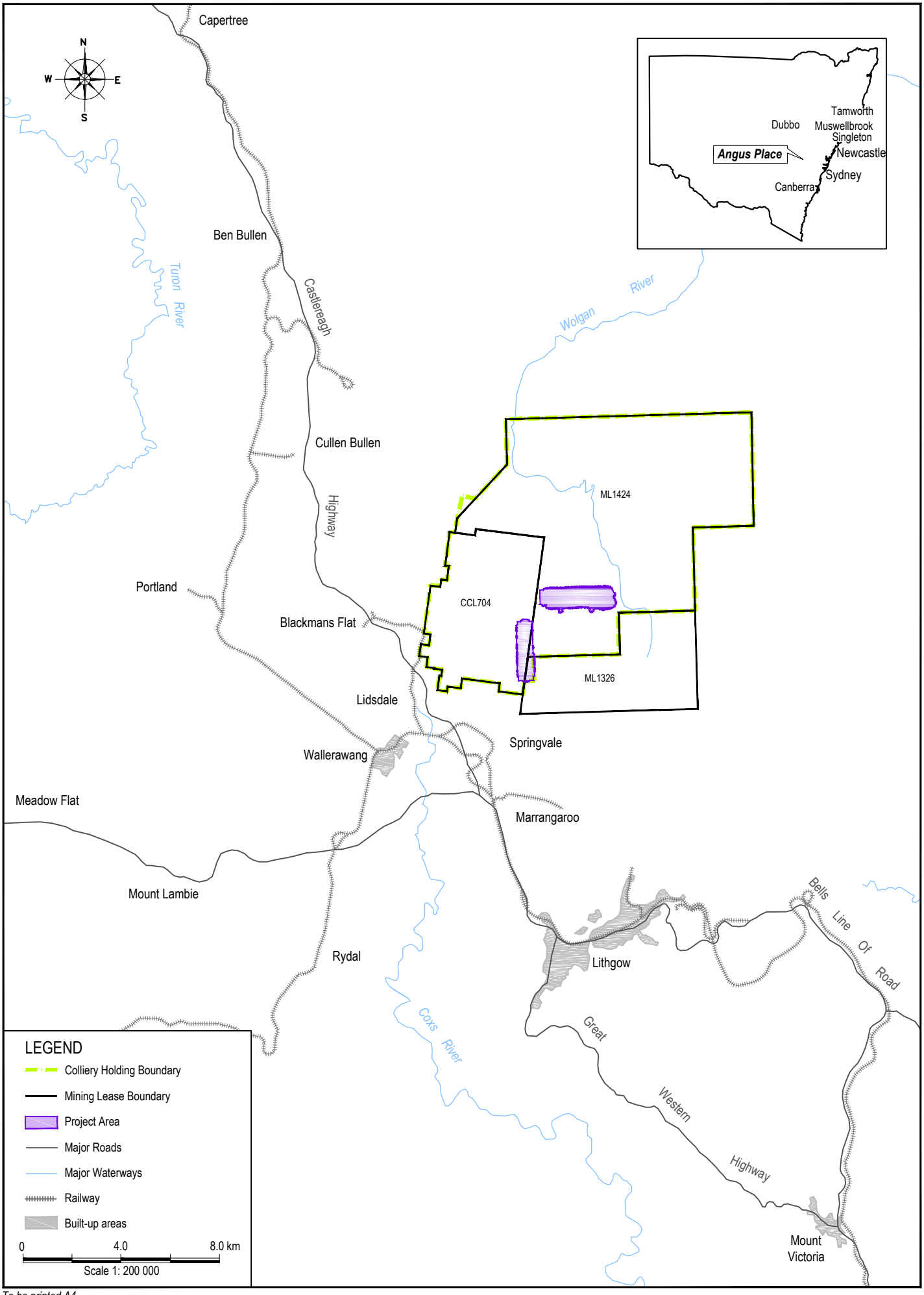
2. PURPOSE

The purpose of this Public Safety Management Plan is to outline the monitoring and management measures to be implemented to identify and manage potential subsidence related impacts resulting from the secondary extraction of Angus Place Longwalls 900W and 910 that may affect public safety. Required actions and responsibilities are defined to ensure detection of any public safety risks from mining induced subsidence.

3. SCOPE

This Public Safety Management Plan applies to the management of any public safety risks caused by mining operations within the Longwall 900W and 910 area (herein referred to as the Project Area). In accordance with the requirements of the *Guidelines for Applications for Subsidence Management Approvals* (Department of Mineral Resources, 2003), this Project Area has been calculated by combining the areas bound by the following limits (see **Figure 2**):

- A 26.5° angle of draw line from the limit of proposed extraction; and
- The predicted limit of vertical subsidence, taken as the 20 mm subsidence contour resulting from the extraction of the Longwalls 900W and 910.



