ANNUAL ENVIRONMENTAL MANAGEMENT REPORT 2014

RIX'S CREEK Pty Limited

Name of Mine -	Rix's Creek Mine
Titles/Mining Leases -	CL352 & ML1432
MOP Commencement Date -	8/3/2013
MOP Completion Date -	8/3/2020
AEMR Commencement Date -	1/1/2014 AEMR End Date - 31/12/2014
Name of leaseholder -	Bloomfield Collieries Pty Limited
Name of Mine Operator -	Bloomfield Collieries Pty Limited
Reporting Officer -	Jason Desmond
Title -	Environmental Officer
Signature –	
Date –	25/02/2015

EXECUTIVE SUMMARY

The reporting period extends from 1 January 2014 to 31 December 2014.

Rix's Creek Mine during 2014 operated three shifts a day, 15 shifts a week for 48 weeks. Day shift operated between 06:30 and 14:30, afternoon shift operated between the hours of 14:30 and 22:30 hours and night shift 22:30 and 06:30. The operation employs a total of 140 personnel.

The major operation took place in Pit 3 (West Pit) for the year, south of the New England Highway and operations finalised in Pit 1 (North Pit) with the last coal down to the Lower Liddell seam removed in February 2014 via open cut methods. Barrett and Hebden coal seam remain beneath this area.

During October 2014 Rix's Creek sought approval for Development Consent – Modification 6 which was subsequently approved. This Modification allowed for an increase of overburden removal from 15 million bank cubic metres (MBCM) to 16.1 MBCM. Saleable coal would remain at 1.5 million tonnes of product coal per annum. The Modification was approved by the NSW Department of Planning and Environment during November 2014.

Three community consultative committee meetings were held during the year. Once in January for information on Rix's Creek Continuation of Mining Project, the second in May to review the Annual Environmental Management Report for 2013 and the third in September to the review the half-yearly environmental monitoring results for January-June 2014 and updates on the Continuation Project.

Twenty (20) complaints were received by the Company during the year. Three were on the Rix's Creek Hotline, fourteen were direct phone calls to the company, one was referred from Planning and Compliance (DPE) and two were referred from the EPA complaints line. Four (4) enquiries were made on the 20/5/2014 (phone), 20/5/2014 (phone), 27/5/2014 (email) and 27/6/2014 (phone), these were all relating to noise and not a complaint.

Environmental monitoring throughout the year showed no significant variation from previous year's results. This is further shown through comparisons of 2014 results to previous years via tables and graphs as per recommendations from the 2013 AEMR review.

Total rainfall for the period was 606.75 mm over 79 days, which was 91.25 mm below average for the year compared to 2013 where rainfall was 823.5 mm or 125.5 mm above average. The yearly average for Singleton is 698 mm.

Air Quality results - The results show an overall decrease in comparison to the 2013 results. In 2014, eight (8) of the dust deposition gauges (27%) exceeded the arbitrary an annual average result of 2 g/m^2/month compared to eleven (11) or 37% in 2013.

Total Suspended Particulates - showed a decrease result to the previous year. There was 39 out of a possible 183 results (21%) that exceeded the annual average limit of 90 $u g/m^3$ compared to 60 out of a possible 183 results (33%) in 2013. Mines Rescue 8 results, Retreat 16, and Rix's Creek 15 results.

Particulate Matter < 10 micron - The annual averages for all three sites were similar to last year's results. Being a dry year this result would have been assumed to increase, however this was not the case. All sites are under the 30 $u g/m^3$ annual average limit. The Mines Rescue Station was the same as 2013, Rix's Creek site has decreased (3 $u g/m^3$) compared to last year's result while the Retreat site decreased by 3 $u g/m^3$.

Above average rainfall was received during March, April, August and December. Throughout 2014 Rix's Creek was dry from subsequently low rainfall as well as dry conditions the second half of 2012 as well as 2013. The high rainfall month's experienced in 2014 were sporadic not allowing for constant rain and flow conditions for prolonged periods with flows only short lived. Due to the drier than normal conditions of 2012, 2013 and 2014 there was minimal flow to the creek throughout the year until December 2014.

All water requirements were met from onsite storage and rainfall. No water was imported onto the site during the year from outside sources. Some water is required from Singleton town water storage supply for administration building and wash-down pad facilities.

Rix's Creek is a non-discharging member of the Hunter River Salinity Scheme and did not discharge as a

participant in the scheme.

Routine groundwater monitoring continued in 2014, with quarterly monitoring of field parameters including:- Electrical conductivity (EC), Total dissolved solids (TDS) and pH. Annual sampling was undertaken for comprehensive laboratory analysis of a broader suite of parameters during November. These results were all similar to previous year's results. Over the monitoring period salinity levels are shown to remain constant in the coal seams and the regolith. This indicates limited connectivity with surface water and no water quality impacts from mining operations.

During 2014 a total of 77 production blasts were initiated into overburden in Pits 1 (4 blasts) and Pit 3 or West pit (73 blasts). Vibration and air blast overpressure monitoring was undertaken for 77 production blasts on overburden in Pits 1 (4 blasts) and Pit 3 or West pit (73 blasts). Of the 77 blasts no blasts recorded vibration over 5 mm/sec and three blasts (3.9%) recorded overpressure above 115 dB_{Linear},however, below 120 dB_{Linear}. During 2014 two (2) complaints were received by the Company relating to two blasts

Machine noise monitoring was undertaken quarterly with no problems identified. All new equipment is fitted with broad band reversing alarms to minimise offsite noise impacts. A sound suppressed Liebherr 9800 Excavator commenced on site during January 2014 with a significant amount of modifications in comparison to a standard 9800 excavator. Sound suppression will continue for any new pieces of open-cut equipment prior to commencing work/s on-site.

Background noise levels were monitored at the four sites on a quarterly basis during the year. All four quarters of monitoring was done by a noise consultant. The locations of the sites are indicated in Plan 1. Aside to the monitoring required to satisfy the requirements of the current Development Consent, attended noise monitoring was undertaken on a monthly basis from January through to December 2014 by a noise consultant. Aside to this attended noise monitoring was carried out on a nightly basis from August through to December 2014 by internal personnel.

During the reporting period a total of 28.5 ha were rehabilitated giving Rix's Creek a cumulative area rehabilitated of 374.4 ha since 1990. This cumulative area is 54.2 ha ahead of the MOP cumulative total of 320.2 ha in 2014. This included 24 ha on the North Pit side of the highway and 4.5 ha on the West Pit side. A majority of this area received an application of biosolids prior to seeding.

An approximate area of 25 ha on the southern and western faces of the South Pit dump was mulched during autumn to stimulate further pasture growth. This area was also maintained as necessary via rock-removal, rill-infilling and any repairs required along clean water drainage lines.

Several rehabilitation areas on the North Pit dump were rolled via a drum-roller after pasture area's had greater than 70% coverage to minimise rock presence at the surface and too allow weed management to be easily carried out for short ground-dwelling species such as *galenia pubescens* (galenia). This was undertaken throughout 2014 across new and previous rehabilitation areas.

During 2014 approval was granted to increase this level to a maximum material movement on site of 16.1 million cubic metres for the 2014 reporting period. 2014 reporting period exceeded the 15 million BCM previous limit but was below the new approval limit of 16.1 million BCM. This is projected to be similar in 2015 with slightly higher rates of overburden movement with saleable coal remaining the same. The overburden increase is aligned to Rix's Creek life-of-mine ratio for dirt to coal movement to keep the mine economically viable. The increased overburden movement is aligned to the increasing strip ratio as the West Pit progresses north-west.

Environmental management is an ongoing process at Rix's Creek with continual improvement being made to the existing systems already in place.

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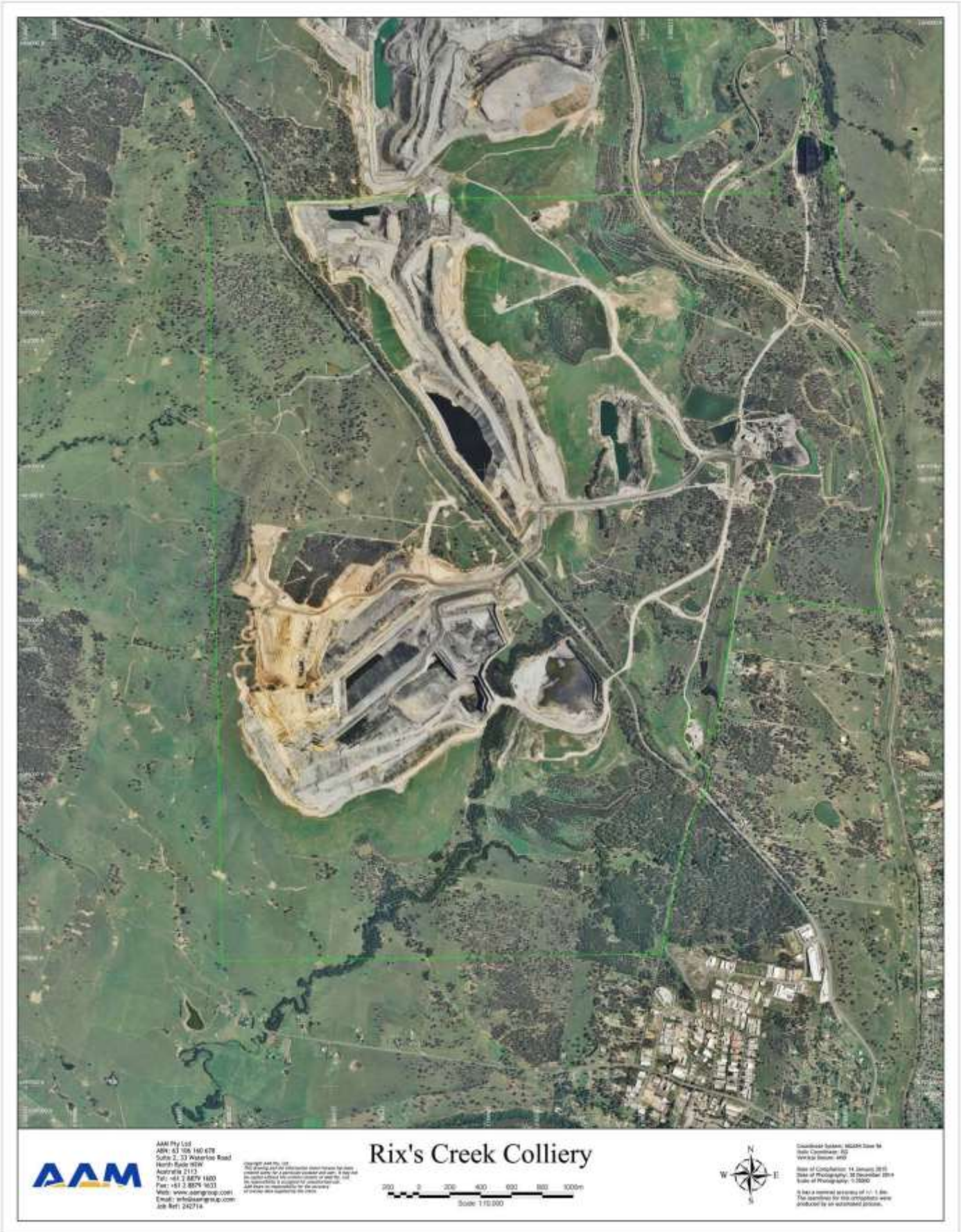


Aerial photograph – 30 December 2014.

SECTION 1 INTRODUCTION

The Annual Environmental Management Report for 2014 is compiled pursuant to Condition 19 of the development consent for Rix's Creek Open Cut Mine. The report is also presented to satisfy the environmental reporting requirements of the NSW Trade and Investment – Division of Resources and Energy (DRE), The Office of Environment and Heritage (OEH), and the Department of Planning and Environment (DPE). This reporting period extends from 1 January 2014 to 31 December 2014.

Rix's Creek Colliery is wholly owned by The Bloomfield Group Ltd. an Australian owned family company. The Bloomfield Group also operates an open cut coal mine at East Maitland, *Bloomfield Collieries Pty. Ltd*, exploration license (EL) 7435 "*Goonbri*", EL5888 and EL5306 "*Bickham*", EL6604, EL7365 and CCL711 "*Curlewis*", engineering businesses *Four Mile Engineering* and *King's Engineering* as well as equity positions in companies specialising in renewable energies, recycling and biofuel production.

Rix's Creek mine commenced operations in July 1990 following the granting of Development Consent and Coal Lease No. 352 on 20 October 1989. This followed the submission of Coal Lease Application No. 185, an Environmental Impact Statement (EIS) and a public inquiry into the development application.

Construction began in late November 1989 establishing access roads, dams, facilities and screening bunds adjacent to the New England Highway. The Mining Operations Plan (MOP) was approved covering a five-year period, which corresponded, to Stage 1 of the mining proposal set out in the EIS.

The initial area was located adjacent to and on the northern side of the New England Highway and utilised bulldozer and scrapers to remove overburden. As mining progressed to greater depths, massive sandstone was encountered, requiring the introduction of overburden blasting. The scraper fleet was substituted with front end loader and trucks as the primary means of overburden removal. The Hebden and Barrett coal seams were mined at the rate of 300,000 tonnes of raw coal per annum.

The mining area was within old underground workings of the New Park Colliery, which dated back to the late 1800's. The underground workings were far more extensive than documented and resulted in poor coal recoveries and quality. This led to the relocation of operations to the north of the mining lease, an area termed the northern mining area or Pit 1.

A bridge over the New England Highway was constructed to enable access to coal reserves in the southern area of the coal lease or Pit 2. Since the completion of the bridge in June 1994 mining operations concentrated in this area. The production rate was then increased to 800,000 tonnes of raw coal per annum.

A coal preparation plant and rail loading facility were commissioned in April 1993, with all product coal being transported by rail to the port of Newcastle, where it is blended with coal from Bloomfield open cut. All product coal is sold on the export market. Prior to the commissioning of Rix's Creek washing and railing facilities, all raw coal was transported to Bloomfield Colliery for washing and blending.

During 1997 the operation expanded following the 1995 Development Consent approval allowing production to increase to current levels.

Along with the continuing operation in Pit 2 operations commenced on the extension of Pit 1 in January 1997. Production increased to 1.7 million tonnes of raw coal. Since 1997 mining operations continued in Pits 1 & 2. During 2002 operations commenced in Pit 3 on the western side of Rix's Creek adjacent to Pit 2. The last coal was extracted from Pit 2 on 23rd June 2003. The emplacement of tailings into the pit 2 void commenced in July 2005 with capacity reached during May 2014. Operations have continued concurrently in Pit 1 and Pit 3 (West Pit) with approximate production of 1,400,000 tonnes of product coal per annum. Mining in Pit 1 via open-cut finalised in 2014 with the focus of the operations continuing in Pit 3.

1.1 Consents, Leases and Licences

A full list of consents, leases and licences held by Rix's Creek Mine is contained in Table 1.

Coal Lease No. 352 was renewed on 20/10/2011 allowing mining operations to continue on the site. Mineral Lease Application No. 17 to remove the surface exclusion from the remaining areas within the lease was submitted in 1995 and access agreements reached with landholders. Mining lease No. 1432 was granted by the Minister on 24/6/1998.

The development application to expand the operation submitted to the Department of Urban Affairs & Planning in November 1994 under the provisions of S.E.P.P. No. 34 was determined by the Minister in October 1995. The development consent came into effect in December 1995, and implementation progressed during 1996.

The Company holds Environmental Protection Licence No. 003391 under the Protection of the Environment Operations Act, 1997. This EPL has been varied to accept wastes on site such as biosolids (rehabilitation), refined oil (blasting) and glycerine (dust suppression). The license has also had variations for PRPs (Pollution Reduction Programs) in regard to *Coal Mine Particulate Matter Control Best Practise* as well as a noise assessment in accordance with the document, 'NSW Industrial Noise Policy', (EPA 2000). The prescribed use classification is Coal Industry Works Class I, and operational scale is more than 500 to 2,000 kilotonnes per annum.

Rix's Creek P/L is a non-discharging participant in the Hunter River Salinity Trading Scheme holding 5 credits.

An application was made in November 2003 to vary the Development Consent to receive and process coal from Glennies Creek Coal Mine. The Notice of a Modification to a Development Consent under Section 96(2) of the Environmental Planning and Assessment Act 1979 was signed by the Minister on 23rd December 2003, modifying the Rix's Creek Development Consent to allow this activity. No coal was received during 2014.

An application was made in April 2004 to vary the Development Consent to receive coal from Bickham Bulk Sample Exploration Licence operation. The Minister signed the Notification of a Modification to Development Consent under Section 96(2) of the Environmental Planning and Assessment Act 1979 (EP&A Act 1979) on 24th June 2004, modifying the Rix's Creek Development Consent to allow this activity. This activity was completed and the last coal railed in March 2005.

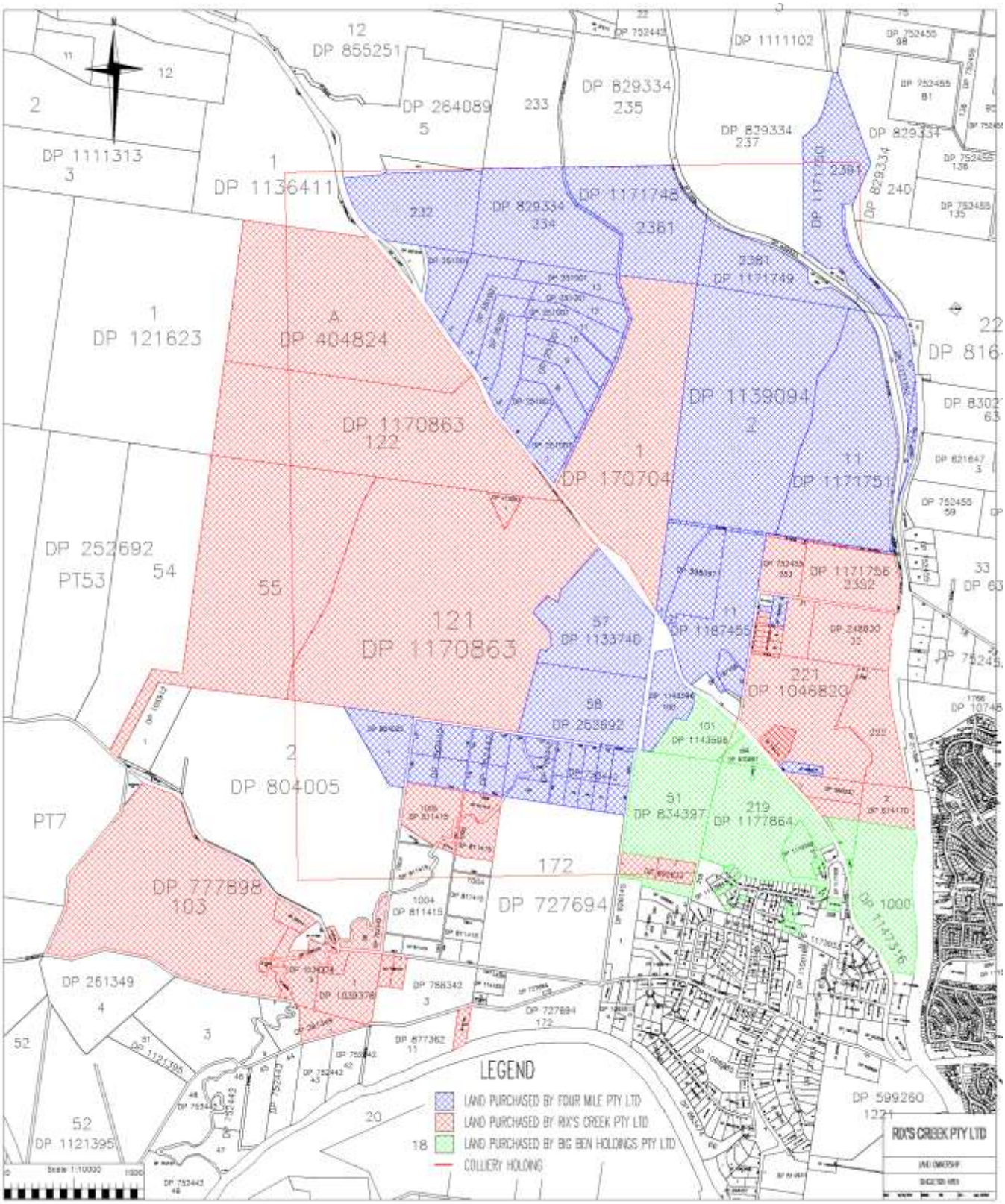
An application for a second crossing of the New England Highway to improve the efficiency of the mining operation was submitted to Department of Planning in March 2009. The Minister approved the modification under Section 96(2) of EP&A Act 1979, on 27 August 2009, for a Cut and Cover Tunnel crossing on the New England Highway. Following final approval of the design by the RTA in October 2010 construction began in November 2010 with completion of the project during June 2012. The first haul truck officially passing under the tunnel on 5 June 2012.

An application for the construction of a rail-loop off the main northern rail-way line onto Rix's Creek owned land was approved in 2013 resulting in modification number 5. No construction has commenced on this project since approval was granted.

On Friday 4th October 2013 Rix's Creek took ownership of land ahead of the West Pit operations to secure the future of mining within the lease. The three properties purchased include Lot A, D.P.404824 (previously owned by A.Bowman); Lot 122, D.P.1170863 (previously owned by E.S.Bowman); and Lot 55, D.P.252692 (previously owned by Canravo Pty Ltd).

A detailed map of Rix's Creek property ownership can be seen on the following page. Areas hatched in blue, red and green are all owned by the Bloomfield Group.

During 2014 an application to increase total material movement from 15 million BCM to 16.1 million BCM was approved resulting in modification number 6. During 2014 Rix's Creek commenced the Rix's Creek Continuation Project (SSD# 6300) in order for the mine to continue another 21 years pending the approval of a new development consent. The draft Environmental Impact Statement (EIS) is expected to be completed early 2015.



Land Ownership December 2014.

Table 1 Current Approvals

APPROVAL	ORGANISATION	EXPIRY DATE
Development Consent DA 49/94	Planning NSW	October 2019
Development Consent DA 49/94 Mod 6	Planning NSW	October 2019
Coal Lease No. 352	Dept. Industry & Infrastructure	October 2031
Mining Lease No. 1432 (Section 100 Tailing's Emplacement Area 4 Approval August 2012)	Dept. Industry & Infrastructure	July 2019
Environmental Protection Licence No. 3391	Environment Protection Authority	Anniversary 3rd April each year. Last reviewed December 2014
Licence No 20SL050160	NSW Office of Water	January 2018
Licence No 20SL049786	NSW Office of Water	October 2017
Licence No 20SL060625 Converted to:- Water Access Licence 20AL201498 WAL 11084, Works Approval 20WA201499	NSW Office of Water	June 2017
Licence No 20WA209900	NSW Office of Water	December 2016
Notification of Dangerous Goods held on site replacing Dangerous Goods Licence NDG032405	WorkCover	Renewed, until 4/10/2015
New England Highway Closure Approval. ROL 511703	RMS	Renewed 6 monthly. Current ROL until 30/6/2015
Licence No. 20BL170863	NSW Office of Water	December 2016
Licence No. 20BL170864	NSW Office of Water	December 2016
License No. 20BL172457	NSW Office of Water	Perpetuity
License No. 20BL172458	NSW Office of Water	Perpetuity
License No. 20BL172459	NSW Office of Water	Perpetuity
License No. 20BL172460	NSW Office of Water	Perpetuity
License No. 20BL172461	NSW Office of Water	Perpetuity
License No. 20BL173812	NSW Office of Water	Perpetuity
License No. 20BL173733	NSW Office of Water	Perpetuity
License No. 20BL173734	NSW Office of Water	Perpetuity

1.2 Mine Contacts

Rix's Creek Pty Limited

Site:-	Rix's Creek Lane Singleton NSW 2330	Postal Address:-	P O Box 4 EAST MAITLAND NSW 2323.
Telephone:-	02 65788800		
Fax:-	02 65711066		

Rix's Creek Community & Blasting Hotline:-
02 49302665 (24hr)

Mine Manager:- Luke Murray
Responsible for overseeing all operations on site.
Telephone No:- 02 65788802
Mobile:- 0427 292152
E-mail:- lmurray@rixs.com.au

Technical Services Manager:- Chris Moy
Responsible for survey and mine planning.
Telephone No:- 02 65788808
Mobile:- 0415 872425
E-mail:- cmoy@rixs.com.au

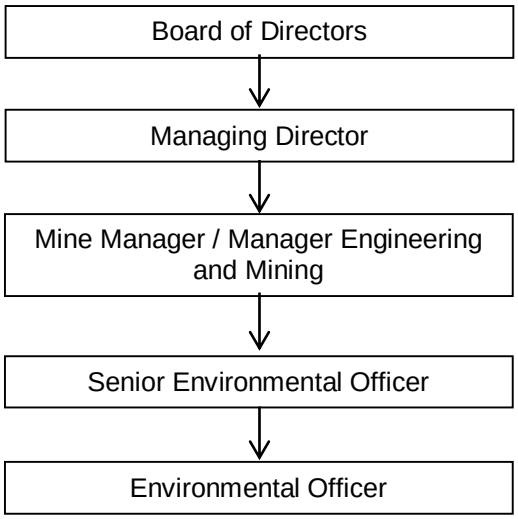
Senior Environmental Officer:- John Hindmarsh
Responsible for consulting with regulatory authorities as required, provide measures for continual improvement to site procedures and ensuring all personnel are trained and competent in relation to rehabilitation of the mine site.
Telephone No:- 02 65788806
Mobile:- 0427 436285
E-mail:- jhindmarsh@rixs.com.au

Environmental Officer:- Jason Desmond
Responsible for assisting monitoring and reporting on the environmental performance of the operation and co-ordinating the rehabilitation on the mine site. Provide support for the implementation of the Senior Environmental Officers responsibilities.
Telephone No:- 02 65788826
Mobile:- 0407 246311
E-mail:- jdesmond@rixs.com.au

Bloomfield / Rix's Creek Website:-
www.bloomcoll.com.au

1.3 Organisational Chart (Environment)

As per *Rix's Creek Mine Management Structure Register* document:



1.4 Employment Demography

Rix's Creek currently has 140 full-time employees comprising of staff and operators. The areas which include the largest number of employees are Singleton Council (35%), Maitland City Council (24%) and Cessnock City Council (16%). Rix's Creek mine endeavour to employ local personnel and local contractors are preferentially engaged as required. During 2014 approximately 82% of suppliers / contractors / consultant companies were within the Local Government Area (LGA) whilst approximately 18% fall outside of the LGA.

Table 2 Demographic Breakdown at Rix's 2014

Council Area	Employees
Cessnock City Council	23
Dungog Shire Council	3
Lake Macquarie City Council	5
Maitland City Council	33
Muswellbrook Shire Council	5
Newcastle City Council	6
Port Stephens Council	3
Singleton Council	49
Upper Hunter Shire Council	12
Wyong Shire Council	1
TOTAL	**140**

1.5 Actions Required at Previous AEMR Review

The last annual environmental inspection took place on 9^{h} July 2014; this inspection was undertaken to review the 2013 reporting period by NSW Trade & Investment – Division of Resources & Energy (DRE) conjoint with NSW Planning and Environment (DPE). A review of the report was undertaken followed by a site tour and close-out site inspection meeting. The review was undertaken by John Trotter (Inspector Environmental, DRE), Jenny Emerson (Compliance Auditor, DRE), Scott Brooks (Team Leader Compliance, DPE) and Ann Hagerthy (Senior Planning Officer Compliance, DPE).

Actions required at review by DPE:

No	Issue/Observation	Action	Responsibility	Due	Action
1	Include town water supply as a separate item in the site water balance table.	Provide additional information in the site water balance table.	John Hindmarsh / Jason Desmond	2014 AEMR	Section 2.8
2	Compare the groundwater level results with previous year's results.	Provide additional groundwater level information and discuss any trends observed.	John Hindmarsh / Jason Desmond	2014 AEMR	Section 3.5.2
3	Noise monitoring results.	Attended noise monitoring results to include only the mines noise contribution rather than total noise levels. Include applicable noise criteria. Noise level ranges is not required.	John Hindmarsh / Jason Desmond	2014 AEMR	Section 3.10.2
4	Diesel fill-point showing evidence of diesel spill.	Rix's Creek to immediately grade the ground surface to the concrete sump and Rix's Creek to consider alternative best practise options such as a bunded concrete apron at the fill-point.	Rix's Creek personnel / John Hindmarsh / Jason Desmond	ASAP and 2014 AEMR	Section 3.17.1
5	Sediment laydown area outside of main workshop.	Area to be lined with clay to prevent any contaminants leaching through the soil profile.	John Hindmarsh / Jason Desmond	2014 AEMR	Section 3.3.4
6	Dust arising from recently drilled benches when strong wind gusts.	Recommend Rix's Creek water drill patterns and associated cuttings to form a surface crust when strong winds forecasted to reduce dust generation.	Rix's Creek personnel / John Hindmarsh / Jason Desmond	ASAP and 2014 AEMR	Section 3.2.4 and 3.9.4

Actions required at review by DRE:

No	Issue/Observation	Action	Responsibility	Due	Action
1	Plan/s showing activities (including land preparation, mining and rehabilitation) for the next AEMR period not provided.	Provide appropriate plan/s in the 2014 AEMR.	John Hindmarsh / Jason Desmond	2014 AEMR	Section 5.2
2	AEMR has not provided sufficient information to fully address AEMR Guidelines Section 5.2.	Provide additional information in future AEMRs to satisfy AEMR Guidelines Section 5.2.	John Hindmarsh / Jason Desmond	2014 AEMR	Section 5.2
3	Variation between 2013 MOP year and actual year with respect to total area disturbed.	Advise DRE as to the reason for this inconsistency.	John Hindmarsh / Jason Desmond	1 August 2014.	Appendix 4
4	Possible adverse impacts upon Rix's Creek rehabilitation from neighbouring mines evaporative sprays.	Rix's Creek management to discuss issue with Integra Coal management.	John Hindmarsh / Jason Desmond	2014 AEMR	Section 5.2

SECTION 2 OPERATIONS DURING THE REPORTING PERIOD

2.1 Exploration

During 2014 exploration was undertaken ahead of mining in the West Pit to better understand future resources available. This included contracted exploration drilling of 30 holes drilled at depth to better determine the extent of the resource.

The Rix's Creek lease holding has a modelled resource of 39.1 million tonnes. Under the proposed Development Consent 29 million tonnes is recoverable by open cut method in the West Pit and 1.6 million tonnes in the North Pit. There is also 8.5 million tonnes potentially gained via underground methods and relevant approvals in the North Pit under currently shaped and rehabilitated land.

Mine life is considered to be approximately 21 years. This is dependent on production rates. Currently the mine produces approximately 1.5 million tonnes saleable per annum with a total movement of 15 million bank cubic metres of material. This can increase up to a maximum movement of 16.1 million bank cubic metres of material movement on the site as per Development Consent Modification 6 approved in November 2014.

2.2 Land Preparation

Pre mining land preparation took place during the reporting period covering an area of 35.9 ha.

All the land area to be disturbed for Pit 1 has been disturbed. No further land disturbance will be necessary. Those area's shaped into final landform design have been rehabilitated as per the normal procedure.

Operations in Pit 3 during the year took place on previously disturbed land with an additional 35.9 ha pre-cleared for the progression of mining operations toward the North-west. Further clearing ahead of the mining operation will be required in 2015 in the West Pit covering an approximate land area of 41.8 ha. Land may also be disturbed for the construction of Rix's Creek rail loop if the development proceeds to go ahead.
Any available topsoil was removed and placed directly on shaped overburden areas as part of the rehabilitation during the year. Excess topsoil was stockpiled and will be reused in the future as reshaped areas become available. Any timber during the pre-clearing process suitable for fencing was re-used on-site as required. Excess timber was stockpiled on-site in manageable stockpiles. Some timber was placed onto rehabilitation areas for habitat construction.

2.3 Construction

The Coal Preparation Plant has undergone modifications to further enhance coal recovery and reduce water usage to maximise washing efficiency. The new design was thoroughly tested throughout 2013 with modifications undertaken where necessary. Stage 1 of a small-scale tailing's drying process was commissioned during November 2013 with early results proving very successful. This process led to Rix's Creek receiving two more solid-bowl centrifuge tailing's drying units and commissioning during November 2014 to minimise the need for tailing's dams and maximise in-pit dumping of washing plant waste product.

No other new infrastructure construction took place during 2014.

2.4 Mining

Rix's Creek Mine during 2014 operated three shifts a day, 15 shifts a week for 48 weeks. Day shift operated between 06:30 and 14:30, afternoon shift operated between the hours of 14:30 and 22:30 hours and night shift 22:30 and 06:30. The operation employs a total of 140 personnel.

The major operation took place in Pit 3 (West Pit), western side of Rix's Creek adjacent to Pit 2 (South Pit). The last coal to be removed from Pit 1 (North Pit), north of New England Highway via open-cut

means was extracted in February 2014. Pit 2 continued to receive tailings until May 2014 since commencing as the tailings emplacement in July 2005. Tailing's Emplacement Area # 4 in the Pit 1 void was approved in August 2012 with the facility receiving it's first tailing's during May 2014. This void is expected to continue receiving a low amount of tailing's pending the tailing's drying process which may prolong the facilities livelihood. This tailing's facility will hopefully be the last on-site whilst mining via open-cut methods.

There has been no major change to mining methods on site during the year, however there has with mining equipment. During January 2014 Rix's Creek commissioned a new Liebherr R9800 excavator to replace the Marion 305 Dragline. The Liebherr is fitted with a 47.5 cubic meter bucket which is 15.1 cubic meters (68%) greater than the EX5500 already utilised on site. The Hitachi EX5500 and Hitachi EX3600 are the two main excavator's that are used to remove overburden alongside the R9800. The Hitachi EX5500 excavator is still effectively utilising the greater capacity 32.4 cubic meter bucket installed during 2011, whilst the EX3600 excavator continues to effectively move overburden unchanged. The cut and cover tunnel has provided a more effective travel route for equipment travelling between the active North and West Pits.

Overburden and inter-burden were removed utilising the Marion 305 Dragline (during January), Liebherr R9800, Hitachi EX5500, a Hitachi EX3600, and large front end loaders (Caterpillar 994 & 992). These machines load 220 and 180 tonne rear dump trucks. Associated with this machinery is the normal suite of ancillary equipment (bulldozers, graders, water carts and drills) used in the overburden and coal removal process. The site has replaced its Caterpillar D9 bulldozers with D10 and D11 models for more effective production and maintenance feasibility.

Table 3 is a list and number of the major pieces of equipment utilised on site for the mining operation.

Table 3. Equipment List 2014

EQUIPMENT LIST 2014	
Caterpillar 789 Truck	6
Caterpillar 793 Truck	11
Caterpillar 994 Front-End Loader	2
Caterpillar 992 Front-End Loader	2
Caterpillar 988 Front-End Loader	1
Caterpillar 950 Front-End Loader	1
Marion 305 Dragline*	1
Liebherr R9800 Excavator**	1
Hitachi EX5500 Excavator	1
Hitachi EX3600 Excavator	1
Caterpillar D 11 Bulldozer	5
Caterpillar D 10 Bulldozer	5
Caterpillar Tiger R690B Bulldozer	1
Caterpillar 16G Grader	2
Caterpillar 24H Grader	1
Redrill SK75	1

Redrill SK50	1
Caterpillar 785 Water Cart (114,000 l)	2
Caterpillar 777 Water Cart (80,000 l)	1
ACCO Water Cart (10,000 l)	1

*Marion 305 dragline finalised work during January 2014.
**Liebherr R9800 commenced work during January 2014 to replace the dragline.

2.5 Mineral Processing

The basis of the Coal Preparation Plant design is:-

- 600 tph plant to process coking and steaming coal,
- raw coal feed size washed -50 mm to +0,
- -50 mm to +1.5 mm washed in heavy medium cyclones,
- -1.5 mm to +0.350mm is cleaned in spirals,
- -0.350 mm is cleaned by mechanical flotation (3 rougher cells and 2 cleaning cells),
- raw coal feed 600 tph maximum = 100 % of nominal feed rate,
- -50 mm to +1.5 mm = 70 % maximum = say 420 tph maximum,
- -1.5 mm to + -0.350 mm = 20 % maximum = say 120 tph,
- -0.350 to 0 mm = 10 % = say 60 tph,
- -feed rates

	Nominal (tph)
design feed to plant	650 (dependant on feed quality)
design feed to heavy medium cyclones	420 (designed to be 70-75% of ROM feed)
design feed to fines plant	180

- allow -0.350 mm to 0 mm = 10 % of plant feed = 60 tph maximum
- should the design feed rate to any circuit be exceeded, due to sizing variations, the plant feed rate would be reduced while the anomaly persisted.

Table 4. Production and Waste Summary

Figures in () are for the current year	Cumulative Production (cubic metres)		
	Start of Reporting Period	**At end of Reporting Period**	**End of next reporting (estimated)**
Topsoil stripped (bcm)*	362,865	398,755 (35,890)	440,555 (41,800)
Topsoil used/spread (bcm)*	237,213	265,753 (28,540)	313,253 (47,500)
Waste Rock (bcm)	182,112,470	195,346,555 (13,234,085)	208,846,555 (13.4 million)
Run Of Mine Coal (tonne)	38,966,543	41,727,236 (2,760,693)	44,427,236 (2.7 million)
Processing Waste Tailings / Chitter (tonne)	15,644,169	16,923,284 (1,279,115)	18,123,284 (1.2 million)
Coal (tonne)	23,280,374	24,761,952 (1,481,578)	26,261,952 (1.5 million)

** Topsoil figures are not from the commencement of the mining operations.*

The recovery of saleable to run of mine coal for the year was 53.7% lower than last year 55.5%. This is lower than the long-term average to date of 60% and a dramatic decrease from the previous three years ~6%. This may be due to different coal quantities washed from the Pit 3 area (i.e. high ash, sulphur, moisture).

Raw coal is dumped by truck or loader into a 600 tonne receival hopper. From the hopper the coal is conveyed at 600-650 tph to a raw coal sizing screen. The raw coal screen is fitted with a double deck and wet screened. The top deck allows wet and +50 mm raw coal to enter the rotary breaker. The lower deck conveys wet -50 mm to +10 mm raw coal to be directed via a chute to the plant feed conveyor. The -10 mm slurry is directed into a conical sump and pumped to the plant.

The -50 mm from the sizing screen and the rotary breaker combine and are conveyed to the coal preparation plant. Material not broken in the rotary breaker is conveyed separately and removed by truck.

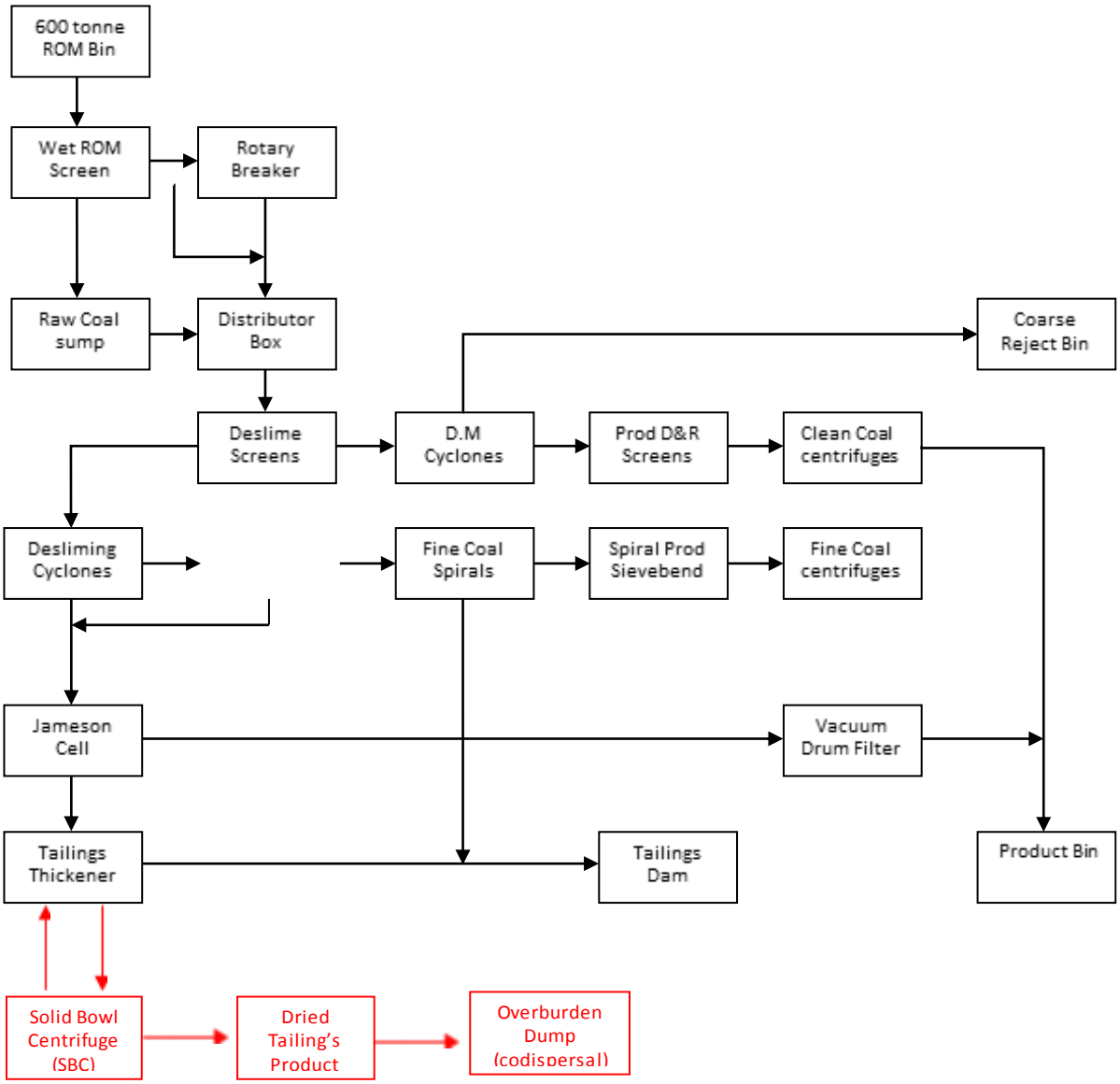
In the coal preparation plant the -50 mm to 0 mm raw coal from the primary raw coal sizing and breaker system is further sized on de-slime screens with each size fraction being cleaned in separate circuits.

Heavy media cyclones treat -50 mm to +1.5 mm fraction. Spiral clean -1.5 mm to 0.350 mm. The –0.350 mm is cleaned in the mechanical cell flotation. The washed product is dewatered in centrifuges and vacuum drum filter then conveyed to a 1,000 tonne bin.

Process Waste: The coarse reject is conveyed to a 500 tonne truck-loading bin. The thickened tailings are pumped to the tailings emplacement. The solid-bowl centrifuge dried tailing's is disposed of in pit (codispersal) via haul trucks.

Coarse reject from the coal preparation plant reports to the reject bin. From this bin it is trucked to the open cut area to be disposed of within the spoil material. Coarse reject disposal within the spoil material is controlled by the production supervisor, with tip areas being located on the basis of environmental constraints, the potential for spontaneous combustion and the stability of tip faces within the spoil area. All carbonaceous and reject material is covered by a minimum of 2 m of inert overburden material before the spoil area is shaped and rehabilitated.

The fine reject consists of a slurry of clay, silt and composite mineral and coal particles -2.2 mm to ~0 mm in size with water to a pulp density of 1.25% specific gravity and approximately 25% solids to water ratio. This slurry is pumped from the underflow of the tailings thickener through a pipeline to the tailings emplacement dam. The previous tailings emplacement (#2) ceased operation in July 2005 when tailings began being received into the old Pit 2 void (tailings emplacement #3). Tailing's emplacement #3 reached capacity during May 2014 with tailing's emplacement #4 (within Pit 1 void) now being used as the new tailing's storage area. If the dried tailing's process works effectively this tailing's facility should be adequate for the life of mine.
Tailing's emplacement #2 was successfully capped and partially rehabilitated in 2013 with rehabilitation of the area completed in 2014. Tailing's Dam #3 has been allowed to dewater and dry since May 2014. This area is being covered with overburden material and when this is completed then the area will be rehabilitated. This process is expected to be completed by 2016. Rix's Creek have installed a third-scale dry tailing's process in December 2013 to allow reject to be trucked to the open cut area and disposed of within the spoil material. Since the one-third scale 'trial' proved effective in early 2014 another two units were installed during December 2014 to allow nearly all washed reject to be placed in-pit with overburden. This product is estimated to be 70% solids 30% moisture in comparison to traditional tailing's slurry which is generally 25% solids and 75% moisture content.



*Currently in transition from one-third scale 'trial' stage to full >90% drying stage.

Coal Preparation Plant Schematic

Table 5. Production History

YEAR	RON-of-MINE COAL PRODUCTION (tonnes)	OVERBURDEN REMOVAL (bank cubic metres)	APPROVAL LIMIT (bank cubic metres)
1990	300,000		
1994	800,000		
1997	1,700,000	7,198,000	15,000,000
1998	1,800,000	7,052,000	15,000,000
1999	1,888,900	7,635,000	15,000,000
2000	2,288,900	7,635,000	15,000,000
2001	1,679,400	7,460,000	15,000,000
2002	1,754,001	7,787,685	15,000,000
2003	1,943,095	8,768,068	15,000,000
2004	1,931,383	8,511,771	15,000,000
2005	1,628,753	9,567,000	15,000,000
2006	2,015,042	11,547,989	15,000,000
2007	2,096,320	11,150,416	15,000,000
2008	2,096,697	11,020,152	15,000,000
2009	2,338,424	10,698,123	15,000,000
2010	2,367,229	10,267,881	15,000,000
2011	2,212,703	10,589,386	15,000,000
2012	2,689,935	10,341,895	15,000,000
2013	2,747,880	11,502,321	15,000,000
2014	2,760,693	13,234,085	16,100,000*

*Development Consent Mod 6 approval granted November 2014.

The tailings is transported by pipeline and safeguarded by:-

- use of welded PVC pipe;
- containment dams located along the length of the pipeline;
- regular pipeline inspections; and
- sequential flow meters.

The solid-bowl centrifuge system will enable a lower amount of tailing's to be transported by pipeline as the water removed during the tailing's 'drying' process allows for co-disposal of the 'dried' tailing's within the open cut emplacement area in a similar fashion to overburden. Early testing of dump areas has shown minimal surface slumping / cracking when this dried tailing's material is capped with sufficient overburden material from the mining process.

Return water is decanted from the emplacement area and pumped back to the containment water system that feeds the coal preparation plant. This maximises the recycling of mine water across site. Even with the tailing's line not pumping at times water enters this area via rainfall and runoff as it is a large catchment.

Following the start of mining in 1990 coal was transported by road to Bloomfield Colliery at East Maitland for beneficiation and shipping to the port of Newcastle. This ceased in 1993 following the commissioning of the coal preparation plant and construction of the joint rail loop with Camberwell Coal and rail loading facility. Since 1993 all product coal has been transported, by rail to the port of Newcastle. There has been no change to the method of transport since the rail loading facility commenced operation.

Application was made during 2000 to increase the level of the 2nd tailings emplacement by 15 metres. This increased the life of the emplacement by 3 years and allowed the area (now rehabilitated) to better fit in with the surrounding landscape. The emplacement ceased operation in July 2005 when tailings receival commenced in the Pit 2 void (or 3rd Tailing's emplacement). The old emplacement was allowed to drain prior to commencing capping and rehabilitation. Capping with overburden, final landform design and rehabilitation was completed during 2014. Some areas will be direct seeded with

native tree species during autumn 2015 which is additional to the 3 ha of tree species already direct seeded and tube stock planted to date.

A similar production level will be maintained for 2014 with the budget being 1.5 million saleable tonnes from 2.7 million tonnes of ROM coal. The total bank cubic metres moved across site will be limited to 16.1 million tonnes with the previous limit being 15 million tonnes in 2013.

2.6 Waste Management

Waste Water: Grey water generated on site consisting of domestic waste water from the bathhouse, associated amenity areas and administration area pass through a septic system approved by the local authorities (OSSM Approval No: 2820/2002 expiry 1/3/2017). The septic tank provides a primary and secondary process with solid waste processed by anaerobic bacteria. Effluent then passes to a maturation pond prior to disposal by evaporation and land irrigation. The Septic system is cleaned out 6-monthly by a suitably qualified waste contractor and removed from site.

Waste Oil: Waste oil from mining equipment as a result of scheduled maintenance operations, breakdown repairs and the oil arrestor is collected in a storage tank and there after removed for recycling by a waste oil collector, Australian Waste Oil Refineries. This oil is processed and returned to site and used in blasting operations at the required specifications. During 2013 a variation to Rix's Creek EPL 3391 has specifications on the refined oil used in this process.

Most mining machinery is greased automatically by an on board system. The system is refilled from a bulk bin on the mobile service cart. Alternatively, this is carried out in the main workshop.

