Appendix O

Preliminary Hazard Analysis

DRAYTON MINE EXTENSION

PRELIMINARY HAZARD ANALYSIS

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for
Anglo Coal (Drayton Management) Pty Ltd

1.0 INTRODUCTION

Anglo Coal (Drayton Management) Pty Ltd (Drayton) currently undertakes open cut mining at the Drayton Coal Mine in the Upper Hunter Valley of New South Wales.

Drayton is applying for a Project Approval under Part 3A of the *Environmental Planning and Assessment Act* (1979) (EP&A Act) to recover additional coal reserves within its current Mining Leases at a rate of up to 8 Million tonnes per annum (Mtpa) of Run-of-Mine (ROM) Coal and to extend the life of the mine until 2017 (the Project). The general arrangement of the Project is illustrated in **Figure 1**.

Land use to the immediate north of the Project Area is dominated by privately owned residences in the Antiene Estate. Mt Arthur Coal (MAC) occupies land to the west of the Project Area, whilst land to the south and south-east of the Project Area is utilised by Macquarie Generation as buffer lands to its power generation facilities. For further details on land ownership surrounding the Project Area, please refer to the main volume of the Environmental Assessment (EA).

To accompany the Project Approval, Hansen Bailey is preparing an EA. As part of the EA, a Preliminary Hazard Analysis (PHA) has been undertaken as determined through the application of *Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines* (DUAP, 1994) (Applying Guidelines) to the Project. This report should be read as a supporting document to the main volume of the EA and its other associated technical reports.

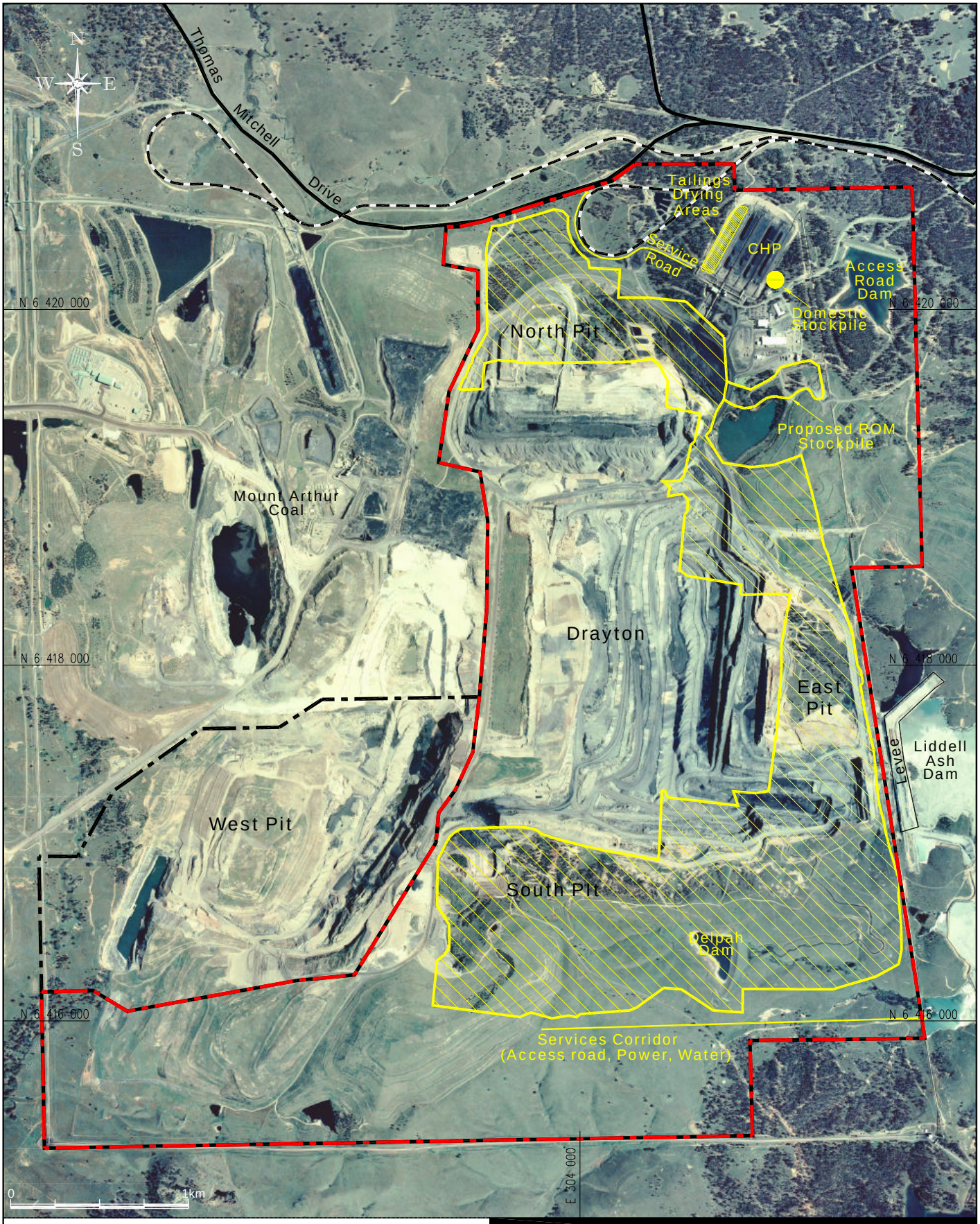
The risks were evaluated in accordance with the Department of Planning's (DoP) *Hazardous Industry Planning Advisory Paper (HIPAP) No. 6 – Guidelines for Hazard Analysis* (HIPAP No. 6 Guidelines) (DUAP, 1992).

