Centennial Coal

Annual Environmental Management Report

Centennial Coal

Myuna Colliery

January 2013 to December 2013

Centennial Coal
Environment Matters

Table of Contents

1. Introduction ***5***

1.1. Consents, Leases and Licences **5**

1.2. Mine Contacts **7**

1.3. Actions Required at Previous AEMR Review **7**

2. Operations during the reporting period ***8***

2.1. Exploration **8**

2.2. Land Preparation **8**

2.3. Construction **8**

2.4. Mining **8**

2.5. Mineral Processing **9**

2.6. Waste Management **9**

2.6.1. Mining **9**

2.6.2. General Waste **9**

2.6.3. Recyclable Waste Collection Systems **10**

2.6.4. Liquid and Hazardous Wastes: **10**

2.6.5. Ore and Product Stockpiles **11**

2.7. Water Management **11**

2.7.1. Underground **11**

2.7.2. Surface **12**

2.8. Hazardous Material Management **14**

2.9. Surface Infrastructure **14**

3. Environmental Management and Performance ***17***

3.1. Environmental Risk Assessment **17**

3.2. Environmental Performance **18**

3.2.1. Air Pollution **18**

3.2.2. Erosion and Sedimentation **20**

3.2.3. Surface Water Management **21**

3.2.4. Groundwater **27**

3.2.5. Contaminated Polluted land **27**

3.2.6. Flora & Fauna **27**

3.2.7. Weeds **28**

3.2.8. Blasting **28**

3.2.9. Operational Noise **28**

3.2.10. Visual, Stray Light **29**

3.2.11. Aboriginal Heritage 29
3.2.12. Natural Heritage 30
3.2.13. Spontaneous Combustion 30
3.2.14. Bush fire 30
3.2.15. Mine Subsidence 30
3.2.16. Hydrocarbon Contamination 31
3.2.17. Greenhouse Gas 31
3.2.18. Public Safety 31
3.2.19. Other Issues and Risks 31
4. Community Relations ***32***
4.1. Community Complaints & Enquiries 32
4.2. Community Liaison and Sponsorships 32
5. Rehabilitation ***33***
5.1. Buildings 33
5.2. Rehabilitation of Disturbed Lands 33
5.3. Other infrastructure 33
5.4. Rehabilitation Trials and Research 33
5.5. Further development of the Final Rehabilitation Plan 33
6. Activities Proposed in the Next Reporting Period ***34***
7. LIST OF PLANS ***36***
8. APPENDICES ***36***

Tables

Table 1: Summary of Myuna Colliery Approvals, Authorities & Licences 6
Table 2: Myuna Colliery Contacts 7
Table 3: Actions Required at Previous AEMR Review 8
Table 4: Monthly General waste to land fill disposal..... 9
Table 5: Liquid and Hazardous Recyclable Waste Volume / Quantity 11
Table 6: 2013 Total Monthly Rainfall (mm).....13
Table 7: Production and Waste Summary 15
Table 8: Stored Water 15
Table 9: Highest Environmental Risks at Myuna Colliery 17
Table 10: Dust Gauge Locations.....19
Table 11: Dust Gauge Rolling Averages 19
Table 12: Discharge and Monitoring Point B.....21

Table 13: Discharge and Monitoring Point A.....22
Table 14: Manganese results from Wangi bay.....22
Table 15: Greenhouse Gas Emissions.....31
Table 16: Rehabilitation Summary.....35

Figures

Figure 1: 2013 Dust Deposition Gauge Results.....20
Figure 2: Daily Mine Water Discharge from LDP00B.....23
Figure 3: LDPB TSS Trends 2013.....24
Figure 4: LDP001 TSS Trends 2013.....24
Figure 5: LDPB pH Trends 2013.....25
Figure 6: LDP1 pH Trends 2013.....25
Figure 7: LDP00B O&G Trends 2013.....26
Figure 8: LDP001 O&GTrends 2013.....26

1. Introduction

Myuna Colliery is an existing underground coal mine owned and operated by Centennial Myuna Pty Ltd, a wholly owned subsidiary of Centennial Coal Company Limited (Centennial). Myuna Colliery's Surface Facilities Area is on the western side of Lake Macquarie, at Wangi Wangi, approximately 25 kilometres south-west of Newcastle, New South Wales.

Development of Myuna Colliery commenced in 1979 and since this time extraction of coal and associated mining activities has occurred in three coal seams (Wallarah, Great Northern and Fassifern) using bord and pillar methods.

Myuna Colliery operates under an existing Development Consent (SH 110/148) within the Development Consent Mining Area, in accordance with the conditions of relevant mining leases.

In 2010 Myuna Colliery submitted a Project Approval under Part 3A of the EP&A Act to continue mining in those areas outside the existing Development Consent Mining Area and within the existing mining leases. In January 2012, Myuna Colliery received Project Approval (10_0080) for the continuation of mining until 31 December 2032. This approval extends mining and coal handling at Myuna Colliery within the Colliery lease Area and proposes to:

- Mine using bord and pillar mining methods in the Wallarah, Great Northern, and Fassifern seams in CCL762 and ML1370, for a further 21 years;
- Produce, handle and distribute to Eraring Power Station, up to 2 million tonnes per annum (Mtpa) using existing infrastructure;
- Continue the use of ancillary infrastructure and service for a further 21 years;
- Upgrade the water management system; and
- Rehabilitate the surface facilities within 5 years of completion of mining.

This Annual Environment Management Report (AEMR) 2013 details the environment and community performance of Myuna Collieries operations for the twelve month period ending 31 December 2013.

The AEMR is a regulatory requirement and has been prepared in accordance with DII guidelines.

1.1. Consents, Leases and Licences

The Colliery lease lies within the Parishes of Awaba, Cooranbong, Morisset and Wallarah in the County of Northumberland subsidence district and is located within the Shire of Lake Macquarie.

The Myuna Colliery Holding is covered by Consolidated Coal Lease No 762. The Consolidated Coal Lease No 762 includes a surface land area of 33 hectares for mine infrastructure (Mining Purposes Lease No. 334). The total lease area is 10,820 hectares. A summary of Myuna's Approvals, Authorities and licences is presented in Table 1 below.

Table 1: Summary of Myuna Colliery Approvals, Authorities & Licences

Name	Summary	Date Granted	Expiry Date
Development Consent	Development of Myuna and Cooranbong Collieries, as described in the EIS and subject to certain conditions	21/12/1977	No expiration date specified in the consent. Subject to renewal of mining leases
Environmental Protection Licence (EPL) 366	Licence authorising discharges to water and Mining for coal at a rate of 0.5 – 2 Mtpa	01/01/2000	N/A
CCL 762	A title including the area originally in CL195 for coal mining purposes of approximately 10,820 Hectares	CL 195 granted 8/8/1979, consolidated into CCL 762 in 1991	Renewal 13/12/2022
MPL 334	Title to construct and operate prescribed mine related plant and infrastructure of approximately 33 Hectares	20/10/1994	Renewal 20/10/2015
ML 1370	Title that provides rights to mine the coal resource of approximately 653 hectares	26/09/1995	Renewal 02/12/2016
Exploration Licence (EL) 4444	Licence granted to allow exploration to be undertaken to determine the occurrence and extent of the coal resource and to assess the potential for mining of approximately 5,164 hectares	23/10/1992	Renewal 23/10/2012
Exploration Licence (EL) 6640	Licence granted to allow exploration to be undertaken to determine the occurrence and extent of the coal resource and to assess the potential for mining of approximately 1,599 hectares	14/10/2013	Renewal 23/10/2017
Trade Waste Permit (D 171027)	Permits the discharge of 'prohibited substances' to sewer in accordance with various quality requirements	23/10/1995	N/A
Section 151 Licence (Mining	Installation and Monitoring of Surface Subsidence	10/09/2009	10/09/2015

Name	Summary	Date Granted	Expiry Date
Operations – Various Licence)	Stations at Point Wolsoncroft		
Section 151 Licence (Mining Operations – Various Licence)	Installation and Monitoring of Surface Subsidence Stations at Pulbah Island	1/11/2011	31/10/2016
Section 151 Licence (Mining Operations – Various Licence)	Installation and Monitoring of Surface Subsidence Stations at Wangi Wangi Point	16/02/2011	16/02/2015
Water Access Licence	Licensing of three existing dewatering bores at the Surface Facilities Area	Licence currently being sought	N/A
Development Consent (10_0080)	Extension of Mining – Environmental Assessment is currently being assessed by the Department of Planning	18/01/2012	31/12/2032

1.2. Mine Contacts

The following are the mine contacts for any information with regards to this report.

