



BLOOMFIELD COLLIERY

Annual Environmental Management Report 2014

Bloomfield Collieries Pty Ltd

Annual Environmental Management Report 2014

Name of Mine	Bloomfield Colliery		
Titles/Mining Leases	Consolidated Coal Lease 761		
MOP Commencement Date	2012	MOP Completion Date	2016
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	Greg Lamb		
Title	Environmental Officer		
Signature	<hr/>		
Date	<hr/>		

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1 INTRODUCTION

Bloomfield Collieries (Bloomfield) is one of two open cut coal mines owned by its parent company, Big Ben Holdings Pty Limited (Big Ben). Bloomfield Colliery is located at East Maitland, NSW, and produces approximately 0.6 million tonnes of product coal by open cut methods per year. Coal has been mined on the property for over 100 years. Underground mining by the current owner commenced in 1937 and the last coal extracted from underground operations was in May 1992. The open cut commenced operations in 1964. Bloomfield produces mainly thermal coal with some semi soft coking coal, principally for the Asian export market.

The parent company also owns Rix's Creek Mine which is located north of Singleton. Rix's Creek currently produces approximately 1.4 million tonnes of product coal per year.

This report covers the calendar year 2014. Prior to the 2012 AEMR, reports had been based on Bloomfield's fiscal reporting year, which is April to March.

This report is prepared to meet the requirements for the production of Annual Environmental Management Reports (AEMR), as outlined by the NSW Department of Primary Industries - Mineral Resources (DPI-MR) in the Guidelines to the Mining, Rehabilitation and Environmental Management Reporting Process (edg03 V3, DPI-MR, 2006).

1.1 Consents, Leases and Licences

Bloomfield operates under consents, leases and licenses presented in Table 1.

Table 1: Approvals, Leases and Licenses for Bloomfield Colliery

Approval/Lease/License	Issue Date	Expiry Date	Details/ Comments
Project Approval 07_0087	3 September 2009	31 December 2021	Granted by the Minister for Planning
Consolidated Coal Lease (CCL) 761	20 October 1991	8 October 2029	Granted by Minister for Natural Resources
Project Approval 05_0136 (Abel)	7 June 2007	31 December 2030	Granted by Minister for Planning
Environmental Protection License 396	31 December 2007	Renewed Annually	Issued by Department of Environment and Climate Change (now EOH)
Project Approval Modification, 07_0087_ Mod 1	16 May 2011	31 December 2021	Granted by Minister for Planning and Infrastructure
Project Approval Modification, 07_0087_ Mod 2	29 March 2012	31 December 2021	Granted by Minister for Planning and Infrastructure
Project Approval Modification, 07_0087_ Mod 3	20 February 2013	31 December 2021	Granted by Minister for Planning and Infrastructure

The lease area for CCL 761 is shown on the Bloomfield site locality plan in Plan 1.

Project Approval (05_0136) for the Abel Underground Mine allows for the operation of the Bloomfield Coal Handling and Preparation Plant (CHPP), Rail Loading Facility (RLF) and other related facilities required for the handling and processing of coal.

Project Approval (07_0087) was granted by the Minister for Planning under Part 3A of the *Environment Planning & Assessment Act 1979* (EP&A Act) to allow for the completion of open cut mining operations and rehabilitation. The approval was issued 3 September, 2009 and is subject to a number of conditions. A variation to modify the Project Approval under s75W of the EP&A Act was granted on 16 May 2011 (07_0087_Mod 1). An additional variation to modify the Project Approval under s75W of the EP&A Act was granted on 29 March 2012 (07_0087_Mod 2). A further variation to modify the Project Approval under s75W of the EP&A Act was granted on 20 February 2013 (07_0087_Mod 3).

A Mining Operations Plan (MOP) has been prepared under DREs new Interim MOP Guidelines. The new MOP has been accepted by DRE and covers the period 2012 – 2016.

1.2 Mine Contacts

The Bloomfield Colliery Mine Manager, Mr Brendon Clements, is the primary mining contact and is responsible for regulatory compliance. The Environmental Officer is Mr Greg Lamb who coordinates environmental management and rehabilitation operations at Bloomfield Colliery.

Postal Address	PO Box 4 East Maitland. NSW 2323	
Site Address	Four Mile Creek Rd Ashtonfield NSW 2323	Tel:02 4930 2600 Fax:02 4933 8940
Environmental / Community Hotline		24hr: 02 4930 2680
Mr Brendon Clements	Mine Manager	Tel: 02 4930 2641 Mob: 0437 684 222 Email: bclements@bloomcoll.com.au
Mr Greg Lamb	Environmental Officer	Tel: 02 4930 2689 Mob: 0457 819 211 Email: glamb@bloomcoll.com.au

1.3 Actions Required at Previous AEMR Review

Listed in Table 2 below are the actions required from the DRE review of the 2013 AEMR. The review of the AEMR was conducted on the 3rd June 2014. Also listed are the relevant sections of the report that describe the measures taken in response to these actions.

Table 2: Action Required from AEMR 2013 Review

Action Required	Status	AEMR Section
Relevant Abel Mine boundaries to be shown in AEMR plans	Complete	Plan 1
Show next periods proposed mining areas on AEMR plans	Complete	Plan 2
Differentiate between Donaldson and Bloomfield monitoring locations on AEMR plans	Complete	Plan 1
Indicate degree of any future noise exceedance in AEMR text	As required	Future AEMR
Provide details on order of weed management	Complete	Section 3.7
Provide relevant information on rehabilitation of "Other Infrastructure"	Complete	Section 5
Provide relevant information on "Rehabilitation Trials & Research"	Complete	Section 5
Develop a weed management plan by 30/6/14	Complete	Section 3.7
Establish a dedicated contaminates soil land farming area by 30/6/14	Complete	Section 3.16
Prepare topsoil balance and report annually in AEMR	Complete	Section 5

2 OPERATIONS DURING THE REPORTING PERIOD

2.1 Exploration

There were no exploration activities at Bloomfield during the reporting period.

2.2 Land Preparation

Approximately 7 ha of land was prepared for mining during the reporting period. This area was to the west of South Cut. Vegetation and groundcover was removed and topsoil stripped. The topsoil was removed and placed directly on shaped overburden areas as part of the rehabilitation program or stockpiled for future rehabilitation. Topsoil volumes are presented in Table 3.

2.3 Construction

No major construction was undertaken on the site during the reporting period.

2.4 Mining

During the reporting period, Bloomfield operated 15 shifts a week for 48 weeks employing 93 personnel. Production was 1,052,000 tonnes of raw coal, 569,000 tonnes of saleable coal and 6.1 million cubic metres of overburden moved primarily using a Hitachi 5500 excavator and Caterpillar rear dump trucks.

Mining operations continued in S Cut and Creek Cut throughout the year, generally in accordance with the mining methods described in the 2012-2016 MOP. During the next reporting period, Mining in S Cut will continue towards the west and Creek Cut will continue towards the south and west.

2.5 Mineral Processing

The coal handling and preparation plant (CHPP) has a throughput of up to 8.5 Mtpa, as approved under the Abel Consent. The throughput is currently rated at 1000 tonnes per hour. ROM coal and clean coal volumes are presented in Table 3.

Table 3: Production and Waste Summary

	Cumulative Production (Annual Production)		
	Start of Reporting Period	At end of Reporting Period	End of next reporting (estimated)
Topsoil stripped (bcm)	263,000	403,000 (140,000)	443,000
Topsoil used (bcm)	263,000	283,000 (20,000)	303,000
Waste Rock (bcm)	59,309,000	65,402,000 (6,093,000)	71,402,000
Run Of Mine Coal (t) (Bloomfield)	10,131,000	11,183,000 (1,052,000)	12,183,000
(Donaldson)	18,794,000	18,794,000 (0)	18,794,000
(Tasman)	3,707,000	3,707,000 (0)	3,707,000
(Abel)	6,630,000	9,103,000 (2,473,000)	12,103,000
TOTAL ROM	39,262,000	42,787,000 (3,525,000)	46,787,000
Processing Waste (t) (Bloomfield)	4,832,000	5,315,000 (407,000)	5,715,000
(Donaldson)	5,827,000	5,827,000 (0)	5,827,000
(Tasman)	1,233,000	1,233,000 (0)	1,233,000
(Abel)	2,144,000	2,919,000 (775,000)	3,819,000
TOTAL WASTE	14,036,000	15,218,000 (1,182,000)	16,594,000
Coal (tonne) (Bloomfield)	5,969,000	6,538,000 (569,000)	7,138,000

2.6 Waste Management

Process Waste: Process Waste from the CHPP consists of breaker reject, coarse rejects and fine rejects (tailings). Breaker reject consists of large diameter (>150mm) rocks and coal rejects, and is hauled by truck to operational open cut pits and placed under advancing overburden dumps. Coarse rejects which are separated out during processing, and are currently disposed of under advancing overburden dumps. Fine tailings are currently pumped as 20% solids slurry to Tailings Dam, a disused open cut pit in north of the mine site. Reject fines settle out of the slurry, gradually backfilling the pit, whilst the decant water is returned to the CHPP for re-use in processing. Process waste volumes are provided in Table 3.

Waste Oil: Waste oil from scheduled maintenance of mining equipment and the workshop oil separator is collected in a storage tank and periodically evacuated for reprocessing and

re-use by a licensed waste oil contractor. The waste contractor re-synthesise the waste oil to a fuel oil product for re-use in ANFO explosive for blasting operations.

Waste Oil Filters: During the reporting period a recycling bin was installed for disposal of used oil filters. Used oil filters are placed in a 3m³ bin and collected by licensed waste contractor for disposal.

Waste Metal: Bloomfield has a well implemented scrap metal recycling program, and has a high rate of on-site re-use of suitable steel. If no longer suitable for re-use, scrap metal is collected in designated skips and sold for recycling.

Waste Tyres: Discarded earthmoving machinery tyres are used on site wherever possible for the protection of the base of concrete plinths and metal columns located in areas where heavy vehicles are operated. As there is no recycling process available for heavy earthmoving machinery tyres, surplus tyres are disposed of progressively in the open cut void and buried. Tyres are disposed of as deep in the void as possible, without being placed on the pit floor, to avoid the potential of re-surfacing. The void is then progressively backfilled with overburden and rehabilitated in the normal process.

General Waste: General waste is placed in 1.5m³ and 3m³ bins and collected by licensed waste contractor for disposal.

Waste Paper: During the reporting period recycling bins were installed for disposal of paper and cardboard. Waste paper and cardboard waste is placed in 1.5m³ and 3.0m³ bins and collected by licensed waste contractor for disposal.

Paint Waste: During the reporting period a recycling bin was installed for disposal of paint drums. Used paint drums are placed in a 1.5m³ bin and collected by licensed waste contractor for disposal.

2.7 Product Stockpiles

The ROM stockpile pad has a capacity of 150,000 tonnes and the clean coal stockpiles have a capacity of approximately 500,000 tonnes.

2.8 Water Management

The water management system has been designed with three primary goals and objectives:

- separation of clean water and mine water;
- safe storage and priority use of mine water on-site;
- management of water that is discharged so as to preserve the environmental values of Four Mile Creek and comply with the conditions of EPL 396.

In meeting these objectives, the following components of the system have been constructed or implemented.

Mine Water: Bloomfield has two major mine water storage facilities, Lake Kennerson and Lake Foster. Water pumped from the open cuts (S Cut and Creek Cut) reports via open drains to Lake Kennerson. Run off from disturbed areas (i.e. high wall, haul roads,

overburden dumps awaiting rehabilitation) which has the potential to carry suspended solids, is also directed to Lake Kennerson. Lake Kennerson dissipates velocity and allows the settlement of suspended solids.

Lake Kennerson has a valve controlled pipe which, when opened, feeds to Lake Foster. Lake Foster also receives decant water from the tailings storage facility (U Cut) and water from the stockpile dam, which collects the run off from the CHPP and coal stockpile pads. Mine water is pumped, primarily from Lake Foster, to the CHPP for use in coal processing and for dust suppression spraying on the coal stockpile pads.