This PHA is designed to serve two main functions in accordance with the Applying Guidelines:

- To identify potential hazards involved in the Project and to ensure that the proposed safeguards are adequate; and
- To demonstrate that the Project will not impose an unacceptable level of risk.

This PHA assesses hazards and risks of the Project in two ways:

1. A qualitative assessment of all Project risks was undertaken in accordance with the Applying Guidelines, against criteria provided in the Australian Standard / New Zealand Standard (AS/NZS) 4360:2004 *Risk Management* (Standards Australia, 2004a) and HB 436:2004 – *Risk Management Guidelines – Companion to AS/NZS 4360:2004* (Standards Australia, 2004b); and
2. Additional Project hazards and their risks associated with prescribed dams were considered in accordance with the *Dam Safety Act 1978* (Dam Safety Act).



Legend

- EA Boundary
- Mine Lease
- Project Mining Areas

Hansen Bailey

ANGLO COAL

DRAYTON

Co-ordinate System: MGA Zone 56

DRAYTON MINE EXTENSION EA

Mine Layout

Cad File: 01949C.dwg	Date: 07.05.2007	Drawn: JD	Figure 1

2.0 EXISTING RISK PREVENTION & REMEDIAL PROCEDURES

2.1 INTRODUCTION

Drayton, as part of Anglo Coal Australia (ACA), has developed a Safety, Health, Environment and Community Management System (SHECMS) accredited to International Standard Organisation (ISO) 14001 standards and also operates in compliance with AS / NZS 4801:2001 *Occupational Health and Safety Management Systems* (Standards Australia, 2001) for health and safety. The SHECMS has been designed so that Drayton can:

- Effectively manage its environmental risks;
- Ensure compliance with regulatory requirements;
- Continually improve its environmental performance; and
- Satisfy the expectations of stakeholders and the local community.

The SHECMS is built on the ACA safety and sustainable development policy, regulatory required management plans and environmental standards and procedures. These policies, plans and procedures guide internal planning decisions, their implementation and operation, and the measurement, evaluation, review and continuous improvement of the action against ISO 14001 standard. For further detail on Drayton's SHECMS and the environmental standards, procedures and management plans which it encompasses, please refer to the main volume of the EA.