Table 2: Myuna Colliery Contacts

Name	Position	Email Address	Contact Telephone Number
Roger Davis	Colliery Manager	myunacolliery@centennialcoal.com.au	02 4970 0221
Nerida Manley	Environment and Community Coordinator		02 4970 0263

1.3. Actions Required at Previous AEMR Review

The NSW Trade & Investment – Division of Resources and Energy (DRE) conducted an annual environmental review at Myuna Colliery on 7 August 2013. The purpose of the inspection was to review compliance with environmental requirements of relevant approval instruments including the Mining Lease, Mining Operation Plan (MOP) and Annual Environmental Management Report (AEMR).

During the inspection, DRE found Myuna to be in general compliance with the relevant statutory approval instruments administered by DRE. The following actions were required as a result of the inspection:

Table 3: Actions Required at Previous AEMR Review

Issue / Observation	Action	Section where addressed in this report
Water management	Settlement ponds and discharge to Wangi Creek Control quality of water discharged	2.7.2

2. Operations during the reporting period

2.1. Exploration

The majority of the Colliery reserves lie below a major water body – Lake Macquarie.

Exploration including Lake drilling is used to determine the solid rock head cover (solid rock mass between the lake bed and the working seams) and seam levels and geological anomalies. The exploration activities have included lake bore drilling programmes, in-seam drilling in advance of the mine workings and floor coring to meet requirements of DPI conditions for mining under foreshores.

There were no surface explorations drilling or interseam drilling activities in the 2013 reporting period.

2.2. Land Preparation

Approximately 20.2 Ha of the surface lease holding is used for services and infrastructure. No additional land preparation occurred during the reporting period.

2.3. Construction

No construction within the surface lease holding of the mine occurred during the reporting period.

2.4. Mining

Mining continued in the Wallarah, Great Northern and Fassifern seam in 2013. Mining in the three seams allow blending of the run of mine coal. Myuna Colliery produced 1,635,662 Tonnes of coal during the 2013 calendar year.

Results of subsidence monitoring programs in areas of Point Wolstoncroft and Pulbah Island continue to show negligible subsidence of <20mm with this trend expected to continue.

Mining activities conducted in the Wallarah, Great Northern & Fassifern Seams during the reporting period are illustrated on plans No **MY11181, MY11182**, and **MY11183**, respectively.

The coal handling plant facilities allow for sizing and crushing of the product prior to delivery via overland conveyor to the Eraring Power Station.

2.5. Mineral Processing

The coal plant crushing arrangement consists of a primary and two secondary crushers, the final product is sized to less than 35mm for delivery to Eraring Energy. Management of coal fines and coal plant dust suppression systems are discussed in section 2.7 – Water Management.

2.6. Waste Management

2.6.1. Mining

There is no coal processing waste stored on site. Inert stone ballast material is stored in an onsite bin then sent to landfill or removed periodically to be stored on the temporary coal stockpile area before being sent to landfill.

2.6.2. General Waste

In 2011 Myuna Colliery moved over to total waste management with JR Richards. This is to allow for more efficient management and reporting of waste, and also greater recycling through the sorting of waste brought to the surface from underground.

General waste is placed into one 15 m^3 and 3m^3 general waste bins. **Table 3** illustrates monthly volume of general waste removed from the site during the reporting period.

Table 4: Monthly General waste to land fill disposal

Month	Bulk Rubbish Tonnes
Jan-13	9.90
Feb-13	9.95
Mar-13	17.45
Apr-13	12.68
May-13	12.76
Jun-13	6.92
Jul-13	17.09
Aug-13	19.15

Month	Bulk Rubbish Tonnes
Sep-13	21.19
Oct-13	10.11
Nov-13	13.28
Dec-13	15.74

2.6.3. Recyclable Waste Collection Systems

Surface cardboard is crushed into 50kg bails via a purpose built machine, which is then collected by JR Richards for recycling. The hire of a cardboard crusher reduces boxes in general waste bins. Training has meant that more office material is being placed in recyclable materials bins.

Ferrous & Non Ferrous Metal are collected using four scrap metal bins which are serviced as required. The removal of bulk scrap steel has greatly increased the amount of scrap steel being resold instead of put to general landfill. There was 167.07 Tonnes of scrap steel which was collected from the site and sold to Simsmetal for recycling during 2013.

All timber waste is stored until a sufficient quantity is collected to have an on-site tub grinder break it down to reusable wood chip. This chip is used for community requests & on-site rehabilitation works. Reusable pallets are neatly stored for reuse.

2.6.4. Liquid and Hazardous Wastes:

All waste oil on the mine surface is collected for reuse. **Table 4** shows the waste oil taken off site for recycling during the reporting period under waste tracking guidelines.

Used batteries are stored on a spill collection tray in a safe, dry, designated area prior to removal off site by an EPA approved recycling company. No batteries were recycled within 2013 due to an insufficient quantity being accumulated. The collection will continue until there is a sufficient amount to request a collection.

Table 5: Liquid and Hazardous Recyclable Waste Volume / Quantity

Month / Year	Waste Oil / Litres / month / recycled	Used Batteries
Jan-13	1.66	
Feb-13	0.3	
Mar-13	0	
Apr-13	3.68	
May-13	0	
Jun-13	0.9	
Jul-13	2.4	
Aug-13	1.7	
Sep-13	4.8	
Oct-13	0	
Nov-13	0.8	
Dec-13	0	
Total	**16.24**	

2.6.5. Ore and Product Stockpiles

A small amount of stone ballast is collected in a bin on the surface coal handling facility and stored temporarily onsite before being sent to landfill.

2.7. Water Management

2.7.1. Underground

A major part of the Fassifern Seam remains dammed to ensure filtration through retention prior to pumping to the surface. Water in the Great Northern Seam is treated through a series of settlement ponds prior to delivery to the major dam underground.

A major restructure of the Great Northern seam pumping arrangements was conducted in 2007 and completed early in 2008. A large area has been dammed (allowing increased retention and settling times) and a major pumping installation was completed during 2009.

Mine water from all 3 seams is pumped to the surface Mine Water Settling Pond 2, which then flows to Mine Water Settling Pond 3 through a connecting weir, prior to discharge through LDP001 to Wangi Creek.

The underground water from the three seams is pumped to the main surface settling ponds at a maximum daily rate of 13 ML as per EPL 366 condition M2.1. The average daily discharge from LDPB in 2013 was 6.2 ML.

2.7.2. Surface

Myuna Colliery's Surface Facilities Area is located in proximity to Wangi Creek which is a heavily modified waterway as a result of the Wangi Power Station outflow canal. Myuna Colliery's existing water management system discharges water to Wangi Creek through two discharge points licensed under Myuna Colliery's EPL 366.

Surface water consists of runoff (both clean and dirty) that contributes to surface water storages. At Myuna Colliery these include the CHP Dam, mine water settlement ponds and the Emergency Coal Stockpile Sediment Dam.

The surface water system is divided into clean and dirty water catchments, as follows:

Clean water management - includes diversion of external catchment runoff through a series of clean water diversions which direct the flow of surface water from clean catchments away from dirty catchment areas, and the management of clean surfaces within the surface facilities area. Clean surfaces managed within the Surface Facilities Area include:

- Roof runoff from the administration, bathhouse and workshop buildings, which is collected through downpipes and directed to the piped stormwater network, into the first flush settlement tank, eventually discharging into an open channel which drains to Wangi Creek.
- Runoff from several clean hardstand areas including the car park and materials yard. To maintain these hardstand areas as clean catchments, regular sweeping is undertaken and these areas are also regularly inspected to ensure that they remain clean. This runoff is discharged through the first flush settlement tank eventually discharging into an open channel which drains to Wangi Creek.
- External catchment runoff from areas surrounding the Surface Facilities Area. There are clean water diversions currently in place. External catchment runoff flows into Wangi Creek.

Dirty water management - includes the capture of water from disturbed surfaces and a series of dirty water diversions which direct flow of dirty water to the dirty water management system. Dirty water sources include:

- Runoff from the CHP and storage yard which is directed through a series of open drains, diversions, collection sumps and pipes to the primary settlement tank, which then discharges into the CHP Dam.
- Runoff captured from the Emergency Coal Stockpile Area within the Emergency Coal Stockpile Sediment Dam. Water levels in the Emergency Coal Stockpile Sediment Dam are monitored, and water is transferred to Mine Water Settling Pond 2 as

required through bi-directional pipeline and pumping mechanism. Water from Mine Water Settling Pond 2 flows to Mine Water Settling Pond 3 through a connecting weir, prior to discharge through LDP001 to Wangi Creek. In the event that the capacity of the Emergency Coal Stockpile Sediment Dam is exceeded, ponding extends into the broader Emergency Coal Stockpile Area.

- Runoff from the washdown bay is directed to the oil/water separator and tank. Water from the oil/water separator is pumped to the sewer in accordance with a Trade Waste Permit from Hunter Water Corporation. Monitoring of the system is conducted on CITECT.

In April 2011 Myuna Colliery installed a weather station in accordance with the requirements of Environmental Protection Licence (EPL) 366 condition M7. **Table 5** shows the total monthly rainfall. This data is used for interpreting water quality and dust results and for implementing improvements in Myuna's water management system.

