Centennial Coal

ANNUAL REVIEW

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT

Awaba Colliery

January 2012 to December 2012

Mining Leases
Owned and Operated by
Centennial Newstan Pty Ltd
ABN 68 101 508 865

Centennial Coal
Environment Matters

TITLE BLOCK

Name of mine	**AWABA COLLIERY**
Mining Titles/Leases	**Newstan Colliery Holding**
AEMR Commencement Date	**01/01/2012**
AEMR Completion Date	**31/12/2012**
Name of leaseholder	**CENTENNIAL COAL LIMITED**
Name of mine operator (if different)	as above
Reporting Officer	Veronica Warren
Title	Environmental Coordinator
Date	28 March 2013

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1 Introduction

Awaba Colliery was an underground coal mine operated by Centennial Newstan Pty Ltd, within the Newstan Colliery Holding producing coal by the bord and pillar method, using continuous miners. The mine has been operational since 1947. During this time over 35 million tonnes of coal has been produced from the Great Northern Seam using a combination of first workings development, pillar extraction, pillar quartering, and pillar stripping.

An application for a Part 3A Project Approval was lodged in March 2010 by Centennial for the Awaba Colliery Mining Project (the "Project"), which sought approval from the Minister for Planning to allow ongoing and extended underground mining and associated surface operations. The project was declared by NSW Department of Planning as a Major Project under Part 3A of the EP&A Act, with Director General's Requirements (DGRs) issued on 22nd April 2010 (DA10_0038) for assessment under Section 75F of the Environmental Planning and Assessment Act (1979). The Environmental Assessment was submitted to the Department in September 2010. The Planning and Assessment Commission of New South Wales granted conditional approval to Centennial Newstan Pty Ltd (Centennial Newstan) for their Part 3A Application on the 13th of May 2011.

The mine entry and primary surface facilities are located approximately 1 km south of Awaba Township and 5.5 km south west of Toronto on Wilton Road. The mine extends from the western extremity of Lake Macquarie to the eastern foothills of the Watagan Mountains.

In March 2012 the Awaba Colliery ceased mining operations as the available coal reserves were exhausted. All mine entries were decommissioned in 2012, removing access to the underground workings.

This AEMR has been developed in accordance with condition 3 of Schedule 5 of the Project Approval 10_0038, and as per Division of Resources & Energy (DRE) document "Guidelines to the Mining, Rehabilitation and Environmental Management Process". (Document edg03 mremp guide v3 dated January 2006).

Figure 1: Aerial photograph of Awaba Colliery Surface Facilities

1.1 Consents, Lease and Licenses

1.1.1 Leases

Awaba Colliery is wholly within the Newstan Colliery Holding and is subject to one mining lease and two mining purposes leases.

The Colliery overlies and is bordered to the north by Newstan Colliery, to the south east by Myuna Colliery and to the west and south west by Mandalong Mine, all Centennial mines.

The northern and eastern boundary of Awaba Colliery is also bordered by Mining Lease No. 1452 (ML1452).

The total mineral area for Awaba Colliery is 2519 hectares and comprises the Great Northern and Fassifern seams for the major portion of Consolidated Coal Lease 746 (CCL746). Surface leasehold land has an area of 1901.438 hectares. These areas are summarised in **Table 1**.

Table 1: Summary of Colliery Lease Details

Plan ID	Title	Mineral (Ha) (Holding)	Surface (Ha) (Holding)	Expiry
	CCL746	2519	1900.00	31/12/2028
1	MPL327	Nil	1.041	25/03/2014
2	MPL328	Nil	0.397	25/03/2014
Total		**2519**	**1901.438**	

The leases above are held by Centennial Newstan Pty Ltd, and are included in a joint security deposit for Newstan.

1.1.2 Mining Leases

Consolidated Coal Lease 746 provides the right to mine for Awaba Colliery. The holding also includes two small surface areas comprised in Mining Purposes Leases 327 and 328.

Mining operations are controlled by the conditions contained within these mining leases, planning approvals and the provisions of the Coal Mines Health and Safety Act / Regulations and the Mining Act. This includes the successful periodic renewal of leases.

Table 1 shows details of mining leases and mining rights as they relate to the Awaba Colliery Holding

Awaba Colliery has no benefiting subleases with adjoining mining lease holders.

1.1.3 Authorisations (Exploration Licences)

Awaba Colliery has no authorisations or exploration licences under the Mining Act. Exploration for the Colliery is undertaken in accordance with the conditions of CCL746 and subject to the provisions of the Coal Mines Health & Safety Act and the Mining Act.

1.1.4 Security Deposit Calculation

Awaba Collieries DRE security deposit is included within the Centennial Newstan deposit of $10,700,000 as per the review conducted in 2009. A copy of the rehabilitation cost calculation has been provided to DRE with the AEMR.

1.1.5 Consent Conditions

The Awaba Colliery Project Approval contains conditions that detail specific requirements on matters to be included in the AEMR. These are set out in Table 2 below, together with notation of the section of this document in which each matter is addressed. These sections of the report are to satisfy the Project Approval requirements and reporting of compliance to the Department of Planning & Infrastructure.

Table 2: Project Approval Condition Requirements

Project Approval Requirement	**Section Addressed**
Annual Review	
3. By the end of March 2012, and annually thereafter, the Proponent shall review the environmental performance of the project to the satisfaction of the Director-General. This review must: (a) describe the development (including any rehabilitation) that was carried out in the past calendar year, and the development that is proposed to be carried out over the next year;	Sections 3 & 5
b) include a comprehensive review of the monitoring results and complaints records of the project over the past calendar year, which includes a comparison of these results against the · the relevant statutory requirements, limits or performance measures/criteria; · the monitoring results of previous years; and · the relevant predictions in the EA;	Sections 3 & 4
c) identify any non-compliance over the past year, and describe what actions were (or are being) taken to ensure compliance;	Section 3.20
d) identify any trends in the monitoring data over the life of the project;	Sections 3 & 4
e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and	Section 3
f) describe what measures will be implemented over the next year to improve the environmental performance of the project.	Sections 3 and 5

1.1.6 Environment Protection Licence

Awaba Colliery operates under current Environmental Protection Licence 443 administered by the Office of Environment & Heritage (OEH). A copy of the 2012 Annual Return is provided in **Appendix 1**.

1.1.7 Dangerous Goods

The Colliery does not store any dangerous or reportable goods above the manifest quantity requiring Notification to Workcover. Dangerous Goods License No 35/025012 was surrendered to Workcover in March 2006.

1.2 Mine Contacts

Mine Manager:	**Grant Watson**
Work Phone:	02 4956 0227
Mobile Phone:	0438 560 227
Environmental Coordinator:	**Veronica Warren**
Work Phone:	02 4956 0206
Mobile Phone:	0428 438 792

1.3 Actions Required at Previous AEMR Review

No actions were required following submission of the 2011AEMR.

2 OPERATIONS DURING THE REPORTING PERIOD

The area of mining undertaken during the reporting period can be found on plan AW2233. The mine ceased underground operations in 2012, and the mine entries were sealed. There will be no mining in 2013.

The site rehabilitation plan was approved by the DRE on 28 June 2011.

2.1 Exploration

No drilling occurred on CCL 746 within the reporting period. Drilling is undertaken in accordance with the *Awaba East Exploration Project Review of Environmental Factors* dated August 2008, approved on the 1/9/08, and *Stage 2 Awaba East Exploration Project Review of Environmental Factors* (REF) May 2009, approved on the 13/7/09. Modifications were made to the 2008 REF and approved on the 15/12/08, & 9/4/09, and a third modification to both REF's was approved on the 4/11/09.

2.2 Land Preparation

No land preparation on the Awaba lease was undertaken for Awaba operations.

2.3 Construction

No additional mine infrastructure for Awaba operations were constructed during the report period. Works onsite were limited to necessary maintenance of existing plant, or demolition and rehabilitation of existing infrastructure.

2.4 Mining

Mining at Awaba Colliery has been ongoing in the Great Northern Seam since 1947. The mine in this time has extended to the limits of its boundaries and then retreated to extract the remaining safely accessible coal. In 2012 Awaba Colliery ceased underground operations, and sealed all entries into the Colliery.

The Great Northern Seam ranges from less than 2.0 m to more than 4.0 m in thickness but generally varies between 2.5 and 3.5 m. The Great Northern seam within the Awaba Colliery is shallow, ranging from 15 to 100 m depth of cover. The seam dips generally in the westerly direction, and is generally thinner to the east.

The primary method of production in recent years had been pillar extraction within narrow panels leaving coal pillars or barriers between adjacent narrow panels. The majority of the pillars were pre-existing, having been developed many years ago.

In areas where there were large pre-existing pillars or blocks of "virgin coal", roadways were driven and supported with additional pillars (in virgin coal) formed using traditional bord and pillar mining methods. These pillars are then subsequently extracted (or left as barriers). All coal was produced using continuous miner machines. The mining sequence involved extracting between three or four rows of pillars and leaving at least one row as support. Depending on geotechnical advice, the resulting voids from this method may range between approximately 40 m and 100 m in width (key design parameter), and up to 500 m in length.

Mine planning ensured panels were not extracted where depth of cover or surface constraints preclude total extraction. This mining method was developed in consultation with DRE and has been utilised successfully to date.

The mining method was based on the requirement to maximise resource recovery while preventing any rapid uncontrolled collapse of the overlying Teralba Conglomerate impacting on the goaf edge stability, safety for the underground miners or subsidence on the surface. The layout minimised the risk of rapid collapse of the conglomerate by keeping spans in the extraction panels to less than approximately 100 mm

Mining was ongoing in the Main South Area (MSA) following staged SMP approvals received from the DRE in 2005, 2008, and 2010 under the NSW Mining Act, 1992. Mining undertaken to date in the MSA has involved the following:

- Stage 1 – This area is located at the southern end of the MSA and received SMP approval in 2005. This was the first area to utilise the current mining method, developed in consultation with DRE of pillar extraction using narrow panels. Mining within Stage 1 area was completed in June 2009.
- Stage 2 – The second stage of the MSA gained SMP approval in September 2008. Mining in this area was undertaken using the same total extraction method used successfully in Stage 1. Mining in this area was completed in March 2012.
- Stage 3 – The third stage of the MSA gained SMP approval on 15 December 2010. Mining in this area was undertaken using the same total extraction method used successfully in Stage 1 and 2. Mining in this area was completed in March 2012.
- East B – Mining commenced in this area following the approval of the East B Extraction Plan on 26 July 2011. Mining in the East B area was completed in December 2011.

2.5 Mineral Processing

No mineral processing is undertaken on site at Awaba Colliery. Mined coal was transferred to the surface by a number of conveyors and through the Run of Mine (ROM) Bin before arriving at the Coal Preparation Plant (CPP) located at the Awaba Colliery pit top area. The CPP was comprised of three screens that coal is initially passed through before entering the primary and one of the two secondary crushers. The final product size is adjusted to suit market demands and is generally less than 100 mm. This material was then delivered to the Final Product Bin by conveyor. From the Final Product Bin coal was loaded into trucks for transport off-site, or, stockpiled in an adjacent area. Awaba Colliery has the capacity to stockpile up to 30,000 tonnes of ROM coal.

Raw materials were transported directly to Eraring Power Station or to Newstan Coal Preparation Plant via the Eraring private haul road. The entire ROM production for the report period was delivered as saleable coal.

The CPP and associated bins and conveyor infrastructure were decommissioned and removed from the Colliery in 2012.

2.6 Waste Management

There are a variety of waste management systems that were maintained during the reporting period at Awaba Colliery; including the following.

- Waste oil recycling
- Waste paper and cardboard recycling
- Scrap steel recycling
- Waste minimisation practices.

Waste oil is collected within an oil water separator, and two 1,000L IBC's located on the mine surface. A contractor regularly services and maintains the oil water separator. Weekly inspections are also conducted on the oil water separators to ensure proper operation. A licensed contractor working within the waste tracking provisions of the *Protection of the Environment Operations Act* (POEO Act) removes all waste oil and greases generated on the site.

General rubbish from the operation is sorted and placed into bins for recycling, reuse and disposal to land fill. Recycling at Awaba includes cardboard and paper from the offices and store, the draining and disposal of 20L oil drums, and the collection and recycling of waste oil.

The Waste Management System is monitored via a weekly inspection where the status of waste oils, waste steel, waste cardboard/paper containers are reviewed for appropriate disposal, and recorded for compliance with the waste tracking guidelines within the POEO Act.

2.7 Ore and Product Stockpiles

The Colliery has the ability to stockpile approx 30,000 tonnes of ROM coal. There are no plans to increase the stockpile capacity.

2.8 Water Management

2.8.1 Surface Runoff and Mine Water

Awaba Colliery pit top is located adjacent to Stony Creek. The aim of Awaba's water management system is to ensure that clean water is diverted away from potential contamination and discharged directly into Stony Creek. Contaminated runoff is retained within the Colliery Pollution Control System and pumped to underground workings for residence time and filtration through goaf areas

before being pumped to the surface at the 10 South Borehole and into Eraring Ash Dam. LDP005 ceased discharge in March 2010.

Clean water is diverted from buildings including the main administration building, bathhouse, workshop complex and hard stand areas via a network of downpipes, dish drains and underground storm water pipes directly into Stony Creek. This minimises the potential for contamination and maximises the effectiveness of the water pollution control system in the event of excessive rainfall.

The yard is divided into two separately drained areas. Areas being classified as clean water are diverted directly into Stony Creek, while the other areas are classified as contaminated. The areas zoned as contaminated are due to the potential risk of hydrocarbon and sediment contamination from the movement and maintenance of equipment. The runoff from these areas is intercepted by drive in sumps and an oil water separator and directed into the Pollution Control Dam (PCD).

Potable water usage for general surface and underground operations for the reporting period was approximately 4,665kL. Water is used on the surface in the bathhouse, for equipment cleaning, and underground for dust suppression, and fire fighting supply.

On 20 October 2011, the EPA approved a licence variation application for EPL 443 to allow Awaba to accept up to 4ML/day of water transferred from the Newstan underground workings for a 12 month trial period. This water is stored within the Awaba Great Northern Seam workings. During the reporting period a total of 899.8 ML had been transferred from Newstan to the Awaba Colliery underground workings.

2.8.2 Water Balance

The water balance completed for the Awaba Colliery Water Management Plan and for the Awaba Colliery Mining Project predicted that the annual average discharge (ML/year) from the Awaba underground workings would be 278.1 ML per annum. Table 5 includes the actual quantities discharged from the Awaba Colliery underground workings.

Table 3: Water Balance

Year	Water Use (ML)	Water pumped from 10 South (ML)	LDP004 (ML)	LDP009 (ML)
2012	47.78	204.284	0	0

2.9 Hazardous Material Management

Material safety data sheets are maintained for all substances used on site. Chemwatch an electronic chemical, MSDS, and handling system is utilised to assist chemical management.

No hazardous material or waste was disposed of on site.

The condition of supply of goods incorporates the supply of MSDS by the product supplier/vendor. This is implemented by means of a condition placed on stores purchase order forms. The MSDS's are managed as per the Colliery Hazardous Substances Safety System, with hard copies located in the first-aid room and electronic copies available on the company intranet.

2.10 Other Infrastructure Management

The Awaba Colliery is listed in the City of Lake Macquarie Heritage Study (1993) as item AW-07. Awaba Colliery is not listed as an LEP (Local Environmental Plan) item but is treated as a provisional heritage item under LMCC DCP1 2004.

Existing Surface infrastructure at the Colliery comprises:

- Mine entry/exit for personnel and materials (1:20 Decline). The drift was sealed in 2012.
- Old mine entry/exit for personnel and materials (1:5 Decline). The drift was sealed in 2012.
- Administration and bathroom facilities
- Workshop facilities
- Pollution control apparatus
- Enclosed and bulk open material and equipment stores facilities
- Air compressors
- Internal roads and car parking facilities
- Nine remote de-watering bores and security enclosures.

Surface infrastructure removed or decommissioned in 2012:

- Coal conveyor drifts (1:3.5 Decline and 1:5 Decline).
- Coal handling facilities which were used for breaking, crushing, sizing and storing product
- The overland conveyor systems
- Mine ventilation equipment
- Ballast borehole (delivery of ballast direct to underground workings).

The total area of effect of the colliery surface infrastructure is approximately seventeen hectares.

Table 4: Production and Waste Summary

	End of 2011 Reporting Period (31 December 2011)	End of Reporting Period (31 December 2012)	End of Next Reporting Period (Estimated)
Topsoil stripped	0	0	0
Topsoil used/spread	0	0	0
Waste rock	0	0	0
Ore	0	0	0
Processing Waste	0	0	0
Product (Tonnes)	643,814t	17,768	0

Table 5: Stored Water

	Start of Reporting Period	End of Reporting Period	Storage Capacity
Clean Water (m^3)	40,000	40,000	40,000
Dirty Water (m^3)	1,879	1,879	3,187

3 Environmental Management and Performance

In October 2011, an Environmental Management Strategy (EMS) was developed for the Awaba Colliery in accordance with Condition 1 of Schedule 5 of the Project Approval (10_0038) and approved by the Department of Planning & Infrastructure in November 2011.

The EMS has been developed to provide an effective management strategy to identify and control potential environmental impacts to achieve compliance with environmental legislation and regulatory requirements applicable to Awaba Colliery.

The objectives of the EMS are as follows:

- Provide the strategic framework for the environmental management of the Project;
- Identify the statutory approvals that apply to the project;
- Describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;
- Describe the procedures that would be implemented to:
    - Keep the local community and relevant agencies informed about the operation and environmental performance of the project (receive, handle, respond to and record complaints;
    - Respond to any non-compliance;
    - Respond to emergencies;
- Include copies of any strategies, plans and programs approved under the conditions of this approval; and
- Include a clear plan depicting all the monitoring required to be carried out under the conditions of this approval.

As required by the EMS, Awaba Colliery uses the risk assessment process to identify safety, environmental and business risks in its operations. Involving its employees (and external experts where necessary) to recommend appropriate controls for these risks. Focus is on the inter-relationship between:

- People.
- Machinery.
- Methods of work.
- Environment.

An annual environmental risk assessment was completed in 2012 as part of the AEMR process as a requirement of DRE. The purpose is to identify mine activities, processes and facilities which require control strategies to ensure environmental protection and compliance with conditions of the lease, licence and consents. This environmental risk assessment is attached in **Appendix 2**.

3.1 Air Quality & Dust

An Air Quality & Greenhouse Gas Management Plan was established at Awaba in October 2011 in accordance with Condition 7 of Schedule 3 of the Project Approval and approved by the Department of Planning & Infrastructure in November 2011. In order to determine the effectiveness of the colliery's dust control measures, a network of dust depositional monitoring gauges have been established. Depositional gauges are located within the Colliery perimeter as well as adjoining areas. A total of 4 depositional gauges are utilised, all located within the Colliery boundary. The following graph **Figure 2** displays Awaba's Annual Average Dust Deposition in 2012 (Insoluble Solids).

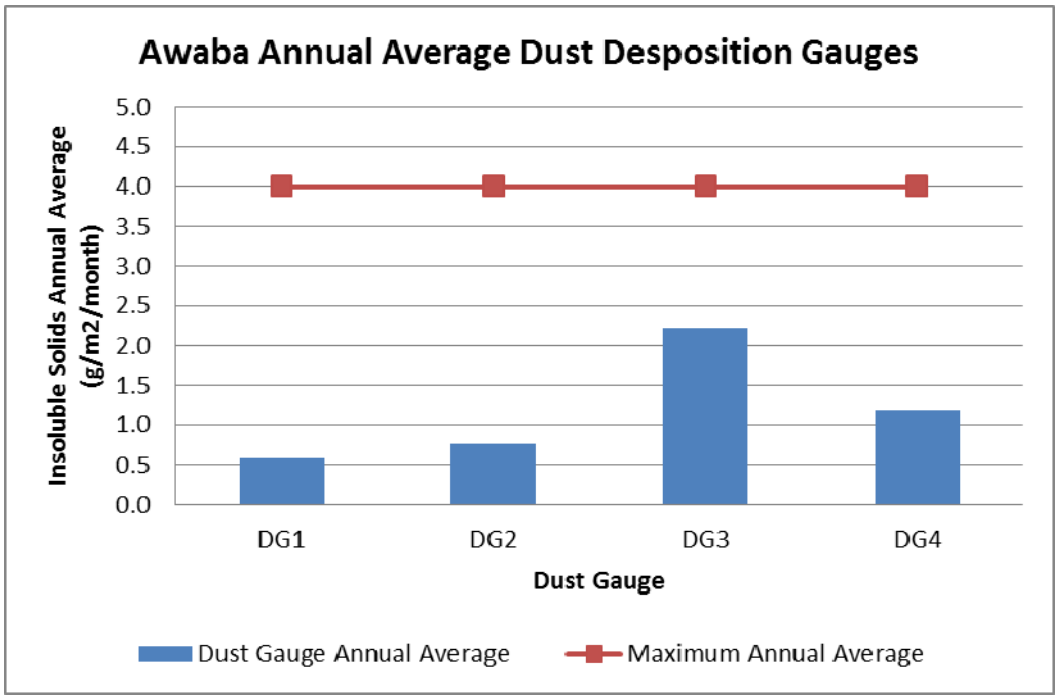


Figure 2: Awaba Average Annual Dust Deposition for 2012.

Samples are taken from the depositional gauges every 28 (±2)days as per *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* as administered by the Office of Environment & Heritage. As predicted with in the Environmental Assessment for the Awaba Colliery Mining Project dust deposition levels were below the Project air quality criteria at all surrounding dwellings.

A dust suppression system (sprinklers) was installed adjacent to the Awaba Colliery stockpile to reduce the dust emissions from the roadways and stockpile area.

A requirement of the Project Approval and the EPL is to install a high volume air sampler to evaluate the performance of the project. Discussions with the Lake Macquarie City Council (LMCC) have been ongoing since August 2011 to potentially allow for the installation of a high volume air sampler adjacent to the Awaba tennis courts.

3.2 Erosion and Sedimentation

An Erosion and Sediment Control Plan was developed for the Awaba Colliery in October 2011 in accordance with Condition 19 of Schedule 3 of the Project Approval and was approved by the Department of Planning & Infrastructure in November 2011.

No land disturbing activities, other then those associated with the decommissioning of existing infrastructure detailed further in section 5 occurred at the Awaba Colliery during the reporting period.

3.3 Surface Water

Water monitoring is undertaken in accordance with the approved Water Management Plan, Project Approval and Environment Protection Licence 443 requirements. There were no discharges from the Licenced discharge points in 2012. Further information is provided in the Annual Return in **Appendix 1**. Surface monitoring locations are provided in on **Plan AW1040**.

The Water Management Plan for Awaba Colliery was developed in October 2011 as per Condition 17 - 22 of Schedule 3 of the Project Approval and was approved by the Department of Planning and Infrastructure in November 2011.

During the reporting period a detailed surface water risk assessment (failure modes and effects analysis) was reviewed for the Awaba Colliery.

An additional pump was also installed in the Awaba Pollution Control Dam (PCD) in 2011 to reduce the likelihood of discharge. Plans for the expansion of the PCD have been put on hold due to the decommissioning of infrastructure at Awaba in 2012.

Upstream and downstream sampling has continued along Stony Creek to establish natural background concentrations, along with the introduction of an additional reference site in the Jigadee Creek catchment area as recommended in the surface water assessment completed for the Environmental Assessment.

3.4 Groundwater

Water underground is generated from groundwater which is released from the strata into underground mine workings. The collected water gravitates through an extensive goaf/underground dam system that allows filtration and settlement. The water is then pumped from the mine via licensed discharge point 004, and via the 10 South Borehole into the Eraring Ash Dam. Discharge from LDP005 ceased in March 2010.

In October 2011, a Groundwater Monitoring Program was developed in accordance with Condition 21 of Schedule 3 of the Project Approval (10_0038) and approved by the Department of Planning and Infrastructure in November 2011.

As recommended by the Groundwater Monitoring Program two groundwater bores were installed in February 2012, with water level loggers. One bore was installed above the Stage 3 mining area, and the other further downstream to the north of the Awaba pit top within the Stony Creek alluvium associated with the third order reach of Stony Creek. The boreholes are to a maximum depth of 10m below ground level (bgl).

The purpose of monitoring the alluvials in Stony Creek is to identify any adverse impacts on groundwater dependant ecosystems and riparian vegetation located in the vicinity of the creek. The trigger for impacts on the Stony Creek alluvium will be flagged when a decreasing underlying trend of the water levels in the bores is detected. The underlying trend can be determined when water levels have been separated from the effects of rainfall. Groundwater monitoring results for 2012 are provided below.

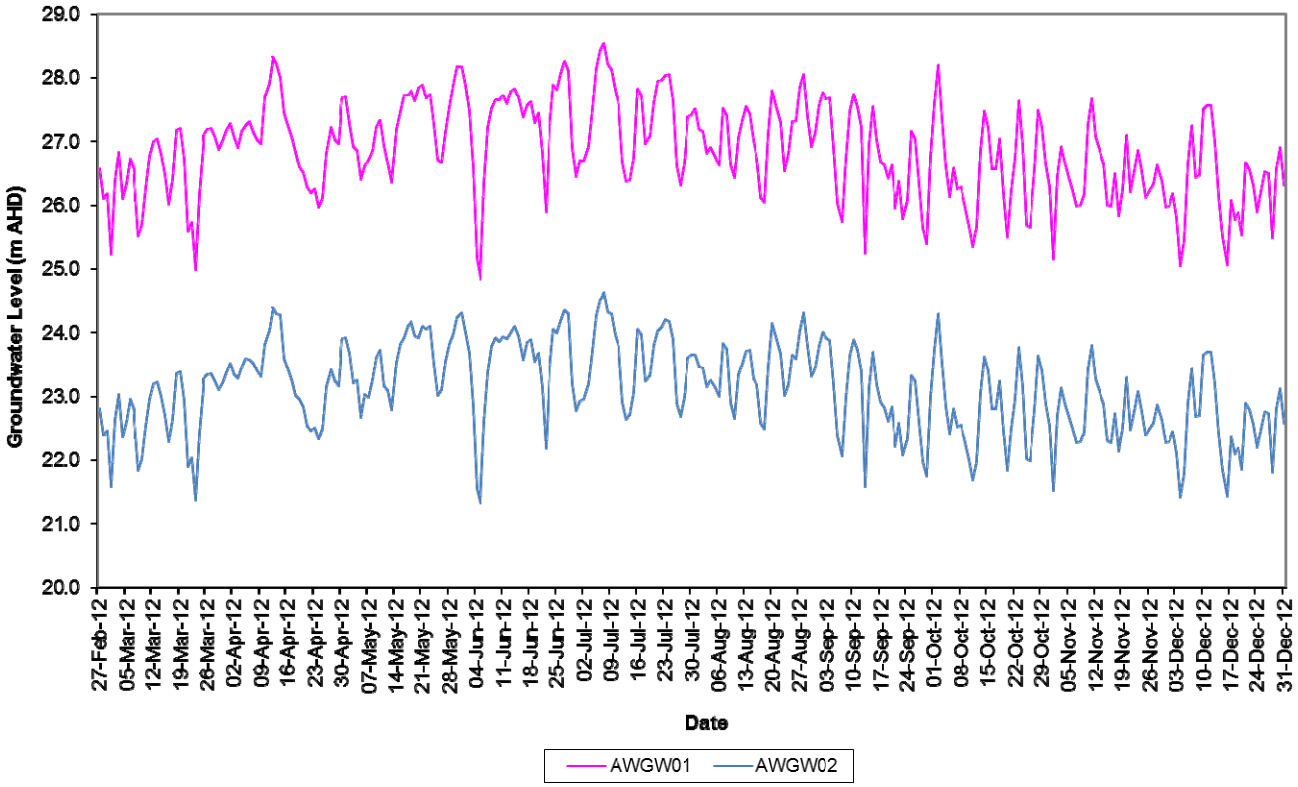


Figure 3: Groundwater Monitoring Results.