All hazardous materials or chemicals that are used, or are proposed to be used on-site are checked for their potential safety and environmental affects by the Safety, Health, Environment and Community (SHEC) department. A Material Safety Data Sheet (MSDS) system is maintained in a central register for all chemicals used on-site. No chemical product is permitted to be used on-site until approval has been obtained from the SHEC Department.

2.2 CHEMICALS MANAGEMENT

The CHEMALERT database is utilised at Drayton to assist in chemical and hazardous materials management. This database is a chemical management system and contains MSDS for all chemicals used on-site. In addition, further information is included in the database for site management purposes. This information includes environmental hazards associated with the use of each chemical and the necessary management measures to control each.

2.3 DANGEROUS GOODS

Drayton maintains compliance with its Acknowledgement of Notification of Dangerous Goods on Premises (formerly termed Dangerous Goods Licence) issued by WorkCover NSW under the *Occupational Health and Safety Act 2000* (OH&S Act). Drayton also operates under Environmental Protection Licence (EPL) 1323 issued under the *Protection of the Environment Operations Act 1997* (POEO Act). Drayton has continually operated in compliance with conditions of EPL 1323 and its previous Pollution Control Licence (prior to implementation of the POEO Act in 1997).

2.4 PRESCRIBED DAMS

Drayton completes regular inspections of three prescribed dams (Liddell Ash Dam Levee, Access Road Dam and Delpah Dam) which are listed under the Dam Safety Act. These are shown on **Figure 1**. Additionally, a surveillance report on each prescribed dam is undertaken in accordance with the requirements of the Dam Safety Act, which involves a regular review of the condition of each dam and any associated risks.

In addition to conditions imposed by EPL 1323, the NSW Dams Safety Committee (DSC) has also placed conditions on the requirements for the management of the Ash Dam Levee where blasting is concerned, including:

- Vibration levels at the dam wall shall not exceed 20 mm/sec;
- All blasts must be monitored at the dam wall;
- If a vibration level from a blast exceeds 10 mm/sec the Ash Dam Levee wall must be inspected for cracking or other damage as soon as practical; and
- Drayton must supply the DSC with a monthly plan showing the location of current mining activity in relation to the dam in the form of quarterly reports.

3.0 RISK ASSESSMENT

3.1 INTRODUCTION

This PHA utilises a qualitative risk assessment to identify potential hazards associated with the Project and to demonstrate that the management techniques currently being utilised are adequate to ensure the Project will not impose an unacceptable level of risk.

3.2 PURPOSE

In accordance with the Applying Guidelines, it is considered that a qualitative PHA is suitable for the Project for the following reasons:

- *"The materials are relatively non-hazardous;*
- *The quantities of materials used are relatively small;*
- *There are no worst case major consequences;*
- *The technical and management safeguards are self-evident and readily implemented; and*
- *The surrounding land uses are relatively non-sensitive"* (Applying Guidelines, 1994).

Accordingly, a qualitative risk assessment was undertaken and is discussed further in **Section 3.4**.

3.3 METHODOLOGY

To undertake the PHA, the following methodology was utilised as per HIPAP No. 6 Guidelines:

1. Identify hazards associated with the Project;
2. Examine the potential consequences of identified events;
3. Qualitatively estimate the likelihood of events;
4. Examine any necessary proposed mitigation measures;
5. Assess the potential risks to the environment, members of the public and their property arising from sudden and unexpected incidents; and
6. Recommend further risk mitigation or remedial measures, if required and repeat the process for each hazard.

This methodology was implemented using information provided by Drayton. The methodology was not implemented in the form of a PHA workshop as the risks identified are currently managed by existing prevention and remediation measures listed in **Section 2.0**. The EA has also been developed upon a risk assessment approach and intends to continue all of the existing prevention and remediation measures.

3.3.1 Risk Assessment Criteria

The qualitative risk assessment was based on the following criteria of consequences and likelihood for potential hazardous events shown in **Table 1** and **Table 2**.