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Longwalls 900W and 910 Public Safety Management Plan
Regional Locality

FIGURE 1

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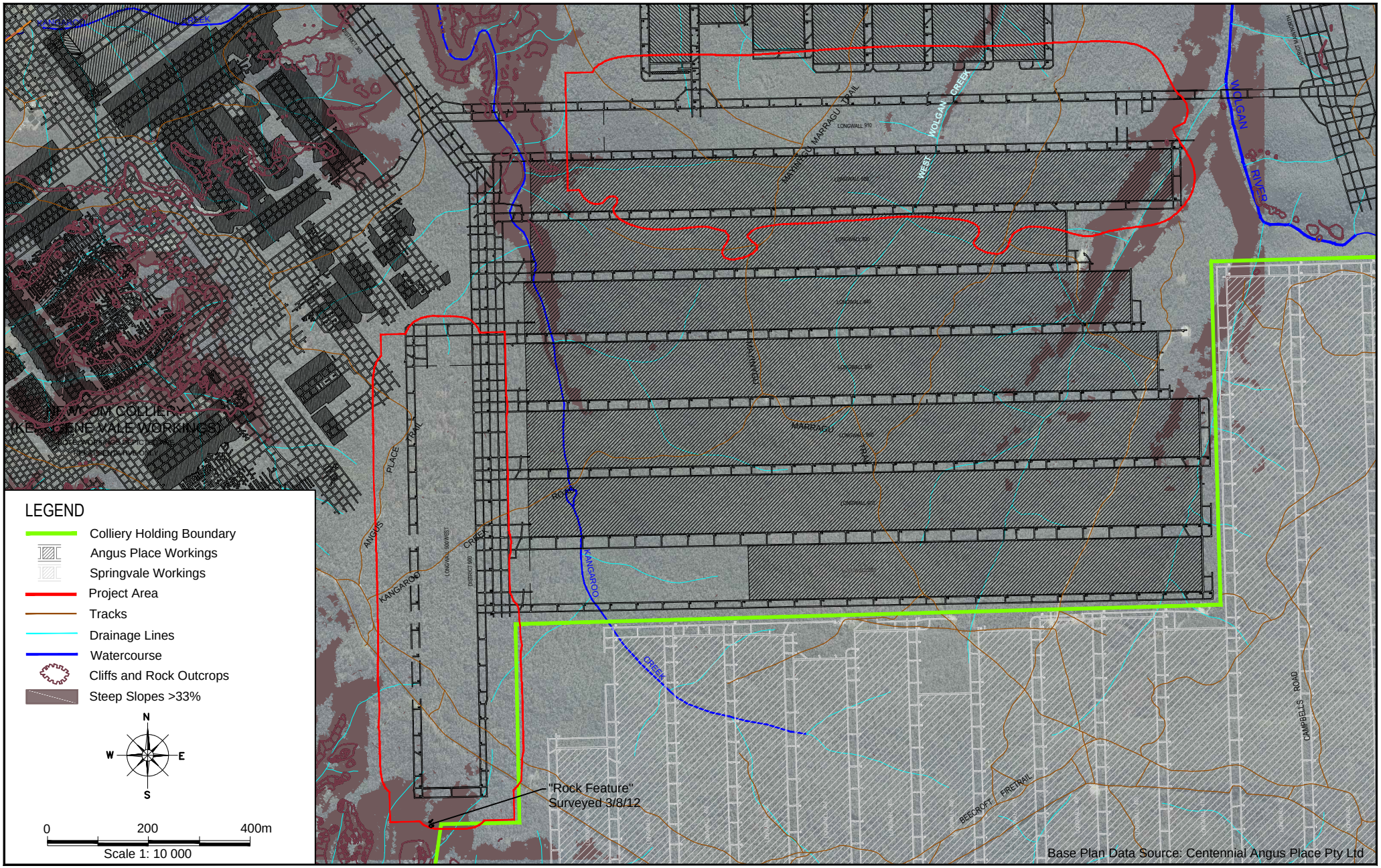

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Environmental, Land and Project Management Consultants

Longwalls 900W and 910 Public Safety Management Plan
Features Relevant to Public Safety Management Plan

FIGURE 2

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4. REGULATORY REQUIREMENTS

4.1. Project Approval and Statement of Commitments

Project Approval PA 06_0021 (as modified) includes a number of conditions relevant to the preparation and implementation of a Public Safety Management Plan for the Project Area. Conditions relating specifically to the production of this Plan have been summarised in **Table 1**. This table also outlines the sections where these conditions have been addressed within this document.

There have not been any commitments made by Angus Place in the Statement of Commitments, as appended to PA 06_0021 (as modified) that are relevant to the preparation of this Public Safety Management Plan.