3.5 Contaminated Land

A hazardous materials assessment of the site was completed in 2009 to assist the colliery in meeting its obligations under the *Occupational Health & Safety Regulation 2001*. The objective of the survey was to identify the location and condition of visually accessible asbestos-containing and other

hazardous materials present on the site. Subsequently as a result of this report an Asbestos Management Plan was developed for the site.

A Phase 1 Environmental Site Assessment (ESA) was completed in the 2009 reporting period. The objective of the Phase 1 ESA was to assess the potential for soil and groundwater contamination and using the findings determine if further assessment is required.

There were several areas which were observed to be potentially impacted by Contaminants of Potential Concern (CoPC's). The Phase 1 report recommended that a Phase 2 site assessment be completed to identify the risks of contamination to possible receptors. The Phase 2 site assessment was undertaken in 2012, however the report is yet to be finalised.

In 2010, Awaba Colliery undertook an environmental assessment to support a Part 3A application to continue mining. During this assessment, the risks associated with contaminated land were reviewed, and the Mine closure Plan updated to include commitments arising from the assessment.

3.6 Flora & Fauna

A Biodiversity Management Plan was developed for Awaba Colliery in October 2011 in accordance with Condition 23 of Schedule 3 of the Project Approval and was approved by the Department of Planning & Infrastructure in November 2011.

Hunter Eco consultants undertook the annual monitoring of riparian vegetation along Stony Creek in February 2012 (**Appendix 3**). A detailed baseline survey was first undertaken in 2008 of the vegetation along Stony Creek with subsequent surveys undertaken to assess whether there has been any changes in vegetation that may be attributed to mining operations, in particular subsidence impacts within the Main South Area. A groundwater dependent ecosystem (GDE) of riparian vegetation was also identified along Stony Creek within the Main South Area by Hunter Eco in 2010 during the ecology survey for the Awaba Colliery Mining Project. The survey completed in February 2012 identified no impacts to the Stony Creek GDE and no deterioration of habitat over time. In February 2012the creek was full of flowing water as a result of recent heavy rain. The creek being full provided an ideal opportunity to detect any sections of the creek bed that might have diverted underground. There were no breaks in water flow which, along with the healthy condition of vegetation, confirms that underground mining has had no effect on the creek or its habitat.

No additional flora or fauna monitoring was requested by the Director General, Department of Planning & Infrastructure during the reporting period.

3.7 Weeds

Weed and pest management was undertaken by Greg Hall Pest Control throughout the reporting period.

Records of chemical usage are kept on site.

3.8 Blasting

No blasting was undertaken in the reporting period and therefore no monitoring was required.

3.9 Noise

A Noise Management Plan for Awaba Colliery was developed in October 2011 as per Condition 2 of Schedule 3 and was approved by the Department of Planning and Infrastructure in November 2011.

Attended noise monitoring commenced in November 2011 at two locations identified within the Noise Management Plan and the Project Approval. The operator attended survey consists of a daytime period (7am – 6pm), an evening (6pm – 10pm) and two night surveys (10pm – 7am) for each of the monitoring locations.

Quarterly noise monitoring was undertaken in February, May, August and November in accordance with:

- Department of Planning and Infrastructure (DoPI) Project approval schedule 3 condition 1;
- Environmental Protection Authority (EPA) Condition M8.2 of EPL 433 dated December 2011
- Office of Environment & Heritage (OEH), Industrial Noise Policy (INP).

The quarterly monitoring showed that the noise emissions from Awaba Colliery showed full compliance with the noise criteria set out within Condition 1 of Schedule 3 along with the predictions made within the Environmental Assessment.

3.10 Meteorological Monitoring

A meteorological monitoring station was installed in April 2011 to comply the requirements of EPL443. The meteorological station complies with the requirements of AS 2922 1987.

Total rainfall for the reporting period is shown in the Table 9 below.

Table 6: Awaba Rainfall Data

Total Rainfall for 2012 (mm)	
Month	**mm**
Jan	92.0
Feb	290.4
Mar	125.0
Apr	140.2
May	21.2
Jun	210.6
Jul	39.4
Aug	31.0

Sep	27.8
Oct	7.6
Nov	76.2
Dec	99.8
Total Rainfall	**1161.2**

3.11 Greenhouse Gas

Table 10 provides a summary of Awaba's Greenhouse Gas emissions for the 2012 AEMR reporting period. Awaba ceased operations and sealed the shafts and portals in 2012.

Table 7: Awaba's Greenhouse Gas emissions for 2012.

Emissions Summary (CO_2-eT)		
	2011 Total	**2012 Total**
Electricity	8,178.25	1433
Diesel	804.16	30
Fugitives – CH_4	1.43	0
Fugitives – CO_2	8534.10	3138
Total GHG Emissions (tonnes)	17,517.95	4,601

3.12 Visual, Stray Light

There are topographic and vegetative barriers between the Awaba Colliery and the nearest residences which act as a barrier, reducing the visual impacts to residents. As such there have been no visual or stray light issues.

3.13 Cultural Heritage

Cultural heritage management at Awaba Colliery is documented in the Archaeology and Cultural Heritage Management Plan completed in October 2011.

In 2012 Centennial Coal developed the Centennial's Northern Holdings Aboriginal Cultural Heritage Management Plan. This document aims to provide a consistent approach to consultation between Centennial and the Aboriginal community as well as identify standard Aboriginal cultural heritage monitoring and management requirements.

During the reporting period quarterly subsidence inspections were undertaken for the areas of moderate and high Aboriginal archaeological sensitivity (as identified in the Aboriginal Heritage Impact Assessment completed for the Awaba Colliery Mining Project) within the East B Area, along Stony Creek and adjacent to a tributary of Stony Creek. Subsidence inspections completed in 2012 found no visual disturbances, or abnormal changes due to mining operations in these areas.

European heritage items at the Awaba Colliery have been identified within the Proposed Schedule of Heritage Sites and Items (Table 11). Each of these items has been proposed for heritage listing within the Lake Macquarie Local Government Area (LGA) Local Environmental Plan (LEP). It is important to emphasise that the items in Table 11 will not appear within the Lake Macquarie LGA LEP because they are only listed within the proposed/draft schedule.

Table 8: Proposed Schedule of Heritage Sites and Items

Name of Item	Item Number
Awaba-Wangi Railway Line	AW-07
Awaba State Mine	AW-07
The Water Pumping Station	AW-06

The buildings including the Administration Office and the Workshop at the Awaba Colliery Pit Top area associated with the Awaba State Mine (AW-07) have been identified with local significance in the Lake Macquarie Inventory, in addition to the Awaba-Wangi Railway Line under the same item number (AW-07). The Water Pumping Station (AW-06) has also been identified in two previous reports as having a very high potential local heritage significance in term of representing extractive industries in the area (Suters Architects Snell 1993a; Suters Architects Snell 1996b).

Awaba Colliery also prepared and submitted a Post Mining Heritage Management Plan in accordance with Condition 31 of Schedule 3 of the Project Approval. This management plan will include a study of the significance of the existing European heritage on the site, and was submitted to various stakeholders for consultation before being submitted to the Department of Planning & Infrastructure for Approval in 2012.

3.14 Spontaneous Combustion

There were no occurrences of spontaneous combustion during the reporting period. A Spontaneous Combustion Management Plan has been prepared in accordance with Condition 11(g) of Schedule 3 of the Project Approval and was approved by the Executive Director of Mineral Resources (Division of Resources & Energy) in July 2011.

3.15 Bush Fire

All surface structures have fire protection equipment installed around them and are compliant with the Coal Mines Health and Safety Act. A designated Fire Officer is in charge of maintaining the fire equipment on the surface and underground areas of the site.

Regular mowing of the lawns surrounding the building structures ensures fire fuel loading is well within acceptable limits. Asset protection zone and hazard reduction slashing was completed in the reporting period.

A Bushfire Management Plan was developed for the Awaba Colliery in the 2010 reporting period.

3.16 Mine Subsidence

Monitoring in the reporting period was conducted in accordance with the Subsidence Management Plan (SMP), SMP approval conditions and the Extraction Plan (as required by Condition 11 of Schedule 3 of the Project Approval) and the associated subsidence monitoring program. Table 12 briefly outlines the subsidence monitoring and results conducted in accordance with the relevant SMP conditions.

Table 9: Subsidence Monitoring Results

Monitoring Results in Accordance with Awaba's SMP Conditions			
Main South Condition No (Stages 1, 2 and 3)	**3 North Condition No**	**Document**	**Monitoring Results**
12.	**12**	**Subsidence Monitoring Programme**	Maximum subsidence in Main South Stage 1 was -151 mm on 06/09/2012, which was within the defined predicted subsidence levels. There was no subsidence impact in monitoring points nearer to the Main Northern Railway, Ulan Rail Loop, Haul Road Bridge or Railcorp Power Poles. Note that Stage 1 Mining was completed on 26/06/2009. The maximum subsidence in the Stage 2 area was -77mm recorded on 06/09/2012. Note that Stage 2 Mining was completed on 08/03/2012. The maximum subsidence in the Stage 3 area was -30 mm recorded in January 2012. There were no impacts on the infrastructure within the Stage 3 area (Eraring Haul Road, Telstra Tower, Rail Corp & Ausgrid Power Poles). Note that Stage 3 Mining was completed on 22/12/2011. Statutory inspections undertaken by mining officials prior to the mine being sealed found no evidence of underground roof failure.

			Ongoing visual inspections undertaken on a quarterly basis have found no evidence of surface impacts. Subsidence has been within predicted levels and has had no detectable adverse impact on surface infrastructure. Maximum subsidence recorded in the 3 North Area was -60mm on 07/06/2010. Note that 3 North Mining was completed on 25/01/2010. Subject to review and final approval of January 2013 monitoring results by P.S.E., Subsidence monitoring in the 3 North Area is now completed. Statutory inspections undertaken by mining officials have found no evidence of underground Pillar failure. Visual inspections continuing have found no evidence of surface impacts.
13.	**13**	**Environmental Monitoring Programme**	A Stony Creek vegetation study was completed in 2009, 2010, 2011 and 2012 in accordance with the Environmental Management Plan. The ecological monitoring of riparian vegetation along Stony Creek at Awaba (**Appendix 3**) was completed as a follow up on the baseline study completed in 2008. This study was undertaken to assess whether there has been any evident changes in the vegetation that may be attributed to extraction operations. This study found that the vegetation along Stony Creek was essentially the same as recorded in 2008, and there was no evidence of cracks that may be attributed to subsidence. Additional quarterly creek inspections were undertaken to identify the following; surface cracking along creeks, step change in bed, damage to drainage channels, and ponding. Visual inspections found no visual disturbances, or abnormal changes due to mining operations.
15.	**14**	**Spontaneous Combustion Management**	Surface visual inspections did not identify any sinkholes during the reporting period in the Main South or 3 North Areas (or other areas) .

		Plan	Stockpiling of coal on the surface did not occur over long periods of time during the reporting period. Production district inspections & out-bye inspections found no abnormal gas results that may indicate or cause spontaneous combustion in the underground workings. History of the mine shows that there have been no known spontaneous combustion events since opening in 1947.
20.	**15**	**Public Safety Management Plan**	Visual inspections were completed on a quarterly basis during 2012. Inspections were undertaken to identify the following; surface cracking, step changes in road pavement, and damage to drainage, watersheds and creeks. Additional creek inspections aim to identify surface cracking along creeks, step change in bed, damage to drainage channels, and ponding. Visual inspections found no visual disturbances, or abnormal changes due to mining operations.
22.	**17**	**Subsidence Management Status Report**	Subsidence report were submitted to the various government departments and stakeholders following scheduled surveys on 31/01/12, 23/04/12, 29/08/12 and 26/09/12.

A Subsidence Monitoring Program was completed for the East B Area as required by Condition 11 (g) of Schedule 3 of the Project Approval. Table 13 provides a summary of the subsidence monitoring undertaken for the East B Area and the subsidence results.

Table 10: East B Subsidence Monitoring Program & Results

SUBSIDENCE MONITORING	INITIAL SURVEY COMMENCEMENT	RESURVEY FREQUENCY	FINAL SURVEY*	RESULTS / COMMENTS
Bush Track Monitoring points	Before Commencement of Extraction All points surveyed twice for Easting, Northing and Height (X,Y,Z)	3 Monthly Resurvey of All Points	Two further surveys to be done after completion Six (6) months and Twelve (12) months.	Monitoring points at approx. 50 metre spacings (Levels only) in safe suitable positions. All surveys were completed during 2012 and Subsidence Reports were provided to the various stakeholders.

SUBSIDENCE MONITORING	INITIAL SURVEY COMMENCEMENT	RESURVEY FREQUENCY	FINAL SURVEY*	RESULTS / COMMENTS
			Meeting to be then held with PSE to discuss and agree on further survey schedule if deemed necessary.	Note that East B Area Mining was completed on 21/12/2011. The maximum level of recorded subsidence in the East B Area in 2012 was -41mm. The predicted maximum level of the subsidence in the Awaba Mining Project was 200mm. Subsidence levels to date are significantly lower than the predicted maximum levels. Subject to review and final approval from P.S.E of January 2013 monitoring results, Subsidence monitoring in the East B area is now completed.
Bush Track Visual Inspections	Before Commencement of Extraction	Monthly by Environmental officer or representative	As above	Monthly visual surface inspections when mining within 50 metres of Bush Tracks. Visual inspections were completed on a Quarterly basis during 2012. Visual inspections found no visual disturbances, or abnormal changes due to mining operations.
Water Course Visual inspection	Before Commencement of Extraction	3 Monthly by environmental officer / representative and/or following significant rainfall	As above	Quarterly water course inspections completed in 2012. Inspections are undertaken to identify the following; surface cracking along creeks, step change in bed, damage to drainage channels, and ponding. Visual inspections completed in 2012 found no visual disturbances, or abnormal changes due to mining operations.

SUBSIDENCE MONITORING	INITIAL SURVEY COMMENCEMENT	RESURVEY FREQUENCY	FINAL SURVEY*	RESULTS / COMMENTS
Haul Road – Newstan/Eraring Monitoring points Visual Inspections	Before Commencement of Extraction All points surveyed twice for X,Y,Z.	Midway and completion of North B Panel	As Above	Monitoring points at approx. 50 metre spacings (Levels only) in safe suitable positions. All surveys were completed during 2012 and Subsidence Reports were provided to the various stakeholders. Weekly Visual Inspection when Mining within 100 metres of the Eraring Haul Road. No impacts were identified in 2012.
Moderate Heritage Value Site Visual Inspections within East B Area	Before Commencement of extraction	3 Monthly Resurvey Monthly by Environmental officer or representative	As Above	Monitoring in 2012 found no impacts on the scar tree. A final due diligence report will be completed in 2013 to cease monitoring at this point.

3.17 Hydrocarbon Contamination

Potential areas where historic operations may have contaminated land have been identified. A Phase1 site contamination assessment was completed in 2009. The Phase 1 report recommended that a Phase 2 site assessment be completed to identify the risks of contamination to possible receptors. A Phase 2 site contamination assessment was undertaken in 2012, the report is yet to be finalised.

Awaba Colliery installed a new hydro-cyclone separator system adjacent to the Wash Bay in 2009. The underground diesel tanks at Awaba Colliery were de-commissioned (no longer in use) and replaced by a 30,000 litre portable self-bunded Transtank during 2009.

3.18 Methane Drainage / Ventilation

There is no methane drainage conducted at Awaba Colliery.

3.19 Public Safety

Awaba Colliery is completely surrounded by fencing and is patrolled by security staff on a regular basis; therefore, public safety was not a concern during the reporting period. Awaba Colliery has an approved Public Safety Management Plan and a Built Features Management Plan. Quarterly

inspections of tracks and trails were undertaken during 2012 within the Stage 2, Stage 3 and East B areas. No subsidence impacts were identified to tracks and trails in these areas during the reporting period.

3.20 Reportable Incidents

There was one non-compliance with the conditions of EPL443 during the reporting period. The 2012 Annual Return is located in Appendix 1 of this AEMR.

Awaba Colliery and Newstan Colliery were granted permission to transfer waste water from Newstan Colliery (EPL 395) to Awaba Colliery (EPL443) for a 12 month period from the date of the first transfer in 2011. This 12 month period ended on the 21 October 2012. Newstan Collieries EPL 395 was varied in October 2012 to remove the timeframe on the transfer, however the same change was not made to the EPL443.

A licence variation application for EPL 443 was submitted to the EPA on the 01 February 2013.

3.21 Independent Environmental Audit

The Independent Environmental Audit of the Awaba Colliery in accordance with Condition 8 of Schedule 5 of the Project Approval was completed in 2012. This audit assessed compliance with relevant approvals, licences and other management plans applicable to Awaba Colliery. The overall compliance status was found to be high, and is summarised in the table below.

Table 11: Overall Compliance Assessment and Audit Score

Relevant Approval	**Per Cent Compliant (%)**	**Number of Conditions non compliant or indeterminate**
Project Approval 10_0038 (59 conditions)	85	9
Environmental Protection Licence No. 443 (88 conditions)	93	6
Consolidated Coal Lease 746 (37 conditions)	89	4

4 Community Relations

4.1 Complaints

There were no complaints made during the 2012 reporting period at the Awaba Colliery.

4.2 Community Liaison

Awaba Colliery is supportive of its local community and seeks opportunities to provide assistance to community groups whenever possible.

A Community Consultative Committee (CCC) for the Awaba Colliery was established and combined with the Newstan CCC with the approval of the Director-General in October 2011. The Committee meets quarterly to review the environmental performance of the mine and other relevant matters. Minutes of the meeting are kept and distributed by the independent Chairman. The minutes are also available on the Centennial Newstan website. Meetings of the Newstan / Awaba CCC were held in February, May, August & December during the reporting period.

5 Rehabilitation

A revised version of the Awaba Colliery Rehabilitation and Environmental Management Plan was approved by DRE on 28 June 2011.

Awaba Colliery revised the Rehabilitation and Environmental Management Plan in accordance with Condition 30 of Schedule 3 of the Project Approval, and submitted to DRE for approval in May 2012.

5.1 Buildings

Surface infrastructure removed or decommissioned in 2012:

- Coal conveyor drifts (1:3.5 Decline and 1:5 Decline).
- Coal handling facilities which were used for breaking, crushing, sizing and storing product
- The overland conveyor systems
- Mine ventilation equipment
- Ballast borehole (delivery of ballast direct to underground workings).

Figure 4: Location of old Coal Preparation Plant

Figure 5: Sealed Mine Entry

Figure 6: Decommissioned bin & sealed shaft

5.2 Rehabilitation of Disturbed Lands

Table 12: Awaba Rehabilitation Summary.

	Area Affected / Rehabilitated (Hectares)		
	To date	**Last Report (2011)**	**Next Report (estimated)**
A: Mine Lease Area			
A1 Mine Lease(s) area	1910		
B: Disturbed Areas			
B1 Infrastructure area	17	17	17
B2: Active Mining Area	0	0	0
B3: Waste emplacements	0	0	0
B4: Tailings emplacements	0	0	0
B5: Shaped waste emplacement	0	0	0
All Disturbed Areas	17	17	17
C: Rehabilitation Progress			
C1 Total rehabilitation area	0	0	0
D: Rehabilitation on Slopes			
D1 10 to 18 degrees	0	0	0
D2 Greater than 18 degrees	0	0	0
E: Surface of Rehabilitated Land			
E1 Pasture and grasses	0	0	0
E2 Native forests / ecosystems	0	0	0
E3 Plantations and crops	0	0	0
E4 Other	0	0	0

5.3 Other Infrastructure

No rehabilitation of infrastructure, other then already discussed was conducted during the reporting period.

5.4 Rehabilitation Trials and Research

No rehabilitation trials occurred during the report period.

6 Activities Proposed in the Next AEMR Period

Activities proposed for the 2013 reporting period include;

- Maintenance of the Awaba Colliery pit top and remaining buildings
- Rehabilitation of sink holes in accordance with the Sinkhole Rehabilitation Plan.

7 Plans

AW2233 – Great Northern Seam Workings January to December 2012

AW2236 – Surface Water & Dust Monitoring Locations.

AW2109 Rev 3 – Waterways of Awaba Colliery licensed discharge points

LOCATION	AWABA COLLIERY
SEAM	GREAT NORTHERN
DRAWN	C.CLUDERAY
CHECKED	
APPROVED	
SCALE	1:15000

LEGEND

- Workings for 2012 Period
- Workings for 2012 Period
- Existing Workings
- Major Road
- Major Creek / Dam
- Minor Creek / Water Course
- Fault Infered
- Powerlines / Towers

Centennial Newstan Pty Ltd (ACN 101 508 865)

AWABA COLLIERY

Great Northern Seam Workings
January to December 2012

Note: Mining Ceased 08/03/2012

Centennial Newstan

AW2233

PDF FILE:
N:\SHARED\PDF\COST\2012\Year12.pdf

29/03/2011

A3

Water Monitoring Down Stream

D3

Coal Haulage Road

Pollution Control Dam

D2

LDP009

MW02

AWGW02

Hunter Water Isolation Valve

Stockpile Area

Helipad

NSH012

NSH013

Newstan Dewatering Bores
4 Megalitres Incoming per Day

Stony Creek

MW05

No.2 Tunnel Belt Drift Sealed

No.1 Tunnel M&M Drift Sealed

Diesel Tank

First Aid Room

MW06

Compressors

Workshop

Stores

Inseam Bin Sealed

Car Parks

D1

Water Suppy (Hunter Water)

Wilton Road

Sub Station

Electrical Switchroom

Pump Station

Shaft No.1 sealed

Water Suppy

COLBIND BIN

No.3 Tunnel M&M Drift Sealed U/G

Explosives Magazine (Not in Use)

MW01

Storage Yard

Maturation Pond

LDP008

MW03

Water Monitoring Up Stream

To Eraring Power Station

To Newstan Colliery

No.4 Tunnel Belt Drift Sealed

Coal Haulage Road

D4

Shaft No.2 Upcast Shaft Sealed

FAN

N

0 50m 100m

LEGEND

- Surface Contours
- Transmission Line - Pole
- Water Course/Creek
- Track
- Sealed Road
- Fenceline - approximate
- Clean Water Systems
- Pollution Control Systems
- Underground Water Supply
- Water Monitoring Locations
- LDP009 Licenced Discharged Point
- D Dust Gauge
- MW01 Decontamination Monitoring Borehole

Centennial Newstan Pty Ltd (ACN 101 508 865)

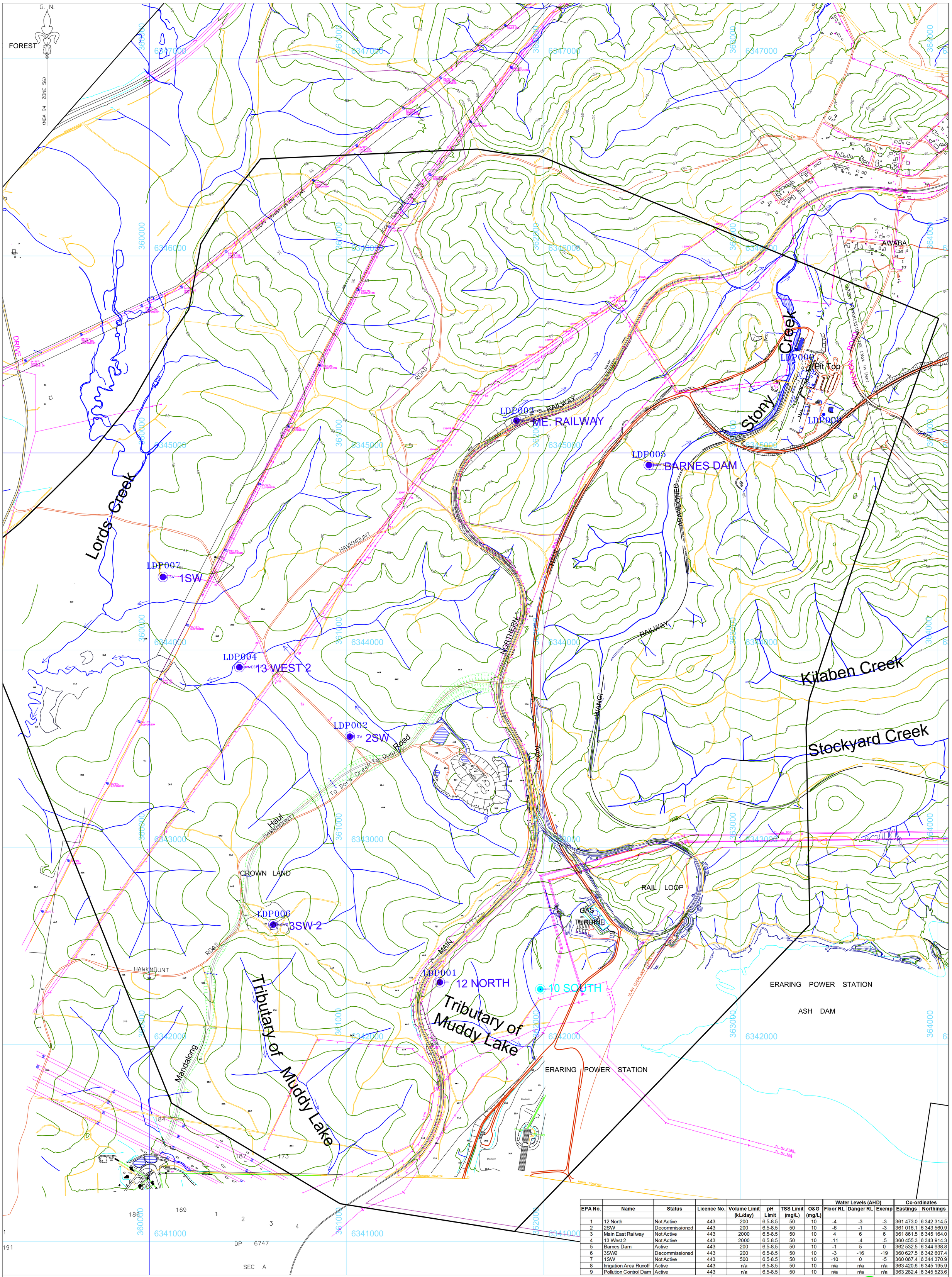
AWABA COLLIERY
Great Northern Seam

Centennial Newstan

TITLE:

Surface Water and Dust Monitoring Locations

DRAWN: C.Cluderay	REV:	All Distances are in metres unless otherwise shown.	A3
DATE: 27/03/2013	FILE: N:\Shared\Plans\Awaba\AW2236.dwg		
CHECKED: V.Warren	PDF FILE: N:\Shared\Pdf\2013\AW2236.pdf		
APPROVED:	SCALE: 1 : 2500		AW2236



EPA No.	Name	Status	Licence No.	Volume Limit (kL/day)	pH Limit	TSS Limit (mg/L)	O&G (mg/L)	Water Levels (AHD) Floor RL	Danger RL	Exemp	Co-ordinates Eastings	Northings
1	12 North	Not Active	443	200	6.5-8.5	50	10	-4	-3	-3	361 473.0	6 342 314.5
2	2SW	Decommissioned	443	200	6.5-8.5	50	10	-6	-1	-3	361 016.1	6 343 560.9
3	Main East Railway	Not Active	443	2000	6.5-8.5	50	10	4	6	6	361 861.5	6 345 164.0
4	13 West 2	Not Active	443	2000	6.5-8.5	50	10	-11	-4	-5	360 455.3	6 343 914.3
5	Barnes Dam	Active	443	200	6.5-8.5	50	10	-1	5	0	362 532.5	6 344 938.8
6	3SW2	Decommissioned	443	200	6.5-8.5	50	10	-3	-16	-19	360 627.5	6 342 607.4
7	1SW	Not Active	443	500	6.5-8.5	50	10	-10	0	-5	360 067.4	6 344 370.9
8	Irrigation Area Runoff	Active	443	n/a	6.5-8.5	50	10	n/a	n/a	n/a	363 420.6	6 345 195.9
9	Pollution Control Dam	Active	443	n/a	6.5-8.5	50	10	n/a	n/a	n/a	363 282.4	6 345 523.6

LEGEND

- Colliery Holding Boundary
- Mine Boundary
- 10 Surface Contours
- Transmission Line - Pole
- Water Course/Creek
- Track
- Sealed Road

LDP005 BARNES DAM — LICENCED DISCHARGE POINT

Centennial Newstan Pty Ltd (ACN 101 508 865)

AWABA COLLIERY
Great Northern Seam

Centennial Newstan

TITLE: WATERWAYS OF AWABA COLLIERY LICENCED DISCHARGE POINTS

DRAWN: C.Cluderay	FILE: N:\Shared\Pdf\2013\AW2109_Rev3.pdf	All Distances are in metres unless otherwise shown.	A0
DATE: 25/03/2013	FILE: N:\Shared\Plans\Awaba\AW2109_Rev3.dwg		
CHECKED: V.Warren	SCALE: 1 : 6000		AW2109_Rev3
APPROVED: G. Watson			

8 Appendices

Appendix 1 – EPL443 2012 Annual Return

ANNUAL RETURN

LICENCE NO.	443
LICENCE HOLDER	CENTENNIAL NEWSTAN PTY LIMITED
REPORTING PERIOD	01-Jan-2012 to 31-Dec-2012

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates above and specify the new dates to which this Annual return relates below:

REVISED REPORTING PERIOD ____/____/____ **to** ____/____/____

(Note: the revised reporting period also needs to be entered in Section E)

THIS ANNUAL RETURN MUST BE RECEIVED BY THE EPA BEFORE 02-Mar-2013

Your Annual Return must be completed, including certification in Section E, and submitted to the EPA no later than 60 Days after the end of the reporting period for your licence.

Failure to submit this Annual Return within 60 days after the reporting period ends may result in:

- **The issue of a Penalty Notice for $750 (individuals) OR $1500 (corporations);**

OR

- **prosecution**

Please send your completed Annual Return by Registered Post to:

Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

It is an offence to supply any information in this form to the EPA that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect.

THERE IS A MAXIMUM PENALTY OF $250,000 FOR A CORPORATION OF $120,000 FOR AN INDIVIDUAL.

Details provided in this Annual Return will be available on the EPA's Public Register in accordance with section 308 of the *Protection of the Environment Operations Act 1997.*

Annual Return

CENTENNIAL NEWSTAN PTY LIMITED

Use the checklist below to ensure that you have completed your Annual Return correctly (√ the boxes)

CHECKLIST		
√	Section A:	All licence details are correct
√	Section B1	You have entered the correct number in the complaints table
√	Section B2 - B3:	If there are tables, you have provided the required details
√	Section C:	You have answered question 1 and 2 if applicable
NA	Section D:	If applicable, you have completed all load calculation worksheets
√	Section E:	The Annual Return has been signed by appropriate person(s) and, if applicable, the revised reporting period entered
√	Make a copy of the completed Annual Return and keep it with your licence records	
❑	Attach a cheque (unless you have paid separately) for the payment of the administrative fee for the next licence fee period. Paid by EFT	

Please send your completed Annual Return by Registered Post to:

Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

A Statement of Compliance – Licence Details

ALL licence holders must check that the licence details in Section A are correct.

If there are changes to any of these details **you must advise the EPA and apply as soon as possible for a variation to your licence or for a licence transfer.**

Licence variation and transfer application forms are available on the EPA website at: http://www.epa.nsw.gov.au/licensing, or from regional offices of the EPA, or by contacting us on telephone 02 9995 5700

If you are apply to vary or transfer your licence you must still complete this Annual Return.

A1 Licence Holder

Licence Number	443
Licence Holder	CENTENNIAL NEWSTAN PTY LIMITED
Trading Name (if applicable)	
ABN	68 101 508 865

A2 Premises to which Licence Applies (if applicable)

Common Name (if any)	AWABA COLLIERY
Premises	WILTON ROAD AWABA NSW 2283

A3 Activities to which Licence Applies

Mining for Coal

A4 Other Activities (if applicable)

Sewage Treatment System

A5 Fee-Based Activity Classifications

Note that the fee based activity classification is used to calculate the administrative fee.

Fee-based activity	Activity scale	Unit of measure
Mining for coal	>500,000.00 - 2,000,000.00	T produced

A6 Assessable Pollutants (Not Applicable)

B Monitoring and Complaints Summary

B1 Number of Pollution Complaints

Number of complaints recorded by the licensee during the reporting period **If no complaints were received enter nil in the attached box, otherwise complete the table below.**	Nil

Pollution Complaint Category	Number of Complaints
Air	
Water	
Noise	
Waste	
Other	

B2 Concentration Monitoring Summary

For each monitoring point identified in your licence complete all the details for each pollutant listed in the tables provided below.

If concentration monitoring is not required by your licence, **no tables** will appear below.
Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable)

Discharge & Monitoring Point 1

Discharge to waters
Discharge quality monitoring Volume monitoring, Outlet from bore hole pump from underground workings Located on the eastern side Main Northern Railway, shown as "12 NORTH" on map AW2109 titled "Waterways of Awaba Colliery Licensed Discharge Points" dated 7.4.2009 (on EPA file LIC07/225/-02).

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Aluminium (dissolved)	micrograms per litre	0	0	-	-	-
Aluminium (total)	micrograms per litre	0	0	-	-	-

Antimony	micrograms per litre	0	0	-	-	-
Arsenic (dissolved)	micrograms per litre	0	0	-	-	-
Arsenic (total)	micrograms per litre	0	0	-	-	-
Barium	micrograms per litre	0	0	-	-	-
Beryllium (dissolved)	micrograms per litre	0	0	-	-	-
Beryllium (total)	micrograms per litre	0	0	-	-	-
Boron	micrograms per litre	0	0	-	-	-
Cadmium (dissolved)	micrograms per litre	0	0	-	-	-
Cadmium (total)	micrograms per litre	0	0	-	-	-
Calcium	micrograms per litre	0	0	-	-	-
Chromium (dissolved)	micrograms per litre	0	0	-	-	-
Chromium (total)	micrograms per litre	0	0	-	-	-
Cobalt (dissolved)	micrograms per litre	0	0	-	-	-
Cobalt (total)	micrograms per litre	0	0	-	-	-
Conductivity	microsiemens per centimetre	0	0	-	-	-
Copper (dissolved)	micrograms per litre	0	0	-	-	-
Copper (total)	micrograms per litre	0	0	-	-	-
Iron (dissolved)	micrograms per litre	0	0	-	-	-

Lead (dissolved)	micrograms per litre	0	0	-	-	-
Lead (total)	micrograms per litre	0	0	-	-	-
Lithium	micrograms per litre	0	0	-	-	-
Magnesium	micrograms per litre	0	0	-	-	-
Manganese (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (total)	micrograms per litre	0	0	-	-	-
Molybdenum (dissolved)	micrograms per litre	0	0	-	-	-
Molybdenum (total)	micrograms per litre	0	0	-	-	-
Nickel (dissolved)	micrograms per litre	0	0	-	-	-
Nickel (total)	micrograms per litre	0	0	-	-	-
Oil and grease	milligrams per litre	0	0	-	-	-
pH	pH	0	0	-	-	-
Potassium	micrograms per litre	0	0	-	-	-
Selenium (dissolved)	micrograms per litre	0	0	-	-	-
Selenium (total)	micrograms per litre	0	0	-	-	-
Silica	micrograms per litre	0	0	-	-	-
Silver (dissolved)	micrograms per litre	0	0	-	-	-
Silver (total)	micrograms per litre	0	0	-	-	-

Sodium	micrograms per litre	0	0	-	-	-
Sulfur	micrograms per litre	0	0	-	-	-
Tin	micrograms per litre	0	0	-	-	-
Titanium	micrograms per litre	0	0	-	-	-
Total suspended solids	milligrams per litre	0	0	-	-	-
Vanadium	micrograms per litre	0	0	-	-	-
Vanadium (dissolved)	micrograms per litre	0	0	-	-	-
Vanadium (total)	micrograms per litre	0	0	-	-	-
Zinc (dissolved)	micrograms per litre	0	0	-	-	-
Zinc (total)	micrograms per litre	0	0	-	-	-

Discharge & Monitoring Point 2

Discharge to waters
Discharge quality monitoring
Volume monitoring, Outlet from bore hole pump from underground workings located along Hawk Mount Road, shown as "2SW" on plan AW2109 titled "Waterways of Awaba Colliery Licensed Discharge Points" Dated 7/4/2009 (on EPA file LIC07/225-02)

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Aluminium (dissolved)	micrograms per litre	0	0	-	-	-
Aluminium (total)	micrograms per litre	0	0	-	-	-
Antimony	micrograms per litre	0	0	-	-	-
Arsenic (dissolved)	micrograms per litre	0	0	-	-	-

Arsenic (total)	micrograms per litre	0	0	-	-	-
Barium	micrograms per litre	0	0	-	-	-
Beryllium (dissolved)	micrograms per litre	0	0	-	-	-
Beryllium (total)	micrograms per litre	0	0	-	-	-
Boron	micrograms per litre	0	0	-	-	-
Cadmium (dissolved)	micrograms per litre	0	0	-	-	-
Cadmium (total)	micrograms per litre	0	0	-	-	-
Calcium	micrograms per litre	0	0	-	-	-
Chromium (dissolved)	micrograms per litre	0	0	-	-	-
Chromium (total)	micrograms per litre	0	0	-	-	-
Cobalt (dissolved)	micrograms per litre	0	0	-	-	-
Cobalt (total)	micrograms per litre	0	0	-	-	-
Conductivity	microsiemens per centimetre	0	0	-	-	-
Copper (dissolved)	micrograms per litre	0	0	-	-	-
Copper (total)	micrograms per litre	0	0	-	-	-
Iron (dissolved)	micrograms per litre	0	0	-	-	-
Lead (dissolved)	micrograms per litre	0	0	-	-	-
Lead (total)	micrograms per litre	0	0	-	-	-

Lithium	micrograms per litre	0	0	-	-	-
Magnesium	micrograms per litre	0	0	-	-	-
Manganese (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (total)	micrograms per litre	0	0	-	-	-
Molybdenum (dissolved)	micrograms per litre	0	0	-	-	-
Molybdenum (total)	micrograms per litre	0	0	-	-	-
Nickel (dissolved)	micrograms per litre	0	0	-	-	-
Nickel (total)	micrograms per litre	0	0	-	-	-
Oil and grease	milligrams per litre	0	0	-	-	-
pH	pH	0	0	-	-	-
Potassium	micrograms per litre	0	0	-	-	-
Selenium (dissolved)	micrograms per litre	0	0	-	-	-
Selenium (total)	micrograms per litre	0	0	-	-	-
Silica	micrograms per litre	0	0	-	-	-
Silver (dissolved)	micrograms per litre	0	0	-	-	-
Silver (total)	micrograms per litre	0	0	-	-	-
Sodium	micrograms per litre	0	0	-	-	-
Sulfur	micrograms per litre	0	0	-	-	-

Tin	micrograms per litre	0	0	-	-	-
Titanium	micrograms per litre	0	0	-	-	-
Total suspended solids	milligrams per litre	0	0	-	-	-
Vanadium	micrograms per litre	0	0	-	-	-
Vanadium (dissolved)	micrograms per litre	0	0	-	-	-
Vanadium (total)	micrograms per litre	0	0	-	-	-
Zinc (dissolved)	micrograms per litre	0	0	-	-	-
Zinc (total)	micrograms per litre	0	0	-	-	-

Discharge & Monitoring Point 3

Discharge to waters
Discharge quality monitoring
Volume monitoring, Drain from bore hole pump from underground workings located on the western side Main Northern Railway, shown as 'ME RAILWAY" on plan AW2109 titled 'Waterways of Awaba Colliery Licensed Discharge Points" dated 7/4/2009 (on EPA file LIC07/22-02)

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Aluminium (dissolved)	micrograms per litre	0	0	-	-	-
Aluminium (total)	micrograms per litre	0	0	-	-	-
Antimony	micrograms per litre	0	0	-	-	-
Arsenic (dissolved)	micrograms per litre	0	0	-	-	-
Arsenic (total)	micrograms per litre	0	0	-	-	-

Barium	micrograms per litre	0	0	-	-	-
Beryllium (dissolved)	micrograms per litre	0	0	-	-	-
Beryllium (total)	micrograms per litre	0	0	-	-	-
Boron	micrograms per litre	0	0	-	-	-
Cadmium (dissolved)	micrograms per litre	0	0	-	-	-
Cadmium (total)	micrograms per litre	0	0	-	-	-
Calcium	micrograms per litre	0	0	-	-	-
Chromium (dissolved)	micrograms per litre	0	0	-	-	-
Chromium (total)	micrograms per litre	0	0	-	-	-
Cobalt (dissolved)	micrograms per litre	0	0	-	-	-
Cobalt (total)	micrograms per litre	0	0	-	-	-
Conductivity	microsiemens per centimetre	0	0	-	-	-
Copper (dissolved)	micrograms per litre	0	0	-	-	-
Copper (total)	micrograms per litre	0	0	-	-	-
Iron (dissolved)	micrograms per litre	0	0	-	-	-
Lead (dissolved)	micrograms per litre	0	0	-	-	-
Lead (total)	micrograms per litre	0	0	-	-	-
Lithium	micrograms per litre	0	0	-	-	-

Magnesium	micrograms per litre	0	0	-	-	-
Manganese (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (total)	micrograms per litre	0	0	-	-	-
Molybdenum (dissolved)	micrograms per litre	0	0	-	-	-
Molybdenum (total)	micrograms per litre	0	0	-	-	-
Nickel (dissolved)	micrograms per litre	0	0	-	-	-
Nickel (total)	micrograms per litre	0	0	-	-	-
Oil and grease	milligrams per litre	0	0	-	-	-
pH	pH	0	0	-	-	-
Potassium	micrograms per litre	0	0	-	-	-
Selenium (dissolved)	micrograms per litre	0	0	-	-	-
Selenium (total)	micrograms per litre	0	0	-	-	-
Silica	micrograms per litre	0	0	-	-	-
Silver (dissolved)	micrograms per litre	0	0	-	-	-
Silver (total)	micrograms per litre	0	0	-	-	-
Sodium	micrograms per litre	0	0	-	-	-
Sulfur	micrograms per litre	0	0	-	-	-
Tin	micrograms per litre	0	0	-	-	-

Titanium	micrograms per litre	0	0	-	-	-
Total suspended solids	milligrams per litre	0	0	-	-	-
Vanadium	micrograms per litre	0	0	-	-	-
Vanadium (dissolved)	micrograms per litre	0	0	-	-	-
Vanadium (total)	micrograms per litre	0	0	-	-	-
Zinc (dissolved)	milligrams per litre	0	0	-	-	-
Zinc (total)	micrograms per litre	0	0	-	-	-

Discharge & Monitoring Point 4

Discharge to waters
Discharge quality monitoring
Volume monitoring, Outlet from bore hole pump from underground workings located along Hawk Mount Road, shown as "13 WEST 2" on plan AW2109 titled "Waterways of Awaba Colliery Licensed Discharge Points" dated 7/4/2009 (on EPA file LIC07/225-02)

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Aluminium (dissolved)	micrograms per litre	0	0	-	-	-
Aluminium (total)	micrograms per litre	0	0	-	-	-
Antimony	micrograms per litre	0	0	-	-	-
Arsenic (dissolved)	micrograms per litre	0	0	-	-	-
Arsenic (total)	micrograms per litre	0	0	-	-	-
Barium	micrograms per litre	0	0	-	-	-

Beryllium (dissolved)	micrograms per litre	0	0	-	-	-
Beryllium (total)	micrograms per litre	0	0	-	-	-
Boron	micrograms per litre	0	0	-	-	-
Cadmium (dissolved)	micrograms per litre	0	0	-	-	-
Cadmium (total)	micrograms per litre	0	0	-	-	-
Calcium	micrograms per litre	0	0	-	-	-
Chromium (dissolved)	micrograms per litre	0	0	-	-	-
Chromium (total)	micrograms per litre	0	0	-	-	-
Cobalt (dissolved)	micrograms per litre	0	0	-	-	-
Cobalt (total)	micrograms per litre	0	0	-	-	-
Conductivity	microsiemens per centimetre	0	0	-	-	-
Copper (dissolved)	micrograms per litre	0	0	-	-	-
Copper (total)	micrograms per litre	0	0	-	-	-
Iron (dissolved)	micrograms per litre	0	0	-	-	-
Lead (dissolved)	micrograms per litre	0	0	-	-	-
Lead (total)	micrograms per litre	0	0	-	-	-
Lithium	micrograms per litre	0	0	-	-	-
Magnesium	micrograms per litre	0	0	-	-	-

Manganese (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (total)	micrograms per litre	0	0	-	-	-
Molybdenum (dissolved)	micrograms per litre	0	0	-	-	-
Molybdenum (total)	micrograms per litre	0	0	-	-	-
Nickel (dissolved)	micrograms per litre	0	0	-	-	-
Nickel (total)	micrograms per litre	0	0	-	-	-
Oil and grease	milligrams per litre	0	0	-	-	-
pH	pH	0	0	-	-	-
Potassium	micrograms per litre	0	0	-	-	-
Selenium (dissolved)	micrograms per litre	0	0	-	-	-
Selenium (total)	micrograms per litre	0	0	-	-	-
Silica	micrograms per litre	0	0	-	-	-
Silver (dissolved)	micrograms per litre	0	0	-	-	-
Silver (total)	micrograms per litre	0	0	-	-	-
Sodium	micrograms per litre	0	0	-	-	-
Sulfur	micrograms per litre	0	0	-	-	-
Tin	micrograms per litre	0	0	-	-	-
Titanium	micrograms per litre	0	0	-	-	-

Total suspended solids	milligrams per litre	0	0	-	-	-
Vanadium	micrograms per litre	0	0	-	-	-
Vanadium (dissolved)	micrograms per litre	0	0	-	-	-
Vanadium (total)	micrograms per litre	0	0	-	-	-
Zinc (dissolved)	milligrams per litre	0	0	-	-	-
Zinc (total)	micrograms per litre	0	0	-	-	-

Discharge & Monitoring Point 5

Discharge to waters
Discharge quality monitoring
Volume monitoring, Outlet from bore hole pump from underground workings on eastern side of private haul road, shown as 'BARNES DAM" ON PLAN AW2109 TITLED "Waterways of Awaba Colliery Licensed Discharge Points" dated 7/4/2009 (on EPA file LIC07/225-02)

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Aluminium (dissolved)	micrograms per litre	0	0	-	-	-
Aluminium (total)	micrograms per litre	0	0	-	-	-
Antimony	micrograms per litre	0	0	-	-	-
Arsenic (dissolved)	micrograms per litre	0	0	-	-	-
Arsenic (total)	micrograms per litre	0	0	-	-	-
Barium	micrograms per litre	0	0	-	-	-
Beryllium (dissolved)	micrograms per litre	0	0	-	-	-

Beryllium (total)	micrograms per litre	0	0	-	-	-
Boron	micrograms per litre	0	0	-	-	-
Cadmium (dissolved)	micrograms per litre	0	0	-	-	-
Cadmium (total)	micrograms per litre	0	0	-	-	-
Calcium	micrograms per litre	0	0	-	-	-
Chromium (dissolved)	micrograms per litre	0	0	-	-	-
Chromium (total)	micrograms per litre	0	0	-	-	-
Cobalt (dissolved)	micrograms per litre	0	0	-	-	-
Cobalt (total)	micrograms per litre	0	0	-	-	-
Conductivity	microsiemens per centimetre	0	0	-	-	-
Copper (dissolved)	micrograms per litre	0	0	-	-	-
Copper (total)	micrograms per litre	0	0	-	-	-
Iron (dissolved)	micrograms per litre	0	0	-	-	-
Lead (dissolved)	micrograms per litre	0	0	-	-	-
Lead (total)	micrograms per litre	0	0	-	-	-
Lithium	micrograms per litre	0	0	-	-	-
Magnesium	micrograms per litre	0	0	-	-	-
Manganese (dissolved)	micrograms per litre	0	0	-	-	-

Mercury (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (total)	micrograms per litre	0	0	-	-	-
Molybdenum (dissolved)	micrograms per litre	0	0	-	-	-
Molybdenum (total)	micrograms per litre	0	0	-	-	-
Nickel (dissolved)	micrograms per litre	0	0	-	-	-
Nickel (total)	micrograms per litre	0	0	-	-	-
Oil and grease	milligrams per litre	0	0	-	-	-
pH	pH	0	0	-	-	-
Potassium	micrograms per litre	0	0	-	-	-
Selenium (dissolved)	micrograms per litre	0	0	-	-	-
Selenium (total)	micrograms per litre	0	0	-	-	-
Silica	micrograms per litre	0	0	-	-	-
Silver (dissolved)	micrograms per litre	0	0	-	-	-
Silver (total)	micrograms per litre	0	0	-	-	-
Sodium	micrograms per litre	0	0	-	-	-
Sulfur	micrograms per litre	0	0	-	-	-
Tin	micrograms per litre	0	0	-	-	-
Titanium	micrograms per litre	0	0	-	-	-
Total suspended solids	milligrams per litre	0	0	-	-	-

Vanadium	micrograms per litre	0	0	-	-	-
Vanadium (dissolved)	micrograms per litre	0	0	-	-	-
Vanadium (total)	micrograms per litre	0	0	-	-	-
Zinc (dissolved)	micrograms per litre	0	0	-	-	-
Zinc (total)	micrograms per litre	0	0	-	-	-

Discharge & Monitoring Point 6

Discharge to waters
Discharge quality monitoring
Volume monitoring, Outlet from bore hole pump from underground workings located in private gravel quarry, shown as "3SW2" on plan AW2109 titled "Waterways of Awaba Colliery Licensed Discharge Points" dated 7/4/2009 ()on EPA file LIC07/225-02)

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Aluminium (dissolved)	micrograms per litre	0	0	-	-	-
Aluminium (total)	micrograms per litre	0	0	-	-	-
Antimony	micrograms per litre	0	0	-	-	-
Arsenic (dissolved)	micrograms per litre	0	0	-	-	-
Arsenic (total)	micrograms per litre	0	0	-	-	-
Barium	micrograms per litre	0	0	-	-	-
Beryllium (dissolved)	micrograms per litre	0	0	-	-	-
Beryllium (total)	micrograms per litre	0	0	-	-	-

Boron	micrograms per litre	0	0	-	-	-
Cadmium (dissolved)	micrograms per litre	0	0	-	-	-
Cadmium (total)	micrograms per litre	0	0	-	-	-
Calcium	micrograms per litre	0	0	-	-	-
Chromium (dissolved)	micrograms per litre	0	0	-	-	-
Chromium (total)	micrograms per litre	0	0	-	-	-
Cobalt (dissolved)	micrograms per litre	0	0	-	-	-
Cobalt (total)	micrograms per litre	0	0	-	-	-
Conductivity	microsiemens per centimetre	0	0	-	-	-
Copper (dissolved)	micrograms per litre	0	0	-	-	-
Copper (total)	micrograms per litre	0	0	-	-	-
Iron (dissolved)	micrograms per litre	0	0	-	-	-
Lead (dissolved)	micrograms per litre	0	0	-	-	-
Lead (total)	micrograms per litre	0	0	-	-	-
Lithium	micrograms per litre	0	0	-	-	-
Magnesium	micrograms per litre	0	0	-	-	-
Manganese (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (dissolved)	micrograms per litre	0	0	-	-	-

Mercury (total)	micrograms per litre	0	0	-	-	-
Molybdenum (dissolved)	micrograms per litre	0	0	-	-	-
Molybdenum (total)	micrograms per litre	0	0	-	-	-
Nickel (dissolved)	micrograms per litre	0	0	-	-	-
Nickel (total)	micrograms per litre	0	0	-	-	-
Oil and grease	milligrams per litre	0	0	-	-	-
pH	pH	0	0	-	-	-
Potassium	micrograms per litre	0	0	-	-	-
Selenium (dissolved)	micrograms per litre	0	0	-	-	-
Selenium (total)	micrograms per litre	0	0	-	-	-
Silica	micrograms per litre	0	0	-	-	-
Silver (dissolved)	micrograms per litre	0	0	-	-	-
Silver (total)	micrograms per litre	0	0	-	-	-
Sodium	micrograms per litre	0	0	-	-	-
Sulfur	micrograms per litre	0	0	-	-	-
Tin	micrograms per litre	0	0	-	-	-
Titanium	micrograms per litre	0	0	-	-	-
Total suspended solids	milligrams per litre	0	0	-	-	-
Vanadium	micrograms per litre	0	0	-	-	-