Table 1
Qualitative Consequence Scale

Descriptor	Definition
Negligible	Insignificant impact. No injury, minimal financial loss.
Minor	Minor impact that is easily repaired. First-aid treatment required, release contained on-site, medium financial loss.
Moderate	Some significant impact. Medical treatment required, release contained on-site with outside assistance, high financial loss.
Major	Significant impact. Extensive injuries, loss of operation capability, off-site release with no detrimental effects, major financial loss.
Severe	Fatality, off-site release with significant effect, severe financial loss.

Source: Standards Australia, 2004a and 2004b

Table 2
Qualitative Likelihood Scale

Descriptor	Definition
Almost certain	Event will occur frequently. On an annual basis.
Likely	Probably occur in most circumstances. Once every 3 years.
Possible	Might occur at some time. Once every ten years.
Unlikely	Could occur at some time. Once every thirty years.
Rare	May occur in exceptional circumstances. Once every hundred years.

Source: Standards Australia, 2004a and 2004b

The level of risk was determined by combining the consequence and likelihood of the event from **Table 1** and **Table 2** and applying the results to **Table 3** which provides a qualitative level of risk to each event.

Table 3
Qualitative Risk Matrix

Likelihood	Consequence				
	Negligible	**Minor**	**Moderate**	**Major**	**Extreme**
Almost Certain	Medium	High	High	Very High	Very High
Likely	Medium	Medium	High	High	Very High
Moderate	Low	Medium	High	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

Source: Standards Australia, 2004a and 2004b

Each level of risk pertains to the following description:

- Low – Manage by routine procedures, unlikely for any specific application of resources;
- Medium – Manage by specific monitoring or response procedures, with management responsibility specified;
- High – Senior management attention required. Action plans and responsibility specified; and
- Very High – Manage in same manner as High category. However, immediate action required.

3.4 DISCUSSION

The qualitative risk assessment was undertaken in accordance with the methodology, risk criteria and ranking listed in **Section 3.3.1**.

The risk assessment is presented in full in **Appendix 1** and identifies all potential hazards associated with:

- Transport to site;
- Storage of goods on-site;
- Prescribed Dams / Levee;
- General Operation;
- Coal Handling Plant (CHP); and
- Transport off-site.

The risk assessment found a medium to low risk associated with the Project, provided that the continued implementation of risk prevention and remediation measures occurs, as discussed further in **Section 5.0**.

4.0 PRESCRIBED DAMS

4.1 LIDDELL ASH DAM LEVEE

The Liddell Ash Dam Levee (listed as a prescribed dam under the Dam Safety Act) is located immediately to the east of the Project Area and provides a barrier between the Liddell Ash Dam and mining operations at Drayton (see **Figure 1**). The closest mining activity to the Liddell Ash Dam levee is approximately 200 m (**Figure 1**). The proposed area for mining does not lie within the "Notification Area" around the Liddell Ash Dam as defined by the DSC (Area Gazetted 13th February 1998). The Drayton to Bayswater Power Station overland conveyor also provides a physical barrier between active mining and the Liddell Ash Dam Levee, and will remain in place for the duration of the Project.

The Liddell Ash Dam Levee was independently inspected in a Type 3 Surveillance Report under the Dam Safety Act in October 2006 and was considered to be in a "safe condition" (Connolly, 2006).

The surveillance report re-considered the consequence of failure of the Liddell Ash Dam Levee in light of the Project mining closer towards the structure than previously proposed. The report considered the Consequence Categories defined by the DSC and found a "low risk to the community, but rather a significant risk to the mining operations" in the event of levee failure (Connolly, 2006). The low risk to the community is attributable to the surrounding land use discussed in **Section 1.0**.

The Sunny Day Consequence Category is described as "failure that occur without any attendant natural flooding", whilst the Flood Consequence Category is described as "failures that occur in association with a natural flood" (DSC, 2007).