Any oily water from spills or contained within bunded storage areas are also collected by a waste oil collector, Australian Waste Oil Refineries. Water high in sediment, coal fines, clays is also handled via a contractor company, Transpacific Industries and handled on-site via the Tailing's Dam facility which has similar quality stored water via the tailing's line from the CHPP.

Waste Metal: Scrap metal is collected for recycling on a regular basis as required. The metal recycler sorts into hard and soft metal for further economic benefit to the company.

Copper Bin: Assorted copper on site, mostly from electrical wiring, is recycled by a metal contractor and collected on a regular basis as required. Most wiring remains with the protective layer attached but where economical a contractor strips assorted wire on-site for further economic benefit to the company. During December a new copper waste bin was placed in the electrical workshop to further minimise waste.

Waste Tyres: Discarded earthmoving machinery tyres not suitable for reuse are disposed of progressively in the void of the mining process and buried, as at present there is no recycling process available for heavy earthmoving machinery tyres in the Hunter Valley. The number of tyres disposed of simultaneously being restricted to 6 to reduce bulk, with the void then progressively backfilled with overburden and rehabilitated in the normal process. Some tyres are recycled across site and used for roadside protection, haul truck parking dividers, signage bases, etc.

General Waste: General garbage is placed in large bins and taken off site by a waste contractor for disposal in the Council landfill site.

Paper/Cardboard Recycling: Paper and Cardboard is placed in large bins and taken off site by contractor for further recycling. Small paper/recycling bins are placed within the main office and workshop to enhance recycling.

Oil Filter Bin: Used oil filters from heavy vehicles are placed in a large bin near the main workshop and taken off site by contractor for cleaning and recycling at the waste contractor's facility.

Used printer cartridges: These are placed in a large bin within the main office and taken off site by contractor for recycling at the waste contractor's facility as required.

Rix's Creek is looking at further waste segregation of plastic and rubber on site with assistance from the waste contractor.

Table 6. Waste Volumes

2014	Waste Oil (L)	Waste Metal (kg)	General Waste (kg)	Paper/Cardboard Recycling (kg)	Oil Filters (kg)
1st Quarter	68,200	48,440	18,622	1,565	1,980
2nd Quarter	52,100	5,080	13,580	1,577	1,780
3rd Quarter	51,700	0	15,617	1,992	2,970
4th Quarter	51,400	18,160	13,625	1,938	1,120
TOTAL	**223,400**	**71,680**	**61,444**	**7,072**	**7,850**

2.7 Product Stockpiles

Raw coal is transported from the active mining areas in 180 and 220 tonne and rear dump trucks (Caterpillar 789 and 793) to the 30,000 tonne capacity run of mine (ROM) stockpile at the coal preparation plant prior to washing.

Product coal (clean coal) is conveyed to a 1,000 tonne bin and then transported by road vehicles 2.0 kilometres to the rail loading facilities. Each road vehicle holds approximately 48 tonnes of clean coal. The capacity of the clean coal stockpile at the rail loading facility is 185,000 tonnes. During 2002 sections of the stockpile area were resurfaced and additional drainage installed. This work was completed in May 2004. The completion was delayed due to stockpile levels.

2.8 Water Management

A Water Management Plan was developed for the site during the year (2010) as part of the development consent modification approval requirements for the cut and cover tunnel. This included a site water balance for the operation. A sample static water balance was calculated for (2013) providing information on inputs and outputs for the site and the results are shown in Table 7.

Table 7. Sample Static Water Balance (2013)

Sample Static Water Balance (2013)	
INPUTS	**VOLUME (ML p.a.)**
Groundwater	22
Rainfall-Runoff	935
Imported Poor & Fresh	0
Water from ROM Coal	202
Potable (Town) water	7
Recycled to CHPP (Tailings + runoff +seepage – not included in total*)	859*
Total Inputs (excludes Recycled to CHPP)	**1,166**
OUTPUTS	
Dust Suppression	482
Evaporation – Mine Water Dams	396.4
Evaporation – Tailings Dams	
Entrained in Process Waste	430.4
Water in Product Coal	130.3
Discharged	0
Pumped to Storage (increase)	0
Water in Tailings (not included in total*)	555.6*
Water in Coarse Reject (not included in total*)	375.9*
Total Outputs	**1,439.1**
Δ Storage (ML)	-273.1
Δ Storage (%)	-24

* Note. As a first preference contaminated water is used in the coal preparation plant and for dust suppression before water

from clean water dams is utilised.

Water requirements on site are normally met from stored water. There are 3 clean water dams, total capacity 95 ML and 2 mine water dam's capacity 44 ML. CWD 4 is now in the dirty water system and the capacity is approximately 335 ML. The West Pit dam or DWD 3 capacity is 33.5 ML and this is the primary source of water for the newer water cart fill station in the West Pit. The old north pit void is also used to store mine water and has a capacity of some 1,100 ML. This was previously thought to be 2,473 ML prior to underground water seepage during May 2012 restricting the volume of water stored in this area.

Table 8. Model Catchment Areas to Rix's Creek storages and runoff volumes from 2013

Catchment	Area (ha)	Runoff (ML)	Classification
North Pit Storage	62 16.6 37 131		Mining Pit (Surface only) Spoil – Unrehabilitated Roads/Industrial/Hardstand (Surface only) Spoil – Unrehabilitated
Subtotal*	**246.6**	316.7	
Old North Pit	94 18.8		Spoil - Unrehabilitated Roads/Industrial/Hardstand (Surface only)
Subtotal*	**112.8**	138.3	
CWD4-DWD4 + DWD1	15.9 159.9 6		Spoil – Unrehabilitated Spoil – Unrehabilitated Roads/Industrial/Hardstand (Surface only)
Subtotal*	181.8	187.9	
Tailing Dam 4	25		Tailing Dam Surface
Subtotal*	**25**	46.6	
Coal Loader Storage	17.7 1		Spoil – Unrehabilitated Roads/Industrial/Hardstand (Surface only)
Subtotal*	**18.7**	18.8	
West Pit Storage	40 32.5 30 50		Mining Pit (Surface only) Spoil – Unrehabilitated Roads/Industrial/Hardstand (Surface only) Spoil – Unrehabilitated
Subtotal*	**152.5**	199.8	
South Pit	25.8 4 3		Spoil – Unrehabilitated Spoil – Unrehabilitated Roads/Industrial/Hardstand (Surface only)
Subtotal*	**32.8**	26.9	
TOTAL	**770.2**	**935**	

Table 9 provides a summary of water stored on site during the reporting period.
Water levels in storage were low throughout the year due to periods of below average rainfall in comparison to 2013 which had above average rainfall. During the year no water was pumped from Glennies Creek using allocation owned by the Company and temporary transfer. The Company has acquired general security water licences with a total of 100 ML allocation. Water licenses are also held that allow for the harvesting of some 655ML on site.

No water was taken from Vale – Integra 'Glennies Creek' underground mine during 2014. The last water transferred was during 2006 when Rix's Creek received 110 ML of recycled water from the Underground Mine.

Mine water dams are used to manage contaminated water from disturbed areas and water make from the active mining areas. Water is also pumped from old underground workings on site to supplement

surface storage when necessary. These workings are also used to store water during wet periods. In times of above average rainfall excessive contaminated water from active mining operations within Pit 1 and Pit 3 is transferred to the tailing's dam. This water is recycled to the coal preparation plant and provides one of the major sources of supply for the coal preparation plant. When required water is also stored in the new tailing's dam # 4 storage area, however, this is not preferential.

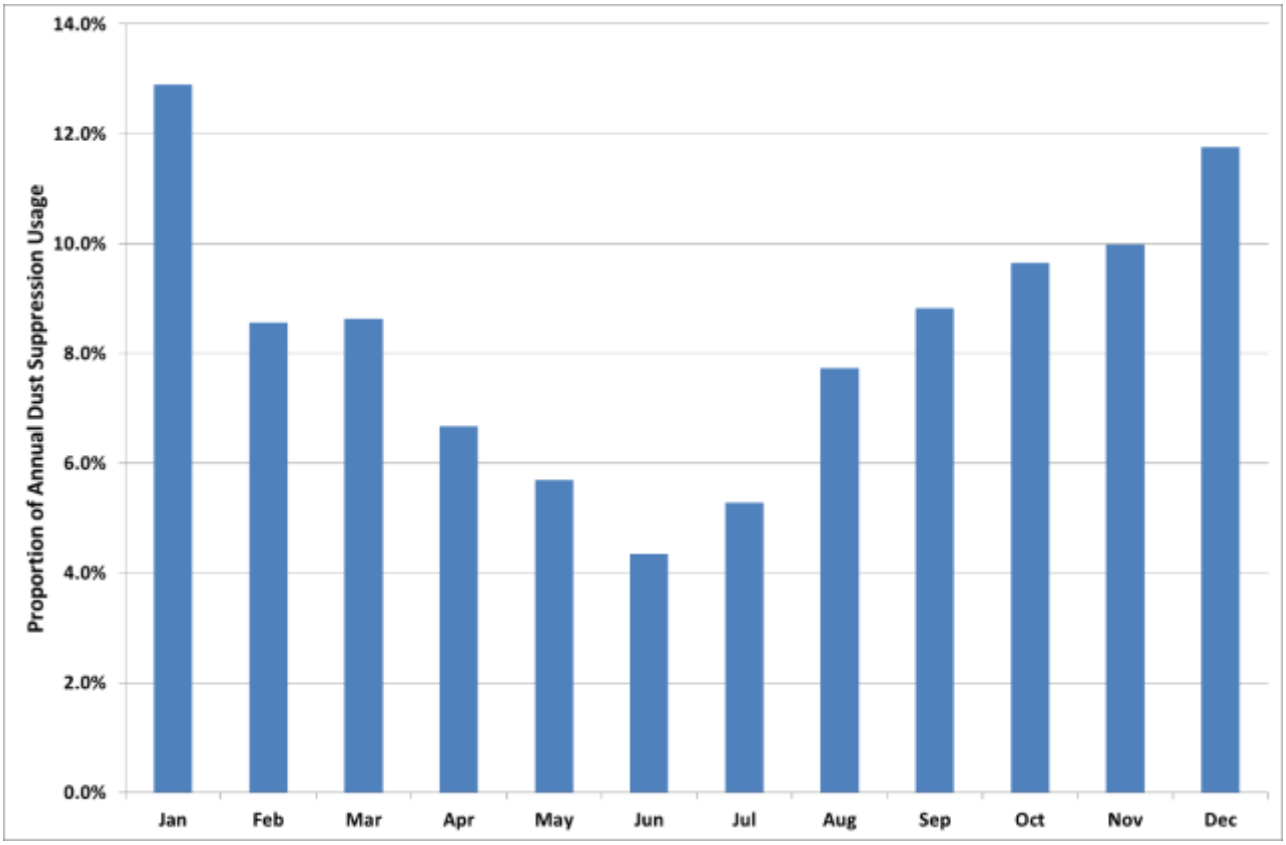
In terms of a mid-term contingency plan, Rix's Creek plan on modelling forecast water storages each year to determine whether water is required to be imported or discharged from site via an off-site model managed by a water consultant. In terms of long-term contingency plan Rix's Creek may require a discharge point to be installed in order to manage water in times of above average rainfall in which water storages are near 100% water capacity and unable to handle large rainfall events.

Table 9. Stored Water during 2014

(If more than one storage of each type, list separately)	Volumes held (cubic metres)		
	Start of Reporting Period	**At end of Reporting Period**	**Storage Capacity**
Clean water	CWD 1 – 9 ML CWD 2 – 8 ML CWD 6 – 65 ML Sediment Dam Pit 3 – East – 9 ML Sediment Dam Pit 3 – West – 9 ML Sediment Dam – North – 9 ML	CWD 1 – 8 ML CWD 2 – 7 ML CWD 6 – 62 ML Sediment Dam Pit 3 – East – 8 ML Sediment Dam Pit 3 – West – 8 ML Sediment Dam – North – 8 ML	CWD 1 – 10 ML CWD 2 – 10 ML CWD 6 – 75 ML Sediment Dam Pit 3 – East – 10 ML Sediment Dam Pit 3 – West – 10 ML Sediment Dam – North – 10 ML
Dirty water	DWD 1 – 28 ML DWD 2 – 16 ML CWD 4 – 280 ML Rail Loader – 30 ML Old North Pit - 712 ML West Pit Dam – 32 ML	DWD 1 – 29 ML DWD 2 – 14 ML CWD 4 – 215 ML Rail Loader - 28 ML Old North Pit - 852 ML West Pit Dam – 32 ML	DWD 1 – 28 ML DWD 2 – 16 ML CWD 4 – 335 ML Rail Loader – 38 ML Old North Pit - 1,100 ML West Pit Dam – 33.5 ML
Controlled discharge water (salinity trading schemes)	Nil	Nil	Nil
Contaminated water	Nil	Nil	Nil
Regulated Allocation water from Glennies Creek	Nil		

Potable water for the bathhouse and administration building was delivered on site from Singleton town water supply. A pipeline allows potable water to be supplied directly from this supply. This can be seen in Table 7.

The major water use on site is the coal preparation plant requiring 20 ML per week. However a large proportion of this is recycled from the tailings emplacement situated in the North Pit (Pit 1) void. At present this void and subsequent decant has an approximate remaining capacity of 875 ML with this number decreasing as disused tailings from the coal preparation plant accumulate below the dirty water surface. Approximately 130.3 ML is lost in product coal per year.
Dust suppression consumes between 3 - 10 ML per week depending on seasonal conditions. This variance can be seen in the following graph. The highest percentage months are in the warmer periods such as January and December.



As a first preference contaminated water is used in the coal preparation plant and for dust suppression before water is utilised from the clean water storage dams. Fresh water usage is minimised as best as possible. Fresh water imported from Singleton Council reservoir is taken at an average rate of 7 ML/year. This is added to the 2013 Sample Static Water Balance.

2.9 Hazardous Material Management

Rix's Creek are the holder of Dangerous Goods Licence No:- NDG032405. Under the new legislation Occupational Health and Safety Amendment (Dangerous Goods) Regulation 2005 notification was renewed in August 2014 until 4/10/2015. The listing of dangerous goods stored on site is listed below:-

Depot 1	Above ground tank for Class C1, UN 00C1 Diesel.	110,000 litres
Depot 2	Above ground tank for Class C1, UN 00C1 Diesel.	90,000 litres
Depot 5	Above ground tank for Class C1, UN 00C1 Diesel.	90,000 litres
Depot 6	Above ground tank for Class 3, UN 1989 Aldehydes, N.O.S.	15,000 litres
Depot 8	Above ground tank for Class C1, UN 00C1 Combustible liquids	60,000 litres
GAS1	Cylinder store for Class 2.1, UN1001 Acetylene, dissolved	1,000 litres
GAS2	Cylinder store for Class 2.2, UN1072 Oxygen, compressed	1,000 litres
GAS2	Cylinder store for Class 2.2, UN1006 Argon, compressed	1,000 litres
RCN1	Above ground tank for Class 5.1, Ammonium Nitrate	50,000 kg
TKN1	Above ground tank for Class 5.1, Ammonium Nitrate Emulsion	60,000 kg
TKN2	Above ground tank for Class 5.1, Ammonium Nitrate Emulsion	30,000 kg

A separate licence for the storage and handling of explosives on the site has also been made to Workcover. License number:- XSTR100131 was renewed in June 2012 until 5/7/2017. The listing of explosives stored on site is listed below:-

MAG1	Magazine Class 1.1B, UN 360, Detonator Assemblies non-electric	10,000 units
MAG1	Magazine Class 1.4S, UN 349, Articles, Explosives, N.O.S.	10,000 metres
MAG1	Magazine Class 1.4B, UN 255, Detonators, Electric for blasting	10,000 units
MAG2	Magazine Class 1.1D, UN 65, Cord, detonating, flexible	3,000 metres
RCN1	Explosives Recepticle Class 5.1, Ammonium Nitrate (ANFO)	50,000 kg
TNK1	Above ground tank Class 5.1, UN 3375, ANFO Emulsion	80,000 litres

TNK2	Above ground tank Class 5.1, UN 3375, ANFO Emulsion	36,000 litres

Access to Material Safety Data Sheets is through the ChemAlert web site. The register is continually updated as new products are brought onsite.

Explosives are stored in explosive magazines located on site. The magazines comply with the relevant standards for storage of explosives AS 2187.

2.10 Other Infrastructure Management

There has been an ongoing maintenance program on infrastructure associated with the Rix's Creek mining operation. This has included painting of the coal preparation plant building and the maintenance shed located in the park up area as well as several other items of infrastructure.

Rix's Creek is required to use the Camberwell Coal rail loop to transport product coal to the port of Newcastle for export. The rail loading facility and clean coal stockpile is located off the mining lease adjacent to the northern boundary on land owned by the Company.

SECTION 3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

An extensive environmental monitoring program is conducted throughout the site and surrounding areas to monitor the impacts of the operation. Environmental parameters monitored include local meteorology, air quality, water quality, vibration and noise.

Plan 1 shows the location of monitoring sites for the various environmental parameters.

3.1 Meteorological

The mine operates a meteorological station on the site. The previous station was located on the northern side of the New England Highway, adjacent to the haul road, leading to the operations on the southern side of the Highway. This unit required replacement during 2014. The new meteorological station is located on the southern side of the New England Highway, adjacent to the Pit 3 operations near Granbalang trig station. This new weather station commenced during April 2014 and has real-time capabilities for all personnel to access via computer or phone. The station records the following environmental parameters:-

- wind speed and direction;
- temperature (2m and 10m);
- relative humidity;
- solar radiation; and
- rainfall.

These parameters are recorded at 10-minute intervals and downloaded on a monthly basis. To complement this Rix's Creek is a member of the Upper Hunter Sounding Group Joint Venture (UHSGJV) which provides access to an atmospheric prediction model providing more accurate weather parameter predictions for the Rix's Creek operation. This information is used by management to access environmental conditions for blast scheduling, and determine when adverse conditions exist to cease dumping to exposed locations. This model also forecasts meteorological data for the following day so operational activities can be scheduled for the predicted conditions.
Rix's Creek installed a new meteorological station near Pit 3 during 2014 so it is closer to the continuation of mining in this area.

3.1.1 Rainfall

Total rainfall for the period was 606.75 mm over 79 days, which was 91.25 mm below average for the year compared to 2013 where rainfall was 823.5 mm or 125.5 mm above average. The yearly average for Singleton is 698 mm. The monthly rainfall data is provided in Table 10 and Figure 1 shows the results graphically.

March, April, August and December were the only months to receive above average rainfall. March received extensive rainfall with nearly double the above average rainfall. January, May to July, and September to November received approximately less than half the monthly average rainfall.

Table 10 Annual Rainfall

RIX'S CREEK ANNUAL RAINFALL 2014													
Month	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
Total Rainfall	7.5	60	128.25	73.25	17.25	25	27	61.75	26	31.5	24	125.25	606.75
Average Rainfall	75	72	71	56	46	57	51	42	45	51	58	74	698
Wet days (>0.5 mm rainfall)	1	3	10	9	4	9	4	9	5	4	7	14	79

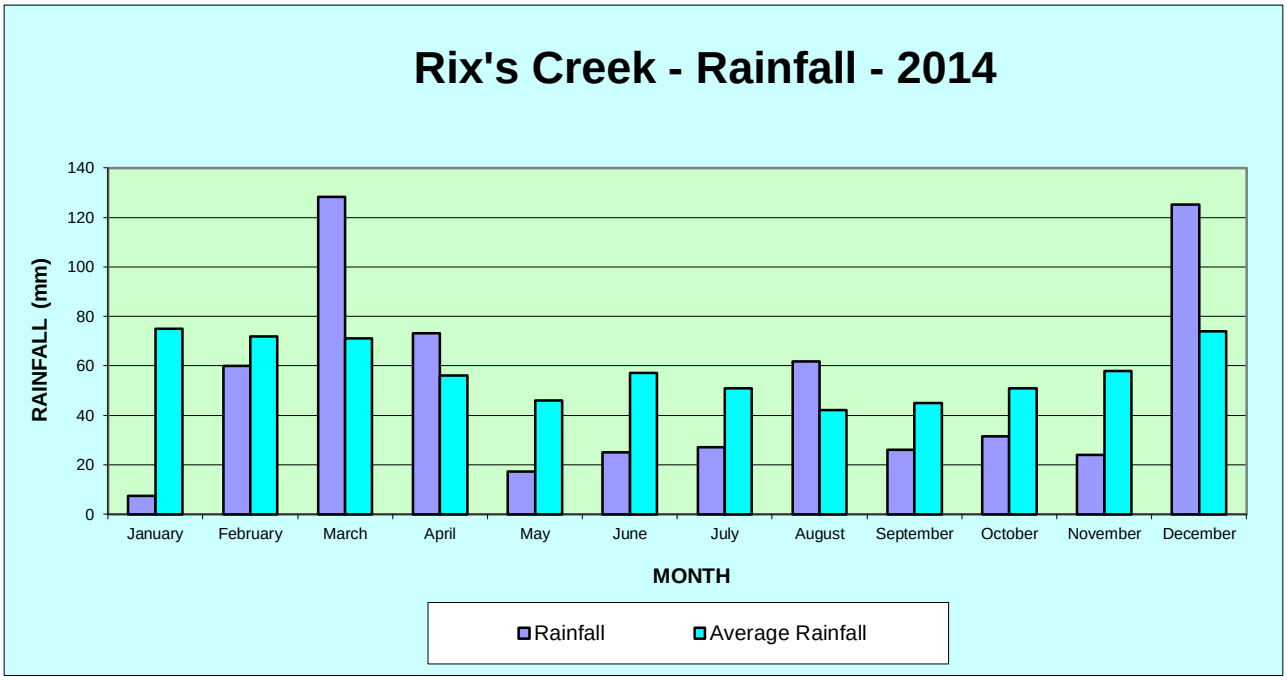


Figure 1 Annual Rainfall 2014

3.1.2 Temperature

The maximum temperature of 42.7 ºC occurred on 23rd November and the minimum temperature of 3.1 ºC was recorded on 6th May. Figure 2 shows the monthly average maximum and minimum temperatures for the site.

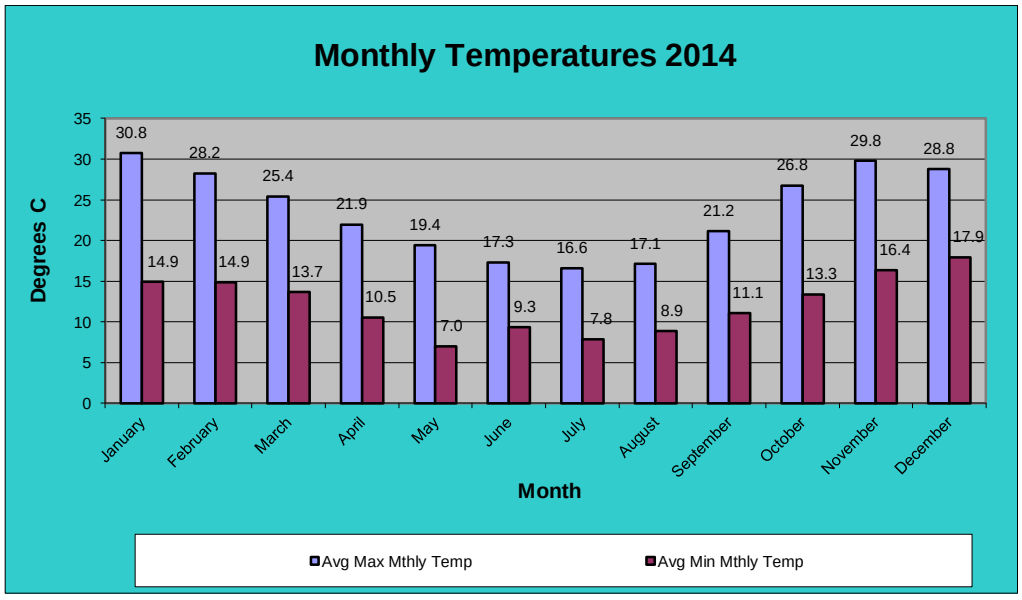


Figure 2 Monthly Average Maximum & Minimum Temperature 2014

3.1.3 Wind Speed and Direction

The results of wind speed and direction monitoring shows similar trends to previous years. During summer the winds predominate from the south east and winter the northwest. Autumn and spring are transitional seasons with winds distributed between both northwest and south-easterly directions.

Figure 3 shows the seasonal windroses generated for the site on a seasonal basis.

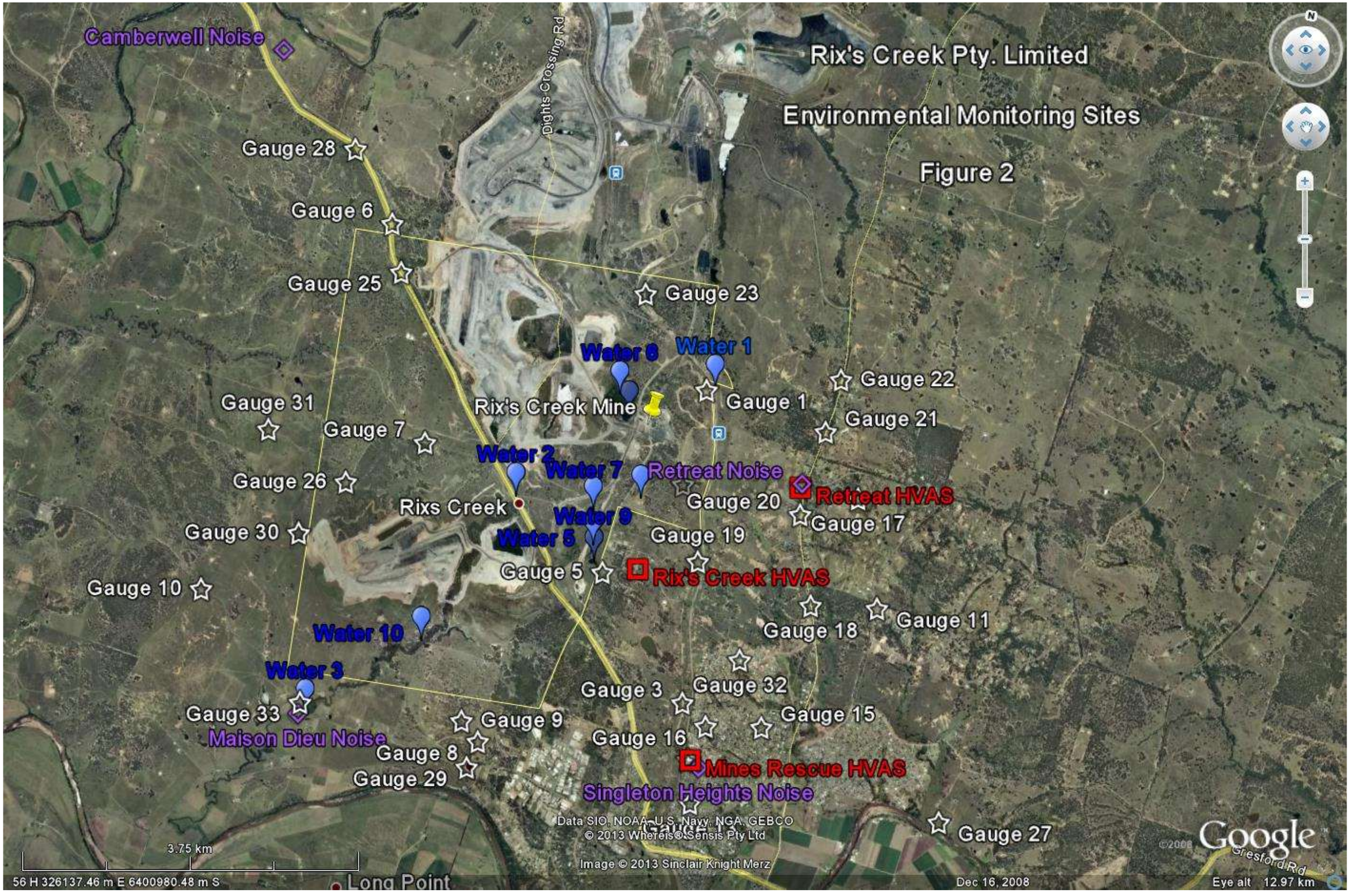

Rix's Creek Pty. Limited
Environmental Monitoring Sites
Figure 2
Camberwell Noise
Dights Crossing Rd
Gauge 28
Gauge 6
Gauge 25
Gauge 23
Water 8
Water 1
Gauge 22
Gauge 1
Gauge 21
Rix's Creek Mine
Gauge 31
Gauge 7
Water 2
Water 7
Retreat Noise
Retreat HVAS
Gauge 26
Rixs Creek
Gauge 20
Gauge 17
Water 9
Water 5
Gauge 19
Gauge 30
Gauge 5
Rix's Creek HVAS
Gauge 10
Gauge 18
Gauge 11
Water 10
Water 3
Gauge 3
Gauge 32
Gauge 33
Gauge 9
Gauge 15
Maison Dieu Noise
Gauge 16
Gauge 8
Mines Rescue HVAS
Gauge 29
Singleton Heights Noise
Gauge 27
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2013 WhereIS © Sensis Pty Ltd
Image © 2013 Sinclair Knight Merz
3.75 km
56 H 326137.46 m E 6400980.48 m S
Long Point
Dec 16, 2008
Eye alt 12.97 km
Google

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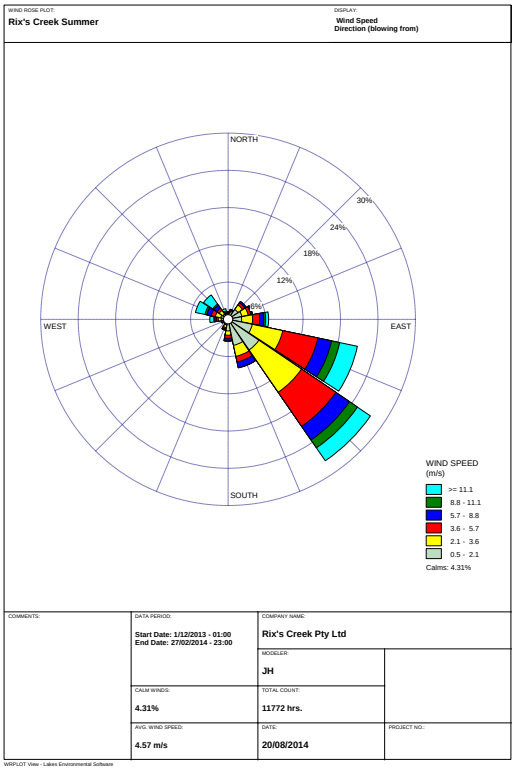
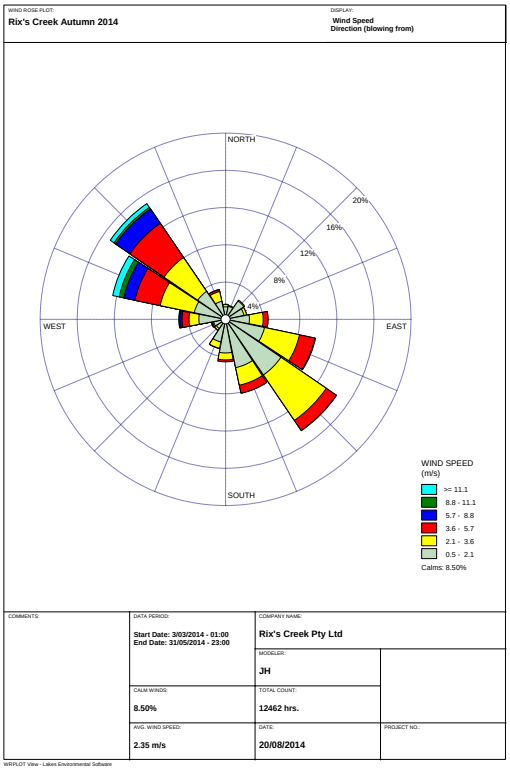
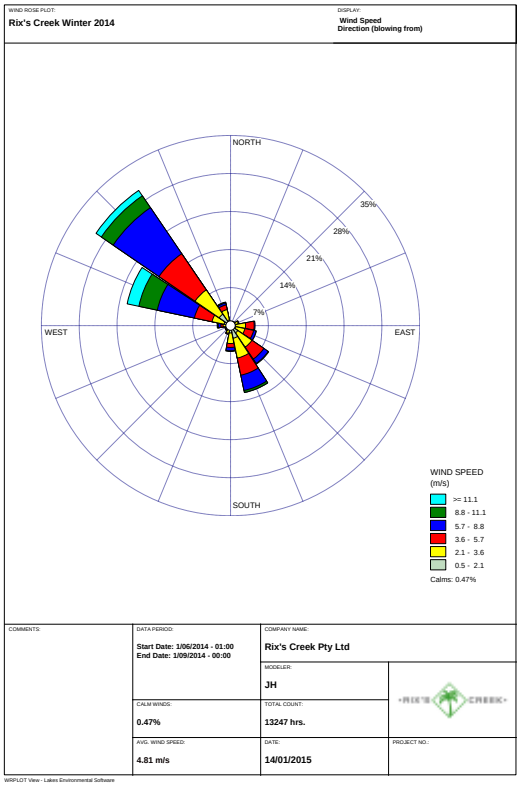
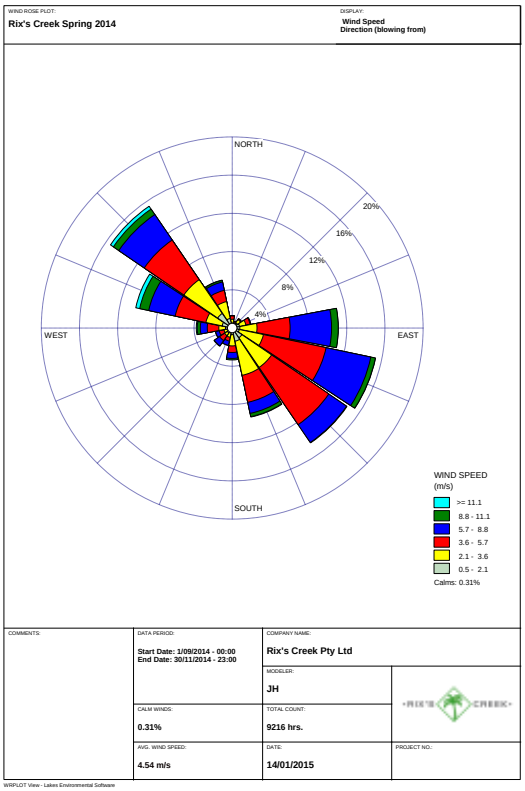
Figure 3 Windroses for Rix's Creek 2014









3.2 Air Pollution

Dust and noise are the main air quality parameters that the operation has the potential to impact. There are a range of operational procedures in place to minimise the potential to generate emissions and actions to mitigate impacts in the surrounding environment.

3.2.1 Environmental Management

An air quality monitoring program is in place for the Rix's Creek operation covering the area surrounding the operation. This program involves monitoring air quality for dust particulates. The air quality assessment criteria are listed in Table 9.

Table 9. Air Quality Assessment Criteria

POLLUTANT	STANDARD	AVERAGE PERIOD	AGENCY
Insoluble Solids Dust Deposition	4 g/m^2/month	Annual	DECC
Total Suspended Particulate Matter (TSP)	90 *u*g/m^3	Annual mean	National health & Medical Research Council (NHMRC)
Particulate Matter < 10 um (PM_{10})	30 *u*g/m^3	Annual mean	National Environment Protection Measure for Ambient Air Quality
	50 *u*g/m^3	(24 hour average, 5 exceedances permitted a year	

A total of 30 dust deposition gauges are located on and around the mining lease area. The location of these gauges are listed in Table 10 and shown in Plan 1.

The dust deposition gauges conform to Australian Standard 2724.1- 1984 Ambient Air - Particulate Matter, Part 1 - Determination of Deposited Matter expressed as insoluble solids and ash residue. Gauges have 150 mm funnels located 2 metres above the ground.

Samples are collected by AECOM, Singleton and analysed by ALS Laboratories which is a NATA registered laboratory.

High volume air samplers are located at three sites on the eastern side of the lease i.e. between the operation and the populated area of Singleton. These samplers run for 24 hours on a six day cycle and provide information on total suspended particulates (TSP) and particulates less than 10 micron (PM_{10}) in diameter and operate in accordance with Australian Standard 2724.3 and AS3580.9.3:2003 These units are located at:-

1) Rix's Creek Lane;
2) Singleton Heights - Mines Rescue Station; and
3) Off Bridgman Road - Lot 2, The Retreat.

The locations of the monitors are shown in Plan 1.

Environmental controls employed to minimise dust generation includes the application of recycled mine water to haulage roads and areas with heavy use by machinery, application of recycled mine water to drill pads (i.e. fine cuttings) and sprinkler systems on coal stockpile areas and the surrounds of the washing plant.

Conveyor systems at the washing plant and rail loader are enclosed on at least two sides to control dust.

Operational procedures for blasting include not blasting under adverse weather conditions i.e. high wind and direction conditions; where there is a likelihood dust generated from the blast will reduce visibility at the lease boundary or New England Highway. Wind speed and direction information is available at the office for staff to make informed decisions regarding the prevailing weather conditions when scheduling blasts. This data is available real time from Rix's Creek weather station as well as

the Hunter Valley Meteorological Sounding Group Joint Venture - Lemington site and through improved localised meteorologic daily forecasts.

This information is used to schedule operations so as to minimise the potential for dust emissions. Under adverse weather conditions overburden is not dumped to exposed locations. When these conditions exist the overburden removal and dumping operation is modified with dumping occurring either in pit or to areas not exposed to the prevailing winds, alternatively operations may be ceased until conditions are suitable. For blasting, information is used in a model to predict the potential for meteorological reinforcement of overpressure as well as directional travel of dust/fume from a blast. The model shows the likelihood and receptors that may be affected by the blast which in turn can alter the timing of the blast being initiated.

Rix's Creek is an active participant of the Upper Hunter Air Quality Monitoring Network. The network consists of Industry and Government. The aim is to establish a network of air quality monitors located throughout the valley from Singleton to Muswellbrook to monitor air quality. There are currently 14 monitoring sites operational. One of the monitoring sites is located between the Rix's Creek mine and Singleton town ship on land owned by the Company. This monitoring site was commissioned in August 2011 and is currently displayed on the OEH website known as 'Singleton NW' and displays wind speed, wind direction and PM10 data on a continuous basis. Rix's Creek has an annual data agreement to access data from this station for a fee.

Table 10. Dust Monitoring Sites

SITE	LOCATION
1	Adjacent to railway line on East Boundary
2	Adjacent to railway line on East Boundary
3	Near old railway cutting
~~4~~	Near Middle Falbrook Road, North boundary (discontinued - area now active mine)
5	Rix's Creek Lane East Boundary
6	Near New England Highway
7	Paddock opposite middle Falbrook Road intersection – moved to Bowman boundary fence during July 2012
8	Off Maison Dieu Road
9	Off Maison Dieu Road near Dight's Crossing intersection
10	Off Maison Dieu Road
11	Wattle Ponds Road
~~12~~	Oval near Singleton Civic Centre (discontinued due to constant vandalism)
13	Lawson Avenue, Singleton Heights
14	Mines Rescue Station, Singleton Heights
15	Gardner Circuit, Singleton Heights
16	46 D'Arbon Crescent, Singleton Heights
17	The Retreat
18	Bridgeman Road
19	Main Northern Railway
20	Bridgeman Road
21	Bridgeman Road
22	Bridgeman Road
23	Main Northern Railway
~~24~~	Off Middle Falbrook Road (discontinued - now active mining area)
25	Off New England Highway
26	Granbalang – Off New England Highway
27	Off Wattle Ponds Road adjacent to Hunter River
28	Off New England Highway north-west of lease. Relocated August 2011
29	South of Maison Dieu Road
30	West of lease
31	West of lease
32	Pre-School Gardner Circuit
33	Wright Property Maison Dieu

3.2.2 Environmental Performance

Insoluble Solids

All (30) of the 30 gauges comply with the DECC Insoluble Solids Dust Deposition assessment criteria of an annual average result of less than 4 gm/m^2/month. No gauges exceed this limit.

Table 11 summarises the monthly insoluble solids deposition results for the year along with long-term averages. The results show an overall decrease in comparison to the 2013 results. Ten (10) gauges exhibited an increase in insoluble solids dust deposition result when compared to 2013, with fifteen (15) gauges showing a decrease, whilst five (5) remained the same. The overall yearly average of all gauges for 2014 was 1.9 g/m^2/month, showing a slight decrease from the 2013 result of 2.0 g/m^2/month.
In 2014 eight (8) of the dust deposition gauges (27%) exceeded the arbitrary an annual average result of 2 g/m^2/month compared to eleven (11) or 37% in 2013.

The results from previous years are listed below:-

- 8 gauges or 27% exceeded 2 g/m^2/month 2014
- 11 gauges or 37% exceeded 2 g/m^2/month 2013
- 17 gauges or 57% exceeded 2 g/m^2/month 2012
- 15 gauges or 50% exceeded 2 g/m^2/month 2011
- 4 gauges or 13% exceeded 2 g/m^2/month 2010
- 17 gauges or 57% exceeded 2 g/m^2/month 2009
- 6 gauges or 20% exceeded 2 g/m^2/month 2008
- 5 gauges or 17% exceeded 2 g/m^2/month 2007
- 10 gauges or 33% exceeded 2 g/m^2/month 2006
- 5 gauges or 17% exceeded 2 g/m^2/month 2005
- 7 gauges or 23% exceeded 2 g/m^2/month 2004
- 4 gauges or 13% exceeded 2 g/m^2/month 2003
- 12 gauges or 40% exceeded 2 g/m^2/month 2002
- 11 gauges or 37% exceeded 2 g/m^2/month 2001
- 9 gauges or 32% exceeded 2 g/m^2/month 2000
- 10 gauges or 35% exceeded 2 g/m^2/month 1999
- 11 gauges or 39% exceeded 2 g/m^2/month 1998
- 12 gauges or 35% exceeded 2 g/m^2/month 1997
- 13 gauges or 35% exceeded 2 g/m^2/month 1996
- 4 gauges or 15% exceeded 2 g/m^2/month 1995

From the above long term results, the insoluble solids dust deposition levels listed for 2014 showed a slight decrease when compared to 2013, when using an arbitrary indicator level of 2 gm/m^2/month annual average result. The recommended deposition limit is 4 gm/m^2/month.

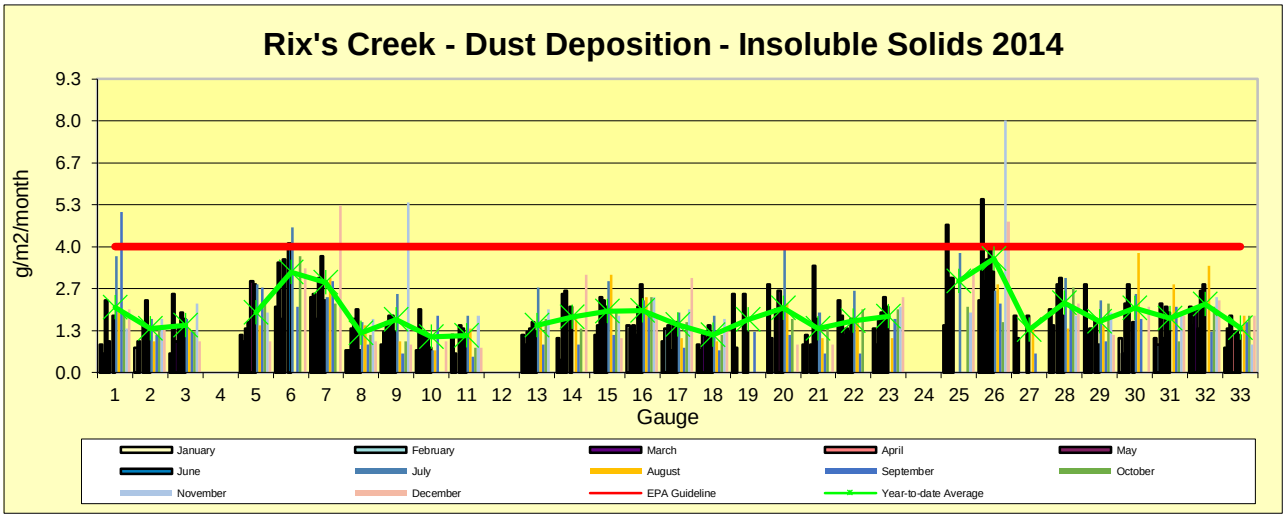


Figure 4 Rix's Creek Insoluble Solids Dust Deposition 2014

Figure 4 displays the individual monthly insoluble solids deposition rates for each gauge and annual average deposition result in gm/m^2/month. The graph does not contain any contaminated results nor have they been included in the annual averages. Forty (40) results were contaminated over the year with either organic matter or bird droppings. An increase from fourteen (14) contaminated results in 2013. There was also six occasions where there was no result. Two gauges were damaged at the laboratory, one gauge was found damaged at its fixed location and four gauges were stolen.

Some sites individual monthly result exceeded the annual limit of 4.0 gm/m^2/month and these results are most likely as a result of localised episodic events.

Figure 5 shows the running 12 month rolling averages for dust deposition and gives a good indication of any trends that may be emerging around the site. From the graph the gauges with the higher results; gauges 6 and 7 are located in close proximity to Pit 1 and Pit 3 mining operations (see Plan 1). These same gauges recorded similar trends in 2012 and 2013 in comparison to the other gauges.

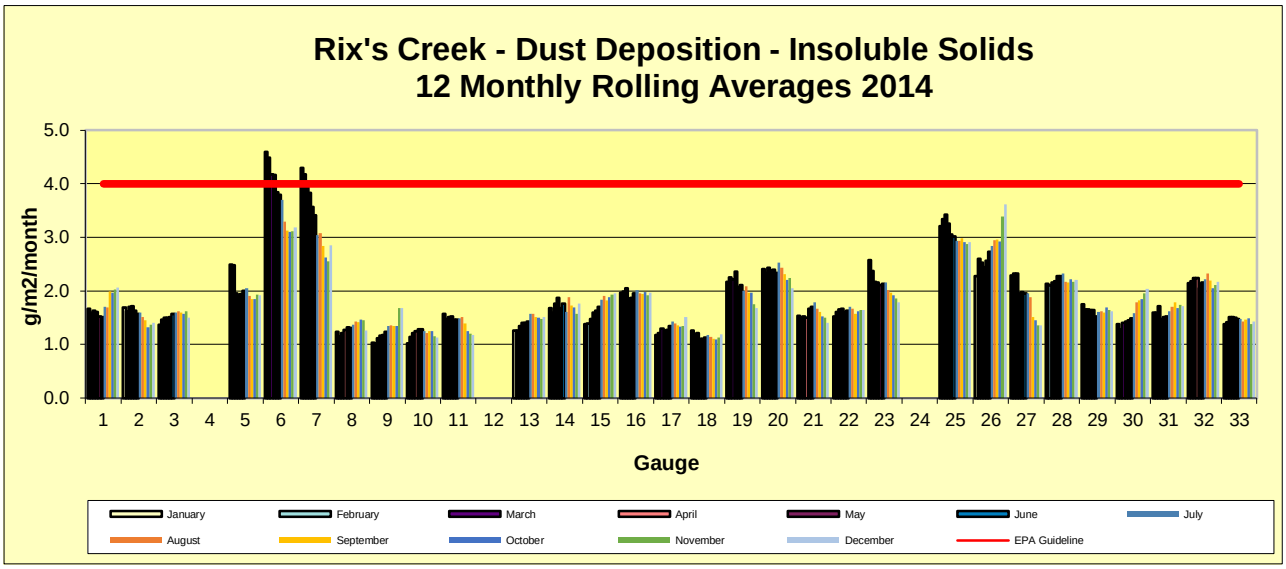


Figure 5 Insoluble Solids Dust Deposition 12 Monthly Rolling Averages 2014

Table 11. Annual Average Dust Deposition Insoluble Solids 2014

SITE	MAXIMUM RESULT 2014	MINIMUM RESULT 2014	YEARLY AVERAGE 2014	YEARLY AVERAGE 2013	LONG TERM AVERAGE (1984 – 2014)	No. of UNCONTAMINATED RESULTS	No result
1	5.1	0.6	2.1	1.8	2.3	11	0
2	2.3	0.8	1.4	1.8	2.1	11	1
3	2.5	0.6	1.5	1.4	1.4	12	0
4	-						
5	2.9	1.0	1.9	2.6	2.2	12	0
6	4.6	1.7	3.2	5.0	2.2	9	0
7	5.3	1.7	2.9	4.6	2.1	11	0
8	2.0	0.7	1.3	1.3	1.1	12	0
9	5.4	0.6	1.7	1.1	1.2	12	0
10	2.0	0.7	1.1	1.0	1.2	10	0
11	1.8	0.5	1.2	1.6	1.9	11	1
12	-						
13	2.7	0.9	1.5	1.3	1.3	11	0
14	3.1	0.4	1.8	1.8	2.1	9	2
15	3.1	1.1	2.0	1.4	2.0	11	0
16	2.8	1.2	2.0	2.0	1.7	12	0
17	3.0	0.7	1.5	1.2	2.1	12	0
18	1.8	0.7	1.2	1.3	1.3	12	0

19	2.5	0.8	1.7	2.5	2.0	5	0
20	3.9	0.9	2.1	2.3	4.4	10	0
21	3.4	0.6	1.4	1.6	2.9	10	0
22	2.6	0.6	1.7	1.5	1.5	11	0
23	2.4	0.9	1.8	2.6	2.2	11	0
24	-						
25	4.7	1.5	2.9	3.4	2.2	8	0
26	8.0	1.6	3.6	2.4	1.5	12	0
27	1.8	0.6	1.4	2.5	3.2	5	0
28	3.0	1.4	2.2	2.3	1.5	11	1
29	2.8	0.9	1.6	1.7	0.9	11	0
30	3.8	0.6	2.0	1.4	1.0	10	1
31	2.8	0.9	1.7	1.7	1.1	11	0
32	3.4	1.3	2.2	2.2	0.7	11	0
33	1.8	0.8	1.4	1.5	0.7	11	0

The annual deposition results from 1996 to 2014 are plotted in Figure 6. From the graph it is difficult to pick any major trends in deposition results for any gauge over the 19 years of results. No gauges in 2014 had any major trends away from previous year's data.