Vanadium (dissolved)	micrograms per litre	0	0	-	-	-
Vanadium (total)	micrograms per litre	0	0	-	-	-
Zinc (dissolved)	micrograms per litre	0	0	-	-	-
Zinc (total)	micrograms per litre	0	0	-	-	-

Discharge & Monitoring Point 7

Discharge to waters
Discharge quality monitoring
Volume monitoring, Outlet from bore hole pump from underground workings located on southern side of gravel road from Freemans Drive, shown as "1SW" on plan AW2109 titled "Waterways of Awaba Colliery Licensed Discharge Points" dated 7/4/2009 (on EPA file LIC07/225-02)

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Aluminium (dissolved)	micrograms per litre	0	0	-	-	-
Aluminium (total)	micrograms per litre	0	0	-	-	-
Antimony	micrograms per litre	0	0	-	-	-
Arsenic (dissolved)	micrograms per litre	0	0	-	-	-
Arsenic (total)	micrograms per litre	0	0	-	-	-
Barium	micrograms per litre	0	0	-	-	-
Beryllium (dissolved)	micrograms per litre	0	0	-	-	-
Beryllium (total)	micrograms per litre	0	0	-	-	-
Boron	micrograms per litre	0	0	-	-	-

Cadmium (dissolved)	micrograms per litre	0	0	-	-	-
Cadmium (total)	micrograms per litre	0	0	-	-	-
Calcium	micrograms per litre	0	0	-	-	-
Chromium (dissolved)	micrograms per litre	0	0	-	-	-
Chromium (total)	micrograms per litre	0	0	-	-	-
Cobalt (dissolved)	micrograms per litre	0	0	-	-	-
Cobalt (total)	micrograms per litre	0	0	-	-	-
Conductivity	microsiemens per centimetre	0	0	-	-	-
Copper (dissolved)	micrograms per litre	0	0	-	-	-
Copper (total)	micrograms per litre	0	0	-	-	-
Iron (dissolved)	micrograms per litre	0	0	-	-	-
Lead (dissolved)	micrograms per litre	0	0	-	-	-
Lead (total)	micrograms per litre	0	0	-	-	-
Lithium	micrograms per litre	0	0	-	-	-
Magnesium	micrograms per litre	0	0	-	-	-
Manganese (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (total)	micrograms per litre	0	0	-	-	-

Molybdenum (dissolved)	micrograms per litre	0	0	-	-	-
Molybdenum (total)	micrograms per litre	0	0	-	-	-
Nickel (dissolved)	micrograms per litre	0	0	-	-	-
Nickel (total)	micrograms per litre	0	0	-	-	-
Oil and grease	milligrams per litre	0	0	-	-	-
pH	pH	0	0	-	-	-
Potassium	micrograms per litre	0	0	-	-	-
Selenium (dissolved)	micrograms per litre	0	0	-	-	-
Selenium (total)	micrograms per litre	0	0	-	-	-
Silica	micrograms per litre	0	0	-	-	-
Silver (dissolved)	micrograms per litre	0	0	-	-	-
Silver (total)	micrograms per litre	0	0	-	-	-
Sodium	micrograms per litre	0	0	-	-	-
Sulfur	micrograms per litre	0	0	-	-	-
Tin	micrograms per litre	0	0	-	-	-
Titanium	micrograms per litre	0	0	-	-	-
Total suspended solids	milligrams per litre	0	0	-	-	-
Vanadium	micrograms per litre	0	0	-	-	-
Vanadium (dissolved)	micrograms per litre	0	0	-	-	-

Vanadium (total)	micrograms per litre	0	0	-	-	
Zinc (dissolved)	micrograms per litre	0	0	-	-	
Zinc (total)	micrograms per litre	0	0	-	-	

Discharge & Monitoring Point 8

Discharge to waters
Discharge quality monitoring, Discharge from utilisation area, shown as "LDP8" on plan AW2109 titled "Waterways of Awaba Colliery Licensed Discharge Points" dated 7/4/2009 (on EPA file LIC07/225-02)

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Oil and Grease	milligrams per litre	1	1	<2	<2	<2
pH	pH	1	1	6.78	6.78	6.78
Total suspended solids	milligrams per litre	1	1	5	5	5

Discharge & Monitoring Point 9

Discharge to waters
Discharge quality monitoring
Volume monitoring, Outlet from Settling Pond, shown as "LDP 9" on plan AW2109 titled "Waterways of Awaba Colliery Licensed Discharge Points" dated 7/4/2009 (on EPA file LIC07/225-02)

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Aluminium (dissolved)	micrograms per litre	0	0	-	-	-
Aluminium (total)	micrograms per litre	0	0	-	-	-

Antimony	micrograms per litre	0	0	-	-	-
Arsenic (dissolved)	micrograms per litre	0	0	-	-	-
Arsenic (total)	micrograms per litre	0	0	-	-	-
Barium	micrograms per litre	0	0	-	-	-
Beryllium (dissolved)	micrograms per litre	0	0	-	-	-
Beryllium (total)	micrograms per litre	0	0	-	-	-
Boron	micrograms per litre	0	0	-	-	-
Cadmium (dissolved)	micrograms per litre	0	0	-	-	-
Cadmium (total)	micrograms per litre	0	0	-	-	-
Calcium	micrograms per litre	0	0	-	-	-
Chromium (dissolved)	micrograms per litre	0	0	-	-	-
Chromium (total)	micrograms per litre	0	0	-	-	-
Cobalt (dissolved)	micrograms per litre	0	0	-	-	-
Cobalt (total)	micrograms per litre	0	0	-	-	-
Copper (dissolved)	micrograms per litre	0	0	-	-	-
Copper (total)	micrograms per litre	0	0	-	-	-
Iron (dissolved)	micrograms per litre	0	0	-	-	-
Lead (dissolved)	micrograms per litre	0	0	-	-	-

Lead (total)	micrograms per litre	0	0	-	-	-
Lithium	micrograms per litre	0	0	-	-	-
Magnesium	micrograms per litre	0	0	-	-	-
Manganese (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (dissolved)	micrograms per litre	0	0	-	-	-
Mercury (total)	micrograms per litre	0	0	-	-	-
Molybdenum (dissolved)	micrograms per litre	0	0	-	-	-
Molybdenum (total)	micrograms per litre	0	0	-	-	-
Nickel (dissolved)	micrograms per litre	0	0	-	-	-
Nickel (total)	micrograms per litre	0	0	-	-	-
Oil and grease	milligrams per litre	0	0	-	-	-
pH	pH	0	0	-	-	-
Potassium	micrograms per litre	0	0	-	-	-
Selenium (dissolved)	micrograms per litre	0	0	-	-	-
Selenium (total)	micrograms per litre	0	0	-	-	-
Silica	micrograms per litre	0	0	-	-	-
Silver (dissolved)	micrograms per litre	0	0	-	-	-
Silver (total)	micrograms per litre	0	0	-	-	-
Sodium	micrograms per litre	0	0	-	-	-

Sulfur	micrograms per litre	0	0	-	-	-
Tin	micrograms per litre	0	0	-	-	-
Titanium	micrograms per litre	0	0	-	-	-
Total suspended solids	milligrams per litre	0	0	-	-	-
Vanadium	micrograms per litre	0	0	-	-	-
Vanadium (dissolved)	micrograms per litre	0	0	-	-	-
Vanadium (total)	micrograms per litre	0	0	-	-	-
Zinc (dissolved)	micrograms per litre	0	0	-	-	-
Zinc (total)	micrograms per litre	0	0	-	-	-

Monitoring Point 10

Dust deposition gauge, Labelled 'DG1' on map titled Awaba Colliery Air Quality Monitoring Network Figure 9.14

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Particulates – Deposited Matter	grams per square metre per month	12	12	0.3	0.6	1.1

Monitoring Point 11

Dust deposition gauge, Labelled 'DG2' on map titled Awaba Colliery Air Quality Monitoring Network Figure 9.14

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Particulates – Deposited Matter	grams per square metre per month	12	12	0.4	0.8	1.4

Monitoring Point 12

Dust deposition gauge, Labelled 'DG3' on map titled Awaba Colliery Air Quality Monitoring Network Figure 9.14

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Particulates – Deposited Matter	grams per square metre per month	12	12	0.3	2.2	4.7

Monitoring Point 13

Dust deposition gauge, Labelled 'GD4' on map titled Awaba Colliery Air Quality Monitoring Network Figure 9.14

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Particulates – Deposited Matter	grams per square metre per month	12	12	0.6	1.2	1.8

Monitoring Point 14

Particulate matter (PM10), At a location agreeable by the EPA

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Particulates matter	micrograms per cubic metre	0*	0*	-	-	-

*Equipment not yet installed. Awaiting LMCC Approval for installation at proposed monitoring location.

B3 Volume or Mass Monitoring Summary

For each monitoring point identified in your licence complete the details of the volume or mass monitoring indicated in the tables proved below.

If volume or mass monitoring is not required by your licence, **no tables** will appear below.

Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

Discharge & Monitoring Point 1

Discharge to waters
Discharge quality monitoring Volume monitoring

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	daily during any discharge	0	-	-	-

Discharge & Monitoring Point 2

Discharge to waters
Discharge quality monitoring
Volume monitoring

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
Kilolitres per day	Daily during any discharge	0	-	-	-

Discharge & Monitoring Point 3

Discharge to waters
Discharge quality monitoring
Volume monitoring

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Daily during any discharge	0	-	-	-

Discharge & Monitoring Point 4

Discharge to waters
Discharge quality monitoring
Volume monitoring

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Daily during any discharge	0	-	-	-

Discharge & Monitoring Point 5

Discharge to waters
Discharge quality monitoring
Volume monitoring

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Daily during any discharge	0	-	-	-

Discharge & Monitoring Point 6

Discharge to waters
Discharge quality monitoring
Volume monitoring

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Daily during any discharge	0	-	-	-

Discharge & Monitoring Point 7

Discharge to waters
Discharge quality monitoring
Volume monitoring

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Daily during any discharge	0	-	-	-

Discharge & Monitoring Point 9

Discharge to waters
Discharge quality monitoring
Volume monitoring

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Continuous	0	-	-	-

C Statement of Compliance – Licence Conditions

C1 Compliance with Licence Conditions

(√ the boxes)

1.	Were all conditions of the licence complied with (including monitoring and reporting requirements)? (√ the boxes)	❑ Yes	√ No

2. If you answered 'No' to question 1, please supply the following details for each non-compliance in the format, or similar format, provided on the following page.

   Please use a separate page for each licence condition that has not been complied with.

   a) What was the specific licence condition that was not complied with?

   b) What were the particulars of the non-compliance?

   c) What were the date(s) when the non-compliance occurred, if applicable?

   d) If relevant, what was the precise location where the non-compliance occurred?

      Attach a map or diagram to the Statement to show the precise location.

   e) What were the registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance?

   f) What was the cause of the non-compliance?

   g) What action has been, or will be, taken to mitigate any adverse effects of the non-compliance?

   h) What action has been, or will be, taken to prevent a recurrence of the non-compliance?

3.	How many pages have you attached? Each attached page must be initialled by the person(s) who signs Section E of this Annual Return	6

C2 Details of Non-Compliance with Licence

Licence condition number not complied with
E1
Summary of particulars of the non-compliance **(NO MORE THAN 50 WORDS)**
Transfer of water to Awaba EPL443 continued after the trial period had ended.
If required, further details on particulars of non-compliance
Awaba Colliery and Newstan Colliery were granted permission to transfer waste water from Newstan Colliery (EPL 395) to Awaba Colliery (EPL443) for a 12 month period from the date of the first transfer in 2011. This 12 month period ended on the 21/10/12. Newstan Collieries EPL 395 was varied in October 2012 to remove the timeframe on the transfer, however the same change was not made to the EPL443.
Date(s) when the non-compliance occurred, if applicable
21-10-12 to 31-12-12
If relevant, precise location where the non-compliance occurred (attached a map or diagram)
If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance
NA
Cause of non-compliance
Awaba Colliery and Newstan Colliery were granted permission to transfer waste water from Newstan Colliery (EPL 395) to Awaba Colliery (EPL443) for a 12 month period from the date of the first transfer in 2011. This 12 month period ended on the 21/10/12. Newstan Collieries EPL 395 was varied in October 2012 to remove the timeframe on the transfer, however the same change was not made to the EPL443.
Action taken or that will be taken to mitigate any adverse effects of the non-compliance
Newstan Collieries EPL 395 was varied in October 2012 to remove the timeframe on the transfer, and to allow the transfer from Newstan to Awaba EPL 443 to continue. A licence variation application was submitted to the EPA on the 01-02-13.

Action taken or that will be taken to prevent a recurrence of the non-compliance
A licence variation application was submitted to the EPA on the 01-02-13.

D Statement of Compliance – Load-Based Fee Calculation Worksheets

If you are not required to monitor assessable pollutants by your licence, no worksheets will appear below. Please go to Section E.

If assessable pollutants have been identified on your licence (see licence condition L2), complete the following worksheets for each assessable pollutant to determine your load-based fee for the licence fee period to which this Annual Return relates.

Loads of assessable pollutants must be calculated using any of the methods provided in the EPA's Load Calculation Protocol for the relevant activity. A Load Calculation Protocol would have been sent to you with your licence. If you require additional copies you can download the Protocol from the EPA's website or you can contact us on telephone 02 9995 5700.

You are required to keep all records used to calculate licence fees for four years after the licence fee was paid or became payable, whichever is the later date.

PENALTIES APPLY FOR SUPPLYING FALSE OR MISLEADING INFORMATION

D1-D8 (Not Applicable)

E Signature and Certification

This Annual Return may only be signed by a person(s) with legal authority to sign it as set out in the categories below. **Please tick (√) the box** next to the category that describes how this Annual Return is being signed.

If you are uncertain about who is entitled to sign or which category to tick, please contact us on telephone 02 9995 5700.

If the licence holder is:		The Annual Return must be signed and certified
an individual	☐	by the individual licence holder, or
	☐	by a person approved in writing by the EPA to sign on the licence holder's behalf
a company	☐	by affixing the common seal in accordance with Corporations Act 2001, or
	☐	by 2 directors, or
	☑	by a director and a company secretary, or
	☐	If a proprietary company that has a sole director who is also the sole company secretary – by that director, or
	☐	by a person delegated to sign on the company's behalf in accordance with the Corporations Act 2001 **and** approved in writing by the EPA to sign on the company's behalf
a public authority (other than a council)	☐	by the Chief Executive Office of the public authority, or
	☐	by a person delegated to sign on the public authority's behalf in accordance with its legislation **and** approved in writing by the EPA to sign on the public authority's behalf
a local council	☐	by the General manager in accordance with s.377 of the Local Government Act 1993, or
	☐	by affixing the seal of the council in a manner authorised under that Act

It is an offence to supply any information in this form that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect. There is a maximum penalty of $250,000 for a corporation or $120,000 for an individual.

I/We

- *declare that the information in the Monitoring and Complaints Summary in Section B of this Annual Return is correct and not false or misleading in a material respect, and*
- *certify that the information in the Statement of Compliance in sections A, C and D and any pages attached to Section C is correct and not false or misleading in a material respect.*

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates below and specify the new dates to which this Annual Return relates below:.

For the reporting period 01-Jan-2012 to 31-Dec-2012 or ____/____/____to____/____/____

SIGNATURE:	[signature]	SIGNATURE:	[signature]
NAME: (printed)	STEVE BRACKEN	NAME: (printed)	Tony Macko
POSITION:	Chief Operating Officer	POSITION:	Company Secretary
DATE:		DATE:	19 Feb 13
SEAL: (if signing under seal)	19 FEB 2013		

PLEASE ENSURE THAT ALL APPROPRIATE BOXES HAVE BEEN COMPLETED AND THAT THE CHECKLIST ON PAGE 2 OF THE ANNUAL RETURN HA BEEN COMPLETED.

Waste Water Maintenance Pty Ltd
ABN 97 123 372 958

Mobile: 0430 218 866
Fax: (02) 9727 8864

PO Box 6525
Wetherill Park NSW 2164

E: deandalpra@yahoo.com.au

No. 0761

Client Awaba Colliery

Date 13/3/12 2PM

Purchase Order No. AW 109669

Job No.

Comments

* Tank condition OK.
* No wet Area's Visable.
* Keep up Regular Pump outs.

Start Time | Finish Time | Travel Time

Parts used or needing replacement

Test Results		Checks and Recommendations			
Temperature	21°c	Chlorine	/	Float Switch	/
Dissolved Oxygen	/	Belts	/	Timers / Relays	/
pH	7.0	Bearings	/	Pump No. 1 HRM	
Nitrate	/	Pump Operation	/	Pump No. 2 HRM	/
Ammonia	/	Balance No. 1	/	Decant HRM	
30 min. Settle Test	/	Balance No. 2	/	Irrigation Pump	
Turbidity	550 ML	Pump No. 1	/	Sprays	/
Sludge Colour (Odour)	/	Pump No. 2	/	Irrigation Area	/
Others	/				

Serviceman Dean

Client

WWM

No. 0888

Waste Water Maintenance
ABN 97 123 372 958

Mobile: 0430 218 8
Fax: (02) 9727 886

PO Box 6525
Wetherill Park NSW

E: deandalpra@yaho

Client Awaba Colliery

Date 6/6/12

Purchase Order No.

Job No.

Comments

* No wet Area visable
* Tanks ok.
* Keep up Regular Pump outs

Start Time 4pm Finish Time 5pm Travel Time

Parts used or needing replacement

Test Results		Checks and Recommendations			
Temperature	15.3°c	Chlorine	/	Float Switch	/
Dissolved Oxygen	/	Belts	/	Timers / Relays	/
pH	7.0	Bearings	/	Pump No. 1 HRM	
Nitrate	/	Pump Operation	/	Pump No. 2 HRM	/
Ammonia	/	Balance No. 1	/	Decant HRM	/
30 min. Settle Test	/	Balance No. 2	/	Irrigation Pump	
Turbidity	800 mL	Pump No. 1	/	Sprays	/
Sludge Colour (Odour)	Nil odour	Pump No. 2	/	Irrigation Area	
Others	/				

Serviceman

Client

Waste Water Maintenance Pty Ltd
ABN 97 123 372 958

Mobile: 0430 218 866
Phone/Fax: (02) 4677 0372
Accounts: 0425 281 096

PO Box 957
Picton NSW 2571

E: deandalpra@yahoo.com.au

No. 1054

Client Awaba Colliery

Date 26/9/12

Purchase Order No.

Job No. (Weirdo Monkey)

Comments

* checked Tanks.
* No wet areas visable.
* Contrive Regular pump outs.

Start Time 6.30 am Finish Time 7.15 am Travel Time

Parts used or needing replacement

Test Results		Checks and Recommendations			
Temperature		Chlorine		Float Switch	
Dissolved Oxygen		Belts		Timers / Relays	
pH		Bearings		Pump No. 1 HRM	
Nitrate		Pump Operation		Pump No. 2 HRM	
Ammonia		Balance No. 1		Decant HRM	
30 min. Settle Test		Balance No. 2		Irrigation Pump	
Turbidity		Pump No. 1		Sprays	
Sludge Colour (Odour)		Pump No. 2		Irrigation Area	
Others					

Serviceman Dean

Client [signature]

Waste Water Maintenance Pty Ltd
ABN 97 123 372 958

Mobile: 0430 218 866
Phone/Fax: (02) 4677 0372
Accounts: 0425 281 096

PO Box 957
Picton NSW 2571

E: deandalpra@yahoo.com.au

No. 1165

Client Awaba Colliery

Date 19/12/12

Purchase Order No.

Job No.

Comments

* Checked Tank Condition.
* Checked for Sign's of wet Area's - Nil.
* Continue Regular Pump outs.

Start Time 8am | Finish Time | Travel Time

Parts used or needing replacement

Test Results		Checks and Recommendations			
Temperature		Chlorine		Float Switch	
Dissolved Oxygen		Belts		Timers / Relays	
pH		Bearings		Pump No. 1 HRM	
Nitrate		Pump Operation		Pump No. 2 HRM	
Ammonia		Balance No. 1		Decant HRM	
30 min. Settle Test		Balance No. 2		Irrigation Pump	
Turbidity		Pump No. 1		Sprays	
Sludge Colour (Odour)		Pump No. 2		Irrigation Area	
Others					

Serviceman

Client

Appendix 2 – Awaba Annual Environmental Risk Assessment – 2012

Centennial Coal

Dyadem Stature for Risk Management:

Risk Assessment Title: Environment & Community Risk Assessment 2011
Version: 1
Region: North
Site: Awaba
Department: Surface
Equipment / Process: Services
Stature Risk Assessment No.: 1000073014
Study Lifecycle State: Risk Assessment Made Effective
Potential Hazard No.: 20339
PULSE Actions Required URL:
Site Risk Assessment Ref. No. (Optional):

Executive Summary of Top 10 Risks

Background	Potential Incident	RR
Discharge of mine waters	There is a risk to Awaba from ::: Non compliance with licence conditions due to discharge of dirty water ::: Caused by: Insufficient capacity in PCD or pumping water from PCD to underground workings Resulting in: Non compliance with EPL 443.	13 (S)
Control of weeds and pests	There is a risk to Awaba from ::: Increased risk of electric shock and fire ::: Caused by: Accumulation of weeds growing in and around switch room, switch yards and transformer compounds Resulting in: Injury to personnel.	16 (M)
Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Leaking of underground diesel tanks and polluting ground water, land and Stoney creek ::: Caused by: Residue diesel in tanks Resulting in: Discharge of contaminates from site or Ground water contamination or Land contamination.	18 (M)
Operations impacts on Cultural Heritage	There is a risk to Awaba from ::: Damage to Heritage listed buildings ::: Caused by: Surface operations Resulting in: Loss of cultural heritage items.	18 (M)
Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Spill during the filling of the surface diesel tank :::	20 (L)

Background	Potential Incident	RR
	Caused by: Deviation from site protocoles/SWMS Resulting in: Diesel spill to separator or diesel spill to stormwater.	
Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence impacting on infrastructure (Power and communication support towers and railways) ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	20 (L)
Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Public vehicle falls into sink hole or subsidence cracks leading to injury ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	20 (L)
Underground mine workings	There is a risk to Awaba from ::: Spontaneous combustion of UG coal ::: Caused by: Heating of coal Resulting in: Bushfires on the surface or production of green house gases..	20 (L)
Discharge of mine waters	There is a risk to Awaba from ::: Unlicence discharge of water from non licence points ::: Caused by: Historic water management or pumping under emergency situations Resulting in: Non compliance with EPL 443.	20 (L)
Vehicle Movements around colliery - delivery trucks, haul trucks, private vehicles	There is a risk to Awaba from ::: Spillage of hydrocarbons from vehicle :::	21 (L)

Background	Potential Incident	RR
	Caused by: Vehicle movements around colliery Resulting in: Discharge of contaminates from site.	
Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Sedimentation of surrounding water ways in average weather conditions ::: Caused by: Truck and loader movements around stockpile/haul road Resulting in: Discharge of contaminates from site.	21 (L)
Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Hydocarbon contamination of the land from heavy vehicles, loaders etc. ::: Caused by: Truck and loader movements around stockpile/haul road Resulting in: Discharge of contaminates from site.	21 (L)
Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Hydrocarbon and/or chemical pollution of ground water from oil drums and machinery ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Inappropriate storage and handling of hydrocarbons.	21 (L)
Disposal of sewage	There is a risk to Awaba from ::: Pollution of Stony creek by nutrients and pathogens from escaping raw sewage into the environment ::: Caused by: Failure of Transporation tanks Resulting in: Discharge of contaminates from site or Ground water contamination.	21 (L)
Disposal of Grey water	There is a risk to Awaba from	21 (L)

Background	Potential Incident	RR
	::: Pollution of Stoney creek by grey water ::: Caused by: Excessive use of sprinklers or failure of sprinklers/pipeline or overtopping of maturation pond Resulting in: Discharge of contaminates from site.	
Operational Impact on Aboriginal Heritage	There is a risk to Awaba from ::: Damage to Aboriginal Heritage during operational activities ::: Caused by: Clearing for projects or Subsidence Resulting in: Damage to archaeological artefacts.	21 (L)
Bushfire control	There is a risk to Awaba from ::: Fire impacting on site operations ::: Caused by: Inappropriate bushfire controls Resulting in: Damage to buildings and infrastructure.	21 (L)
Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence of land leading to injury to bush walkers and other people ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	21 (L)
Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence impacting on surrounding water courses ::: Caused by: Failure of underground support/workings Resulting in: Damage to watercourse or Inrush underground.	21 (L)
Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from	21 (L)

Background	Potential Incident	RR
	::: Sedimentation of surrounding waterways ::: Caused by: Rehabilitation activities Resulting in: Discharge of sediment laden waters.	
Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Hydocarbon contamination of the land from heavy vehicles, loaders etc.from earth moving vehicles or when filling these vehicles ::: Caused by: Rehabilitation activities Resulting in: Contamination of waters.	21 (L)
Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Failure of rehabilitation area over time ::: Caused by: Poor rehabilitation Resulting in: Community complaint or failure to achieve bond sign off.	21 (L)
Past Underground Operations impacts on Land and ground water	There is a risk to Awaba from ::: Hydocarbon contamination of the land ::: Caused by: Discharge of underground water through LDP's Resulting in: Exceedence of licence (EPL 443) condictions or Land contamination.	21 (L)
Past Underground Operations impacts on Land and ground water	There is a risk to Awaba from ::: Contamination of ground water by discharge of surface water underground ::: Caused by: Transferring surface water underground Resulting in: Ground water contamination.	21 (L)
Clearing of vegetation for subsidence monitoring	There is a risk to Awaba from	21

Background	Potential Incident	RR
	::: Impact on vulnerable and threatened plant species ::: Caused by: Clearing for access and subsidence lines Resulting in: Damage to vulnerable/threatened Flora & Fanuna.	(L)
Clearing of vegetation for subsidence monitoring	There is a risk to Awaba from ::: Impact on significant site or artefact ::: Caused by: Clearing for access and subsidence lines Resulting in: Damage to archaeological artefacts.	21 (L)
Discharge of mine waters	There is a risk to Awaba from ::: Storm water contamination ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Discharge of contaminates from site.	21 (L)