Table 1. Relevant Project Approval Conditions

<table>
<tr><th>Condition</th><th>Condition Requirement</th><th>Section Addressed</th></tr>
<tr><td>Schedule 3, Condition 3A</td><td>The Proponent shall ensure that underground mining does not cause any exceedances of the performance measures in Table 1B, to the satisfaction of the Executive Director Mineral Resources.
Table 1B:Subsidence Impact Performance Measures
<table><tr><td colspan="2">Public Safety</td></tr><tr><td>Public safety</td><td>No additional risk</td></tr></table></td><td>Section 7</td></tr>
<tr><td>Schedule 3, Condition 3C</td><td>The Proponent shall prepare and implement Extraction Plan/s for the second workings in Longwalls 910 and 900W to the satisfaction of the Director-General. Each Extraction Plan must:
(g) Include the following to the satisfaction of the Executive Director Mineral Resources:
• A Public Safety Management Plan to ensure that mining-related activities do not impact public safety in the mining area.</td><td>This document</td></tr>
</table>

4.2. Mining Leases

The Project Area is associated with three mining tenements, these being ML 1326, ML 1424 and CCL 704. As replicated in **Table 2,** these leases include one condition that is relevant to the preparation and implementation of this Public Safety Management Plan. .

Table 2. Relevant Mining Lease Conditions

Mining Lease	Condition Requirement	Section Addressed
ML 1326, ML 1424 and CCL 704	**Safety** Operations must be carried out in a manner that ensures the safety of the persons or stock in the vicinity of the operations. All drill holes, shafts and excavations must be appropriately protected to the satisfaction of the director general, to ensure that access to them by persons and stock is restricted. Abandoned shafts and excavations opened up or used by the lease holder must be filled in or otherwise rendered safe to a standard acceptable to the Director-General.	Section 8

4.3. Longwalls 930 – 980 SMP Approval

In accordance with the requirements of relevant mining tenements, Angus Place received Subsidence Management Plan (SMP) Approval from the then NSW Department of Primary Industries (now DTIRIS) in December 2005 allowing first workings and secondary extraction within Longwalls 930 - 980. This SMP Approval includes a number of conditions relevant to the management of public safety at Angus Place. These conditions and where they have been addressed within this Public Safety Management Plan are listed in **Table 3**.

While the SMP Approval for Longwalls 930 – 980 does not relate to the subject Longwalls 900W and 910, **Table 3** has been included to demonstrate that the typical conditions associated with an SMP Approval, specifically those already applicable at Angus Place, have been addressed within this document. This section will be reviwed and revised (if necessary) following receipt of SMP Approval for the Project Area.

Table 3. Relevant SMP Approval Conditions

Condition	Condition Requirement	Section Addressed
13	The Leaseholder shall provide to the Mine Subsidence Board, the owners/operators of any infrastructure and the Director Environmental Sustainability and Principal Subsidence Engineer of the Department of Primary Industries, notification within 24 hours of occurrence or identification of the following during the development of subsidence caused by longwall mining. The same information shall also be made available to other relevant stakeholders if requested. a) Any observed subsidence impacts adverse to groundwater resources and/or the natural environment that may be affected by longwall mining; b) **Any observed subsidence impacts adverse to the serviceability and/or safety of infrastructure and other built structures that may be affected by longwall mining;** c) Any significant unpredicted and/or higher than predicted subsidence and/or abnormalities in subsidence development in any surface areas that may be affected by longwall mining; d) Any adverse subsidence impacts reported by any relevant stakeholder; and e) Any other relevant information requiring prompt notification Note: Pursuant to paragraph (e) of the subsidence management condition in the leaseholder's Coal Lease, the SMP is also subject to the requirements for subsidence monitoring and reporting set out in the document '*New Approval Process for Management of Coal Mining Subsidence – Policy (2003)*'. The monitoring and reporting requirements set out in that document apply, as modified by these conditions.	Section 14
16	The leaseholder shall implement a Public Safety Management Plan to ensure public safety in any surface areas that may be affected by subsidence arising from longwall mining. This plan shall include, but not be limited to, regular monitoring of areas or infrastructure/structures posing safety risks, erection of warning signs, entry restrictions, backfilling of dangerous surface cracks and securing of unstable built structures or rockmass where required and appropriate, and the provision of timey notification of mining progress to the community and any other relevant stakeholders where management of public safety is required. The plan shall be developed and implemented to the satisfaction of the District Inspector of Coal Mines.	This document

5. RELEVANT FEATURE(S) AND PREDICTED IMPACTS

5.1. Relevant Feature(s)

All land overlying the Project Area is within the Newnes State Forest, managed by the Forestry Corporation of NSW (FCNSW) as part of a forestry enterprise. The predominant land uses within the State Forest include native hardwood harvesting and recreational activities such as bushwalking, motor cycling and four wheel drive pursuits. A number of publicly-accessible forest tracks are located within the Project Area including Kangaroos Creek Road, Beecroft Fire Trail, Mayinygu Marragu Trail and Angus Place Trail (see **Figure 2**).

There are no significant clifflines (i.e. >20 metres (m) in height) or rock features (between 5 and 20 m in height) located within the 26.5˚ angle of draw line from the limit of extraction within Longwalls 900W and 910. The nearest rock feature is located approximately 175 m south of the commencing end of Longwall 900W. This feature is located approximately 17 m within the 20 mm subsidence contour and is subsequently located within the Project Area. The nearest cliffline is located approximately 275 m west of the finishing end of Longwall 910. The location of all clifflines and rock features in proximity to the Project Area have been shown in **Figure 2**.