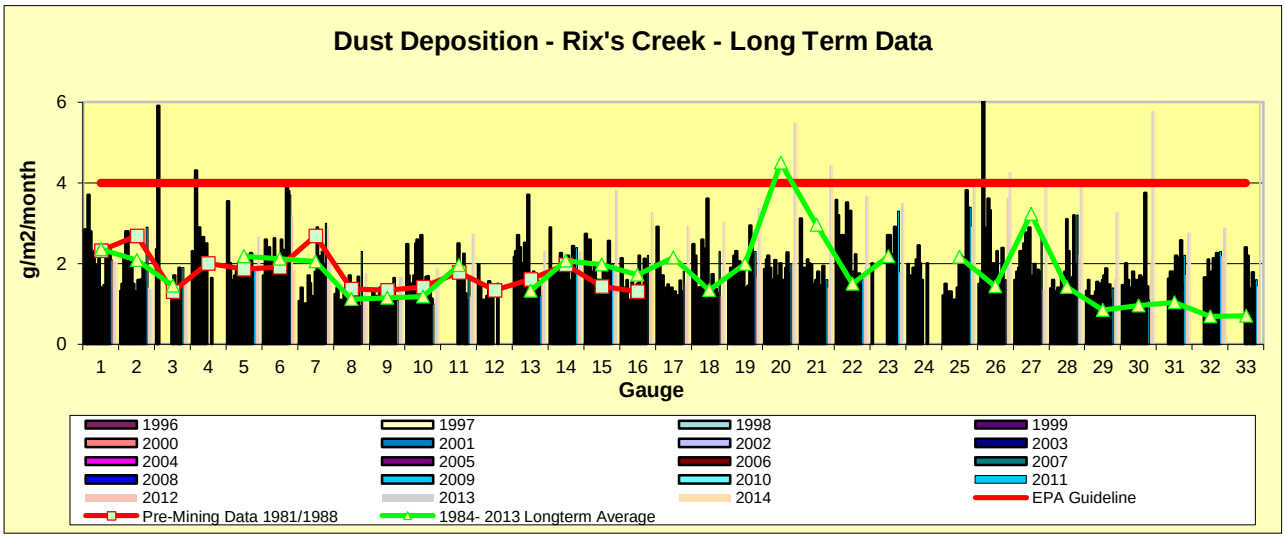


Figure 6 Long Term Insoluble Solids Dust Deposition Results

Figure 7 and Figure 8 are isopleths plots showing dust deposition concentrations from the monitoring results. Figure 7 indicates the higher concentrations are being associated in close proximity to the active mining areas, in particular Pit 3 pre-strip.

The following is an extract from PAE Limited' report who produced the isopleth plots from the yearly data.

'Please note that our concerns regarding this method of presentation remain unchanged from our memorandum we included with the 1996 data analysis, dated 17th March 1997. In that memorandum we raised the concern that the data used to generate these plots have been prepared from 27 data points (now 31) covering a reasonably large area. It is assumed by the plotting software that there is smooth variation in dust from one data point to the next. In reality these values can vary significantly over very short distances and the plots may therefore not reflect the real detail in dust deposition.'

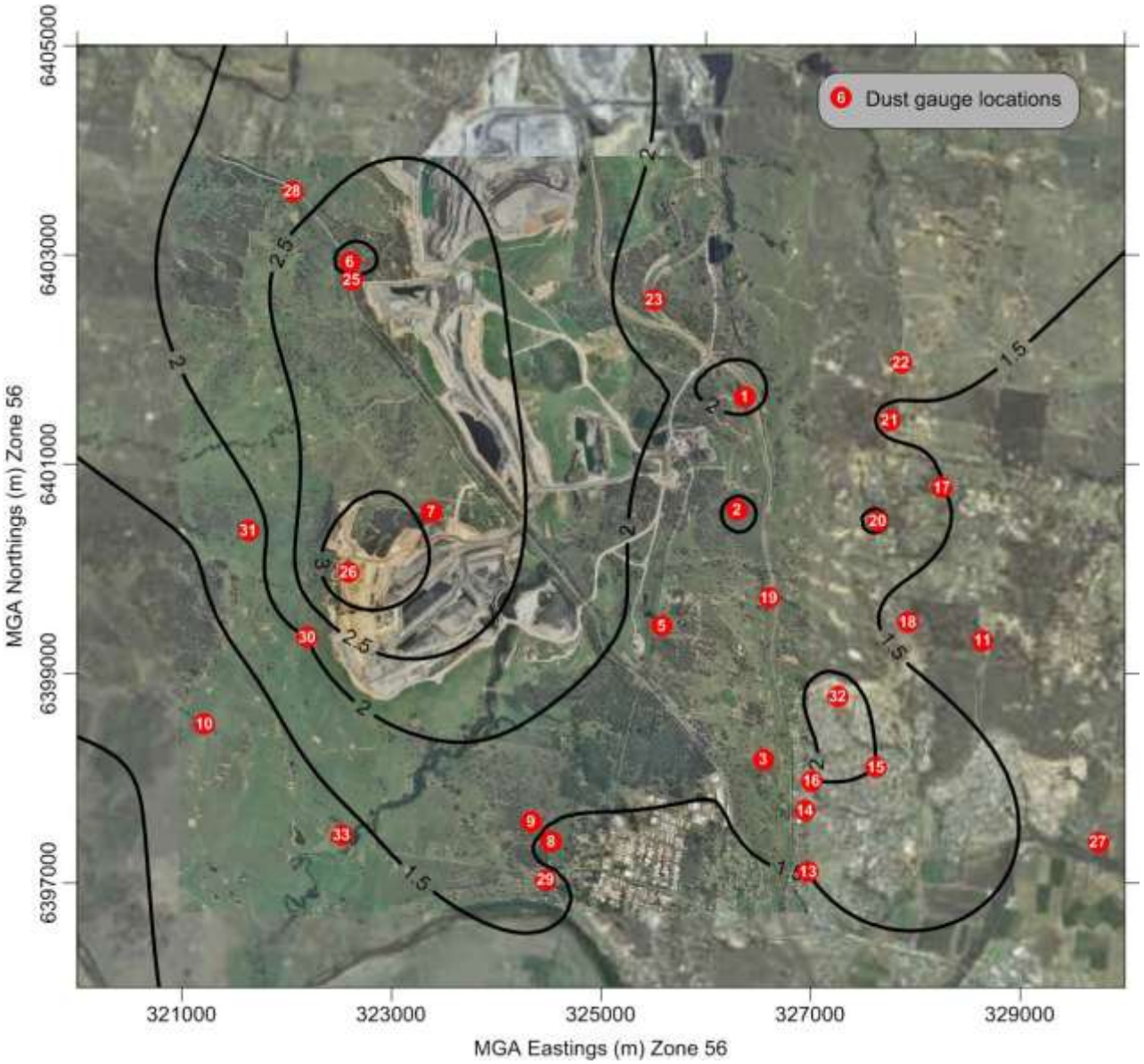


Figure 7 Measured Annual Average Insoluble Solids Isopleths 2014

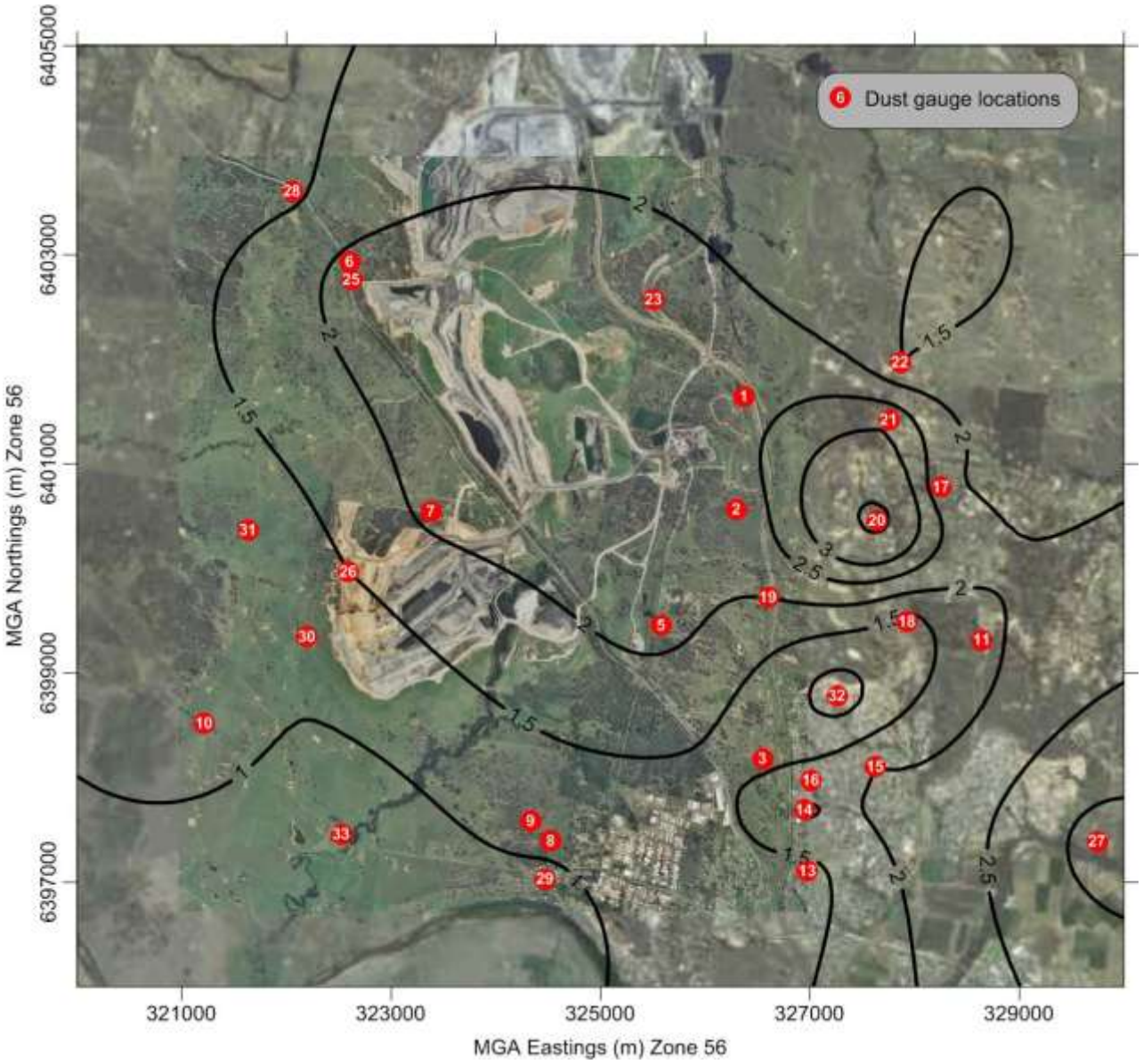


Figure 8 Measured Long Term Average Insoluble Solids Isopleths 1984 – 2014

Total Suspended Particulates

All sites are below the limit set by the National health & Medical Research Council (NHMRC) air quality guideline (Table 9) annual average of 90 *u*g/m^3. The maximum, minimum and average results are summarised in Table 12 and Figure 9 show the individual results for each site throughout the year and monthly averages. There was 39 out of a possible 183 results (21%) that exceeded the annual average limit of 90 *u*g/m^3. Mines Rescue 8 results, Retreat 16, and Rix's Creek 15 results.

The last 10 years individual results that exceeded the Annual Average level of 90 *u*g/m^3 are:-

- 39 results – 21% in 2014
- 60 results – 33% in 2013
- 32 results – 17% in 2012
- 34 results – 19% in 2011
- 35 results – 19% in 2010
- 44 results – 24% in 2009
- 36 results – 20% in 2008
- 18 results – 10% in 2007
- 40 results – 22% in 2006
- 28 results – 15% in 2005
- 34 results – 18% in 2004

Table 12. Total Suspended Particulates (*u*g/m^3) 2014

GAUGE	MINIMUM		MAXIMUM		AVERAGE		No. of RECORDINGS
	2014	2013	2014	2013	2014	2013	
Mines Rescue Station	15	12	115	153	52.4	56.4	100 (%)
Rix's Creek	12	11	230	317	68.1	76.7	100 (%)
The Retreat	17	16	273	286	72.5	86.0	100 (%)

The average TSP results decreased at all of the three sites – Mines Rescue by 4 *u*g/m^3, Rix's Creek by 8.6 *u*g/m^3 and The Retreat by 13.5 *u*g/m^3 as per Table 12 above.

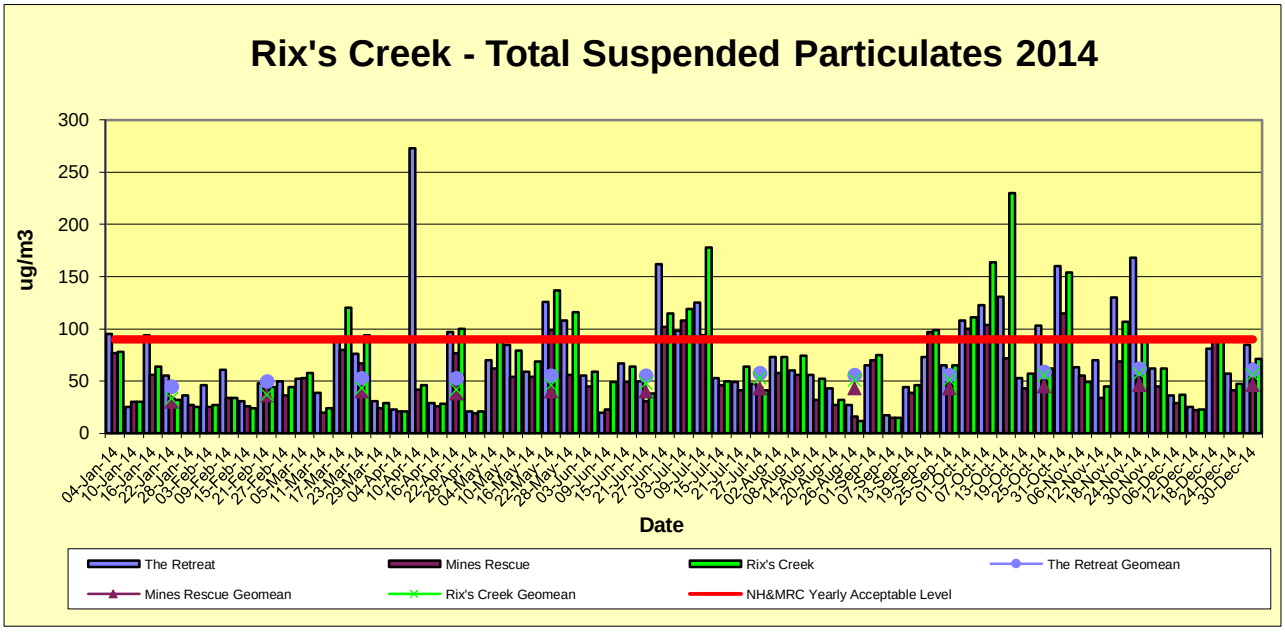


Figure 9 Total Suspended Particulates 2014

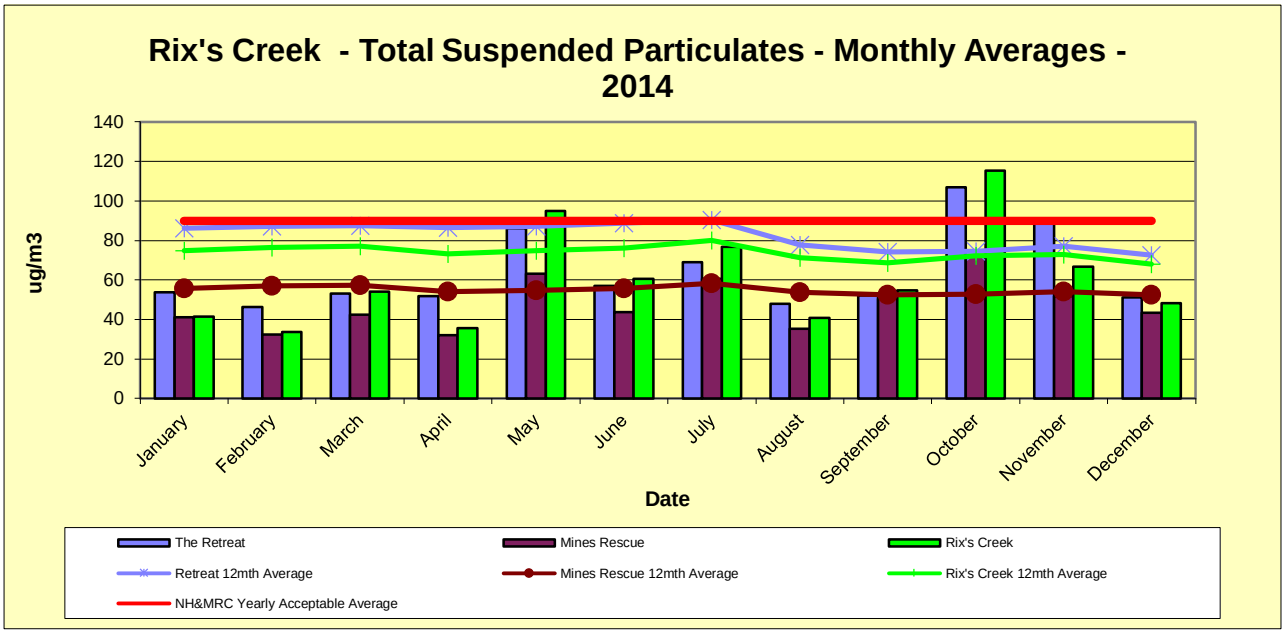


Figure 10 Total Suspended Particulates Monthly Averages & 12 Monthly Rolling Averages

Figure 10 shows the monthly average results for each site during the year along with the running 12 monthly averages. The monthly results were elevated at the Retreat and Rix's Creek sites for May, and October, whilst the Retreat site also recorded a higher reading during November compared to the other two sites. May through to November were all subsequently dry months of the year regarding low rainfall. The Retreat November results also had higher than usual results most likely from localised climatic conditions as well as nearby factors. During October and November the Darlington Rural Fire Service notified Rix's Creek of back burning activities around the Retreat area which may have affected air quality meters although these higher readings are usually associated with PM 2.5 particulates.

Particulates Less Than 10 Micron

The daily goal of 50 *u*g/m^3 was exceeded at the Rix's Creek site on 4 occasions and the Retreat site on 1 occasion.

Throughout the reporting period no problems were experienced with 100% of the data collected.

The annual averages for all three sites were similar to last year's results. Being a dry year this result would have been assumed to increase, however this was not the case. The Mines Rescue Station was the same as 2013, Rix's Creek site has decreased (3 *u*g/m^3) compared to last year's result while the Retreat site decreased by 3 *u*g/m^3. All sites are under the 30 *u*g/m^3 annual average limit.

Table 13. Particulate Matter < 10 Micron 2014 (*u*g/m^3)

GAUGE	MINIMUM		MAXIMUM		Average		No. of RECORDINGS
	2014	2013	2014	2013	2014	2013	
Mines Rescue Station	6	4	50	53	20	20	100 (%)
Rix's Creek	5	1	91	129	27	30	100 (%)
The Retreat	5	4	58	84	22	25	100 (%)

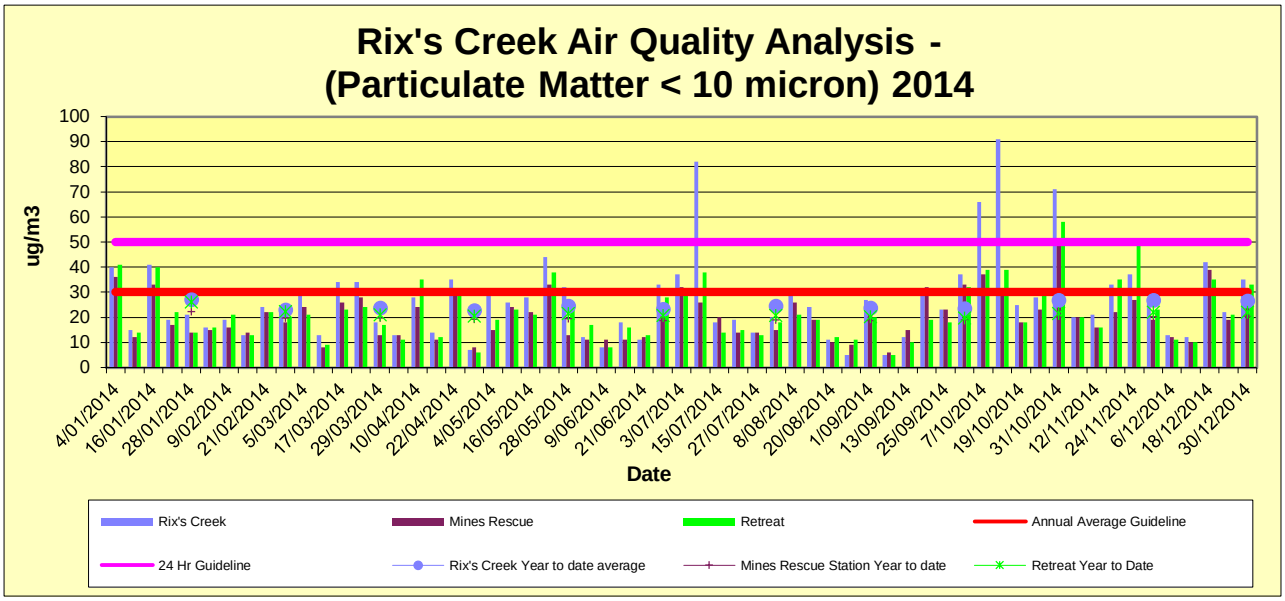


Figure 11 Particulate Matter <10 Micron 2014

Individual run results are depicted in Figure 11 with the monthly results and 12 monthly rolling averages shown in Figure 12.

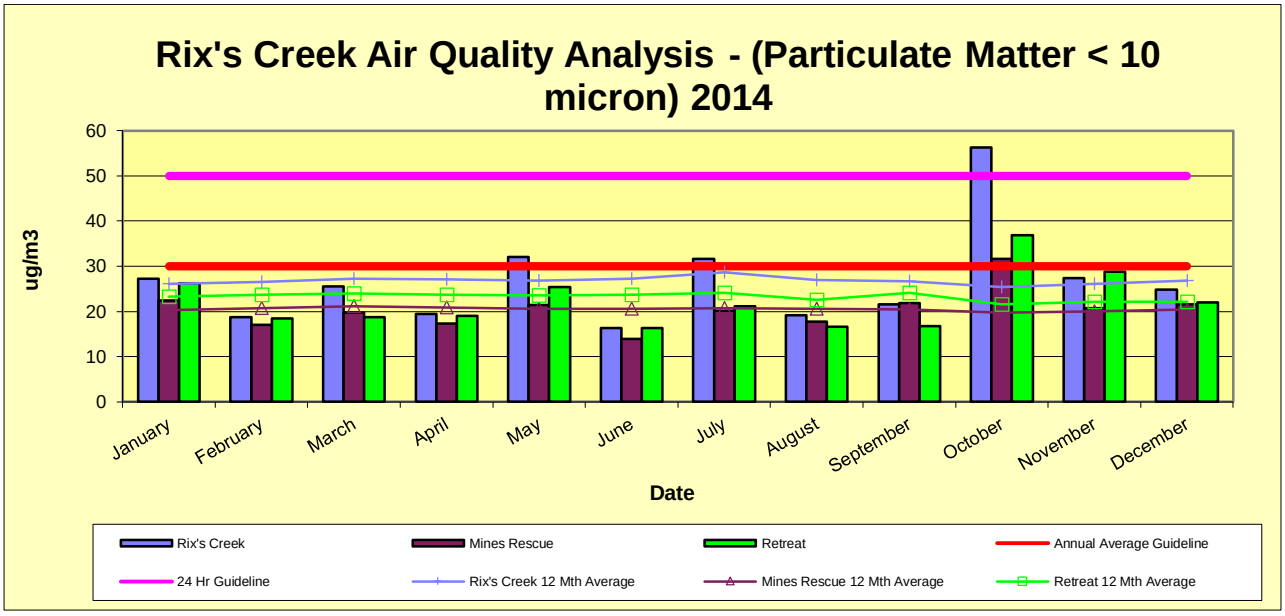


Figure 12 Particulate Matter < 10 Micron Monthly Averages & 12 Monthly Rolling Averages 2014

3.2.3 Reportable Incidents

Three (3) complaints and were received in relation to air quality during the 2014 reporting period. These can be seen in Table 14.

Table 14. Air quality Complaints Received During Reporting Period 2014

DATE	COMPLAINT	RESOLUTION
18/1/2014	Complaint received to Rix's Creek complaints line from passing motorist on New England Highway. The complainant reported dust from dozer on highway bund adjacent to highway blowing across the road.	OCE inspected area and no dust was blowing across the highway and wind drift was from the south-east away from highway. Bulldozer continued shaping topsoil with water cart used to spray topsoil via water cannon.
20/2/2014	Complaint received from resident on Rix's Creek Lane regarding dust from trucks running on haul road.	Trucks were stopped until haul roads were sufficiently watered to minimise dust.
7/7/2014	Complaint received from resident in Maison Dieu regarding dust from West Pit operation.	OCE inspected work area and continued operation as there was a high level of dust control efficiency. Complainant notified of low dust reading's at time of complaint.

3.2.4 Further Improvements

The EPA issued in January a Specific Exemption under Part 6, Clause 51 and 51A of Protection of the Environment Operations (Waste) Regulation 2005 – The Rix's Creek glycerine exemption 2013 for 3 months to trial the use of glycerine as a dust suppressant for the control of vehicle generated dust. The glycerine was mixed in water carts at a 2% solution and sprayed onto haul roads. During the 3 month trial period a number of studies were conducted to satisfy the requirements of the exemption looking at the possible impacts on groundwater and surface waters. Another study examined the breakdown of the glycerine when applied on haul roads. The glycerine had to be tested to ensure its chemical attributes. Over the period of the trial results of the chemical analysis returned some results outside the parameters set under the exemption. At the completion of the completion of the trial period reports of the studies were submitted to the EPA. Further work was undertaken over the rest of the year in an attempt to ascertain the source of the out of specification chemical analysis results of the glycerine. The trial has been suspended until the outcome of this investigation is known. A report has been submitted to the EPA outlining the results of this investigation into the anomalies. The anomalies arose out of differences in laboratory analytical capabilities and were not as result of sample contamination as was initially suspected.

New exemption issued in November 2014 and is valid until May 2016. Trialling of the glycerine for dust suppression will commence in early 2015.

As part of the Pollution Reduction Program (PRP) enacted by the EPA on Rix's Creek EPL 3391 an independent consultant conducted PRP '*Wheel Generated Dust*' monitoring across site to demonstrate a control efficiency of at least 80% is being achieved on all active haul roads. Rix's Creek average control efficiency was 93% after July and December monitoring rounds. The results can be seen in Appendix 5 at the back of this report.

An additional PRP '*Coal Mine Wind Erosion of Exposed Land Assessment'* was enacted during October 2014 requiring as assessment of the exposed areas on site to be conducted as at the 31st December 2014. This report will be submitted the end of March 2015.

Rix's Creek has trialled irrigating its blasted benches following a blast being initiated and levelled off prior to an excavator entering the area and removing the blasted dirt. This has helped saturate the top surface layer of the material forcing it to crust and prevent dust lift-off. The irrigation uses water from within the active mining area to essentially wet the area as if rainfall would.

3.3 Erosion and Sediment

3.3.1 Environmental Management

Erosion and sedimentation control is an integral part of the water management across the entire site. Erosion control on reshaped and rehabilitation areas is achieved by having the minimum delay in time and area between the active mining operation and establishing rehabilitation. Revegetation of rehabilitation areas is undertaken as soon as an area becomes available with the aim to establishing a minimum of 70% ground cover, the level required to adequately control soil erosion. Accompanied with this is the use of sediment detention basins in front of the operation, along haulage roads and on drainage lines flowing from establishing rehabilitation areas.

Throughout May-June 2014 a majority of sediment dams were de-silted whilst climatic conditions were dry allowing adequate access and works to take place. This required the use of a long-arm excavator. Several other smaller sediment dams were also cleaned via an on-site backhoe as required throughout the year. These sediment dams contain the same material as that excavated from the open cut operation as well as clays, soil and silt from the natural environment.

3.3.2 Environmental Performance

Total Suspended Solids (TSS) results from water sampling is used as a key indicator of sediment control. TSS results are discussed in Section 3.4 Surface Water Pollution.

3.3.3 Reportable Incidents

No reportable incidents relating to erosion and sediment occurred during the 2014 reporting period.

3.3.4 Further Improvements

An erosion and sediment control plan has been developed as part of a Water Management Plan. The plan was prepared in response to a condition of the approval for a modification to the development consent enabling the construction of a second crossing of the New England Highway (Modification #4). Relevant recommendations identified in the control plan will be incorporated into the operation as the mine progresses.

Following the 2013 AEMR inspection a sediment laydown area beside the main workshop adjacent

to the oil/water separator was removed. This sediment is now transported to the bioremediation area prior to in-pit disposal.

3.4 Surface Water Pollution

3.4.1 Environmental Management

The water management system at Rix's Creek as outlined in the EIS, has been designed with the primary objectives of:-

- segregation of uncontaminated, clean water runoff, from contaminated-mine water on site; and
- priority use of and safe disposal on site of contaminated water.

Clean Water

Runoff from undisturbed areas is directed away from mining operations through diversion banks and channels. The clean water is directed into Rix's Creek, which flows through the lease. North of the New England Highway the Creek consists of a number of flow lines in smaller catchments. South of the Highway Rix's Creek is a defined flow line amongst a belt of riparian vegetation.

Water quality is monitored in the Creek on a monthly basis when there is sufficient water to sample as Rix's Creek is an ephemeral stream.

Contaminated Water

Runoff from disturbed areas is contained within a system of detention dams designed to allow settlement of the suspended solids. Runoff from active mining areas is pumped to the dirty water storages.

Tailings from the coal beneficiation process are directed to the emplacement area and water decanted off the tailing's dam surface is recycled through the coal preparation plant.

First priority is given to the use of contaminated water in mine operations. Contaminated water is used in the coal beneficiation process and for dust suppression via water carts for haul road watering and spraying coal stockpiles.

Hunter River Salinity Trading Scheme

Rix's Creek is a member of the Hunter River Trading Scheme holding 5 salt credits. Rix's Creek is classified as a non-discharging credit holder. Although Rix's Creek is a member of the scheme there has been no need to discharge saline water and the instrumentation necessary to participate in the scheme was not installed. As a consequence, Rix's Creek is unable to discharge and EPA has subsequently revoked the discharge component of the Environmental Protection Licence.
Credits are traded to other operations when required. Rix's Creek has traded credits to Glencore (formally Xstrata) in the past for example.

3.4.2 Environmental Performance

Rix's Creek runs the length of the mining lease area. A small portion on the east side of the site adjacent to Rix's Creek Lane is drained by a tributary of Rix's Creek, known as 'Stone Quarry Gully'. Grab samples are taken from the Creek in four locations. They are:-

- Site 1 - Railway Underpass, as the Creek enters the site;
- Site 2 - New England Highway Bridge, at the mid-point through the mine site;
- Site 10 – Below Operation, a new location started in June 2004 on Rix's Creek below the operation; and
- Site 3 - Maison Dieu Road Bridge, after the Creek has left the site.

Sampling site locations are indicated on Plan 1. Samples are taken on a monthly basis. Above average rainfall was received during March, April, August and December. Throughout 2014 the Creek was dry from subsequently low rainfall as well as dry conditions the second half of 2012 as well as

2013. The high rainfall month's experienced in 2014 was sporadic not allowing for constant rain and flow conditions for prolonged periods with flows only short lived. In addition to monthly sampling, the Creek is also sampled under flow conditions to monitor conditions considered more representative of the water quality in Rix's Creek during flow. Due to the drier than normal conditions of 2012, 2013 and 2014 there was minimal flow to the creek throughout the year until December 2014.

Table 15 to Table 18 show results of the analysis and Figure 14, Figure 15, Figure 16 and Figure 17 being graphical representations of these results.

Grab samples are analysed for water quality parameters of pH, electrical conductivity, total dissolved solids and total suspended solids. The water samples are analysed by Steel River Testing Mayfield as well as ALS Laboratory Group at Warabrook. Both laboratories are registered by the National Association of Testing Authorities, Australia.

Yearly rainfall was 91.25 mm below average for 2014 at 606.75 mm (See Figure 1 Annual Rainfall 2014) Historical averages at Singleton Post Office (1881- 1967) is 698 mm.

Annual rainfall results are seen for the last 16 years:-

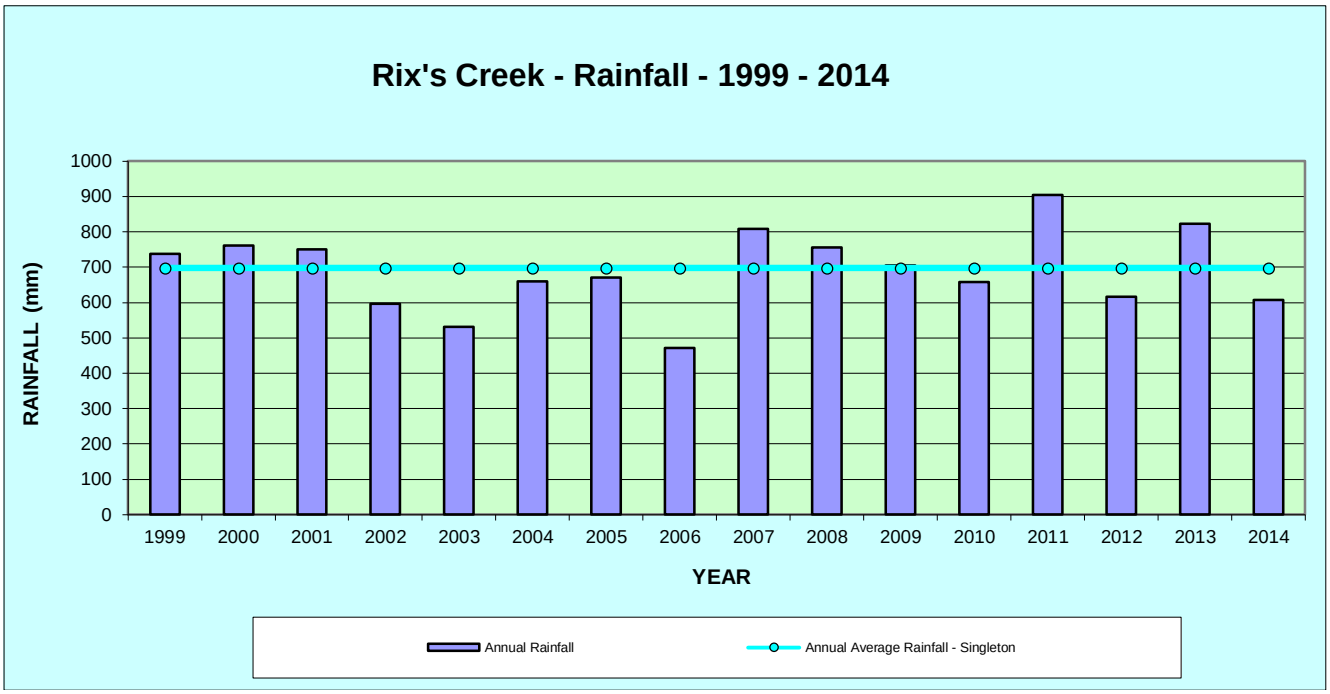


Figure 13. Annual rainfall at Rix's Creek 1999-2014

The rainfall and flows in Rix's Creek again highlight the irregular weather pattern in the Hunter Valley. The water quality in Rix's Creek reflects its ephemeral nature being affected by rainfall events and resultant flow / no flow conditions.

Table 15. Rix's Creek (Site 1 – Railway Underpass) Water Quality 2014

DATE	FLOW	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2014	Nil	8.4	20	365	540
13/02/2014	Nil	8.9	18	354	637
31/03/2014	Nil	7.5	51	540	448
29/04/2014	Nil	7.9	19	422	488
29/05/2014	Nil	9.1	4	377	526
25/06/2014	Nil	8.1	5	387	598
29/07/2014	Nil	8.5	5	299	616
29/08/2014	Nil	8.4	13	370	634
30/09/2014	Nil	9.4	6	498	650

27/10/2014	Nil	9.0	3	455	721
27/11/2014	Nil	8.8	8	493	767
15/12/2014	Nil	8.0	14	468	830

Table 16. Rix's Creek (Site 2 - New England Highway) Water Quality 2014

DATE	FLOW	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2014	Dry	-	-	-	-
13/02/2014	Dry	-	-	-	-
31/03/2014	Trickle	7.2	66	388	533
29/04/2014	Trickle	7.4	37	597	682
29/05/2014	No	7.7	14	517	767
25/06/2014	No	8.1	18	574	844
29/07/2014	Trickle	7.9	5	484	937
29/08/2014	Trickle	7.3	34	426	525
30/09/2014	Nil	7.4	30	548	582
27/10/2014	Dry	-	-	-	-
27/11/2014	Dry	-	-	-	-
15/12/2014	Trickle	7.2	79	1360	2210

Table 17. Rix's Creek (Site 10 - Below Operation) Water Quality 2014

DATE	Flow	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2014	Dry	-	-	-	-
13/02/2014	Dry	-	-	-	-
31/03/2014	Trickle	8	74	353	445
29/04/2014	Low	7.7	38	912	1443
29/05/2014	No	7.4	8	829	1426
25/06/2014	No	8.1	9	617	1066
29/07/2014	Trickle	8.0	6	340	701
29/08/2014	Trickle	7.7	67	646	1042
30/09/2014	No	7.5	19	697	1083
27/10/2014	Dry	-	-	-	-
27/11/2014	Dry	-	-	-	-
15/12/2014	No	7.3	23	371	558

Table 18. Rix's Creek (Site 3 - Maison Dieu) Water Quality 2014

DATE	FLOW	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2014	Dry	-	-	-	-
13/02/2014	Dry	-	-	-	-
31/03/2014	Trickle	7	176	337	383
29/04/2014	Low	7.3	25	1040	1734
29/05/2014	No	7.5	2	800	1385
25/06/2014	No	7.6	1	952	1765
29/07/2014	Trickle	7.6	7	326	684
29/08/2014	Trickle	7.3	35	299	419
30/09/2014	Trickle	7.4	8	704	1225
27/10/2014	Nil	7.4	10	452	694
27/11/2014	Dry	-	-	-	-
15/12/2014	Low	7.0	67	284	330

The **pH** of Rix's Creek (Figure 14) during 2014 ranged between 6.8 (January) at the Clean Water Dam 1 and 9.4 (September) at the Railway Underpass under nil flow conditions. The pH trend in the Creek is to decrease under flow conditions and increase in times of nil flow. The decrease in pH under flow conditions reflects the acidic nature of rainfall. The trends and results are consistent with previous year's results.

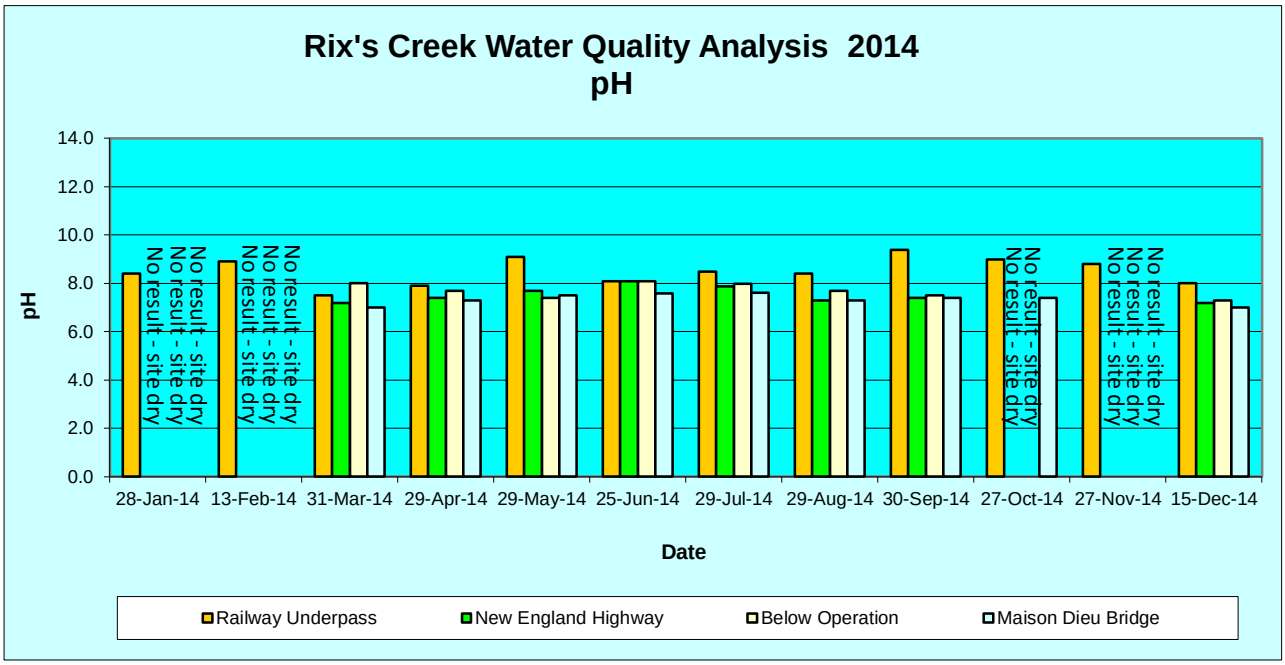


Figure 14 Rix's Creek Water Quality 2014 - pH.

Total dissolved solids (Figure 15) ranged from 284 mg/l (December) – Maison Dieu Bridge to 1,360 mg/l (December) – New England Highway. The high results reflect dry conditions in the Creek. The high December result for the New England Highway site is an example of this due to dry conditions in October and November. The trend with total dissolved solids is to decrease in the lower catchment and again this is consistent with previous year's results. The trend under flow conditions shows a general decrease down the catchment reflecting a flushing of the Creek with fresh water. Again this is dependent on the size of the flow. The higher the runoff and resultant flow, produces greater decreases in total dissolved solids results throughout the catchment.

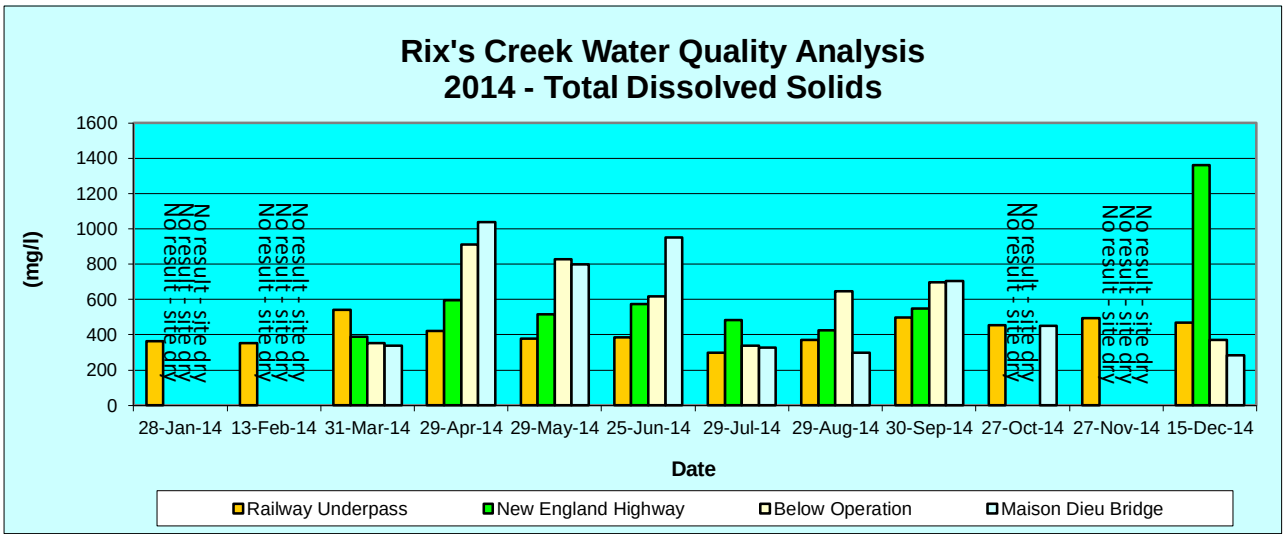


Figure 15 Rix's Creek Water Quality 2014 - Total Dissolved Solids

Total suspended solids (Figure 16) results ranged from 1 mg/l (June) at the Maison Dieu site under

no flow conditions to 176 mg/l (March) at the same site with a low flow following two months of the site being dry. The general trend is for levels to increase down the catchment under flow conditions. The past trend is an indication that the water flowing in the Creek increases the sediment load down the catchment. The March result depicts this clearly.

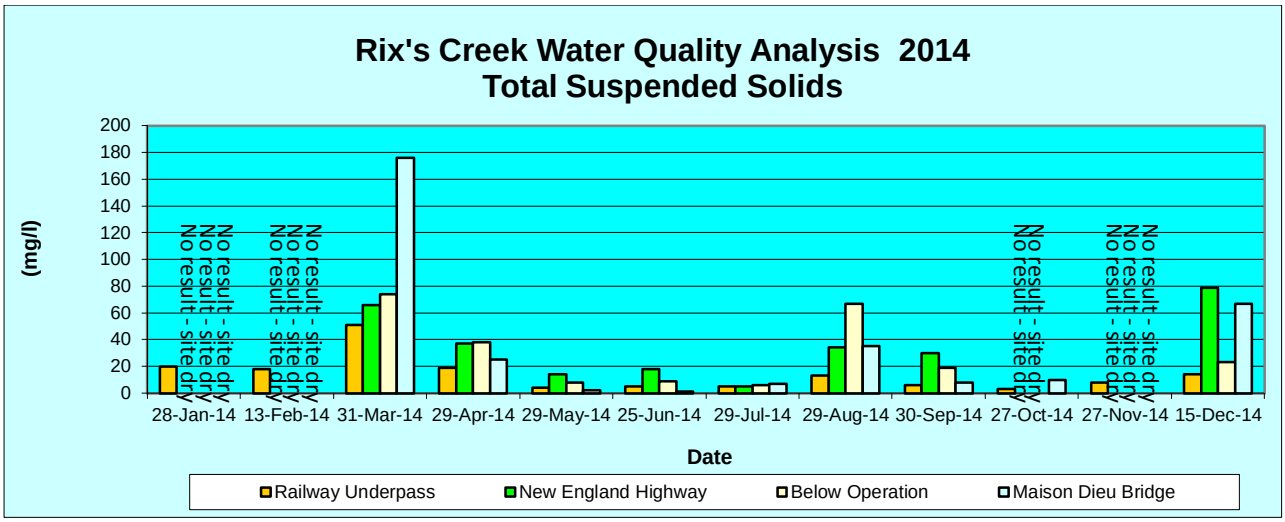


Figure 16 Rix's Creek Water Quality 2014 - Total Suspended Solids

The water quality parameter of **salinity** measured as specific conductance - electrical conductivity (EC)

Figure 17 tends to mirror total dissolved solids Figure 15. The results under flow conditions typically decrease down the catchment reflecting a flushing of the Creek with clean runoff water. During times of no flow the salinity increases at all sites, as the water becomes stagnant. This is evident from April to June at all four sites. Results ranged from 330 uS/cm (December) at the Maison Dieu Bridge site to 2210 uS/cm (December) at the New England Highway site. The high December result at the New England Highway site may have occurred due to the dry conditions and minimal creek flow in the months prior to the next rainfall even (December) which subsequently had high salinity runoff up the catchment from stagnant water. Lower salinity levels further down the catchment highlights the clean water runoff into Rix's Creek via rainfall.