Table 6: 2013 Total Monthly Rainfall (mm)

Period	Total Rainfall (mm)
January	235.6
February	277.8
March	175.6
April	171.0
May	97.6
June	133.4
July	13.2
August	13.2
September	28.2
October	44.0
November	389.8
December	24.4
Total	**1603.8**

2.8. Hazardous Material Management

One round of shot firing was undertaken in July 2013 within the Wallarah and Great Northern interburden. Explosives are bought on site specifically for the individual task. Explosives are not stored on site.

No other blasting was undertaken within the reporting period.

Centennial Coal employees have access to the online up to date register Chemwatch. Myuna Colliery's Hazardous Substance Management Plan specifies obligations, responsibilities and safe hazardous substances storage, purchase, use and general management of hazardous substances.

2.9. Surface Infrastructure

Surface infrastructure at the Colliery comprises:

- Mine Infrastructure:
    - Men and materials portal;
    - Conveyor drift portal;
    - Drive houses;
    - Up-cast ventilation shaft and fan-house;
    - Downcast ventilation shaft;
    - Road ballast and concrete bore holes with associated infrastructure;
    - Power Factor Correction Banks;
    - Diesel and Oil Tanks;
    - Water storage tanks; and
    - Emergency Coal Stockpile Area.
- Coal Handling Plant:
    - Breaker and crusher groups, feeders and coal storage bins (ROM bin and Final Product Bin); and
    - Surface conveyor systems.
- Workshop and administration infrastructure:
    - Workshop, store and wash down facilities;
    - Material yard and equipment/oil and gas stores;
    - Materials reclaim area;
    - Administration offices and bath house;
    - Air compressors and associate infrastructure;
    - Service bay;
    - Hardstand areas, haul roads, car-parking areas and emergency heli-pad;
    - Explosives magazine; and
    - Fire station and associated fire fighting equipment.
- Pollution control infrastructure:

- Wash down bay oil/water separator;
- Primary settlement tank (sump);
- Emergency Coal Stockpile Sediment Dam and pump-house;
- Dust suppression system at the CHP and coal stockpile area;
- Sewerage treatment plant and associated infrastructure; and
- Hydrocarbon recycling depot.
- Water management Infrastructure.

Table 7: Production and Waste Summary

	Cumulative Production (tonnes)		
	Start of Reporting Period	**At end of Reporting Period**	**End of Next Reporting Period**
Topsoil stripped	Nil	Nil	Nil
Topsoil Used / Spread	Nil	Nil	Nil
Waste Rock	7800	8200	8600
Processing Waste	Nil	Nil	Nil
Product (tonnes)	40,584,287	42,416,727	44,254,192

Table 8: Stored Water

	Volumes Held (cubic meters)		
	Start of Reporting Period	***At end of Reporting Period***	**Storage Capacity**
Clean Water	*4x 100,000L*	*4 x 100,000L*	4 x 100,000L
Dirty Water	*Nil*	*Nil*	Nil
Controlled Discharge Water	Nil	Nil	Nil
Contaminated Water	Nil	Nil	Nil

Note Clean Water: Backup water supply from Toronto Reservoir is connected to the incoming mains along with water supply from Wangi Reservoir in case of emergencies, allowing a secondary source of permanent mains pressure supply to the mine, however, this water supply was not required during the reporting period. The stored clean water in tanks is backup for emergencies should both water supplies be unavailable.

Note Dirty Water: Dirty water is collected, treated and processed in our Oil/Water sump and oil separator prior to discharge under Centennial Myuna's Trade Waste Permit with Hunter Water to sewer. Separated waste oil is transported and disposed of by licensed contractor with waste details saved for waste tracking.

Note Contaminated Water: Contaminated water is not stored on site.

3. Environmental Management and Performance

3.1. Environmental Risk Assessment

A risk assessment was completed using the Centennial Coal framework Stature (Previously known as Dyadem). This assessment was conducted for all relevant environmental management issues at the site. A copy of the risk assessment is attached as **Appendix 1**. The purpose of the risk assessment is to identify mine activities, processes and facilities which require control strategies to ensure environmental protection and compliance with conditions of the leases, licence(s) and the development consents.

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.

The Environmental Risk Assessment is reviewed annually to identify any new risks, controls implemented or changes in legislative requirements. This document lists current or existing controls and new controls that may be investigated during the next report period.

The higher risks identified in the Annual Environmental Risk Assessment can be found in Table 9 below.

Table 9: Highest Environmental Risks at Myuna Colliery

Background	Potential Incident	RR
Surface water management	There is a risk to Myuna from ::: Contamination of storm water system ::: Caused by: Boot wash or Failure of the oil separator system or Hydrocarbon spills / leaks or Leaking machinery in clean areas or Underground machinery & equipment brought to the surface or Vehicle movements on site or Vehicles coming to & from the site Resulting in: Community Complaints or Contamination of waterways or Exceedence of EPL Conditions or Non-compliance with Development Consent conditions.	18 (M)
Operation of oil / water separators	There is a risk to Myuna from ::: Discharge of contaminated water into Storm water ::: Caused by: Failure of pollution control system or Heavy rainfall Resulting in: Contamination of waterways or Exceedence of EPL Conditions or Non-compliance with Development Consent conditions.	18 (M)

Transport of Machinery and Equipment to and from the site	There is a risk to Myuna from ::: Coal or waste materials or Loose objects falling from transport machinery / equipment while on public roads ::: Caused by: Improper preparation of machinery or equipment for transport Resulting in: Community Complaints or Injury to person(s) or Public Liability.	18 (M)

3.2. Environmental Performance

This section presents a summary of relevant monitoring data for Myuna Colliery.

3.2.1. Air Pollution

(i) Dust

The Dust Management Plan for the site outlines potential sources and impacts of raised dust levels. The Plan also identifies measures which must be in place to reduce dust and environmental activities conducted to minimise elevated dust levels. All contractors and employees undergo induction and regular refresher training to help identify responsibilities.

In order to determine the effectiveness of the colliery's dust control measures, a network of dust depositional monitoring gauges has been established. Depositional gauges are located on the Colliery boundary, a total of 4 depositional gauges are utilised (locations identified in plan MY10965 attached).

For the report period an independent consultant collected the samples for analyses. Samples were taken from the depositional gauges every 30 + or - 2 days as per *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW*.

(ii) Dust Control Measures

Due to the physical nature of operations there is the potential for air pollution due to suspended dust particles. The dust generally emanates from stockpiles and operational hardstand areas and can be either wind or traffic generated.

Over the report period control measures implemented in these areas to minimise the potential for dust generation are outlined below.

- **Vacuum sweeping -** All hard stand and sealed roads are swept by a vacuum sweeper truck on a weekly basis.
- **Damping Down -** The haul road and coal pad areas are damped down when required.
- **Speed Limits -** Speed on site is limited to 20 km/h.
- **Conveyors** - Conveyors are enclosed and washed down weekly to prevent aeration

- **Buffer zone and topography -** Maintaining a vegetated buffer zone assists in reducing any airborne particulate movement from site. The mine is positioned in a small hollow which reduces the effect and severity of wind gusts, and the surrounding vegetation acts as a filter system if airborne dust is created.

(iii) Dust Monitoring

Dust monitoring was performed at the Colliery during 2013 and occurs on a monthly basis at four dust depositional gauges (Table 9).

Monthly results are collated and assessed against the DECCW annual average guideline of 4 g/m^2/month for total insoluble solids. Table 10 below shows the rolling annual averages for each dust gauge.

Table 10: Dust Gauge Locations

Dust Gauge	GPS Location	Description
D1	366672E, 6340919N	Between boundary of Power Station and Wangi Creek
D2	366202E, 6341128N	Western side of disused weigh bridge
D3	366669E, 6340350N	Horse paddock, off Wangi Point Road
D4	366020E, 6340755N	Between Summerville Drive and the final products bin

Table 11: Dust Gauge Rolling Averages

Annual Average	DG1	DG2	DG3	DG4
Total Insoluble Solids (g/m^2/month)	0.6	0.9	1.9	1.2
DECCW Annual Average Guideline	4.0	4.0	4.0	4.0

One above average monthly reading was recorded at DG3 which was sent for microanalysis and were the result of increased plant matter and mineral quartz/clay matter.

The annual average for each dust gauge is below the DECCW guideline (4/g/m^2/month). Figure 1 also shows the monthly results from the Dust Depositional Gauges.