The Sunny Day Consequence Category and Flood Consequence Category were both considered to be low for the Project. In a probable maximum rainfall event, the Bayswater Creek basin would largely contain the event east of the Drayton to Bayswater Power Station conveyor. If any flow did reach the mining operations, it would be insignificant given the pit catchment (Connolly, 2006).

The Population at Risk (PAR) includes those persons who would be directly exposed to floodwaters in the event of levee failure. The PAR would be persons working in the mine, particularly those working at the bottom of the East and South pits (depending on the failure location). Accordingly, the PAR category would be 1 - 10, but would include an itinerant population. The workers in the pit would most likely be equipment operators who have continuous communications with a central control and alertness for unusual events such as water flows, rock falls, etc. (Connolly, 2006).

A stability assessment of the East Pit Final Highwall and the Liddell Ash Dam Levee was conducted in March 2003 by Boyd Mining Pty Ltd (Boyd Mining, 2003) and reviewed by Boyd Mining in February 2006.

The principle aim of the study was to establish safe mining limits from the Liddell Ash Dam Levee by assessing any impacts of the pit proximity on the integrity of the levee embankment and any possible impacts of blasting vibration on the levee wall integrity. The assessment was supplemented by a field program of geotechnical drilling and logging.

The stability assessment concluded that "progressive stripping and mining toward the final highwall demonstrated that little potential exists for cracking of the rock mass beneath the levees and directly under the ash dam and lateral strains were uniform, but insignificant". Thus, the process of mining towards the Liddell Ash Dam Levee is anticipated to result in minimal impact on the levee wall.

Current management and mitigation measures will continue for the Project which is discussed in **Section 5.0**.

4.2 ACCESS ROAD DAM

The Access Road Dam (listed as a prescribed dam under the Dam Safety Act) is located adjacent to the Drayton Mine Access Road in the north – east of the Project Area (see **Figure 1**). The Access Road Dam will not be impacted by the Project as the closest approach to the dam associated with mining is 1200 m.

The Access Road Dam was independently inspected in a Type 3 Surveillance Report under the Dam Safety Act in April 2005 and was considered to be in a "safe condition" (Connolly, 2005).

The surveillance report reconsidered the risk of failure of the Access Road Dam and found the Sunny Day Consequence Category to be significant as loss of life is possible. It was noted that damage to the immediate internal road and private rail network would be likely in the event of dam failure.

The Flood Consequence Category was considered to be low, as the possible flood yield is small (Connolly, 2005).

Current management and mitigation measures will continue for the Project and these are discussed in **Section 5.0**.

4.3 DELPAH DAM

Delpah Dam (also referred to as Dam 1690) (listed as a prescribed dam under the Dam Safety Act) is located to the south of the Project Area (see **Figure 1**). Delpah Dam will be removed by the progression of mining associated with the Project and is currently being dewatered in preparation for removal. Approval will be sought to de-list Delpah Dam from Schedule 1 of the Dam Safety Act.

Delpah Dam was independently inspected in a Type 3 Surveillance Report under the Dam Safety Act in May 2003 and was considered to be in a safe condition (Connolly, 2003).

Both the Sunny Day Consequence Category and Flood Consequence Category were considered to be low and that failure of the dam would be unlikely to result in loss of life (Connolly, 2003).

The hazard associated with Delpah Dam and activities associated with the Project will be eliminated due to the removal of the dam as a result of the progression of mining.

5.0 PROJECT RISK PREVENTION & REMEDIAL PROCEDURES

As noted in **Section 2.0**, Drayton will continue to rely on the SHECMS to manage the hazards and risks associated with the Project. In particular, the SHECMS Waste and Hazardous Materials Procedure and the Drayton Risk Management System will be updated to include hazards associated with the Project.

The diesel and LPG storage tanks will continue to be refilled as required by a fully licensed contractor, who are inducted and fully familiarised with SHECMS procedures on refilling the system.

Explosives will continue to be utilised in accordance with SHECMS procedures and the requirements of AS/NZS 2187.1 – 1998: *Explosives – Storage, Transport and Use – Storage* (Standards Australia, 1998) and the *Coal Mines (Open Cut) Regulation 1999*.