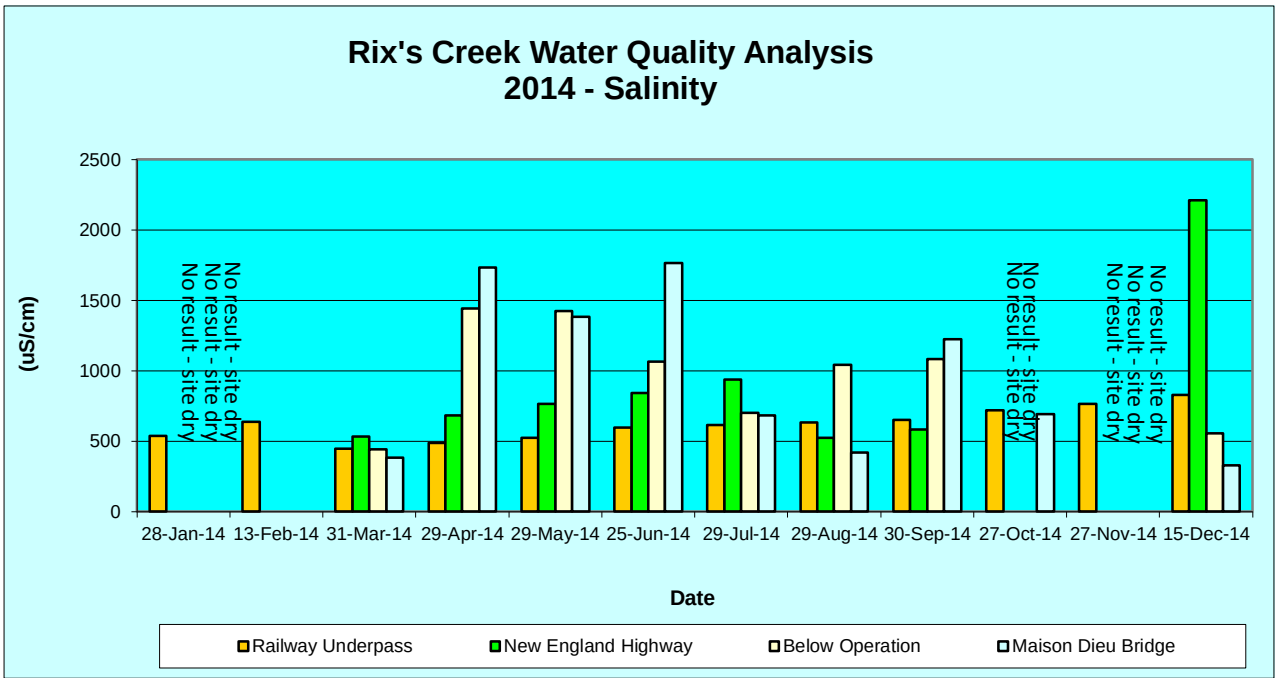


Figure 17 Rix's Creek Water Quality 2014 - Electrical Conductivity (Salinity)

The variations in water quality throughout the catchment are dependent on the amount of rainfall and

resultant runoff flushing stagnant water through the catchment. During times of nil flow the pH, electrical conductivity and total dissolved solids increase. Conversely total suspended solids are highest following storm events.
Water storage dams 1, 2, and 6 are sampled and analysed monthly. The locations of these dams are shown on Figure 1 with the relationship being:-

Site 4 - Clean Water Dam 1 - (CWD 1)
Site 5 - Clean Water Dam 2 - (CWD 2)
Site 7 - Clean Water Dam 6 - (CWD 6)

These results are indicative of site variations that occur as a result of soil qualities and weather patterns.

Table 19. Clean Water Dam 1 (CWD 1) Water Quality 2014

DATE	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2014	7.6	10	119	174
13/02/2014	7.8	9	128	184
31/03/2014	7.1	86	112	98
29/04/2014	6.8	31	108	104
29/05/2014	7.0	8	108	108
25/06/2014	7.5	5	133	112
29/07/2014	7.5	5	116	145
29/08/2014	7.1	41	156	130
30/09/2014	7.4	15	146	148
27/10/2014	7.8	5	139	148
27/11/2014	8.2	7	136	157
15/12/2014	7.3	17	122	148

The water quality in water storages from undisturbed catchments on site is of higher quality i.e. lower salinity. See Table 19, Table 20 and Table 21.

pH ranged from 6.8 (CWD 1) to 9.2 (CWD 6). Salinity ranged from 104 *u*S/cm (CWD 1) to 397 *u*S/cm (CWD 6). TSS ranged from 4 mg/l (CWD 2 and CWD 6) to 40 mg/l (CWD 1). TSS levels are generally higher in low salinity water, as higher salt concentrations act to flocculate the suspended clay particles settling them out of suspension.

Table 20. Clean Water Dam 2 (CWD 2) Water Quality 2014

DATE	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2014	7.4	6	133	199
13/02/2014	8	13	134	244
31/03/2014	7.5	47	101	155
29/04/2014	6.9	17	105	118
29/05/2014	7.0	9	114	125
25/06/2014	7.5	10	129	133
29/07/2014	7.5	5	126	156
29/08/2014	7.4	10	134	141
30/09/2014	7.8	8	141	141
27/10/2014	7.6	4	143	142
27/11/2014	7.5	7	143	173
15/12/2014	7.9	7	125	155

Table 21. Clean Water Dam (CWD 6) Water Quality 2014

DATE	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2014	8.4	7	228	331
13/02/2014	8.9	5	224	344
31/03/2014	7.9	18	256	322
29/04/2014	7.6	10	197	289
29/05/2014	8.5	6	209	397
25/06/2014	8.3	6	189	329
29/07/2014	8.1	5	128	297
29/08/2014	8.8	7	189	314
30/09/2014	9.2	10	207	323
27/10/2014	8.9	4	229	341
27/11/2014	8.3	32	195	329
15/12/2014	8.2	10	201	340

3.4.3 Reportable Incidents

There were no reportable incidents relating to water during the 2014 reporting period.

3.4.4 Further Improvements

The surface monitoring program developed as part of the Water Management Plan includes annual analysis for major ions. Surface water monitoring results will be compared to impact assessment criteria trigger levels for any exceedences of the criteria. Where it is determined the exceedance is attributed to mining operations further investigations will be undertaken as per the "Surface Water Impact Assessment Criteria, Trigger Levels and Response Plan Rix's Creek Open Cut Coal Mine." The trigger levels were previously greater than 99th percentile (1st and 99th percentile pH), however, the Department of Planning met with Rix's Creek during September 2013 to review the Water Management Plan for site and determined the 95 percentile (5th and 95th for pH) would be more suited for site trigger levels. The 95 percentile was used as a trigger level for all 2014 results.

From January 2015 Rix's Creek will additionally monitor several sites before (dams) and along Dead Man's Creek as per the monthly surface water regime for internal reference.

3.5 Ground Water Pollution

3.5.1 Environmental Management

The Groundwater Monitoring Plan is an integral component of the Water Management Plan. The plan identifies locations and schedule for monitoring.

A number of groundwater monitoring sites have been identified to enable the development of a suitable groundwater monitoring network. In May 2010, five standpipe piezometer monitoring bores were installed (BH1 to BH5) and along with an existing production bore (20BL170864), these make up the monitoring network.

Groundwater monitoring continued in 2014, with quarterly monitoring of field parameters including:- Electrical conductivity (EC), Total dissolved solids (TDS) and pH. Annual sampling was undertaken for comprehensive laboratory analysis of a broader suite of parameters including:

- Physical properties (EC, TDS, and pH);
- Major cations and anions (Ca, Mg, Na, K, Cl, SO4, HC)3 and CO3);
- Nutrients; and
- Dissolved metals.

The development of open cut mines has the potential to form a sink into which groundwater will flow from the coal measures and therefore control the piezometric head immediately around the pit. Due to the very low hydraulic conductivities of the mined seams and minor seepages noted to date, this impact is expected to be limited to the area immediately around the pits. There are likely to be limited regional groundwater level drawdown impacts as a result of current mine activities and these will be confined to the basin structure that contains the Rix's Creek Coal Project.

Other mining activities that have the potential to impact groundwater levels and quality are:

- Tailings emplacement area - groundwater pollution;
- Spoils and emplacement – contribution of salt to surface water and groundwater;
- Surface water bodies – these may locally control groundwater levels in surrounding spoil and Permian strata; and
- Waste dumps & Coal Handling plant – surface water runoff and associated water quality issues.

Low pit inflows observed to date, combined with the lower hydraulic conductivities of the mined coal seams expected at depth, suggest that groundwater drawdown from mining in the proposed continuation of mining will not emanate outside the basin structure (which falls within the Mine Lease).

3.5.2 Environmental Performance

Data collected during the groundwater monitoring included:-

- Analyses of groundwater level and water quality data

Three piezometers are installed into the Permian coal measures and two into overlaying regolith. Their locations are shown on Figure 19. Piezometers BH1, BH2 and BH5 are the deeper bore holes into the coal measures while Piezometers BH3 and BH4 are shallow into the overlying regolith. The monitoring network also included the existing production bore 20BL170864. Piezometer BH6 was proposed but not constructed due to no access onto privately owned property.

Table 22. Rix's Creek Groundwater Monitoring Network

Bore ID	Easting (UTM84)	Northing (UTM84)	Type	Depth (mbgl)	Location	Screened Aquifer
BH1	323190	6400562	Standpipe Piezometer	130	Middle of basin	Upper / Lower Arties
BH2	322936	6401923	Standpipe Piezometer	90	West of basin, close to outcrop	Lower Barrett
BH3	325457	6401923	Standpipe Piezometer	11	East of waste dump / backfill area	Regolith and shallow coal seams
BH4	323982	6398666	Standpipe Piezometer	10	Rix's Creek south of Pit 3	Regolith
BH5	324562	6399924	Standpipe Piezometer	66.5	East of Rix's Creek / tailings emplacement area	Lower Barrett
20BL170864	324633	6400335	Production bore	~70	Above underground workings	All coal seams

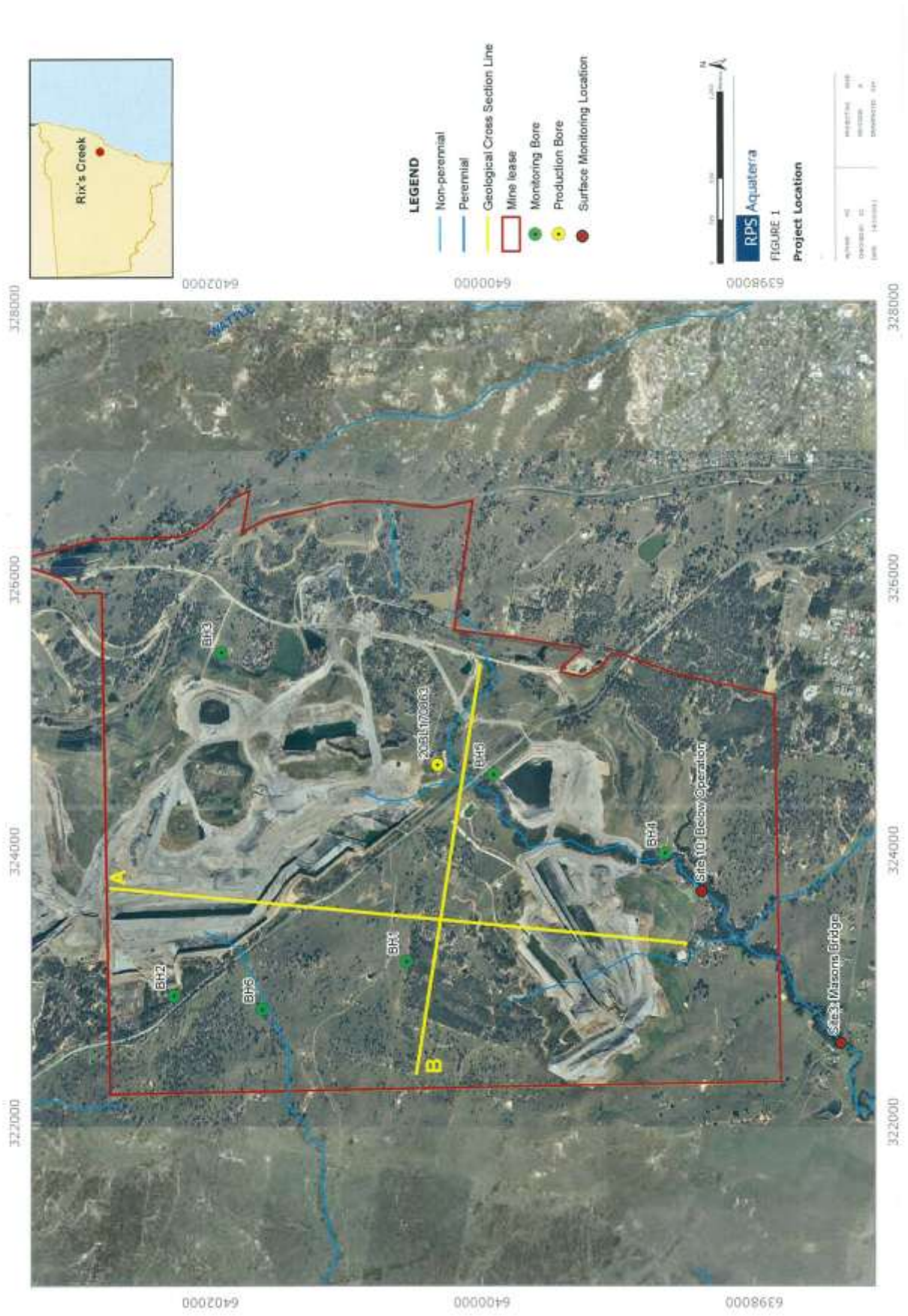


Figure 18. Groundwater Monitoring Network

Groundwater Levels

Groundwater level monitoring was monitored on a monthly basis in all piezometers and the existing bore (20BL170864) which intercepts the underground workings during January to November in 2011. After approval of Rix's Creek Water Management Plan 2011 (WMP) by NSW Office of Water (NOW) groundwater level monitoring has been undertaken on a quarterly basis from 2012 to 2014.

A water level transducer placed in BH4 during November 2012 is set to record groundwater levels at 12 hourly intervals. This enables the groundwater levels to be compared against surface water flows in Rix's Creek.

The groundwater levels are presented in Figure 19 and data collected to date show that:-

- BH1 which monitors the Upper Arties seams to the north of Pit 3, revealed a groundwater level head of about 17 - 22 m above the base of the Arties seam (31.58 - 37.48 mAHD) prior to insufficient water in the bore expected by dewatering as Pit 3 moves north-west towards the bore. This bore is expected to be replaced in 2015;
- The groundwater elevations within the underground working (which extends down to the Barrett seam) and BH5 (which monitors the Lower Barrett seam, between the old underground workings and Pit 2) are 60.46 – 70.77 mAHD and 57.65 – 64.03 mAHD, respectively;
- Groundwater levels in BH2 which was screened in the Lower Barrett Seam near the outcrop, suggest the seam has been dewatered in the area. This is mostly likely due to neighbouring influences of the Camberwell Open Cut Pit, which mined down to the Lower Barrett seam, rather than Pit 1, which mined down to the overlying Upper Liddell Seams. The groundwater elevation last recorded 49.06 mAHD in February 2012. Since this date no measurements have been recorded due to the peizometer being 'bent' preventing water level and bailer access. This bore is expected to be replaced in 2015;
- BH3 which is screened in both the regolith and shallow coal measures reported groundwater elevations between 95.96 – 96.46 mAHD (3.54 – 4.04 m below the ground); and
- BH4 which is located 50 m to the east of Rix's Creek, revealed a groundwater elevation of 60.39 – 60.90 mAHD (2.61 – 2.10 m below ground level) which is similar however slightly lower than the floor of Rix's Creek (61 mAHD).

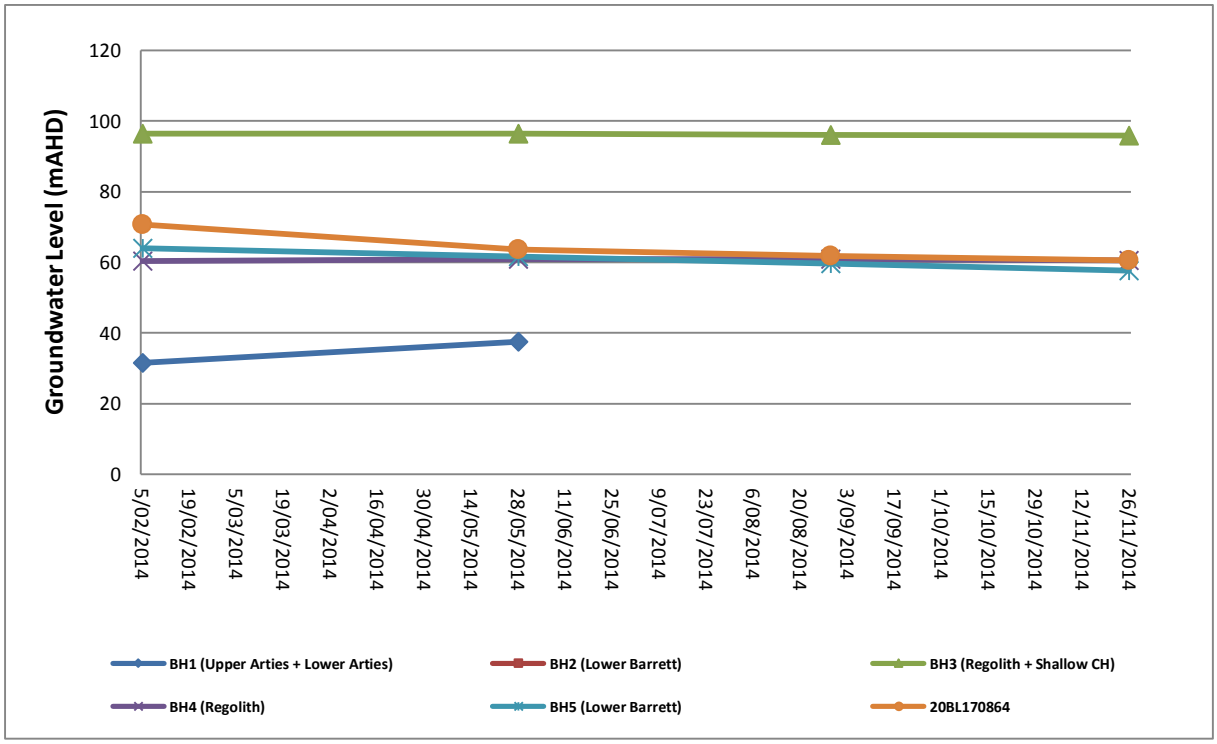


Figure 19. Hydrographs of BH1 to BH5 during 2014

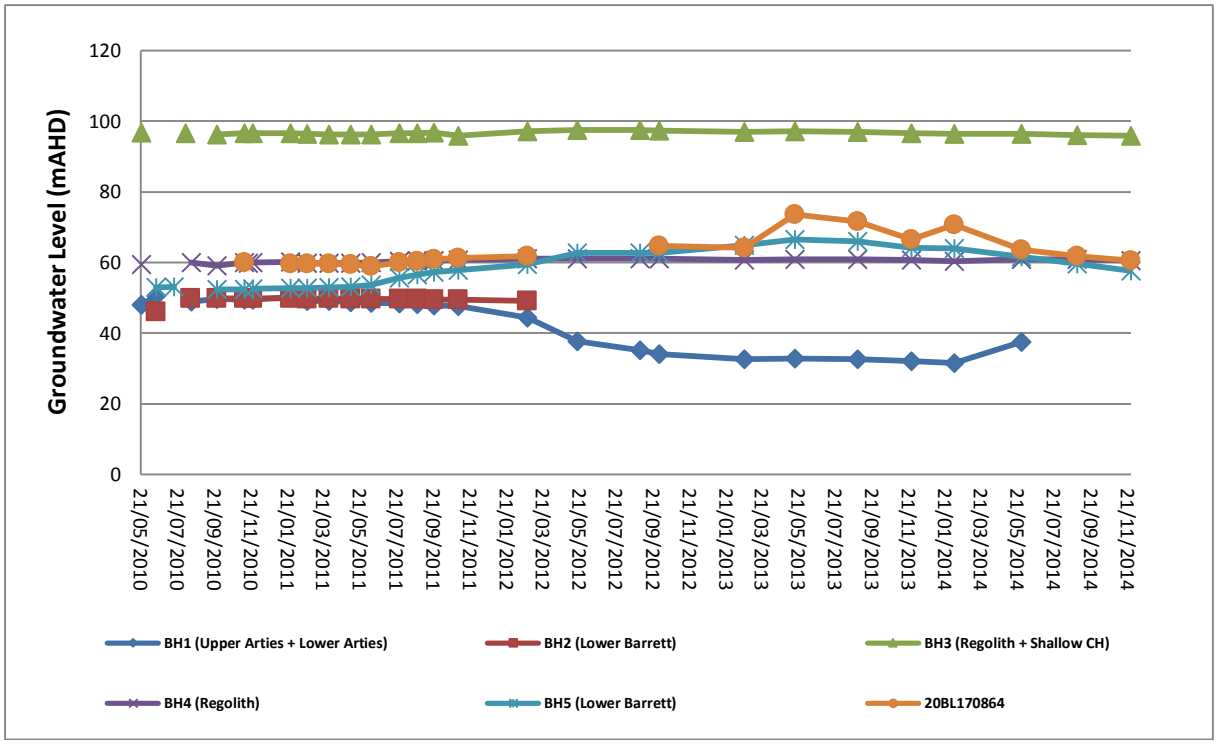


Figure 20. Hydrographs of BH1 to BH5 from 2010-2014

Figure 20 shows all six bores have remained fairly consistent since the commencement of monitoring ground water levels. Figure 21 also displays a consistent ground water EC (mS) throughout the period of monitoring. This is all consistent with the ground water monitoring showing that Rix's Creek open-cut is within a contained 'basin' where ground water is not impacted greatly by mining.

Groundwater Quality

Prior to collecting water samples the Piezometers were either pumped or bailed until at least 3 bore volumes had been purged to ensure that the samples were represented of the groundwater quality at the time of sampling. The samples were collected in laboratory prepared containers, stored on ice and submitted with a chain of custody to ALS Environmental Pty Ltd (ALS) on an annual basis. Their laboratory is NATA accredited for the analyses undertaken. Due to the depth of BH1 (81.42 mbgl) it is hard to recognise if the samples are representative of the groundwater quality in the bore. This is again shown in Figure 21 in which it is the only bore with a fluctuations of EC (26/7/2011 and 1/11/2011) evident since the commencement of monitoring.

The analyses included:

- General: pH, EC, total dissolved solids (TDS) and alkalinity;
- Major ions: Sulphate, chloride, calcium, magnesium, sodium, potassium, carbonate and bicarbonate (as CaCO3);
- Dissolved metals: Arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, vanadium and zinc; and
- Nutrients: Nitrite (as N), nitrate (as N) and nitrite + nitrate (as N), total nitrogen, ammonia as N, total phosphorus as P.

Salinity

The average salinity values of the groundwater sampled from the screened bore in the coal seam (BH5) ranged between 3,200 to 7,320 mg/L showing high levels of salinity. BH2 is also within the coal seam but was unable to be sampled during 2014. The last time it was successfully sampled was November 2011. The average salinity value within the regolith (BH3 and BH4) is also high ranging from 5,100 to 20,100 mg/L.

Over the monitoring period salinity levels are shown to remain constant in the coal seams and the regolith. This indicates limited connectivity with surface water and no water quality impacts from mining operations.

BH1 was unable to be sampled during 2014 due to dewatering. The last time it was successfully sampled in November 2012 it had an salinity value of 650 mg/L which may have been due to the bore being dewatered and/or sampled rainwater sitting in the bore casing with previous year's results being much higher. Relatively low salinity levels were also observed in BH1 prior to July 2011 which suggested mixing influences from the water that was used during the drilling process to flush the hole, and hence, values were not representative of the screened aquifer. The borehole was successfully purged and sampled using a submersible pump in July 2011. Analysis of this sample indicated much higher salinity levels (11,010 mg/L), which are consistent with typical groundwater salinities of coal measures.

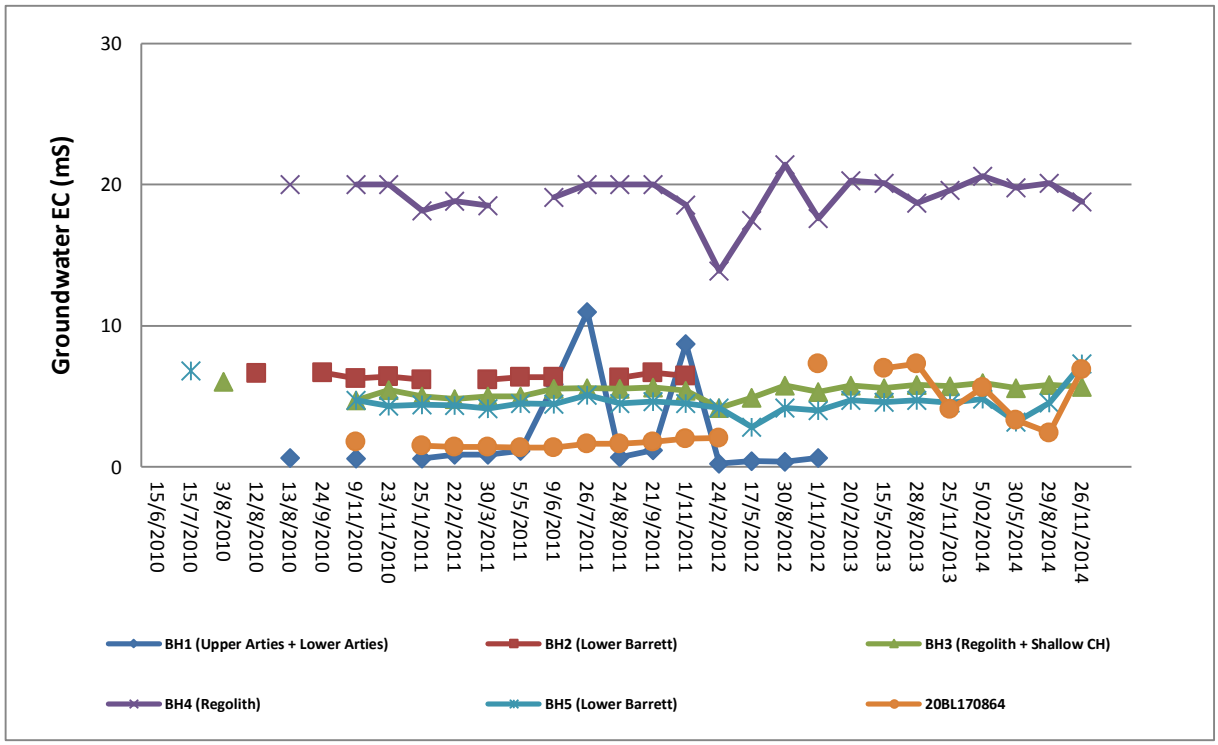


Figure 21. Hydrographs of BH1 to BH5 from 2010-2014

Figure 21 displays the EC across all bores since the commencement of monitoring. It is evident BH4 has the highest average salinity reading whilst BH1 had the lowest average readings across this time period. It is also worthwhile noting the frequency of monitoring changing from monthly (2010-2011) to quarterly (2012-present).

Major Ions

Aside from BH1 and BH2, groundwater samples collected from the piezometers showed a dominance in chloride ions in respect to bicarbonate and calcium ions, which is indicative of old ground waters, which are not readily recharged and/or are remote from recharge zones. This is particularly the case for BH4, which targets the shallow regolith near Rix's Creek. The high groundwater salinity (18,800 to 20,600 mg/L), suggests that ground waters within the regolith are not hydraulically connected to Rix's Creek, which is characterised by occasional surface water flows of much lower salinity (445 to 1,443 mg/L).

Dissolved Metals

Comparison of the analysis results for dissolved metals against the ANZECC guideline values for the protection of Freshwater Ecosystems (ANZECC, 2000) shows a number of exceedances of the guideline values, as follows:

- Copper was detected above the freshwater ecosystem value limit of 0.0014 mg/L in BH3 and production bore 20BL170864 at concentrations of 0.0060 and 0.0300 mg/L respectively;
- Nickel was detected above the freshwater ecosystem value limit of 0.011 mg/L in BH3 at concentrations of 0.013; and

- Zinc was detected in piezometers BH3, production bore 20BL170864 and BH5 at concentrations of 0.022, 0.102 and 0.016 mg/L respectively, which exceeded the freshwater ecosystem guideline of 0.008 mg/L.

Nutrients

Comparisons of the analyses for nutrients against the ANZECC guideline values for protection of Freshwater Ecosystems (ANZECC, 2000) shows a number of exceedances of the guideline values, as follows:

- Total kjeldahl nitrate concentration in piezometers BH3, BH4 and BH5 and 20BL170864 ranged from 0.3 to 2.9 mg/L, which exceeds the freshwater ecosystem protection guideline limit of 0.25 mg/L (Nitrate as N); and
- Total nitrogen concentration in all piezometers ranged from 0.5 to 2.9 mg/L, which exceeds the freshwater ecosystem protection guideline limit of 0.35 mg/L (Total N).

3.5.3 Reportable Incidents

No reportable incidents relating to groundwater pollution occurred during the 2014 reporting period.

3.5.4 Further Improvements

Now land has been purchased ahead of the Pit 3 operation a new borehole will be established outside of the intended mining area as BH1 is dewatered and will be mined through within the next several years. This borehole will be within close proximity to the proposed BH6 formerly planned with access prevented at time of initial groundwater monitoring. This borehole will be placed outside of the Pit 3 rehabilitation to monitor ground water outside of the geology / basin of Rix's Creek mine and any influences on Dead Man's Creek. BH2 (bent bore) will also be replaced in a suitable location along the North Pit high wall approximately 500 m south-east of its previous location. Any other bores will be dependent on the Rix's Creek Continuation of Mining project (2016 – beyond).

3.6 Contaminated Polluted Land

3.6.1 Environmental Management

No contaminated or polluted land has been identified at Rix's Creek. No significant hydrocarbon or chemical spills accrued requiring special response, clean-up or ongoing management.

3.6.2 Environmental Performance

Quarterly inspections of hydrocarbon storage facilities are completed as part of the site EMS, and no land contamination or significant pollution incidents were reported during these inspections. New signs were installed at the main hydrocarbon storage facilities tanks in 2014.

3.6.3 Reportable Incidents

No reportable incidents relating to land contamination occurred during the 2014 reporting period.

3.6.4 Further Improvements

The inspection regime is ongoing and management practises are in place to identify and control leaks or spills before they become contamination issues. The bioremediation area is regularly monitored and maintained as necessary. Signs were erected to this area following a 2014 inspection where it was recommended by DP&E to make site personnel more aware.

3.7 Threatened Flora and Fauna

3.7.1 Environmental Management

No threatened species have been identified on site in the EIS prepared for the operation or since then as the operation has progressed. No area of significant habitat exists on the site. "*The site has been extensively disturbed as a result of previous land uses and similar species and habitats exist in surrounding areas. No rare or endangered plant or animal species were observed during the study or are likely to occur on the site."* Environmental Impact Statement for Proposed Modification of Mining Operations – Rix's Creek Coal Mine, November 1994.

3.7.2 Environmental Performance

Areas of timber clearing were undertaken in advance of Pit 3 and for haul road access to the Pit 3 out of pit dump. No threatened flora and fauna issues were encountered during clearing operations.

3.7.3 Reportable Incidents

No reportable incidents relating to flora and fauna management occurred during the 2014 reporting period.

3.7.4 Further Improvements

Trees associated with timber clearing of good structural value are re-used in the creation of fence posts for the site. Timber ahead of Pit 3 was used for the construction of approximately 1100 m of cattle-fence within the lease to allow staged grazing of the land until mining has advanced into the area. Timber posts were also cut and stockpiled for future use. Several cleared trees were also placed onto rehabilitation areas for alternative habitat.

Rix's Creek is a participating member of the Upper Hunter Strategic Assessment (UHSA) with likely impacts on threatened biodiversity being assessed using the Biodiversity Certification Assessment Methodology (BCAM). BCAM is being used to quantify biodiversity value as ecosystem or threatened species credits.

3.8 Weeds & Pests

3.8.1 Environmental Management

A weed control program is undertaken on site each year. During the year areas were targeted to control African Boxthorn, Mother of Millions, Prickly/Creeping/Tiger Pear, Paterson's Curse, Blue

Heliotrope, Galenia, St. John's wart, Scotch/Safron thistle, Cotton bush, Lantana, Castor Oil, Green Cestrum, Bitou bush and Pampas grass. During November extensive Pear control was carried out across rehabilitated areas on the South Pit dump, North Pit Dump topsoil stockpiles and undisturbed land ahead of the West Pit operations. Extensive follow-up weed control from 2012 and 2013 works was undertaken along Rix's Creek itself on the noxious weed African Boxthorn during June and July. The program includes spraying and/or the removal of plant material from the site. This was carried out in conjunction with adjoining land holders.

The first quarter of 2014 was focussed on Galenia control works on the entire site with focus on the North Pit rehabilitation areas.

The last quarter of 2014 was focused on Pear control across the entire site on rehabilitated and undisturbed areas. The prolific coverage of Pear was likely aligned to low rainfall and hot, dry climatic conditions. Biological methods for the control of prickly pear/tiger pear have also been used in the past. Assorted weeds and grasses surrounding site infrastructure and topsoil stockpiles were also controlled as required.

Throughout May and July/August, 1080 Wild Dog Baiting was undertaken across site in consultation with LHPA's aerial baiting in surrounding areas. During May Kangaroo culling was conducted on site. During November a qualified pest control contractor sprayed the entire site with odourless chemical prior to summer.

3.8.2 Environmental Performance

The following weed species have been identified and treated on-site during 2014:-

- Mother-of-millions, *Bryophyllum* spp. (class 3);
- Galenia, *Galenia pubescens* (non noxious – class 4 Tamworth);
- Pampas grass, *Cortaderia* spp. (class 4);
- Prickly pear, *Cylindropuntia* spp. (class 4);
- Creeping pear, *Cylindropuntia* spp. (class 4);
- Tiger pear, *Cylindropuntia* spp. (class 4);
- African boxthorn, *Lycium ferocissimum* (class 4);
- St John's wort, *Hypericum perforatum* (class 4);
- Paterson's curse, *Echium plantaginuem* (class 4);
- Castor Oil, *Ricinus communis* (non noxious – class 4 Sydney area);
- Blue Heliotrope, *Heliotropium amplexicaule* (non noxious - class 4 outside of Singleton LGA);
- Cotton bush, *Gomphocarpus fruticosus* (non noxious);
- Green Cestrum, *Cestrum parqui* (class 3);
- Lantana, *Lantana* spp. (class 4); and
- Bitou bush, *Chrysanthemoides monilifera* (non-noxious – class 3/4 out of Singleton LGA).

The following 1080 baits have been laid on site during 2013:

- 20 ground meat baits (targeting wild dogs) during Autumn; and
- 15 ground meat baits (targeting wild dogs) during Winter.

The Autumn 1080 baiting program was aligned with the Upper Hunter 1080 Wild Dog Aerial baiting program. During this period Rix's Creek undertook their Kangaroo culling program.

During May, qualified open range shooters conducted a Kangaroo culling program across site. The shooting was undertaken across four nights (across several weeks) with 197 Eastern Grey Kangaroo's (*Macropus giganteus*) culled and tagged with tags supplied by National Parks and Wildlife Service (NPWS). NPWS also provided approval for meat to be taken off-site and provided to local Wild Dog Associations for wild dog control during the May aerial baiting program as well as ground baiting for wild dog control in the local area. The total meat provided for baiting purposes totaled 1000 kg+ from 150 culled Kangaroos in which Wild Dog Associations and the LHPA typically struggle for funding.

N

W E

S

E 323000 E 324000 E 325000 E 326000

N 6402000 N 6402000

N 6401000 N 6401000

N 6400000 N 6400000

N 6399000 N 6399000

N 6398000 N 6398000

E 323000 E 324000 E 325000 E 326000

LEGEND

- Mining Lease
- St Johns Wart
- Galenia
- Assorted Pear
- Paterson's Curse
- Blue Heliotrope
- Castor Oil
- Grass Control
- Lantana
- African Boxthorn
- African Boxthorn
- Mother-of-Millions
- Mother-of-Millions
- Noogoora Burr
- Pampus Grass
- Bitou Bush

0 1 km

The Bloomfield Group

Rix's Creek Mine

Annual Environmental Management Report - 2014

Weed Management Plan

Scale as Shown	Date : January 2015 Photo : December 2014	Drawing A3 JD

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3.8.3 Reportable Incidents

No reportable incidents relating to weed and/or pest management occurred during the 2014 reporting period.

3.8.4 Further Improvements

An annual weed spraying program is undertaken to control the weeds listed in section 3.8.2. The following weed species have been identified on-site and will be managed as practicable in 2015:-

- Prickly pear, *Cylindropuntia* spp. (class 4); and
- Galenia, *Galenia pubescens* (non noxious – class 4 Tamworth).

Several goats have been seen around site and disturbing rehabilitation areas. These will be monitored and managed where possible during 2015. Continuation of Kangaroo culling program aligned with the annual wild dog aerial baiting program for Upper Hunter and WDA's requirements.

3.9 Blasting

3.9.1 Environmental Management

Blasting criteria for mining at Rix's Creek is specified in the Development Consent conditions and Environmental Protection License. The conditions state that blasting is to be carried out in accordance with the recommendations of Australian Standard 2187-1993 and in terms of ANZEC Guidelines and to the satisfaction of the EPA.

Blasting is not to be carried out within 500 m of the New England Highway or an approved deviation of the highway while open to traffic. During the year blasting in Pit 1 and Pit 3 has taken place within the 500m exclusion zone under an approved procedure to close the Highway to traffic during blasting. The Company has approval from the Roads and Maritime Services (RMS) to conduct closures of the Highway for blasting under a Road Occupancy License (currently ROL 511703) – This approval is renewed every six months.

The conditions specified in the Development Consent and Environmental Protection License require blasts be designed to minimise air blast overpressure and ground vibration. A NONEL (non-electric) system is used so that any blast only has less than 5 % probability of exceeding an air blast overpressure of 115 $dB_{(Linear)}$ to a maximum of 120 $dB_{(Linear)}$ and vibration with peak particle velocity of 5 mm/sec to a maximum of 10 mm/sec at the closest residence (not owned by the applicant outside the mining lease).

Instantaneous wind speed and direction information is available to management to be used in scheduling blasting operations to minimise offsite effects of air blast overpressure and dust. The Company is one of the joint venture partners in the Meteorological Sounding Group. This group has purchased equipment to measure wind speed, direction and temperature in the atmosphere. This data is then used to better predict the impacts of atmospheric conditions that can result in overpressure enhancement off site. The on-site weather station also has real-time data that can be viewed at any time by relevant site personnel. This weather station has the ability to alarm when conditions are not suitable for blasting i.e. wind speed currently greater than 10 m/s.

All blasts are monitored to record air blast overpressure and peak particle velocity at residences most likely to be effected. The modelling of dust and fume associated with blasting commenced during March 2012 and verified using DustTrak DRX dust monitors and App-Tek OdaStat gas monitors. During 2012 approximately 40 blasts were monitored in conjunction with the model. The monitoring was in conjunction with Rix's Creek daily EnvMet and NOx emissions predictive modelling. The NOx modelling shows various predicted outcomes and has played an integral part of Rix's Blast regime during 2013 and 2014 and can be seen in Figure 22. The predictive modelling is continually updated and can be seen in Figure 20. The pink dots on the model are the closest residences/receptor's that can potentially be impacted via blasting.

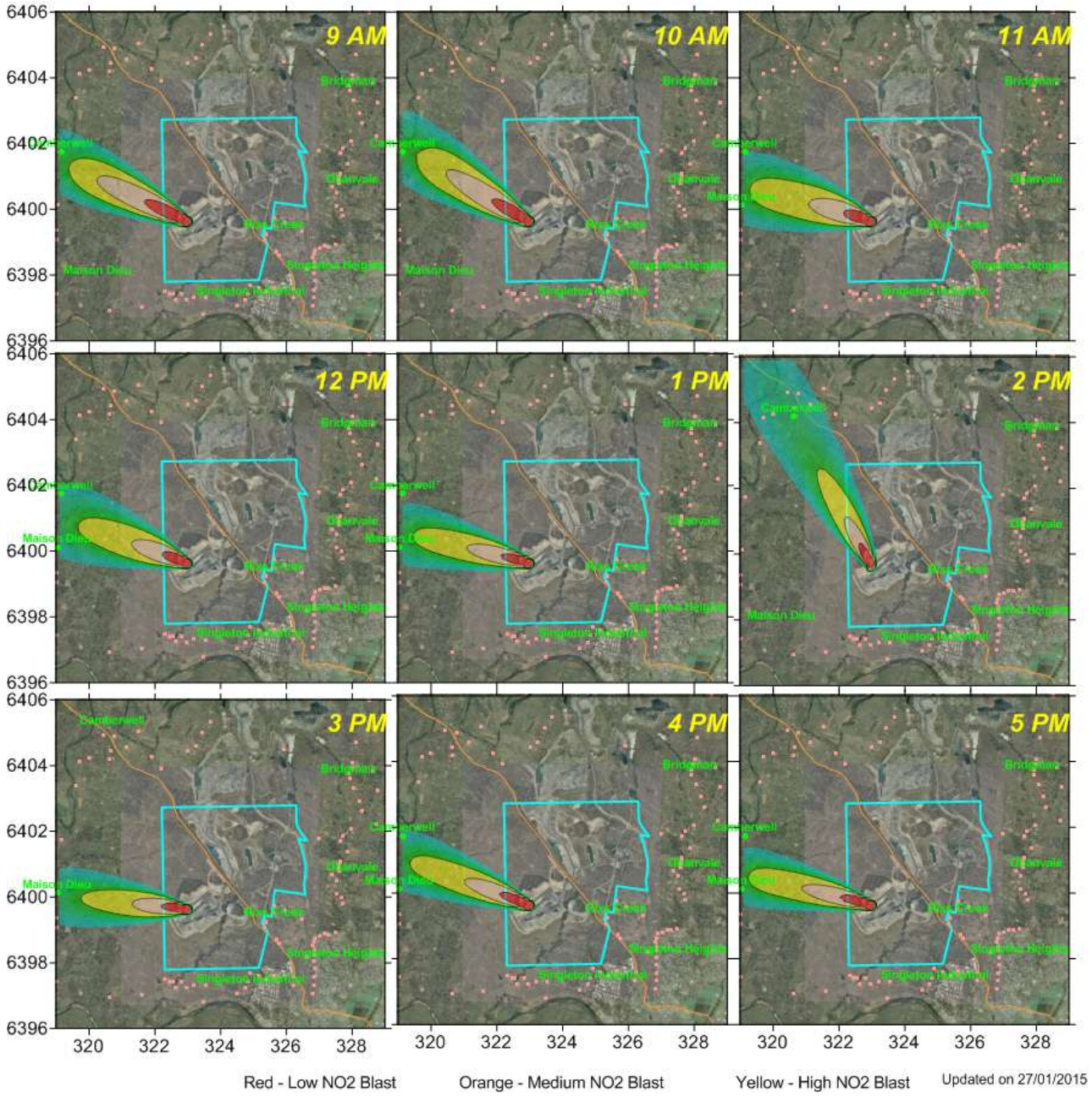


Figure 22. Blast Dust / Fume 'Plume' Model 2014.

3.9.2 Environmental Performance

During 2014 a total of 77 production blasts were initiated into overburden in Pits 1 (4 blasts) and Pit 3 or West pit (73 blasts).

See Appendix 2 for monitoring results of individual blasts.

Of the 77 blasts no blasts recorded vibration over 5 mm/sec and three blasts (3.9%) recorded overpressure above 115 dB_{Linear},however, these blasts did not exceed 120 dB_{Linear}. 40 blasts were cancelled and rescheduled due to unfavourable weather conditions, this included windspeed, wind direction, dust potential, fume potential and overpressure potential. Several other blasts were delayed and / or prevented due to rainfall.

3.9.3 Reportable Incidents

During 2014 two (2) complaints were received by the Company relating to two blasts. See Table 23 for details.

Table 23. Blast Complaints

DATE	LOCATION	RESOLUTION
16/4/2014	Singleton	Complaint referred from EPA, regarding a complaint from a caller in the Singleton area regarding blast fume observed from a blast. Blast results and images/video of blast provided to the EPA with minimal fume and no further action.
23/6/2014	Long Point	Caller to Planning & Environment regarding overpressure from blast that shook the complainant's house. Rix's Creek provided blast overpressure and vibration results to Planning & Environment which were all below the mines limits. No further action was taken by Planning & Environment.

3.9.4 Further Improvements

The Company is part of the Terrock EnvMet Research Project. This allows access to the prediction model for atmospheric enhancement for overpressure. This information is used to access the potential for overpressure enhancement due to the predicted atmospheric conditions throughout the day. This information can then be used to schedule blasting operations to minimise off site environmental impacts resulting from blast overpressure. The models (overpressure, fume and dust) are undergoing predictive forecasting for atmospheric conditions two days ahead to further enhance undertaking blasting during ideal weather conditions. The models have also been updated to include nearest receptors which are likely to be affected by blasting activities.

Rix's Creek have access to several predictive weather models in which products are selected for blasting based on possible weather conditions prior to blasting. Blast products will continually be reviewed and trialled where thought beneficial throughout 2015 to minimise fume emitted from blasting. Fume will continually be monitored on site to manage any onsite and offsite impacts in the case of a fume event resultant from a blast.

Rix's Creek blast fume model was updated in December 2014 to progress from the model seen in Figure 22 to one displaying the modelling of altitude (up to 1000m) as well as wind speed and direction to further assist the scheduling of blasting activities.

The ACCO 10,000L water cart will continually be used across site to minimise dust from hardstand areas, concrete surfaces and in particular what it was purchased for crusting drill cuttings from the drill and blast process. The watering of drill cuttings generally follows the path of the drill on the shot and also when unfavourable wind conditions are predicted.

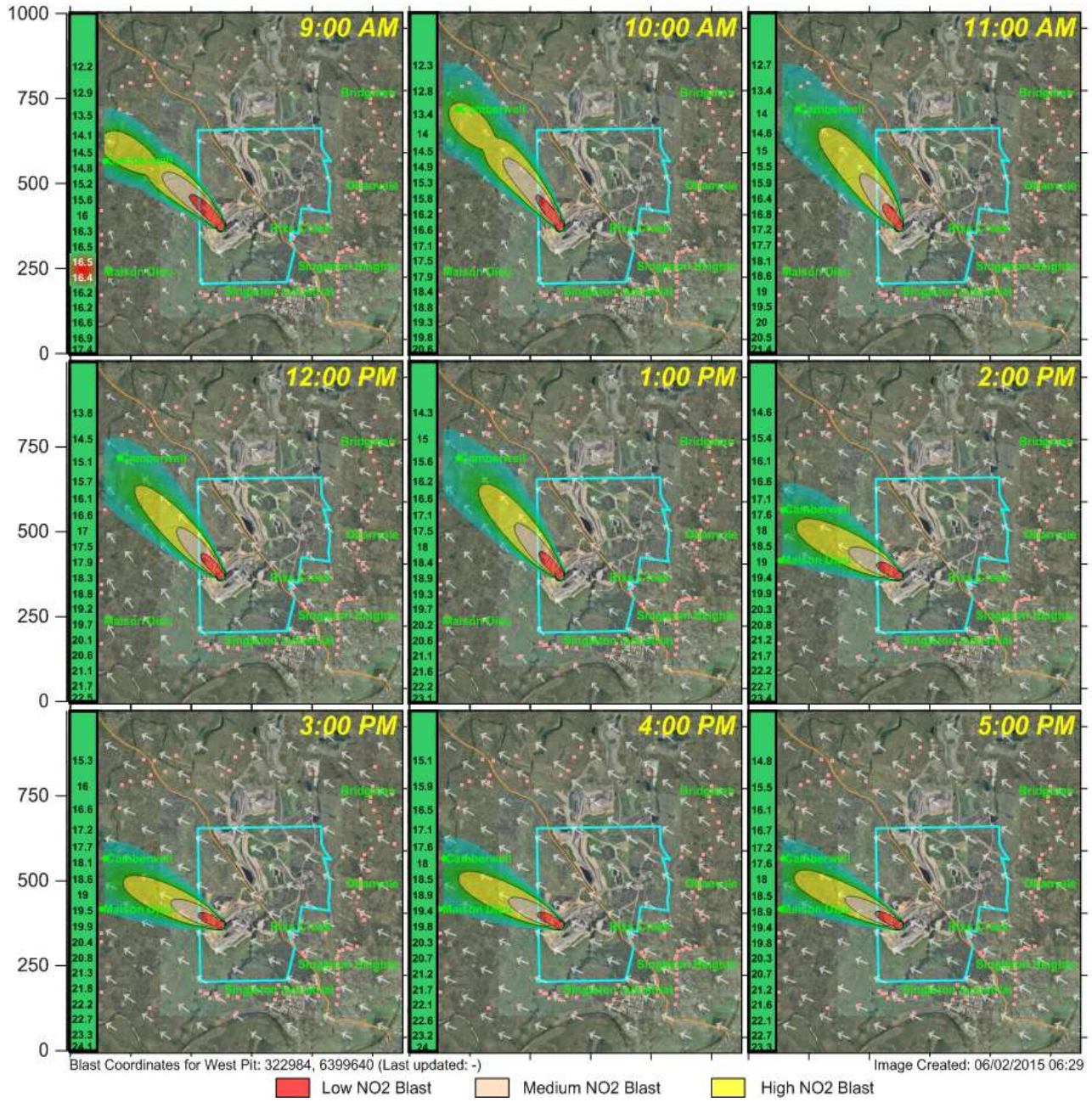


Figure 23. Blast Dust / Fume 'Plume' Model Updated December 2014.