Executive Summary of Top 10 Severities

Background	Potential Incident	MRC
Control of weeds and pests	There is a risk to Awaba from ::: Increased risk of electric shock and fire ::: Caused by: Accumulation of weeds growing in and around switch room, switch yards and transformer compounds Resulting in: Injury to personnel.	2
Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Spill during the filling of the surface diesel tank ::: Caused by: Deviation from site protocoles/SWMS Resulting in: Diesel spill to separator or diesel spill to stormwater.	3
Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence impacting on infrastructure (Power and communication support towers and railways) ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	3
Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Public vehicle falls into sink hole or subsidence cracks leading to injury ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	3
Underground mine workings	There is a risk to Awaba from ::: Spontaneous combustion of UG coal :::	3

Background	Potential Incident	MRC
	Caused by: Heating of coal Resulting in: Bushfires on the surface or production of green house gases..	
Discharge of mine waters	There is a risk to Awaba from ::: Non compliance with licence conditions due to discharge of dirty water ::: Caused by: Insufficient capacity in PCD or pumping water from PCD to underground workings Resulting in: Non compliance with EPL 443.	3
Discharge of mine waters	There is a risk to Awaba from ::: Unlicence discharge of water from non licence points ::: Caused by: Historic water management or pumping under emergency situations Resulting in: Non compliance with EPL 443.	3
Vehicle Movements around colliery - delivery trucks, haul trucks, private vehicles	There is a risk to Awaba from ::: Spillage of hydrocarbons from vehicle ::: Caused by: Vehicle movements around colliery Resulting in: Discharge of contaminates from site.	4
Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Sedimentation of surrounding water ways in average weather conditions ::: Caused by: Truck and loader movements around stockpile/haul road Resulting in: Discharge of contaminates from site.	4
Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Hydocarbon contamination of the land from heavy vehicles, loaders etc. :::	4

Background	Potential Incident	MRC
	Caused by: Truck and loader movements around stockpile/haul road Resulting in: Discharge of contaminates from site.	
Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Hydrocarbon and/or chemical pollution of ground water from oil drums and machinery ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Inappropriate storage and handling of hydrocarbons.	4
Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Leaking of underground diesel tanks and polluting ground water, land and Stoney creek ::: Caused by: Residue diesel in tanks Resulting in: Discharge of contaminates from site or Ground water contamination or Land contamination.	4
Disposal of sewage	There is a risk to Awaba from ::: Pollution of Stony creek by nutrients and pathogens from escaping raw sewage into the environment ::: Caused by: Failure of Transporation tanks Resulting in: Discharge of contaminates from site or Ground water contamination.	4
Disposal of Grey water	There is a risk to Awaba from ::: Pollution of Stoney creek by grey water ::: Caused by: Excessive use of sprinklers or failure of sprinklers/pipeline or overtopping of maturation pond Resulting in: Discharge of contaminates from site.	4
Operation impacts on vulnerable/threatened Flora & Fauna	There is a risk to Awaba from ::: Clearing of threatened species and damage to bushland due to operational activities :::	4

Background	Potential Incident	MRC
	Caused by: Clearing projects Resulting in: Damage to vulnerable/threatened Flora & Fanuna.	
Operational Impact on Aboriginal Heritage	There is a risk to Awaba from ::: Damage to Aboriginal Heritage during operational activities ::: Caused by: Clearing for projects or Subsidence Resulting in: Damage to archaeological artefacts.	4
Operations impacts on Cultural Heritage	There is a risk to Awaba from ::: Damage to Heritage listed buildings ::: Caused by: Surface operations Resulting in: Loss of cultural heritage items.	4
Bushfire control	There is a risk to Awaba from ::: Fire impacting on site operations ::: Caused by: Inappropriate bushfire controls Resulting in: Damage to buildings and infrastructure.	4
Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence of land leading to injury to bush walkers and other people ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	4
Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence impacting on surrounding water courses :::	4

Background	Potential Incident	MRC
	Caused by: Failure of underground support/workings Resulting in: Damage to watercourse or Inrush underground.	
Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Sedimentation of surrounding waterways ::: Caused by: Rehabilitation activities Resulting in: Discharge of sediment laden waters.	4
Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Hydocarbon contamination of the land from heavy vehicles, loaders etc.from earth moving vehicles or when filling these vehicles ::: Caused by: Rehabilitation activities Resulting in: Contamination of waters.	4
Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Failure of rehabilitation area over time ::: Caused by: Poor rehabilitation Resulting in: Community complaint or failure to achieve bond sign off.	4
Past Underground Operations impacts on Land and ground water	There is a risk to Awaba from ::: Hydocarbon contamination of the land ::: Caused by: Discharge of underground water through LDP's Resulting in: Exceedence of licence (EPL 443) condictions or Land contamination.	4
Past Underground Operations impacts on Land and ground water	There is a risk to Awaba from	4

Background	Potential Incident	MRC
	::: Contamination of ground water by discharge of surface water underground ::: Caused by: Transferring surface water underground Resulting in: Ground water contamination.	
Clearing of vegetation for subsidence monitoring	There is a risk to Awaba from ::: Impact on vulnerable and threatened plant species ::: Caused by: Clearing for access and subsidence lines Resulting in: Damage to vulnerable/threatened Flora & Fanuna.	4
Clearing of vegetation for subsidence monitoring	There is a risk to Awaba from ::: Impact on significant site or artefact ::: Caused by: Clearing for access and subsidence lines Resulting in: Damage to archaeological artefacts.	4
Discharge of mine waters	There is a risk to Awaba from ::: Discharge of mine water to land ::: Caused by: Inappropriate location of boreholes Resulting in: Ecological damage.	4
Discharge of mine waters	There is a risk to Awaba from ::: Storm water contamination ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Discharge of contaminates from site.	4

Study Approval

Approver	Approved / Rejected	Date	Comments
1. Stuart Waite	Approved	May 30, 2012	

1. Background

The Department of Primary Industries (Mineral Resources) has included in the MOP and AEMR process the requirement to undertake an environmental risk assessment of operations. The purpose is to identify mine activities, processes and facilities which require control strategies to ensure environmental protection and compliance with conditions of the lease, licence and development consent.

To identify risks, consideration should be given to circumstances which may trigger or exacerbate risks from: intense rain or storm events; prolonged above average rain; drought; flood and inundation, wind, earthquake, fire, equipment breakdown, human error, and accidents.

Awaba Colliery ceased production in February 2012. Concern exists regarding the impact of surface by removal of plant and equipment from the mine to the surface in preparation for closure. A separate risk assessment has been conducted to address any issues relating to the closure.

2. Objective

The following Hierarchy of Controls offers a framework for considering the effectiveness of controls. Note that the effectiveness of a control that is intended to reduce a risk decreases from top to bottom of the list. In other words, the closer the control type is to the top of the hierarchy, the more potentially effective the control.

·Eliminate the hazard or energy source (do not use the energy)
·Minimise or replace the hazard or energy source (reduce the amount of energy to a less damaging level or replace the energy with another that has less potential negative consequences)
·Control the hazard or energy using engineered devices (ex. Lock outs, chemical containers, mechanical roof support, gas monitors, etc.)
·Control the hazard or energy by using physical barriers (ex. machine guarding, warning signs, etc.)
·Control the hazard or energy with procedures (ex. Isolation procedures, standard operating procedures, etc.)
·Control the hazard or energy with personal protective equipment (ex. hard hats, boots with toe caps, gloves, safety glasses, welding gear, etc.)
·Control the hazard or energy with warnings and awareness (ex. posters, labels, stickers, verbal warnings, etc.)

The objective of this risk assessment is to meet the requirements of Section 6 of the DMR document titled "Guidelines to the Mining, Rehabilitation and Environment Management Process". To identify and assess the likelihood of occurrence and consequence of the environmental risks associated with Awaba Colliery, and to control the risks to people and the environment while conducting mining operations on Awaba lease holdings.

3. Potential Hazards

1.1. Airborne dust
2.1. Sedimentation of surrounding waterways
2.2. Hydrocarbon contamination of the land
2.3. Spontaneous combustion of coal stockpile
3.1. Hydrocarbon pollution of Stony creek
3.2. Hydrocarbon pollution of the land
3.3. Hydrocarbon and/or chemical pollution of ground water
4.1. Pollution of Stony Creek
4.2. Hydrocarbon pollution of the land
4.3. Hydrocarbon and/or chemical pollution of ground water
5.1. Pollution of Stony creek by nutrients and pathogens from escaping raw sewage into the environment.
7.1. Infestation and/or spread of declared weeds
9.1. Noise impacts on sensitive receivers
12.1. Damage to Heritage listed buildings
13.1. Bushfire impacting on site operations
14.1. Subsidence of land leading to injury to bush walkers and other persons.
14.2. Subsidence impacting on surrounding vegetation/creeks
14.3. Subsidence impacting on infrastructure (Power and communication support towers)
14.4. Ponding and/or draining in of creek water
14.5. Public vehicle falls into sink hole or subsidence cracks leading to injury
16.1. Public vehicles coming into contact with mine trucks and machinery
16.2. Member of the public falls into colliery dams/tanks.
17.1. Airborne dust
17.2. Sedimentation of surrounding water ways
17.3. Hydrocarbon contamination of creeks and swamp areas
17.4. Public vehicle collides with earthmoving vehicle during operations
18.1. Hydrocarbon contamination of the land
18.2. Hydrocarbon and/or chemical pollution of ground water
19.1. Impact on vulnerable and threatened plant species
19.2. Impact on significant site or artefacts
20.1. Spontaneous combustion of UG coal.

4a. Risk Assessment Boundary Definition

1. Vehicle Movements around colliery
2. Coal Stockpiling and loading
3. Vehicle and machinery wash down area
4. Transport and storage of Hydrocarbons and chemicals on site.
5. Disposal of Grey water and sewage
6. Flora/Fauna
7. Control of weeds
8. Blasting (Not carried out)
9. Operational noise due to loading and transporting of product
10. Visual Stray Light
11. Aboriginal Heritage
12. Cultural Heritage
13. Bushfire control
14. Subsidence and sink holes
15. Methane drainage
16. Mine operations
17. Rehabilitation of Subsidence cracks, "sink" holes and access tracks
18. Land and ground water.
19. Clearing of vegetation for subsidence monitoring
20. Underground mining operations
21. Demolition

4b. Boundary Definition

5. Risk Assessment Methods

Yes/No	Method
Yes	Workplace Risk Assessment and Control (WRAC)
	Fault Tree Analysis (FTA)
	Safety Integrity Level Analysis to Australian Standard 61508 (SIL)
	Bow Tie Analysis (BTA)
	Failure Modes and Effects Analysis (FMEA)
	Hazard and Operability Analysis (HAZOP)

6. Previous Risk Assessment and other documents to be used and/or referenced

Document Name	Title	Version	Referenced Document Date
Awaba Environment & Community RA 2010	Awaba Environment & Community RA 2010	1	
Awaba Environment & Community RA 2011	Awaba Environment & Community RA 2011	1	

7. Information Required for Risk Assessment

Awaba Environment & Community RA 2010 & 2011

8. Venue and Time

Date	Description	Location	Start Time	End Time	Comment
1. 30-May-2012	Scoping	Awaba	8:30 AM	10:00 AM	
2. 30-May-2012	Assessment	Awaba	8:30 AM	12:30 PM	
3.	Review				

9. Risk Assessment Team Selection

Name	Title	Company	Industry Start Date	Yrs. of Exp.	Mobile Phone #	E-Mail Address	Pulse User No.	Role	Attendance		
									1. 30-May-2012	2. 30-May-2012	3.
Stuart Waite	OHS Coordinator (Casual)	Centennial Coal	04-Sep-1972	41	0400 309 399	stuart.waite@centennialcoal.com.au	50029	Facilitator	P	P	
Trevor Hines	Production Manager	Centennial Nothern Coal services	02-Jun-1986	27		trevor.hines@centennialcoal.com.au	60002		P	P	
Rick Howell	Operations Engineer-Mechanical	Awaba Colliery	19-Jan-1976	37	0438 488 718	rick.howell@centennial.com.au	60003		P	P	
Nerida Manley	Environment & Community Coordinator	Awaba Colliery	01-Dec-2008	4		nerida.manely@centennialcoal.com.au	100103	Risk Assessment Owner	P	P	
Grant Watson	Mine Manager	Centennial Fassifern	19-Aug-1991	22	0438560227	grant.watson@centennialcoal.com.au	100027		A	pr	

10. Scope Confirmation

Approver	Scope Confirmation	Date	Comments
1. Stuart Waite	Yes	May 22, 2012	

WRAC Analysis Worksheet

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
1. Vehicle Movements around colliery - delivery trucks, haul trucks, private vehicles	There is a risk to Awaba from ::: Airborne dust ::: Caused by: Vehicle movements around colliery Resulting in: Community complaint or exceedance of DECCW guideleines.	1.1.a. Covering loads 1.1.b. Speed limits on haul road and colliery 1.1.c. Watering of haul road and colliery areas. 1.1.d. Sweeping of roads 1.1.e. Dust deposition gauges. 1.1.f. Sprinkler system at truck loading bin	**C** (Pb)	5 (E)	22 (L)		
	There is a risk to Awaba from ::: Noise impacts on sensitive receivers ::: Caused by: Vehicle movements around colliery Resulting in: Community complaint or exceedance of DECCW guideleines and INP.	1.2.a. Vehicles, trucks and machinery have silencers fitted. 1.2.b. RTA registered. 1.2.c. Deliveries only occur in daytime hours. 1.2.d. Mine operations reduced to day time hours.	**C** (Pb)	5 (E)	22 (L)		
	There is a risk to Awaba from ::: Spillage of hydrocarbons from vehicle ::: Caused by: Vehicle movements around colliery Resulting in: Discharge of contaminates from site.	1.3.a. RTA registered.	**D** (Pb)	4 (E)	21 (L)		
2. Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Sedimentation of surrounding water ways in average weather conditions ::: Caused by: Truck and loader movements around stockpile/haul road	2.1.a. Catch drains 2.1.b. Pollution (sediment) dam 2.1.c. Silt fence 2.1.d. Sediment sumps and drive in sumps 2.1.e. Inspection program and maintenance of sumps and	**D** (Pb)	4 (E)	21 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
		basins					
	Resulting in: Discharge of contaminates from site.	2.1.f. Pumping of turbid water underground					
		2.1.g. Lined and piped drains to minimise erosion					
		2.1.h. Program to remove accumulated sediment from basins and drains to maintain capacity					
		2.1.i. Primary and secondary pumps to drain underground in high rainfall events.					
	There is a risk to Awaba from ::: Hydocarbon contamination of the land from heavy vehicles, loaders etc. ::: Caused by: Truck and loader movements around stockpile/haul road Resulting in: Discharge of contaminates from site.	2.2.a. Programmed maintenance of machinery and vehicles reducing the likelihood of oil/fuel leaks	**D** (Pb)	4 (E)	21 (L)		
		2.2.b. Spill kits located throughout the mine site					
		2.2.c. Pollution (sediment) dam					
		2.2.d. Reduced truck and loader movements due to no production					
	There is a risk to Awaba from ::: Noise impacts on sensitive receivers ::: Caused by: Truck and loader movements around stockpile/haul road Resulting in: Community complaint or exceedance of DECCW guideleines and INP.	2.3.a. Vehicles, trucks and machinery have silencers fitted.	**D** (D)	5 (L)	24 (L)		
		2.3.b. Operating hours are limited					
		2.3.c. Nearest resident approximately 150 metres away and natural topography barriers.					
		2.3.d. Reduced truck and loader movements due to no production					
	There is a risk to Awaba from ::: Airborne dust during loading, driving and windy conditions impacting on local receivers. :::	2.4.a. Location of stockpile area reduces dust emissions	**D** (D)	5 (L)	24 (L)		
		2.4.b. Water cart available when required					
		2.4.c. Watering of haul road and colliery areas					

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Caused by: Truck and loader movements around stockpile/haul road Resulting in: Community complaint or exceedance of DECCW guideleines.	2.4.d. Covering loads 2.4.e. Dust deposition gauges. 2.4.f. Sprinkler system at truck loading bin 2.4.g. Reduced truck and loader movements due to no production					
3. Vehicle and machinery surface wash down area (Northern end of workshop)	There is a risk to Awaba from ::: Hydrocarbon &/or sediment pollution of Stoney creek ::: Caused by: Excessive oil spills resulting in failure of the separator Resulting in: Exceedence of Licence (EPL 443) conditions.	3.1.a. Improved wash down bay facilities. 3.1.b. Oil/water separators on washdown bay. 3.1.c. Spill kits located throughout the mine site 3.1.d. Inspection program and maintenance of sumps and oil/water separator 3.1.e. Sediment dam established 3.1.f. Real time level monitoring of Dam level on CITECT 3.1.g. Waste oil capture and contained during routine maintenance 3.1.h. Reduction in mine vehicle movements due to ceased production 3.1.i. Quarterly service of oil seperator	**D** (D)	5 (E)	24 (L)	1. Expansion / upgrade of PCD 2. Install ultrasonic overflow on PCD outlet	
	There is a risk to Awaba from ::: Hydrocarbon pollution of the land ::: Caused by: Significant spills Resulting in: Land contamination.	3.2.a. Bunded hard stand area t wash down bay 3.2.b. Spill kits located throughout the mine site 3.2.c. Inspection program and maintenance of sumps and oil/water separator 3.2.d. Clean wash down bay weekly 3.2.e. Reduction in mine vehicle movements due to ceased production 3.2.f. Hydrocarbon inventory has	**D** (Pb)	5 (E)	24 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
		been reduced significantly					
	There is a risk to Awaba from ::: Hydrocarbon &/or chemical pollution of ground water ::: Caused by: Significant spills Resulting in: Ground water contamination.	3.3.a. Bunded bulk storage for oil and chemical drums in hard stand areas. 3.3.b. Spill kits located throughout the mine site 3.3.c. Inspection program and maintenance of sumps and oil/water separator 3.3.d. Hydrocarbon emergency response procedures and training of appropriate personnel 3.3.e. Hydrocarbon inventory has been reduced significantly 3.3.f. Reduction in mine vehicle movements due to ceased production	**D** (Pb)	5 (E)	24 (L)		
4. Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: leaking oil drums polluting Stony creek ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Discharge of contaminates from site.	4.1.a. Bunded bulk storage for oil and chemical drums in hard stand areas. 4.1.b. Spill kits located throughout the mine site 4.1.c. Spill training of "key" employees completed in 2010 4.1.d. Fit for Purpose delivery vehicles and associated apparatus 4.1.e. Inspection program of surface facilities 4.1.f. Hydrocarbon inventory has been reduced significantly 4.1.g. Reduction in mine vehicle movements due to ceased production	**D** (D)	5 (E)	24 (L)		
	There is a risk to Awaba from ::: Hydrocarbon pollution of the land from machinery and oil drums :::	4.2.a. Bunded bulk storage for oil and chemical drums in hard stand areas. 4.2.b. Spill kits located throughout the mine site	**D** (D)	5 (E)	24 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Caused by: Significant oil spills Resulting in: Land contamination.	4.2.c. Designated storage area for materials pods 4.2.d. Hydrocarbon inventory has been reduced significantly 4.2.e. Reduction in mine vehicle movements due to ceased production					
	There is a risk to Awaba from ::: Hydrocarbon and/or chemical pollution of ground water from oil drums and machinery ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Inappropriate storage and handling of hydrocarbons.	4.3.a. Bunded bulk storage for oil and chemical drums in hard stand areas. 4.3.b. Spill kits located throughout the mine site 4.3.c. Designated storage area for materials pods 4.3.d. Hydrocarbon inventory has been reduced significantly 4.3.e. Reduction in mine vehicle movements due to ceased production	**D** (Pb)	4 (E)	21 (L)		
	There is a risk to Awaba from ::: Leaking of underground diesel tanks and polluting ground water, land and Stoney creek ::: Caused by: Residue diesel in tanks Resulting in: Discharge of contaminates from site or Ground water contamination or Land contamination.	4.4.a. Underground diesel tanks no longer used 4.4.b. Above ground self bunded diesel tank installed in bunded area - drains to separator	**C** (D)	4 (E)	18 (M)	3. Considerremoving underground diesel tanks after mine closure. 4. Phase 2 Contaminated Sites Assessment to be undertaken.	
	There is a risk to Awaba from ::: Spill during the filling of the surface diesel tank ::: Caused by: Deviation from site protocoles/SWMS Resulting in: Diesel spill to separator or diesel spill	4.5.a. Tank appropriately situated with diesel supplier input into location and decanting methods 4.5.b. Refilling conducted in a bunded area 4.5.c. Fit for purpose delivery tanker 4.5.d. SWP for filling vehicles and pods	**E** (Pb)	3 (E)	20 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	to stormwater.	4.5.e. SWP for filling diesel tank 4.5.f. Vehicle parking area revised 4.5.g. Improvement of bunded area during 2010 4.5.h. Reduction in refuelling of surface diesel tank due to reduced consumption of diesel on site.					
5. Disposal of sewage	There is a risk to Awaba from ::: Pollution of Stony creek by nutrients and pathogens from escaping raw sewage into the environment ::: Caused by: Failure of Transporation tanks Resulting in: Discharge of contaminates from site or Ground water contamination.	5.1.a. Pump out septic tanks as required 5.1.b. Transporation area operational 5.1.c. Reduction in total manning for surface restructure process 5.1.d. Quarterly inspections of septic system	**D** (Pb)	4 (E)	21 (L)		
6. Disposal of Grey water	There is a risk to Awaba from ::: Pollution of Stoney creek by grey water ::: Caused by: Excessive use of sprinklers or failure of sprinklers/pipeline or overtopping of maturation pond Resulting in: Discharge of contaminates from site.	6.1.a. Designated holding tanks 6.1.b. Spray irrigation of grey water 6.1.c. Weekly inspection of dam 6.1.d. Testing of pumping and irrigation system 6.1.e. Reduction in total manning for surface restructure process	**D** (Pb)	4 (E)	21 (L)		
7. Operation impacts on vulnerable/threatened Flora & Fauna	There is a risk to Awaba from ::: Clearing of threatened species and damage to bushland due to operational activities ::: Caused by: Clearing projects Resulting in: Damage to vulnerable/threatened	7.1.a. Permit to Clear Form in Lotus Notes	**E** (D)	4 (L)	23 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Flora & Fanuna.						
8. Control of weeds and pests	There is a risk to Awaba from ::: Infestation and /or spread of declared weeds or pests onsite ::: Caused by: General operations Resulting in: Infestations or spider bites to personnel.	8.1.a. Routine inspection and control using herbicide 8.1.b. Minimised disturbance of area 8.1.c. Pest spraying / control by request	**D** (Pb)	5 (PI)	24 (L)		
	There is a risk to Awaba from ::: Increased risk of electric shock and fire ::: Caused by: Accumulation of weeds growing in and around switch room, switch yards and transformer compounds Resulting in: Injury to personnel.	8.2.a. Routine inspection and control using herbicide 8.2.b. Limited and authised access only 8.2.c. Routine slashing undertaken	**E** (Pb)	2 (PI)	16 (M)		
9. Visual Stray Light from mining operations	There is a risk to Awaba from ::: Impact on sensitive receivers ::: Caused by: Surface lighting Resulting in: Community complaint.	9.1.a. Topography of area 9.1.b. Reduced working hours due to ceased production	**D** (D)	5 (L)	24 (L)		
10. Operational Impact on Aboriginal Heritage	There is a risk to Awaba from ::: Damage to Aboriginal Heritage during operational activities ::: Caused by: Clearing for projects or Subsidence Resulting in: Damage to archaeological artefacts.	10.1.a. Existing surface infrastructure foot print will not be increased 10.1.b. Compliance with Centennial Borehole Management Standard 10.1.c. Monitoring of scar tree in place 10.1.d. Surveys completed to identify artifacts within newly	**D** (D)	4 (L)	21 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
		identified subsidence areas					
11. Operations impacts on Cultural Heritage	There is a risk to Awaba from ::: Damage to Heritage listed buildings ::: Caused by: Surface operations Resulting in: Loss of cultural heritage items.	11.1.a. Management are aware of these buildings on site 11.1.b. Post mining heritage management plan in draft	**C** (D)	4 (R)	18 (M)		
12. Bushfire control	There is a risk to Awaba from ::: Fire impacting on site operations ::: Caused by: Inappropriate bushfire controls Resulting in: Damage to buildings and infrastructure.	12.1.a. Fire breaks established and maintained 12.1.b. Fuel reduction program 12.1.c. Fire suppression systems throughout the colliery 12.1.d. Hydrants located around the permiter of the colliery site 12.1.e. Access to local Bush Fire Brigades	**D** (D)	4 (BI)	21 (L)		
13. Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence of land leading to injury to bush walkers and other people ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	13.1.a. Public Safety Management Plan 13.1.b. Regular surface inspections over mining areas 13.1.c. Present Awaba mine desgin and layout to minimise subsidence impacts 13.1.d. Subsidence area in forested areas 13.1.e. Subsidence data to show minimum subsidence as per mine design 13.1.f. Feedback from orienteering group regarding sink holes and subsidence cracks 13.1.g. Quarterly Inspections of drainage lines above old workings	**D** (D)	4 (PI)	21 (L)	5. Consider an external contractor to undertake quarterly inspections of drainage lines above old workings.	
	There is a risk to Awaba from	13.2.a. Water Course Management Plan	**D** (D)	4 (E)	21 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	::: Subsidence impacting on surrounding water courses ::: Caused by: Failure of underground support/workings Resulting in: Damage to watercourse or Inrush underground.	13.2.b. Regular surface inspections in old mining areas 13.2.c. No further mining within GNS 13.2.d. Public Safety Management Plan					
	There is a risk to Awaba from ::: Subsidence impacting on infrastructure (Power and communication support towers and railways) ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	13.3.a. No further mining within GNS 13.3.b. SMP approval for mining 13.3.c. Regular surface monitoring	**E** (Pb)	3 (PI)	20 (L)		
	There is a risk to Awaba from ::: Public vehicle falls into sink hole or subsidence cracks leading to injury ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	13.4.a. Prompt rehabilitation as required to repair sink holes and subsidence 13.4.b. Signage through out bush area 13.4.c. Regular inspections 13.4.d. Public Safety Management Plan 13.4.e. Site security arrangements	**E** (Pb)	3 (PI)	20 (L)		
14. Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Airborne dust ::: Caused by: Rehabilitation activities Resulting in: Community complaint or exceedance of DECCW guideleines.	14.1.a. Water cart available when required 14.1.b. Work is programmed to minimise impact (small area rehabilitated) 14.1.c. Subsidence impacts in remote locations	**E** (D)	5 (L)	25 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	There is a risk to Awaba from ::: Sedimentation of surrounding waterways ::: Caused by: Rehabilitation activities Resulting in: Discharge of sediment laden waters.	14.2.a. Installation of erosion and sediment controls prior to disturbance 14.2.b. Competent and experienced operators carry out the work 14.2.c. Installation and maintenance of drainage turn-outs and roll-over banks 14.2.d. Approved Rehabilitation Management Plan	**D** (D)	4 (E)	21 (L)		
	There is a risk to Awaba from ::: Hydocarbon contamination of the land from heavy vehicles, loaders etc.from earth moving vehicles or when filling these vehicles ::: Caused by: Rehabilitation activities Resulting in: Contamination of waters.	14.3.a. Programmed maintenance of machinery and vehicles reducing the likelihood of oil/fuel leaks 14.3.b. Competent and experienced operators carry out the work 14.3.c. Fit for Purpose delivery vehicles and associated apparatus	**D** (D)	4 (E)	21 (L)		
	There is a risk to Awaba from ::: Public vehicle collides earthmoving vehicle during operations ::: Caused by: Rehabilitation activities Resulting in: Damage to vehicles or injury.	14.4.a. Signage erected 14.4.b. Temporary fencing erected 14.4.c. Remote location	**D** (D)	5 (PI)	24 (L)		
	There is a risk to Awaba from ::: Failure of rehabilitation area over time ::: Caused by: Poor rehabilitation Resulting in: Community complaint or failure to achieve bond sign off.	14.5.a. Competent and experienced operators carry out the work 14.5.b. Rehabilitation inspection/audit on regular basis	**D** (D)	4 (L)	21 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
15. Past Underground Operations impacts on Land and ground water	There is a risk to Awaba from ::: Hydocarbon contamination of the land ::: Caused by: Discharge of underground water through LDP's Resulting in: Exceedence of licence (EPL 443) condictions or Land contamination.	15.1.a. Faulty vehicles/machinery moved to workshop for major repairs 15.1.b. Spill kits located throughout the mine site 15.1.c. Minimum discharge of mine water due to retreating workings 15.1.d. No further mining within GNS	**D** (D)	4 (L)	21 (L)		
	There is a risk to Awaba from ::: Contamination of ground water by discharge of surface water underground ::: Caused by: Transferring surface water underground Resulting in: Ground water contamination.	15.2.a. Water quality monitoring on surface discharge points 15.2.b. Monitoring of water quality from Newstan discharge to Awaba workings	**D** (D)	4 (E)	21 (L)		
16. Clearing of vegetation for subsidence monitoring	There is a risk to Awaba from ::: Impact on vulnerable and threatened plant species ::: Caused by: Clearing for access and subsidence lines Resulting in: Damage to vulnerable/threatened Flora & Fanuna.	16.1.a. Flora assessment underaken prior to clearing 16.1.b. Pre-clearing inspections undertaken 16.1.c. No new subsidence lines to be installed	**D** (D)	4 (E)	21 (L)		
	There is a risk to Awaba from ::: Impact on significant site or artefact ::: Caused by: Clearing for access and subsidence lines	16.2.a. Pre-clearing inspections undertaken 16.2.b. No new subsidence lines to be installed	**D** (D)	4 (L)	21 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Resulting in: Damage to archaeological artefacts.						
17. Underground mine workings	There is a risk to Awaba from ::: Spontaneous combustion of UG coal ::: Caused by: Heating of coal Resulting in: Bushfires on the surface or production of green house gases..	17.1.a. Monitoring of gas levels by Maihak System 17.1.b. Coal seam has low spon com levels 17.1.c. Rehabilitation of surface cracks and sink holes reduces the risk of spon com 17.1.d. Old workings inundated with ground water	**E** (D)	3 (E)	20 (L)		
18. Disposal of waste	There is a risk to Awaba from ::: Public disposing of waste at Awaba ::: Caused by: Unauthorised access to site by Public Resulting in: Hazarduous materials entering site or Non-compliance with EPL 443.	18.1.a. Site security arrangements 18.1.b. Site fencing 18.1.c. Signage erected 18.1.d. CCTV installed around site	**D** (D)	5 (E)	24 (L)		
	There is a risk to Awaba from ::: Employees disposing of domestic waste at Awaba ::: Caused by: Employees Resulting in: Hazarduous materials entering site or Non-compliance with EPL 443.	18.2.a. Site fencing 18.2.b. Site security arrangements 18.2.c. Site signage 18.2.d. CCTV installed around site	**D** (D)	5 (E)	24 (L)		
	There is a risk to Awaba from ::: Improper disposal of hydrocarbon waste ::: Caused by: Inappropriate storage and handling of	18.3.a. Site fencing 18.3.b. Site security arrangements 18.3.c. Site signage 18.3.d. Waste oil containers 18.3.e. Waste collection of oils 18.3.f. Hydrocarbon inventory has	**E** (D)	5 (E)	25 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	hyrdocarbons Resulting in: Hazarduous materials entering site or Non-compliance with EPL 443.	been reduced significantly 18.3.g. CCTV installed around site					
19. Discharge of mine waters	There is a risk to Awaba from ::: Non compliance with licence conditions due to discharge of dirty water ::: Caused by: Insufficient capacity in PCD or pumping water from PCD to underground workings Resulting in: Non compliance with EPL 443.	19.1.a. Water quality monitoring on surface discharge points 19.1.b. Regular weekly inspections 19.1.c. Dams cleaned on a regular basis 19.1.d. Dams kept at low levels 19.1.e. Pumping system in place 19.1.f. CITEC Alarm 19.1.g. Primary and secondary pumps to drain underground in high rainfall events.	**C** (D)	3 (L)	13 (S)	1. Expansion / upgrade of PCD	
	There is a risk to Awaba from ::: Unlicence discharge of water from non licence points ::: Caused by: Historic water management or pumping under emergency situations Resulting in: Non compliance with EPL 443.	19.2.a. Inspections of discharge points 19.2.b. Competent and experienced operators carry out the work	**E** (D)	3 (L)	20 (L)		
	There is a risk to Awaba from ::: Discharge of mine water to land ::: Caused by: Inappropriate location of boreholes Resulting in: Ecological damage.	19.3.a. Water quality monitoring on surface discharge points 19.3.b. No discharge to land	**E** (D)	4 (E)	23 (L)		
	There is a risk to Awaba from ::: Storm water contamination ::: Caused by: Inappropriate storage and handling of	19.4.a. Hydrocarbon emergency response procedures and training of appropriate personnel 19.4.b. Spill kits located throughout the mine site	**D** (D)	4 (E)	21 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	hyrdocarbons Resulting in: Discharge of contaminates from site.	19.4.c. Hydrocarbons stored in bunded area 19.4.d. Improvements made to bunded area 19.4.e. Hydrocarbon inventory has been reduced significantly 19.4.f. Reduction in mine vehicle movements due to ceased production					
20. Operational impact on community	There is a risk to Awaba from ::: Noise impacts on Awaba community ::: Caused by: Surface restructure Resulting in: Community complaint or exceedance of DECCW guideleines and INP.	20.1.a. Vehicles, trucks and machinery have silencers fitted. 20.1.b. Operating hours are limited 20.1.c. Nearest resident approximately 150 metres away and natural topography barriers. 20.1.d. Reduction in mine vehicle movements due to ceased production	**D** (D)	5 (L)	24 (L)		
	There is a risk to Awaba from ::: Visual pollution ::: Caused by: General operations Resulting in: Community complaint.	20.2.a. Location of stockpile area reduces dust emissions 20.2.b. Water cart available when required 20.2.c. Watering of haul road and colliery areas 20.2.d. Reduction in mine vehicle movements due to ceased production	**D** (D)	5 (L)	24 (L)		
	There is a risk to Awaba from ::: Traffic on public roads ::: Caused by: General operations Resulting in: Community complaint or Vehicle collisions.	20.3.a. Location of stockpile area reduces dust emissions 20.3.b. No transporting of coal on public road 20.3.c. Reduction in mine vehicle movements due to ceased production	**D** (D)	5 (PI)	24 (L)		
21. Surface Restructure	There is a risk to Awaba from	21.1.a. No transporting of coal on public road	**D** (D)	5 (PI)	24 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	::: Traffic on public roads ::: Caused by: Demolition, repairs and upgrades of mine structures Resulting in: Community complaint or Vehicle collisions.	21.1.b. Reduced working hours due to ceased production					
	There is a risk to Awaba from ::: Visual pollution ::: Caused by: Demolition, repairs and upgrades of mine structures Resulting in: Community complaint.	21.2.a. Reduced working hours due to ceased production	**D** (D)	5 (L)	24 (L)		
	There is a risk to Awaba from ::: Noise impacts on Awaba community ::: Caused by: Demolition of mine structures or Demolition, repairs and upgrades of mine structures Resulting in: Community complaint or exceedance of DECCW guideleines and INP.	21.3.a. Vehicles, trucks and machinery have silencers fitted. 21.3.b. Operating hours are limited 21.3.c. Nearest resident approximately 150 metres away and natural topography barriers. 21.3.d. Reduced working hours due to ceased production	**D** (D)	5 (L)	24 (L)		