5.2. Predicted Impacts

5.2.1. Clifflines and Rock Features

Angus Place designed Longwalls 900W and 910 to mitigate potential subsidence related risks to significant surface features including the significant rock feature (5 to 20 m in height) located to the south of Longwall 900W and the cliffline (>20 m in height) located to the west of Longwall 910. As outlined within the *Subsidence Prediction and Impact Assessment* (Ditton Geotechnical Services (DgS), 2010), there has been no impact to sensitive cliff sites outside the 26.5˚ design angle of draw associated with the extraction of Longwalls 920 – 950 at Angus Place (DgS, 2010). Accordingly Angus Place ensured that the identified significant cliffline and rock features were located beyond the extent of the 26.5˚ design angle of draw.

The significant rock formation (>5 m and <20 m high) located approximately 175 m south of Longwall 900W is the equivalent to an angle of draw of 35˚, based on a cover depth of 310 m (DgS, 2010). The significant cliffline located approximately 275 m west of Longwall 910 is the equivalent to an angle of draw of 42°, based on a cover depth of 310 m (DgS, 2010).

DgS (2010) state that it is *expected that no impact will occur to the cliffs or rock features outside the 26.5˚ design angle of draw limit from Longwalls 910 and 900W*.

5.2.2. Surface Cracking

DgS (2010) states surface cracking widths of between 1 and 20 mm may occur within the limits of extraction and up to 90 mm where competent rock is exposed near strain peaks. It is however considered unlikely that the cracks will occur as a single crack where deep soil or weathered surface rock exists, and likely to be several smaller width ones. With regard to cracking of forest access tracks within the Project Area, DgS (2010) predict that the worst case crack width is estimated to range between 20 and 90 mm. It is expected that approximately 30 to 50 m long sections of the tracks above each of the longwalls may require repairs to tensile cracking or compressive shear failures through the road after each panel is completed.

Minor transient surface cracking with widths <20 mm may develop behind the retreating secondary extraction face and along and across creek beds or watercourses that are undermined (DgS, 2010). Cracks that occur within the drainage gullies or creek beds may result in sub-surface re-routing of surface flows during storm periods and particularly those areas that have bedrock exposed. However, the impacts in most cases should be self-healing, due to sediment bed load that is likely to accumulate in the cracks after several storm events occur.

5.2.3. Steep Slopes

According to DgS (2010), valley 'closure' and 'upsidence' movements could also occur above Longwalls 910 and 900W. However, as the valleys are wider in this area of the mine, the uplift and closure movements are likely to be lower than those observed to-date. The impact of the movements, if they occur, are very unlikely to result in more damage than the minor cracking predicted for normal subsidence development of the near surface rocks.

5.2.4. Subsidence Assessment Review

As a component of the *Longwalls 900W and 910 Integrated SMP/Extraction Plan*, DgS completed a review of the *Subsidence Prediction and Impact Assessment* (DgS, 2010). This review was completed to satisfy the requirement of Schedule 3, Condition 3C(e) of PA 06_0021 (Mod 1), which requires the proponent to:

> *Provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed second workings, incorporating any relevant information obtained since this approval.*

The report titled *Subsidence Assessment Review for the Longwalls 900W and 910 Integrated SMP/Extraction Plan, Centennial Angus Place Colliery* (DgS, 2013), incorporated relevant information obtained by Angus Place since the approval of PA 06_0021 (Mod 1) in August 2011, including subsidence monitoring data and observed subsidence effects following the completion of secondary extraction in Longwalls 960 and 970, and a change to the mining height within Longwalls 900W and 910.

The *Subsidence Prediction and Impact Assessment* (DgS, 2010) assessed potential subsidence effects based upon a mining height of 3.25 m. Angus Place will now mine Longwalls 900W and 910 at an extraction height up to 3.425 m. This change has been assessed by DgS (2013), who concluded:

> *the observed and predicted subsidence impacts and environmental consequences for LWs 960 and 970 have also been consistent with predictions for LWs 900W and 910, and as such, the predicted 'negligible' environmental consequences for LWs 900W and 910 are not expected to change from the previous assessment due to the 5% increase in mining height.*
>
> *It is therefore considered that the impact management strategies for the environment and site developments (e.g. access roads and Endeavour Energy 66kV power line) that were outlined in DgS, 2010 are still valid and do not require amendment*.

The management measures as outlined in **Section 8** are consistent with the impact management strategies outlined in the *Subsidence Prediction and Impact Assessment* (DgS, 2010).

6. IDENTIFIED RISKS

A SMP Risk Assessment was conducted on 25 July 2012 to identify subsidence related hazards that may affect the environment and community as a result of the extraction of Angus Place Longwalls 900W and 910. This risk assessment was completed in accordance with the requirements of the *Guideline for Applications for Subsidence Management Approvals* (Department of Mineral Resources, 2003) and the *Centennial Coal Risk Management Standard - Management Standard 004* (Centennial Coal, 2008).