3.10 Operational Noise

3.10.1 Environmental Management

Under the Development Consent DA 49/94 operational noise level limits were set for daytime and night-time levels.

'The Applicant shall

i) comply with L_A10 Daytime noise level design goals set out below:

The Retreat	*42 dB(A)*
Singleton Heights	*42 dB(A)*
Maison Dieu Road	*38 dB(A)*

ii) comply with L_A10 Night time noise level design goals set out below:

The Retreat	*40 dB(A)*
Singleton Heights	*40 dB(A)*

Maison Dieu Road 38 dB(A)

These goals relate to average atmospheric conditions (neutral atmospheric) and not to inversion conditions.'

The Development Consent also sets out a monitoring program to be conducted to show that the operation is meeting the noise criteria as set. This program includes measuring background noise levels at four locations over a 72-hour period, during each quarter. The locations of the monitoring sites are:

1) Lot 2 'The Retreat' off Bridgman Road
2) Lot 2 'Glen Lemon' Maison Dieu Road
3) 40 Wilcox Ave, Singleton Heights
4) Ernst property New England Highway Camberwell

These sites are shown in Plan 1.

During the 2013 AEMR review it was requested by the Department of Planning and Environment that the noise monitoring results include only the mine's noise contribution rather than total noise levels, and to include the applicable noise criteria and EIS predictions also. Table including noise level ranges is not required as per past reports. Any data and a discussion of low frequency noise assessment (less than 1,000 hz) would also be helpful. The following Project specific criteria is based on the Rix's Creek Pollution Reduction Program (PRP) Environmental Noise Assessment report (12323_PRP_R02.pdf).

Table 24. Rix's Creek Project Specific Levels (PSL) Criteria

Location	Not Winter – Night LAeq, 15 minute	Winter – Night LAeq, 15 minute	Not Winter – Night LA1, 1 minute	Winter – Night LA1, 1 Minute
Retreat	35	42	45	45
Maison Dieu	35	45	45	47
Singleton Heights	35	41	45	45
Camberwell	35	41	45	45

The readings are made with an Acoustic Research Laboratories EL-215 Portable Statistical Noise Logger and Ngara noise logger.

This standard monitoring procedure provides measurements of the background noise levels at the sites that may be influenced by noise from the operation, but does not provide actual measured operational noise at the locations. The logger measures total environmental noise at the site. To better determine the level of noise the operation may be contributing to the background noise environment, at the monitoring sites, on site attended monitoring is undertaken during the 72 hour monitoring period. Attended monitoring is undertaken during the day and night over the monitoring period. A hand held Rion NL-32 sound level meter set on 'fast' response is used to give an $L_{A10,15min}$ & $L_{AEQ,15min}$ noise level for the operation at the site. This instrument is capable of making a sound recording of the noise. This can later be played back to listen to the contributing noise sources. During 2014 a frequency card was utilised in the Rion NL-32 sound level meter to record noise frequency levels in the <1000 Hz range (generally 16 – 800 Hz). This will be discussed further in section 3.10.4 – Further Improvements.

Part of the Development Consent conditions relating to noise required the preparation of a Noise Management Plan for the operation. The Noise Management Plan was submitted to the EPA in November 1996. This Plan looks at all control measures in place on site to minimise the level of noise emanating from the operation. The Plan also describes the procedures for dealing with noise episodes that exceed the limits as set out above, if and when they occur.

Plant and equipment noise levels are monitored on a quarterly basis. Individual items of plant are measured to check that noise attenuating equipment e.g. silencers, are operating effectively and if any deterioration in efficiency is detected then the items are altered or replaced. All new mining equipment coming to site will be noise attenuated.

3.10.2 Environmental Performance

Background noise levels were monitored at the 4 sites on a quarterly basis (Table 255) during the year. All four quarters of monitoring was done by a noise consultant. The locations of the sites are indicated in Plan 1. Aside to the monitoring required to satisfy the requirements of the current Development Consent, attended noise monitoring was undertaken on a monthly basis from January through to December 2014 by a noise consultant. Aside to this attended noise monitoring was carried out on a nightly basis from August through to December 2014 by internal personnel. This will be discussed further in section 3.10.4 – Further Improvements.

Table 26 outlines the range of noise levels recorded at the sites during the monitoring periods. These readings are of the total localised noise levels and are not of operational noise levels. The attended monitoring undertaken during the periods give a better understanding of the operational noise levels at the monitoring sites. Attended monitoring was carried out to give an indication of the operations contribution to the noise environment.

Table 25. Schedule of Noise Monitoring

	LOCATION	MONITORING	DATE
Site 1	The Retreat	First Quarter	17/03/14 09:00
			21/03/14 10:30
		Second Quarter	23/06/14 15:15
			01/07/14 07:00
		Third Quarter	29/9/14 09:30
			3/10/14 14:15
		Fourth Quarter	1/12/14 12:45
			5/12/14 10:15
Site 2	Maison Dieu Road	First Quarter	24/03/14 10:00
			31/03/14 12:30
		Second Quarter	2/07/14 06:45
			8/07/14 14:30
		Third Quarter	7/10/14 09:45
			10/10/14 15:45
		Fourth Quarter	3/12/14 10:15
			9/12/14 10:00
Site 3	Singleton Heights	First Quarter	17/03/14 08:45
			21/03/14 10:30
		Second Quarter	23/06/14 15:00
			1/07/14 07:00
		Third Quarter	20/10/14 10:00
			24/10/14 13:30
		Fourth Quarter	8/12/14 13:00
			12/12/14 09:45
Site 4	Camberwell	First Quarter	24/3/14 09:30
			31/03/14 12:15
		Second Quarter	1/07/14 07:15
			6/07/14 02:45
		Third Quarter	13/10/14 08:30
			17/10/14 09:15
		Fourth Quarter	9/12/14 10:00
			16/12/14 12:45

The levels recorded at the sites during the monitoring periods throughout the year are consistent with levels recorded since the commencement of mining operations and are well within the range of results presented to the Commission of Inquiry and established prior to the commencement of mining. It would appear that noise levels are influenced in all locations by a number of localised factors outside of as well as within mine operating hours.

It can be seen from Table 26 that the noise levels vary significantly between recording periods and between sites. This reflects the localised noise sources at the sites during the periods and not the effects of the mining operation. The Retreat site showed operational noise was evident during the third quarter monitoring round with significant noise being audible under certain weather conditions,

in particular a north westerly wind influence. The Maison Dieu area throughout the year had some audible but not measureable results. The Singleton Heights and Camberwell sites were mostly inaudible and measureable in terms of Rix's Creek operational noise. It was always a view by the company to further minimise noise by moving the operation away from populated areas as mining progresses (such as Singleton Heights/Retreat/Maison Dieu).

During the 72 hour monitoring periods throughout the year attended on site monitoring was undertaken at all sites for a minimum of one 15 minute period during the day and again in the night. This monitoring has been undertaken in an attempt to better determine the actual level of noise the operation is contributing to the acoustic environment at the monitoring sites.

Table 26. Noise monitoring exceedances based on PSL Criteria

Site	Time	Date	Wind speed m/s	VTG	LAeq Criterion	Criterion applies?	RC LAeq / LA1,1min	Exceedance with MET	Exceedance regardless
First Quarter									
Retreat	23:29	30/3/14	2.1	-1	35	Y	IA	Nil	Nil
	23:29	30/3/14	2.1	-1	45	Y	IA	Nil	Nil
Maison Dieu	22:26	30/3/14	1.2	0.5	35	Y	IA	Nil	Nil
	22:26	30/3/14	1.2	0.5	45	Y	IA	Nil	Nil
Singleton Heights	23:09	30/3/14	1.5	-1	35	Y	IA	Nil	Nil
	23:09	30/3/14	1.5	-1	45	Y	IA	Nil	Nil
Camberwell	22:00	30/3/14	1.6	-1	35	Y	NM	Nil	Nil
	22:00	30/3/14	1.6	-1	45	Y	NM	Nil	Nil
Second Quarter									
Retreat	00:12	17/7/14	8.3	-1	42	N	40 (LAeq)	N/A	Nil
	00:12	17/7/14	8.3	-1	45	N	43 (LA1,1min)	N/A	Nil
Maison Dieu	22:29	16/7/14	8.5	-1	45	N	NM	N/A	Nil
	22:29	16/7/14	8.5	-1	47	N	NM	N/A	Nil
Singleton Heights	23:23	16/7/14	8.5	-1	41	N	39 (LAeq)	N/A	Nil
	23:23	16/7/14	8.5	-1	45	N	42 (LA1,1min)	N/A	Nil
Camberwell	22:00	16/7/14	7.3	-1	41	N	IA	N/A	Nil
	22:00	16/7/14	7.3	-1	45	N	IA	N/A	Nil
Third Quarter									
Retreat	00:10	16/10/14	1.8	0.5	35	Y	44	9	9
	00:10	16/10/14	1.8	0.5	45	Y	46 (LA1, 1min)	1	1
Maison Dieu	23:07	15/10/14	1.8	-1.0	35	Y	33	Nil	Nil
	23:07	15/10/14	1.8	-1.0	45	Y	38 (LA1, 1min)	Nil	Nil
Singleton Heights	00:39	16/10/14	1.8	4.1	35	N	33	Nil	N/A
	00:39	16/10/14	1.8	4.1	45	N	36 (LA1, 1min)	Nil	N/A
Camberwell	23:37	15/10/14	2.8	0.5	35	Y	IA	Nil	Nil
	23:37	15/10/14	2.8	0.5	45	Y	IA	Nil	Nil
Fourth Quarter									
Retreat	00:43	16/12/14	4.0	-1.0	35	N	30	N/A	N/A
	00:43	16/12/14	4.0	-1.0	35	N	30	N/A	N/A
Maison Dieu	23:15	15/12/14	5.3	-1.0	35	N	IA	N/A	N/A

	23:15	15/12/14	5.3	-1.0	35	N	IA	N/A	N/A
Singleton Heights	00:18	16/12/14	3.0	0.5	35	Y	<25	N/A	N/A
	00:18	16/12/14	3.0	0.5	35	Y	<25	N/A	N/A
Camberwell	23:46	15/12/14	3.8	0.5	35	N	NM	N/A	N/A
	23:46	15/12/14	3.8	0.5	35	N	IA	N/A	N/A

VTG: Vertical Temperature Gradient
NM: denotes audible noise but not measureable
IA: denotes inaudible noise
N/A: in exceedance column means atmospheric conditions outside conditions specified in PSL so criterion is not applicable.

The following are the attended monitoring results for each quarter.

First quarter 2014. **March monitoring.**

Retreat — Mining operation noise was not audible during the day and night time attended monitoring periods. For the majority of the monitoring period air movement was from the south-east away from the Retreat area so operational noise was not audible.

Retreat Road (RC4) – Measurement 1, Night time - Retreat

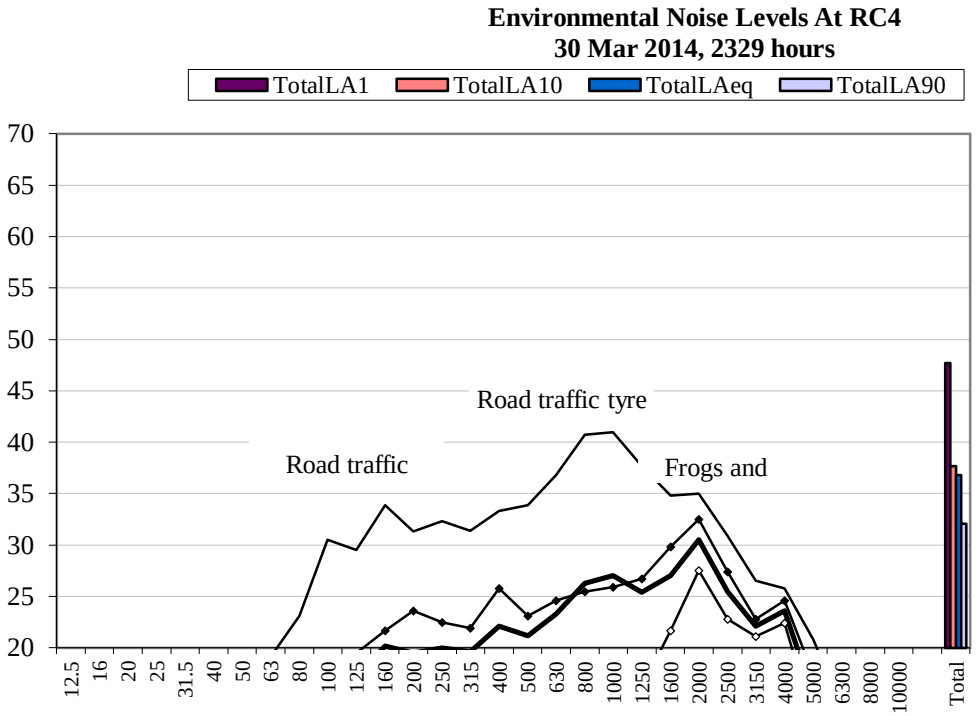


Figure 24 Environmental Noise Levels, Retreat Road

Rix's Creek was inaudible.
Frogs, insects, road traffic and a train combined to generate the measured LA1, LA10 and LAeq.
Frogs and insects were primarily responsible for the measured LA90.
Dogs were also noted.

Maison Dieu Area	Mining operation noise was inaudible during the day and night time monitoring sessions. Some noise was heard under background levels from vehicle movement on the New England Highway which bisects the mine as well as industrial activity in the Maison Dieu area under south-easterly wind conditions.

Maison Dieu Road (RC2) – Measurement 1, Night time – Maison Dieu

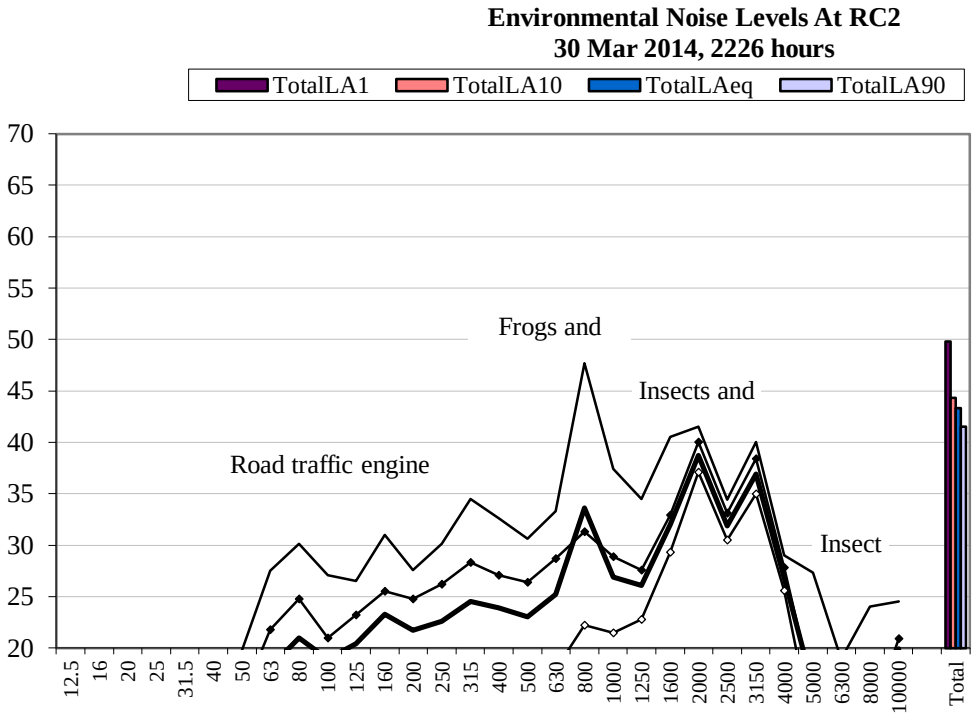


Figure 25 Environmental Noise Levels, Maison Dieu Road

Rix's Creek was inaudible.
Frogs and insects combined with road traffic and a train to generate the measured LA1, LA10, and LAeq. Frogs and insects were responsible for the measured LA90.
Impact noise from Maison Dieu Industrial Estate was also noted.

Singleton Heights

Mining operational noise was not audible during the day or night time attended monitoring periods. For the majority of the monitoring period air movement was low from the south-east away from the Singleton Heights area. A lot of background noise contribution was from traffic on the New England Highway.

Rodd Close (RC3) – Measurement 1- Night time – Singleton Heights

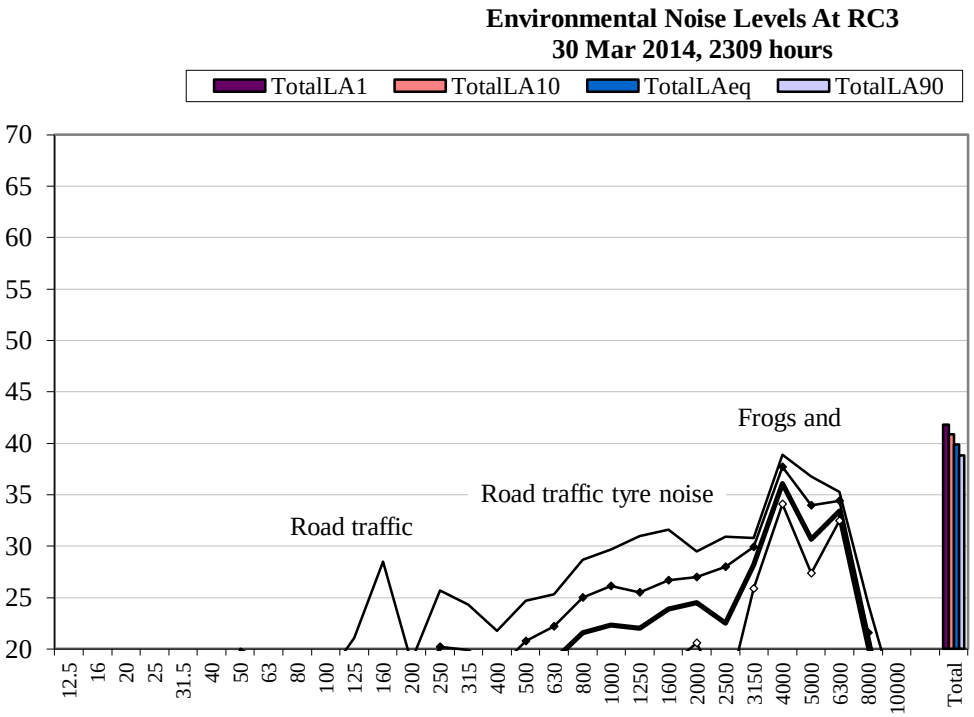


Figure 26 Environmental Noise Levels, Rodd Close

Rix's Creek was inaudible.
Frogs and insects were primarily responsible for measured levels.
Road traffic, dogs and a train were also noted.

Camberwell	Mining operational noise from Rix's Creek was audible during a night time monitoring sessions but not measureable as it was less than background levels. At the attended monitoring sessions the air movement was from the south-east toward the monitoring location. A majority of noise monitored come from traffic movement on the New England Highway which was the main contribution to background noise. Another mine's noise was also noted.

McInerneys Road (RC1) – Measurement 1, Night time- Camberwell

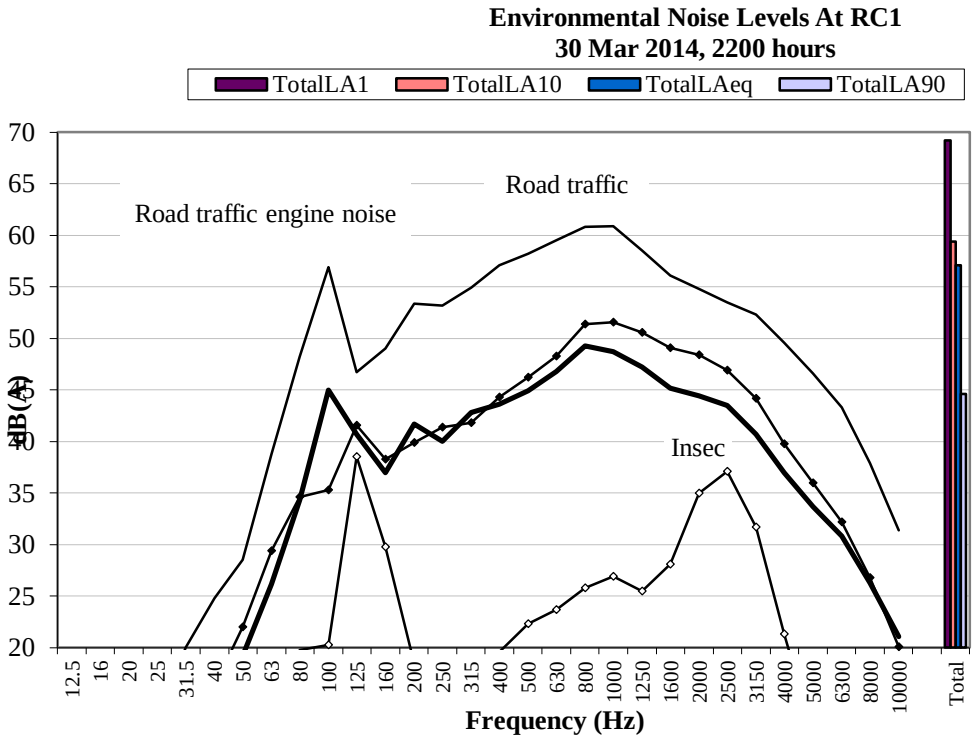


Figure 27 Environmental Noise Levels, McInerneys Road

Rix's Creek was audible through a low-level mining continuum during the measurement but was not measureable.
Road traffic noise was responsible for the measure LA1, LA10 and LAeq. A generator and insects were primarily responsible for the measured LA90.
Another mine continuum, frogs and a train were also noted.

Second quarter 2014. July monitoring

Retreat — Mining operation noise was audible during the night time attended monitoring and measureable on one occasion. Audible noise was evident via breeze in foliage and train movement on the Northern Rail line. Road traffic noise on Bridgman Rd was also noted.

Retreat Road (RC4) – Measurement 2, Night time - Retreat

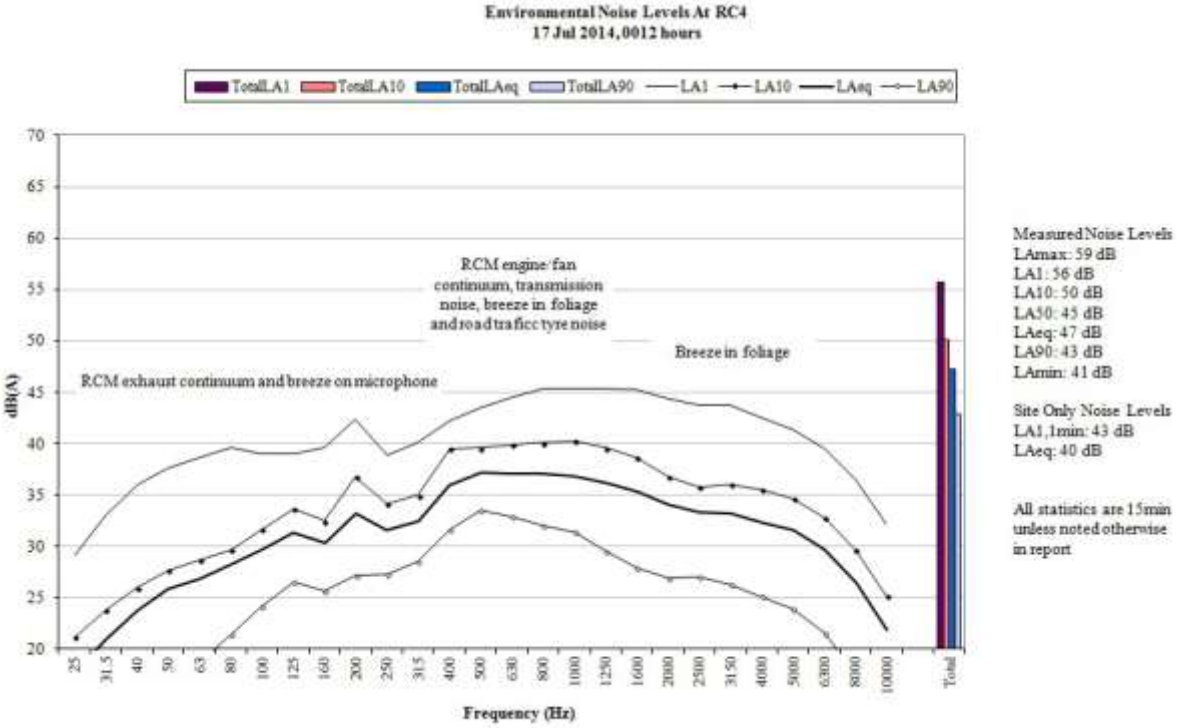


Figure 28 Environmental Noise Levels, Retreat Road

Rix's Creek was audible for an engine/fan/CHPP continuum, generating the site only LAeq of 40 dB. A surge in the continuum generated the site only LA1, 1 minute of 43 dB. Low level transmission noise was briefly audible.

Breeze in the foliage and on the microphone dominated the acoustic environment, primarily responsible for the measured LA1, LA10, LAeq, and combining with Rix's Creek to generate the LA90. Locomotive noise contributed to the measured LA1, LA10 and LAeq. Road traffic noise contributed to the LA1.

Maison Dieu Area	Mining operational noise was audible on several occasions during night time monitoring but not measurable above the background levels. Noise from another mine generated the measured levels as well as insects/frogs being minor contributors. Traffic noise was also noted.

Maison Dieu Road (RC2) – Measurement 2, Night time – Maison Dieu

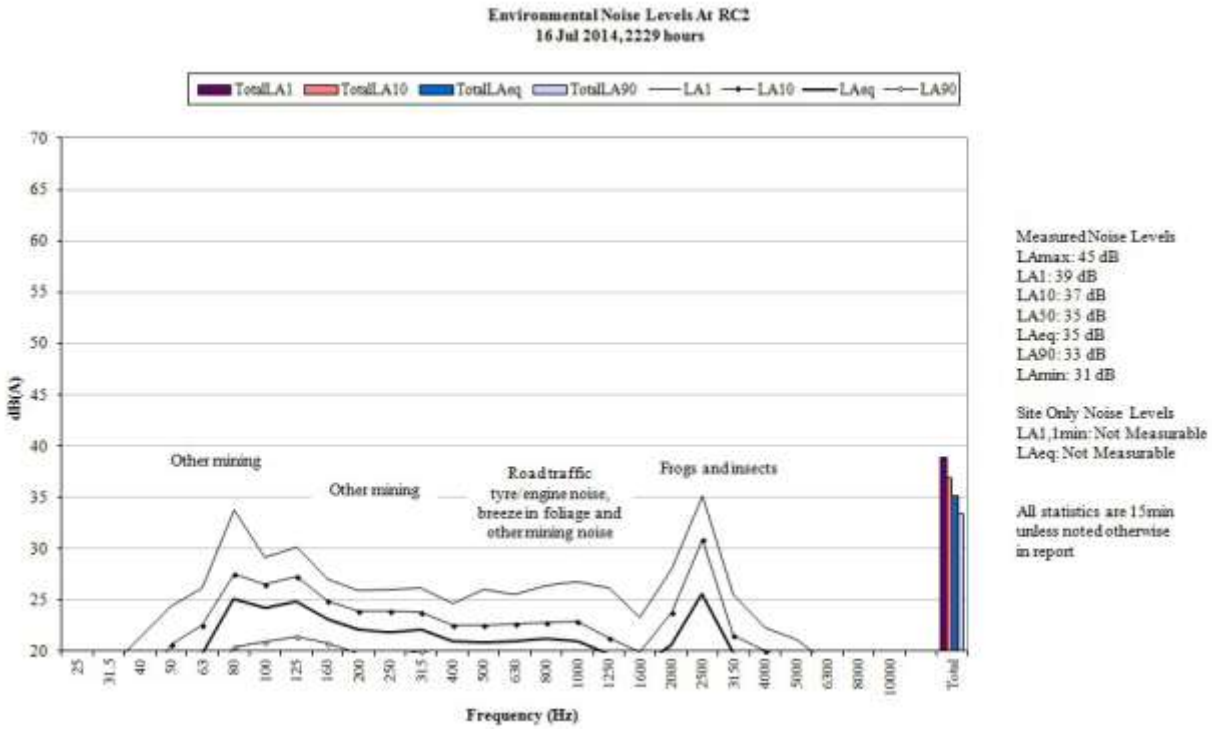


Figure 29 Environmental Noise Levels, Maison Dieu Road

Rix's Creek was briefly audible at times throughout the measurement. These levels were not measureable.
A continuum from another mine combined with frogs and insects to generate the measured LA1, LA10, LAeq and LA90. Breeze in the foliage/on the microphone was a minor contributor to the measured LA1 and LA10.
Cows and road traffic noise was also noted.

Singleton Heights	Mining operational noise was audible during the night time attended monitoring on several occasions and measureable on one occasion. A lot of noise was audible from traffic travelling on the New England Highway as well as train movement on the Northern Rail line. Insects, frogs and bats were also noted.

Rodd Close (RC3) – Measurement 2, Night time – Singleton Heights

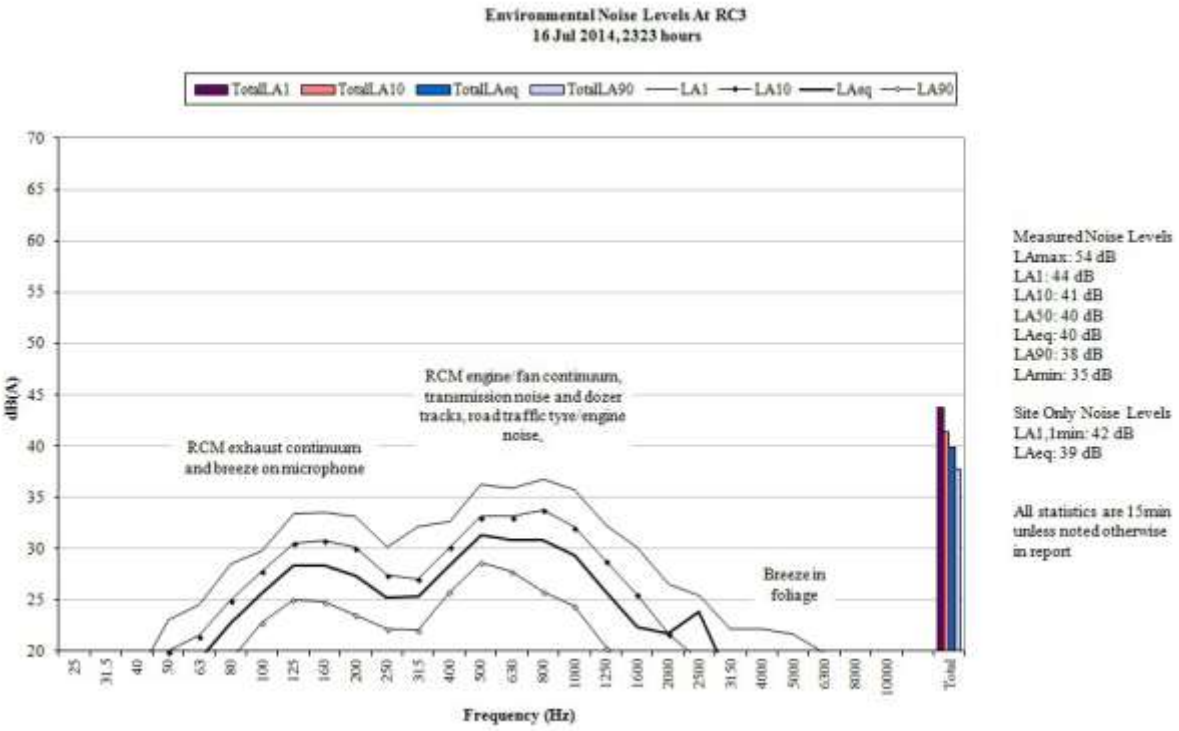


Figure 30 Environmental Noise Levels, Rodd Close

Rix's Creek was audible for an exhaust and engine/fan continuum which generated the site only LAeq of 39 dB. A surge in the continuum (dumping noise) generated the site only LA1, 1 minute of 42 dB. Track noise and transmission noise was also noted.
Rix's Creek was primarily responsible for the measured LAeq, and LA90. Bats, road traffic, locomotive noise and breeze in foliage were also noted.

Camberwell	Mining operational noise was not audible during the day or night time attended monitoring periods. A lot of noise was audible from traffic travelling on the New England Highway whilst noise from the breeze on foliage, frogs and insects were also noted.

McInerneys Road (RC1) – Measurement 2, Night time - Camberwell

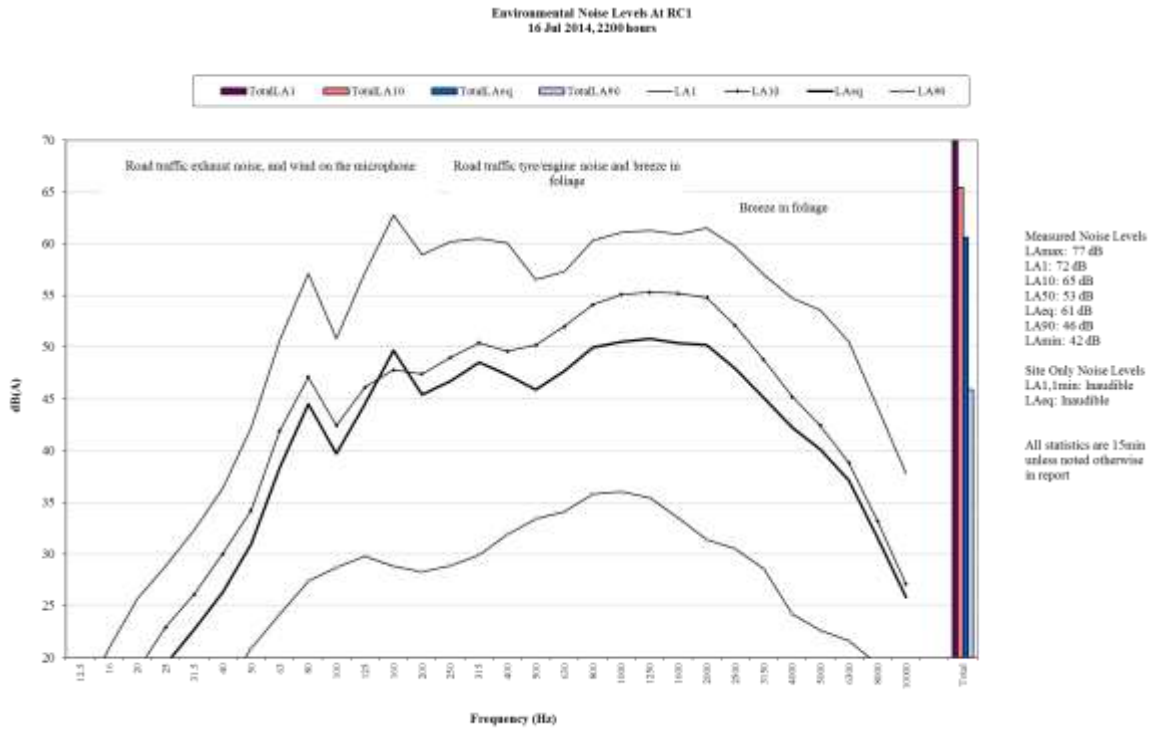


Figure 31 Environmental Noise Levels, McInerneys Road

Rix's Creek was inaudible.
Road traffic noise was responsible for all measured levels.
Breeze in foliage, breeze on microphone, frogs and insects were also noted.

Third quarter 2014. **September monitoring.**

Retreat — Mining operation noise was audible on several occasions during the night time monitoring. Acontinuum, engine and fan noise were the predominant sources. Audible noise was evident from traffic on Bridgman Rd and train ovement on the Northern Rail line.

Retreat (RC4) – Measurement 3, Night-time - Retreat

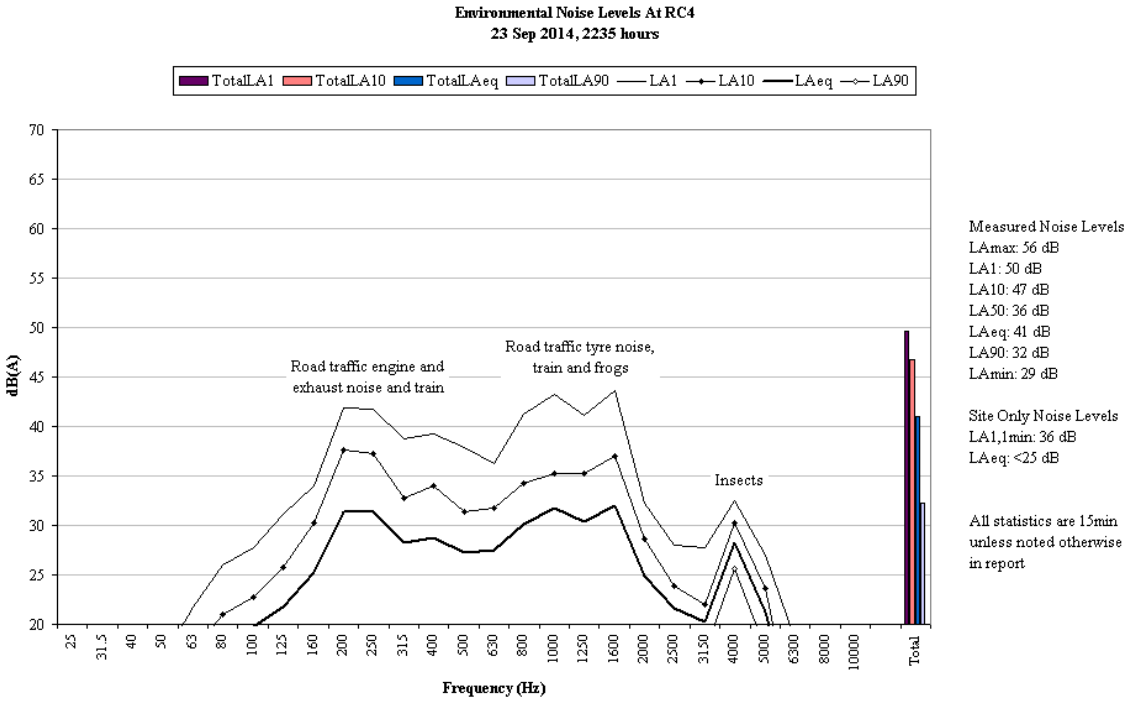


Figure 32: Environmental Noise Levels, Retreat Road

A continuum, engine and fan noise from RCM was audible throughout the measurement generating the site only L_{Aeq} of less than 25 dB. Engine noise generated the site only $L_{A1,1minute}$ of 36 dB.
Road traffic tyre noise was responsible for the measured L_{A1}. Road traffic tyre noise and a train generated the measured L_{A10} and L_{Aeq}. Insects and road traffic were responsible for the measured L_{A90}.
A train horn was also noted.

Maison Dieu Area — Mining operational noise was not audible during the day or night time attended monitoring periods. Predominant noise was from livestock and local industrial noise.

Maison Dieu Road (RC2) – Measurement 3, Night-time - Maison Dieu

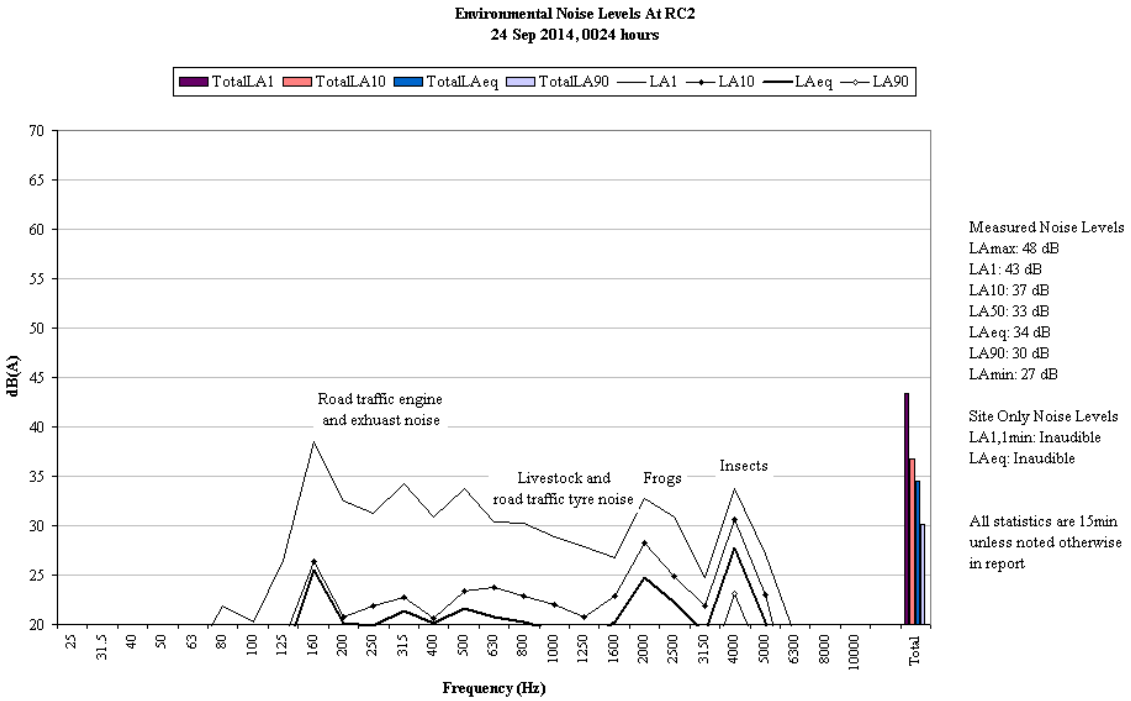


Figure 33: Environmental Noise Levels, Maison Dieu Road

RCM was inaudible.
Road traffic engine noise was responsible for the measured L_{A1}. Frogs and insects generated the measured L_{A10}. Frogs, insects and road traffic were primarily responsible for the measured L_{Aeq}. Frogs, insects and road traffic noise generated the measured L_{A90}.
Livestock, local industrial noise and birds were also noted.

Singleton Heights — Mining operational noise was not audible during the day or night time attended monitoring periods. Predominant noise was from insects and traffic travelling along the New England Highway.

Rodd Close (RC3) – Measurement 3, Night-time – Singleton Heights

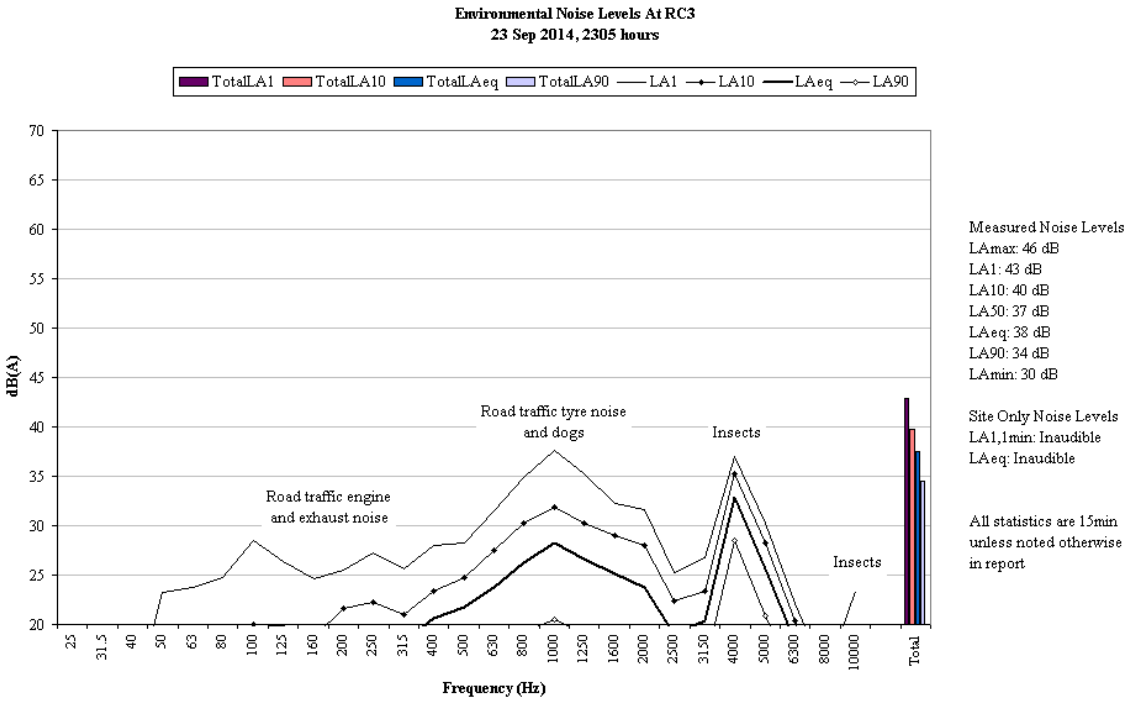


Figure 34: Environmental Noise Levels, Rodd Close

RCM was inaudible.
Dogs were responsible for the measured L_{A1}. Insects and road traffic tyre noise generated the measured L_{A10} and L_{Aeq}. Insects were responsible for the measured L_{A90}.
A train, road traffic engine and exhaust noise and a train horn were also noted.

Camberwell

Mining operational noise was not audible during the day or night time attended monitoring periods. Predominant noise was from traffic travelling along the New England Highway.

McInerneys Road (RC1) – Measurement 3, Night-time -Camberwell

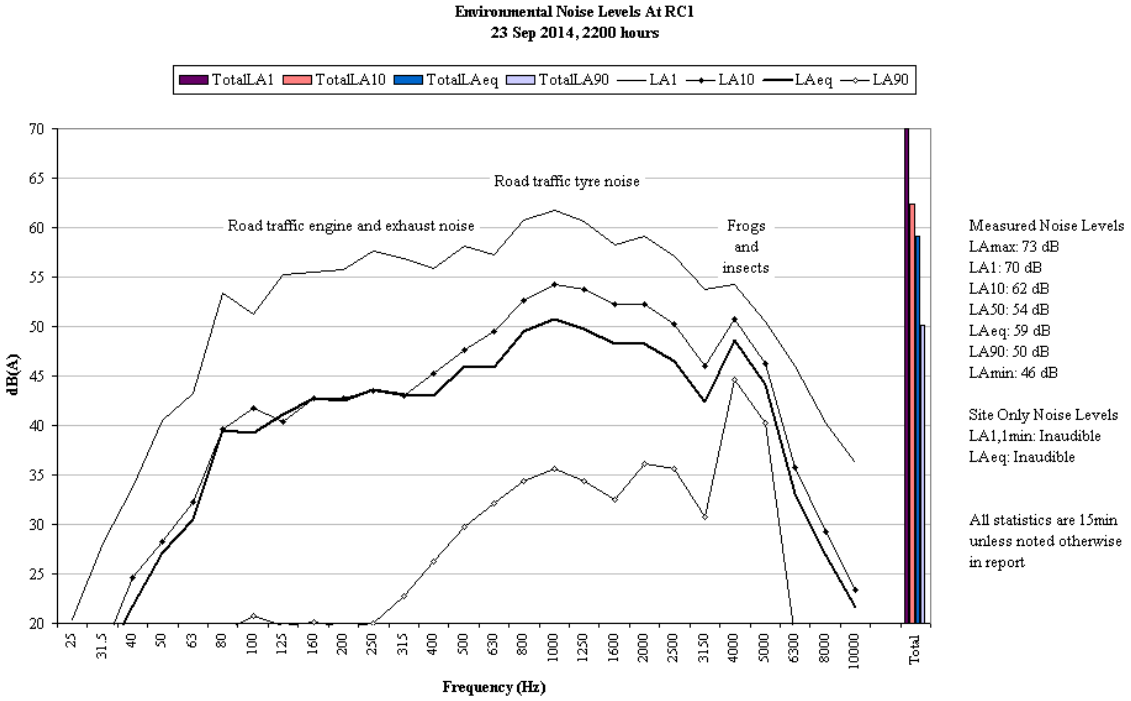


Figure 35: Environmental Noise Levels, McInerneys Road

RCM was inaudible.
Road traffic tyre and engine noise was responsible for the measured L_{A1}, L_{A10} and L_{Aeq}. Frogs and insects were primarily responsible for the measured L_{A90}.
Dogs, a train, a train horn and transmission noise from another mine were also noted.