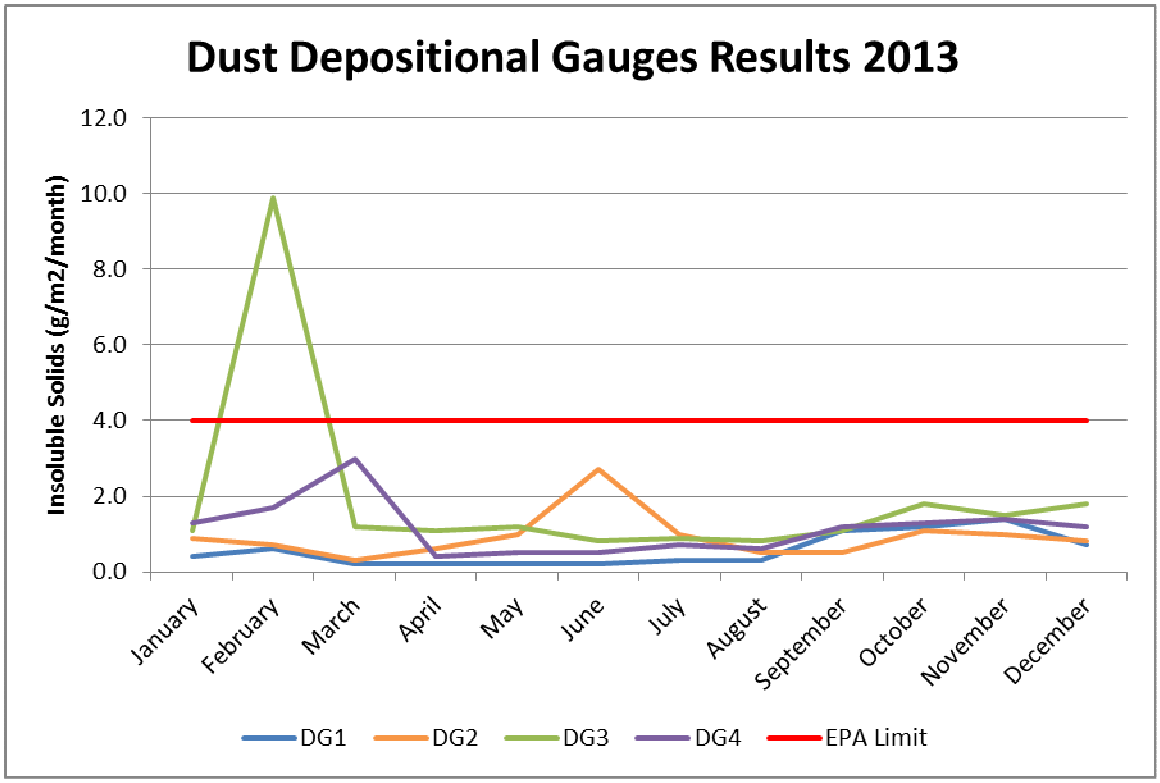

Figure 1: 2013 Dust Deposition Gauge Results

3.2.2. Erosion and Sedimentation

Myuna Colliery has 3 dams designed with over/under weirs, permanent floating booms, and a drive in sump. These structures are inspected weekly. A status report is generated by the Environment & Community Coordinator and actions are initiated as and when required.

Emergency sediment control equipment is contained in the store and contains booms, stakes, sediment fencing, & shovels.

Checking of fire trails, roads and unvegetated areas occurs routinely under work orders through the PULSE system. No vegetation clearing works were undertaken nor were erosion or sedimentation issues or incidents recorded for the reporting period.

3.2.3. Surface Water Management

Myuna Colliery has a Water Management Plan which discusses responsibilities, pollution sources, hazards, risks and mitigation strategies of water management. Regular refresher training and site inductions discuss water management to make personnel aware of the site issues. The water management system at Myuna is discussed in further detail in Section 2.7 above.

Myuna Colliery operates under an Environmental Protection Licence (EPL) No 366. This Licence specifies monitoring and reporting requirements along with criteria for water discharge through LDPA and LDPB.

In February 2013 there was a review of the EPL during the reporting period which altered Licenced Discharge Points 1 and 2 to the new locations of Licenced Discharge Points A and B. Myuna Colliery also received a Pollutions Studies and Reduction Program (PRP) to conduct an assessment of potential impacts of metals.

During the 2013 reporting period there were two non-compliance with the Environmental Protection Licence. This was due to a TSS exceedence at LDPB and a volumetric exceedance at LDPB during a rainfall event. The monitoring results for 2013 and non-compliances with the licence can be found in more detail in Appendix 2 – Annual Return.

There were no discharges from LDPA or LDP2 prior to the EPL variation throughout 2013.

The Following tables show the results of the water monitoring against the concentration limits as set out in the EPL.

Table 12: Discharge and Monitoring Point B

Pollutant	Unit of Measure	Licence concentration limit	No. of Samples Required by licence	No. of samples you collected and analysed	Lowest Sample Value	Mean of Samples	Highest Sample Value
pH	pH	6.5 – 8.5	307	327	0	1.13	4
Total Suspended Solids	mg/L	50	307	327	7.34	7.66	7.87
Oil & Grease	mg/L	10	307	327	5	7.77	94

[1]= Indicates that the result was below detectable limits of the NATA accredited instrumentation at laboratory.

Table 13: Discharge and Monitoring Point A

Pollutant	Unit of Measure	Licence concentration limit	No. of Samples Required by licence	No. of samples you collected and analysed	Lowest Sample Value	Mean of Samples	Highest Sample Value
pH	pH	6.5 – 8.5	0*				
Total Suspended Solids	mg/L	50	0*				
Oil & Grease	mg/L	10	0*				

[1] = Indicates the result was below NATA accredited laboratory instrument limit of reporting.

* No discharges from LDPA or LDP2 in 2013

The risk of surface polluted water leaving the site remains one of the highest environmental risks at the Colliery. Numerous hard barriers and control measures are in place at the Colliery to address this risk. The Colliery submits an Annual Return to the EPA every year, summarising water quality information. The Annual Return can be found in Appendix 2.

(iv) Manganese Monitoring in Lake Macquarie

Under special condition E1 Additional Monitoring of Licence No 366, a surface water monitoring program in Wangi Bay has been implemented. The program requires three monthly sampling for the level of filterable manganese to be carried out. The results are submitted to the EPA Regional Manager, Hunter. Below are the results for the reporting period.

Table 14: Manganese results from Wangi bay

Date	Filterable Manganese (mg/L)			
	T2 – 5m (1)	T2 – 5m (2)	T2 – 10m (1)	T2 – 10m (2)
4/03/13	0.114	0.123	0.116	0.115
13/06/13	0.086	0.090	0.110	0.107
5/09/13	0.094	0.093	0.103	0.107
5/12/13	0.188	0.223	0.184	0.225