Risks were identified and assessed through the review of known surface and sub-surface features within the Project Area. A risk ranking (low, moderate, significant, high or extreme) was assigned to each risk/hazard. There were four potential risks to public safety identified during the SMP Risk Assessment which related to:

- Subsidence related rockfall resulting in personal injury (moderate);
- Subsidence related surface cracking resulting in personal injury (low);
- Subsidence related tree fall resulting in personal injury (low); and
- The stability of steep slopes is compromised by subsidence, resulting in personal injury (low).

Although there is a very low likelihood of subsidence related rockfall causing a public safety incident, the moderate risk ranking was assigned due to the potential consequence (noted as major) that would occur as a result of subsidence related rockfall resulting in personal injury. These risks and the recommended controls have been presented in **Table 4**.

Table 4. Risk to Public Safety

Risk	Current Controls	Risk Ranking	Recommended Controls
There is a risk to Angus Place from ::: Rock fall ::: Caused by: Subsidence Resulting in: Personal Injury.	• Existing Public Safety Management Plan including; - Subsidence warning signs; - Pre/post mining inspections; • Subsidence TARP within SMP; • Subsidence survey within SMP; • Notification of relevant stakeholders; • Mining geometry design to minimise potential surface impact; and • Terrain analysis identified no significant rock outcrops near formed tracks and trails.	Moderate	Prepare Public Safety Management Plan for Project Area. Prepare Public Roads and Infrastructure Management Plan for Project Area. Prepare Subsidence Monitoring Program for Project Area. Placement of subsidence warning signs within the Project Area.

Risk	Current Controls	Risk Ranking	Recommended Controls
There is a risk to Angus Place from ::: Surface cracking ::: Caused by: Subsidence Resulting in: Personal Injury.	• Existing Public Safety Management Plan including; - Subsidence warning signs; - Pre/post mining inspections; • Subsidence TARP within SMP; • Subsidence survey within SMP; • Notification of relevant stakeholders; • Road and Infrastructure Management Plan; • High visibility caps on subsidence monitoring points; • Monitoring point stakes typically 300 mm from ground; • Subsidence Assessment predicts surface cracking of up to 90 mm; and • Mining geometry design to minimise potential surface impact.	Low	Placement of subsidence warning signs within the Project Area. Prepare Public Roads and Infrastructure Management Plan for Project Area. Prepare Public Safety Management Plan for Project Area. Prepare Subsidence Monitoring Program for Project Area.
There is a risk to Angus Place from ::: Tree Fall ::: Caused by: Subsidence Resulting in: Personal Injury.	• Road regularly traversed; • Mining geometry design to minimise potential surface impact; • Consultation with relevant stakeholders; and • Existing Public Safety Management Plan.	Low	Prepare Public Safety Management Plan for Project Area. Prepare Public Roads and Infrastructure Management Plan for Project Area. Placement of subsidence warning signs within the Project Area.
There is a risk to Angus Place from ::: Stability of Steep Slopes Compromised ::: Caused by: Subsidence Resulting in: Personal Injury.	• Existing Public Safety Management Plan; • Mining geometry design to minimise potential surface impact; • Subsidence warning signs; • Terrain Analysis Identified steep slopes within application area; and • Subsidence survey within SMP.	Low	Placement of subsidence warning signs within the Project Area. Prepare Public Safety Management Plan for Project Area. Prepare Subsidence Monitoring Program for Project Area.

To further mitigate subsidence-related risks to public safety, Angus Place have implemented the 'recommended controls' listed in **Table 4.** The recommendation to place subsidence warning signs within the Project Area is addressed in **Section 8**. The recommendation to prepare a Public Roads and Infrastructure Management Plan for the Project Area has been addressed through preparation of the *Longwalls 900W and 910 Built Features Management Plan*. Angus Place has also prepared a Public Safety Management Plan (this document) and the *Longwalls 900W and 910 Subsidence Monitoring and Reporting Program*.

The recommendation for regular monitoring of roads/tracks, steep banks, rock outcrops and drainage lines are addressed in **Section 9** of this document.

7. PERFORMANCE MEASURES AND INDICATORS

7.1. Performance Measures

Subsidence impact performance measures are specified in Schedule 3, Condition 3A of PA 06_0021 (as modified). The performance measure that specifically relates to this Plan states that subsidence impacts are to pose "no additional risk" to public safety.

Predicted subsidence related impacts that may affect public safety (see **Section 5.2**) include:

- Potential cracking of the forest access tracks;
- General surface cracking; and
- Compressive shear failures.

No subsidence is predicted in the area of cliff lines or rock formations.

7.2. Performance Indicators

To establish compliance with the performance measure of "no additional risk to public safety" (see **Section 7.1**), Angus Place has developed a monitoring program (see **Section 9**) to demonstrate that the environmental performance satisfies the following performance indicators:

- Visual inspections of the site identify that there is no evidence of damage; and
- Survey monitoring within the Project Area identifies that subsidence parameters (angle of draw, subsidence, tilt and strain) are within the limits of the prediction model.