Mine water is discharged, via lockable valve pipes, into an open drain that flows to Four Mile Creek. Discharges are undertaken in accordance with conditions of the Environmental Protection Licence (EPL 396). Water samples are collected during discharge for independent water quality analysis. A monitoring station located downstream in Four Mile Creek continuously measures electrical conductivity (EC) and water level. Monthly background sampling is conducted in Lake Kennerson, Lake Foster and various upstream and downstream watercourses (see Section 3.3 for details).

During the reporting period, fine coal rejects (tailings) was transferred for disposal to a disused open cut pit (U Cut). Water from the historic underground workings is used in dust suppression and coal processing. Water storage volumes are presented in Table 4.

Clean Water: Run off from undisturbed and rehabilitated areas is directed away from operational areas and mine water storages via diversion banks and channels. These banks and channels direct this run off into clean water dams or natural watercourses. The major clean water storage dam is Possums Puddle. No clean water is accessed for operational purposes and these dams overflow into natural drainage systems. Further isolation of smaller rehabilitated catchment areas from the mine water system will continue as rehabilitation work progresses.

The major natural creek running through the site is Four Mile Creek. Most of the operational mining areas at Bloomfield are located within the catchment of Four Mile Creek. A series of drains and levees direct Four Mile Creek around Lake Foster (mine water storage) and into Possums Puddle (clean water storage). From Possums Puddle clean water overflows back into Four Mile Creek.

Table 4: Stored Water

	Volumes held (cubic metres)		
	Start of Reporting Period	At end of Reporting Period	Storage Capacity
Clean Water	90ML	90ML	90ML
Dirty Water			
Lake Kennerson	120ML	130ML	190ML
Lake Foster	20ML	20ML	45ML
Tailings Dam	400ML	400ML	600ML
S Cut	NIL (operational pit)	NIL (operational pit)	NIL (operational pit)
Creek Cut	NIL (operational pit)	NIL (operational pit)	NIL (operational pit)
Controlled Discharge Water (EPL 396)		990 ML	
Contaminated Water	NIL	NIL	NIL

Waste water: Wastewater generated on site, consisting of domestic waste from bathhouses, administration offices and associated amenity areas, passes through a Cessnock City Council approved anaerobic waste water treatment system.

2.9 Hazardous Materials Management

Bloomfield held dangerous goods notification and a licence to store and handle explosives in accordance with WorkCover legislation for substances stored on site. The notification covers depots for explosives, distillate, gas cylinder stores, sodium hydroxide and MIBC reagent.

Explosives are stored in an explosive magazine located on site. The magazine complies with the relevant standards for storage of explosives. Bulk materials are also stored on site in a hopper for loading into a mobile mixing unit. This area is enclosed within concrete bunding and any spillage from this area is directed into a collection tank for periodic evacuation by a licensed contractor.

A bunded fuel farm, designed in accordance with AS1940, is used for bulk distillate storage at the open cut workshop. Spill protected racks are used for small volume oil and lubricant storage. Distillate, MIBC and sodium hydroxide used for coal processing in the CHPP are stored in tanks contained in bunded enclosures.

ChemAlert is an online Material Safety Data Sheet (MSDS) database service and is used to provide up to date MSDS information. If new chemicals are introduced to site they must comply with system requirements and be approved by the Mine Manager.

No hazardous materials-related environmental incidents were reported during the reporting period.

2.10 Other Infrastructure Management

Silt traps along the edges of haul roads and hard stand areas are cleaned at regular intervals. They have been designed to capture surface run off during rain events and allow sediment to settle. All silt traps, dams, drains, bunds, lines, valves and other infrastructure used to manage runoff are inspected on a quarterly basis as part of the site Environmental Management System (EMS). Issues identified during the inspections are reported and appropriate actions taken to address these matters.

3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

3.1 Meteorological Monitoring

Bloomfield Colliery has installed a continuously operating meteorological station in accordance with Development Consent requirements for the operation of the mine. The weather station has real-time capabilities for all personnel to access via computer or phone. The station records the following environmental parameters:

- wind speed;
- wind direction;
- temperature;
- relative humidity;
- rainfall
- solar radiation; and
- evaporation.

A comparison of monthly recorded rainfall for the 2014 reporting period and annual average data is shown in Figure 1. The total rainfall for the twelve month period was 844 mm. This was 48mm below the annual average of 892 mm.

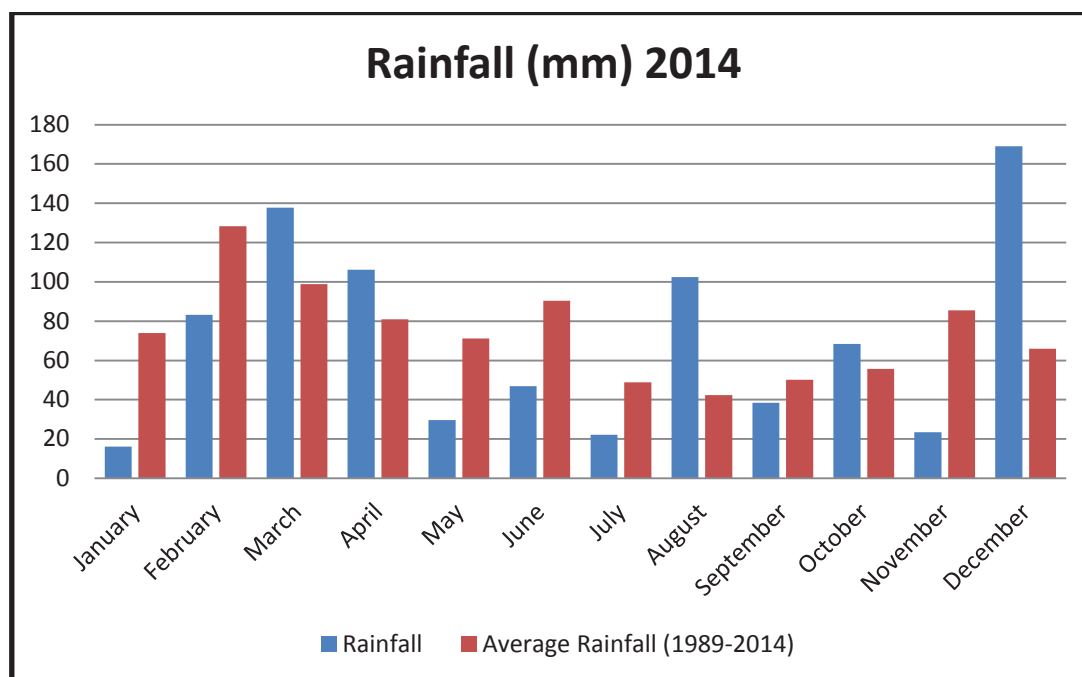


Figure 1: Rainfall

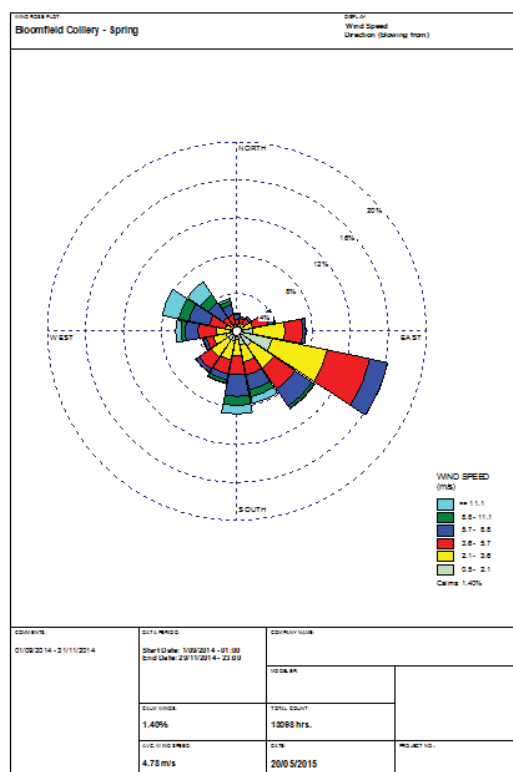
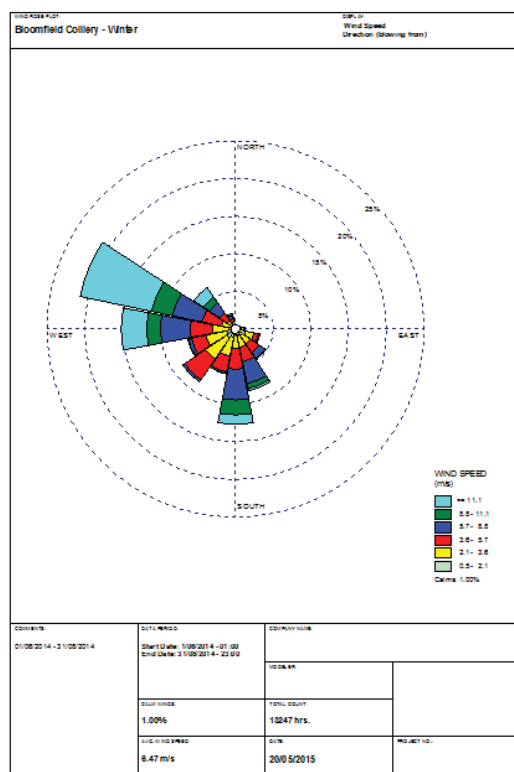
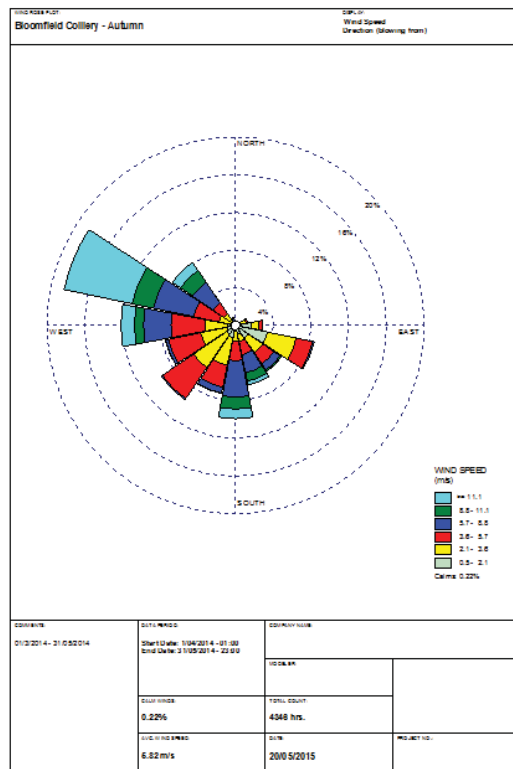
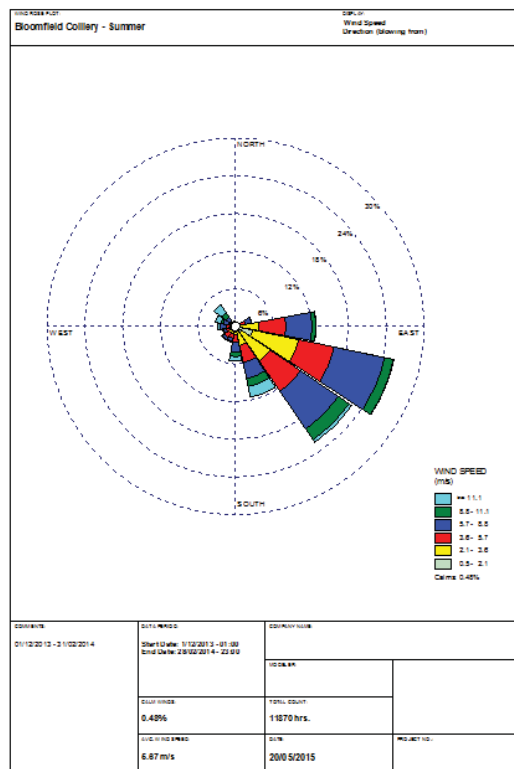
A summary of the rainfall data for the past 26 years is presented in Table 5.