(v) Monitoring Data Results for the 2013 Calendar Year

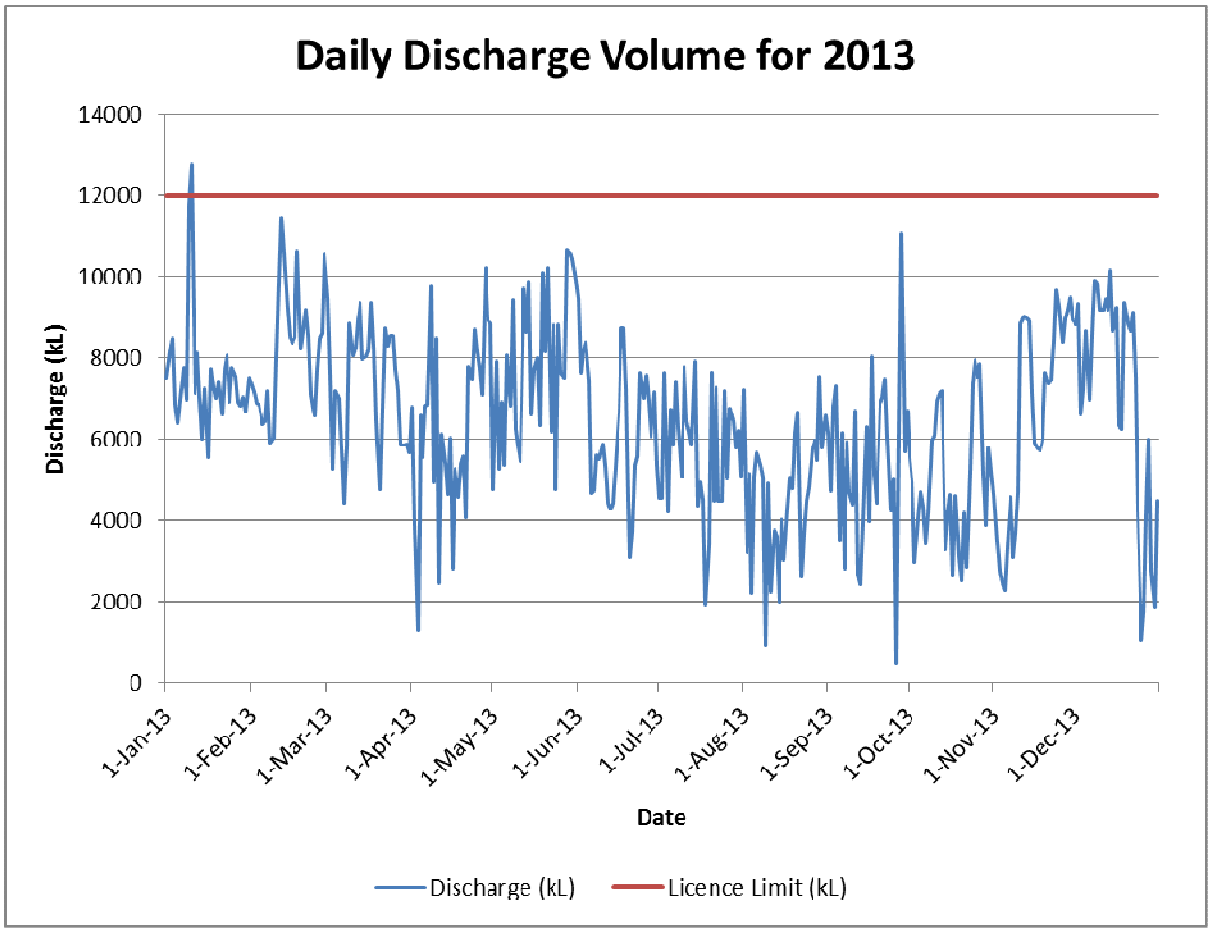

Figure 2: Daily Mine Water Discharge from LDP00B

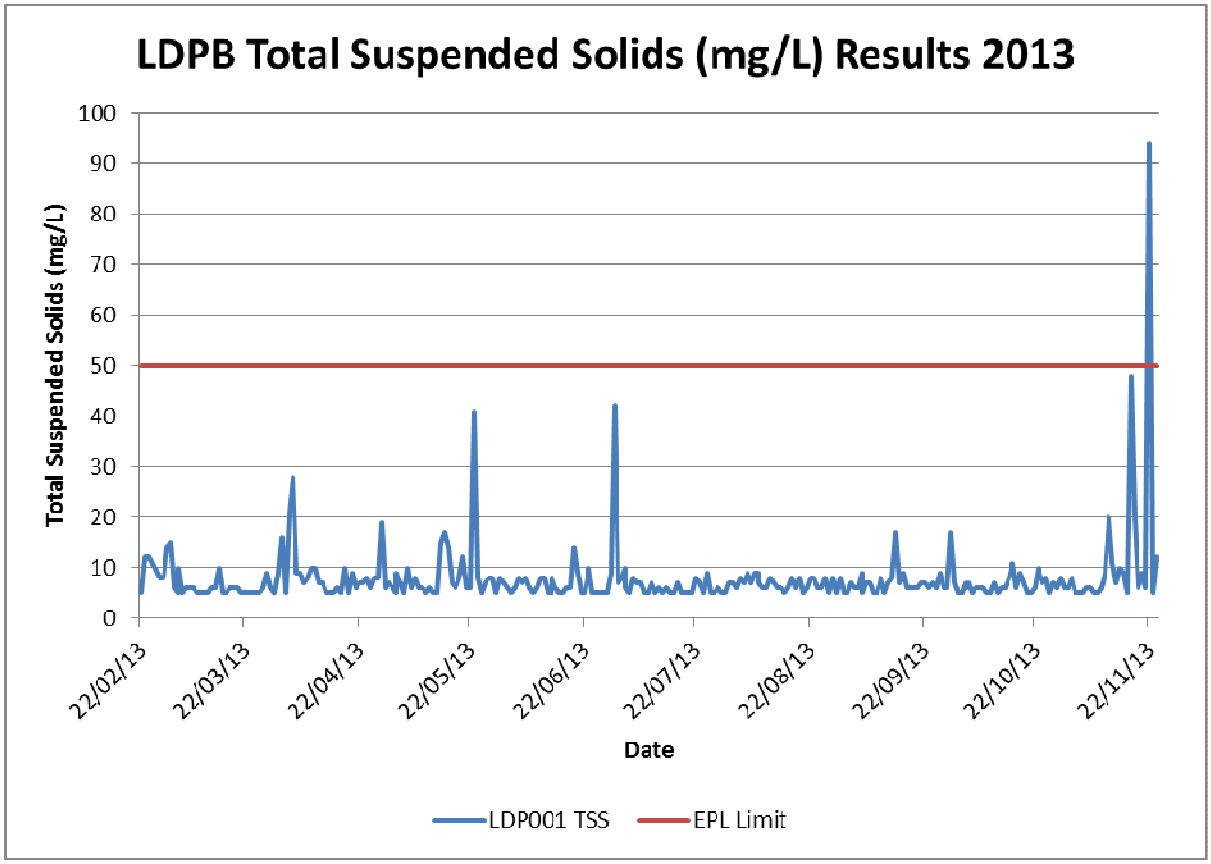

Figure 3: LDPB TSS Trends 2013

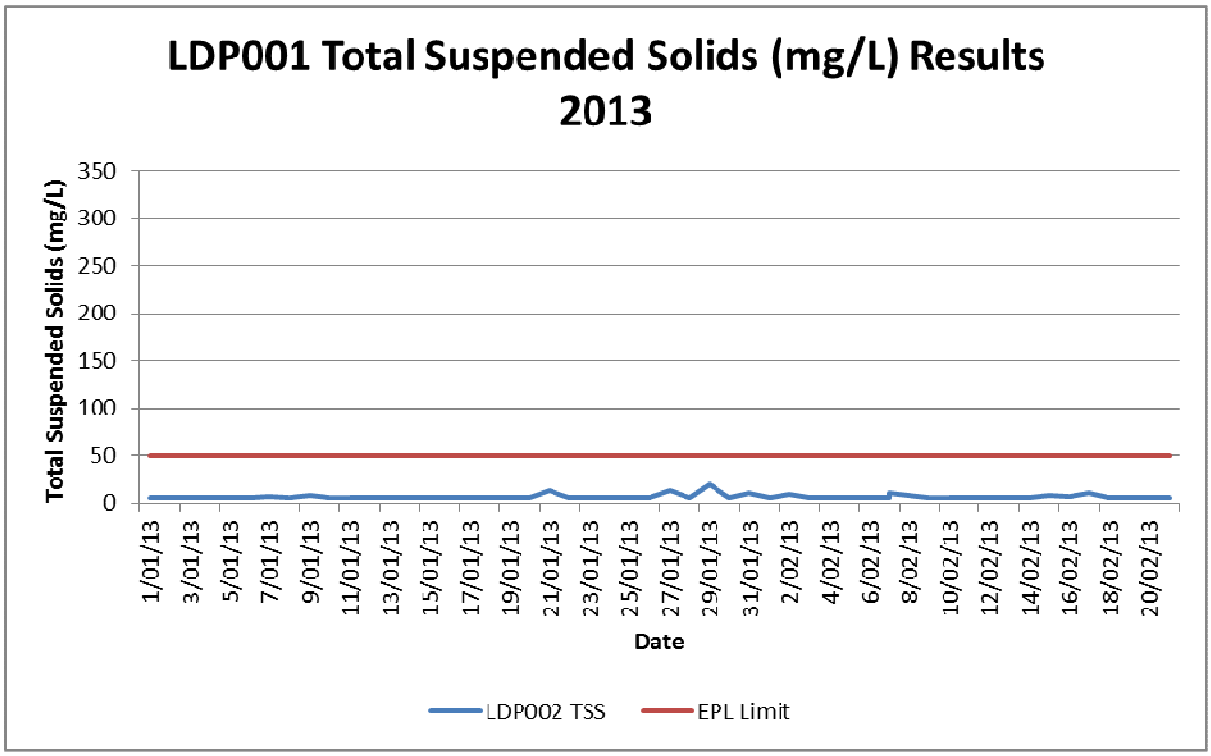

Figure 4: LDP001 TSS Trends 2013

The Figures 3 & 4 show the TSS results for LDPB and LDP1 during the reporting year.

There was one non-conformance with regards to high TSS reported in the Annual Return (Appendix 2) for 2013.

LDP002 was blocked in April 2012 to prevent dirty water leaving site therefore no results were recorded with in the 2013 reporting period.