8. MANAGEMENT MEASURES

As per the recommendations of the *Subsidence Prediction and Impact Assessment for the Proposed Longwall Panels 910 and 900 West at Angus Place Colliery, Lidsdale* (DgS, 2010), the following management and mitigation measures will be implemented by Angus Place during secondary extraction of Longwalls 900W and 910:

- The development of a suitable monitoring and response plan (this document) with stakeholders to ensure that any impacts to forest access tracks do not result in unsafe conditions during and after the effects of mining;
- Visual inspections of the forest access tracks on a monthly basis just prior to and after undermining of the roads until 90 percent of subsidence has developed (usually occurs when the longwall face has retreated 1.4 times the cover depth past the road). The inspections will be completed above each panel and any impacts repaired promptly in accordance with the *Built Features Management Plan*;
- Erection of signage along the affected area, including along the forest access tracks, which caution drivers/riders of vehicles/motorbikes/mountain bikes of the hazards associated with mine subsidence. A contact phone number is provided on the Centennial Coal website and in the White Pages for the reporting of subsidence impacts (if they are encountered);

- Communicating any observed general surface cracking impacts caused by subsidence to the FCNSW;
- In the unlikely event that significant cracking occurs on an access track, Angus Place will fence/close the forest access in consultation with FCNSW while rehabilitation works are undertaken; and
- If rehabilitation of surface cracks is required these will be undertaken in accordance with the methodology specified in the approved Mining Operations Plan (MOP) (GSS Environmental, 2013) and in consultation with FCNSW.

In accordance with conditions stipulated in ML 1424, ML 1326 and CCL 704, all drill holes, shafts and excavations will be appropriately protected to ensure that public access is restricted. Any abandoned shafts or excavations opened up by Angus Place will be filled in and rendered safe to the general public.

9. MONITORING PROGRAM

9.1. Baseline Monitoring

Baseline monitoring of the relevant features will be undertaken prior to the commencement of secondary extraction within Longwalls 900W and 910. Baseline data will be obtained by Angus Place using a combination of the following methods:

- Installation of subsidence monitoring lines that will be used to monitor the angle of draw, subsidence, tilt and strain. The lines will be surveyed prior to secondary extraction in Longwalls 900W and 910 to establish pre-mining data;
- Installation of Global Navigation Satellite Systems (GNSS) stations at two locations along a cliffline located to the west of Longwall 910, beyond the extent of the Project Area. These GNSS stations will be surveyed prior to secondary extraction within Longwall 910 to establish pre-mining data; and
- A visual inspection program will be undertaken by Angus Place that includes the use of photo monitoring points prior to the commencement of secondary extraction in Longwalls 900W and 910 to establish the pre-mining condition of significant features within and in close proximity to the Project Area (e.g. forest tracks, clifflines, and rock features).

9.2. Monitoring Subsidence Impacts

Significant features within and in close proximity to the Project Area, such as forest tracks, clifflines, and rock features will be monitored pre and post mining for evidence of any subsidence related impacts such as surface cracking, erosion and ponding. **Table 5** provides a summary of the subsidence monitoring program that will be undertaken to monitor development of subsidence effects associated with these features. Additional detail pertaining to subsidence monitoring methodology relevant to the Project Area can be found in the *Longwalls 900W and 910 Subsidence Monitoring and Reporting Program*.

Table 5. Public Safety Monitoring Program

Monitoring Method	Parameter	Frequency
Subsidence survey lines	Subsidence, tilt, strain and angle of draw	Prior and post secondary extraction within Longwalls 900W and 910
GNSS stations	Subsidence and angle of draw	Prior and post secondary extraction in Longwall 910
Visual inspections (including photo monitoring) of clifflines, rock features and access tracks	Presence or absence of damage	Monthly during secondary extraction within 500m of Longwalls 900W and 910. Inspections will continue for four consecutive months following the completion of secondary extraction within Longwalls 900W and 910. A final inspection will be undertaken 12 months after the completion of secondary extraction within Longwall 900W and 910

9.3. Monitoring Environmental Consequences

Angus Place will implement the monitoring program as specified in **Table 5** to monitor the development of predicted subsidence related environmental impacts (see **Section 5.2**). A contingency plan has been developed as a component of this Public Safety Management Plan to outline management measures that will be implemented in the event that predicted environmental consequences are exceeded (see **Section 12**).

9.4. Success of Remediation Measures

In the event that public safety risks are identified and remediation is required, Angus Place will undertake rehabilitation in consultation with relevant NSW government agencies, including FCNSW. During consultation and prior to implementation of any remedial measures, Angus Place will determine the ongoing monitoring requirements.

10. CONSULTATION

Angus Place will provide FCNSW with regular reports to that will include details regarding the staus of mining. Additional consultations will be undertaken if there is an identified risk to public safety.

All monitoring and management activities for features relevant to public safety within and in close proximity of the Project Area (clifflines, rock features, forest access tracks) are consistent with the *Longwalls 900W and 910 Land Management Plan*, which has been prepared in consultation with FCNSW. At the time of preparation of this Public Safety Management Plan no comment has been received.