Fourth quarter 2014. December monitoring.

Retreat — Mining operation noise was not audible during day however a mining continuum from Rix's Creek CHPP was audible during one night time monitoring session.

Retreat Road (RC4) – Measurement 4, Night-time - Retreat

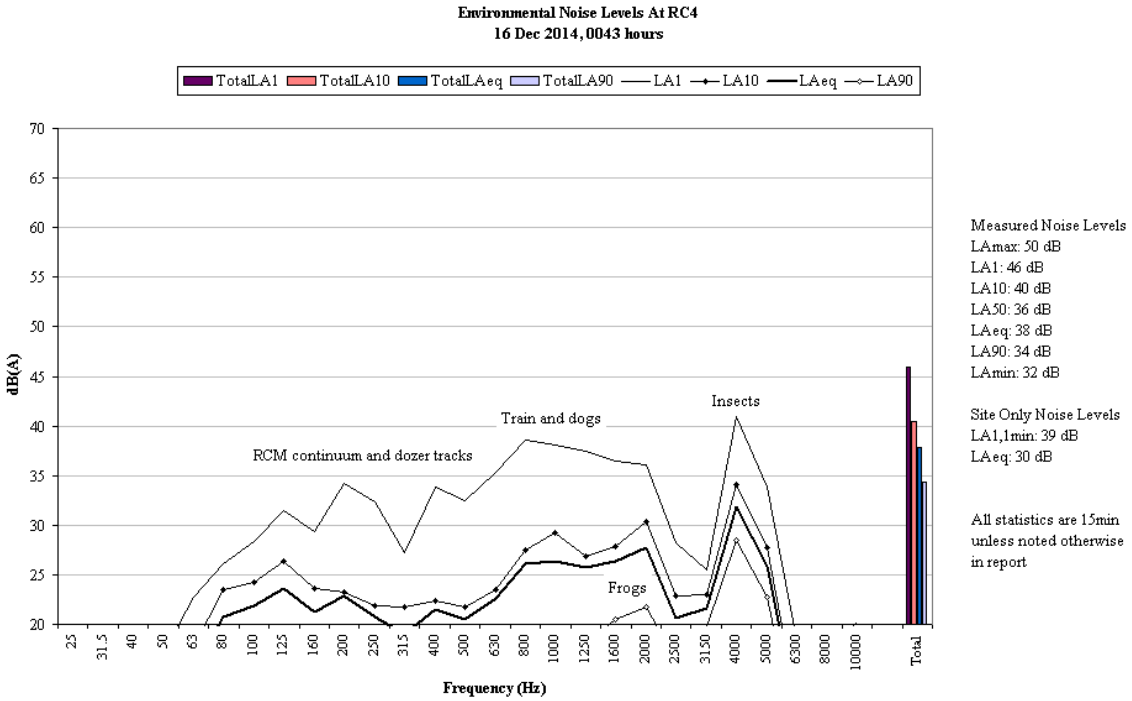


Figure 36: Environmental Noise Levels, Retreat Road

An engine and fan continuum from RCM was audible throughout the measurement generating the site only L_{Aeq} of 30 dB. A surge in the continuum generated the site only $L_{A1,1minute}$ of 39 dB. Dozer tracks were also noted.
Insects were the major contributor to the measured L_{A1}, L_{A10} and L_{Aeq}. Dogs were minor contributors to the measured L_{A1}. A train and frogs were minor contributors to the measured L_{Aeq}. Insects generated the measured L_{A90}.
Road traffic tyre noise was also noted.

Maison Dieu Area

Mining operational noise was not audible during the day or night time attended monitoring periods. Frogs and insects were the primary contributor to all measured levels.

Maison Dieu Road (RC2) – Measurement 4, Night-time - Maison Dieu

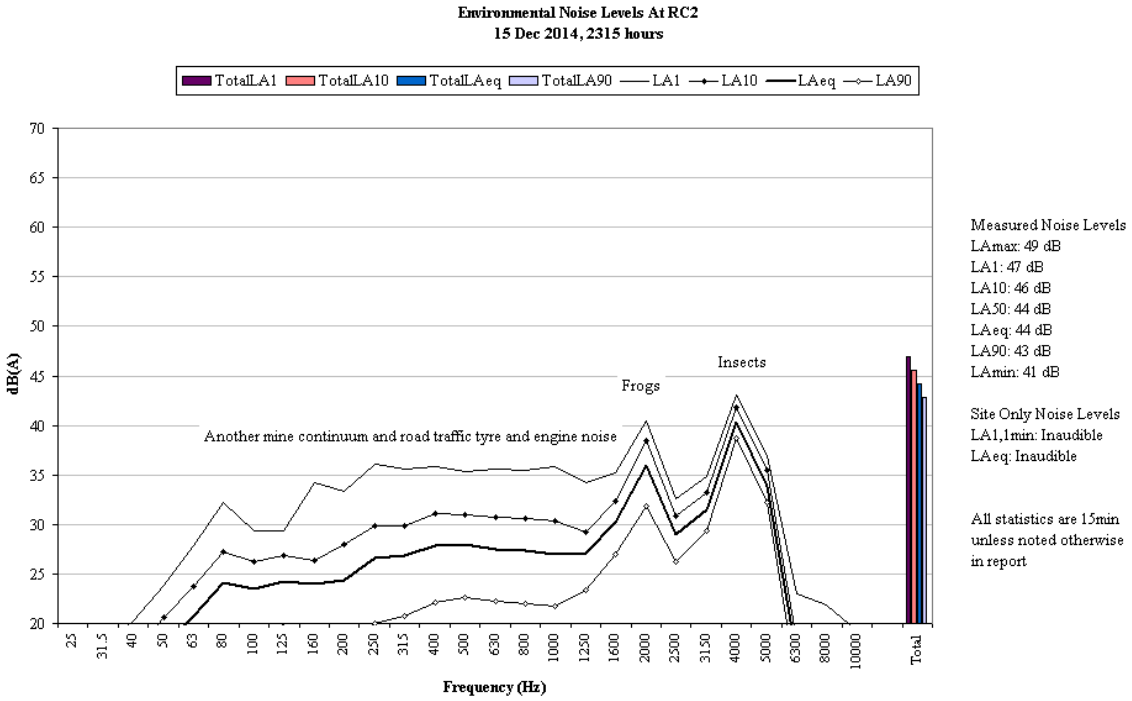


Figure 37: Environmental Noise Levels, Maison Dieu Road

RCM was inaudible.
Frogs and insects were responsible for measured levels.
A continuum and dozer tracks from another mine, a train and road traffic tyre and engine noise were also noted.

Singleton Heights — During the night-time attended monitoring operational noise was audible through a mining continuum. A lot of background noise was evident from the New England Highway and insects to all measured levels.

Rodd Close (RC3) – Measurement 4, Night-time – Singleton Heights

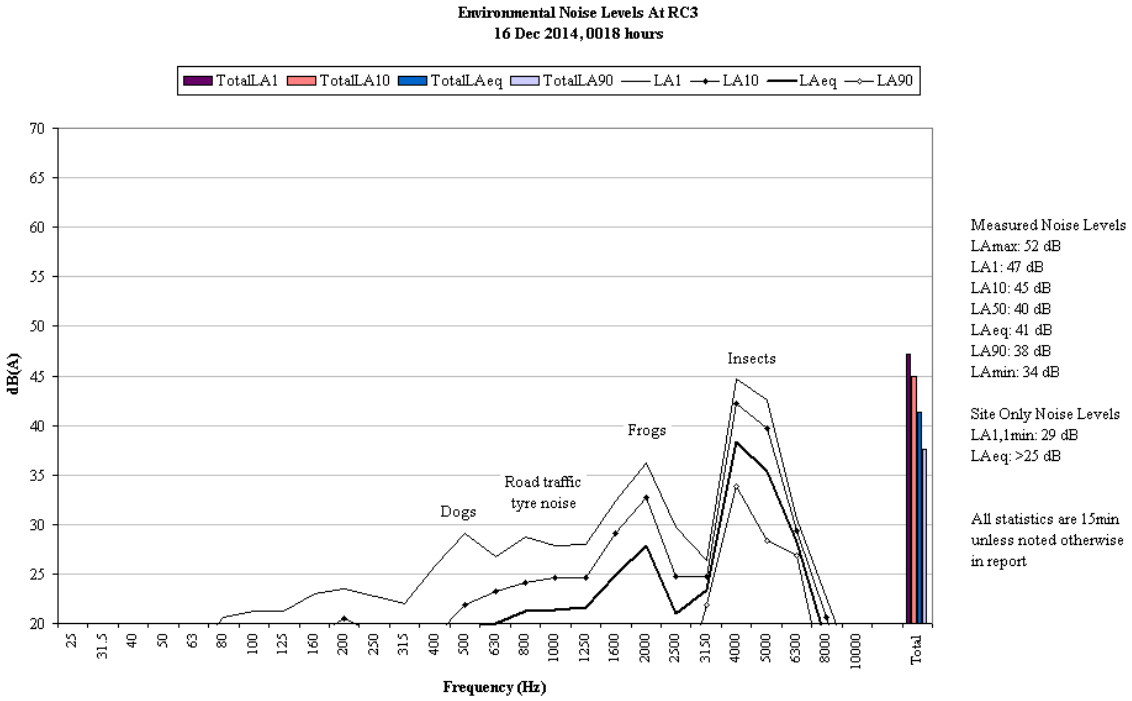


Figure 38: Environmental Noise Levels, Rodd Close

A low-level continuum from RCM was audible at times during the measurement generating the site only L_{Aeq} of less than 25 dB. A surge in the continuum generated the site only $L_{A1,1minute}$ of 29 dB. Insects were responsible for measured levels.
Road traffic tyre noise, frogs and dogs were also noted.

Camberwell — During the attended night any day time monitoring periods mine operational noise was not audible. New England Highway traffic, as well as insects and frogs were audible during the measurement, contributing to all measured levels.

McInerneys Road (RC1) – Measurement 4, Night-time - Camberwell

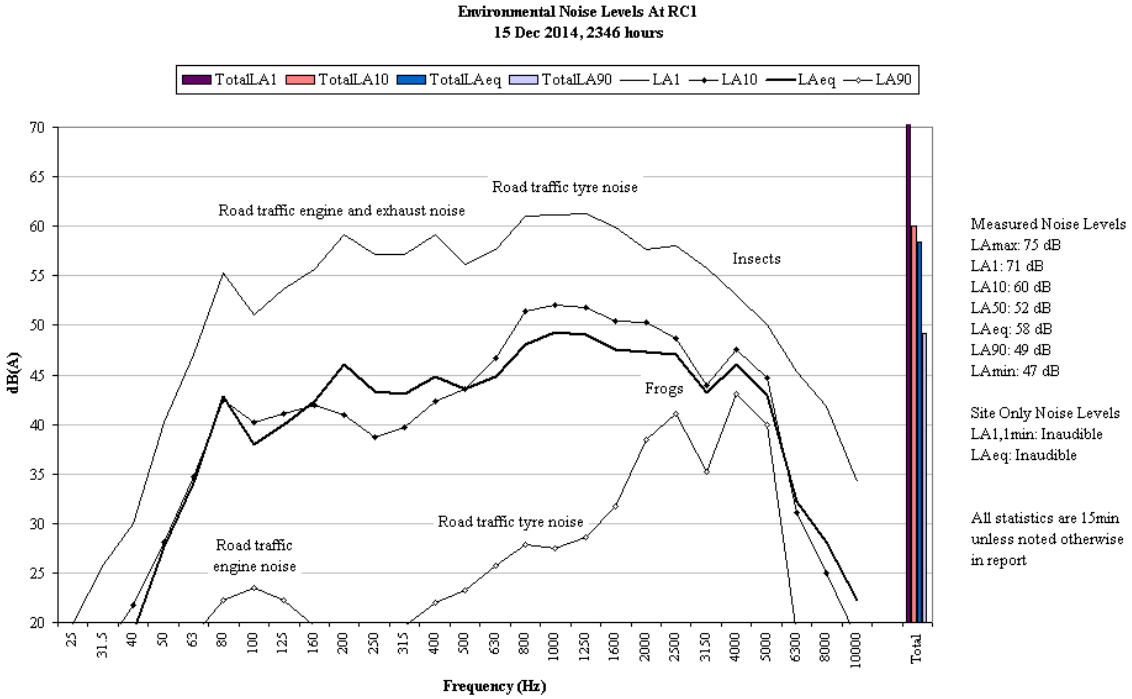


Figure 39: Environmental Noise Levels, McInerneys Road

RCM was inaudible.
Road traffic tyre noise was responsible for the measured L_{A1}, L_{A10} and L_{Aeq}. Insects and frogs generated the measured L_{A90}.

The quarterly results from noise monitoring of individual items of equipment are shown in Appendix 3.

During 2014 Rix's Creek trialled several forms of noise attenuation equipment on its clean coal stockpile dozer with monitoring results provided by an independent noise consultant. These results can be found in Appendix 6.

Rix's Creek has changed the monitoring and reporting of noise during 2014 as it goes through a transition period from the existing 1995 development consent into the hopefully new consent (2016-onwards for a period of 21 years). In the meantime, to satisfy consent requirements, both 72 hour monitoring (current Consent requirement) and attended monitoring results (Updated current noise monitoring procedure) will be reported in the AEMR.

3.10.3 Reportable Incidents

Fifteen (15) complaints and four (4) enquiries have been received in relation to operational noise over

the reporting period. Over this period five (5) complaints were from the one complainant in Maison Dieu over various dates, whilst another three (3) were from another complainant situated at Long Point over various dates.

Table 27. Noise Complaints

DATE	LOCATION	RESOLUTION
11/2/2014	Long Point	Phone call from resident located in Long Point regarding noise from Rix's Creek operation disturbing sleep. OCE relocated equipment working high in Pit 3 lower into the pit.
25/2/2014	Long Point	Phone call from resident located in Long Point regarding noise from Rix's Creek operation disturbing sleep. Noise monitoring was being undertaken on the same night and noise levels were < 35 dB (below Rix's Creek Project Specific Levels (PSL). Rix's Creek offered complainant to come to site to provide further explanation of operation – complainant to contact Rix's with availability.
19/3/2014	Long Point	Phone call from resident located in Long Point regarding noise from Rix's Creek operation disturbing sleep. Noise monitoring was undertaken shortly after phone call at residence with levels ~35 dB (below PSL).
1/4/2014	Long Point	Complaint regarding operational noise keeping complainant awake to Rix's Creek Hotline. Complainant contacted following morning and had window open and truck noise was keeping them awake so had to close window to overcome it.
12/5/2014	Maison Dieu	Phone call from resident located in Maison Dieu regarding noise from Rix's Creek operation being noisier than ever before. Complainant explained changes made to pit, noise model being developed and NW winds.
15/5/2014	Retreat	Phone call to Rix's Creek from complainant located in the Retreat. Complaint aimed at trucks running on/off the ROM Pad and trucks revving as they tip their coal loads. Coal run from West Pit over the highway bridge changed to run through New England Highway tunnel.
19/5/2014	Maison Dieu	Phone call from resident located in Maison Dieu regarding noise from operations in the West Pit. OCE relocated R9800 excavator lower in the pit to minimise excavator truck noise.
20/5/2014	Wattle Ponds	Complaint regarding noise from mining operations in the North Pit / ROM Pad area under NW winds. Noise consultant to conduct attended noise monitoring 21/5/2014 at complainant's residence.
20/5/2014*	Maison Dieu	Inquiry into West Pit noise from operation. Explained noise modelling being undertaken, changes to West Pit shape and have trialled sound suppression on equipment.
20/5/2014*	Maison Dieu	Inquiry into West Pit noise from operation. Explained noise modelling being undertaken, changes to West Pit shape and have trialled sound suppression on equipment.
27/5/2014*	Hunterview	Inquiry into noise from operation. Recently moved into area and wanted to know if they will hear the operation much over the next several years. Explained operation is moving away from Singleton, noise modelling being undertaken, changes to West Pit shape and have trialled sound suppression on equipment.
27/6/2014*	Long Point	Inquiry into West Pit noise from operation. Explained noise modelling being undertaken, changes to West Pit shape and have trialled sound suppression on equipment.
9/7/2014	Maison Dieu	Complaint regarding noise from operation in the West Pit keeping complainant awake. OCE changed operation and complainant given OCE number for future contact. Complainant informed Rix's Creek currently creating a 3-D noise model for offsite impacts as a proactive approach to noise management.
16/7/2014	Maison Dieu	Complaint to Rix's Creek hotline regarding noise from West Pit operation from unknown caller. Complainant didn't leave name or number to call back.
25/7/2014		Noise complaint from West Pit operations direct to OCE. Operation

		was shifted on afternoon shift prior to night-shift, however, still too noisy for complainant to sleep. OCE limited all dozers to 1st gear, trucks speed limited, excavators to load as gently as possible into truck bodies, EX5500 excavator shut-down. Complainant phoned back to notify OCE noise levels were acceptable to sleep. Complainant contacted following day and informed 3-D noise model still being validated prior to use.
25/7/2014	Unknown	Complaint to EPA complaints line regarding potentially offensive noise from Rix's Creek mine. Rix's Creek provided EPA with report outlining changes made to operation regarding noise during 24/7/2014-25/7/2014 and informed of 3-D noise model to be used to predict future noisy nights. EPA satisfied with immediate and future actions.
3-D Noise model and nightly attended noise monitoring commenced.		
15/9/2014	Long Point	Complaint regarding noise from operation in the West Pit at 8:10 pm. Noise monitoring conducted 8:52 pm (15-minutes) and 9:25 pm (15 minutes) at residence with levels below Project Specific Levels. OCE parked up EX5500 Excavator to further decrease noise levels to assist complainant. Complainant contacted following day and noise levels provided. Also informed of 3-D noise level running as well as noise monitoring aligned to the forecasts. Complainant happy with proactive work done.
23/9/2014	Long Point	Complaint regarding noise from operation in the West Pit at 9:06 pm. Noise monitoring commenced 9:10 pm at residence with levels below Project Specific Levels. OCE instructed dozers to work in 1st gear and excavators to load as gently as possible into truck bodies to further decrease noise levels. Noise monitoring also carried out at 11:10 pm and 3:29 am with levels remaining below Project Specific Levels. Complainant contacted following day and noise levels provided.
23/10/2014	Maison Dieu	Complaint regarding noise from operation in the West Pit at 00:39 am. OCE instructed trucks to be speed limited straight away. Noise levels were monitored at residence 1:20 am and were above Project Specific Levels (PSL). OCE kept truck speed limits in place and levels were monitored 1:47 am to be below PSL. Noise levels monitored again at 3:37 am, 4:51 am and 5:36 am at residence as well as several other locations within Maison Dieu. At 4:30 am OCE shut-down EX5500 excavator (working higher in West Pit) and started EX3600 excavator (working lower in West Pit) to maintain noise levels below PSL.

* Inquiry

3.10.4 Further Improvements.

All equipment is checked and maintained on a regular basis to ensure noise attenuation equipment silencers – mufflers are operational. All new equipment is fitted with broad band reversing alarms to minimise offsite noise impacts. A sound suppressed Liebherr 9800 Excavator commenced on site during January 2014 with a significant amount of modifications in comparison to a standard 9800 excavator. Sound suppression will continue for any new pieces of equipment prior to commencing work/s on-site.

An acoustic bund on the Singleton side of the ROM pad at the CHPP has been built to attenuate noise directed to the Retreat area for noise from haul trucks on the ROM pad. This bund was rehabilitated with various over storey and understorey species in May 2013 to further minimise offsite impacts. Limited tree success due to dry conditions were restocked during April 2014 and more tube stock will be planted on the bund in autumn 2015 for noise and visual amenity aspects. Further noise attenuation work is also being reviewed for the CHPP and ROM Pad receival hopper to minimise noise travelling south-east from this area.

During 2014 Rix's Creek has worked with Todoroski Air Sciences (TAS) and Nigel Holmes to develop

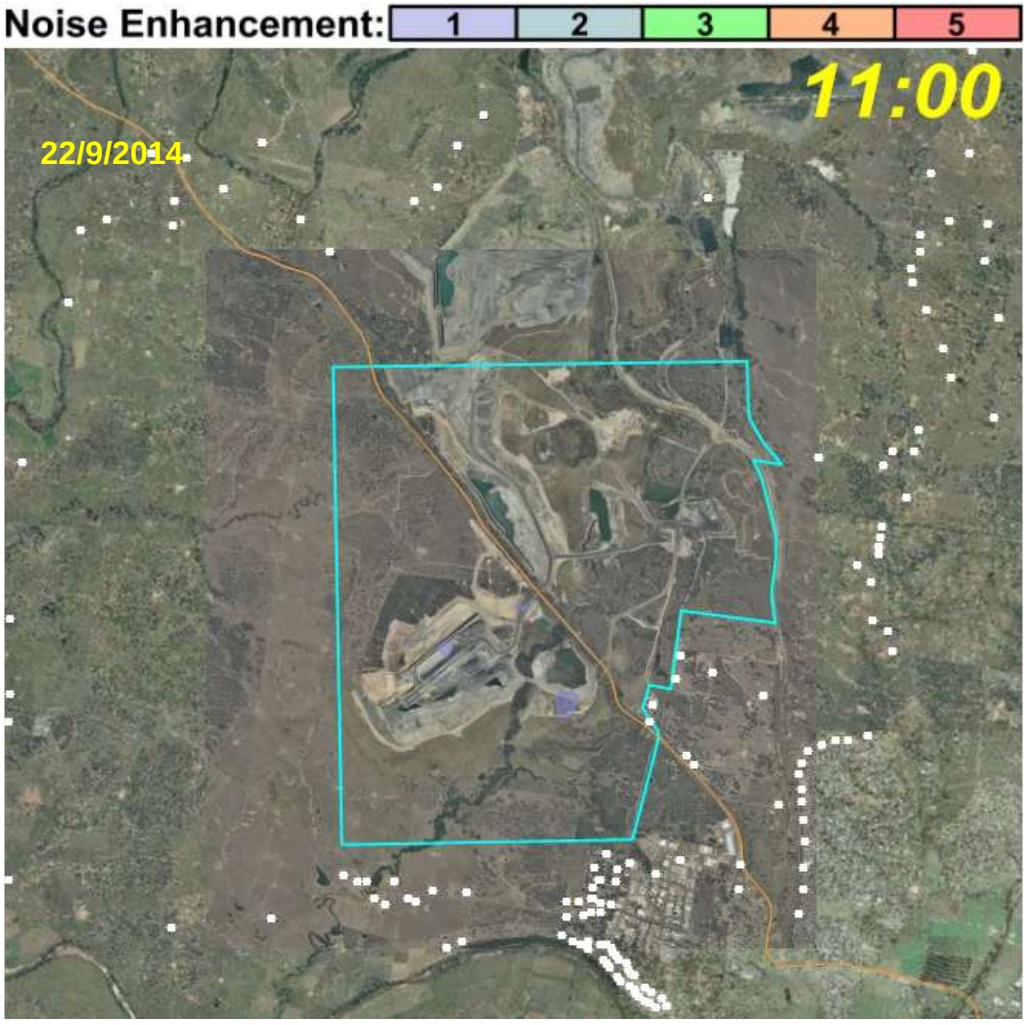
a 3-D predictive noise model for the Mine. The meteorological data from the Hunter Valley Meteorological Sounding Group Joint Venture (HVMSGJV), meteorological forecasts for the Rix's Creek mine site is used to develop half hourly predictions, of noise enhancement conditions, for each twenty four hours of Mine production.

The Mine working areas have been planned to allow for alternate dump and working levels. The Mine production schedule is made up of two operating Excavator faces (overburden) and a Front-End Loader ROM coal face. Rix's Creek currently have three Excavators, Liebherr R9800 and Hitachi EX5500 and EX3600. Three working levels are maintained (high, middle and bottom of the pit) with predicted meteorological conditions governing the day's operations. The mobile nature of the Front-End Loader coaling fleet means its night time working level can be readily modified. In comparison the excavator's are limited in their movement so forward planning is required to maintain production at an acceptable level.

To calibrate this model and to develop the management systems required to gain the best possible use of this technology, Rix's Creek has undertaken a program of attended noise monitoring during evening and night operations, since the models inception.

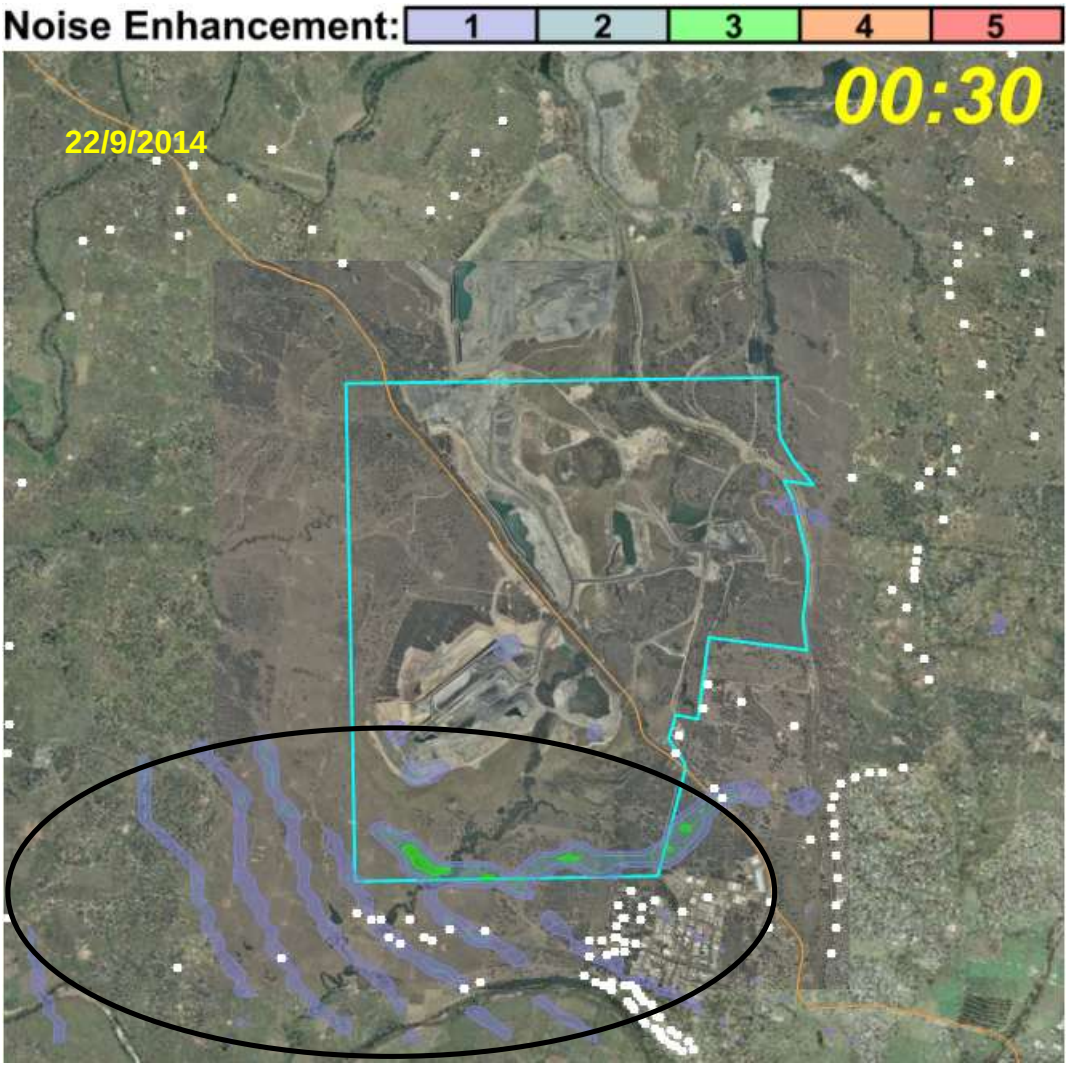
To date noise enhancement has been in predicted area's shown on model – more confidence is starting to be put into the model and the forecast/s.

Example of minimal noise enhancement predicted offsite:



*White dots indicate residences / off-site receptors closest to mining operation.

Example of potential noise enhancement predicted offsite:



*Black indicates area/s of potential concern and these will be the focus area/s when undertaking off-site attended noise monitoring.

The use of the Todoroski 3-D noise model to predict areas of possible meteorological enhancement of Rixs Creek open cut noise, to plan mine working faces has been successful in controlling it's noise impact to current Environment Protection License (EPL 3391) Project Specific Noise Criteria as per Noise Pollution Production Program (U1 Premises Noise Limits: 12323_PRP_R02 as submitted by Global Acoustics). An integral part of the Noise Management Plan is using real time attended monitoring. The monitoring results assist in calibration of the noise model and production shift supervisor placement of the mines production units to keep mine noise levels to license conditions.

Noise model examples assisting operations include:

- 31/8/14 – NW winds with enhancement SE of operation. NW winds relocate R9800 (to mid-level) and shutdown EX5500 (high pit level) and run EX3600 (bottom pit level).
- 8/9/14 - Enhancement predicted SW of operation. Run EX5500 (high pit level) if noise levels acceptable. EX3600 (mid pit level) if EX5500 noise levels excessive. Modify coal level if noise an issue.
- 15/9/14 – Enhancement predicted SE of operation. Stop EX5500 (high pit level) and run EX3600 (bottom pit level) if noise an issue.

Noise monitoring examples assisting operations include:

- 31/8/14 – EX5500 parked up, R9800 relocated and EX3600 operated.
- 8/9/14 – EX5500 shutdown and ran EX3600 due to noise.
- 15/9/14 – Complaint Long Point. Measured 20:25 at 38 dB (A). At 21:40 measured 37-38 dB (A). Ran EX3600 due to noise.

Out of the fifteen noise complaints received by the company in 2014, only three were received after the 3-D model and attended noise monitoring commenced.

The noise model was updated in December 2014 to include all receptors within close proximity to the mine as well as the December 2014 aerial map.

3.11 Visual, Stray Light

3.11.1 Environmental Management

It is a Development Consent requirement to direct or screen floodlighting away from residences and roads.

Progressive rehabilitation of mining disturbed land is the main strategy for minimising visual impacts from Rix's Creek. As well as providing a safe and stable landform, one of the key objectives of rehabilitation planning is to provide vegetated landforms that blend with the surrounding landscape.

3.11.2 Environmental Performance

There is a standard operational procedure for lights not to be directed towards the New England Highway or towards local residences.

3.11.3 Reportable Incidents

No incidents were recorded during the reporting period relating to lighting.

3.11.4 Further Improvements.

There has been an ongoing maintenance program repainting the exterior of main infrastructure across site in predominately 'rivergum green' colour. The top portion of the clean coal product bin was replaced in January 2014 and painted in this colour.

3.12 Aboriginal Heritage

3.12.1 Environmental Management

Aboriginal heritage issues identified in the EIS have been addressed. Application was made and Consent No:- SZ 163 granted on 25/5/97 under Section 90 of National Parks and Wildlife Act , 1974 to Carry out the Destruction of an Aboriginal Relic/Place. The Consent was issued in relation to Aboriginal sites NWP #37-6-244 and #37-6-245.

3.12.2 Environmental Performance

The Company has given an undertaking to the Wonnarua Tribal Council Inc. to widen the exclusion from mining corridor to 40 m along the western side of Rix's Creek before mining commences in Pit 3 – West Pit. The sites listed as R1, R2, 12 and 15 will be fenced around to ensure they are not damaged during the life of mining. This was maintained in 2014.

The Company also agreed to leave a 40 metre buffer strip along Rix's Creek to preserve any possible Aboriginal heritage sites that may be associated with the Creek that were not identified.

Aboriginal sites within the mine path were identified and HLA-Envirosciences Pty Limited (now AECOM Australia) were engaged to prepare a section 90 'Consent to Destroy' application and research design for the investigation and mitigation of several known sites within the Rix's Creek

mining lease.

An initial inspection and investigation of the sites took place in December 2006 involving members of the Aboriginal community. Following from this an application for Consent to Destroy was submitted to Department of Environment and Conservation in early April 2007. Approval for the Consent to Destroy was given in November 2007. Collection of artefacts took place in December 2007. One area was partially under water as the site was located on the edge of a dam. This area was revisited in February 2009 when the water was drained from the dam and the area dry. Only a few small artefacts were identified and collected.

During 2013 the proposed Rix's Creek rail loop was examined by AECOM and several Aboriginal community members for inspection and investigation of any potential sites. The construction of this rail loop did not commence during 2014.

During 2014 the proposed Rix's Creek Continuation Project area was examined by AECOM and several Aboriginal community members for inspection and investigation of any potential sites (archaeological due diligence assessment).

3.12.3 Reportable Incidents

No artefacts were identified during operations over the 2014 reporting period.

3.12.4 Further Improvements.

It was decided to replace the collected artefacts under the Section 90 Consent to Destroy to an area protected from mining adjacent to Rix's Creek. This area was initially identified as a potential artefact site. The area is in the bend of the Creek and has been fenced to exclude access. When the study of the artefacts has concluded then they will be placed in this area.

The next step for the Rix's Creek Continuation project will be the development of an Aboriginal Cultural Heritage Management Plan which will set out procedures for the management of Aboriginal cultural heritage within the disturbance footprint of the project.

3.13 Natural Heritage

3.13.1 Environmental Management

The Rix's Creek Coke Ovens and associated works adjacent to Rix's Creek Lane are the subject of an Order made under Section 130 (1) of the Heritage Act, 1997. The order was made on 23/7/82.

The Rix's Creek Coke Ovens are also classified by the Natural Trust of Australia and are included in the Trust Register.

As such the Company prepared in 1989 a Rix's Creek Coke Ovens Conservation Plan. The Plan outlines the measures the Company has put in place and operational controls to conserve the area.

The Plan was reviewed during 2004 by Peter Lonergan of Cracknell & Lonergan a heritage architect. The following recommendations were made:-

> *17. It is my opinion that any active conservation to the fabric is unwarranted and inappropriate. The ovens ceased operation some 60 years prior to the conservation plan and now 15 years later little further deterioration has occurred, or is evident.*

3.13.2 Environmental Performance

A program of cutting and cleaning the dead wood around the area was undertaken during 2006 and weed control over the area is undertaken as necessary. Mother-of-Millions weeds around the area were sprayed again this year as well as assorted Pear (*Opuntia spp.*) species. Some scattered African Boxthorn weed species were also found and sprayed as necessary. Restricted access and security of the area has been maintained.

3.13.3 Reportable Incidents

There were no reportable incidents in relation to natural heritage during the 2014 reporting period.

3.13.4 Further Improvements.

The program of protection of the Coke oven area will continue. Annual inspections are undertaken of the area. Any weeds identified will be sprayed. Vegetation maintenance may be required as necessary.

3.14 Spontaneous Combustion

3.14.1 Environmental Management

The coal seams mined at the site are not susceptible to spontaneous combustion. All stockpiles are however inspected regularly to check for heating of the material. Any coal mined and not able to be washed is stockpiled in-pit onto overburden where no combustible materials surround it.

3.14.2 Environmental Performance

N/A

3.14.3 Reportable Incidents

There were no reportable incidents relating to spontaneous combustion during the 2014 reporting period.

3.14.4 Further Improvements.

Monitoring of stockpiles will continue as an ongoing operational procedure.

3.15 Bushfire

3.15.1 Environmental Management

Fuel reduction programs are undertaken on an as needed basis and done in conjunction with the local Rural Fire Service (RFS).

3.15.2 Environmental Performance

A bushfire was ignited via a lightning strike on the Vale – Integra / Rix's Creek mining lease border during November. The fire burnt established pasture rehabilitation. The approximate area burnt was three hectares with the fire contained by the RFS who accessed via Rix's Creek mine.

A slashing program was undertaken during August and December to reduce fuel loads. As well as reducing fuel loads mulching this material into the surface will enhance the rehabilitation through improved nutrient recycling as the material decomposes over time. Excessive grass and weeds were sprayed around site infrastructure to further reduce fuel loads. Rix's Creek and AustGrid also conducted spraying and mulching of power line easements across site throughout the year.

Grazing of cattle was undertaken around mining activities to apply grazing pressure to land ahead of the West Pit during 2014. This will continue in 2015 as the mining operation continues in a north-westerly direction along the New England Highway. Some cattle may be brought onto a 55 hectare area of pasture rehabilitation fenced in December 2015 for further reduction of fuel loads.

During 2014 Rix's Creek purchased a property and existing four-bay shed in Maison Dieu in which the shed is provided to the Rural Fire Service – Darlington brigade in sponsorship by the Bloomfield Group at no cost.

3.15.3 Reportable Incidents

There was one bushfire on the Vale – Integra boundary near the lease area during the 2014 reporting

period. This was contained by the RFS.

3.15.4 Further Improvements.

Fuel reduction programs are undertaken on an as needed basis and done in conjunction with the local Rural Fire Service and local landholders. Areas of land owned within the lease and outside of the active mining area and rehabilitated areas will continually be leased to lessee's to graze cattle in a bid to minimise fuel loads across site.

3.16 Mine Subsidence

3.16.1 Environmental Management

Areas of the Rix's Creek mine site are undermined by historic underground workings. Sink holes associated with shallow workings are infrequent. If identified, the standard management procedure is to flag off and isolate the sink holes from access, back fill the holes and monitor for further subsidence. Once deemed stable, the area will then be rehabilitated and periodic inspections will continue.

3.16.2 Environmental Performance

One sink hole was identified during the reporting period. This was in an area of known pre-existing underground working's (shallow) near the New England Highway overhead bridge. The hole become exposed after heavy rainfall and was backfilled to minimise potential subsidence in the future.

3.16.3 Reportable Incidents

There were no reportable incidents in relation to mine subsidence during the 2014 reporting period.

3.16.4 Further Improvements

Identified sink holes will be remediated and the heritage areas will be protected. No other improvements to subsidence management are planned.

3.17 Hydrocarbon Contamination

3.17.1 Environmental Management

No areas of hydrocarbon contamination have been identified within the Rix's Creek lease area. Management is geared to contamination prevention. Procedures are in place on site to handle any hydrocarbon spills. Containment equipment is located in the store, site workshops as well as the CHPP.

Hydrocarbon storages at Rix's Creek consist of 3 bulk storage areas. The main fuel farm for distillate and lubrication oils for machinery. The second smaller area for hydrocarbons used in the CHPP and the third a tank for processed oil/diesel for use in explosives.

The hydrocarbon storage areas have the storage tanks located within a bunded area capable of containing greater than 110 % of the largest storage tank. The bunded area is lined with an impervious 'Claymax' product barrier. Any fluids including water and hydrocarbons drain to a sump where the water is decanted and processed through an oil arrestor to remove any hydrocarbons. The hydrocarbons are directed to a waste oil tank for recycling. The water goes into the contaminated water system for recycling through the CHPP.

The refuelling fill-point drains to a sump where the water and any hydrocarbons are directed through the oil arrestor. Following the DP&E 2013 AEMR review and site inspection the fill-point area had a new bunded concrete apron installed during December 2014 to prevent diesel spilling on unsealed ground.

Plate. 1 New concrete apron at diesel-fill point

All machinery is fitted with quick fill mechanisms. The inlets and outlets, at the refuelling bay and mobile tanker are positively closed with an automatic cut off when full. This refuelling method is quick and minimises any potential for spillage during the refuelling operation.

3.17.2 Environmental Performance

There were no major hydrocarbon spills during the year. Any minor spills are cleaned up and any contaminated material is placed in a remediation area.

3.17.3 Reportable Incidents

Nil

3.17.4 Further Improvements

The use of S200 / Micro-blaze for minor hydrocarbon spills to assist in the breaking down of hydrocarbons via bacteria will continue during 2015. This technique has proven effective and was used several times throughout the year to clean up areas around the fuel farm and equipment.

3.18 Public Safety.

3.18.1 Environmental Management

Visual bunds were constructed along the New England Highway adjacent to the old Middle Fallbrook Road and the southern side of the Highway from Rix's Creek to the old 'Granbalang' entrance during 2008.

These bunds were sown with a cover crop and planted with tube stock to further screen the operation and blend in with the existing remaining trees retained along the edge of the Highway. Establishment of the trees was poor and these have been prepared for replanting during 2008. Replanting of these bunds took place in 2009 with high success rates aligned with good rainfall following planting.

New bunds ahead of the West Pit operation were completed during early 2014. These were seeded by hand with two hectares of tree species (facing the highway) and two hectares of pasture species (facing the West Pit). Several hundred Casuarina luehmannii (Bull Oak) species were also planted

amongst the hand seeded area's to improve tree success. To date a lot of seedlings have germinated in the area.

Fences along the New England Highway were checked during the year and repaired as necessary with 'No Trespassing' signs replaced every 100 m along the fences on both sides of the New England Highway in which the lease intersects. Gates along the New England Highway as well as bordering rehabilitation areas were chained secure during the 2014 period to prevent unauthorised access.

3.18.2 Environmental Performance

There was illegal entry gained ahead of the West Pit during July with several tree's felled and timber cut and removed from site. Police were notified of the illegal access and with assistance from adjacent landholders the illegal trespassers details were provided to the police for further action.

3.18.3 Reportable Incidents

One public safety incident was reported to police during the 2014 reporting period.

3.18.4 Further Improvements

The installation of more visual bunds will be placed along the Highway corridor of the West Pit ahead of the operation during 2015/16 and rehabilitated to final landform design to improve the West Pit's visual amenity. These bunds will be installed beside the newly created highway bunds installed during 2014. A colorbond fence was also installed during 2014 alongside Rix's Creek cut and cover tunnel for further visual amenity between the tunnel and a visual bund.

No other overall improvements are planned to manage public safety, however Rix's Creek will continue to maintain existing fencing, gates, barriers and signage.

3.19 Other Issues and Risks

Security Deposit Review

In accordance with the Annual Environmental Management Review process the security liability for Rix's Creek mine was calculated at $19,908,058.16 as at 24th February 2015 (based on the 2014 Calendar year). The previous calculation was calculated at $24,068,000.00 as at 31st December 2013 (based on the 2013 Calendar year). The decrease compared to the 2013 AEMR is due to the reduced tailing's dam size (TD#3), Overburden dumps and active mining area's decreasing in size, contingency and project management which are related to the before mentioned items.

Figure 40 provides a summary of the rehabilitation cost calculation.

NSW GOVERNMENT Resources & Energy

Summary Rehabilitation Cost Calculation

Note: Sections of this page are automatically filled in from the registration page

Mine Name:	Rix's Creek
Lease(s):	CL352 & ML1432
Mine Owner:	Bloomfield Collieries Pty Ltd
Mine Operator:	Bloomfield Collieries Pty Ltd
Expiry of MOP:	8/3/2020
Current Security:	$ 24,068,000.00
Date of Last Security Bond Review:	14/05/2014
Mine Contact:	Luke Murray
Position:	Manager Engineering & Mining
Address:	PO Box 4 East Maitland
Phone:	02 6578 8802
email:	lmurray@rixs.com.au

Domain	Security Deposit
Domain 1: Infrastructure Areas	$2,127,106.93
Domain 2: Tailings & Rejects Emplacements (1)	$695,339.70
Domain 2: Tailings & Rejects Emplacements (2)	$563,666.21
Domain 2: Tailings & Rejects Emplacements (3)	
Domain 3: Overburden & Waste Dumps	$5,130,344.57
Domain 4: Active Mine & Voids	$7,052,434.67
Domain 5: Other	
Sub-Total (Domains and Sundry Items)	**$15,568,892.08**
Contingency	$1,809,823.47
Third Party Project Management	$2,529,342.61
Total Security Deposit for the Mining Project (excl. of GST)	**$19,908,058.16**

Note: GST is not included in the above calculation or as part of rehabilitation security deposits required by the Department

☐ Alterations have been made to unit prices within this spreadsheet. (Attach a separate sheet providing details of changes)

☐ The proposed rehabilitation design is generally consistent with the development consent for the project

This Registration Form, Summary Report and calculation pages are to be printed and attached as an appendix the AEMR.

This mine security calculation has been estimated using the best available information at the time.
It is a true and accurate reflection of the total rehabilitation liability held by this mine.

Signature Mine Manager	Print Name	Date:
	LUKE MURRAY	24/02/2015
Signature **Accepted: DRE Reporting Officer**	**Print Name**	**Date:**

SECTION 4 COMMUNITY RELATIONS

4.1 Environmental Complaints.

All complaints are dealt with under the '*Complaints Protocol for Rix's Creek Coal Mine'* as set up in response to the Rix's Creek Environmental Monitoring Committee under the original development Consent. The protocol is used to register and investigate all complaints. All complaints are referred to the Mine Manager, Mr. Luke Murray and are dealt with on an individual basis.

The Company policy is to personally deal with every complainant to expedite a resolution to his or her concern.

Table 28. Complaints 2014

No.	Date Received	How Received	Complaints					
			Blast	Noise	Dust	Water	Lights	Odour
1	18/1/2014	Rix's Creek Hotline			X			
2	11/2/2014	Phone		X				
3	20/2/2014	Phone			X			
4	25/2/2014	Phone		X				
5	19/3/2014	Phone		X				
6	1/4/2014	Rix's Creek Hotline		X				
7	16/4/2014	EPA complaints line. E-mail	X					
8	12/5/2014	Phone		X				
9	15/5/2014	Phone		X				
10	19/5/2014	Phone		X				
11	20/5/2014	Phone		X				
12*	20/5/2014	Phone		X*				
13*	20/5/2014	Phone		X*				
14*	27/05/2014	Email		X*				
15	23/6/2014	Planning Compliance - email	X					
16*	27/6/2014	Phone		X*				
17	7/7/2014	Phone			X			
18	9/7/2014	Phone		X				
19	16/7/2014	Rix's Creek Hotline		X				
20	25/7/2014	Phone		X				
21	25/7/2014	EPA complaints line. Email		X				
22	15/9/2014	Phone		X				
23	23/9/2014	Phone		X				
24	1/4/2014	Phone		X				

* Enquiry

Twenty (20) complaints were received by the Company during the year. Three were on the Rix's Creek Hotline, fourteen were direct phone calls to the company, one was referred from Planning and Compliance (DPE) and two were referred from the EPA complaints line. Four (4) enquiries were made on the 20/5/2014 (phone), 20/5/2014 (phone), 27/5/2014 (email) and 27/6/2014 (phone), these were all relating to noise and not a complaint.

All complaints have been dealt with in the various sections of the report specific to that complaint.

Table 29. Complaints 2001-2014

Year	Complaints	Enquiries	Complaints					
			Blast	Noise	Dust	Water	Lights	Odour
2001	7		2	1	3	1		
2002	29		11	9	8	1		
2003	16		5	10	1			
2004	10		7	1	1		1	
2005	12	2	4	6	1		1	
2006	27	1	4	21	1			1
2007	14		7	4			1	2
2008	4		4					
2009	7		2		5			
2010	11		2	3	3	1	2	
2011	11	5	6	2	2			1
2012	20	2	9	4	7			
2013	19	5	8	10				1
2014	20	4	2	15	3			
Average 2001-2014	14.8	3.2	5.2	5.6	3.2	1.0	1.3	1.3

Rix's Creek received 20 complaints in 2014 which is above average. It is preferential no complaints are received and Rix's Creek endeavour to work with the community to minimise and eliminate the sites environmental impacts.

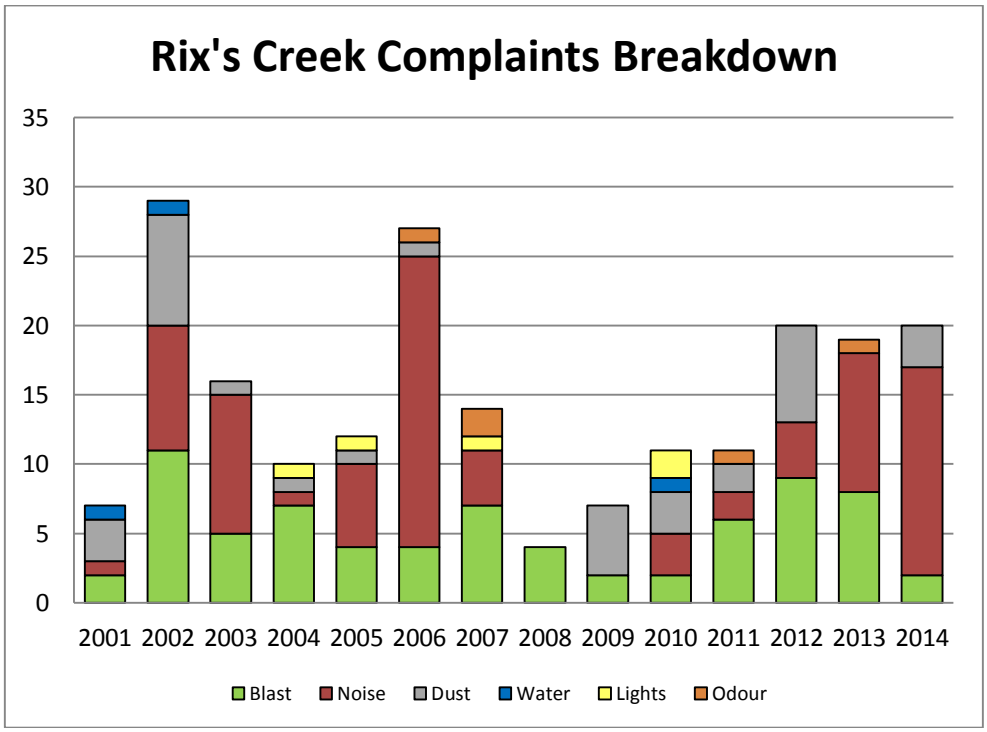


Figure 41. Summary of Rix's Creek Complaints 2001-2014.