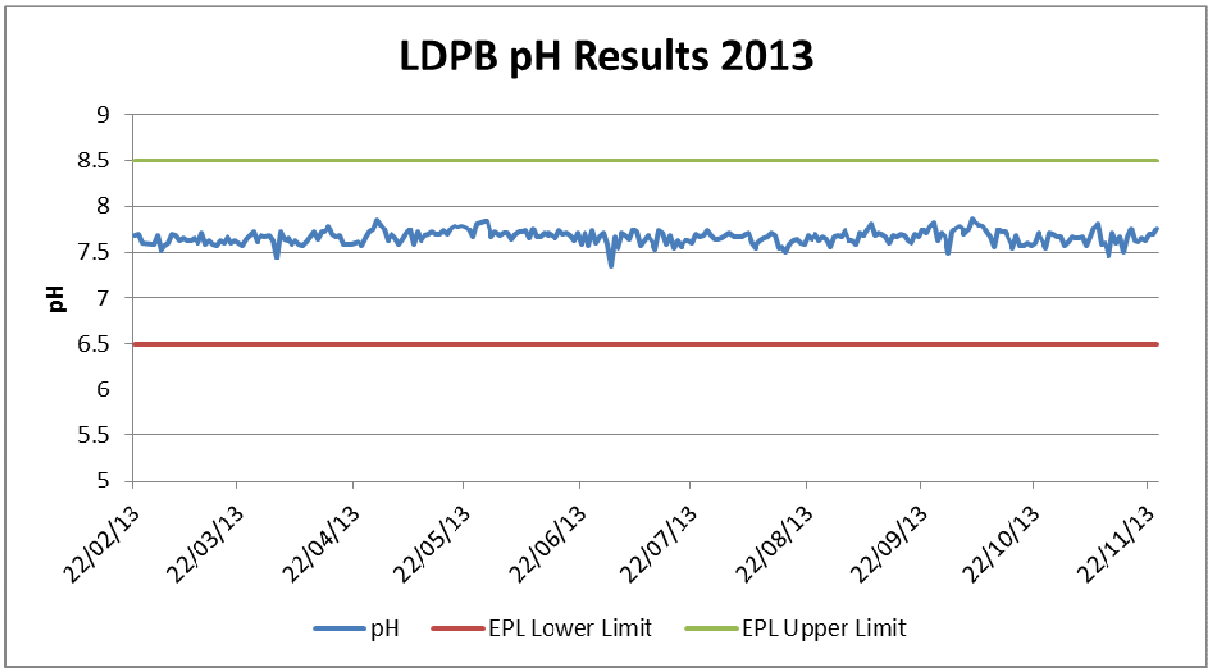

Figure 5: LDPB pH Trends 2013

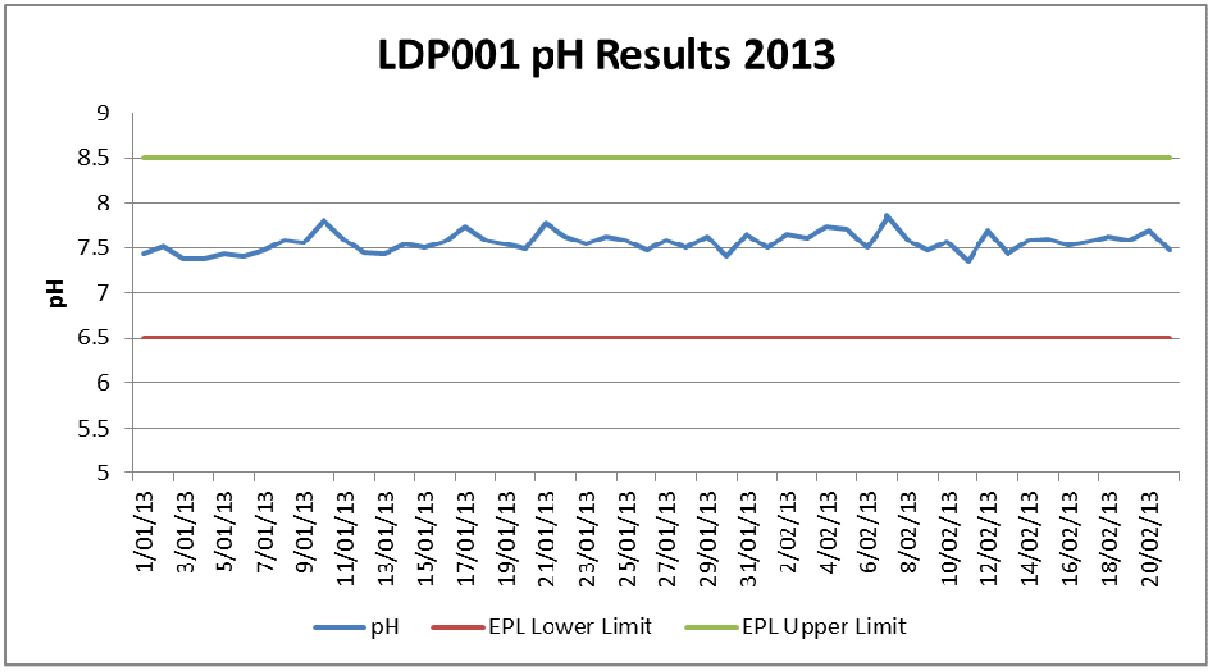

Figure 6: LDP1 pH Trends 2013

Figures 5 & 6 shows the results of pH monitoring at LDPB and LDP1 during the reporting period. There were no pH exceedences in 2013.