LPG will continue to be utilised in accordance with AS/NZS 1596 – 2002: *The Storage and Handling of LP Gas* (Class 2.1) (Standards Australia, 2002) for the purposes of storage and handling. LPG will continue to be transported by a licensed contractor in accordance with the *Australian Code for Transport of Dangerous Goods by Road and Rail* (EPA, 1998).

Staff training on hazardous materials and their management will continue to be provided for the duration of the Project. The existing emergency response procedures and systems is updated as required to include risks identified from the Project and all storage facilities will be upgraded to accommodate any increase in hazardous materials required. All storage facilities will continue to be designed to meet relevant Australian Standards.

Site specific management measures will continue to be implemented to reduce the potential for off-site impacts of blast vibration and overpressure. These include temporary closures of a short section of Thomas Mitchell Drive when open cut blasting is within 500 m of the road and notification of Energy Australia / Transgrid and downstream users when blasting will occur within 100 m of the powerlines.

Regular surveillance audits and monitoring of prescribed dams will continue to occur. All blasts will be designed in accordance with the Dam Safety Act, EPL 1323 and SHECMS, so that ground vibration levels at the Liddell Ash Dam Levee wall will not exceed 20 mm/s and all blasts will be monitored at the levee wall. If a vibration level exceeds 10 mm/s, the Liddell Ash Dam Levee wall will be inspected for damage or cracking immediately following the blast.

6.0 CONCLUSION

The qualitative risk assessment presented in **Appendix 1** identifies potential hazards associated with the Project and ensures that the existing and continued implementation of risk prevention and remediation techniques is adequate. This risk assessment has confirmed that the Project will not impose an unacceptable level of risk and is therefore not a hazardous or offensive development.

The continued implementation of the SHECMS and associated management techniques will ensure the Project maintains a low level of risk in accordance with the criteria described in **Section 3.3.1**.

* * *

for
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Melissa Walker
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James Bailey
Director

7.0 REFERENCES

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- Connolly (2003) *Drayton Dam 1690, Surveillance Report – Type 3* for Anglo Coal (Drayton Management) Pty Ltd.
- Connolly (2005) *Access Road Dam, Surveillance Report – Type 3* for Anglo Coal (Drayton Management) Pty Ltd.
- Connolly (2006) *Liddell Ash Dam Levee, Surveillance Report – Type 3* for Anglo Coal (Drayton Management) Pty Ltd.
- Dam Safety Committee (2007) *Consequence Categories for Dams*, http://www.damsafety.nsw.gov.au
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- DUAP (1994) *Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines.*
- *DUAP (2001) Antiene Rail Spur Development Consent (DA 106-04-00).*
- *Environmental Protection Agency (1998) Australian Code for Transport of Dangerous Goods by Road and Rail.*
- Standards Australia (1998) *AS / NZS 2187.1 – 1998: Explosives – Storage, Transport and Use – Storage.*
- Standards Australia (2001) *AS / NZS 4801: 2001 Occupational Health and Safety Management Systems.*
- Standards Australian (2002) *AS / NZS 1596 – 2002: The Storage and Handling of LP Gas.*
- Standards Australia (2004a) *AS / NZS 4360: 2004 Risk Management.*
- Standards Australia (2004b) *HB 436: 2004b Risk Management Guidelines – Companion to AS / NZS 4360:2004.*
- WorkCover NSW (2006) *Acknowledgement of Notification of Dangerous Goods on Premises at Drayton Coal Pty Limited.*