4.2 Community Liaison

Rix's Creek is required under the development consent to participate and co-operate with a Community Consultative Committee (CCC). The committee consists of three community representatives and is chaired by Council and other Govt representatives are invited to participate on the committee. Rix's Creek was the first mine in the Hunter Valley to have a CCC which has operated for 24 years.

The Committee representatives are:-

Chairperson:-	Councillor Val Scott
Community representatives:-	Patricia Bestic
	Reg Eveleigh
	Michelle Higgins
DPE representative:-	Ann Hagerthy
Company representatives:-	Mine Manager – Luke Murray
	Senior Environmental Officer – John Hindmarsh
	Environmental Officer – Jason Desmond

The Committee met three times during the year. A Planning Focus Meeting was held in January 2014 to discuss the Continuation of Mining Project, once on 27th May 2014 to present the Annual Environmental Management Report (AEMR) for 2013, and again on 9th September 2014 for the presentation of 6 monthly environmental monitoring results for the January to June 2014 monitoring period.

The Company is a financial member of the Hunter Coal Environmental Group (HCEG).

The company is a financial member of the Hunter Valley Combined Wild Dog Association (HVCWDA) Incorporation.

The company is also part of the Upper Hunter Mining Dialogue (UHMD) in association with the NSW Minerals Council (NSWMC) which brings industry, community, and key stakeholder groups together across various projects and goals relating to:-

- Land Management
- Social Impacts and Infrastructure
- Water
- Emissions and Health

The Bloomfield Group UHMD representatives are:-

Executive Oversight Committee (Chair):-	Managing Director / CEO – John Richards
Steering Commitee:-	General Manager Mining Development – Garry Bailey
Emissions and Health Working Group:-	Senior Environmental Officer – John Hindmarsh
Land Management Working Group:-	Environmental Officer – Jason Desmond
Water Working Group:-	Environmental Officer – Greg Lamb
Social Impacts and Infrastructure Working Group:-	Executive Assistant to Managing Director – Suzie Messner

The company provides annual donations to approximately 30 charitable groups as well as annual sponsorship to around 50 local community groups. In particular in the Singleton Community over the last five years:

- Samaritans and the Singleton Christmas Lunch
- Singleton Legacy
- Cancer Council Singleton Office – patient support and carer transport
- Rose Point Park Tree Planting
- Many Local Junior Sporting groups
- Singleton Show
- Singleton High School, Singleton Public School, Singleton Pre-School
- Singleton Hospital and Hunter New England Health
- Uniting Care Disability Services
- SES, Salvation Army, Red Cross
- Westpac Helicopter Services
- Darlington Bush Fire Services
- Scouts and Girl Guides

Rix's Creek has had collaboration with Newcastle University and Australian Coal Association Research Program (ACARP) to support effective innovation and development for the improvement

of mine operations and environmental practices. This is highlighted recently with the revolutionary tailings drying project that will do away with the need for Tailings Dams.

SECTION 5 REHABILITATION

5.1 Buildings

Maintenance of structures is undertaken on as needs basis throughout the year. Throughout 2014 infrastructure sheds and structures were painted as necessary. The colour scheme is light green with this same colour utilised on the colorbond fencing installed adjacent to the bridge of the cut and cover tunnel as well as major infrastructure across the site. A new 30 metre section of colorbond fencing was installed for visual amenity between the tunnel (under the highway) and the West Pit visual bunds.

5.2 Rehabilitation of Disturbed Land

Re-contouring, topsoil handling and revegetation techniques are generally well established at Rix's Creek and undertaken in accordance with the Bloomfield Mining Operations Land Rehabilitation Management System (LRMS).

The key elements of the LRMS include:-

- setting overall rehabilitation aim and objectives;
- developing appropriate rehabilitation indicators and completion criteria;
- undertaking land rehabilitation;
- developing and implementing a rehabilitation assessment program;
- continuing rehabilitation management and maintenance; and
- presenting a request for rehabilitation sign-off to regulators, supported by results from the assessment program.

The aim of rehabilitation at Rix's Creek Colliery is to reinstate the pre-mining land capability of grazing land, with stable landforms, compatible with the surrounding landscape, and allow for a range of possible post-mining land-uses such as agricultural lots. As of 2014 Rix's Creek is beginning to achieve large parcels of grazing land in which The Bloomfield Group is hopeful of purchasing cattle in the near future to assess if the pasture rehabilitation is sustainable long-term prior to sign-off.

The rehabilitation is undertaken to meet the following objectives.

General

- Land will be rehabilitated in accordance with relevant NSW Department of Primary Industries – Mineral Resources (DRE) standards applicable at the time of rehabilitation i.e. Mining Operations Plan (MOP) guidelines, September 2013.
- Rehabilitated land will represent a minimal source of offsite environmental impacts, such as dust, water pollution, visual amenity and weeds.
- Rehabilitated land will require ongoing management inputs no greater than similar adjacent land.
- Rehabilitation will be compatible with the proposed post-mining land-use.

Landform

- Rehabilitated land will be safe and stable.
- Land capability will be returned to a class similar to that existing prior to the commencement of mining.
- Mined land will be re-contoured to a landform compatible with the surrounding natural landscape.
- Reinstate a stable drainage network.

Vegetation

- Rehabilitated land will be topsoiled, fertilised and sown with grass and/or native vegetation species.

- A sustainable vegetation cover will be established on rehabilitated land.
- Grazing areas will be established with a range of species suitable for pasture production in the area.
    - An example of a species mix that may be used as per Rix's Creek MOP is:-
    - **Pasture mix #1** - Rhodes Grass, Couch, Rye, Sub. Clover, Wolly Pod Vetch, Green Panic, Sirosa Phalaris, Sephi Barrel Medic, Lucerne, and Kikuyu. All summer / winter active.
    -

Pasture mix #1 was amended in the 2013 Rix's Creek MOP with Rhodes grass being restricted from previously used rates of 5 kg/ha back to 1 kg/ha to minimise potential for 'monocultures' of Rhodes grass being dominant in the pasture rehabilitation area.

- Tree areas will be established with native species by either direct seeding or tubestock planting techniques.
    - An example of a native species mix that may be used as per Rix's Creek MOP:-
    - **Tree mix #1** - *Eucalyptus crebra, E. fibrosa, , E. mollucana, E. melliodora, Corymbia maculate, Acacia decora, A. falcata, A. implexa, A. paradoxa, A. salicina, Casuarina luehmannii, Hardenbergia violacea*, and hybrid *Eucalyptus* spp. suitable for plantations.

Rehabilitation is generally carried out on a seasonal basis in Spring and Autumn. Cover crops used in pasture rehabilitation may be adjusted to suit the climatic conditions at time of sowing. Preferred species may also require adjustment due to availability.

During the reporting period a total of 28.5 ha were rehabilitated. A further breakdown of this can be seen in Table 30.

Table 30. 2014 Rehabilitation Summary

Locator	Site Name	Type	Date Sown	Species mix	Area (ha)
West Pit	Highway visual bunds	Pasture / Tree's	March	Tree #1	4.5
North Pit	TD#2	Tree's	March	Tree #1	2.7
North Pit	North Pit Dump (Camberwell RL130)	Pasture	March	Pasture #2	1.6
North Pit	Old North Void drill site	Pasture	March	Tree #1	0.4
North Pit	9-ways batters	Pasture	March and August	Pasture #2	1.0
North Pit	Rix's triangle	Tree's	April	Pasture #2	2.1
North Pit	TD# 2	Pasture	May - June	Pasture #2	15.5
North Pit	TD# 2 Batter	Tree's	July	Tree #1	0.7
TOTAL 2014					**28.5**
CUMULATIVE TOTAL INCLUDING 2014					**374.4**

West Pit Highway Visual Bunds

The West Pit highway visual bunds were rehabilitated in March 2014 totalling 4.5 ha. Of this area 2 ha was hand seeded using native tree species (Tree mix #1) and 2.5 ha was hand seeded using pasture species (Pasture mix #1). The tree species were seeded on the highway (eastern) side of the bunds whilst the pasture seed was seeded on the pit (western) side of the bunds. Tree species were seeded approximately three metres over the crest to give the bunds a more uniform look. 830 Casuarina Glauca were also planted during March on the highway side of the bunds to ensure tree success if direct seeding was of low success.

The highway bunds were created using clay and subsoil from the West Pit pre-strip, shaped into a 14 degree slope either side and overlaid with approximately 100-200 mm of topsoil using a D10 dozer. A majority of this topsoil was from the unmined surface beneath the bunds which was stripped prior to bund construction. Extra topsoil was sourced from the freshly stripped West Pit pre-strip. Prior to seeding the area was deep ripped with a D6 dozer with rip lines running across the contour to minimise erosion from surface run-off.

The material used in the bund construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. Early indications show a moderate to high rate of seedlings emerging. A cover crop was also applied to minimise the weed potential and provide good visual amenity to passing road users. Early indications also show some weed (Galenia) which will be monitored and managed accordingly.

Plate. 2 West Pit – New England Highway visual bunds (Stage 1) – freshly seeded (March 2014)

Plate. 3 West Pit – New England Highway visual bunds (Stage 1) – 4 months after seeding (July 2014)

North Pit Tailing's Dam #2 (tree area).

The North Pit Tailing's Dam #2 (tree area) was rehabilitated in March 2014 totalling 2.7 ha. This area was hand seeded using native tree species (Tree mix #1). 170 Casuarina Glauca were also planted during March in this area to ensure tree success if direct seeding was of low success.

The area was created using overburden from the West Pit operation to cap the old tailing's dam #2 then clay and subsoil from the West Pit pre-strip was shaped onto a 10 degree slope and on the flatter crest of the area and overlaid with approximately 100-200 mm of topsoil using a D10 dozer. The topsoil was from the West Pit pre-strip area. Prior to seeding the area was deep ripped with a D6 dozer with rip lines running across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. Early indications show a moderate to high rate of seedlings emerging. A cover crop was also applied to stabilise the slope, minimise the weed potential and provide good visual amenity towards the New England Highway. Early indications also show some weed (Galenia) which will be monitored and managed accordingly.

Plate. 4 Rehabilitation at North Pit Tailing's Dam #2; (tree area) facing north-west

North Pit dump (Camberwell RL130)

The North Pit dump – Camberwell RL130 area was rehabilitated in March 2014 totalling 1.6 ha. This area was direct seeded via a tractor using pasture species (Pasture mix #1). It should be noted an additional area of 1.9 ha was seeded on Vale-Integra's mining lease as part of a boundary agreement. This 1.9 ha area has not been included within Rix's Creek mines rehabilitation total for the 2014 period as it is not within the Rix's Creek mining lease.

The area was created using overburden from the North Pit operation then clay and subsoil from the West Pit pre-strip was shaped onto a 10 degree slope. This slope was overlaid with approximately 100-200 mm of topsoil/biosolids mix using a D6 dozer. The biosolids was part of a trial with Hunter Water to add and mix Rix's Creek on-site topsoil with Hunter Water's odourous material typically not used within the Hunter Valley. The mixing and stockpiling of the material over a several month period resulted in a much lower (very low odour) product that was effectively spread to optimal thickness. Based on the calculations the biosolids within the topsoil was applied at a rate of 100 tonnes / ha. The topsoil was from the West Pit pre-strip area. Prior to seeding the area was lightly ripped with a D6 dozer with rip lines running across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. A cover crop was also applied to stabilise the slope, minimise the weed potential and provide good visual amenity towards the New England Highway. Early indications also show some weed (Galenia and scotch thistle) which will be monitored and managed accordingly.

This area was also seen to be affected by saline water via spray-drift from a neighbouring mines evaporative sprays. The neighbouring mine was contacted and shut-down the evaporative sprays under certain weather conditions that will create spray-drift onto the nearby rehabilitation area. The area had 'yellowed off' during August 2014 but fortunately some rainfall and the prevention of the spray-drift onto the rehabilitation area has seen it recover during the end of 2014. The area will continually be monitored throughout 2015.

Plate. 5 North Pit dump (Camberwell RL130) pasture rehabilitation facing west

North Pit Old North Void drill site

The North Pit Old North Void drill site was rehabilitated in March 2014 totalling 0.4 ha. This area was direct seeded via a tractor using tree species (Tree mix #1).

The area was an area previously cleared for an operation drill pad on unmined land. The area was left after underground mining in this area extracted more coal than previously thought. The slope was overlaid with approximately 100-200 mm of topsoil stockpiled adjacent to the area from when it was stripped via a D6 dozer. Prior to seeding the area was lightly ripped with a tractor with rip lines running across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. No cover crop or ameliorants were used. Early indications also show some weed (Galenia and Prickly Pear) which will be monitored and managed accordingly.

Plate. 6 North Pit Old North Void drill site

North Pit 9-Way batter (Muswellbrook side)

The North Pit 9-way batter (Muswellbrook) site was rehabilitated in March 2014 totalling 0.6 ha. This area was direct seeded via a tractor using pasture species (Pasture mix #1).

The area was created using overburden from the West Pit operation then clay and subsoil from the West Pit pre-strip was shaped onto a 10 degree slope. This slope was overlaid with approximately 100-200 mm of topsoil from the West Pit pre-strip area. Prior to seeding the area was ripped with a tractor with rip lines running across the contour to minimise erosion from surface run-off.
The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. No cover crop or ameliorants were used. Early indications also show some weed (Galenia) which will be monitored and managed accordingly.

Plate. 7 North Pit 9-Way batter (Muswellbrook side) facing north-east

North Pit 9-Way batter (Singleton side)

The North Pit 9-way batter (Singleton) site was rehabilitated in August 2014 totalling 0.4 ha. This area was direct seeded via a tractor using pasture species (Pasture mix #1).

The area was created using overburden from the West Pit operation then clay and subsoil from the West Pit pre-strip was shaped onto an approximately 6 degree slope. This slope was overlaid with approximately 100-200 mm of topsoil from the West Pit pre-strip area. Prior to seeding the area was spread with biosolids at a rate of 90 tonnes / hectare and ripped into the soil with a tractor. The rip lines were created across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. A cover crop was also applied to stabilise the slope, minimise the weed potential and provide good visual amenity towards the New England Highway. Early indications also show some weed (Galenia and Prickly Pear) which will be monitored and managed accordingly. Prickly Pear was sprayed during December 2014 due to the seed being in the freshly stripped topsoil and drier than average conditions.

Plate. 8 North Pit 9-Way batter (Singleton side) facing east

North Pit dump (Rix's triangle)

The North Pit dump (Rix's triangle) site was rehabilitated in April 2014 totalling 2.1 ha. This area was direct seeded via a tractor using pasture species (Pasture mix #1) at a lighter rate than those in the MOP.

The area was created using overburden from the North Pit operation then clay and subsoil from the West Pit pre-strip was shaped onto a generally flat slope. This slope was overlaid with approximately 100-200 mm of topsoil from the West Pit pre-strip area. Prior to seeding the area was spread with biosolids at a rate of 80 tonnes / hectare and ripped into the soil with a tractor. The rip lines were created across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 100 kg/ha. A cover crop was also applied to stabilise the slope and minimise the weed potential. This area will be lightly re-ripped and direct seeded via a tractor in 2015 with the Tree mix #1 species mix.

Plate. 9 North Pit dump (Rix's triangle) facing west

North Pit Tailing's Dam #2 (pasture area)

The North Pit Tailing's Dam #2 site was rehabilitated throughout May-June 2014 totalling 15.5 ha. This area was direct seeded via a tractor using pasture species (Pasture mix #1).

The area was created using overburden from the North Pit and West Pit operation then clay and subsoil from the West Pit pre-strip was shaped onto a 10 degree slope. The whole was overlaid with approximately 100-200 mm of topsoil from the West Pit pre-strip area with some topsoil utilised from North Pit dump topsoil stockpiles. Prior to seeding the area was spread with biosolids at a rate of 140 tonnes / hectare and ripped into the soil with a tractor. The rip lines were created across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. A cover crop was also applied to stabilise the slope and minimise the weed potential. Some of the area will be lightly re-ripped and direct seeded via a tractor in 2015 with the Tree mix #1 species mix. The idea of the tree species mix to create habitat corridors and shelter (for cattle grazing end land use) within the existing pasture areas.

Two contour banks were also installed across the Tailing's Dam #2 slope with a D6 dozer at a fall of 0.5 degree's. These banks were installed to minimise erosion down the 10 degree batter. To date the banks have worked effectively.

A 3 hectare area was spread with high clay content. This area within the 15.5 ha total for the area received gypsum at an approximate rate of 10 t /ha prior to biosolids being applied and contour ripping followed by direct seeding. The high clay content has dispersed well throughout the reporting period with minimal erosion also noted.

Early indications also show some weed (Galenia and Prickly Pear) which will be monitored and managed accordingly. Galenia was sprayed during August and December whilst Prickly Pear was sprayed during December 2014 due to the seed being in the freshly stripped topsoil from the West Pit and drier than average conditions. This was evident in the fresh topsoil placed for the last 2 hectares of the area on the western face.

The area is quite evident amongst the rehabilitation on the North Pit dump due to the height required to cap the existing tailing's dam but it has created a more natural landform.

Plate. 10 Rehabilitation at North Pit Tailing's Dam #2; (pasture area) facing west

Plate. 11 Rehabilitation at North Pit Tailing's Dam #2; (pasture area) facing east

North Pit Tailing's Dam #2 batter (tree area)

The North Pit Tailing's Dam #2 batter site was rehabilitated in March 2014 totalling 0.7 ha. This area was direct seeded by hand using tree species (Tree mix #1).

The area was remaining adjacent to the Tailing's Dam #2 tree and pasture sites. The area was created using overburden from the West Pit operation then clay and subsoil from the West Pit pre-strip was shaped onto a 10 degree slope. The whole area was overlaid with approximately 100-200 mm of topsoil from the West Pit pre-strip area. Prior to seeding the area was deep ripped with a D6 with the rip lines running across the contour to minimise erosion from surface run-off. A cover crop was also used to assist in minimising surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. No ameliorants were used.

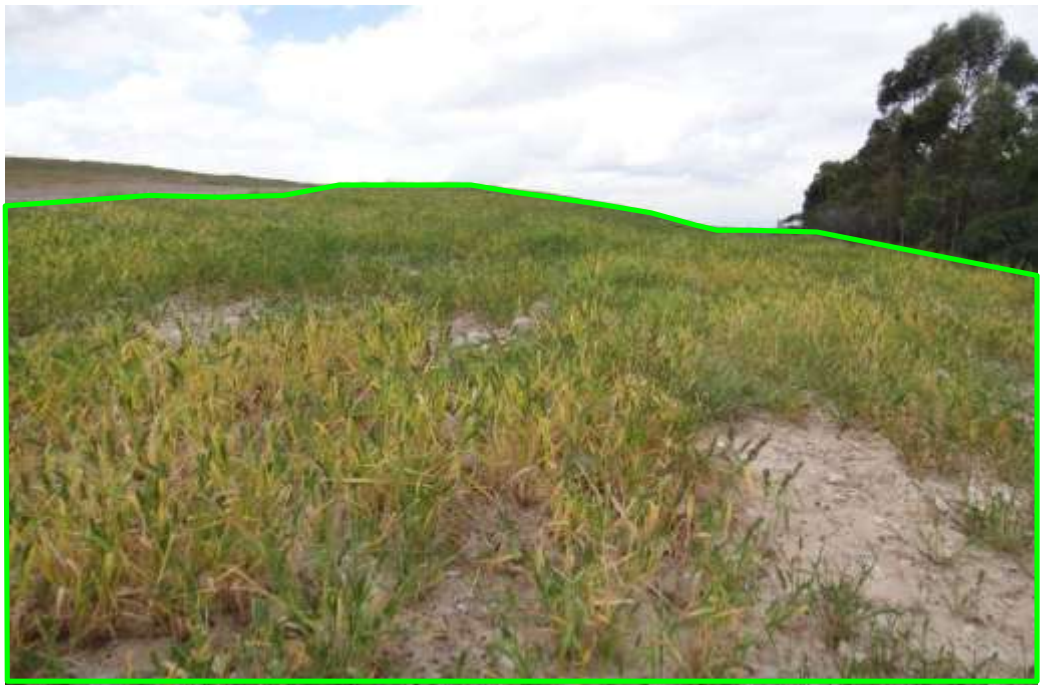


Plate. 12 Rehabilitation at North Pit Tailing's Dam #2 batter; (tree area) facing south

During March and April 2620 tube stock were planted across site as summer temperatures settled. These areas were predominately along the New England highway for visual screening, on top of the North Pit Dump for habitat corridor creation, on the Tailing's Dam #2 rehabilitation site and on the ROM Pad noise bund for noise screening purposes.

300 Tube stock were planted during September 2014 in a riparian zone between the West Pit Highway visual bunds for visual amenity. These were planted with advanced tube stock after rainfall in which the soil had high moisture. The tube stock was also watered during October and November until high rainfall in December. The tube stock were planted with water-saving gel, fertiliser and tree guards to see them withstand the summer season.

Throughout the year habitat construction took place across the North Pit dump rehabilitated areas through the installation of reused timber 'stag' tree's, rock piles and timber piles. Several possum and bird nest boxes for current and future habitat needs were also installed across this area.

Plate. 13 Habitat creation on North Pit dump (tree area) facing south-west

An approximate area of 25 ha on the southern and western faces of the South Pit dump was mulched during autumn to stimulate further pasture growth. This area was also maintained as necessary via rock-removal, rill-infilling and any repairs required along clean water drainage lines.

Several rehabilitation areas on the North Pit dump were rolled via a drum-roller after pasture area's had greater than 70% coverage to minimise rock presence at the surface and too allow weed management to be easily carried out for short ground-dwelling species such as *galenia pubescens* (galenia). This was undertaken throughout 2014 across new and previous rehabilitation areas.

Table 30 shows 28.5 ha was rehabilitated in 2014 giving Rix's Creek a cumulative area rehabilitated of 374.4 ha since 1990. This cumulative area is 54.2 ha ahead of the MOP cumulative total of 320.2 ha in 2014 as seen in Table 31. This is a great outcome to date as Rix's Creek MOP is aligned to maximum production rates of 15 million BCM (Bank Cubic Metres) of material movement per year (now 16.1 million BCM), with Rix's Creek generally well below this level in all its previous years of operation.

Table 31. 2014 Rehabilitation and Disturbance Areas (ha) compared to MOP

Domain / Phase	2014 MOP	2014 Actual	2015 MOP	2016 MOP
Infrastructure Area	59.9	67.8	59.9	59.7
Tailing's Emplacement Area	13.5	21.9	16.9	17.6
Active Mining Area	95.2	150.6	100.7	82
Overburden Emplacement Area	273.4	304.3	263.9	258.9
Rehabilitated Lands – Pasture; Landform Establishment	0	28.5	0	0
Rehabilitated Lands – Pasture; Ecosystem and Landuse Establishment	69.9	0	10	56.7
Rehabilitated Lands – Pasture; Ecosystem and Landuse Sustainability	0	0	69.9	80
Total Rehabilitation – Ecosystem and Landuse Sustainability (incl. pre MOP rehabilitation)	320.2	374.4	390.1	400.2
Rehabilitated Lands – Trees over Grass; Ecosystem and Landuse Sustainability	92.9	92.9	92.9	92.9

Table 32 & Table 33 outline the progression of rehabilitation and this is shown in Plan 2.
The areas previously treated with biosolids are still proving to perform exceptionally well when compared to other areas. The biosolids greatly enhances revegetation onsite given the poor quality of available topsoil. A 4 ha area was chosen on top of the North Pit Dump to conduct a trial of biosolids and compost for comparative analysis of effective rehabilitation ameliorants. This area was sown in August 2013 with minimal results seen during the 12 monthly analysis due to dry conditions. The area has since received very good rainfall and is expected to have further improved results during the 18-month pasture analysis.

The shaped area requiring rehabilitation at the end of the reporting period was 6.3 ha with the area estimated to be rehabilitated during 2015 is 46.8 ha.

Two area's to be disturbed during 2015 (approximately 41.8 ha in total) are in front of the West Pit through pre-stripping activities as mining in this area progressively moves in a north-westerly direction.

Table 32. Rehabilitation Summary

	Area Affected/Rehabilitated (hectares)			
	To date	Last report	Next Report (estimated)	
A: MINE LEASE AREA				
A1 Mine Lease(s) Area	1,823.3 ha			
B: DISTURBED AREAS				
B1 Infrastructure area (other disturbed areas to be rehabilitated at closure including facilities, roads)	67.8	71.2	67.8	
B2: Active Mining Area (excluding items B3 - B5 below)	150.2	137.4	138.4	
B3 Waste emplacements, (active/unshaped/in or out-of-pit)	304.3	316.3	330.8	
B4 Tailings emplacements, (active/unshaped/uncapped)	21.9	38.9	21.9	
B5 Shaped waste emplacement (awaits final vegetation)	6.3	1.8	27.0	
ALL DISTURBED AREAS	550.5	565.6	585.9	F1
C REHABILITATION PROGRESS				
C1 Total Rehabilitated area (except for maintenance)	374.4	346.0	421.2	F2
D: REHABILITATION ON SLOPES				

D1 10 to 18 degrees	5.2	0.0	0.0
D2 Greater than 18 degrees	-	-	-

E: SURFACE OF REHABILITATED LAND

E1 Pasture and grasses	270.5	247.3	305.3
E2 Native forest/ecosystems	-	-	-
E3 Plantations and crops (Includes Tree Plantation 51 ha and bunds along Highway**)**	103.9	98.7	115.9
E4 Other (include non-vegetative outcomes)	-	-	-

Table 33. Maintenance Activities on Rehabilitation Land

(This period's activities and activities proposed in the next reporting period)

NATURE OF TREATMENT	Area Treated (ha)		Comment/control strategies/ treatment detail
	Report period	Next period	
Additional erosion control works (drains re-contouring, rock protection)	3	5	Contour banks constructed on 10 degree rehabilitation areas where required. Sediment dams constructed to decant runoff of sediment and reduce runoff.
Re-covering (detail - further topsoil, subsoil sealing etc)	1	-	Further topsoil placed on North Pit pin dump from erosion due to high rainfall.
Soil treatment (detail - fertiliser, lime, gypsum etc)	28.5	46.8	Biosolids applied to all pasture areas rehabilitated. Some tree seed areas either received low rates of biosolids or did not receive biosolids in 2014 where high quality topsoil with tree seed bank is spread onto rehabilitation areas.
Treatment/Management (detail - grazing, cropping, slashing etc)	30	15	30 ha of rock rolling and slashing of rehabilitated areas was completed in 2014. This included 5 ha of the North Pit and 25 ha of the South Pit. Further rehabilitation will be slashed during 2015.
Re-seeding/Replanting (detail - species density, season etc)	1	7	1 ha rehabilitation area on North Pit pin dump was reseeded due to erosion. 6 ha to be reseeded in 2015 on the North Pit dump that did not receive biosolids application.
Adversely Affected by Weeds (detail - type and treatment)	410	150	Localised areas across the site. Large areas of African Boxthorn, Galenia and assorted Pear were priority for 2014. Small areas of Mother–of-Millions and Paterson's Curse sprayed as well as other assorted species. This will be ongoing in 2015 with increased focus again on Galenia especially in older rehabilitation as well as follow up assorted Pear spraying from 2014 works.
Feral animal control (detail - additional fencing, trapping, baiting etc)	200	200	Population has been increasing and an application will be made to cull excess numbers across the site. Now allowed to harvest meat from cull. During 2013 and 2014 meat was provided for baiting purposes from culled Kangaroos in which Wild Dog Associations and the LHPA typically struggle for funding.

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LEGEND

- MOP 2014 Rehabilitation Planned
- Areas to be Rehabilitated 2015
- Areas to be Disturbed 2015
- Rehabilitation Areas 2014
- Previous Rehabilitation Areas 1990-2013
- Reshaped Overburden Areas
- Unshaped Overburden Areas
- Active Mining Areas
- Infrastructure Areas
- Tailings Emplacement Areas
- Mine Water Dams
- Clean Water Dams
- Clean Water
- Colliery Holding
- Contour Lines

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Rix's Creek Mine

Annual Environmental Management Report - 2014

Rehabilitation Plan 2014

Scale as Shown	Date : February 2015 Photo : December 2014	Drawing A3 File: AEMR2014_A3

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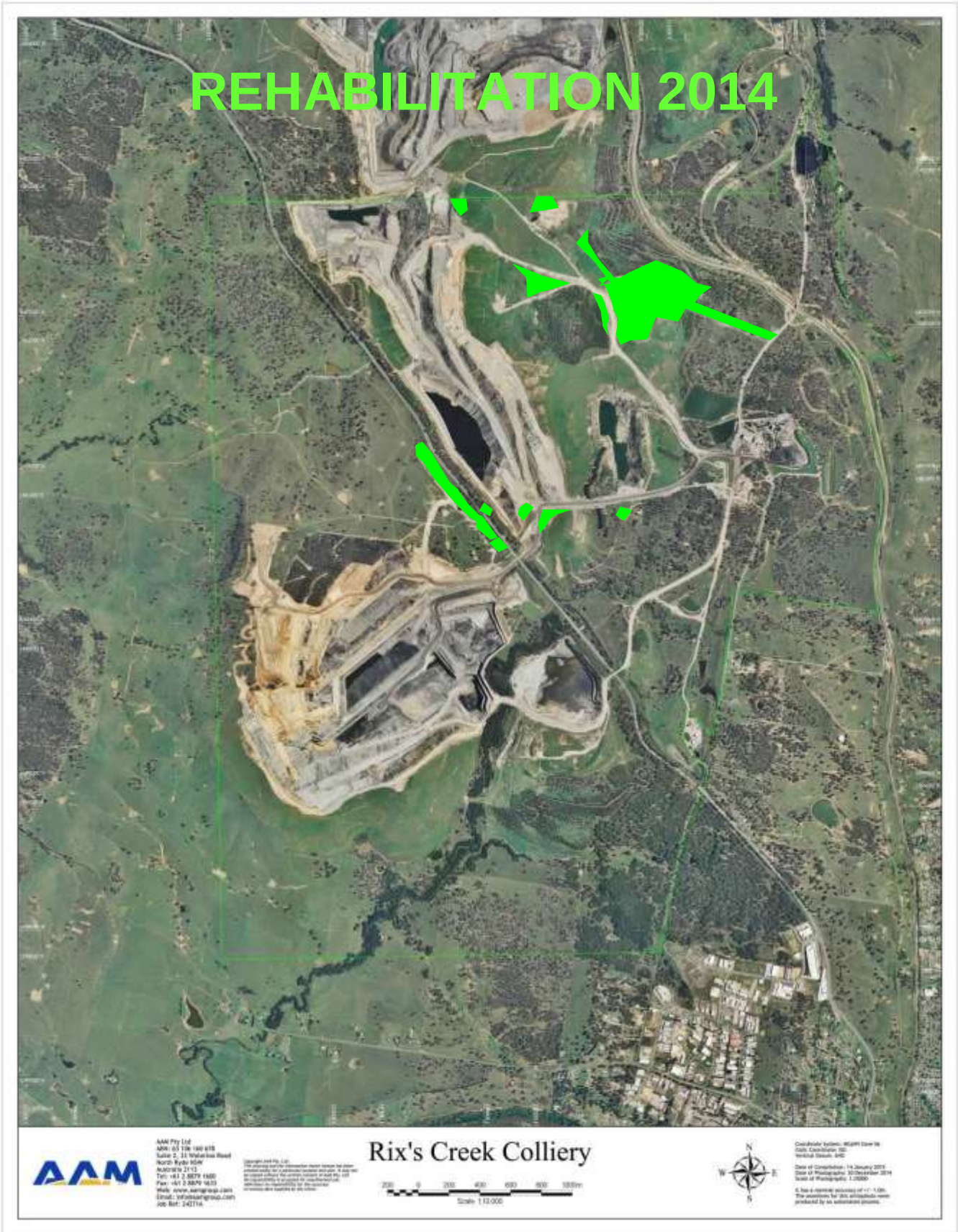
REHABILITATION 2014
Rix's Creek Colliery

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LEGEND

2013	2006	1997
2012	2005	1996
2011	2004	1995
2010	2003	1994
2009	2002	1993
2008	2001	1992
2007	2000	1991
	1999	1990
	1998	Colliery Holding

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Rix's Creek Mine

Annual Environmental Management Report - 2014

Rehabilitation History

Scale as Shown	Date: February 2015 Photo: December 2014	Drawing A3

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5.3 Other Infrastructure

No major infrastructure was installed during 2014.

Rix's Creek mine during 2014 undertook feasibility studies for the installation of another two solid-bowl centrifuge units following on from the initial trial unit. The additional two units (making three in total) were installed during November and December 2014. These were additional to the existing CHPP infrastructure area already existing on-site.

5.4 Rehabilitation Trials and Research

During the end of 2013 Rix's Creek trialled the mixing of 500 wet tonnes 'high-odour' biosolids material with 500 tonnes of on-site topsoil. This trial was to see if Hunter Water had an alternative end-life for its high-odour material not usually used in the mining / agricultural industry. The material was mixed using Rix's Creek owned and operated front-end loader with odour drastically reduced within 24 hours. The material was stockpiled throughout 2013 until November when it was re-mixed with the original material and again stockpiled.
Some of this material was used on a 3.5 ha pasture rehabilitation area in March 2014 (North Pit – Camberwell RL130) via a D6 Bulldozer after subsoil / topsoil was shaped. This 3.5 ha area included 1.9 ha on Vale –Integra's lease area and was not subsequently included in this report. The material was spread at an approximate coverage of 10 mm then subsequently incorporated into the surface via a D6 dozer / tractor rippers and then sown. The end-result being low in odour and an enriched topsoil not typically available on a mine-site. The pasture rehabilitation area has shown good early germination results.
In terms of biosolids being used on site long-term, Rix's Creek first begun using biosolids in 1994 and has continued ever since. The quality of the biosolids material has changed over time due to sewerage treatment plant upgrades which has seen a lot of material accepted to site without further treatments such as lime, gypsum, etc to minimise odour and the acidic nature. Low odour lagoon material is the preferential material spread and areas are completed dependant on the season as wind and wind direction can send any odour if present off-site towards nearby receptor's.

A 4 ha rehabilitation trial comprising of four 1 ha quadrats was conducted on site during August 2013. During 2014 this trial was monitored in February (six months after sowing) and August (12 months after sowing). Rix's Creek set up this trial to compare the conventionally used biosolids with compost (reuse of garden green waste) to evaluate the effectiveness of both products in contributing to long-term sustainability for the site. The four 1 ha quadrats were sown with conventional methods using pasture species already used on site with soil treatment as follows:

- Quadrat 1: Control with 200 kg starter fertiliser applied
- Quadrat 2: Compost at 70 t / ha
- Quadrat 3: Compost at 140 t /ha
- Qaudrat 4: Biosolids at 140 t / ha (maximum allowable rate).

The six and 12 monthly results to date can be seen in the graph below. To date all sites are similar in terms of pasture composition and species diversity but dry conditions have seen the rehabilitation growth rates lower than average annual growth rates across the site. Physically looking at the area's during August the control plot is slightly lower in quality then the three other plots, whilst the biosolids plot is slightly higher in quality then the other plots. These plots will be monitored again in February 2015 to see any seasonal influences and further rehabilitation progression (after 18 months) on the four trial plots.

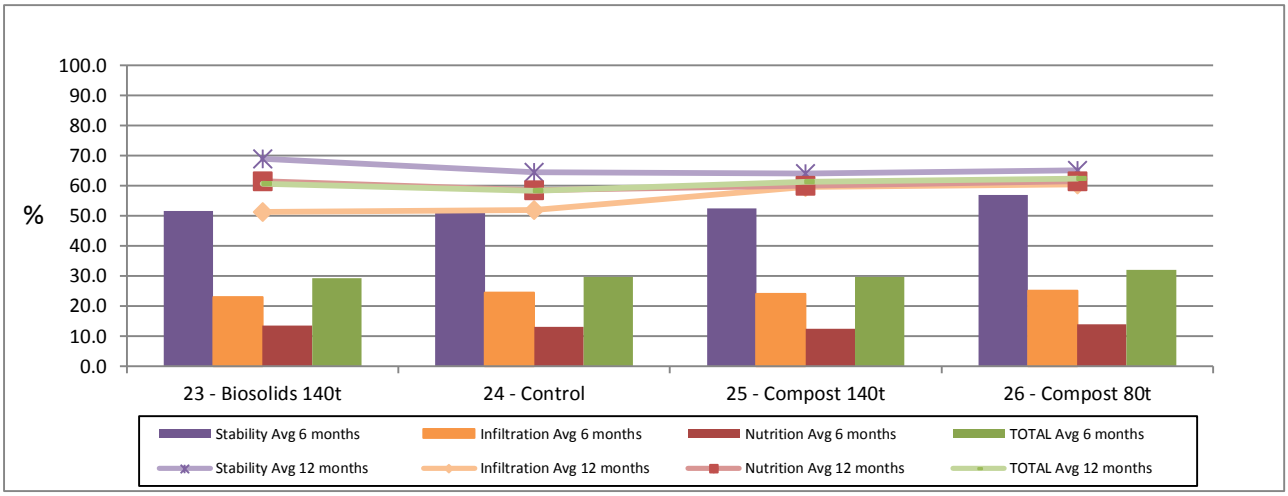

Figure 42. Summary of Rix's Creek 4 ha trial on North Pit Dump.

5.5 Rehabilitation Monitoring

Rehabilitation monitoring is conducted at Rix's Creek mine as per Bloomfield Mining Operations Land Rehabilitation Management System (LRMS). Monitoring was conducted in January 2011 on eighteen (18) existing sites and two (2) new sites less than 12 months after establishment. Rehabilitation monitoring was planned for November 2013, however, this was completed in January 2014. The timing was still throughout a prolonged dry period with similar rehabilitation conditions seen across all sites without the delay in monitoring having any impact. The monitoring included six (6) new sites, four of these being within the rehabilitation trial area of 4 ha (four 1 ha quadrats). The ultimate goal of rehabilitation monitoring is to assess rehabilitated land success prior to final sign-off by DRE. Rehabilitation monitoring will be further conducted throughout 2015. No areas have been applied to DRE for final sign-off, this was last done in 2009. Rix's Creek is hopeful to graze some of its pasture rehabilitation areas in the next several years to show evidence that the land can be sustainable for long-term grazing following the completion of mining.

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Site 8
Site 6
Site 26
Site 25
Site 22
Site 24
Site 23
NSW Govt Monitoring
Site 1
Site 2
Site 3
Site 21
Site 5
Site 20
Site 9
Site 4
Site 10
Site 19
Site 12
Site 11
Site 18
Site 17
Site 16
Site 15
Site 13
Site 14

Legend

- Transect Location

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Rix's Creek Mine

Annual Environmental Management Report 2014

Rehabilitation Monitoring - Transect Location

Scale as Shown	Date: February 2015 Photo: December 2014	Drawing A3

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5.6 Further Development of the Final Rehabilitation Plan

Rix's Creek Mining Operations Plan was issued 8 March 2013 with original expiry date being 15 September 2012. Rix's Creek was granted a time extension for the period of this MOP until 15 March 2013 to conform to the new MOP guidelines developed by DRE. In accordance with the Rehabilitation Management Plan (RMP 2011) Rix's Creek will provide rehabilitated land that meets the rehabilitation objectives throughout the different phases for the life of mine. The MOP will continue to be undertaken in accordance with the procedures outlined in the RMP so post mined lands are suitable for post-mining land use and in a state suitable for DPI sign-off. The Rix's Creek Mine MOP is approved to 8 March 2020.

Final rehabilitation outcomes are being agreed as Rix's Creek develops its new EIS for the Rix's Creek Continuation of Mining project. If granted to mine for another 21 years, a MOP variation will be submitted aligned to any further changes made to the new consent. During the next AEMR period rehabilitation will be undertaken in line with production and the MOP with no different techniques being utilised compared with previous years. The 4 ha pasture trial on the North Pit dump will be monitored and pasture mass data will be gathered to show the area can be preferentially grazed in the next several years.

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SECTION 6 ACTIVITIES PROPOSED IN THE NEXT AEMR PERIOD.

The operations for the coming year will be similar to 2014. Mining will be focussed in the West Pit (Pit 3). Due to coal advances in Pit 3 a majority of overburden from Pit 3 will be placed in Pit 1 until coal reserves move in a northward fashion. Pit 3 will require progressive pre-stripping ahead of the mining operations. Coal advancement in Pit 3 was limited in 2014 due to water within the active mining area preventing coal access and the subsequent rehabilitation progression on the Pit 3 dump. During 2015 this should begin to occur as overburden can begin to be filled in the Pit 3 voids behind the coal resource. During 2014 rehabilitation was ahead of the proposed MOP area due to the additional overburden dumped within the Pit 1 void which was not able to be dumped behind the Pit 3 operation.

The overall production level scheduled in the MOP is for the approved development consent level of a maximum material movement on site of 15 million cubic metres as shown in Table 34. During 2014 approval was granted to increase this level to a maximum material movement on site of 16.1 million cubic metres for the 2014 reporting period. 2014 reporting period exceeded the 15 million BCM previous limit but was below the new approval limit of 16.1 million BCM. This is projected to be similar in 2015 with slightly higher rates of overburden movement with saleable coal remaining the same. The overburden increase is aligned to Rix's Creek life-of-mine ratio for dirt to coal movement to keep the mine economically viable. The increased overburden movement is aligned to the increasing strip ratio as the West Pit progresses north-west.

Table 34. Mining Operation Plan Production Schedule

Year	Area	Description	Overburden (bank cubic metres)	Saleable (tonnes)	Strip Ratio
2013 Actual production	Pit 1	Arties	1,731,028	357,390	4.84
	Pit 3	Barrett	10,484,706	1,161,971	9.02
	Total		11,502,321	1,525,684	7.54
2014 Projected	Pit 1	Arties	114,437	58,554	1.95
	Pit 3	Barrett	13,185,863	1,089,600	9.13
	Total		13,300,000	1,500,000	8.87
2014 Actual production	Pit 1	Arties	110,435	61,379	1.80
	Pit 3	Barrett	13,123,650	1,420,199	9.24
	Total		13,234,085	1,481,578	8.93
2015 Projected	Pit 1	Arties	0	0	-
	Pit 3	Barrett	13,630,000	1,450,000	9.4
	Total		13,630,000	1,450,000	9.4

The area rehabilitated in 2014 was 28.5 ha. The cumulative rehabilitation area to date is 374.4 ha, which is 54.2 ha ahead of the MOP cumulative total at 2014 of 320.2 ha. Areas are being prepared for final shaping and topsoiling during early 2015 and throughout the remainder of the year. The area planned for rehabilitation during 2015 is estimated to be approximately 46.8 ha.

Environmental management is an ongoing process at Rix's Creek with continual improvement being made to the existing systems already in place.

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Appendix 1 Air Quality Monitoring Data

	Rix's Creek Dust Deposition Insoluble Solids 2014														
	c = Contaminated Result														
	ns = no sample														
Gauge	**Jan-14**	**Feb-14**	**Mar-14**	**Apr-14**	**May-14**	**Jun-14**	**Jul-14**	**Aug-14**	**Sep-14**	**Oct-14**	**Nov-14**	**Dec-14**	**Max**	**Min**	**Avg**
1	0.9	0.6	2.3	1.0	**5.6c**	1.8	3.7	2.1	5.1	1.8	1.4	2.0	5.1	0.6	2.1
2	0.8	1.0	**ns**	1.5	2.3	1.4	1.7	1.0	1.2	1.4	1.7	1.4	2.3	0.8	1.4
3	0.6	2.5	1.0	1.4	1.9	1.7	1.7	1.4	1.3	1.3	2.2	1.0	2.5	0.6	1.5
5	1.2	1.0	1.4	1.6	2.9	2.8	2.8	1.5	2.7	2.2	1.9	1.0	2.9	1.0	1.9
6	2.1	3.5	1.7	3.6	**4.8c**	4.1	4.6	**5.0c**	2.1	3.7	**7.2c**	3.3	4.6	1.7	3.2
7	2.4	2.5	1.7	3.0	3.7	2.3	2.4	3.0	2.9	2.2	**7.9c**	5.3	5.3	1.7	2.9
8	0.7	0.7	1.4	1.7	2.0	0.7	1.6	1.5	0.9	1.2	1.7	1.0	2.0	0.7	1.3
9	0.9	1.3	1.6	1.8	1.8	1.3	2.5	1.0	0.6	1.0	5.4	0.9	5.4	0.6	1.7
10	0.7	2.0	1.2	1.2	1.2	0.8	0.7	0.7	1.8	**2.4c**	**1.9c**	1.0	2.0	0.7	1.1
11	1.2	0.6	**ns**	1.5	1.4	1.1	1.8	1.4	0.5	0.8	1.8	0.8	1.8	0.5	1.2
13	1.2	0.9	1.3	1.4	1.6	1.3	2.7	1.6	0.9	1.7	2.0	**2.3c**	2.7	0.9	1.5
14	1.1	0.4	2.5	2.6	**ns**	2.1	**ns**	1.8	0.9	1.4	**0.2c**	3.1	3.1	0.4	1.8
15	**4.4c**	1.2	1.5	2.4	2.3	2.1	2.9	3.1	1.2	1.9	1.8	1.1	3.1	1.1	2.0
16	1.5	1.4	1.5	1.2	2.1	2.8	2.3	2.4	1.8	2.4	2.4	1.8	2.8	1.2	2.0
17	1.0	1.4	1.5	0.7	1.6	1.6	1.9	1.1	0.8	1.6	2.0	3.0	3.0	0.7	1.5
18	0.9	0.7	1.2	1.1	1.5	1.2	1.8	1.0	0.7	1.2	1.7	1.3	1.8	0.7	1.2
19	2.5	0.8	**8.9c**	**16.3c**	2.5	1.3	**3.3c**	**5.8c**	1.3	**19.9c**	**21.8c**	**11.4c**	2.5	0.8	1.7
20	2.8	1.1	**3.7c**	2.0	2.6	2.1	3.9	2.2	1.2	1.7	**3.0c**	0.9	3.9	0.9	2.1
21	0.9	1.2	**4.5c**	0.9	3.4	1.7	1.9	1.1	0.6	1.5	**2.4c**	0.9	3.4	0.6	1.4
22	2.3	1.8	1.2	1.4	1.3	1.7	2.6	1.6	0.6	2.0	**2.2c**	**2.2c**	2.6	0.6	1.7
23	1.4	0.9	1.7	1.9	2.4	2.1	**4.1c**	1.1	1.7	2.0	2.1	2.4	2.4	0.9	1.8
25	1.5	4.7	3.0	3.0	**3.7c**	**5.0c**	3.8	**5.0c**	**3.1c**	2.1	1.9	3.3	4.7	1.5	2.9
26	2.3	5.5	2.9	3.6	3.9	3.2	2.6	2.8	2.2	1.6	8.0	4.8	8.0	1.6	3.6
27	1.8	1.1	**8.0c**	**17.9c**	**4.6c**	1.8	**5.3c**	1.5	0.6	**6.0c**	**73c**	**20.4c**	1.8	0.6	1.4
28	2.0	1.5	**ns**	2.8	3.0	1.8	3.0	1.4	2.1	2.7	1.8	2.2	3.0	1.4	2.2
29	2.8	0.9	1.4	**3.5c**	1.7	0.9	2.3	1.5	1.0	2.2	1.9	1.2	2.8	0.9	1.6
30	1.1	0.6	2.2	2.8	**7.5c**	1.6	2.5	3.8	1.7	**ns**	**1.0c**	2.1	3.8	0.6	2.0
31	1.1	0.9	2.2	1.1	2.1	1.9	**6.3c**	2.8	2.1	1.0	1.9	1.8	2.8	0.9	1.7
32	2.1	1.5	2.0	1.4	2.6	2.8	**5.8c**	3.4	1.3	2.1	2.4	2.3	3.4	1.3	2.2
33	0.8	1.4	1.8	1.3	1.3	1.2	**2.8c**	1.8	1.6	1.8	0.9	1.8	1.8	0.8	1.4

TOTAL SUSPENDED PARTICILATES 2014 (ug/m3)				
	Date	Retreat Site	Mines Rescue Site	Rix's Creek Site
1	04-Jan-14	**95**	77	78
2	10-Jan-14	25	30	30
3	16-Jan-14	**94**	56	64
4	22-Jan-14	55	33	32
5	28-Jan-14	36	27	25
6	03-Feb-14	46	25	27
7	09-Feb-14	61	34	34
8	15-Feb-14	31	26	24
9	21-Feb-14	48	45	44
10	27-Feb-14	50	36	44
11	05-Mar-14	52	53	58
12	11-Mar-14	39	20	24
13	17-Mar-14	88	80	**120**
14	23-Mar-14	76	67	**94**
15	4-Apr-14	23	21	21
16	10-Apr-14	**273**	42	46
17	16-Apr-14	29	26	28
18	22-Apr-14	**97**	77	**100**
19	28-Apr-14	21	19	21
20	4-May-14	70	62	89
21	10-May-14	85	54	79
22	16-May-14	59	54	69
23	22-May-14	**126**	**99**	**137**
24	28-May-14	**108**	56	**116**
25	3-Jun-14	55	45	59
26	9-Jun-14	20	23	49
27	15-Jun-14	67	49	64
28	21-Jun-14	50	31	38
29	27-Jun-14	**162**	**102**	**115**
30	3-Jul-14	**98**	**108**	**119**
31	9-Jul-14	**125**	**94**	**178**
32	15-Jul-14	53	46	50
33	21-Jul-14	49	41	64
34	27-Jul-14	47	44	41
35	2-Aug-14	73	58	73
36	8-Aug-14	60	56	74
37	14-Aug-14	56	32	52
38	20-Aug-14	43	27	32
39	26-Aug-14	27	16	12
40	1-Sep-14	65	70	75
41	7-Sep-14	17	15	15
42	13-Sep-14	44	39	46

43	19-Sep-14	73	**97**	**99**
44	25-Sep-14	65	58	65
45	1-Oct-14	**108**	**100**	**111**
46	7-Oct-14	**123**	**104**	**164**
47	13-Oct-14	**131**	72	**230**
48	19-Oct-14	53	43	57
49	25-Oct-14	**103**	53	62
50	31-Oct-14	**160**	**115**	**154**
51	6-Nov-14	63	55	49
52	12-Nov-14	70	34	45
53	18-Nov-14	**130**	69	**107**
54	24-Nov-14	**168**	64	90
55	30-Nov-14	62	45	62
56	6-Dec-14	36	29	37
57	12-Dec-14	25	22	23
58	18-Dec-14	81	88	**91**
59	24-Dec-14	57	41	47
60	30-Dec-14	85	66	71
61	4-Apr-14	23	21	21
	Runs	61	61	61
	DNR	0	0	0
	% run	100.00%	100.00%	100.00%
	Maximum	**273**	**115**	**230**
	Minimum	17	15	12
	Average	72.5	52.4	68.1
	Results >90 ug/m3 Annual Average Limit	16	8	15

Bold – results > 90 *u*g/m^3 - annual average limit (EPA Air Quality Assessment Criteria)

Laboratory reports are available upon request from the Company.