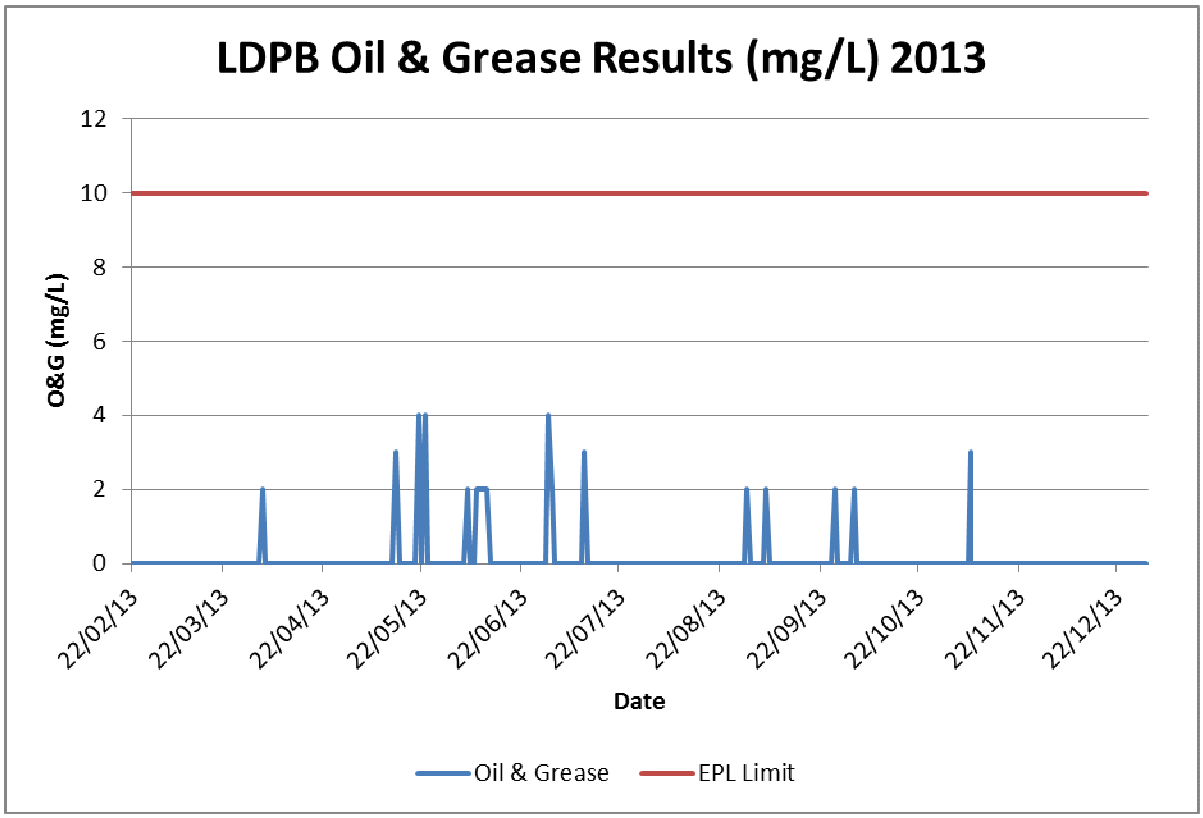

Figure 7: LDP00B O&G Trends 2013

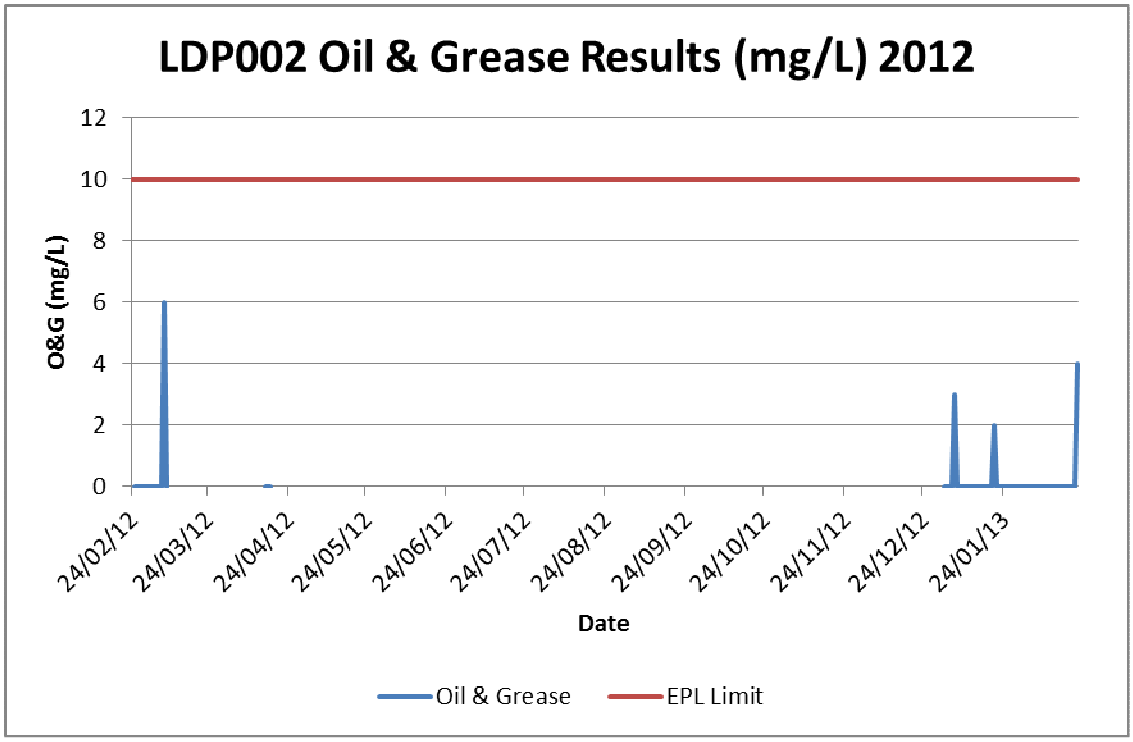

Figure 8: LDP001 O&GTrends 2013

Figures 7 & 8 show the results of Oil & Grease (O&G) monitoring at LDPB and LDP001 during the reporting period. There were no O&G exceedences in 2013.

3.2.4. Groundwater

Water in underground workings is generated from ground water which is released from the strata into mine workings, as well as process water. The collected water is pumped through an extensive system that allows filtration and settlement in large dams. The water is then pumped from the mine into the surface settlement pond systems prior to discharge via EPL LDPB.

Continual sampling and inline flow monitoring enables monitoring of Myuna operations impact on the groundwater quality and increase or decrease in groundwater make. No incident of contamination or variation in flow volumes occurred over the report period.

No piezometer groundwater monitoring was undertaken during the report period.

3.2.5. Contaminated Polluted land

A Phase 2 Part 1 contaminated site assessment was completed during the 2008 year. Potential areas of contamination were identified. Ongoing investigations into contaminated lands will occur over the life of the mine.

A Phase 2 Contaminated Sites Assessment was undertaken in 2012 and was finalised in early 2013.

Under Section 3 of the Environmental Management System, a Hydrocarbon Management Plan is in place to reduce the risk of contamination by hydrostatic materials. Spills are controlled in appropriate areas of the pit top surface, they are cleaned up using emergency spill kit material which is restocked once a month. Spills are reported in accordance with our internal environmental incident reporting system and investigated.

Training in Myuna's Hydrocarbon Management Plan occurs in all inductions with refresher training rolled out to the workforce routinely to ensure all personnel appropriately manage hydrocarbons and spills.

3.2.6. Flora & Fauna

Within the Environmental Management System sits the Land Management Plan and the Bushfire Management Plan. These plans identify different vegetation types and management methods. No threatened flora or fauna was impacted due to surface or mining operations during the reporting period.

A Flora Assessment was conducted on site in 1999, one vulnerable species (under Threatened Species Conservation Act (1995) was identified. *Tetratheca juncea* was found to occur in small numbers in the mines buffer zone.

A fauna survey was also conducted in 1999, while two vulnerable species (Koala and Swift Parrot as per Threatened Species Conservation Act, 1995) have been observed in bushland near the Colliery no evidence of Koalas using the site were observed. The report determined that the likelihood of the Swift Parrot using the buffer zones as a nesting site was extremely low. Some suitable feeding trees for Koalas were observed on site.

A Terrestrial Flora and Fauna Impact Assessment was completed during the 2010 reporting period for the Myuna Colliery Extension of Mining Environmental Assessment. A search of the DECCW Wildlife Atlas revealed there were 24 threatened flora species (7 Endangered & 17 Vulnerable) & 56 threatened terrestrial fauna species (8 endangered & 48 vulnerable) listed under the TSC Act in the lease area.

Minimal changes to sub-surface hydrology are expected and existing infrastructure at the Surface Facilities Area will be utilised to service Myuna Colliery. Due to the predicted negligible surface impacts, Myuna Colliery is unlikely to impact on any threatened species, endangered population or TECs.

Minimal removal of vegetation occurred during the reporting period

3.2.7. Weeds

Under Section 8 of the Environmental Management System is the Weed & Pest Management Plan. This plan identifies the weeds on site and management techniques used to control them. A contract weed controller is engaged to manage weeds at the Colliery on a regular basis. A weed audit was conducted during the reporting period, with a weed action plan implemented in the 2013 reporting period.

3.2.8. Blasting

One round of shot firing was undertaken in July 2013 within the Wallarah to the Great Northern Seam interburden. Explosives are bought on site specifically for the individual task. Explosives are not stored on site.

No other shot firing was undertaken within the reporting period.

3.2.9. Operational Noise

Noise monitoring commenced at Myuna in December 2012 as required by the Development Consent received in January 2012. The noise results were inconclusive from the first round of monitoring due to high background noise levels which has continued throughout 2013. Further monitoring on site is proposed to be undertaken in 2014 through the installation of a real time noise monitor to quantify the operational noise impacts on the closest receivers to the Colliery.

A impact noise assessment was completed as part of the Part 3A. This report concluded that the operation noise levels are predicted to meet the project specific noise criteria at all assessed residential receivers under calm and prevailing weather conditions with the recommended noise mitigation and management strategies in place.

Myuna Colliery does not transport coal by road or rail. Coal is transported directly to Eraring Power Station by direct conveyor which is owned and operated by Eraring Power Station. The ROM coal drop bin has been removed as Myuna no longer separates any coal for export.

Trees surround the surface area of the Colliery for approximately 270°. The now obsolete Wangi Power Station occupies the remaining area. Overall, the Colliery is well screened from nearby residences, of which the closest is approximately 500-600 metres away.

The surrounding vegetated buffer zone and the Wangi Power Station are at slightly higher elevation than the Colliery surface infrastructure. This is forming a natural 'bowl' that the colliery sits within.

3.2.10. Visual, Stray Light

The Myuna Colliery Surface Facilities Area is surrounded by ridgelines which vary from 20 to 50 metres RL. The Surface Facilities Area is bound in all directions by a natural bushland buffer and road network, with the closest receivers over 500 metres away. The surface facilities are well shielded from passerby traffic and residences and contribute a very low visual impact to the area.

3.2.11. Aboriginal Heritage

A study in 1977 stated that no aboriginal sites or artefacts were recorded.

The Colliery's underground workings extend under Point Wolstoncroft in Lake Macquarie which is listed as State Conservation Area under NPWS legislation. The application to mine under Point Wolstoncroft was granted approval by DPI 15 March 2007 (S89 Consent to Mine in High Water Level Subsidence Control Zone). A further variation to the original approved mining plan have been subsequently submitted and approved 18 August 2008. A condition of the original approval, was to perform routine subsidence monitoring on Point Wolstoncroft. To perform subsidence monitoring on Point Wolstoncroft a S90 Consent to Destroy was required, applied for (together with REF) and granted by NPWS (26 June 2007) to perform subsidence monitoring on the island which included several conditions.

A Cultural Heritage Assessment was also completed as part of the Part 3A process. Results of DECCW's Aboriginal Heritage Information Management System (AHIMS) found that the most commonly occurring heritage site type associated with Lake Macquarie are middens. The AHIMS database search identified 11 middens, two isolated finds and one Potential Archaeological Deposit previously recorded across the lease Area, and a number of artefact scatters, open camp sites and scarred trees within the surrounding area.

The field survey conducted as part of the Assessment recorded an additional 4 new sites, and two previously identified sites, as detailed below:

- Midden located at Myuna Bay
- Cultural Site at Buttaba Hills
- Midden – Previously recorded site. Anadara trapezia adjacent waterhole

- Midden; artefacts; cultural site – extensive Anadara trapezia, few Ostr

The Cultural Heritage Assessment also identified the following European Heritage items in and surrounding the lease areas:

- Decommissioned Wangi Power Station
- Threkholds original Coal Mine
- Remnants of the Wangi Power Station railway line

3.2.12. Natural Heritage

An extensive Environmental Assessment undertaken for the mine's original Development Consent approval included information regarding aboriginal heritage, natural drainage and current land use.

Mine design is such that there is no visible disturbance to the surface due to mine subsidence therefore no impact predicted to natural heritage or the requirement for investigation triggered.