Table 5: Monthly Rainfall Records

Period	Average Monthly Rainfall (mm)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
1989	177	62	168	133	95	208	52	6	15	33	48	43	1038
1990	42	448	80	190	80	58	71	135	73	57	6	39	1278
1991	83	14	4	12	90	104	39	9	6	30	37	167	593
1992	64	235	91	86	23	72	12	22	20	25	87	175	911
1993	125	53	65	16	29	81	109	64	36	31	72	33	713
1994	30	102	89	76	53	36	4	11	0	36	64	13	514
1995	162	48	171	0	129	51	1	0	78	37	184	80	942
1996	70	71	28	7	106	74	50	59	48	24	59	30	625
1997	105	101	63	0	85	78	65	28	50	34	25	56	688
1998	89	81	3	45	203	90	84	155	73	63	108	121	1114
1999	66	74	64	129	8	122	156	47	64	173	36	58	997
2000	95	34	281	149	44	12	51	36	31	58	93	28	912
2001	44	163	174	113	156	7	44	21	21	30	124	46	941
2002	54	235	172	48	55	28	31	26	25	10	43	129	856
2003	1	93	53	72	133	13	42	42	0	112	102	39	701
2004	76	163	72	45	18	10	27	44	64	154	59	38	769
2005	64	135	153	27	112	67	10	1	40	81	72	14	775
2006	38	66	39	23	11	62	50	58	194	21	53	24	635
2007	24	101	103	87	66	377	20	75	28	32	144	94	1150
2008	139	173	46	240	4	131	33	32	195	65	70	59	1184
2009	6	340	107	129	83	66	33	2	31	60	40	48	943
2010	78	35	75	28	75	118	62	43	27	66	151	70	826
2011	32	41	73	125	100	162	127	54	109	100	179	81	1182
2012	65	205	137	122	7	179	57	20	19	6	58	40	915
2013	180	184	121	101	59	99	18	11	22	43	288	22	1147
2014	16	83	138	106	30	47	22	102	38	68	23	169	844
Average	74	128	99	81	71	90	49	42	50	56	86	66	892

The results of wind speed and direction monitoring shows a pattern typical in the Hunter Valley. During summer the winds predominate from the south east and winter the west-northwest. Autumn and spring are transitional seasons with winds distributed between both northwest and south-easterly directions. Figure 2 shows the seasonal windroses generated for the site on a seasonal basis.

Figure 2: Windroses for Bloomfield 2014



3.2 Air Pollution

3.2.1 Environmental Management

Dust can be generated by the operation of mobile plant on unsealed surfaces, loading and handling of coal and overburden in dry and windy conditions, or by blasting.

Operational procedures are in place to minimise dust impacts on the surrounding environment and community. Vehicular generated dust is controlled through the use of water carts on all internal roads and high traffic areas. The company provides a fleet of three water trucks to allow for greater coverage and flexibility in dry and/or windy conditions.

Sprinkler systems operate 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. Operational practices such as not dumping to exposed locations, minimizing the drop height into trucks during loading are also employed.

The use of a predictive meteorological modeling software program is utilised to assist in planning mine operations. The software incorporates regional weather station data to predict daily weather events that may exacerbate dust impacts from operations.

A dust monitoring program is in place with 10 dust deposition gauges and 2 High Volume Air Samplers (HVOL) located on and around the mine lease area. The locations are listed in Table 6 and are shown in Plan 1. Samples are collected by independent environmental consultants and analysed by a NATA registered laboratory.

Table 6: Dust Monitoring Sites

Site	Location
On Lease	
D1	Adjacent to Buttai Reservoir
D2	Adjacent to Main Haul Road
D3	Communications Tower
D4	Adjacent John Renshaw Drive
D9	Shamrock Lane
Off Lease	
D5	Bali Close Ashtonfield
D6	Off Four Mile Creek Road
D7	Off New England Highway Avalon Estate
D8	Adjacent of Main North Rail line at Rail Loop
D10	Private property adjacent to John Renshaw Drive
HVOLs	Private property adjacent to John Renshaw Drive

3.2.2 Environmental Performance

Dust Deposition

Table 7 summarises the monthly deposition rates for insoluble solids during the reporting period and includes long-term averages for the site and the EPA guideline of 4 g/m²/month.

Table 7: Annual Average Dust Deposition for Reporting Period

Insoluble Solids (g/m ² /month)										
Site	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Jan-14	1.5	1.4	2.0	2.6	1.5	1.4	1.9	1.8	0.8	2.4
Feb-14	0.9	1.5	1.6	2.2	1.0	5.4	2.4	2.4	0.9	1.3
Mar-14	0.7	1.4	1.8	2.1	0.4	3.2	1.7	1.2	0.9	1.3
Apr-14	1.7	1.3	1.0	0.9	0.9	1.2	0.8	1.0	0.7	0.9
May-14	1.8	1.5	1.4	2.3	2.2	7.7	1.5	1.3	1.1	1.4
Jun-14	1.1	0.9	1.0	0.6	0.6	0.9	0.7	1.3	1.1	1.2
Jul-14	1.1	1.7	1.4	1.6	2.3	2.7	1.9	1.3	1.3	2.2
Aug-14	1.3	1.1	1.3	1.3	1.0	1.0	0.5	0.9	0.5	2.0
Sep-14	1.4	0.7	1.7	0.5	1.1	0.8	0.7	0.7	1.4	0.5
Oct-14	1.8	2.1	2.2	1.0	2.2	1.7	1.6	3.0	1.2	2.1
Nov-14	1.0	1.5	1.9	1.9	1.7	1.5	6.0c	2.7	1.7	4.5c
Dec-14	0.5	1.4	1.4	1.4	2.7	1.9	1.3	2.4	2.1	1.5
Annual Averages										
1997-1998	1.2	1.8	1.8	1.5	1.1	1.9	1.6	1.5	1.8	1.7
1998-1999	1.5	2.1	1.8	1.6	1.3	2.4	1.6	1.1	1.8	0.9
1999-2000	1.8	2.6	1.8	1.1	1.5	1.9	2.0	1.3		
2000-2001	1.2	1.6	1.3	1.4	1.2	3.1	1.8	1.1		
2001-2002	1.1	1.8	1.4	6.6	1.3	2.0	2.4	1.3	1.4	1.7
2002-2003	1.7	2.0	1.2	4.3	1.9	2.3	1.9	1.8	1.4	2.2
2003-2004	2.4	1.6	0.8	6.5	1.2	1.5	1.4	1.3	1.0	1.0
2004-2005	1.6	1.5	1.1	3.2	1.1	2.2	1.4	1.4	0.9	1.1
2005-2006	3.4	1.9	1.2	3.1	1.0	1.4	1.5	1.4	1.2	1.9
2006-2007	2.8	2.2	1.5	3.9	3.0	1.7	1.8	1.7	1.2	1.8
2007-2008	2.7	1.9	1.6	5.2	2.1	2.0	1.9	2.2	1.2	2.3
2008-2009	1.8	1.9	3.3	6.0	1.3	1.7	2.0	1.9	1.5	2.9
2009-2010	1.8	2.4	3.2	3.1	1.4	1.6	2.3	1.8	1.5	2.8
2010-2011	1.1	1.6	1.8	1.6	0.9	2.4	1.4	1.4	1.1	2.1
2011-2012	1.6	1.5	1.3	3.4	1.5	3.8	1.2	3.2	1.0	1.9
2012	1.5	1.7	1.9	3.1	1.4	3.4	1.8	1.6	1.1	2.2
2013	1.7	1.6	2.5	1.3	1.5	2.5	1.7	1.7	1.3	1.5
2014	1.2	1.4	1.6	1.5	1.5	2.5	1.4	1.7	1.1	1.5
Overall	1.7	1.8	1.7	3.0	1.4	2.2	1.7	1.6	1.2	1.9
EPA Licence Limit	4									

Notes: * - Overall annual average since 1997.

C - "Denotes highest result contaminated with insects, vegetation or bird droppings and considered non standard

All dust deposition gauges recorded annual averages below the 4g/m²/month limit for 2014. The long term average annual dust deposition rates are all within the nominated criteria.

Results are graphically provided in Appendix A. Figure A1 in Appendix A shows yearly results since PA 07_0087 approval. The results show a slight trend downwards. Sites D2 and D3 are located adjacent to operational areas well within lease boundaries. Results from these sites indicate the level of dust generated by mining operations and are unlikely to impact off site. Site D4 was located adjacent to operational areas and was repositioned in December 2012 to the southern mining lease boundary, adjacent to John Renshaw Drive.

PM10 and TSP

Table 8 summarises the PM10 and TSP monitoring results during the reporting period and detailed results are provided in Table A1 in Appendix A. All PM10 results recorded 24-hour averages below the 50 ug/m³ limit for 2014. The highest result recorded was 36 ug/m³. The annual average PM10 result recorded was below the 30 ug/m³ limit for 2014. The average annual PM10 level was 15 ug/m³. The annual average TSP result recorded was below the 90 ug/m³ limit for 2014. The average annual TSP level was 31 ug/m³.

Table 8: PM10 and TSP Results Summary 2014

	PM10 24hr (ug/m ³)	TSP (ug/m ³)
Maximum 24hr Average result 2014	36	-
EPA Licence Limit PM10 24hr Average	50	-
Annual Average 2014	15	31
EPA Licence Limit Annual Average	30	90

Figures A2 and A3 in Appendix A shows yearly results of PM10 and TSP dust levels. The results show seasonal trends as well as rolling averages. In general higher results occur in the summer months and lower results occur in the winter months. All results are within EPA criteria.

Dust Predictions

Dust modelling predictions conducted as part of the Environmental Assessment (PA 07_0087) are shown in Table 9. Monitoring during the reporting period indicates that dust results are close to predicted levels. As shown in Plan 1, the nearest modelled resident to the monitoring locations is Resident N. The dust monitoring locations are actually situated closer the mine site than Resident N and as expected the dust results a slightly higher.

Table 9: Dust Predictions

Resident ID: N	EA Predictions	2014 Actual
Dust Deposition D10 (g/m ² /month)	0.7	1.5
PM10 (ug/m ³)	13.8	15
TSP (ug/m ³)	29.7	31

3.2.3 Reportable Incidents

No reportable incidents relating to air pollution occurred within the reporting period.

3.2.4 Further Improvements

The air quality monitoring program will be continued in accordance with Air Quality Monitoring Plan requirements.

3.3 Erosion and Sediment

3.3.1 Environmental Management

Erosion and sedimentation control is an integral part of the site's water management system. The design of rehabilitated areas incorporates water management structures to effectively shed run-off water, whilst minimising erosion and sediment load. Progressive rehabilitation of disturbed areas as soon as is practicable also reduces the potential for erosion and downstream sedimentation.

There are a number of sediment basins around the site that are positioned to intercept run-off from other disturbed areas on-site, such as along haul roads, stockpile pads, infrastructure areas, and recently rehabilitated areas. These structures are inspected as part of the site EMS and cleaned as necessary.

Site drains used to transport mine water, or natural catchment flow, are inspected for erosion or damage as part of the site EMS, and remedial maintenance works conducted as necessary.

3.3.2 Environmental Performance

No major erosion or problems with erosion and sediment control were observed during the reporting period. Rehabilitated areas are regularly inspected in addition to quarterly inspections of erosion and sediment controls across the site.

3.3.3 Environmental Incidents

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

3.3.4 Further Improvements

An erosion and sediment control plan has been prepared in accordance with the conditions of the Project Approval. As mining and rehabilitation progresses the recommendations will be followed including ongoing quarterly inspections of erosion and sediment control structures.

3.4 Surface Water

3.4.1 Environmental Management

Bloomfield Colliery has prepared and submitted a Water Management Plan (WMP) in accordance with Development Consent requirements for the operation of the mine. The Plans prescribe the process water source and supply requirements, site-water balance, storage, impact management and monitoring of surface water in the vicinity of the mining operations.

Bloomfield has several sources of surface water (mine water) that require management to avoid pollution, or a non-compliance with the site EPL.

In addition to the physical, or infrastructure, components of the mine water management system (as detailed in Section 2.8), the two major management controls for surface water pollution are *water quality monitoring* and *licensed mine water discharge*.

Water Quality Monitoring

The water monitoring program at Bloomfield consists of discharge sampling, which is under *licensed mine water discharge*, and background monitoring. The background monitoring sites are centred on Four Mile Creek and its tributaries and Wallis Creek tributaries to the west of the mining lease. Plan 2 shows the location of the monitoring sites and Table 10 lists the monitoring sites.