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
19. Discharge of mine waters	There is a risk to Awaba from ::: Non compliance with licence conditions due to discharge of dirty water ::: Caused by: Insufficient capacity in PCD or pumping water from PCD to underground workings Resulting in: Non compliance with EPL 443.	19.1.a. Water quality monitoring on surface discharge points 19.1.b. Regular weekly inspections 19.1.c. Dams cleaned on a regular basis 19.1.d. Dams kept at low levels 19.1.e. Pumping system in place 19.1.f. CITEC Alarm 19.1.g. Primary and secondary pumps to drain underground in high rainfall events.	**C** (D)	3 (L)	13 (S)	1. Expansion / upgrade of PCD
8. Control of weeds and pests	There is a risk to Awaba from ::: Increased risk of electric shock and fire ::: Caused by: Accumulation of weeds growing in and around switch room, switch yards and transformer compounds Resulting in: Injury to personnel.	8.2.a. Routine inspection and control using herbicide 8.2.b. Limited and authised access only 8.2.c. Routine slashing undertaken	**E** (Pb)	2 (PI)	16 (M)	
4. Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Leaking of underground diesel tanks and polluting ground water, land and Stoney creek ::: Caused by: Residue diesel in tanks Resulting in: Discharge of contaminates from site or Ground water contamination or Land contamination.	4.4.a. Underground diesel tanks no longer used 4.4.b. Above ground self bunded diesel tank installed in bunded area - drains to separator	**C** (D)	4 (E)	18 (M)	3. Considerremoving underground diesel tanks after mine closure. 4. Phase 2 Contaminated Sites Assessment to be undertaken.
11. Operations impacts on Cultural Heritage	There is a risk to Awaba from	11.1.a. Management are aware of these buildings on site	**C** (D)	4 (R)	18 (M)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	::: Damage to Heritage listed buildings ::: Caused by: Surface operations Resulting in: Loss of cultural heritage items.	11.1.b. Post mining heritage management plan in draft				
4. Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Spill during the filling of the surface diesel tank ::: Caused by: Deviation from site protocoles/SWMS Resulting in: Diesel spill to separator or diesel spill to stormwater.	4.5.a. Tank appropriately situated with diesel supplier input into location and decanting methods 4.5.b. Refilling conducted in a bunded area 4.5.c. Fit for purpose delivery tanker 4.5.d. SWP for filling vehicles and pods 4.5.e. SWP for filling diesel tank 4.5.f. Vehicle parking area revised 4.5.g. Improvement of bunded area during 2010 4.5.h. Reduction in refuelling of surface diesel tank due to reduced consumption of diesel on site.	**E** (Pb)	3 (E)	20 (L)	
13. Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence impacting on infrastructure (Power and communication support towers and railways) ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	13.3.a. No further mining within GNS 13.3.b. SMP approval for mining 13.3.c. Regular surface monitoring	**E** (Pb)	3 (PI)	20 (L)	
13. Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Public vehicle falls into sink hole or subsidence cracks leading to injury :::	13.4.a. Prompt rehabilitation as required to repair sink holes and subsidence 13.4.b. Signage through out bush	**E** (Pb)	3 (PI)	20 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		area				
	Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	13.4.c. Regular inspections				
		13.4.d. Public Safety Management Plan				
		13.4.e. Site security arrangements				
17. Underground mine workings	There is a risk to Awaba from ::: Spontaneous combustion of UG coal ::: Caused by: Heating of coal Resulting in: Bushfires on the surface or production of green house gases..	17.1.a. Monitoring of gas levels by Maihak System	**E** (D)	3 (E)	20 (L)	
		17.1.b. Coal seam has low spon com levels				
		17.1.c. Rehabilitation of surface cracks and sink holes reduces the risk of spon com				
		17.1.d. Old workings inundated with ground water				
19. Discharge of mine waters	There is a risk to Awaba from ::: Unlicence discharge of water from non licence points ::: Caused by: Historic water management or pumping under emergency situations Resulting in: Non compliance with EPL 443.	19.2.a. Inspections of discharge points	**E** (D)	3 (L)	20 (L)	
		19.2.b. Competent and experienced operators carry out the work				
1. Vehicle Movements around colliery - delivery trucks, haul trucks, private vehicles	There is a risk to Awaba from ::: Spillage of hydrocarbons from vehicle ::: Caused by: Vehicle movements around colliery Resulting in: Discharge of contaminates from site.	1.3.a. RTA registered.	**D** (Pb)	4 (E)	21 (L)	
2. Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Sedimentation of surrounding water ways in average weather conditions ::: Caused by:	2.1.a. Catch drains	**D** (Pb)	4 (E)	21 (L)	
		2.1.b. Pollution (sediment) dam				
		2.1.c. Silt fence				
		2.1.d. Sediment sumps and drive in sumps				

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Truck and loader movements around stockpile/haul road Resulting in: Discharge of contaminates from site.	2.1.e. Inspection program and maintenance of sumps and basins				
		2.1.f. Pumping of turbid water underground				
		2.1.g. Lined and piped drains to minimise erosion				
		2.1.h. Program to remove accumulated sediment from basins and drains to maintain capacity				
		2.1.i. Primary and secondary pumps to drain underground in high rainfall events.				
2. Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Hydocarbon contamination of the land from heavy vehicles, loaders etc. ::: Caused by: Truck and loader movements around stockpile/haul road Resulting in: Discharge of contaminates from site.	2.2.a. Programmed maintenance of machinery and vehicles reducing the likelihood of oil/fuel leaks	**D** (Pb)	4 (E)	21 (L)	
		2.2.b. Spill kits located throughout the mine site				
		2.2.c. Pollution (sediment) dam				
		2.2.d. Reduced truck and loader movements due to no production				
4. Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Hydrocarbon and/or chemical pollution of ground water from oil drums and machinery ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Inappropriate storage and handling of hydrocarbons.	4.3.a. Bunded bulk storage for oil and chemical drums in hard stand areas.	**D** (Pb)	4 (E)	21 (L)	
		4.3.b. Spill kits located throughout the mine site				
		4.3.c. Designated storage area for materials pods				
		4.3.d. Hydrocarbon inventory has been reduced significantly				
		4.3.e. Reduction in mine vehicle movements due to ceased production				
5. Disposal of sewage	There is a risk to Awaba from ::: Pollution of Stony creek by nutrients and pathogens from	5.1.a. Pump out septic tanks as required	**D** (Pb)	4 (E)	21 (L)	
		5.1.b. Transporation area operational				

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	escaping raw sewage into the environment ::: Caused by: Failure of Transporation tanks Resulting in: Discharge of contaminates from site or Ground water contamination.	5.1.c. Reduction in total manning for surface restructure process 5.1.d. Quarterly inspections of septic system				
6. Disposal of Grey water	There is a risk to Awaba from ::: Pollution of Stoney creek by grey water ::: Caused by: Excessive use of sprinklers or failure of sprinklers/pipeline or overtopping of maturation pond Resulting in: Discharge of contaminates from site.	6.1.a. Designated holding tanks 6.1.b. Spray irrigation of grey water 6.1.c. Weekly inspection of dam 6.1.d. Testing of pumping and irrigation system 6.1.e. Reduction in total manning for surface restructure process	**D** (Pb)	4 (E)	21 (L)	
10. Operational Impact on Aboriginal Heritage	There is a risk to Awaba from ::: Damage to Aboriginal Heritage during operational activities ::: Caused by: Clearing for projects or Subsidence Resulting in: Damage to archaeological artefacts.	10.1.a. Existing surface infrastructure foot print will not be increased 10.1.b. Compliance with Centennial Borehole Management Standard 10.1.c. Monitoring of scar tree in place 10.1.d. Surveys completed to identify artifacts within newly identified subsidence areas	**D** (D)	4 (L)	21 (L)	
12. Bushfire control	There is a risk to Awaba from ::: Fire impacting on site operations ::: Caused by: Inappropriate bushfire controls Resulting in: Damage to buildings and infrastructure.	12.1.a. Fire breaks established and maintained 12.1.b. Fuel reduction program 12.1.c. Fire suppression systems throughout the colliery 12.1.d. Hydrants located around the permiter of the colliery site 12.1.e. Access to local Bush Fire Brigades	**D** (D)	4 (BI)	21 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
13. Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence of land leading to injury to bush walkers and other people ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	13.1.a. Public Safety Management Plan 13.1.b. Regular surface inspections over mining areas 13.1.c. Present Awaba mine desgin and layout to minimise subsidence impacts 13.1.d. Subsidence area in forested areas 13.1.e. Subsidence data to show minimum subsidence as per mine design 13.1.f. Feedback from orienteering group regarding sink holes and subsidence cracks 13.1.g. Quarterly Inspections of drainage lines above old workings	**D** (D)	4 (PI)	21 (L)	5. Consider an external contractor to undertake quarterly inspections of drainage lines above old workings.
13. Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence impacting on surrounding water courses ::: Caused by: Failure of underground support/workings Resulting in: Damage to watercourse or Inrush underground.	13.2.a. Water Course Management Plan 13.2.b. Regular surface inspections in old mining areas 13.2.c. No further mining within GNS 13.2.d. Public Safety Management Plan	**D** (D)	4 (E)	21 (L)	
14. Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Sedimentation of surrounding waterways ::: Caused by: Rehabilitation activities Resulting in: Discharge of sediment laden waters.	14.2.a. Installation of erosion and sediment controls prior to disturbance 14.2.b. Competent and experienced operators carry out the work 14.2.c. Installation and maintenance of drainage turn-outs and roll-over banks 14.2.d. Approved Rehabilitation	**D** (D)	4 (E)	21 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		Management Plan				
14. Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Hydocarbon contamination of the land from heavy vehicles, loaders etc.from earth moving vehicles or when filling these vehicles ::: Caused by: Rehabilitation activities Resulting in: Contamination of waters.	14.3.a. Programmed maintenance of machinery and vehicles reducing the likelihood of oil/fuel leaks 14.3.b. Competent and experienced operators carry out the work 14.3.c. Fit for Purpose delivery vehicles and associated apparatus	**D** (D)	4 (E)	21 (L)	
14. Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Failure of rehabilitation area over time ::: Caused by: Poor rehabilitation Resulting in: Community complaint or failure to achieve bond sign off.	14.5.a. Competent and experienced operators carry out the work 14.5.b. Rehabilitation inspection/audit on regular basis	**D** (D)	4 (L)	21 (L)	
15. Past Underground Operations impacts on Land and ground water	There is a risk to Awaba from ::: Hydocarbon contamination of the land ::: Caused by: Discharge of underground water through LDP's Resulting in: Exceedence of licence (EPL 443) condictions or Land contamination.	15.1.a. Faulty vehicles/machinery moved to workshop for major repairs 15.1.b. Spill kits located throughout the mine site 15.1.c. Minimum discharge of mine water due to retreating workings 15.1.d. No further mining within GNS	**D** (D)	4 (L)	21 (L)	
15. Past Underground Operations impacts on Land and ground water	There is a risk to Awaba from ::: Contamination of ground water by discharge of surface water underground ::: Caused by: Transferring surface water underground	15.2.a. Water quality monitoring on surface discharge points 15.2.b. Monitoring of water quality from Newstan discharge to Awaba workings	**D** (D)	4 (E)	21 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Resulting in: Ground water contamination.					
16. Clearing of vegetation for subsidence monitoring	There is a risk to Awaba from ::: Impact on vulnerable and threatened plant species ::: Caused by: Clearing for access and subsidence lines Resulting in: Damage to vulnerable/threatened Flora & Fanuna.	16.1.a. Flora assessment underaken prior to clearing 16.1.b. Pre-clearing inspections undertaken 16.1.c. No new subsidence lines to be installed	**D** (D)	4 (E)	21 (L)	
16. Clearing of vegetation for subsidence monitoring	There is a risk to Awaba from ::: Impact on significant site or artefact ::: Caused by: Clearing for access and subsidence lines Resulting in: Damage to archaeological artefacts.	16.2.a. Pre-clearing inspections undertaken 16.2.b. No new subsidence lines to be installed	**D** (D)	4 (L)	21 (L)	
19. Discharge of mine waters	There is a risk to Awaba from ::: Storm water contamination ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Discharge of contaminates from site.	19.4.a. Hydrocarbon emergency response procedures and training of appropriate personnel 19.4.b. Spill kits located throughout the mine site 19.4.c. Hydrocarbons stored in bunded area 19.4.d. Improvements made to bunded area 19.4.e. Hydrocarbon inventory has been reduced significantly 19.4.f. Reduction in mine vehicle movements due to ceased production	**D** (D)	4 (E)	21 (L)	
1. Vehicle Movements around colliery -	There is a risk to Awaba from	1.1.a. Covering loads 1.1.b. Speed limits on haul road	**C** (Pb)	5 (E)	22 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
delivery trucks, haul trucks, private vehicles	::: Airborne dust ::: Caused by: Vehicle movements around colliery Resulting in: Community complaint or exceedance of DECCW guideleines.	and colliery 1.1.c. Watering of haul road and colliery areas. 1.1.d. Sweeping of roads 1.1.e. Dust deposition gauges. 1.1.f. Sprinkler system at truck loading bin				
1. Vehicle Movements around colliery - delivery trucks, haul trucks, private vehicles	There is a risk to Awaba from ::: Noise impacts on sensitive receivers ::: Caused by: Vehicle movements around colliery Resulting in: Community complaint or exceedance of DECCW guideleines and INP.	1.2.a. Vehicles, trucks and machinery have silencers fitted. 1.2.b. RTA registered. 1.2.c. Deliveries only occur in daytime hours. 1.2.d. Mine operations reduced to day time hours.	**C** (Pb)	5 (E)	22 (L)	
7. Operation impacts on vulnerable/threatened Flora & Fauna	There is a risk to Awaba from ::: Clearing of threatened species and damage to bushland due to operational activities ::: Caused by: Clearing projects Resulting in: Damage to vulnerable/threatened Flora & Fanuna.	7.1.a. Permit to Clear Form in Lotus Notes	**E** (D)	4 (L)	23 (L)	
19. Discharge of mine waters	There is a risk to Awaba from ::: Discharge of mine water to land ::: Caused by: Inappropriate location of boreholes Resulting in: Ecological damage.	19.3.a. Water quality monitoring on surface discharge points 19.3.b. No discharge to land	**E** (D)	4 (E)	23 (L)	
2. Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Noise impacts on sensitive receivers :::	2.3.a. Vehicles, trucks and machinery have silencers fitted. 2.3.b. Operating hours are limited	**D** (D)	5 (L)	24 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Truck and loader movements around stockpile/haul road Resulting in: Community complaint or exceedance of DECCW guideleines and INP.	2.3.c. Nearest resident approximately 150 metres away and natural topography barriers. 2.3.d. Reduced truck and loader movements due to no production				
2. Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Airborne dust during loading, driving and windy conditions impacting on local receivers. ::: Caused by: Truck and loader movements around stockpile/haul road Resulting in: Community complaint or exceedance of DECCW guideleines.	2.4.a. Location of stockpile area reduces dust emissions 2.4.b. Water cart available when required 2.4.c. Watering of haul road and colliery areas 2.4.d. Covering loads 2.4.e. Dust deposition gauges. 2.4.f. Sprinkler system at truck loading bin 2.4.g. Reduced truck and loader movements due to no production	**D** (D)	5 (L)	24 (L)	
3. Vehicle and machinery surface wash down area (Northern end of workshop)	There is a risk to Awaba from ::: Hydrocarbon &/or sediment pollution of Stoney creek ::: Caused by: Excessive oil spills resulting in failure of the separator Resulting in: Exceedence of Licence (EPL 443) conditions.	3.1.a. Improved wash down bay facilities. 3.1.b. Oil/water separators on washdown bay. 3.1.c. Spill kits located throughout the mine site 3.1.d. Inspection program and maintenance of sumps and oil/water separator 3.1.e. Sediment dam established 3.1.f. Real time level monitoring of Dam level on CITECT 3.1.g. Waste oil capture and contained during routine maintenance 3.1.h. Reduction in mine vehicle movements due to ceased production 3.1.i. Quarterly service of oil seperator	**D** (D)	5 (E)	24 (L)	1. Expansion / upgrade of PCD 2. Install ultrasonic overflow on PCD outlet

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
3. Vehicle and machinery surface wash down area (Northern end of workshop)	There is a risk to Awaba from ::: Hydrocarbon pollution of the land ::: Caused by: Significant spills Resulting in: Land contamination.	3.2.a. Bunded hard stand area t wash down bay 3.2.b. Spill kits located throughout the mine site 3.2.c. Inspection program and maintenance of sumps and oil/water separator 3.2.d. Clean wash down bay weekly 3.2.e. Reduction in mine vehicle movements due to ceased production 3.2.f. Hydrocarbon inventory has been reduced significantly	**D** (Pb)	5 (E)	24 (L)	
3. Vehicle and machinery surface wash down area (Northern end of workshop)	There is a risk to Awaba from ::: Hydrocarbon &/or chemical pollution of ground water ::: Caused by: Significant spills Resulting in: Ground water contamination.	3.3.a. Bunded bulk storage for oil and chemical drums in hard stand areas. 3.3.b. Spill kits located throughout the mine site 3.3.c. Inspection program and maintenance of sumps and oil/water separator 3.3.d. Hydrocarbon emergency response procedures and training of appropriate personnel 3.3.e. Hydrocarbon inventory has been reduced significantly 3.3.f. Reduction in mine vehicle movements due to ceased production	**D** (Pb)	5 (E)	24 (L)	
4. Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: leaking oil drums polluting Stony creek ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Discharge of contaminates from site.	4.1.a. Bunded bulk storage for oil and chemical drums in hard stand areas. 4.1.b. Spill kits located throughout the mine site 4.1.c. Spill training of "key" employees completed in 2010 4.1.d. Fit for Purpose delivery vehicles and associated	**D** (D)	5 (E)	24 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		apparatus				
		4.1.e. Inspection program of surface facilities				
		4.1.f. Hydrocarbon inventory has been reduced significantly				
		4.1.g. Reduction in mine vehicle movements due to ceased production				
4. Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Hydrocarbon pollution of the land from machinery and oil drums ::: Caused by: Significant oil spills Resulting in: Land contamination.	4.2.a. Bunded bulk storage for oil and chemical drums in hard stand areas.	**D** (D)	5 (E)	24 (L)	
		4.2.b. Spill kits located throughout the mine site				
		4.2.c. Designated storage area for materials pods				
		4.2.d. Hydrocarbon inventory has been reduced significantly				
		4.2.e. Reduction in mine vehicle movements due to ceased production				
8. Control of weeds and pests	There is a risk to Awaba from ::: Infestation and /or spread of declared weeds or pests onsite ::: Caused by: General operations Resulting in: Infestations or spider bites to personnel.	8.1.a. Routine inspection and control using herbicide	**D** (Pb)	5 (PI)	24 (L)	
		8.1.b. Minimised disturbance of area				
		8.1.c. Pest spraying / control by request				
9. Visual Stray Light from mining operations	There is a risk to Awaba from ::: Impact on sensitive receivers ::: Caused by: Surface lighting Resulting in: Community complaint.	9.1.a. Topography of area	**D** (D)	5 (L)	24 (L)	
		9.1.b. Reduced working hours due to ceased production				
14. Rehabilitation of Subsidence cracks,	There is a risk to Awaba from	14.4.a. Signage erected	**D** (D)	5 (PI)	24 (L)	
		14.4.b. Temporary fencing erected				