3.2.13. Spontaneous Combustion

There were no occurrences of spontaneous combustion during the reporting period in stockpiles or underground.

3.2.14. Bush fire

Surface structures have fire protection equipment installed around them for compliance with the Coal Mines Regulation Act 1999. 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. No bushfire incidents occurred in the reporting period.

Hazard reduction slashing around the boundary and Asset Protection Zones are undertaken on a quarterly basis. Fire Trails and vegetated zones are routinely inspected. A fuel loading assessment is performed throughout the sites buffer zones annually by the Wangi Fire Brigade and Environment and Community Coordinator.

3.2.15. Mine Subsidence

The Subsidence effects in the surface mining areas are predicted to be negligible (ie. <20 mm). This prediction is based on latest pillar design principles, local roof and floor conditions and results of subsidence monitoring to date.

A monitoring program has been implemented to collect data on surface movement. The formation of pillars is effectively managed to ensure headings and cut-throughs are formed to design dimensions.

A Panel inspection/audit system has been implemented to monitor and report any deviation from the plan and the corrective action taken.

3.2.16. Hydrocarbon Contamination

Under Section 6 of the Environmental Management System is the Hydrocarbon Management Plan to ensure hazards and risks are identified and harm minimisation and mitigation systems are in place. All hydrocarbon materials are stored within a dedicated bunded bulk oil store building.

Emergency spill stations are positioned in strategic locations around the site surface and provide hydrocarbon spill containment equipment. All emergency spill equipment is checked weekly and refilled as required and a written report carried out monthly.

Potential areas where historic operations may have contaminated land have been identified through the phase two part 1 contaminated land survey. A Phase 2 Contaminated Sites Assessment was undertaken in 2012 and was finalised in early 2013.

Hydrocarbon spills are immediately cleaned up and contaminated material disposed of appropriately and reported to Environment and Community Officer.

3.2.17. Greenhouse Gas

Estimation of the GHG emissions associated with the Myuna was undertaken using the emission factors and methods outlined in the National Greenhouse and Energy Reporting (Measurement) Determination 2008.

Table 15: Greenhouse Gas Emissions

Emissions (CO_2-eT) 2013	
Diesel	4167
Electricity	144,308
CO_2 Emissions	7715
CH_4 Emissions	265,219
Total Emissions (CO_2-eT)	421,410

3.2.18. Public Safety

Myuna Colliery is surrounded by fencing and is patrolled by security staff on a regular basis; public safety was not a concern during the reporting period.

No surface impacts from mining that could pose a risk to public safety were identified during the report period.

3.2.19. Other Issues and Risks

There were no other environmental issues or risks encountered during the reporting period.

4. Community Relations

4.1. Community Complaints & Enquiries

A community complaints register is kept on site including forms that are to be completed by staff that receives a complaint. This information is then entered into the Centennial Coal Environment and Community Database (ECD).

There were no complaints regarding the Colliery during the reporting period.

4.2. Community Liaison and Sponsorships

Myuna Colliery operates under a Stakeholder Engagement Plan, and continues to support the local community through various sponsorship schemes. The following is the sponsorship and support carried out locally during the calendar year:

- Myuna Colliery was a major sponsor of the Wangi Dobell Festival of Arts and Crafts 2013;
- Sponsorship of the Centennial Coal Australia Day Regatta run by the Wangi RSL Amateur Sailing Club
- Sponsorship of the Wangi Lions Club and the Wangi Beautifying Project
- Wangi Amateur Sailing Club Youthsail Lake Macquarie Regatta
- Rathmines Catalina Festival

Myuna Colliery also supported corporate sponsorships for local sporting organisations, with sponsorship assistance for new equipment and operational costs. These sporting clubs include: Westlake Wildcats, Royal Motor Yacht Club Toronto, Toronto Awaba Junior Soccer Club, Lake Macquarie Dockers, Westlakes District Netball, Lake Macquarie Dolphins, Macquarie Shores Swim Club, South Lakes Rugby, Cricket Southern Lakes, Westlake Wild Cats and Macquarie Scorpions Rugby League.

The colliery also supported corporate sponsorship for community organisations and events including: Speers Point Park Australia Day Festival, Morriset / Toronto Meals on Wheels, Dora Creek Rural Fire Brigade, Hunter Rescue Helicopter West Cycle Classic, sponsorship and participation in the Rotary Club of Toronto Sunrise's Paddlefest event, Hunter Life Education Australia Secondary high school program, the YMCA Lake Macquarie, Hunter Valley Research Foundation, Chuck Duck Breakfast Club Food supporting in need local school children, the Rathmines Catalina Festival, and the Hunter Medical Research Institute Capital Campaign .

5. Rehabilitation

5.1. Buildings

Myuna Colliery surface infrastructure is listed in detail in section 2.9 Surface Infrastructure.

Buildings include the administration offices, bathhouse, fire station, cable shed, stone dust shed, car parks and hardstand areas

Due to Myuna's minimal foot print mining infrastructure areas will continue to be used throughout the MOP period to facilitate mining operations.

No buildings were renovated, removed or rehabilitated during the AEMR period.

5.2. Rehabilitation of Disturbed Lands

There was no disturbance of native vegetation during the reporting period.

As shown in Table 15 Myuna Colliery proposes to rehabilitate the land to a combination of native vegetation and grasses upon mine closure.

5.3. Other infrastructure

During the reporting period no surface exploration, new infrastructure, shafts, dams or fences were built, requiring rehabilitation works.

5.4. Rehabilitation Trials and Research

No rehabilitation trials, research or initiatives were undertaken during the reporting period.

5.5. Further development of the Final Rehabilitation Plan

All surface infrastructure associated with Myuna Colliery's operations is located at the Surface Facilities Area. The Surface Facilities Area encompasses a footprint of approximately 89 hectares, of which 20.2 hectares includes the surface infrastructure. This 20.2 hectares is the total area currently requiring rehabilitation prior to mine closure. The remainder of the Surface Facilities Area is predominantly natural bushland vegetation, the Wangi Creek watercourse and existing cleared easement corridors.

Final landform creation and rehabilitation activities will largely be undertaken following the completion of mining and removable of surface infrastructure. The final landform will reflect the existing topography providing a free draining landform similar to that which currently exists with the exception of the mine access road.

The site will also be largely revegetated with native tree and shrub species (except within transmission line easements) and will blend with the surrounding landscape. Hence, the potential visual impact from Summerhill Drive will remain negligible.

Plan MY11215 illustrates the planned final landform following the completion of all approved coal mining operations at the mine.

The current MOP / Rehabilitation Management Plan includes a conceptual final land use plan for the Surface Facilities Area. In accordance with Development Consent (10_0080).

6. Activities Proposed in the Next Reporting Period

Planned activities for the next reporting year:

- Review and Development of Management Plans as per approval (10_0080) conditions.
- Ongoing improvements to the surface water management.

Table 16: Rehabilitation Summary

		Area Affected/Rehabilitated (hectares)		
A	**MINE LEASE AREA**	**Total Area, start of MOP**	**Total Area, end of MOP**	**At mine closure (*anticipated)***
A1	Mine Lease(s) Area	6500ha	6500ha	
B.	DISTURBED AREAS			
B1	Infrastructure Area (other disturbed areas to be rehabilitated at closure including facilities, roads)	20.2ha	20.2ha	
B2:	Active Mining Area (excluding items B3-B5 below)	Na	Na	
B3:	Waste Emplacements (active/unshaped/in or out-of-pit)	Nil	Nil	
B4	Tailings Emplacements (active/unshaped/uncapped)	Nil	Nil	
B5	Shaped Waste Emplacement (awaits final vegetation)	Nil	Nil	
ALL DISTURBED AREAS		20.2ha	20.2ha	
C.	REHABILITATION			
C1	Total Rehabilitated Area (except for maintenance)	Nil	Nil	Nil
D.	REHABILITATION ON SLOPES			
D1	10 to 18 Degrees	Nil	Nil	Nil
D2	Greater than 18 degrees	Nil	Nil	Nil
E:	SURFACE OF REHABILITATED LAND			
E1	Pasture and Grasses	Nil	Nil	15ha
E2	Native Forest/Ecosystems	Nil	Nil	5.2ha
E3	Plantations and Crops	Nil	Nil	Nil
E4	Other(include non-vegetative outcomes)	Nil	Nil	Nil

7. LIST OF PLANS

MY11181 – Wallarah Seam Workings 1 Jan 2013 – 31 Dec 2013

MY11182 – Great Northern Seam Workings 1 Jan 2013 – 31 Dec 2013

MY11183 – Fassifern Seam Workings 1 Jan 2013 – 31 Dec 2013

MY10547 – Site Services Plan

MY10956 – Dust Management Plan

PC14 - Myuna Lease Area Plan

MY11215 – Final Rehabilitation

8. APPENDICES

Appendix 1 - Myuna Colliery Environmental Risk Assessment

Appendix 2 – Myuna Colliery Annual Return (EPL 366)