Table 10: Background Water Sample Locations

Creek	ID	Location
Four Mile Creek	W10	John Renshaw Drive
	W6	Upstream from Lake Foster
	W7	Possums Puddle
	W4	Possums Puddle Overflow
	W3	Elwells Creek & Four Mile Creek junction
	W12	Shamrocks Creek & Four Mile Creek junction
	W11	New England Highway
Four Mile Creek tributary	W2	Shamrock Creek
	W5	Elwells Creek
Wallis Creek tributary	W1	Adjacent old Rathluba Colliery
	W13	Buttai Creek
On-site water storage	W8	Lake Foster
	W9	Lake Kennerson

Table 11 outlines the background surface water analysis program undertaken at Bloomfield Colliery.

Table 11: Background Water Analysis

Analyte	Monthly	Quarterly	6 Monthly
pH	✓	✓	✓
Electrical Conductivity	✓	✓	✓
Dissolved Oxygen	✓	✓	✓
Turbidity	✓	✓	✓
Total Suspended Solids		✓	✓
Total Dissolved Solids		✓	✓
Filterable Iron		✓	✓
Chloride			✓
Sulphate			✓
Alkalinity			✓
Calcium			✓
Magnesium			✓
Sodium			✓
Potassium			✓

These results are reviewed and, if required, remedial action or further investigation initiated to identify the cause of anomalies.

Mine Water Discharge

Mine water is discharged in accordance with conditions P1, L2 and L3 of EPL 396. These conditions allow discharge of 40ML of mine water per day, within water quality limits, dependent on rainfall. Representative samples are collected at the discharge point and at the Four Mile Creek monitoring station during each day of discharge. Samples are tested on site to ensure discharge water is within the allowed water quality limits, before being dispatched to an independent NATA accredited laboratory for analysis. Discharge samples are tested for:

- pH;
- EC;
- Total Suspended Solids (TSS);
- Total Dissolved Solids (TDS); and
- Filterable Iron (for discharge point samples).

A permanent monitoring station is located on Four Mile Creek, approximately 500m upstream of the New England Highway. It records EC and water level (via pressure sensor and V-notch weir) every 15 minutes and logs the results every hour.

Other Management

All infrastructure (i.e. drains, dams, spillways, discharge pipes and valves) used for the separation of clean water and mine water, or the discharge of mine water, are inspected as part of the site EMS, with a documented quarterly check sheet being completed.

3.4.2 Environmental Performance

Background Monitoring Results

The background surface water monitoring results for the reporting period are shown in Figures 3 to 7 below. Figures 3 to 7 provide a graphical presentation of EC and pH which are the main surface water parameters, with the full data set provided in Appendix B.

Figure 3 and 4 shows EC and pH results for the Four Mile Creek sites. Figure 3 shows salinity levels are slightly elevated in the lower end the catchment. Four Mile Creek is ephemeral and the EC level varies due to rainfall and mine discharge. The higher salinity results along Four Mile Creek (Elwells Creek and Shamrock Creek junctions and New England Hwy) reflect concentration of solutes in ponds during low flow periods and from licensed discharges in addition to offsite sources such historic underground workings.

As outlined later, there were 19 licensed discharges throughout the reporting period. The monthly sample collected in July coincided with a licensed discharge event. EC levels vary due to rainfall and mine discharge therefore monthly and yearly trends cannot be assessed.

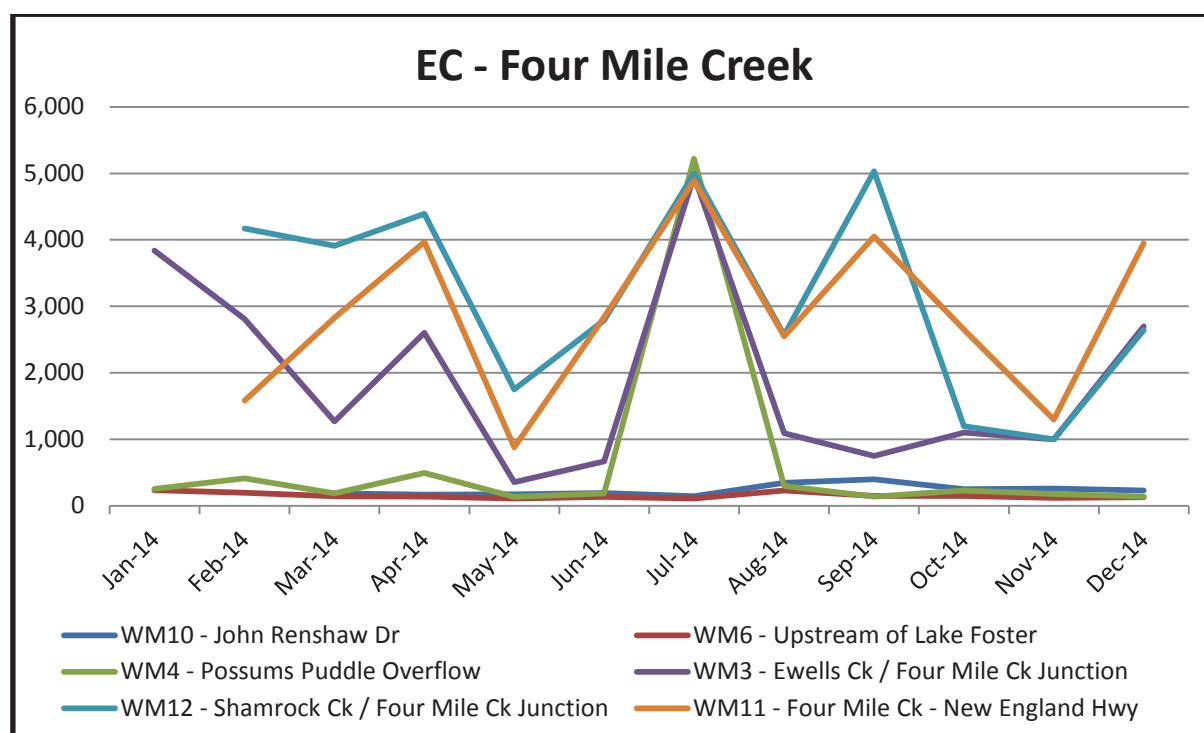


Figure 3: Four Mile Creek Catchment Electrical Conductivity

Figure 4 shows the pH levels in Four Mile Creek are generally consistent with ANZECC water quality guidelines (pH 6.5-8.5). pH levels vary due to rainfall and mine discharge therefore monthly and yearly trends cannot be assessed.

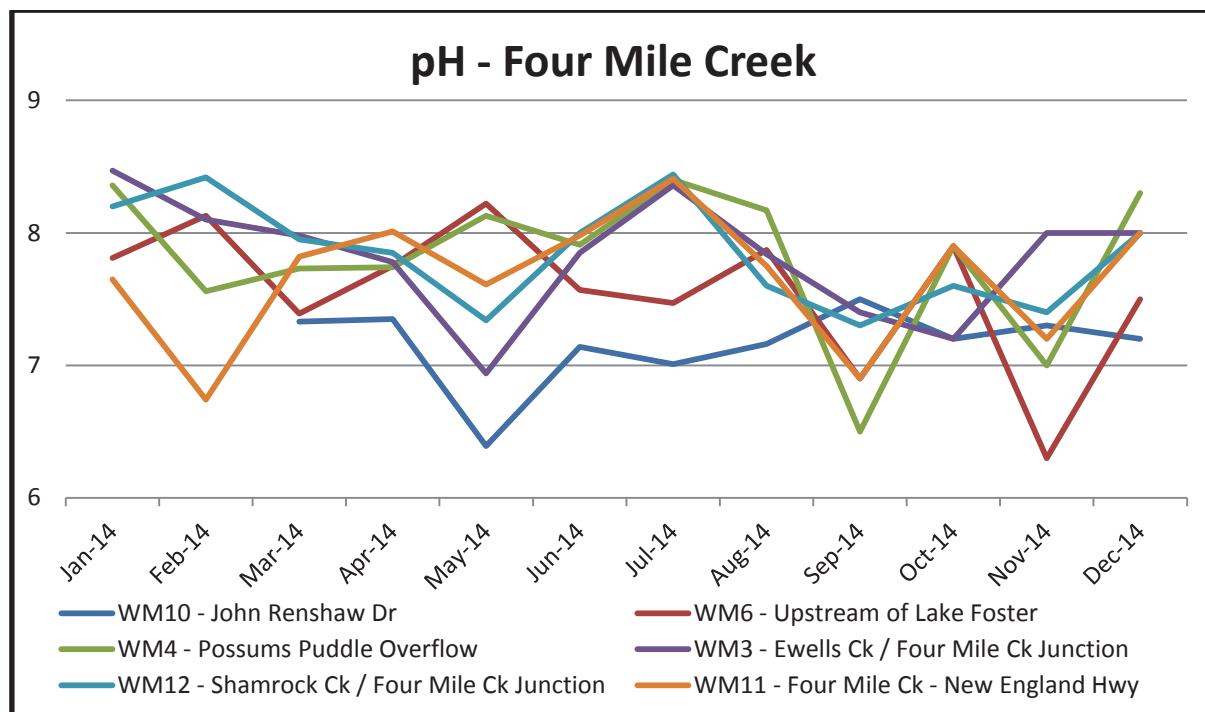


Figure 4: pH of Four Mile Creek

Figure 5 shows EC and pH results for water storage dams. Water quality within the mine water storage dams (Lake Kennerson and Lake Foster) varies throughout the year depending on rainfall capture in the open cut pits, CHPP water usage and frequency of licensed discharge events, which are also rainfall dependent. The freshwater dam (Possums Puddle) remains fairly constant throughout the year as it is separate from mining influences.

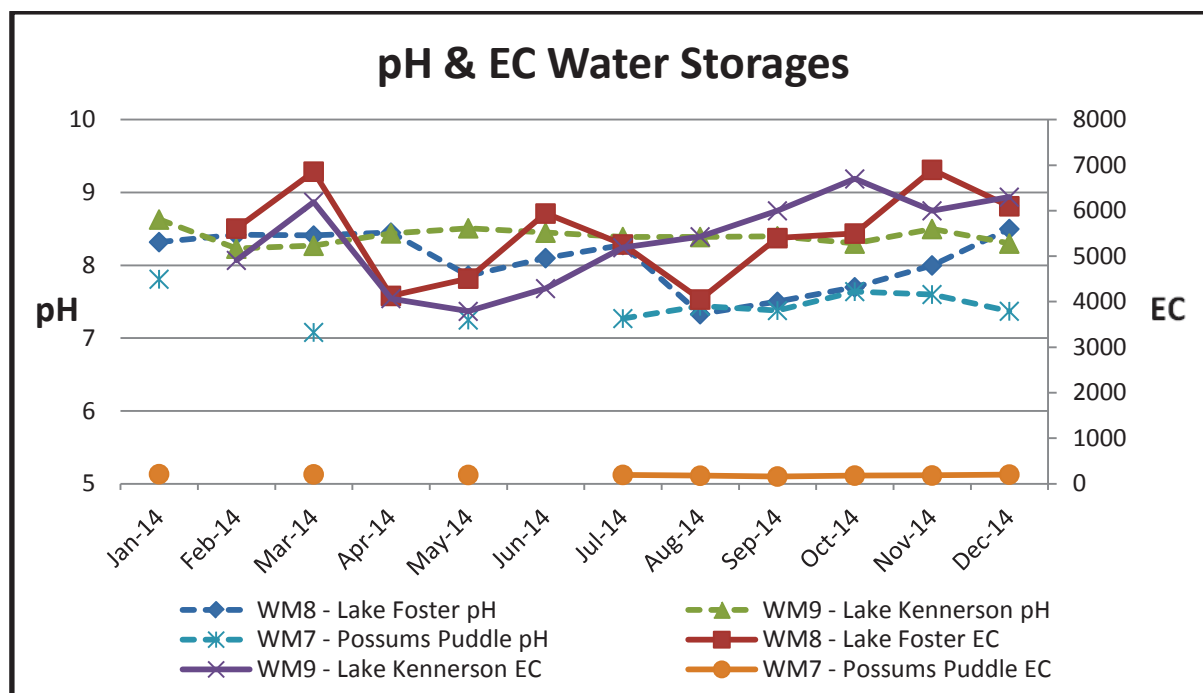


Figure 5: pH & EC in Site Water Storages

Figure 6 shows the pH and salinity levels in Four Mile Creek tributaries are generally consistent with ANZECC water quality guidelines (pH 6.5-8.5 & EC 125-2200). These tributaries are ephemeral streams and are often dry. This results in gaps in the graphed data.