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
"sink" holes and access tracks	::: Public vehicle collides earthmoving vehicle during operations ::: Caused by: Rehabilitation activities Resulting in: Damage to vehicles or injury.	14.4.c. Remote location				
18. Disposal of waste	There is a risk to Awaba from ::: Public disposing of waste at Awaba ::: Caused by: Unauthorised access to site by Public Resulting in: Hazarduous materials entering site or Non-compliance with EPL 443.	18.1.a. Site security arrangements 18.1.b. Site fencing 18.1.c. Signage erected 18.1.d. CCTV installed around site	**D** (D)	5 (E)	24 (L)	
18. Disposal of waste	There is a risk to Awaba from ::: Employees disposing of domestic waste at Awaba ::: Caused by: Employees Resulting in: Hazarduous materials entering site or Non-compliance with EPL 443.	18.2.a. Site fencing 18.2.b. Site security arrangements 18.2.c. Site signage 18.2.d. CCTV installed around site	**D** (D)	5 (E)	24 (L)	
20. Operational impact on community	There is a risk to Awaba from ::: Noise impacts on Awaba community ::: Caused by: Surface restructure Resulting in: Community complaint or exceedance of DECCW guideleines and INP.	20.1.a. Vehicles, trucks and machinery have silencers fitted. 20.1.b. Operating hours are limited 20.1.c. Nearest resident approximately 150 metres away and natural topography barriers. 20.1.d. Reduction in mine vehicle movements due to ceased production	**D** (D)	5 (L)	24 (L)	
20. Operational impact on community	There is a risk to Awaba from ::: Visual pollution :::	20.2.a. Location of stockpile area reduces dust emissions 20.2.b. Water cart available when	**D** (D)	5 (L)	24 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: General operations Resulting in: Community complaint.	required 20.2.c. Watering of haul road and colliery areas 20.2.d. Reduction in mine vehicle movements due to ceased production				
20. Operational impact on community	There is a risk to Awaba from ::: Traffic on public roads ::: Caused by: General operations Resulting in: Community complaint or Vehicle collisions.	20.3.a. Location of stockpile area reduces dust emissions 20.3.b. No transporting of coal on public road 20.3.c. Reduction in mine vehicle movements due to ceased production	**D** (D)	5 (PI)	24 (L)	
21. Surface Restructure	There is a risk to Awaba from ::: Traffic on public roads ::: Caused by: Demolition, repairs and upgrades of mine structures Resulting in: Community complaint or Vehicle collisions.	21.1.a. No transporting of coal on public road 21.1.b. Reduced working hours due to ceased production	**D** (D)	5 (PI)	24 (L)	
21. Surface Restructure	There is a risk to Awaba from ::: Visual pollution ::: Caused by: Demolition, repairs and upgrades of mine structures Resulting in: Community complaint.	21.2.a. Reduced working hours due to ceased production	**D** (D)	5 (L)	24 (L)	
21. Surface Restructure	There is a risk to Awaba from ::: Noise impacts on Awaba community ::: Caused by: Demolition of mine structures or	21.3.a. Vehicles, trucks and machinery have silencers fitted. 21.3.b. Operating hours are limited 21.3.c. Nearest resident approximately 150 metres away and natural	**D** (D)	5 (L)	24 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Demolition, repairs and upgrades of mine structures Resulting in: Community complaint or exceedance of DECCW guideleines and INP.	topography barriers. 21.3.d. Reduced working hours due to ceased production				
14. Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Airborne dust ::: Caused by: Rehabilitation activities Resulting in: Community complaint or exceedance of DECCW guideleines.	14.1.a. Water cart available when required 14.1.b. Work is programmed to minimise impact (small area rehabilitated) 14.1.c. Subsidence impacts in remote locations	**E** (D)	5 (L)	25 (L)	
18. Disposal of waste	There is a risk to Awaba from ::: Improper disposal of hydrocarbon waste ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Hazarduous materials entering site or Non-compliance with EPL 443.	18.3.a. Site fencing 18.3.b. Site security arrangements 18.3.c. Site signage 18.3.d. Waste oil containers 18.3.e. Waste collection of oils 18.3.f. Hydrocarbon inventory has been reduced significantly 18.3.g. CCTV installed around site	**E** (D)	5 (E)	25 (L)	

WRAC Analysis Sorted by Consequence

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
8. Control of weeds and pests	There is a risk to Awaba from ::: Increased risk of electric shock and fire ::: Caused by: Accumulation of weeds growing in and around switch room, switch yards and transformer compounds Resulting in: Injury to personnel.	8.2.a. Routine inspection and control using herbicide 8.2.b. Limited and authised access only 8.2.c. Routine slashing undertaken	**E** (Pb)	2 (PI)	16 (M)	
4. Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Spill during the filling of the surface diesel tank ::: Caused by: Deviation from site protocoles/SWMS Resulting in: Diesel spill to separator or diesel spill to stormwater.	4.5.a. Tank appropriately situated with diesel supplier input into location and decanting methods 4.5.b. Refilling conducted in a bunded area 4.5.c. Fit for purpose delivery tanker 4.5.d. SWP for filling vehicles and pods 4.5.e. SWP for filling diesel tank 4.5.f. Vehicle parking area revised 4.5.g. Improvement of bunded area during 2010 4.5.h. Reduction in refuelling of surface diesel tank due to reduced consumption of diesel on site.	**E** (Pb)	3 (E)	20 (L)	
17. Underground mine workings	There is a risk to Awaba from ::: Spontaneous combustion of UG coal ::: Caused by: Heating of coal Resulting in: Bushfires on the surface or production of green house gases..	17.1.a. Monitoring of gas levels by Maihak System 17.1.b. Coal seam has low spon com levels 17.1.c. Rehabilitation of surface cracks and sink holes reduces the risk of spon com 17.1.d. Old workings inundated with ground water	**E** (D)	3 (E)	20 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
19. Discharge of mine waters	There is a risk to Awaba from ::: Non compliance with licence conditions due to discharge of dirty water ::: Caused by: Insufficient capacity in PCD or pumping water from PCD to underground workings Resulting in: Non compliance with EPL 443.	19.1.a. Water quality monitoring on surface discharge points 19.1.b. Regular weekly inspections 19.1.c. Dams cleaned on a regular basis 19.1.d. Dams kept at low levels 19.1.e. Pumping system in place 19.1.f. CITEC Alarm 19.1.g. Primary and secondary pumps to drain underground in high rainfall events.	**C** (D)	3 (L)	13 (S)	1. Expansion / upgrade of PCD
19. Discharge of mine waters	There is a risk to Awaba from ::: Unlicence discharge of water from non licence points ::: Caused by: Historic water management or pumping under emergency situations Resulting in: Non compliance with EPL 443.	19.2.a. Inspections of discharge points 19.2.b. Competent and experienced operators carry out the work	**E** (D)	3 (L)	20 (L)	
13. Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence impacting on infrastructure (Power and communication support towers and railways) ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	13.3.a. No further mining within GNS 13.3.b. SMP approval for mining 13.3.c. Regular surface monitoring	**E** (Pb)	3 (PI)	20 (L)	
13. Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Public vehicle falls into sink hole or subsidence cracks leading to injury ::: Caused by: Failure of underground support/workings	13.4.a. Prompt rehabilitation as required to repair sink holes and subsidence 13.4.b. Signage through out bush area 13.4.c. Regular inspections 13.4.d. Public Safety Management	**E** (Pb)	3 (PI)	20 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		Plan				
	Resulting in: Injury to personnel.	13.4.e. Site security arrangements				
12. Bushfire control	There is a risk to Awaba from ::: Fire impacting on site operations ::: Caused by: Inappropriate bushfire controls Resulting in: Damage to buildings and infrastructure.	12.1.a. Fire breaks established and maintained 12.1.b. Fuel reduction program 12.1.c. Fire suppression systems throughout the colliery 12.1.d. Hydrants located around the permiter of the colliery site 12.1.e. Access to local Bush Fire Brigades	**D** (D)	4 (BI)	21 (L)	
1. Vehicle Movements around colliery - delivery trucks, haul trucks, private vehicles	There is a risk to Awaba from ::: Spillage of hydrocarbons from vehicle ::: Caused by: Vehicle movements around colliery Resulting in: Discharge of contaminates from site.	1.3.a. RTA registered.	**D** (Pb)	4 (E)	21 (L)	
2. Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Sedimentation of surrounding water ways in average weather conditions ::: Caused by: Truck and loader movements around stockpile/haul road Resulting in: Discharge of contaminates from site.	2.1.a. Catch drains 2.1.b. Pollution (sediment) dam 2.1.c. Silt fence 2.1.d. Sediment sumps and drive in sumps 2.1.e. Inspection program and maintenance of sumps and basins 2.1.f. Pumping of turbid water underground 2.1.g. Lined and piped drains to minimise erosion 2.1.h. Program to remove accumulated sediment from basins and drains to maintain capacity 2.1.i. Primary and secondary pumps to drain underground in high rainfall events.	**D** (Pb)	4 (E)	21 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
2. Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Hydocarbon contamination of the land from heavy vehicles, loaders etc. ::: Caused by: Truck and loader movements around stockpile/haul road Resulting in: Discharge of contaminates from site.	2.2.a. Programmed maintenance of machinery and vehicles reducing the likelihood of oil/fuel leaks 2.2.b. Spill kits located throughout the mine site 2.2.c. Pollution (sediment) dam 2.2.d. Reduced truck and loader movements due to no production	**D** (Pb)	4 (E)	21 (L)	
4. Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Hydrocarbon and/or chemical pollution of ground water from oil drums and machinery ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Inappropriate storage and handling of hydrocarbons.	4.3.a. Bunded bulk storage for oil and chemical drums in hard stand areas. 4.3.b. Spill kits located throughout the mine site 4.3.c. Designated storage area for materials pods 4.3.d. Hydrocarbon inventory has been reduced significantly 4.3.e. Reduction in mine vehicle movements due to ceased production	**D** (Pb)	4 (E)	21 (L)	
4. Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Leaking of underground diesel tanks and polluting ground water, land and Stoney creek ::: Caused by: Residue diesel in tanks Resulting in: Discharge of contaminates from site or Ground water contamination or Land contamination.	4.4.a. Underground diesel tanks no longer used 4.4.b. Above ground self bunded diesel tank installed in bunded area - drains to separator	**C** (D)	4 (E)	18 (M)	3. Considerremoving underground diesel tanks after mine closure. 4. Phase 2 Contaminated Sites Assessment to be undertaken.
5. Disposal of sewage	There is a risk to Awaba from ::: Pollution of Stony creek by nutrients and pathogens from escaping raw sewage into the environment :::	5.1.a. Pump out septic tanks as required 5.1.b. Transporation area operational 5.1.c. Reduction in total manning for surface restructure process	**D** (Pb)	4 (E)	21 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Failure of Transporation tanks Resulting in: Discharge of contaminates from site or Ground water contamination.	5.1.d. Quarterly inspections of septic system				
6. Disposal of Grey water	There is a risk to Awaba from ::: Pollution of Stoney creek by grey water ::: Caused by: Excessive use of sprinklers or failure of sprinklers/pipeline or overtopping of maturation pond Resulting in: Discharge of contaminates from site.	6.1.a. Designated holding tanks 6.1.b. Spray irrigation of grey water 6.1.c. Weekly inspection of dam 6.1.d. Testing of pumping and irrigation system 6.1.e. Reduction in total manning for surface restructure process	**D** (Pb)	4 (E)	21 (L)	
13. Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence impacting on surrounding water courses ::: Caused by: Failure of underground support/workings Resulting in: Damage to watercourse or Inrush underground.	13.2.a. Water Course Management Plan 13.2.b. Regular surface inspections in old mining areas 13.2.c. No further mining within GNS 13.2.d. Public Safety Management Plan	**D** (D)	4 (E)	21 (L)	
14. Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Sedimentation of surrounding waterways ::: Caused by: Rehabilitation activities Resulting in: Discharge of sediment laden waters.	14.2.a. Installation of erosion and sediment controls prior to disturbance 14.2.b. Competent and experienced operators carry out the work 14.2.c. Installation and maintenance of drainage turn-outs and roll-over banks 14.2.d. Approved Rehabilitation Management Plan	**D** (D)	4 (E)	21 (L)	
14. Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Hydocarbon contamination of the land from heavy vehicles, loaders	14.3.a. Programmed maintenance of machinery and vehicles reducing the likelihood of oil/fuel leaks	**D** (D)	4 (E)	21 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	etc.from earth moving vehicles or when filling these vehicles ::: Caused by: Rehabilitation activities Resulting in: Contamination of waters.	14.3.b. Competent and experienced operators carry out the work 14.3.c. Fit for Purpose delivery vehicles and associated apparatus				
15. Past Underground Operations impacts on Land and ground water	There is a risk to Awaba from ::: Contamination of ground water by discharge of surface water underground ::: Caused by: Transferring surface water underground Resulting in: Ground water contamination.	15.2.a. Water quality monitoring on surface discharge points 15.2.b. Monitoring of water quality from Newstan discharge to Awaba workings	**D** (D)	4 (E)	21 (L)	
16. Clearing of vegetation for subsidence monitoring	There is a risk to Awaba from ::: Impact on vulnerable and threatened plant species ::: Caused by: Clearing for access and subsidence lines Resulting in: Damage to vulnerable/threatened Flora & Fanuna.	16.1.a. Flora assessment underaken prior to clearing 16.1.b. Pre-clearing inspections undertaken 16.1.c. No new subsidence lines to be installed	**D** (D)	4 (E)	21 (L)	
19. Discharge of mine waters	There is a risk to Awaba from ::: Discharge of mine water to land ::: Caused by: Inappropriate location of boreholes Resulting in: Ecological damage.	19.3.a. Water quality monitoring on surface discharge points 19.3.b. No discharge to land	**E** (D)	4 (E)	23 (L)	
19. Discharge of mine waters	There is a risk to Awaba from ::: Storm water contamination :::	19.4.a. Hydrocarbon emergency response procedures and training of appropriate personnel	**D** (D)	4 (E)	21 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Discharge of contaminates from site.	19.4.b. Spill kits located throughout the mine site 19.4.c. Hydrocarbons stored in bunded area 19.4.d. Improvements made to bunded area 19.4.e. Hydrocarbon inventory has been reduced significantly 19.4.f. Reduction in mine vehicle movements due to ceased production				
7. Operation impacts on vulnerable/threatened Flora & Fauna	There is a risk to Awaba from ::: Clearing of threatened species and damage to bushland due to operational activities ::: Caused by: Clearing projects Resulting in: Damage to vulnerable/threatened Flora & Fanuna.	7.1.a. Permit to Clear Form in Lotus Notes	**E** (D)	4 (L)	23 (L)	
10. Operational Impact on Aboriginal Heritage	There is a risk to Awaba from ::: Damage to Aboriginal Heritage during operational activities ::: Caused by: Clearing for projects or Subsidence Resulting in: Damage to archaeological artefacts.	10.1.a. Existing surface infrastructure foot print will not be increased 10.1.b. Compliance with Centennial Borehole Management Standard 10.1.c. Monitoring of scar tree in place 10.1.d. Surveys completed to identify artifacts within newly identified subsidence areas	**D** (D)	4 (L)	21 (L)	
14. Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Failure of rehabilitation area over time ::: Caused by: Poor rehabilitation Resulting in:	14.5.a. Competent and experienced operators carry out the work 14.5.b. Rehabilitation inspection/audit on regular basis	**D** (D)	4 (L)	21 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Community complaint or failure to achieve bond sign off.					
15. Past Underground Operations impacts on Land and ground water	There is a risk to Awaba from ::: Hydocarbon contamination of the land ::: Caused by: Discharge of underground water through LDP's Resulting in: Exceedence of licence (EPL 443) condictions or Land contamination.	15.1.a. Faulty vehicles/machinery moved to workshop for major repairs 15.1.b. Spill kits located throughout the mine site 15.1.c. Minimum discharge of mine water due to retreating workings 15.1.d. No further mining within GNS	**D** (D)	4 (L)	21 (L)	
16. Clearing of vegetation for subsidence monitoring	There is a risk to Awaba from ::: Impact on significant site or artefact ::: Caused by: Clearing for access and subsidence lines Resulting in: Damage to archaeological artefacts.	16.2.a. Pre-clearing inspections undertaken 16.2.b. No new subsidence lines to be installed	**D** (D)	4 (L)	21 (L)	
13. Subsidence and sink holes from mining operations	There is a risk to Awaba from ::: Subsidence of land leading to injury to bush walkers and other people ::: Caused by: Failure of underground support/workings Resulting in: Injury to personnel.	13.1.a. Public Safety Management Plan 13.1.b. Regular surface inspections over mining areas 13.1.c. Present Awaba mine desgin and layout to minimise subsidence impacts 13.1.d. Subsidence area in forested areas 13.1.e. Subsidence data to show minimum subsidence as per mine design 13.1.f. Feedback from orienteering group regarding sink holes and subsidence cracks 13.1.g. Quarterly Inspections of drainage lines above old workings	**D** (D)	4 (PI)	21 (L)	5. Consider an external contractor to undertake quarterly inspections of drainage lines above old workings.

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
11. Operations impacts on Cultural Heritage	There is a risk to Awaba from ::: Damage to Heritage listed buildings ::: Caused by: Surface operations Resulting in: Loss of cultural heritage items.	11.1.a. Management are aware of these buildings on site 11.1.b. Post mining heritage management plan in draft	**C** (D)	4 (R)	18 (M)	
1. Vehicle Movements around colliery - delivery trucks, haul trucks, private vehicles	There is a risk to Awaba from ::: Airborne dust ::: Caused by: Vehicle movements around colliery Resulting in: Community complaint or exceedance of DECCW guideleines.	1.1.a. Covering loads 1.1.b. Speed limits on haul road and colliery 1.1.c. Watering of haul road and colliery areas. 1.1.d. Sweeping of roads 1.1.e. Dust deposition gauges. 1.1.f. Sprinkler system at truck loading bin	**C** (Pb)	5 (E)	22 (L)	
1. Vehicle Movements around colliery - delivery trucks, haul trucks, private vehicles	There is a risk to Awaba from ::: Noise impacts on sensitive receivers ::: Caused by: Vehicle movements around colliery Resulting in: Community complaint or exceedance of DECCW guideleines and INP.	1.2.a. Vehicles, trucks and machinery have silencers fitted. 1.2.b. RTA registered. 1.2.c. Deliveries only occur in daytime hours. 1.2.d. Mine operations reduced to day time hours.	**C** (Pb)	5 (E)	22 (L)	
3. Vehicle and machinery surface wash down area (Northern end of workshop)	There is a risk to Awaba from ::: Hydrocarbon &/or sediment pollution of Stoney creek ::: Caused by: Excessive oil spills resulting in failure of the separator Resulting in: Exceedence of Licence (EPL 443) conditions.	3.1.a. Improved wash down bay facilities. 3.1.b. Oil/water separators on washdown bay. 3.1.c. Spill kits located throughout the mine site 3.1.d. Inspection program and maintenance of sumps and oil/water separator 3.1.e. Sediment dam established 3.1.f. Real time level monitoring of Dam level on CITECT	**D** (D)	5 (E)	24 (L)	1. Expansion / upgrade of PCD 2. Install ultrasonic overflow on PCD outlet

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		3.1.g. Waste oil capture and contained during routine maintenance				
		3.1.h. Reduction in mine vehicle movements due to ceased production				
		3.1.i. Quarterly service of oil seperator				
3. Vehicle and machinery surface wash down area (Northern end of workshop)	There is a risk to Awaba from ::: Hydrocarbon pollution of the land ::: Caused by: Significant spills Resulting in: Land contamination.	3.2.a. Bunded hard stand area t wash down bay	**D** (Pb)	5 (E)	24 (L)	
		3.2.b. Spill kits located throughout the mine site				
		3.2.c. Inspection program and maintenance of sumps and oil/water separator				
		3.2.d. Clean wash down bay weekly				
		3.2.e. Reduction in mine vehicle movements due to ceased production				
		3.2.f. Hydrocarbon inventory has been reduced significantly				
3. Vehicle and machinery surface wash down area (Northern end of workshop)	There is a risk to Awaba from ::: Hydrocarbon &/or chemical pollution of ground water ::: Caused by: Significant spills Resulting in: Ground water contamination.	3.3.a. Bunded bulk storage for oil and chemical drums in hard stand areas.	**D** (Pb)	5 (E)	24 (L)	
		3.3.b. Spill kits located throughout the mine site				
		3.3.c. Inspection program and maintenance of sumps and oil/water separator				
		3.3.d. Hydrocarbon emergency response procedures and training of appropriate personnel				
		3.3.e. Hydrocarbon inventory has been reduced significantly				
		3.3.f. Reduction in mine vehicle movements due to ceased production				
4. Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: leaking oil drums polluting Stony	4.1.a. Bunded bulk storage for oil and chemical drums in hard stand areas.	**D** (D)	5 (E)	24 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	creek ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Discharge of contaminates from site.	4.1.b. Spill kits located throughout the mine site 4.1.c. Spill training of "key" employees completed in 2010 4.1.d. Fit for Purpose delivery vehicles and associated apparatus 4.1.e. Inspection program of surface facilities 4.1.f. Hydrocarbon inventory has been reduced significantly 4.1.g. Reduction in mine vehicle movements due to ceased production				
4. Transport and storage of Hydrocarbons and chemicals on site.	There is a risk to Awaba from ::: Hydrocarbon pollution of the land from machinery and oil drums ::: Caused by: Significant oil spills Resulting in: Land contamination.	4.2.a. Bunded bulk storage for oil and chemical drums in hard stand areas. 4.2.b. Spill kits located throughout the mine site 4.2.c. Designated storage area for materials pods 4.2.d. Hydrocarbon inventory has been reduced significantly 4.2.e. Reduction in mine vehicle movements due to ceased production	**D** (D)	5 (E)	24 (L)	
18. Disposal of waste	There is a risk to Awaba from ::: Public disposing of waste at Awaba ::: Caused by: Unauthorised access to site by Public Resulting in: Hazarduous materials entering site or Non-compliance with EPL 443.	18.1.a. Site security arrangements 18.1.b. Site fencing 18.1.c. Signage erected 18.1.d. CCTV installed around site	**D** (D)	5 (E)	24 (L)	
18. Disposal of waste	There is a risk to Awaba from ::: Employees disposing of domestic waste at Awaba :::	18.2.a. Site fencing 18.2.b. Site security arrangements 18.2.c. Site signage 18.2.d. CCTV installed around site	**D** (D)	5 (E)	24 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Employees Resulting in: Hazarduous materials entering site or Non-compliance with EPL 443.					
18. Disposal of waste	There is a risk to Awaba from ::: Improper disposal of hydrocarbon waste ::: Caused by: Inappropriate storage and handling of hyrdocarbons Resulting in: Hazarduous materials entering site or Non-compliance with EPL 443.	18.3.a. Site fencing 18.3.b. Site security arrangements 18.3.c. Site signage 18.3.d. Waste oil containers 18.3.e. Waste collection of oils 18.3.f. Hydrocarbon inventory has been reduced significantly 18.3.g. CCTV installed around site	**E** (D)	5 (E)	25 (L)	
2. Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Noise impacts on sensitive receivers ::: Caused by: Truck and loader movements around stockpile/haul road Resulting in: Community complaint or exceedance of DECCW guideleines and INP.	2.3.a. Vehicles, trucks and machinery have silencers fitted. 2.3.b. Operating hours are limited 2.3.c. Nearest resident approximately 150 metres away and natural topography barriers. 2.3.d. Reduced truck and loader movements due to no production	**D** (D)	5 (L)	24 (L)	
2. Collecting, discharging of coal from surface Stockpiling area	There is a risk to Awaba from ::: Airborne dust during loading, driving and windy conditions impacting on local receivers. ::: Caused by: Truck and loader movements around stockpile/haul road Resulting in: Community complaint or exceedance of DECCW guideleines.	2.4.a. Location of stockpile area reduces dust emissions 2.4.b. Water cart available when required 2.4.c. Watering of haul road and colliery areas 2.4.d. Covering loads 2.4.e. Dust deposition gauges. 2.4.f. Sprinkler system at truck loading bin 2.4.g. Reduced truck and loader movements due to no production	**D** (D)	5 (L)	24 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
9. Visual Stray Light from mining operations	There is a risk to Awaba from ::: Impact on sensitive receivers ::: Caused by: Surface lighting Resulting in: Community complaint.	9.1.a. Topography of area 9.1.b. Reduced working hours due to ceased production	**D** (D)	5 (L)	24 (L)	
14. Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Airborne dust ::: Caused by: Rehabilitation activities Resulting in: Community complaint or exceedance of DECCW guideleines.	14.1.a. Water cart available when required 14.1.b. Work is programmed to minimise impact (small area rehabilitated) 14.1.c. Subsidence impacts in remote locations	**E** (D)	5 (L)	25 (L)	
20. Operational impact on community	There is a risk to Awaba from ::: Noise impacts on Awaba community ::: Caused by: Surface restructure Resulting in: Community complaint or exceedance of DECCW guideleines and INP.	20.1.a. Vehicles, trucks and machinery have silencers fitted. 20.1.b. Operating hours are limited 20.1.c. Nearest resident approximately 150 metres away and natural topography barriers. 20.1.d. Reduction in mine vehicle movements due to ceased production	**D** (D)	5 (L)	24 (L)	
20. Operational impact on community	There is a risk to Awaba from ::: Visual pollution ::: Caused by: General operations Resulting in: Community complaint.	20.2.a. Location of stockpile area reduces dust emissions 20.2.b. Water cart available when required 20.2.c. Watering of haul road and colliery areas 20.2.d. Reduction in mine vehicle movements due to ceased production	**D** (D)	5 (L)	24 (L)	
21. Surface Restructure	There is a risk to Awaba from ::: Visual pollution :::	21.2.a. Reduced working hours due to ceased production	**D** (D)	5 (L)	24 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Demolition, repairs and upgrades of mine structures Resulting in: Community complaint.					
21. Surface Restructure	There is a risk to Awaba from ::: Noise impacts on Awaba community ::: Caused by: Demolition of mine structures or Demolition, repairs and upgrades of mine structures Resulting in: Community complaint or exceedance of DECCW guideleines and INP.	21.3.a. Vehicles, trucks and machinery have silencers fitted. 21.3.b. Operating hours are limited 21.3.c. Nearest resident approximately 150 metres away and natural topography barriers. 21.3.d. Reduced working hours due to ceased production	**D** (D)	5 (L)	24 (L)	
8. Control of weeds and pests	There is a risk to Awaba from ::: Infestation and /or spread of declared weeds or pests onsite ::: Caused by: General operations Resulting in: Infestations or spider bites to personnel.	8.1.a. Routine inspection and control using herbicide 8.1.b. Minimised disturbance of area 8.1.c. Pest spraying / control by request	**D** (Pb)	5 (Pl)	24 (L)	
14. Rehabilitation of Subsidence cracks, "sink" holes and access tracks	There is a risk to Awaba from ::: Public vehicle collides earthmoving vehicle during operations ::: Caused by: Rehabilitation activities Resulting in: Damage to vehicles or injury.	14.4.a. Signage erected 14.4.b. Temporary fencing erected 14.4.c. Remote location	**D** (D)	5 (Pl)	24 (L)	
20. Operational impact on community	There is a risk to Awaba from ::: Traffic on public roads ::: Caused by:	20.3.a. Location of stockpile area reduces dust emissions 20.3.b. No transporting of coal on public road 20.3.c. Reduction in mine vehicle	**D** (D)	5 (Pl)	24 (L)	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	General operations Resulting in: Community complaint or Vehicle collisions.	movements due to ceased production				
21. Surface Restructure	There is a risk to Awaba from ::: Traffic on public roads ::: Caused by: Demolition, repairs and upgrades of mine structures Resulting in: Community complaint or Vehicle collisions.	21.1.a. No transporting of coal on public road 21.1.b. Reduced working hours due to ceased production	**D** (D)	5 (PI)	24 (L)	