APPENDIX 1

Qualitative Risk Assessment Summary

Table O-1
Qualitative Risk Assessment

Functional / Operational Area	Incident Type	Scenario	Proposed Management Measures	Likelihood	Consequence	Risk
Transport to Site (Explosives, Fuel, Chemicals and General Goods)	Spill Fire Explosion	Vehicle collision, poor maintenance, or human error leading to off-site impacts. Material ignited following spill.	• Licensed contractors to transport and operate in accordance with AS and NSW Legislation; • Fire fighting equipment to be stored with vehicle; • Transport vehicles to have communication (e.g. mobile, radio); and • Spill kit stored on transport vehicles.	Unlikely	Major	Medium
	Theft	Theft of dangerous goods during transport, leading to off-site impacts.	• Transport vehicles to have communication (e.g. mobile, radio); • Follow specified route as per procedure; and • Inventory Control	Rare	Major	Medium
On-Site Storage (Fuels, Chemicals, Explosives and Mine Water)	Leak	Failed tank or pipe with possible off-site impacts including chemical or fuel contamination.	• All storage containers, bunding, drainage and pipelines designed to AS; • All re-fills conducted by fully licensed contractor, who is inducted and trained; • Operators using the facility to be inducted and trained; • Regular staff training in accordance with SHECMS; • Regular inspections of facilities; • Maintenance when required; • Operating procedures followed; and • Retention bunds.	Rare	Major	Medium

Functional / Operational Area	Incident Type	Scenario	Proposed Management Measures	Likelihood	Consequence	Risk
	Spill	Failed dam leading to off-site contamination.	• Design of dam structures to relevant standards; • Regular emergency response training ; • Follow SHECMS response procedures; • Regular inspections and maintenance as required; and • Retention bunds.	Rare	Major	Medium
	Spill	Exceeded dam capacity leading to an overflow event.	• Inspections and intervention where required; • Design of dam structures to relevant standards and required containment capacities; and • Follow SHECMS response procedures.	Rare	Minor	Low
	Theft	Unauthorised personnel removing products, which could result on off-site impact.	• All storage containers, bunding, drainage and pipelines designed to NSW legislation; • Security fencing, and security services in operation; • Operators using the facility to be inducted and familiarised; and • Regular inspections of facilities.	Rare	Minor	Low
	Fire / Explosion	Flammable or combustible materials ignited causing a fire which has potential to spread.	• All storage containers, bunding, drainage and pipelines designed to AS; • Regular inspections of facilities; • Maintenance when required; • Operators using the facility to be inducted and familiarised; • Fire fighting equipment available on-site; • All spillage cleaned up; and • Operating procedures.	Rare	Moderate	Medium

Functional / Operational Area	Incident Type	Scenario	Proposed Management Measures	Likelihood	Consequence	Risk
Prescribed Dams / Levee	Failure of dam structures and levee	Possible failure of dams and levee wall from cracking and stress from mining operations and blasting and release of water.	• Planning and design of blast events to ensure adequate control and buffer distances; • Operational procedures - blasting undertaken by trained personnel in compliance with EPL / DSC Requirements; • Transport vehicles to have communication; • Development and implementation of appropriate operating procedures; • Training and competency assessment of plant operators; • Regular monitoring of dam and monitoring of all blasts; • Design of blasts not to exceed 10 mm/s. If any blasts exceed 10 mm/s then inspect for cracking; • Inspection of prescribed dams and levee after extreme rainfall conditions; and • Regular Surveillance report to assess condition and risks.	Rare	Major	Medium
General Operations (Construction, ground preparation, rock emplacement, waste excavation, rehabilitation,	Spill	Containment structure not adequately built or maintained leading to off-site discharge of silt, saline water, diesel or chemicals.	• Design of dam structures to relevant standards and required containment capacities; • Operators using the facility to be inducted and trained; • Regular maintenance; • Supervision during construction; • Inspection of containment structures and pipes; and • Maintenance or intervention where required;	Rare	Moderate	Medium