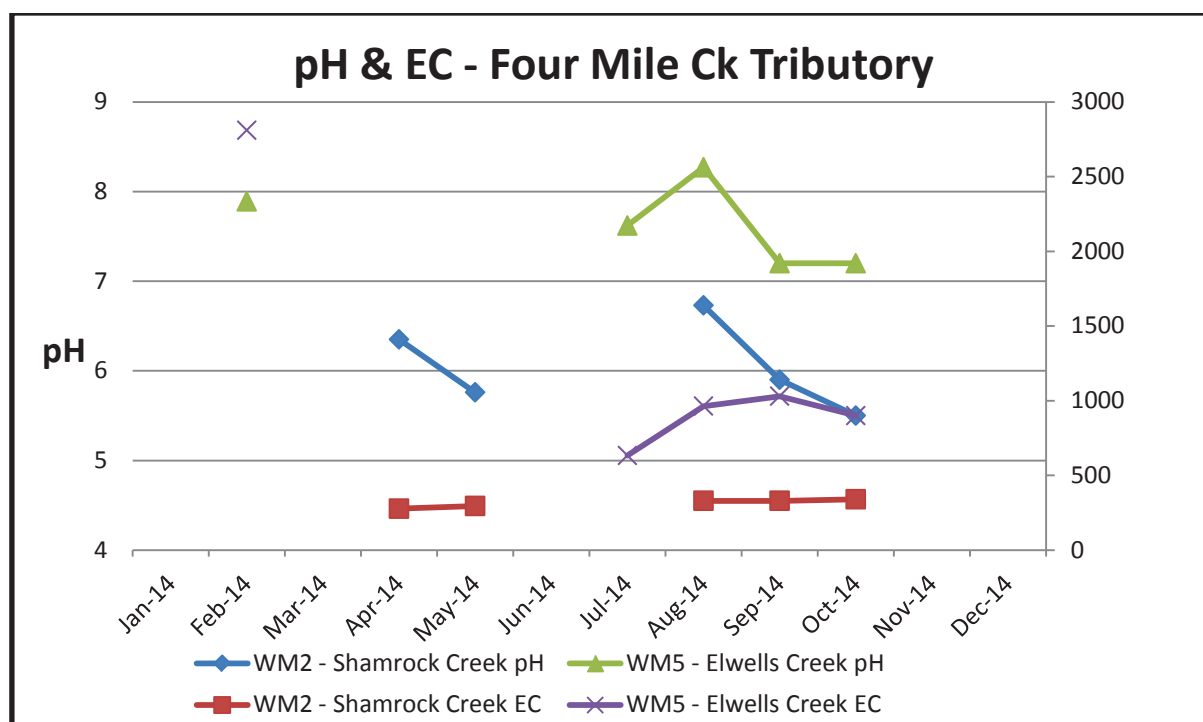


Figure 6: pH & EC in Four Mile Ck Tributary

Figure 7 shows the pH and salinity levels in Wallis Creek tributaries are generally consistent with ANZECC water quality guidelines (pH 6.5-8.5 & EC 125-2200).

Previous results indicate that the surface flow adjacent to Rathluba has historically been of low pH, regardless of mining impacts. Prior to 2006 pH results were less than 4 however pH levels have been steadily increasing since then. This drainage line carries surface flow from non-mining land and rehabilitated mining land, indicating that other off-site effects may be influencing the water quality in the area. The drainage line is ephemeral and is usually dry resulting in gaps in the graphed data.

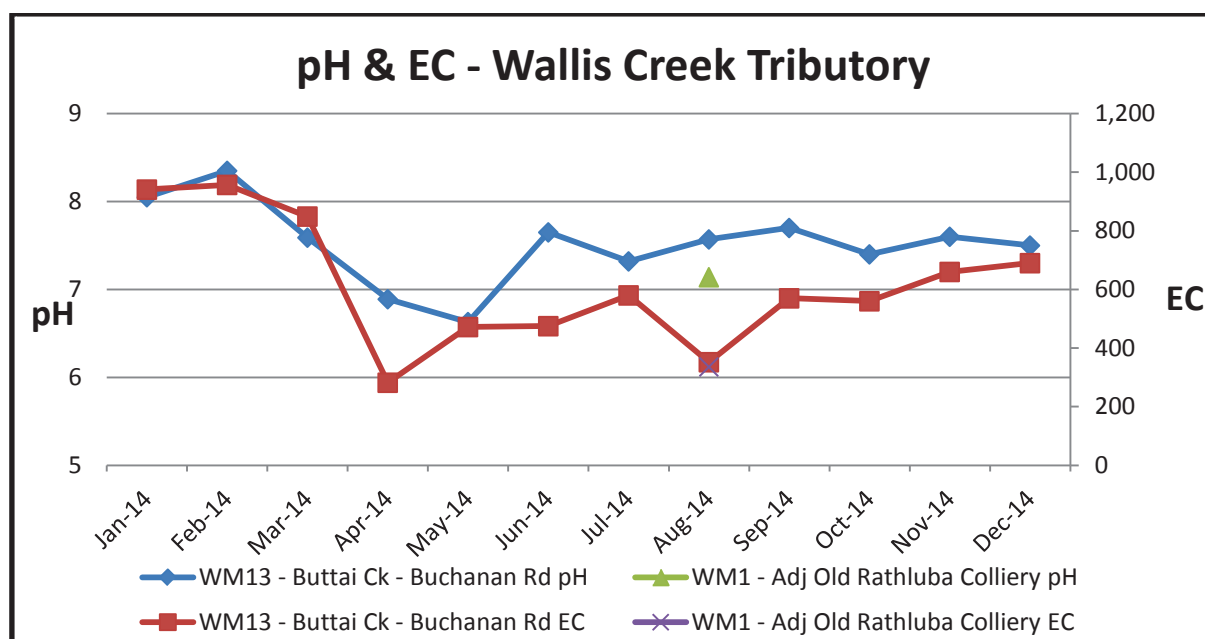


Figure 7: pH & EC in Wallis Ck Tributary

The WMP proposed water quality trigger values for Buttai Creek (WM13) and Elwells Creek (WM5). Table 12 summarises the results, with the full data set provided in Appendix B. Results were within either WMP or ANZECC 2000 trigger values with the exception of TSS at WM5 which was due to a 40mm rainfall event on the day of sampling and TSS at WM13 which may be influenced by stock upstream of the sampling point.

Table 12: Trigger Values

Sampling Site	pH	EC	TSS
WM5 – Elwells Creek	7.2 to 8.3	633 to 2810	9 to 160
WMP Trigger Level	5.2 - 8.0	430 - 4000	4 - 85
WM13 – Buttai Creek	6.6 to 8.4	282 to 957	5 to 60
WMP Trigger Level	6.4 – 7.8	380 - 1100	5 - 45
ANZECC 2000 Trigger Level	6.5 - 8.5	125 - 2200	50*

* Standard Industry Criterion

Discharge Monitoring Results

There were 19 licensed discharges conducted during the reporting period, with a total discharge volume of 990 ML. Table 13 shows the average, maximum and minimum water quality results at the discharge point, compared to EPA discharge water quality thresholds. Detailed daily discharge results are provided in Table B1 in Appendix B.

Table 13: Discharge Sampling Analytical Results

DATE	pH	TOTAL SUSPENDED SOLIDS (mg/L)	TOTAL DISSOLVED SOLIDS (mg/L)	CONDUCTIVITY (uS/cm)	IRON (mg/L)	DISCHARGE VOLUME (ML/day)
EPA Limits	6.5-8.5	30	-	6,000	1	40
Average	8.2	9	3,997	5,387	<0.05	28
Maximum	8.5	24	4,640	5,970	<0.05	40
Minimum	7.8	1	2,550	3,860	<0.05	5

3.4.3 Environmental Incidents

There was a reportable surface water incident during 2014. In May 2014 a leak in the recycle water pipeline from the tailings dam occurred resulting in potential loss of water off site into Four Mile Creek. The incident was reported to the EPA in accordance with EPL 396 conditions and is provided in Appendix B. No action taken by the EPA as at the end of the reporting period.

There were no other reportable surface water incidents during the reporting period.

3.4.4 Further Improvements

The surface water monitoring program will be continued in accordance with WMP requirements.

3.5 Ground Water**3.5.1 Environmental Management**

Bloomfield Colliery has prepared and submitted a Water Management Plan (WMP) in accordance with Development Consent requirements for the operation of the mine. The Plans prescribe the process water source and supply requirements, site-water balance,

storage, impact management and monitoring of groundwater in the vicinity of the mining operations.

Table 14 outlines the groundwater monitoring program undertaken at Bloomfield Colliery.

Table 14: Groundwater Monitoring Program

Analyte	Quarterly	6 Monthly	Annual
Water Levels	✓	✓	✓
pH		✓	✓
Electrical Conductivity		✓	✓
Total Dissolved Solids		✓	✓
Filterable Iron			✓
Chloride			✓
Sulphate			✓
Alkalinity			✓
Calcium			✓
Magnesium			✓
Sodium			✓
Potassium			✓

3.5.2 Environmental Performance

Monitoring was undertaken during the period and the results for 2014 and previous years are summarised in Figures 8 – 10, with the full data set provided in Appendix C. The results are fairly consistent and do not show any real trends. Bore PD7.1 shows variation in EC levels. The S Cut high wall has moved west and is now within a few metres of Bore PD7.1. This may have some bearing on EC levels.