Recommended Controls

Recommended Controls Do NOT enter additional Recommended Controls on this sheet.	Place(s) Used	Allocated To (Only one SITE person for each Recommended Control)	Required By Date	Pulse User No.	PULSE Ref. No.
1. Expansion / upgrade of PCD	Events: 3.1, 19.1	Nerida Manley	15-Dec-2013	100103	20339.45203
2. Install ultrasonic overflow on PCD outlet	Events: 3.1	Nerida Manley	15-Dec-2013	100103	20339.45204
3. Considerremoving underground diesel tanks after mine closure.	Events: 4.4	Nerida Manley	15-Dec-2012	100103	20339.45205
4. Phase 2 Contaminated Sites Assessment to be undertaken.	Events: 4.4	Nerida Manley	15-Dec-2012	100103	20339.45206
5. Consider an external contractor to undertake quarterly inspections of drainage lines above old workings.	Events: 13.1	Nerida Manley	15-Dec-2012	100103	20339.45207

CEY Risk Matrix Page 1

RISK MANAGEMENT STANDARD **Management Standard-004**

CENTENNIAL RISK MATRIX							Likelihood					
							A Certain	B Probable	C Possible	D Remote	E Improbable	Description (D)
Rating	Consequence Note: Consequence may result from a single event or may represent a cumulative impact over a period of 12 months. Use the worst case reasonable consequence if there is more than one.						Common"	Has Happened within Centennial"	"Could Happen & has happened in non-CEY operations	Not Likely	"Practically impossible	Probability (Pb)
	Impact to Annual Business Plan (F)	Personal Injury (PI)	Business Interruption (BI)	Legal (L)	Reputation (R)	Environment (E)	Frequent incidents	Regular incidents	Infrequent incidents	Unlikely to occur. Very few recorded or known incidents	May occur in exceptional circumstances. Almost no recorded incidents.	Incident Frequency (IF)
							Operations – within 3 months	Operations – within 2 years	Operations – within 5 years	Operations – within 10 years	Operations – within 30 years	Operations (Op)
							Project – Every project	Project – Every 2 projects	Project – Every 5 projects	Project – Every 10 projects	Project – Every 30 projects	Project (Pr)
1. Catastrophic	>$50m	Multiple Fatalities	> 1month	Prolonged litigation, heavy fines, potential jail term	Prolonged International media attention	Long term impairment habitats/ ecosystem	1 (E)	2 (E)	5 (H)	7 (H)	11 (S)	
2. Major	$10m - $50m	Single Fatality	1 week to 1 month	Major breach/ major litigation	International media attention	Long term effects of ecosystem	3 (E)	4 (E)	8 (H)	12 (S)	16 (M)	
3. Moderate	$1m - $10m	Serious/ Disabling Injury	1 day to 1 week	Serious breach of regulation. prosecution/ fine	National media attention	Serious medium term environmental effects	6 (H)	9 (H)	13 (S)	17 (M)	20 (L)	
4. Minor	$100k - $1m	Lost Time Injury	12 hrs to 1 day	Non-compliance, breaches in regulation	Adverse local public attention	Minor effects to physical environment	10 (S)	14 (S)	18 (M)	21 (L)	23 (L)	
5. Insignificant	<$100k	First Aid Treatment Only	< 12 hrs	Low level compliance issue	Local complaints	Limited physical damage	15 (S)	19 (M)	22 (L)	24 (L)	25 (L)	

CEY Risk Matrix Page 2

Risk Rating	Risk Category		Generic Management Actions
1 to 4	E	Extreme	Immediate intervention required from senior management to eliminate or reduce this risk
5 to 9	H	High	Imperative to eliminate or reduce risk to a lower level by the introduction of control measures. Management planning required at senior levels
10 to 15	S	Significant	Corrective action required, senior management attention needed to eliminate or reduce risk
16 to 19	M	Moderate	Corrective action to be determined, management responsibility must be specified
20 to 25	L	Low	Monitor and manage by corrective action where practicable

CEY Risk Matrix Page 3

BOW TIE ANALYSIS - Control Effectiveness Matrix

TYPE OF CONTROL	Examples	Description	Rank	Control Category	CONTROL – Impact / Status / Quality				
					A >= 80%	B 50 – 80%	C 50 / 50%	D 50 – 20%	E <= 20%
	Replace electric hand tools with compressed air alternatives in wet conditions	Eliminates a hazard by removal	1.	Elimination of hazard	100	45.0	40.0	14.0	10.0
	Replace large diameter, heavy cables with smaller ones that are easier to handle manually	Replace element with less risky alternative	2.	Substitution	85.0	40.0	35.0	13.0	8.5
	Automatic fire fighting sprinkler systems	An automatic device that operates without intervention by personnel	3.	Engineered without people	70.0	30.0	25.0	12.0	7.0
	Fire alarm that sounds & the operator then has to initiate an evacuation	A device that requires personnel to respond to a stimulus	4.	Engineered with people	50.0	20.0	14.0	10.0	5.0
	Inspection, maintenance and repair of machinery	A process carried out by personnel	5.	Procedural	20.0	15.0	10.0	6.5	2.0
	Employee made aware of dangers of large moving equipment where the operators have limited vision	Induction training programs	6.	Awareness	5.0	3.0	2.5	1.5	1.0

Appendix 3 – Ecological Monitoring of Riparian Vegetation Along Stony Creek at Awaba – February 2012.

Centennial Coal

Ecological Monitoring of Riparian Vegetation along Stony Creek at Awaba

Awaba Colliery

February 2012

HUNTER ECO

Centennial Coal
Environment Matters

Ecological Monitoring of Riparian Vegetation along Stony Creek at Awaba – February 2012

Introduction

Condition 12 of the approval for pillar extraction of coal from the vicinity of Stony Creek by Centennial Awaba Colliery required monitoring to be conducted at selected intervals along the creekline. Winning (2008) prepared a detailed baseline survey of the vegetation at selected sites. Follow-up surveys were undertaken (Winning 2009; Hunter Eco 2011) to determine whether there was any deterioration in the riparian vegetation that may be attributed to coal extraction operations.

Reduction in the size of coal pillars can result in surface subsidence as a consequence of the pillar sinking into the floor and/or the wider area between pillars subsiding further. Severe subsidence can lead to cracks extending to the surface. If such cracks were to form in the creek bed water could be diverted underground, depriving water dependent ecosystems.

Methods

A general inspection was conducted along the length of the creek, and detailed qualitative sampling conducted along five transects A to E. An additional transect F was added in 2011. The location of the transects were chosen in consultation with Centennial environmental, surveying and operational personnel to ensure that they were representative of the Stony Creek system. The length of each transect was determined by the width of the creek at each location (measured from east or south, as relevant). Stakes, at which data were collected, were placed at 5 metre intervals along each transect. Upstream and downstream photographs, and dominant floristics (the two nearest tree species and the two most abundant understorey species) were recorded. The transect locations are shown in **Figure 1**. The camera used was a Panasonic FZ28 at the widest lens setting.

Most of the original wooden stakes had rotted at ground level and were either fallen or had been swept away by stormwater. During the current monitoring, all old stakes were replaced with durable plastic coated steel stakes.

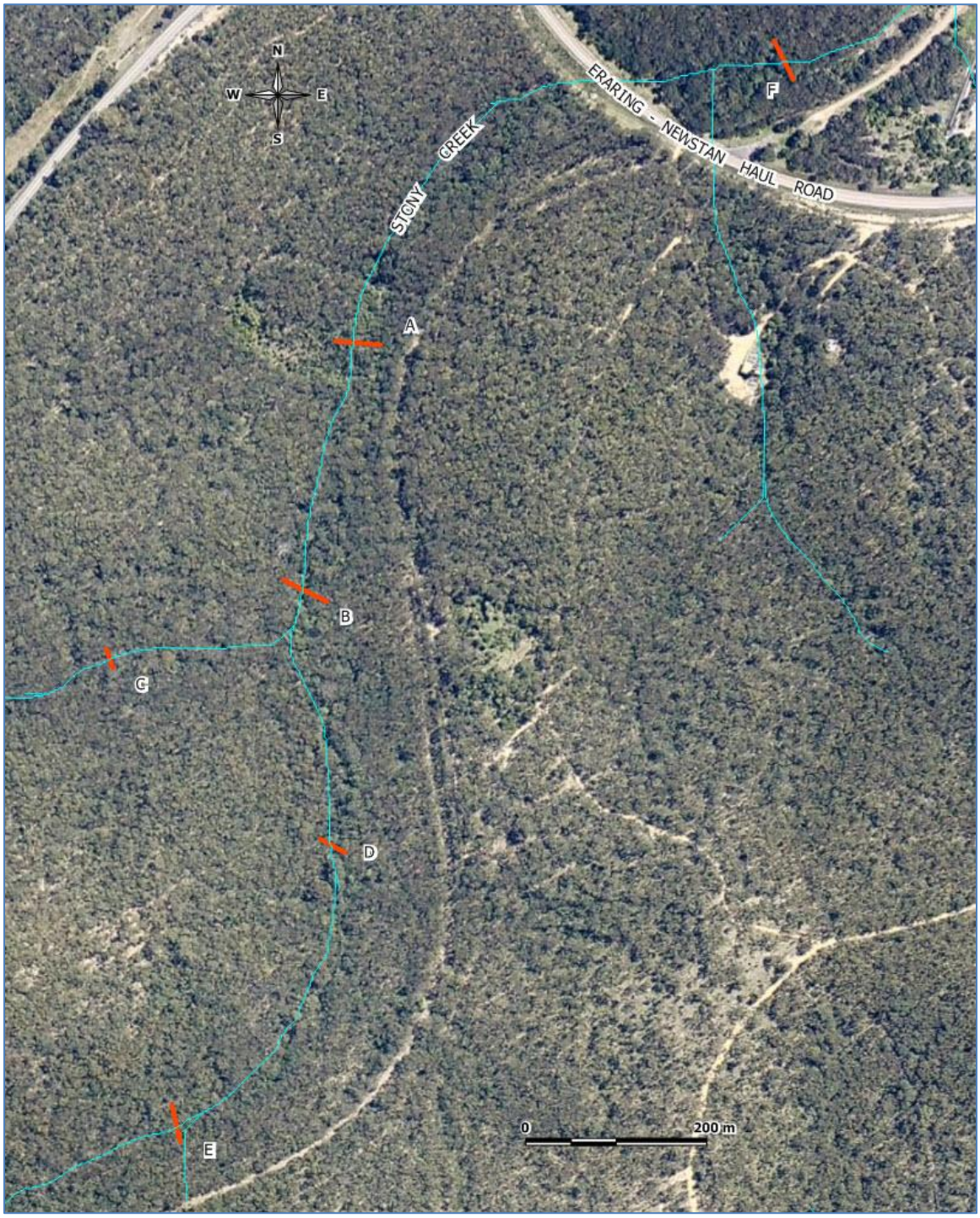


Figure 1 Showing the monitoring transects along Stony Creek

Results & Discussion

Transect photographs and descriptions are presented in **Appendix 1**. The vegetation in February 2012 was essentially the same as that recorded previously. **Appendix 2** provides example comparison photographs for the four monitoring periods, illustrating that there has been no deterioration of habitat over time. The creek was generally dry in March 2011 with water in a few deep waterholes. In February 2012, the creek was full of flowing water as a result of recent heavy rain.

Traversing between transects involved walking along over a kilometre of Stony Creek, including part of a tributary. The creek being full and flowing provided an ideal opportunity to detect any sections of the creek bed that might have water diverted underground. There were no breaks in water flow which, along with the healthy condition of vegetation, confirms that underground mining has had no effect on the creek or its habitat.

References

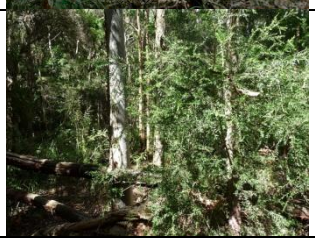
Winning, G 2008, *Baseline ecological description of riparian vegetation along Stony Creek at Awaba*. A report to Centennial Newstan by HWR Pty Ltd.

Winning G 2009, *Ecological monitoring of riparian vegetation along Stony Creek at Awaba - 2009 survey*. A report to Centennial Newstan by HWR Pty Ltd.

Hunter Eco (2011) Ecological Monitoring of Riparian Vegetation Along Stony Creek at Awaba – March 2011. A report to Centennial Awaba by Hunter Eco.

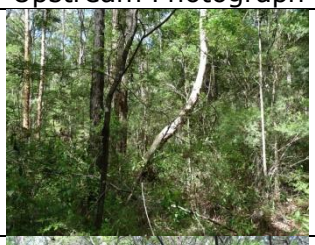
Appendix 1

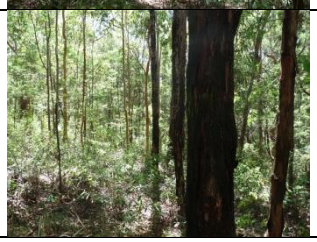
Transect A

Point	Floristics	Downstream Photograph	Upstream Photograph
0m	*Angophora costata* x2 *Leptospermum polygalifolium* *Doryanthes excelsa*		
5m	*Angophora costata* x2 *Dodonaea triquetra* *Doryanthes excelsa*		
10m	*Melaleuca styphelioides* x2 *Callicoma serratifolia* *Gahnia clarkei*		
15m	*Melaleuca styphelioides* x2 *Lomandra longifolia* *Gahnia clarkei*		
20m	*Angophora costata* *Melaleuca styphelioides* *Lomandra longifolia* *Entolasia stricta*		
25m	*Corymbia gummifera* *Eucalyptus umbra* *Dodonaea triquetra* *Acmena smithii*		

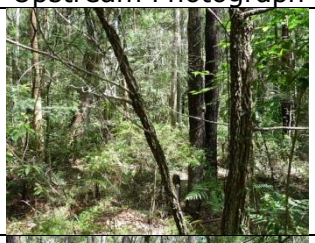
Point	Floristics	Downstream Photograph	Upstream Photograph
30m	*Melaleuca styphelioides* *Eucalyptus resinifera* *Gahnia clarkei* *Leptospermum polygalifolia*		
35m	*Melaleuca styphelioides* x2 *Gahnia clarkei*		
40m	*Eucalyptus resinifera* *Angophora costata* *Gahnia clarkei* *Doryanthes excelsa*		
45m	*Eucalyptus resinifera* x2 *Doryanthes excelsa* *Dodonaea triquetra*		
50m	*Syncarpia glomulifera* *Eucalyptus resinifera* *Doryanthes excelsa* *Dodonaea triquetra*		

Transect B

Point	Floristics	Downstream Photograph	Upstream Photograph
0m	*Corymbia maculata* *Eucalyptus umbra* *Dodonaea triquetra* *Leptospermum polygalifolia*		
5m	*Corymbia gummifera* *Eucalyptus piperita* *Dodonaea triquetra* *Doryanthes excelsa*		
10m	*Corymbia gummifera* *Eucalyptus piperita* *Dodonaea triquetra* *Entolasia stricta*		
15m	*Corymbia gummifera* x2 *Dodonaea triquetra* *Entolasia stricta*		
20m	*Eucalyptus resinifera* *Melaleuca styphelioides* *Gahnia clarkei* *Acmena smithii*		
25m	*Melaleuca styphelioides* *Acmena smithii* *Gahnia clarkei* *Lomandra longifolia*		

Point	Floristics	Downstream Photograph	Upstream Photograph
30m	*Melaleuca styphelioides* x2 *Gahnia clarkei* *Lomandra longifolia*		
35m	*Eucalyptus resinifera* *Angophora costata* *Gahnia clarkei* *Smilax australis*		
40m	*Angophora costata* *Eucalyptus umbra* *Xanthorrhoea macronema* *Platylobium formosum*		
45m	*Corymbia gummifera* *Angophora costata* *Dodonaea triquetra* *Entolasia stricta*		
50m	*Eucalyptus piperita* *Eucalyptus umbra* *Dodonaea triquetra* *Entolasia stricta*		

Transect C

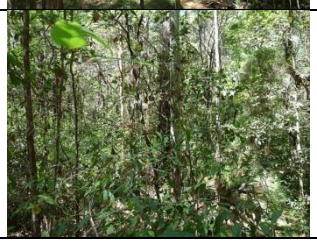
Point	Floristics	Downstream Photograph	Upstream Photograph
0m	*Eucalyptus umbra* x2 *Dodonaea triquetra* *Entolasia stricta*		
5m	*Eucalyptus umbra* x2 *Dodonaea triquetra* *Adiantum aethiopicum*		
10m	*Corymbia maculata* *Glochidion ferdinandi* *Imperata cylindrica* *Microlaena stipoides*		
15m	*Eucalyptus resinifera* *Angophora costata* *Entolasia stricta* ***Dianella caerulea***		
20m	*Corymbia gummifera* x2 *Entolasia stricta* *Leptospermum polygalifolium*		

Transect D

Point	Floristics	Downstream Photograph	Upstream Photograph
0m	*Eucalyptus piperita* *Corymbia maculata* *Dodonaea triquetra* *Doryanthes excelsa*		
5m	*Corymbia maculata* x2 *Dodonaea triquetra* *Pteridium esculentum*		
10m	*Angophora costata* *Eucalyptus umbra* *Dodonaea triquetra* *Smilax australis*		
15m	*Melaleuca styphelioides* x2 *Carex appressa* *Dianella caerulea*		
20m	*Melaleuca styphelioides* *Eucalyptus piperita* *Gahnia clarkei* *Blechnum indicum*		
25m	*Melaleuca styphelioides* x2 *Gahnia clarkei* *Adiantum aethiopicum*		

Point	Floristics	Downstream Photograph	Upstream Photograph
30m	*Eucalyptus umbra* *Corymbia maculata* *Dodonaea triquetra* *Entolasia stricta*		

Transect E

Point	Floristics	Downstream Photograph	Upstream Photograph
0m	*Corymbia maculata* x2 *Entolasia stricta* *Dodonaea triquetra*		
5m	*Angophora costata* *Syncarpia glomulifera* *Callicoma serratifolia* *Entolasia stricta*		
10m	*Melaleuca styphelioides* *Syncarpia glomulifera* *Calochlaena dubia* *Doryanthes excelsa*		
15m	*Corymbia maculata* *Syncarpia glomulifera* *Entolasia stricta* *Adiantum aethiopicum*		
20m	*Corymbia maculata* *Corymbia gummifera* *Dodonaea triquetra* *Callicoma serratifolia*		

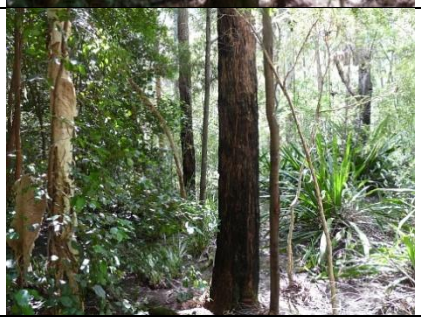
Transect F

Point	Floristics	Downstream Photograph	Upstream Photograph
0m	*Eucalyptus piperita* *Angophora costata* *Leptospermum polygalifolium* *Acacia parramattensis*		
5m	*Eucalyptus umbra* *Angophora costata* *Leptospermum polygalifolium* *Banksia spinosa*		
10m	*Melaleuca linariifolia x2* *Melaleuca linariifolia* *Gahnia clarkei*		
15m	*Melaleuca linariifolia x2* *Callicoma serratifolia* *Acmena smithii*		
20m	*Eucalyptus umbra* *Melaleuca linariifolia* *Gahnia clarkei x2*		
25m	*Eucalyptus umbra x2* *Dodonaea triquetra x2*		

Point	Floristics	Downstream Photograph	Upstream Photograph
30m	*Eucalyptus piperita* *Corymbia maculata* *Dodonaea triquetra x2*		

Appendix 2
Sample photographs from the four monitoring periods. Note that a different camera was used for 2008, 2009 and 2011, 2012.

Transect, location & Year	Downstream Photograph	Upstream Photograph
Transect A Point 0m 2008		
Transect A Point 0m 2009		
Transect A Point 0m 2011		
Transect A Point 0m 2012		

Transect, location & Year	Downstream Photograph	Upstream Photograph
Transect B Point 20m 2008		
Transect B Point 20m 2009		
Transect B Point 20m 2011		
Transect B Point 20m 2012		

Transect, location & Year	Downstream Photograph	Upstream Photograph
Transect D Point 20m 2008		
Transect D Point 20m 2009		
Transect D Point 20m 2011		
Transect D Point 20m 2012		

Centennial Coal

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Appendix 4 – End of Year Subsidence Report.

Awaba Colliery
End of Year
Subsidence Management Report

Report Number: 5
Date: 01-02-2013

Distribution List:

- DTIRIS - Director Environmental Sustainability
- DTIRIS - Subsidence Executive Officer
- DTIRIS - District Inspector
- DTIRIS - Principal Subsidence Engineer
- DTIRIS - Subsidence Engineer
- NOW – NSW Office of Water
- OEH - Office of Environment & Heritage
- DOPI – Department of Planning & Infrastructure
- TransGrid,
- Ausgrid
- RailCorp,
- MSB,
- Eraring Energy,
- Telstra
- Awaba Mine Manager,
- Awaba Environmental Coordinator.

General Comments:

- Approval to mine Stage 1 of MSMP at Awaba Colliery was granted on 03/09/2007
- Stage 1 Mining completed on 26/06/2009.
- Stage 1 Monitoring variation from 3 to 6 monthly approved 28/06/2011.
- Approval to mine Stage 2 of MSMP at Awaba Colliery was granted on 29/08/2008
- Stage 2 Mining completed on 08/03/2012.
- Approval to mine MSMP 3 NORTH Area - Awaba Colliery was granted on 13/05/2009
- 3 North Mining completed on 25/01/2010.
- Approval to mine Stage 3 of MSMP at Awaba Colliery was granted on 15/12/2010
- Stage 3 Mining Completed on 22/12/2011.
- Approval to mine MSMP East B Area at Awaba Colliery was granted on 27/07/2011
- East B Mining Completed on 21/12/2011.
- **Awaba Colliery Great Northern Seam Mining Ceased 08/03/2012.**

SMP Approval Condition No.	Requirement Summary	Comment / Description
22 (a)	**Summary of Subsidence and Environmental Monitoring Results**	The Following subsidence surveys and inspections have been completed: ***Surface Surveys –*** All scheduled subsidence surveys completed at end of January2013. As of 31/01/2013, the maximum subsidence is -151mm at XL56 in the centre of Main South X–Line in Stage 1. There is no subsidence impact on monitoring points nearer to the Main Northern Railway, Ulan Rail Loop,Haul Road, Haul Road Bridge, Telstra Tower or Railcorp and Ausgrid Power Poles. Visual Inspections have found one case of surface impacts. This impact was a sinkhole in the Stage 3 area - found following heavy rain over the June 2011 long weekend. The hole was approximately 33x38 metres in surface area with cover ranging between 26-30 metres. The relevant government authorities and stake holders were informed of this within 24 hours of the discovery of the hole. An Environmental rehabilitation of the site has since been completed. The location of the sinkhole was plotted and is shown on the Stage 3 Face Position plan AW2176. ***Underground Surveys –*** Statutory inspections undertaken by mining officials have found no evidence of underground pillar failure.
22 (b)	**Analysis of**	

SMP Approval Condition No.	Requirement Summary	Comment / Description
	Subsidence and Environmental Monitoring Results	Subsidence has been within predicted levels and has had no detectable adverse impact on surface infrastructure. Environmental impacts have been confined to the one sinkhole as described above.
22 (c)	**Trends in Monitoring Results**	The trend in monitoring results shows that the majority of subsidence occurs during and shortly after mining extraction. In the following months the rate of subsidence decreases toward a stable environment.
22 (d)	**Management Actions of Potential Impacts**	All current Public Safety and Subsidence Management Plans are considered adequate. The current monitoring schedule is being reviewed to reduce the frequency of resurveys in consultation with DPI Principal Subsidence Engineer**.**

Grant Watson

Awaba Colliery - Mine Manager

For any comments or questions please contact
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grant.watson@centennialcoal.com.au