Rix's Creek Particulate Matter <10 Micron Results 2014				
	Date	1	2	3
		Rix's Creek site	Mines Rescue Site	Retreat Site
1	4/01/2014	40	36	41
2	10/01/2014	15	12	14
3	16/01/2014	41	33	40
4	22/01/2014	19	17	22
5	28/01/2014	21	14	14
6	3/02/2014	16	15	16
7	9/02/2014	19	16	21
8	15/02/2014	13	14	13
9	21/02/2014	24	22	22
10	27/02/2014	22	18	20
11	5/03/2014	29	24	21
12	11/03/2014	13	8	9
13	17/03/2014	34	26	23
14	23/03/2014	34	28	24
15	29/03/2014	18	13	17
16	4/04/2014	13	13	11
17	10/04/2014	28	24	35
18	16/04/2014	14	11	12
19	22/04/2014	35	31	31
20	28/04/2014	7	8	6
21	4/05/2014	30	15	19
22	10/05/2014	26	24	23
23	16/05/2014	28	22	21
24	22/05/2014	44	33	38
25	28/05/2014	32	13	26
26	3/06/2014	12	11	17
27	9/06/2014	8	11	8
28	15/06/2014	18	11	16
29	21/06/2014	11	12	13
30	27/06/2014	33	25	28
31	3/07/2014	37	32	29
32	9/07/2014	**82**	26	38
33	15/07/2014	18	20	14
34	21/07/2014	19	14	15
35	27/07/2014	14	14	13
36	2/08/2014	20	15	18
37	8/08/2014	29	26	21
38	14/08/2014	24	19	19
39	20/08/2014	11	10	12
40	26/08/2014	5	9	11
41	1/09/2014	27	25	20
42	7/09/2014	5	6	5
43	13/09/2014	12	15	10
44	19/09/2014	31	32	19
45	25/09/2014	23	23	18
46	1/10/2014	37	33	32
47	7/10/2014	**66**	37	39
48	13/10/2014	**91**	30	39
49	19/10/2014	25	18	18

50	25/10/2014	28	23	30
51	31/10/2014	**71**	50	**58**
52	6/11/2014	20	20	20
53	12/11/2014	21	16	16
54	18/11/2014	33	22	35
55	24/11/2014	37	27	50
56	30/11/2014	26	19	23
57	6/12/2014	13	12	11
58	12/12/2014	12	10	10
59	18/12/2014	42	39	35
60	24/12/2014	22	19	21
61	30/12/2014	35	28	33
	Runs	61	61	61
	DNR	0	0	0
	%	100%	100%	100%
	Maximum	91	50	58
	Minimum	5	6	5
	Average	27	20	22
	Results >50 ug/m3	4	0	1

Bold – results > 50 *u*g/m^3 – daily air quality limit over a 24 hour averaging period (EPA Air Quality Assessment Criteria)

Laboratory reports are available upon request from the Company.

Appendix 2 Blast Results

BLAST RESULTS 2014

DATE	*TIME*	*LOCATION*	*WIND SPEED m/sec*	*WIND DIRECTION*	*COMPLAINTS*	*VIBRATION mm/sec*	*OVERPRESSURE dBL*	*LOCATION*	
16/01/2014									
	11:04 AM								
		MS01 L21 Flat zone above	*0.9*	*17*	*0*				
						<0.3	<113	Thornton	RETREAT
						<0.3	<113	Ernst	NEH
						<0.3	<113	Mines	SINGLETON
		MS01 L21 Steep zone	*0.9*	*17*	*0*				
						<0.3	<113	Ernst	NEH
						<0.3	<113	Mines	SINGLETON
						<0.3	<113	Thornton	RETREAT
21/01/2014									
	11:08 AM								
		WP10 Extended Surface Level	*1.9*	*221*	*0*				
						0.55	94.7	Dunn	MAISON
						0.62	101.73	Wright	Maison Dieu
						0.21	94.89	Mines	SINGLETON
6/02/2014									
	2:21 PM								
		WP09 PG28	*3.7*	*104*	*0*				
						1.35	104.8	Dunn	MAISON
						1.25	104.56	Wright	Maison Dieu
						0.51	94.7	Mines	SINGLETON
4/03/2014									
	11:12 AM								
		WP09 PG29	*2.1*	*104*	*0*				
						1.4	109.96	Wright	Maison Dieu
						0.48	99.18	Mines	SINGLETON
						1.33	112.3	Dunn	MAISON
7/03/2014									
	11:06 AM								
		MS01 L21	*0.6*	*61*	*0*				
						<0.3	<113	Ernst	NEH
						<0.3	<113	Mines	SINGLETON
						<0.3	<113	Thornton	RETREAT

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
14/03/2014									
	11:04 AM								
		WP10 Extended PG29							
			0.8	*270*	*0*				
						0.88	100.37	Wright	Maison Dieu
						0.96	98.8	Dunn	MAISON
						0.41	92.61	Mines	SINGLETON
18/03/2014									
	11:01 AM								
		MS01 L21							
			1.1	*261*	*0*				
						0.48	110.81	Wright	Maison Dieu
						<0.3	<113	Dunn	MAISON
						0.07	95.36	Mines	SINGLETON
	2:10 PM								
		WP08 L15 Presplit							
			2	*75*	*0*				
						0.35	100.96	Wright	Maison Dieu
						0.36	105.3	Dunn	MAISON
						0.1	97.0		
19/03/2014									
	11:05 AM								
		WP07 L13							
			0.5	*110*	*0*				
						<0.3	<113	Dunn	MAISON
						0.11	92.23		
						0.28	101.06	Wright	Maison Dieu
26/03/2014									
	11:02 AM								
		WP07 L13							
			2.1	*142*	*0*				
						<0.3	<113	Dunn	MAISON
						0.07	91.97	Mines	SINGLETON
						0.1	79.23	Wright	Maison Dieu
	11:04 AM								
		WP08 L15							
			2.1	*142*	*0*				
						1.74	80.82	Wright	Maison Dieu
						1.58	108.5	Dunn	MAISON
						0.31	95.71	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	VIBRATION mm/sec / OVERPRESSURE dBL		LOCATION	
	11:58 AM	WP08 L15						
			2.7	104	0			
					0.4	82.95	Wright	Maison Dieu
					0.39	105.6	Dunn	MAISON
					0.15	89.52	Mines	SINGLETON
2/04/2014								
	2:13 PM	WP10 Extended PG29						
			0.4	305	0			
					<0.3	<113	Wright	Maison Dieu
					0.42	101.5	Dunn	MAISON
					0.24	98.12	Mines	SINGLETON
16/04/2014								
	2:13 PM	WP08 L15						
			1.1	155	1			
					2.05	103.21	Wright	Maison Dieu
					2.05	104.8	Dunn	MAISON
					0.51	96.3	Mines	SINGLETON
1/05/2014								
	2:22 PM	WP08 L17						
			1.5	107	0			
					0.4	95.45	Wright	Maison Dieu
							Dunn	MAISON
							Mines	SINGLETON
6/05/2014								
	2:17 PM	WP08 L17						
			2.8	314	0			
					0.6	100.3	Dunn	MAISON
					0.66	99.35	Wright	Maison Dieu
					0.14	93.66	Mines	SINGLETON
9/05/2014								
	11:00 AM	WP08 L17						
			2	139	0			
					0.39	103.6	Dunn	MAISON
					0.26	103.81	Wright	Maison Dieu
					0.15	93.1	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
13/05/2014									
	2:10 PM								
		WP08 Upper Barrett							
			1.3	*163*	*0*				
						<0.3	<113	Mines	SINGLETON
						1.12	103.6	Dunn	MAISON
						<0.3	<113	Wright	Maison Dieu
14/05/2014									
	2:13 PM								
		WP09 L17 Presplit							
			1.5	*117*	*0*				
						0.07	89.69	Mines	SINGLETON
						<0.3	<113	Wright	Maison Dieu
						<0.3	<113	Dunn	MAISON
21/05/2014									
	10:57 AM								
		WS11 Peak 2							
			1	*260*	*0*				
						<0.3	<113	Dunn	MAISON
						0.12	105.34	Wright	Maison Dieu
						0.17	98.19	Mines	SINGLETON
	11:03 AM								
		WS11 Haul Road							
			1.5	*175*	*0*				
						0.42	110.4	Dunn	MAISON
						0.29	111.43	Wright	Maison Dieu
						0.09	104.37	Mines	SINGLETON
	2:12 PM								
		WP09 L20							
			2	*163*	*0*				
						0.88	101.9	Dunn	MAISON
						0.7	97.51	Wright	Maison Dieu
						0.14	88.38	Mines	SINGLETON
23/05/2014									
	11:00 AM								
		WP08 L15 Presplit							
			5.3	*282*	*0*				
						0.12	100.27	Mines	SINGLETON
						0.55	99.8	Dunn	MAISON
						0.49	115.04	Wright	Maison Dieu

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
29/05/2014									
	2:20 PM								
		WS11 Peak 1							
			2.5	*130*	*0*				
						0.08	90.68	Mines	SINGLETON
						0.39	106.3	Dunn	MAISON
						0.25	101.24	Wright	Maison Dieu
5/06/2014									
	11:01 AM								
		WP09 L17 Presplit							
			2.3	*314*	*0*				
						0.83	100.3	Dunn	MAISON
						0.68	83.67	Wright	Maison Dieu
						0.11	104.78	Mines	SINGLETON
18/06/2014									
	2:11 PM								
		WP08 L15							
			0.5	*51*	*0*				
						1.92	113.5	Dunn	MAISON
						2.04	111.57	Wright	Maison Dieu
						0.48	107.22	Mines	SINGLETON
23/06/2014									
	12:57 PM								
		WP09 L20							
			2.8	*291*	*1*				
						0.7	108.5	Dunn	MAISON
						0.74	104.21	Wright	Maison Dieu
						0.18	105.81	Mines	SINGLETON
27/06/2014									
	9:06 AM								
		WP09 L17 Presplit							
			5.5	*295*	*0*				
						0.53	116.06	Wright	Maison Dieu
						<0.3	<113	Mines	SINGLETON
						0.55	101.1	Dunn	MAISON
	9:31 AM								
		WP09 L17 Presplit							
			4.8	*295*	*0*				
						0.52	91.6	Dunn	MAISON
						0.48	105.62	Wright	Maison Dieu
						<0.3	<113	Mines	SINGLETON

DATE	*TIME*	*LOCATION*	*WIND SPEED m/sec*	*WIND DIRECTION*	*VIBRATION mm/sec COMPLAINTS*	*OVERPRESSURE dBL*	*LOCATION*	
2/07/2014								
	2:20 PM	WP09 L20	*1.8*	*141*	*0*			
					0.75	104.2	Dunn	MAISON
					0.85	97.3	Wright	Maison Dieu
					0.25	89.15	Mines	SINGLETON
14/07/2014								
	11:05 AM	WP09 L20	*2*	*166*	*0*			
					0.68	101.5	Dunn	MAISON
					<0.3	<113	Wright	Maison Dieu
					<0.3	<113	Mines	SINGLETON
	11:07 AM	WS11 Peak 1	*2*	*166*	*0*			
					<0.3	<113	Dunn	MAISON
					<0.3	<113	Wright	Maison Dieu
					<0.3	<113	Mines	SINGLETON
	2:25 PM	WP09 Extended PG28	*4.3*	*92*	*0*			
					0.6	103.6	Dunn	MAISON
					<0.3	<113	Wright	Maison Dieu
					<0.3	<113	Mines	SINGLETON
15/07/2014								
	2:24 PM	WP09 L20	*1.8*	*84*	*0*			
					<0.3	<113	Dunn	MAISON
					0.65	101.5	Wright	Maison Dieu
					<0.3	<113	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	VIBRATION mm/sec / COMPLAINTS	OVERPRESSURE dBL	LOCATION	
21/07/2014								
	2:24 PM							
		WS11 Haul Road Peak 3						
			2.5	*72*	*0*			
					<0.3	<113	Dunn	MAISON
					<0.3	<113	Wright	Maison Dieu
					<0.3	<113	Mines	SINGLETON
	2:29 PM							
		WP10 L38						
			2.5	*72*	*0*			
					<0.3	<113	Dunn	MAISON
					<0.3	<113	Wright	Maison Dieu
					<0.3	<113	Mines	SINGLETON
23/07/2014								
	2:26 PM							
		WP10 L38 #2						
			1.5	*84*	*0*			
					<0.3	<113	Mines	SINGLETON
					<0.3	<113	Dunn	MAISON
					<0.3	<113	Wright	Maison Dieu
4/08/2014								
	2:24 PM							
		WP10 L38						
			1.5	*86*	*0*			
					<0.3	<113	Dunn	MAISON
					0.1	95.54	Wright	Maison Dieu
					0.07	95.45	Mines	SINGLETON
	2:31 PM							
		WP11 L42						
			1	*66*	*0*			
					<0.3	<113	Dunn	MAISON
					0.12	92.74	Wright	Maison Dieu
					0.07	92.98	Mines	SINGLETON
8/08/2014								
	11:13 AM							
		WP09 L17 Presplit						
			2.3	*147*	*0*			
					<0.3	<113	Dunn	MAISON
0.33	95.36	Wright	Maison Dieu		<0.3	<113	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
	2:26 PM	WP10 L38	2.8	123	0				
						<0.3	<113	Dunn	MAISON
						0.16	98.51	Wright	Maison Dieu
						<0.3	<113	Mines	SINGLETON
11/08/2014									
	2:26 PM	WS11 L42 Peak 1	1.5	131	0				
						<0.3	<113	Dunn	MAISON
						0.19	95.17	Wright	Maison Dieu
						<0.3	<113	Mines	SINGLETON
	2:30 PM	WP09 Extended L20	2	150	0				
						<0.3	<113	Dunn	MAISON
						0.85	95.36	Wright	Maison Dieu
						<0.3	<113	Mines	SINGLETON
12/08/2014									
	11:03 AM	WP08 Upper Barrett	2	128	0				
						<0.3	<113	Dunn	MAISON
						1.09	105.45	Wright	Maison Dieu
						0.3	94.8	Mines	SINGLETON
20/08/2014									
	10:55 AM	WP08 Extended L20	6.8	156	0				
						0.84	100.4	Dunn	MAISON
						1.28	107.08	Wright	Maison Dieu
						0.55	90.98	Mines	SINGLETON
21/08/2014									
	2:25 PM	WP08 L17 Presplit	5.5	137	0				
						<0.3	<113	Mines	SINGLETON
						0.53	101.2	Dunn	MAISON
						0.25	96.14	Wright	Maison Dieu

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
4/09/2014									
	2:28 PM								
		WP08 Barrett	*8.8*	*165*	*0*				
						0.41	99.52	Mines	SINGLETON
						0.93	106.2	Dunn	MAISON
						1.48	99.85	Wright	Maison Dieu
	2:32 PM								
		WS11 PG29 Peak 2	*8.8*	*163*	*0*				
						0.22	112.3	Dunn	MAISON
						0.3	106.47	Wright	Maison Dieu
						0.08	107.51	Mines	SINGLETON
5/09/2014									
	2:30 PM								
		WP07 Barrett Presplit	*6.8*	*185*	*0*				
						<0.3	<113	Dunn	MAISON
						<0.3	<113	Wright	Maison Dieu
						<0.3	<113	Mines	SINGLETON
12/09/2014									
	2:28 PM								
		WP09 Extended L20	*5.5*	*88*	*0*				
						<0.3	<113	Dunn	MAISON
						<0.3	<113	Wright	Maison Dieu
						0.19	98.88	Mines	SINGLETON
15/09/2014									
	2:16 PM								
		WS11 Peak 1	*2.5*	*300*	*0*				
						0.08	99.79	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.4	115.18	Wright	Maison Dieu
26/09/2014									
	11:06 AM								
		WP07 Presplit	*3*	*148*	*0*				
						0.79	99.12	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						2.21	107.49	Wright	Maison Dieu

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
		WP07 Upper Barrett	3	148	0				
						<0.3	<113	Dunn	MAISON
						2.21	107.49	Wright	Maison Dieu
						0.79	99.12	Mines	SINGLETON
1/10/2014									
	2:26 PM								
		WP09 L19 Shot 1	4.8	162	0				
						<0.3	<113	Dunn	MAISON
						0.15	96.7	Wright	Maison Dieu
						0.07	87.75	Mines	SINGLETON
3/10/2014									
	11:01 AM								
		WP09 L19 Shot 2	3.5	120	0				
						<0.3	<113	Dunn	MAISON
						0.15	94.7	Wright	Maison Dieu
						0.07	87.75	Mines	SINGLETON
8/10/2014									
	1:56 PM								
		WP09 L19 Shot 3	6.5	91	0				
						0.15	94.7	Wright	Maison Dieu
						0.07	87.75	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
17/10/2014									
	11:09 AM								
		WP07 Barrett	4.3	161	0				
						<0.3	<113	Dunn	MAISON
						0.24	106.08	Wright	Maison Dieu
						<0.3	<113	Mines	SINGLETON
22/10/2014									
	2:25 PM								
		WP08 Extended L19	3	127	0				
						0.56	98.5	Dunn	MAISON
						0.42	98.57	Wright	Maison Dieu
						0.22	96.7	Mines	SINGLETON

DATE	*TIME*	*LOCATION*	*WIND SPEED m/sec*	*WIND DIRECTION*	*COMPLAINTS*	*VIBRATION mm/sec*	*OVERPRESSURE dBL*	*LOCATION*	
29/10/2014									
	2:40 PM	WP09 L19	*2*	*26*	*0*				
						0.53	92.4	Dunn	MAISON
						0.31	105.3	Wright	Maison Dieu
						0.11	82.1	Mines	SINGLETON
31/10/2014									
	11:05 AM	WP08 Extended L17 Presplit	*3.8*	*326*	*0*				
						0.18	87.4	Mines	SINGLETON
						0.39	91.3	Dunn	MAISON
						0.21	100.6	Wright	Maison Dieu
4/11/2014									
	11:07 AM	WP07 Barrett	*2*	*65*	*0*				
						0.19	90.1	Mines	SINGLETON
						0.34	93.8	Dunn	MAISON
						0.21	98.9	Wright	Maison Dieu
	11:18 AM	WP08 Extended L20	*1.8*	*105*	*0*				
						<0.3	<113	Dunn	MAISON
						0.02	80.9	Wright	Maison Dieu
						0.04	88.4	Mines	SINGLETON
6/11/2014									
	2:25 PM	WP09 L19	*4.8*	*99*	*0*				
						<0.3	<113	Dunn	MAISON
						0.22	96.4	Wright	Maison Dieu
						0.09	86.2	Mines	SINGLETON
12/11/2014									
	2:27 PM	WP08 Extended L20	*6*	*101*	*0*				
						<0.3	<113	Dunn	MAISON
						0.48	100.2	Wright	Maison Dieu
						0.39	97.3	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
19/11/2014									
	11:06 AM	WP09 L19	*7.3*	*98*	*0*				
						<0.3	<113	Dunn	MAISON
						2.11	95.2	Wright	Maison Dieu
						0.24	94.4	Wright	Maison Dieu
						<0.3	<113	Dunn	MAISON
						0.84	108.2	Mines	SINGLETON
						0.08	85.5	Mines	SINGLETON
	2:27 PM	WP08 Barrett	*9.8*	*124*	*0*				
						<0.3	<113	Dunn	MAISON
						0.07	97.8	Wright	Maison Dieu
						0.04	87.5	Mines	SINGLETON
25/11/2014									
	2:29 PM	WP10 L38	*8*	*93*	*0*				
						0.05	89.7	Dunn	MAISON
						0.07	97.8	Wright	Maison Dieu
						0.04	87.5	Mines	SINGLETON
9/12/2014									
	11:13 AM	WS11 Peak 3 - Shot 1	*3.3*	*100*	*0*				
						<0.3	<113	Dunn	MAISON
						0.23	103	Wright	Maison Dieu
						0.1	89.1	Mines	SINGLETON
	2:24 PM	WP08 Barrett	*6.3*	*96*	*0*				
						1.66	98.3	Wright	Maison Dieu
						0.64	97.6	Mines	SINGLETON
						1.4	102	Dunn	MAISON
10/12/2014									
	2:25 PM	WS11 Peak 3 - Shot 2	*3.8*	*101*	*0*				
						<0.3	<113	Dunn	MAISON
						0.2	100.9	Wright	Maison Dieu
						0.1	89.2	Mines	SINGLETON

DATE	*TIME*	*LOCATION*	*WIND SPEED m/sec*	*WIND DIRECTION*	*COMPLAINTS*	*VIBRATION mm/sec*	*OVERPRESSURE dBL*	*LOCATION*	
17/12/2014									
	11:15 AM								
		WS11 Peak 3 - Shot 3							
			8.3	*87*	*0*				
						<0.3	<113	Dunn	MAISON
						0.17	100.8	Wright	Maison Dieu
						0.11	97.6	Mines	SINGLETON
18/12/2014									
	10:10 AM								
		WS11 L42							
			3.5	*179*	*0*				
						<0.3	<113	Dunn	MAISON
						0.19	97.1	Wright	Maison Dieu
						0.09	85.9	Mines	SINGLETON
22/12/2014									
	3:57 PM								
		WP10 L38							
			6.3	*75*	*0*				
						<0.3	<113	Dunn	MAISON
						0.11	101.8	Wright	Maison Dieu
						0.09	85.9	Mines	SINGLETON
23/12/2014									
	10:54 AM								
		WS11 L40							
			1.5	*64*	*0*				
						<0.3	<113	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.18	101.8	Wright	Maison Dieu

Appendix 3 Quarterly Noise Monitoring Results for Items of Equipment

PLANT AND EQUIPMENT LEVELS.

First quarter results 2014:-

PLANT & EQUIPMENT	SOUND POWER LEVEL dB(A)	DISTANCE FROM MONITOR TO MACHINE
Cat 690B Tiger	90	12.0 m
Bulldozer Cat D11 - 2	91	12.0 m
Bulldozer Cat D11 - 3	91	12.0 m
Bulldozer Cat D11 - 4	90	12.0 m
Bulldozer Cat D11 - 7	91	12.0 m
Bulldozer Cat D11 - 8	91	12.0 m
Bulldozer Cat D10 - 5	91	12.0 m
Bulldozer Cat D10 - 8	90	12.0 m
Bulldozer Cat D10 - 10	90	12.0 m
Bulldozer Cat D10 - 11	90	12.0 m
Bulldozer Cat D10 - 13	90	12.0 m
Front-End Loader Cat 950- 1	89	12.0 m
Front-End Loader Cat 988 - 1	89	12.0 m
Front-End Loader Cat 992 - 5	88	12.0 m
Front-End Loader Cat 994 -2	86	12.0 m
Front-End Loader Cat 994 -3	87	12.0 m
Grader Caterpillar 16G - 2	87	12.0 m
Grader Caterpillar 16G - 4	87	12.0 m
Grader Caterpillar 24H	88	12.0 m
ReDrill SK 75	87	12.0 m
ReDrill SK 50-2	83	12.0 m
Acco Water Cart	78	12.0 m
Water Cart Cat 777 - 5	87	12.0 m
Water Cart Cat 785 - 1	88	12.0 m
Water Cart Cat 785 - 2	88	12.0 m
Dump Truck Cat 789 - 1	91	12.0 m
Dump Truck Cat 789 - 6	91	12.0 m
Dump Truck Cat 789 - 9	89	12.0 m
Dump Truck Cat 789 - 10	88	12.0 m
Dump Truck Cat 789 - 11	89	12.0 m
Dump Truck Cat 789 - 12	89	12.0 m
Dump Truck Cat 793 - 1	90	12.0 m
Dump Truck Cat 793 - 2	89	12.0 m
Dump Truck Cat 793 - 3	90	12.0 m
Dump Truck Cat 793 - 4	91	12.0 m
Dump Truck Cat 793 - 5	90	12.0 m
Dump Truck Cat 793 - 6	91	12.0 m
Dump Truck Cat 793 - 7	90	12.0 m
Dump Truck Cat 793 - 8	90	12.0 m
Dump Truck Cat 793 - 12	90	12.0 m
Dump Truck Cat 793 - 13	90	12.0 m
Dump Truck Cat 793 – 14	91	12.0 m
Hitachi 3600 Excavator	118	12.0 m
Hitachi 5500 Excavator	119	12.0 m
Dragline Marion 305*	89	12.0 m
Liebherr R9800 Excavator**	113	12.0 m

*Dragline Marion 305 finished January 2014.
**Liebherr R9800 Excavator commenced January 2014.

Second quarter results 2014:-

PLANT & EQUIPMENT	SOUND POWER LEVEL dB(A)	DISTANCE FROM MONITOR TO MACHINE
Cat 690B Tiger	90	12.0 m
Bulldozer Cat D11 - 2	91	12.0 m
Bulldozer Cat D11 - 3	91	12.0 m
Bulldozer Cat D11 - 4	90	12.0 m
Bulldozer Cat D11 - 7	91	12.0 m
Bulldozer Cat D11 - 8	91	12.0 m
Bulldozer Cat D10 - 5	91	12.0 m
Bulldozer Cat D10 - 8	90	12.0 m
Bulldozer Cat D10 - 10	90	12.0 m
Bulldozer Cat D10 - 11	90	12.0 m
Bulldozer Cat D10 - 13	90	12.0 m
Front-End Loader Cat 950- 1	89	12.0 m
Front-End Loader Cat 988 - 1	89	12.0 m
Front-End Loader Cat 992 - 5	88	12.0 m
Front-End Loader Cat 994 -2	86	12.0 m
Front-End Loader Cat 994 -3	87	12.0 m
Grader Caterpillar 16G - 2	87	12.0 m
Grader Caterpillar 16G - 4	87	12.0 m
Grader Caterpillar 24H	88	12.0 m
ReDrill SK 75	87	12.0 m
ReDrill SK 50-2	83	12.0 m
Acco Water Cart	78	12.0 m
Water Cart Cat 777 - 5	87	12.0 m
Water Cart Cat 785 - 1	88	12.0 m
Water Cart Cat 785 - 2	88	12.0 m
Dump Truck Cat 789 - 1	91	12.0 m
Dump Truck Cat 789 - 6	91	12.0 m
Dump Truck Cat 789 - 9	89	12.0 m
Dump Truck Cat 789 - 10	88	12.0 m
Dump Truck Cat 789 - 11	89	12.0 m
Dump Truck Cat 789 - 12	89	12.0 m
Dump Truck Cat 793 - 1	90	12.0 m
Dump Truck Cat 793 - 2	89	12.0 m
Dump Truck Cat 793 - 3	90	12.0 m
Dump Truck Cat 793 - 4	91	12.0 m
Dump Truck Cat 793 - 5	90	12.0 m
Dump Truck Cat 793 - 6	91	12.0 m
Dump Truck Cat 793 - 7	90	12.0 m
Dump Truck Cat 793 - 8	90	12.0 m
Dump Truck Cat 793 - 12	90	12.0 m
Dump Truck Cat 793 - 13	90	12.0 m
Dump Truck Cat 793 – 14	91	12.0 m
Hitachi 3600 Excavator	118	12.0 m
Hitachi 5500 Excavator	119	12.0 m
Liebherr R9800 Excavator	113	12.0 m

Third quarter results 2014:-

PLANT & EQUIPMENT	SOUND POWER LEVEL dB(A)	DISTANCE FROM MONITOR TO MACHINE
Cat 690B Tiger	91	12.0 m
Bulldozer Cat D11 - 2	91	12.0 m
Bulldozer Cat D11 - 3	91	12.0 m
Bulldozer Cat D11 - 4	91	12.0 m
Bulldozer Cat D11 - 7	91	12.0 m
Bulldozer Cat D11 - 8	91	12.0 m
Bulldozer Cat D10 - 5	91	12.0 m
Bulldozer Cat D10 - 8	90	12.0 m
Bulldozer Cat D10 - 10	90	12.0 m
Bulldozer Cat D10 - 11	90	12.0 m
Bulldozer Cat D10 - 13	90	12.0 m
Front-End Loader Cat 950- 1	90	12.0 m
Front-End Loader Cat 988 - 1	90	12.0 m
Front-End Loader Cat 992 - 5	88	12.0 m
Front-End Loader Cat 994 -2	86	12.0 m
Front-End Loader Cat 994 -3	87	12.0 m
Grader Caterpillar 16G - 2	87	12.0 m
Grader Caterpillar 16G - 4	87	12.0 m
Grader Caterpillar 24H	88	12.0 m
ReDrill SK 75	87	12.0 m
ReDrill SK 50-2	83	12.0 m
Acco Water Cart	78	12.0 m
Water Cart Cat 777 - 5	87	12.0 m
Water Cart Cat 785 - 1	89	12.0 m
Water Cart Cat 785 - 2	88	12.0 m
Dump Truck Cat 789 - 1	91	12.0 m
Dump Truck Cat 789 - 6	91	12.0 m
Dump Truck Cat 789 - 9	89	12.0 m
Dump Truck Cat 789 - 10	88	12.0 m
Dump Truck Cat 789 - 11	90	12.0 m
Dump Truck Cat 789 - 12	90	12.0 m
Dump Truck Cat 793 - 1	90	12.0 m
Dump Truck Cat 793 - 2	89	12.0 m
Dump Truck Cat 793 - 3	90	12.0 m
Dump Truck Cat 793 - 4	91	12.0 m
Dump Truck Cat 793 - 5	90	12.0 m
Dump Truck Cat 793 - 6	91	12.0 m
Dump Truck Cat 793 - 7	90	12.0 m
Dump Truck Cat 793 - 8	90	12.0 m
Dump Truck Cat 793 - 12	90	12.0 m
Dump Truck Cat 793 - 13	90	12.0 m
Dump Truck Cat 793 – 14	91	12.0 m
Hitachi 3600 Excavator	118	12.0 m
Hitachi 5500 Excavator	119	12.0 m
Liebherr R9800 Excavator	114	12.0 m

Fourth quarter results 2014:-

PLANT & EQUIPMENT	SOUND POWER LEVEL dB(A)	DISTANCE FROM MONITOR TO MACHINE
Cat 690B Tiger	91	12.0 m
Bulldozer Cat D11 - 2	91	12.0 m
Bulldozer Cat D11 - 3	91	12.0 m
Bulldozer Cat D11 - 4	92	12.0 m
Bulldozer Cat D11 - 7	91	12.0 m
Bulldozer Cat D11 - 8	91	12.0 m
Bulldozer Cat D10 - 5	91	12.0 m
Bulldozer Cat D10 - 8	90	12.0 m
Bulldozer Cat D10 - 10	90	12.0 m
Bulldozer Cat D10 - 11	90	12.0 m
Bulldozer Cat D10 - 13	90	12.0 m
Front-End Loader Cat 950- 1	91	12.0 m
Front-End Loader Cat 988 - 1	90	12.0 m
Front-End Loader Cat 992 - 5	88	12.0 m
Front-End Loader Cat 994 -2	86	12.0 m
Front-End Loader Cat 994 -3	86	12.0 m
Grader Caterpillar 16G - 2	87	12.0 m
Grader Caterpillar 16G - 4	87	12.0 m
Grader Caterpillar 24H	88	12.0 m
ReDrill SK 75	87	12.0 m
ReDrill SK 50-2	84	12.0 m
Acco Water Cart	78	12.0 m
Water Cart Cat 777 - 5	87	12.0 m
Water Cart Cat 785 - 1	89	12.0 m
Water Cart Cat 785 - 2	88	12.0 m
Dump Truck Cat 789 - 1	91	12.0 m
Dump Truck Cat 789 - 6	91	12.0 m
Dump Truck Cat 789 - 9	89	12.0 m
Dump Truck Cat 789 - 10	88	12.0 m
Dump Truck Cat 789 - 11	90	12.0 m
Dump Truck Cat 789 - 12	90	12.0 m
Dump Truck Cat 793 - 1	90	12.0 m
Dump Truck Cat 793 - 2	90	12.0 m
Dump Truck Cat 793 - 3	90	12.0 m
Dump Truck Cat 793 - 4	91	12.0 m
Dump Truck Cat 793 - 5	91	12.0 m
Dump Truck Cat 793 - 6	91	12.0 m
Dump Truck Cat 793 - 7	90	12.0 m
Dump Truck Cat 793 - 8	90	12.0 m
Dump Truck Cat 793 - 12	90	12.0 m
Dump Truck Cat 793 - 13	90	12.0 m
Dump Truck Cat 793 – 14	91	12.0 m
Hitachi 3600 Excavator	118	12.0 m
Hitachi 5500 Excavator	120	12.0 m
Liebherr R9800 Excavator	114	12.0 m

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Appendix 4 Rix's Creek response to DRE 2013 AEMR Review

Rix's Creek Lane
Singleton NSW 2330
AUSTRALIA

PO Box 4
East Maitland NSW 2323

T: 61 2 6578 8888
F: 61 2 6571 1066

ABN 25 003 824 244

Wednesday, 6th August 2014

Inspector Environment
NSW Trade & Investment – Division of Resources and Energy
Mineral Resources – Environmental Sustainability Unit
P O Box 344
HRMC NSW 2310

Attention:- Mr John Trotter

RIX'S CREEK PTY LIMITED
RIX'S CREEK MINE AEMR 2013 – SITE INSPECTION

Dear John,

As per DRE's letter received 12/7/2014 regarding Rix's Creek 2013 AEMR review and site inspection:

No.	Issue / Observation	Action
3	Variation between 2013 MOP year and actual year with respect to total area disturbed.	Advise DRE as to the reason for this inconsistency.

Rix's Creek is providing the following information arising from this action:

Table 1. 2013 Rehabilitation and Disturbance Areas (ha) compared to MOP

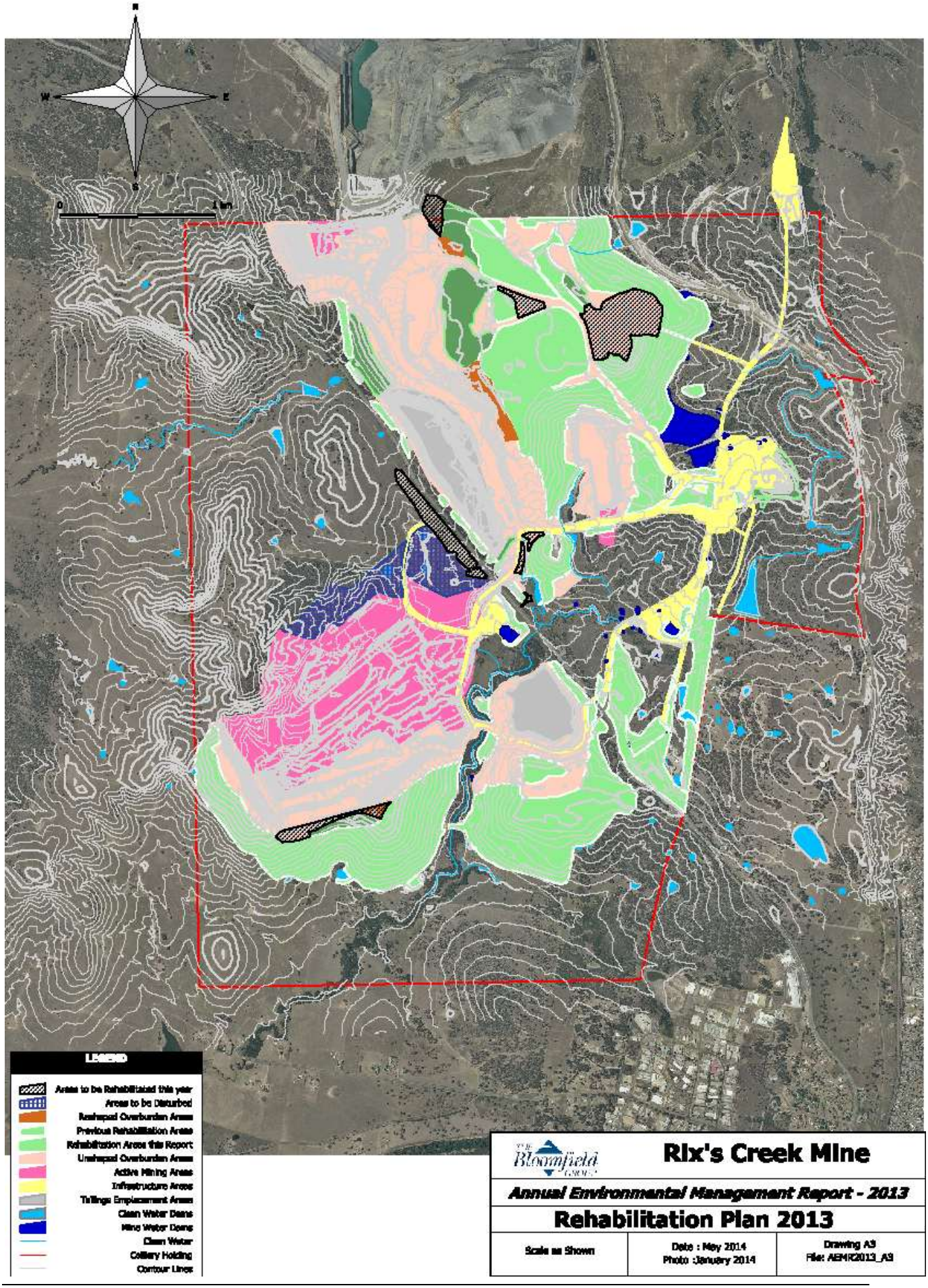
Domain / Phase	2013 MOP	2013 Actual	2014 MOP	2015 MOP
Infrastructure Area	60	71.2	59.9	59.9
Tailing's Emplacement Area	13.5	38.9	13.5	16.9
Active Mining Area	89.8	137.4	95.2	100.7
Overburden Emplacement Area	306.2	316.3	273.4	263.9
Rehabilitated Lands – Pasture; Landform Establishment	12.2	37.1	0	0
Rehabilitated Lands – Pasture; Ecosystem and Landuse Establishment	0	0	69.9	10
Rehabilitated Lands – Pasture; Ecosystem and Landuse Sustainability	0	0	0	69.9
Total Rehabilitation – Ecosystem and Landuse Sustainability (incl. pre MOP rehabilitation)	320.2	346.0	320.2	390.1
Rehabilitated Lands – Trees over Grass; Ecosystem and Landuse Sustainability	92.9	92.9	92.9	92.9

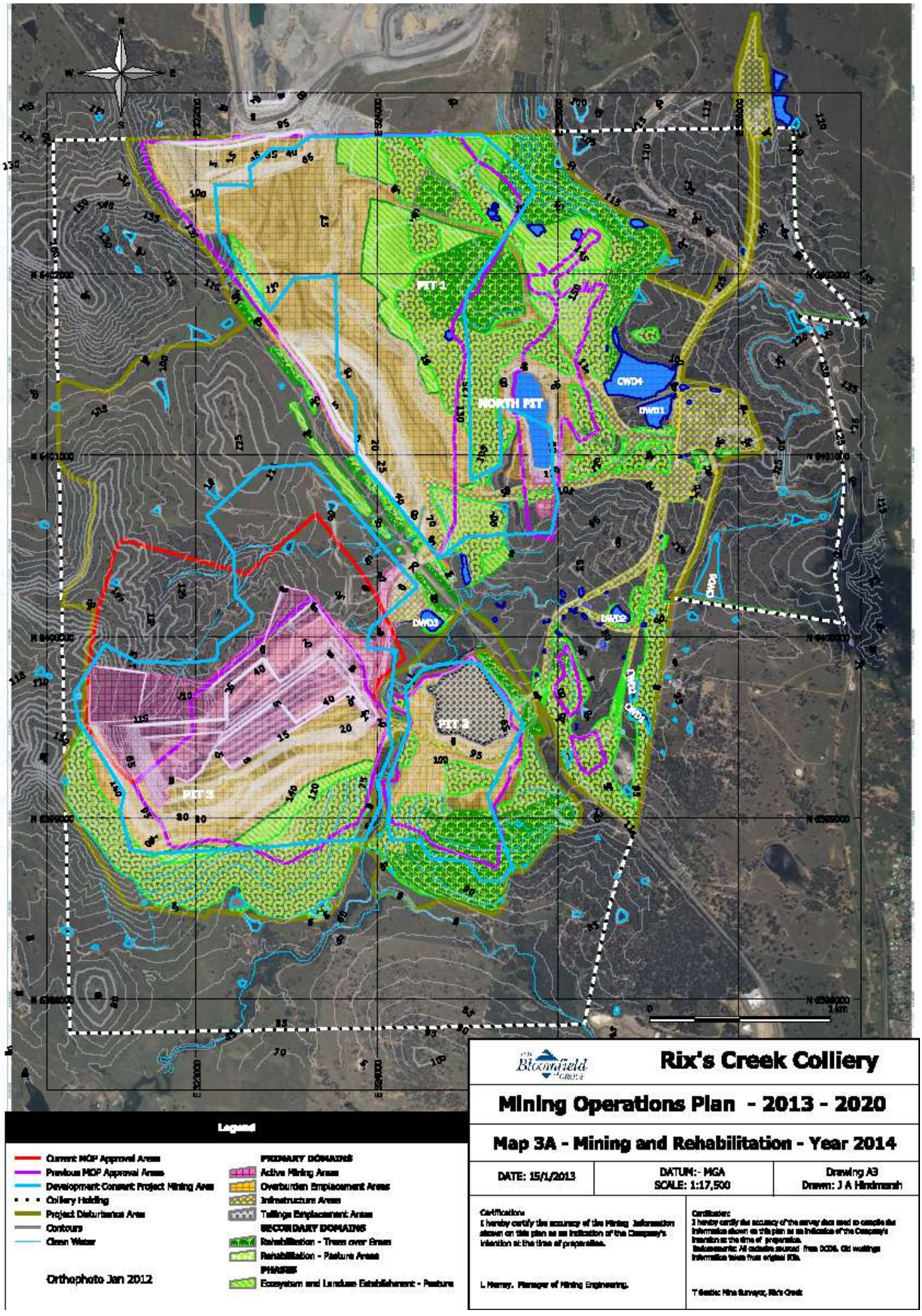
Table 1 highlights the variation between 2013 MOP and 2013 Actual. The distinct variation can be seen between the Active mining area proposed and actual. This is due to the North Pit (Pit 1) coal accessible by open-cut means becoming exhausted and the focus of the operation commencing in the West Pit (Pit 3). The limiting factor in this process has been the dirty water (rainfall within active mining catchment) stored in the West Pit not allowing for access via open-cut means to the lower coal seams. This water then was left on the West Pit floor up until the North Pit had been fully extracted (creating a void) and transferring then began to the

1

remaining North Pit void so that the lower coal measures of the West Pit could be mined. By not extracting the lower coal seams in this pit it has prevented the infilling of waste rock material behind the mining operation. Due to minimising offsite noise levels, mining these upper levels of the West Pit was then scheduled for the 2013 summer months where prevailing winds and atmospheric conditions were more suitable. To off-set the advanced clearing ahead of the West Pit operation extensive rehabilitation has followed closely to the North Pit operation with 37.1 ha rehabilitated in 2013 compared to the MOP figure of 12.2 ha. The variation of disturbance during 2013 should see a decrease in the disturbance carried out in following years.

The following map (Rehabilitation Plan 2013) highlight's the actual rehabilitation and disturbance carried out over the 2013 period. The second map (Map 3A – Mining and Rehabilitation – Year 2014) shows the MOP intended rehabilitation and disturbance area's at the end of the 2013 reporting period.


N
W
E
S
0
1 km
Areas to be Rehabilitated this year
Areas to be Disturbed
Reshaped Overburden Areas
Previous Rehabilitation Areas
Rehabilitation Areas this Report
Unshaped Overburden Areas
Active Mining Areas
Infrastructure Areas
Tailings Emplacement Areas
Clean Water Dams
Mine Water Dams
Clean Water
Colliery Holding
Contour Lines
Rix's Creek Mine
Annual Environmental Management Report - 2013
Rehabilitation Plan 2013
Scale as Shown
Date : May 2014
Photo :January 2014
Drawing A3
File: AEMR2013_A3


PIT 1
NORTH PIT
PIT 2
PIT 3
CWD4
DWD1
DWD3
DWD2
CWD3
CWD2
CWD1
Legend
Current MOP Approval Areas
Previous MOP Approval Areas
Development Consent Project Mining Area
Colliery Holding
Project Disturbance Area
Contours
Clean Water
Orthophoto Jan 2012
PRIMARY DOMAINS
Active Mining Areas
Overburden Emplacement Areas
Infrastructure Areas
Tailings Emplacement Areas
SECONDARY DOMAINS
Rehabilitation - Trees over 5mes
Rehabilitation - Pasture Areas
PHASES
Ecosystem and Landuse Establishment - Pasture
Bloomfield Group
Rix's Creek Colliery
Mining Operations Plan - 2013 - 2020
Map 3A - Mining and Rehabilitation - Year 2014
DATE: 15/1/2013
DATUM:- MGA
SCALE: 1:17,500
Drawing A3
Drawn: J A Hindmarsh
Certification
I hereby certify the accuracy of the Mining Information shown on this plan as an indication of the Company's intention at the time of preparation.
L Harney. Manager of Mining Engineering.
Certification:
I hereby certify the accuracy of the survey data used to compile the information shown on this plan as an indication of the Company's intention at the time of preparation.
Tenements: All cadastre sourced from DCDB. Old workings information taken from original Plan.
T Beattie: Mine Surveyor, Rix's Creek

Although disturbance is higher than the MOP year it needs to be reiterated that the total cumulative rehabilitation to date at Rix's Creek is 346.0 ha which is higher than the MOP cumulative total to date of 320.2 ha.

If you require any further information please do not hesitate to contact me.

Yours faithfully,

Jason Desmond
Environmental Officer
Rix's Creek Pty. Limited
(02)65788826 (02)65711066 0407246311
E-mail: jdesmond@rixs.com.au

THE Bloomfield GROUP

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