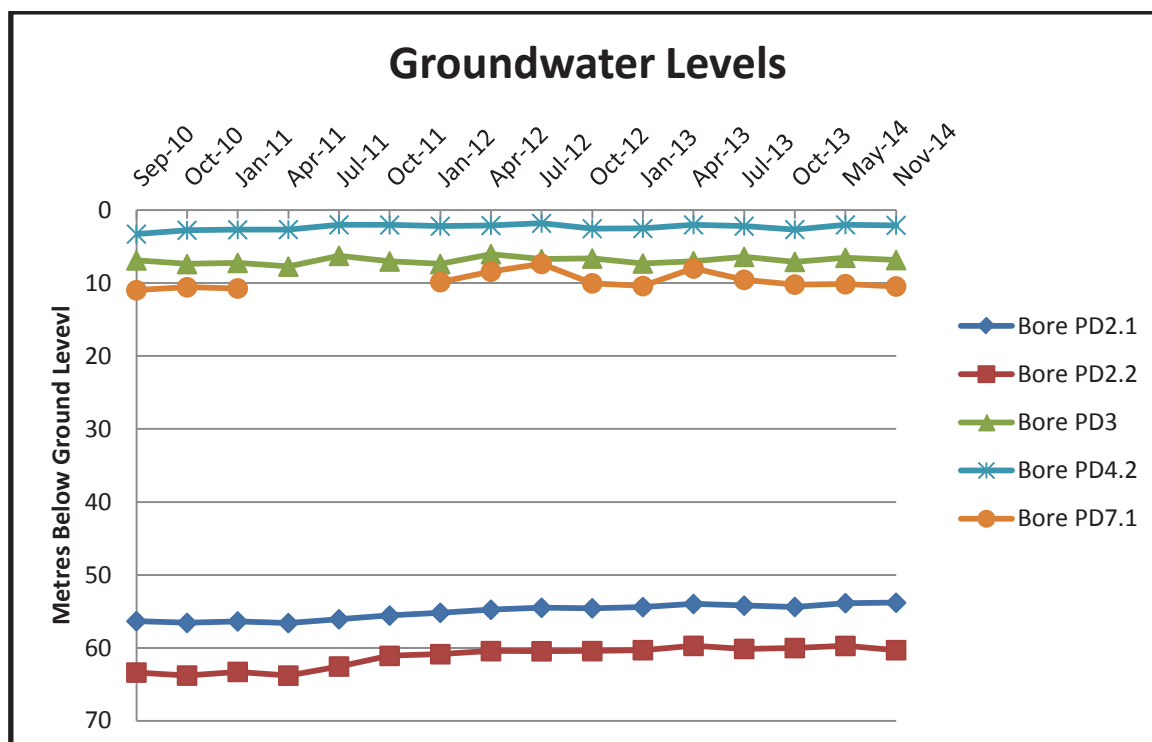


Figure 8: Groundwater Levels

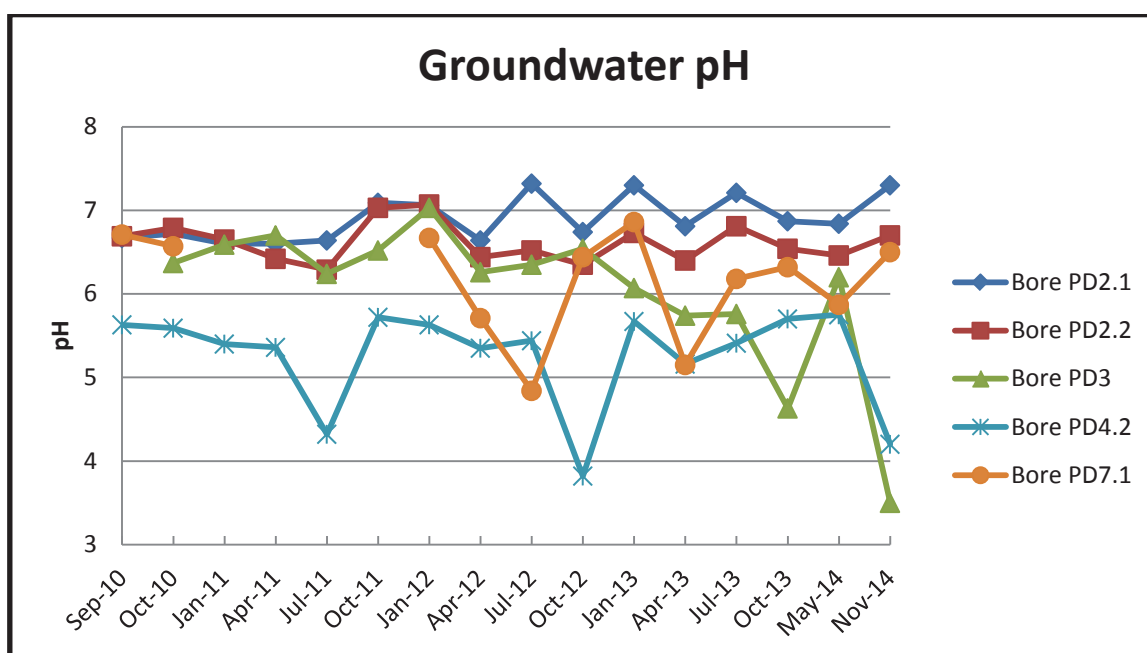


Figure 9: Groundwater pH

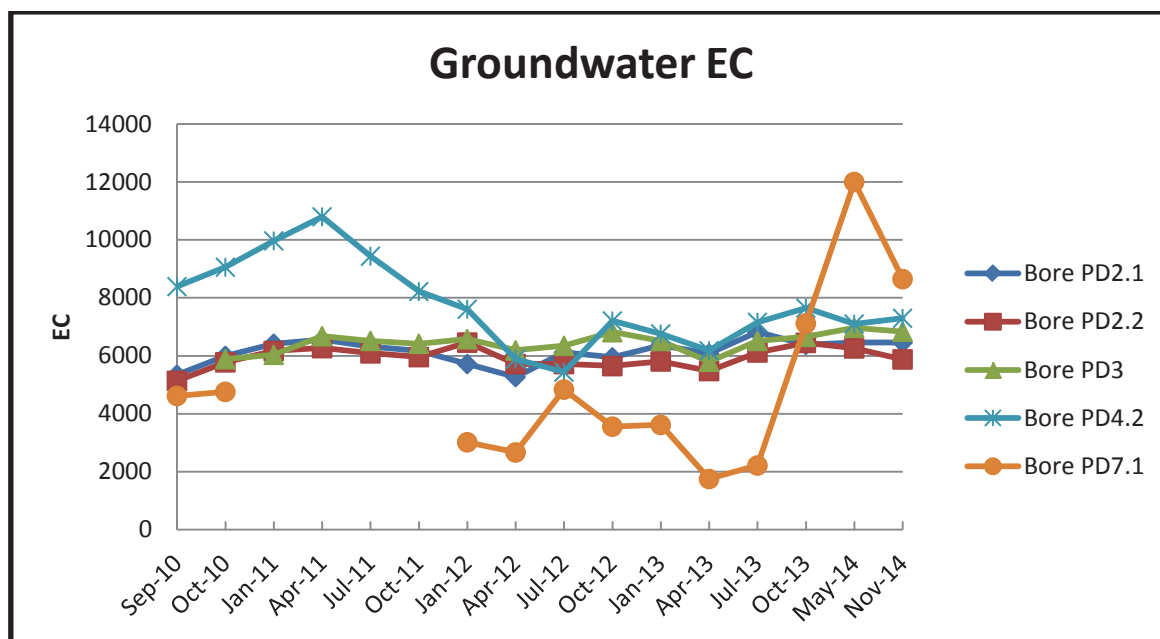


Figure 10: Groundwater EC

3.5.3 Environmental Incidents

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

3.5.4 Further Improvements

The groundwater monitoring program will be continued in accordance with WMP requirements. As more groundwater data is collected any long-term trends may be identified.

3.6 Contaminated Land

3.6.1 Environmental Management

No contaminated or polluted land has been identified at Bloomfield. No significant hydrocarbon or chemical spills occurred within the Lease 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 polluting incidents were reported during these inspections.

3.6.3 Reportable Incidents

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

3.6.4 Further Improvements

As no areas of land contamination have been identified, no improvements to the current management system are planned. Quarterly inspections will be maintained.

3.7 Threatened Flora and Fauna

3.7.1 Environmental Management

The Environmental Assessment included an assessment of the potential impacts associated with the clearance vegetation. Any clearing of vegetation within the project area must be undertaken in accordance with the requirements of the Project Approval.

3.7.2 Environmental Performance

No vegetation was cleared for Bloomfield mining or coal washing operations during the reporting period. Biodiversity enhancement has also been considered during the planning and implementation of land rehabilitation.

A Biodiversity Offset Area has been established to compensate for future land clearance at the mine. The land was purchased by Bloomfield in December 2011 and consists of 40 Ha of remnant vegetation adjacent to the Watagan State Forest. The western boundary abuts a part of Watagan State Forest on the eastern side of the Corrabare Range. A Biodiversity Offset Management Plan was submitted to DP&I for approval in November 2011. Bloomfield is waiting on approval of the Plan before undertaking conservation works on the site.

3.7.3 Reportable Incidents

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

3.7.4 Further Improvements

Further details on progress of the implementation measures of the Biodiversity Offset Area will be provided in the next AEMR.

3.8 Weeds & Pests

3.8.1 Environmental Management

A Weed Management Plan has been developed to provide a plan for weed management at Bloomfield Colliery. The purpose of the Weed Management Plan is to conduct regular

surveys to identify weed species requiring control, identify and map weed infestation locations, and implement a weed control priority action plan to control weeds. Bloomfield undertakes regular inspections and has a treatment program to control weeds across the site. A contract weed-sprayer is employed in addition to mechanical support from mine plant such as dozers and backhoes when required. Over the reporting period priority was given to the control of pampas grass, blackberry and mother-of-millions. Lantana was also targeted during the reporting period.

Periodic feral animal control programs are undertaken in conjunction with neighboring mines. Activities include feral dog baiting programs. These programs are conducted on an as need basis.

3.8.2 Environmental Performance

Approximately \$99,000 was spent across the site on weed control during the reporting period. This consisted of a combination of spraying and slashing. Weed control works included rehabilitation areas and remnant vegetation within CCL 761 as well as land outside the mining lease under the control of Bloomfield. No Class 1 or Class 2 declared weeds were identified onsite.

The following weed species were identified and treated during the reporting period included:

Table 15: Weed Priority Level

Common Name	Scientific Name	Priority Level
African Daisy	<i>Senecio pterophorus</i>	Medium
Blackberry	<i>Rubus fruticosus</i>	Medium
Castor Oil	<i>Ricinus communis</i>	Low
Crofton Weed	<i>Ageratina adenophora</i>	Low
Farmers Friend	<i>Bidens pilosa</i>	Low
Giant Parramatta Grass	<i>Sporobolus fertilis</i>	Low
Lantana	<i>Lantana camara</i>	High
Mother of Millions	<i>Bryophyllum delagoense</i>	Low
Pampas Grass	<i>Cortaderia selloana</i>	High
Morning Glory	<i>Ipomoea indica</i>	Low
Tobacco Bush	<i>Solanum mauritianum</i>	Low

3.8.3 Reportable Incidents

No reportable incidents relating to weed management occurred during the reporting period.

3.8.4 Further Improvements

The weed management budget for the upcoming reporting period will be maintained at a similar level to previous years. The control of pampass grass and African daisy remains the priority for the next reporting period in addition to the ongoing management of Lantana.

A wild dog and fox baiting program will be undertaken in 2015 in conjunction with neighbouring mines and the Livestock Health and Pest Authority.

3.9 Blasting

3.9.1 Environmental Management

A blast monitoring plan has been prepared in accordance with the conditions of the Project Approval. It is expected that the blast monitoring plan will be endorsed by the Director General during the next reporting period. Blasting activities are licensed under EPL 396. The EPL stipulates monitoring requirements, restricts blasting hours, as well as limiting airblast overpressure and ground vibration impacts at the nearest residences.

Blasting techniques have been developed in conjunction with ORICA, utilising the “nonel” initiation system and implemented to achieve maximum fragmentation and maintain levels ground vibration and overpressure levels within the approved criteria for the site.

Each blast is monitored at four nearby residences for ground vibration and overpressure. Monitors are located at residences to the south, south-east, west and north-west of current open cut operations. The location of the blast monitors is shown on Plan 1.

Also the use of a predictive meteorological modeling software program is utilised to assist in planning blast operations. The software incorporates regional weather station data to predict daily weather events that may exacerbate overpressure impacts from blasting operations.

3.9.2 Environmental Performance

All blast results for the reporting period are included in Appendix D and are summarised in Table 16 and Table 17.

During the reporting period a total of 87 blasts were initiated on the site. One blast (1.1% of total shots) exceeded 115 dB blast overpressure. No blasts exceeded 120 dB blast overpressure limits. Four blasts (4.6% of total shots) exceeded 5mm/sec ground vibration. No blasts exceeded 10 mm/sec ground vibration limits. .

Table 16: Blast Monitoring Summary

Blasting Criteria Limits	Allowable Exceedance¹	Results 2014
Airblast Overpressure Level dB (Lin Peak)		
115	5 %	1.1 %
120	0 %	0 %
Ground Vibration Peak Particle Velocity (mm/s)		
5	5 %	4.6 %
10	0 %	0 %

Note: 1. Percentage of the total number of blasts over a period of 12 months

Blast modelling predictions conducted as part of the Environmental Assessment (PA 07_0087) are shown in Table 14. Monitoring during the reporting period indicates that mean and median results are at or below predicted levels.

Table 17: Blast Predictions

Location	N – Elliotts		M - MacNaughtons		H - Mt Vincent Rd		G - Richards	
	Airblast dBL	Vibration mm/s	Airblast dBL	Vibration mm/s	Airblast dBL	Vibration mm/s	Airblast dBL	Vibration mm/s
Max	112.5	7.2	115.0	1.5	109.2	0.9	109.9	1.1
Min	96.0	0.2	92.9	0.1	82.0	0.02	79.9	0.02
Mean	103.5	1.7	101.9	0.5	92.5	0.2	98.0	0.3
Median	103.6	1.0	101.1	0.4	92.2	0.1	97.9	0.2
EA Prediction	113.0	4.8	103.5	1.2	96.5	0.4	102.1	1.0

3.9.3 Reportable Incidents

No reportable incidents relating to blasting occurred during the reporting period.

3.9.4 Further Improvements

Monitoring of blasts will continue in accordance with EPL and Project Approval requirements.