Functional / Operational Area	Incident Type	Scenario	Proposed Management Measures	Likelihood	Consequence	Risk
CHP (Coal transport and tailings)	Spill	Vehicle collision, poor maintenance, procedures absent, leading to off-site impacts.	• Storage containers, bunding, drainage and pipelines designed to AS; • Regular inspections of facilities; • Maintenance when required; • Operators using the facility to be inducted and trained; and • Operating procedures followed.	Rare	Minor	Low
	Fire / Explosion	Mobile plant, powerlines, fixed plant, human action or spontaneous combustion leading to off-site fire related impacts.	• Extension of existing operating procedures to manage Project related activities; • Regular maintenance of mobile plant and fire fighting equipment; • Development and maintenance of appropriate fire breaks; • Review of the existing Bushfire Management Plan; • Review and implementation of the existing Emergency Response Plan; • Regular inspections of mobile and fixed plant, coal stockpiles, fire fighting equipment and fire breaks; • Review and implementation of the existing Spontaneous Combustion Plan; and • Training and competency assessment of plant operators.	Rare	Major	Medium

Functional / Operational Area	Incident Type	Scenario	Proposed Management Measures	Likelihood	Consequence	Risk
	Unplanned movement to off-site	Waste rock, mobile plant move off-site in an uncontrolled manner.	• Planning of activities to ensure adequate control and buffer distances; • Supervision by appropriately qualified persons; • Development of appropriate operating procedures; and • Training and competency assessment of plant operators.	Rare	Minor	Low
Blasting Activities (Drill and Blast)	Unplanned movement to off-site	Blasting leading to flyrock damaging property/persons off-site.	• Planning and design of blast events to ensure adequate control and buffer distances; • Operational procedures - blasting undertaken by trained personnel in compliance with EPL / DSC requirements and Mine Managers Rules; and • Where blasting occurs in close proximity to the Thomas Mitchell Drive temporary road closures would occur in accordance with RTA requirements. Following blasting, the road would be checked for debris prior to re-opening.	Rare	Minor	Low
	Disruption of powerlines	Blasting flyrock leading to damage of powerlines. Destabilisation of Footings.	• Planning and design of blast events to ensure adequate control and buffer distances; • Operational procedures - blasting undertaken by trained personnel in compliance with EPL / DSC requirements and Mine Managers Rules; • Consult Energy Australia / Transgrid when approaching powerlines (100 m.)	Rare	Minor	Low

Functional / Operational Area	Incident Type	Scenario	Proposed Management Measures	Likelihood	Consequence	Risk
Open Cut (Overburden Emplacements)	Unplanned movement to off-site	Slump or collapse of Overburden emplacement batter leading to off-site impacts.	• Overburden emplacement batters designed to appropriate standards; • Establishment of appropriate buffer distances; and • Regular inspections and surveys of overburden emplacement batters during their development.	Rare	Major	Medium
CHPP (Tailings Drying Area)	Leaks / Spills	Pipeline failure leads to off-site release of tailings.	• The pipeline systems designed to appropriate standards; • Regular inspections and maintenance as required; • Bunding of portions of the pipeline that are outside of the catchment of containment structures of open cuts; and • Bunds to be designed to divert tailings to a containment structure.	Possible	Major	Medium
Transport On-Site (Explosives, Fuel, Chemicals and General Goods)	Spill Fire Explosion	Vehicle collision, poor maintenance, or human error leading to off-site impacts.	• Contractors licensed and operate in accordance with AS and NSW Legislation; • Site policies, management plans and procedures; • Containment structures; and • Operator training.	Rare	Minor	Low
Transport Off-Site (Rail Loop and conveyor Operations)	Leaks / Spills	Sediment control structure failure leads to discharge to watercourse.	• Sediment control structures to be designed to relevant standards; • Review of existing Erosion and Sediment Control Plan and Water Management Plan; and • Regular inspections and maintenance where required.	Unlikely	Moderate	Medium

Functional / Operational Area	Incident Type	Scenario	Proposed Management Measures	Likelihood	Consequence	Risk
	Leaks / Spills	Overloading, derailment or collision leading to coal or fuel spillage off-site.	• Regular inspections of train loading activities and rail infrastructure and intervention / maintenance where required; and • Appropriately qualified engineers to design the rail infrastructure and signalling systems.	Unlikely	Minor	Low