11. ADAPTIVE MANAGEMENT

Angus Place has developed an adaptive management approach that is designed to avoid repetition of any unpredicted subsidence impacts and/or environmental consequences. This approach will include:

- The monitoring and periodic evaluation of environmental consequences against the performance indicators defined in **Section 7.2**;
- The implementation of the contingency plan (see **Section 12**) in the event that a performance indicator is exceeded; and
- The review of this Public Safety Management Plan as necessary (see **Section 15**).

12. CONTINGENCY PLAN

A Trigger Action Response Plan (TARP) has been developed using the performance indicators for public safety (see **Section 7.2**). In the event that subsidence monitoring and/or visual inspections identify that a performance indicator has been exceeded, Angus Place will implement the contingency measures as detailed in the TARP presented in **Table 6**.

Table 6. Trigger Action Response Plan for Public Safety Management

Aspect/ Category	Key Element	Trigger Response	Condition Green	Condition Amber	Condition Red
Public Safety	Subsidence	Trigger	Survey monitoring within the Project Area identifies that subsidence parameters (subsidence, tilt and strain) are less than the limits specified by the prediction model.	Survey monitoring within the Project Area identifies that subsidence parameters (subsidence, tilt and strain) are up to, but do not exceed the limits of the prediction model.	Survey monitoring within the Project Area identifies that subsidence parameters (subsidence, tilt and strain) exceed the limits of the prediction model.
		Response	No response required. Continue monitoring program.	No response required. Continue monitoring program.	If subsidence within the Project Area exceeds the limits of the prediction model, notify the Director-General of DP&I, DTIRIS and relevant stakeholders of exceedance of subsidence predictions. Investigate exceedance of subsidence prediction model. Identify and implement remedial actions in consultation with relevant stakeholders, if necessary (e.g. undertake review of Public Safety Management Plan).
		Trigger	Survey monitoring identifies that there is no measurable subsidence beyond the design angle of draw.	Survey monitoring identifies that measured subsidence beyond the design angle of draw is <20 mm (negligible).	Survey monitoring identifies that measured subsidence beyond the design angle of draw is >20 mm.
		Response	No response required. Continue monitoring program.	No response required as measured subsidence is negligible. Continue monitoring program.	If subsidence beyond the design angle of draw exceeds 20 mm, notify the Director-General of DP&I, DTIRIS, and the FCNSW of exceedance of subsidence predictions. Erect warning signs and danger tape in immediate Area. Investigate exceedance of subsidence prediction model. Identify and implement remedial actions in consultation with relevant stakeholders, if necessary.
	Clifflines and Rock Features	Trigger	Visual inspections of the site identify that there is no evidence of damage.	Visual inspections identify potential evidence of damage at the site i.e. minor cracking in rock face.	Visual inspections identify evidence of damage at the site i.e. cracking in rock face or rock fall.
		Response	No response required. Continue monitoring program.	Review previous photographic evidence to identify if there have been visual changes to the site since the commencement of secondary extraction in Longwall 900W or 910 i.e. minor cracking. If visual changes are identified, undertake survey monitoring to identify if there is measurable subsidence beyond the design angle of draw or if impacts were the result of natural processes. If there is no measurable subsidence, or subsidence is <20mm, no response required as subsidence is negligible. Continue monitoring program. If measurable subsidence beyond the design angle of draw exceeds 20mm, undertake management as outlined for Condition Red responses.	Undertake survey monitoring to identify if there is measurable subsidence beyond the design angle of draw or if impacts were the result of natural processes. If subsidence beyond the design angle of draw exceeds 20 mm, notify the Director-General of DP&I, DTIRIS and relevant stakeholders of exceedance of subsidence predictions. Erect warning signs and danger tape in immediate area. Investigate exceedance of subsidence prediction model. Identify and implement remedial actions in consultation with relevant stakeholders, if necessary.
	Surface Cracking on Roads and Tracks	Trigger	Surface cracking < 5 cm wide.	Surface Cracking 5-10 cm wide.	Surface cracking >10 cm wide.
		Response	Continue monitoring program to confirm that cracks are adequately repaired naturally through sedimentation and infilling of vegetation and surface debris.	Prompt notification of FCNSW. In response to observed impact, erect warning signs or danger tape in the immediate area if considered a public danger. Repair by grading after subsidence is complete if required. Repairs to FCNSW roads/tracks to be completed in consultation with FCNSW. Monitor cracking.	Prompt notification of FCNSW. In response to observed impact, erect warning signs or danger tape in the immediate area if considered a public danger. Repair cracks >20 cm in width with excavation and re-compaction. A field inspection will be carried out by the Environment and Community Coordinator (for FCNSW roads/tracks). Angus Place will provide FCNSW with an invitation to attend relevant inspections. Repairs to FCNSW roads/tracks to be completed in consultation with FCNSW.