3.10 Operational Noise

3.10.1 Environmental Management

A noise monitoring plan has been prepared in accordance with the conditions of the Project Approval. The noise monitoring plan has been endorsed by the Director General. Quarterly noise monitoring has been undertaken in accordance with the monitoring plan.

The use of a predictive meteorological modeling software program is utilised to assist in planning mine operations. The software incorporates regional weather station data to predict daily weather events that may exacerbate noise impacts from operations.

3.10.2 Environmental Performance

Attended and unattended quarterly noise monitoring was undertaken during the reporting period which assessed noise impacts from Bloomfield Colliery against relevant criteria detailed within PA 07_0087 at five monitoring locations (see Plan 1). Monitoring results are summarised in Table 18 and copies of the monitoring reports are presented in Appendix E.

All noise monitoring indicated that compliance with consent criteria was met at all locations during day, evening and the night-time periods. The noise criteria were set based on the noise predictions conducted in the Environmental Assessment (PA 07_0087).

Table 18: Summary of Attended Noise Monitoring Results

Location	Time	Noise Criteria	Attended Monitoring	Bloomfield generated noise
F – Black Hill Rd, Black Hill	Day (LAeq (15 min))	35	<34 to <39	Inaudible
	Evening (LAeq (15 min))	35	<33 to <41	Inaudible
	Night (LAeq (15 min))	35	<33 to <43	March – Contribution 37 dBA ¹ June to Dec - Inaudible
G – Buchanan Rd, Buchanan	Day (LAeq (15 min))	39	<30 to 35	
	Evening (LAeq (15 min))	42	<30 to 35	
	Night (LAeq (15 min))	37	<30 to 35	
L – Kilshanny Ave, Ashtonfield	Day (LAeq (15 min))	35	<30 to <34	
	Evening (LAeq (15 min))	35	<30 to <34	
	Night (LAeq (15 min))	35	<30 to <31	
M – John Renshaw Dr, Buttai	Day (LAeq (15 min))	39	<32 to <39	
	Evening (LAeq (15 min))	39	<32 to 39	
	Night (LAeq (15 min))	37	<30 to 35	
N – Lings Rd, Buttai	Day (LAeq (15 min))	42	<35 to <38	
	Evening (LAeq (15 min))	42	<32 to <39	
	Night (LAeq (15 min))	35	<34 to <38	March – Contribution 37 dBA ² June to Dec - Inaudible

1 – Mine owned property

2 – Within 2 dB as per Industrial Noise Policy

Night time sleep disturbance criteria ($LA1_{(1min)}$) were in compliance during all monitoring events.

3.10.3 Reportable Incidents

No reportable incidents relating to operational noise occurred during the reporting period.

3.10.4 Further Improvements

Use of the predictive meteorological modeling software program will be refined with the incorporation of Williamstown meteorological data. This will enable more accurate weather predictions to be made.

3.11 Visual, Stray Light

3.11.1 Environmental Management

Progressive rehabilitation of disturbed land is the main strategy for minimising visual impacts. In addition to 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.

Fixed lighting around the site has been positioned and/or shielded where possible to minimise light shed. Consideration is also given to the location and alignment of mobile light to minimise stray light.

3.11.2 Environmental Performance

The visual assessment of the Bloomfield open cut noted that the main visual impacts are on residences to the south of John Renshaw Drive, to the south of the mine.

3.11.3 Reportable Incidents

No reportable incidents relating to visual amenity or stray light occurred during the reporting period.

3.11.4 Further Improvements

Rehabilitation of areas visible from nearby residences or road traffic will be given priority during mine planning and rehabilitation scheduling.

3.12 Aboriginal Heritage

3.12.1 Environmental Management

An Aboriginal Cultural Heritage Management Plan (ACHMP) was prepared in consultation with Mindaribba LALC. The plan was endorsed by DECCW and the Director General of Planning during the reporting period.

3.12.2 Environmental Performance

A number of Aboriginal sites identified during the Project Approval process were previously salvaged in 2010 in accordance with the ACHMP. Representatives from Mindaribba LALC participated and monitored the process ahead of preparation for mining activities. In all, 80 artefacts were salvaged and are being stored at Bloomfield Colliery.

In 2014 an additional 3 Ha was stripped of topsoil in preparation for mining activities. In accordance with the approved ACHMP Bloomfield engaged an archaeologist and the Mindaribba LALC to monitor the ground disturbance works and salvage identified artefacts. In all a further 6 artefacts were salvaged and are being stored at Bloomfield Colliery.

3.12.3 Reportable Incidents

No reportable incidents relating to Aboriginal heritage occurred during the reporting period.

3.12.4 Further Improvements

Any Aboriginal heritage evidence that is identified will be managed in accordance with the ACHMP and reported in the 2015 AEMR.

3.13 Natural Heritage

3.13.1 Environmental Management

No National Parks, nature reserves, or other areas of protected natural heritage are located near Bloomfield. The nearest, Pambalong Nature Reserve, is located approximately 6km to the south-east of Bloomfield mining operations. Therefore, natural heritage management is not considered a significant environmental risk.

3.13.2 Environmental Performance

N/A

3.13.3 Reportable Incidents

No reportable incidents relating to natural heritage occurred during the reporting period.

3.13.4 Further Improvements

No improvements are planned with regards to natural heritage management.

3.14 Spontaneous Combustion

3.14.1 Environmental Management

There was no major spontaneous combustion incidences recorded during the reporting period. Historically the site does not have a problem with spontaneous combustion.

3.14.2 Environmental Performance

A small area of spontaneous combustion was identified in an overburden dump that required capping with clay to seal off the available air supply.

3.14.3 Reportable Incidents

No reportable incidents relating to spontaneous combustion occurred during the reporting period.

3.14.4 Further Improvements

No improvements are planned with regards to spontaneous combustion management.

3.15 Bushfire

3.15.1 Environmental Management

A Bushfire Management Plan for Bloomfield Colliery was prepared in consultation with representatives of the NSW Rural Fire Service (RFS). The plan divides the site into 44 fire management Sectors, describes fire risk levels across the site, and outlines site features relevant to fire management such as vegetation type, access trail locations, asset locations, and water supplies.

Weather conditions permitting, hazard reduction burns are conducted periodically by the RFS. Selection of burn location is based on risk levels, as determined by fuel load assessment and location of assets/asset protection zones. Hazard reduction clearing/slashing was also undertaken by Bloomfield along fire trails, asset protection zones and the mine boundary.

3.15.2 Environmental Performance

An asset protection zone adjacent to residential areas near Ashtonfield and Buchanan was slashed and maintenance work carried on a number of tracks to enable access for hazard

reduction activities by the RFS. A hazard reduction burn was planned but not undertaken due to persistent unfavourable weather conditions.

During 2014 representatives from the East Maitland RFS were given a tour of the mine to familiarise themselves with the layout of the site.

3.15.3 Reportable Incidents

No reportable incidents relating to bushfire management occurred during the reporting period.

3.15.4 Further Improvements

No improvements to the Bushfire Management Plan are planned, however, ongoing hazard reduction burning and clearing will continue in consultation with the RFS. A hazard reduction burn is planned for winter 2015.

3.16 Mine Subsidence

3.16.1 Environmental Management

Areas of the Bloomfield mine site (CCL 761) are undermined by historic underground workings, some relatively shallow. Sink holes associated with shallow workings are infrequent, but have previously been identified. 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 periodical inspections will continue.

3.16.2 Environmental Performance

A sink hole previously identified and filled in X-Cut near Buchan Road has been rehabilitated. There is no damage to any infrastructure.

3.16.3 Reportable Incidents

No reportable incidents relating to subsidence management occurred during the reporting period.

3.16.4 Further Improvements

Other than the remediation and rehabilitation of sink holes as identified, no improvements to subsidence management are planned.

3.17 Hydrocarbon Contamination

3.17.1 Environmental Management

As no areas of hydrocarbon contamination have been identified within the Bloomfield lease area, management is geared to contamination prevention. Bulk hydrocarbon storages (including the NALCO products) are located within bunded areas. The volumes of these bunded areas are capable of containing greater than 110% of the largest storage tank.

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

Hydrocarbon storage infrastructure at the CHPP and open cut is inspected regularly and documented maintenance check sheets are completed quarterly.

A dedicated contaminated soil land farming area is established on-site to treat any hydrocarbon contaminated due to accidental spills.

3.17.2 Environmental Performance

No major areas of hydrocarbon contamination were identified during the reporting period. Soil from minor spills were collected and deposited the contaminated soil land farming area.

3.17.3 Reportable Incidents

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

3.17.4 Further Improvements

No improvements are planned for hydrocarbon management.

3.18 Public Safety

3.18.1 Environmental Management

Being situated close to urban areas, Bloomfield has historically had a problem with dumping of rubbish, theft and vandalism on the site. A major fencing and exclusion barrier program has greatly reduced these occurrences. Bloomfield continues to invest significant time and resources into keeping the site closed to unauthorised access, including fencing along all public roads, installing lockable gates and other temporary barriers (such as logs, rocks and concrete blocks) on major access tracks and ensuring clear signage is placed covering likely approaches.

3.18.2 Environmental Performance

No public safety incidents were recorded or reported during the reporting period.

3.18.3 Reportable Incidents

No reportable incidents relating to public safety during the reporting period.

3.18.4 Further Improvements

No overall improvements are planned to manage public safety; however, Bloomfield will continue to maintain existing fencing, gates, barriers and signage.

4 COMMUNITY RELATIONS

4.1 Environmental Complaints

Ten community complaints were received during the reporting period and a summary is provided below (Table 19). The complaints register for the reporting period is presented in Appendix F.

Table 19: Community Contacts Register

Date	Issue	Type	Location
11-Mar-14	Noise	Resident	Ashtonfield
24-Mar-14	Noise	Resident	Ashtonfield
24-Apr-14	Odour	Resident	Black Hill
08-Jun-14	Noise	Resident	Ashtonfield
28-Jul-14	Noise	Resident	Buttai
27-Aug-14	Noise	Resident	Ashtonfield
18-Sep-14	Noise	Resident	Black Hill
27-Oct-14	Blasting	Unknown	Unknown
13-Nov-14	Wild Dogs	Resident	Louth Park
26-Nov-14	Blasting	Resident	Buchanan

Figure 11 displays a comparison of complaints with previous reporting periods, which demonstrates a decline in the number of complaints received.

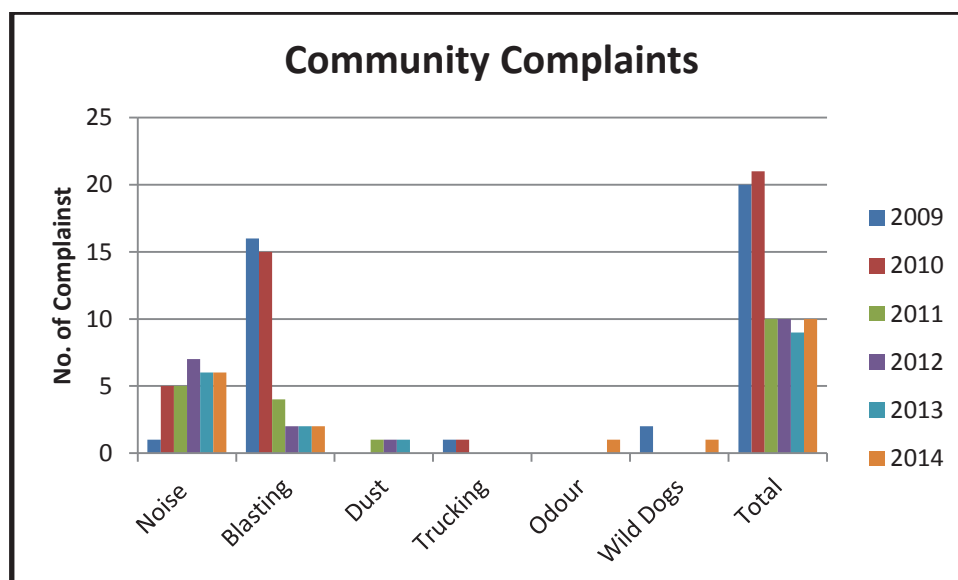


Figure 11: Community Complaints

4.2 Community Liaison

4.2.1 Community Consultative Committee

In accordance with the Project Approval, a Community Consultative Committee (CCC) has been established. The CCC meets three times a year basis. Additional information about the operation has been included on the company website (www.bloomcoll.com.au) and information about blasting schedules advertised quarterly in local newspapers.