Aspect/ Category	Key Element	Trigger Response	Condition Green	Condition Amber	Condition Red
	Surface Cracking in Vegetated Areas	Trigger	Surface cracking <10 cm wide.	Surface cracking 10-20 cm wide.	Surface cracking >20 cm wide
		Response	No response required. Continue monitoring program.	Erect warning signs or danger tape if necessary and if a public hazard. Monitor cracks over next 12 months.	Erect warning signs or danger tape if necessary and if a public hazard. Repair cracks >20 cm in width where practicable. Assess public safety issues.

13. ROLES AND RESPONSIBILITIES

The responsibility for implementation, monitoring and review of this Public Safety Management Plan lies with the Angus Place Environment and Community Coordinator, with the Mine Manager responsible for ensuring appropriate resources are available to implement the Plan and also for ensuring required reporting to external stakeholders is undertaken. The roles and responsibilities for the Angus Place Public Safety Management Plan are outlined in **Table 7** below:

Table 7. Key Personnel and Accountabilities

Position	Responsibility
Mine Manager	• Ensuring that sufficient resources are available to implement and execute the requirements of this Plan; and • Reporting triggers/non-conformances to external stakeholders.
Environment and Community Coordinator	Implementation, monitoring and review of this plan, including: • The carrying out of inspections; • The installation and maintenance of signage; • Reporting triggers/non-conformances internally to the Mine Manager as appropriate; • Consulting with relevant stakeholders regarding any public safety issues arising from subsidence; • Consultation during the review process with relevant stakeholders and distributing this Public Safety Management Plan; • Coordinating any remediation work as required; • Inspecting areas susceptible to tensile and compressive strains and potential cracking; • Coordinating the generation and submission of formal reporting requirements outlined in this Plan (e.g. Bi-monthly Subsidence Impact Reports, Six-monthly Environmental Monitoring Reports, End of Panel Reports and the Annual Environmental Management Report); and • Reviewing this Public Safety Management Plan.
FCNSW	• Undertake inspections as required with Environment and Community Coordinator; • Review and assist in preparation of appropriate rehabilitation / remediation / management procedures in consultation with Environment and Community Coordinator; and • Determine appropriate remedial measures in conjunction with Environment and Community Coordinator.

14. REPORTING

In accordance with the requirements of the *Draft Guidelines for the Preparation of Extraction Plans* (DP&I 2012), Angus Place will submit the following reports to the DP&I and DTIRIS during the secondary extraction of Longwalls 900W and 910:

- Bi-monthly Subsidence Impact Reports - these reports will be submitted following the regular monthly inspections if any new subsidence impacts are identified; and

- Six-monthly Environmental Monitoring Report - this report will include:

- a comprehensive summary of all impacts, including a revised characterisation according to the relevant TARP and any proposed actions resulting from the relevant TARP (see **Section 12**);
- an assessment of compliance with relevant performance indicators (see **Section 7.2**); and
- a comprehensive summary of all quantitative and qualitative environmental monitoring results.

The Annual Environmental Management Report (AEMR)/Annual Review will be made available on the Centennial Coal website and will include subsidence monitoring results, performance against subsidence predictions and identification of any subsidence related environmental impacts identified during the reporting period.

In accordance with the requirements of Schedule 5, Condition 6 of PA 06_0021 (Mod 2), Angus Place will notify the Director-General of DP&I, FCNSW and any other relevant agencies of any significant public safety incident resulting from the extraction of Longwalls 900W and 910 as soon as practicable after becoming aware of the incident. Within seven days of the incident, Angus Place will provide the Director-General of DP&I and any relevant agencies with a detailed report on the incident.

Angus Place will also prepare an End of Panel Report to encompass all environmental and subsidence monitoring, including a comparison of actual impacts with predicted subsidence impacts. This report will be submitted to DTIRIS within three months of secondary extraction being completed in each longwall panel.

15. REVIEW

This Public Safety Management Plan will be reviewed every three years, or in the event that the following occur:

- Stakeholders raise issues that necessitate a review;
- There are changes to the management requirements (e.g. changes to related approvals);
- Where unpredicted impacts or consequences have required implementation of contingency actions under this plan; or
- Monitoring, incident, or audit processes demonstrate that a review is warranted.

Any amendments to this Public Safety Management Plan will be undertaken in consultation with the Executive Director Mineral Resources (DTIRIS). Following any changes a copy of the amended Public Safety Management Plan will be forwarded to the Director-General of the DP&I for approval.

16. REFERENCES

Centennial Coal (2008) *Centennial Coal Risk Management Standard (Management Standard – 004)*.

Department of Mineral Resources (2003) *Guideline for Applications for Subsidence Management Approvals*.

DgS (2010) *Subsidence Prediction and Impact Assessment, Report no ANP_002/1*.

DgS (2013) *Subsidence Assessment Review for the Longwalls 900 West and 910 Integrated SMP/Extraction Plan, Centennial Angus Place Colliery, Report No. ANP-002/7.*

DP&I (2012) *Draft Guidelines for the Preparation of Extraction Plans*.

GSS Environmental (2013) *Angus Place Colliery Mining Operations Plan*.

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