4.2.2 Adopt-a-Road Program

Bloomfield is a participant in Cessnock City Council's Adopt-a-Road program. Bloomfield has entered into a three year agreement with the Council to undertake litter collection campaigns along Buchanan Road, between John Renshaw Drive and Louth Park Road, Buchanan. Bloomfield has contracted the Kurri Kurri Community Center Inc to conduct quarterly litter collection programs.

4.2.3 Community Sponsorship

The Bloomfield Group has a commitment to support local community projects and activities. As part of this commitment, during 2014 financial sponsorship was provided for the following community groups, schools, charities and community events:

- Allambi Care
- ARTC Charity Ball
- Ashtonfield Public School
- Assistance Dogs NSW
- Australian Posties Bike Grande Prix
- Australian Red Cross
- Belltrees Public School
- Blackhill Church
- Blandford Public School
- Branxton Touch Football
- Cancer Council NSW
- Cancer Council Relay For Life
- Canteen
- Carols In the City
- Carrie's Place
- Cerebral Palsy Alliance
- Chris O'Brien Lighthouse
- Chuck Duck & Rooster Cluck's Good Life Truck
- Country Education Foundation
- Curlewis Campdraft
- Darlington Fire Brigade
- Darlington RFS Sign
- Denman Classic Fours (Shirts)
- East Junior Rugby Club

- East Maitland Rugby League
- EdFest Kurri Learning Community
- Fred Hollows Foundation
- Giant Steps Sydney
- Girl Guides Association
- Go Fund Raiser
- Hunter ICAA
- Hunter Region Botanic Gardens
- Hunter River Agricultural Association
- Hunter River Agricultural Show
- Hunter Valley Broncos
- Hunter Valley Junior Cricket Council Inc
- Hunter Valley Men's Crisis
- HV Returned Services Gallipoli Trip
- HVRF
- Iona Public School Horse Sports
- Kaleidoscope
- Kurri Kurri Community Centre Litter Clean up
- Kurri Kurri Community Fest 2014
- Lochinvar Public School
- Mai Wel
- Mai Wel Group
- Maitland City Council Taste Festival
- Maitland Football Club Inc
- Maitland Grossman High
- Maitland Netball
- Maitland Polocrosse
- Maitland Rugby Union Club
- Maitland Taste Festival
- Mc Grath foundation
- Metford Public School
- Minerals Council Westpac Rescue Helicopter
- MMRF
- Motor Neurone Disease Association
- Movember
- Mr Sports Anaiwan Nation Jnr football
- Mr Sports Sponsorship Denman Classic Fours
- MS Australia
- Northern Agricultural Association
- Outreach Music
- OxFam
- Red Shield Appeal
- Rock Solid Gear Emu Netball
- Royal Flying Doctors
- Rugby Blacks Netball Association
- Samaritans Foundation
- Scouts Association of Australia

- Shine For Kids
- Singleton Baptist Church
- Singleton Gymkana Club
- Singleton Height Pre-School
- Singleton Heights Annual Fete
- Singleton Junior Soccer Club
- Singleton Legacy
- Singleton Netball
- Special Childrens' Christmas Party
- St Vincent de Paul
- Stanford Methyr Infants School
- Steamfest
- The Smith Family
- Thornton Public School
- Towns With Hearts
- Uniting Care Singleton
- Upper Hunter Special Children's Christmas Party
- Variety The Children's Charity
- We Help Ourselves
- Wean Amateur Picnic Race Club
- West Wallsend Public School
- Woodbury Warriors
- Youth Off The Streets

5 REHABILITATION

5.1 Buildings

There have been no buildings or structures decommissioned over the site during the reporting period.

5.2 Rehabilitation of Disturbed Land

The Mining Operations Plan (MOP) 2012-2016 for Bloomfield Collieries has been accepted by DRE. The MOP was prepared under DRE's new Interim MOP Guidelines.

Landscape re-contouring, topsoil handling and revegetation techniques are well established at Bloomfield. The objectives of the rehabilitation program being:

- To establish post-mining surfaces and vegetation cover which ensure a safe and stable landform of land capability class equal to that which existed prior to mining disturbance.
- Return the land to a condition suitable for a range of post-mining landuses, which take into account the proximity of the site to the urban areas of Maitland and possible future development demands.
- Create landforms that can accommodate overburden and waste products produced during coal mining and processing, and merge with adjoining undisturbed landforms.
- Reinststate a surface drainage network on the rehabilitated landforms that is hydrologically stable and incorporates adequate erosion and sediment control structures so as to effectively protect adjoining areas from potential water-borne impacts.
- Undertake a maintenance program to ensure the continued sustainability of previously rehabilitated areas.

Rehabilitation is carried out throughout the year, with the aim of timing vegetation seeding operations in Spring and Autumn.

The majority of the lease area is relatively undisturbed remnant native bushland and no other activities are carried out on the area other than the mining operation. To date 456 Ha has been rehabilitated.

As reported in the previous AEMR, the major rehabilitation program undertaken over the past decade has now resulted in only relatively small areas becoming available for rehabilitation each year. Combined with this was an expansion of dumping area over areas previously categorised as rehabilitated. The expansion of the dumping areas ceased in 2012 and as such there has been an increase in rehabilitated land. A total of 8.5 ha of land were rehabilitated during the reporting period (see Table 20).

The 8.5 Ha of rehabilitation completed during the reporting period is slightly less than the MOP rehabilitation for 2014 which was estimated to be 9.8 Ha. However rehabilitation completed during the MOP period exceeds estimates. Plan 2 provides an overview of the site showing areas previously rehabilitated, rehabilitation undertaken during the reporting period, shaped areas ready for rehabilitation, unshaped areas (active dumps), and active mining areas.

Table 20: Rehabilitation Summary

		Area Affected/Rehabilitated (hectares)		
		To date	Last report	Next Report (estimated)
A: MINE LEASE AREA				
A1	Mine Lease(s) Area	1,453		
B: DISTURBED AREAS				
B1	Infrastructure area (other disturbed areas to be rehabilitated at closure including facilities, roads)	72	72	72
B2:	Active Mining Area (excluding items B3 – B5 below)	78	73	75
B3	Waste emplacements, (active/unshaped/in or out-of-pit)	140	152	136
B4	Tailings emplacements, (active/unshaped/uncapped)	87	87	87
B5	Shaped waste emplacement (awaits final vegetation)	11	14	10
ALL DISTURBED AREAS		388	398	380
C REHABILITATION PROGRESS				
C1	Total Rehabilitated area (except for maintenance)	456	448	463
D: REHABILITATION ON SLOPES				
D1	10 to 18 degrees	28	28	28
D2	Greater than 18 degrees	-	-	-
E: SURFACE OF REHABILITATED LAND				
E1	Pasture and grasses	451	443	458
E2	Native forest/ecosystems	-	-	-
E3	Plantations and crops	5	5	5
E4	Other (include nonvegetative outcomes)	-	-	-

F1

F2

Table 21 provides a summary of the maintenance activities during the period and activities proposed for the next reporting period.

Table 21: Maintenance Activities on Rehabilitated Land

NATURE OF TREATMENT	Area Treated (ha)		Comment/control strategies/ treatment detail
	Report period	Next period	
Additional erosion control works (drains re-contouring, rock protection)	-	-	Construction of contour drain to manage run off from expanded workings.
Re-covering (detail – further topsoil, subsoil sealing etc)	0.5	-	Small, isolated bare patches & washouts across the site to be ripped, retreated with lime, biosolids and/or fertiliser, and re-seeded during the next reporting period. Actual areas small and difficult to calculate.
Soil treatment (detail – fertiliser, lime, gypsum etc)	-	-	See "Re-covering" above.
Treatment/Management (detail – grazing, cropping, slashing etc)	74	50	The southern area of X Cut fenced and cattle grazing introduced to maintain pasture.
	-	5	The western area of K Cut fenced to be fenced and cattle grazing introduced to maintain pasture. Slashing of established rehabilitation to encourage nutrient recycling and, where needed, fertiliser application.
Re-seeding/Replanting (detail – species density, season etc)	-	-	See "Re-covering" above.
Adversely Affected by Weeds (detail - type and treatment)	ML	ML	Continual localised areas of weed treatment across all disturbed and undisturbed areas (see Section 3.7), but no specific areas of intensive treatment.
Feral animal control (detail – additional fencing, trapping, baiting etc)	-	1500	Feral dog baiting undertaken during the reporting period in consultation with other large land holders in the area.

Topsoil Balance

Table 22 provides a topsoil balance as at the end of the reporting period and the current disturbance area.

Table 22: Topsoil Balance

Current Disturbance Area	388 Ha
Stockpiled Soil Material	250,000 m ³
In-Situ Soil Material	210,000 m ³
Total Soil Material	460,000 m³
Soil Cover Depth	0.12 m

Rehabilitation Monitoring

Bloomfield Colliery has prepared and submitted a Landscape Management Plan (LMP) which includes a Rehabilitation Management Plan (RMP) in accordance with Development Consent requirements for the operation of the mine. The RMP outlines the objectives, methodology and monitoring of rehabilitation.

There are currently 23 established monitoring sites within the rehabilitated areas. Additional sites will be added as rehabilitation progresses. Monitoring is carried every 2 years. The 2014 reporting period was not one of the monitoring years therefore no monitoring results are reported in this AEMR. The previous rehabilitation monitoring was carried out in 2013. The results of the 2013 monitoring are summarised in Appendix G. The next round of monitoring will be conducted in 2015 and the results will be presented in the 2015 AEMR.

5.3 Other Infrastructure

No infrastructure was decommissioned during the reporting period.

5.4 Rehabilitation Trials and Research

No trials or research were undertaken during the reporting period.

5.5 Further Development of the Final Rehabilitation Plan

In accordance with the Project Approval, the Landscape Management Plan, Rehabilitation Management Plan, Mine Closure Plan and Final Void Management Plan have been prepared and submitted to DP&I for approval. These documents outline the rehabilitation planning, operation and monitoring process for Bloomfield Group mining operations. All are expected to be approved during the next reporting period.

Under the current mine plan mining will cease at Bloomfield in 2021. The Bloomfield washery, rail loader and tailings facility will continue to operate after the mining is scheduled to be completed. The continued use of the washery, rail loader and tailings facility is approved under Project Approval 05_0136 for the Abel Underground Mine. These items associated with the operation of the washery are currently used to process coal from Bloomfield, Abel and Tasman mines. When mining is completed at Bloomfield Colliery, the washery will continue processing coal from the Abel and Tasman mines. Project Approval 05_0136 permits operations until 2030.

The final void remaining at the end of mining will be used as the tailings facility for the washery operations. An estimated 20 M m³ of storage capacity will be required for the final void as a tailings facility. This will be used for the disposal of approximately 18 M m³ of waste rejects and a further 2 M m³ of overburden capping. The tailings material will be capped with 2 metres of overburden material and soil and rehabilitated. Overburden material and topsoil will be stockpiled adjacent to the final void towards the end of Bloomfield mining operations to be utilised for final closure when washery operations are completed in 2030.

6 ACTIVITIES PROPOSED IN THE NEXT AEMR PERIOD

The activities for the ensuing year will generally be in accordance with the rehabilitation and landscape management strategy outlined in the Environmental Assessment and the MOP schedule. Environmental activities proposed for the next AEMR period have been previously reported within relevant sections of this document.

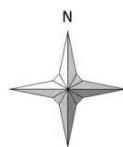
In accordance with the rehabilitation and landscape management strategy outlined in the Environmental Assessment and the MOP, an approximately 50 Ha area of the established rehabilitation area will be fenced and stock introduced for grazing purposes. The area will consist of the western part of K-Cut. Further details will be provided in the next AEMR.

PLANS



LEGEND

0 1 km



- | | |
|--|--|
| — Bloomfield Project Area | ▲ High Volume Air Sampler |
| — Abel Mine Project Area | ■ Noise Monitor |
| — Bloomfield Mining Lease | ◆ Piezometers |
| ▲ Blast Monitor | ● Water Monitoring |
| ▲ Dust Monitor | |



Bloomfield Colliery

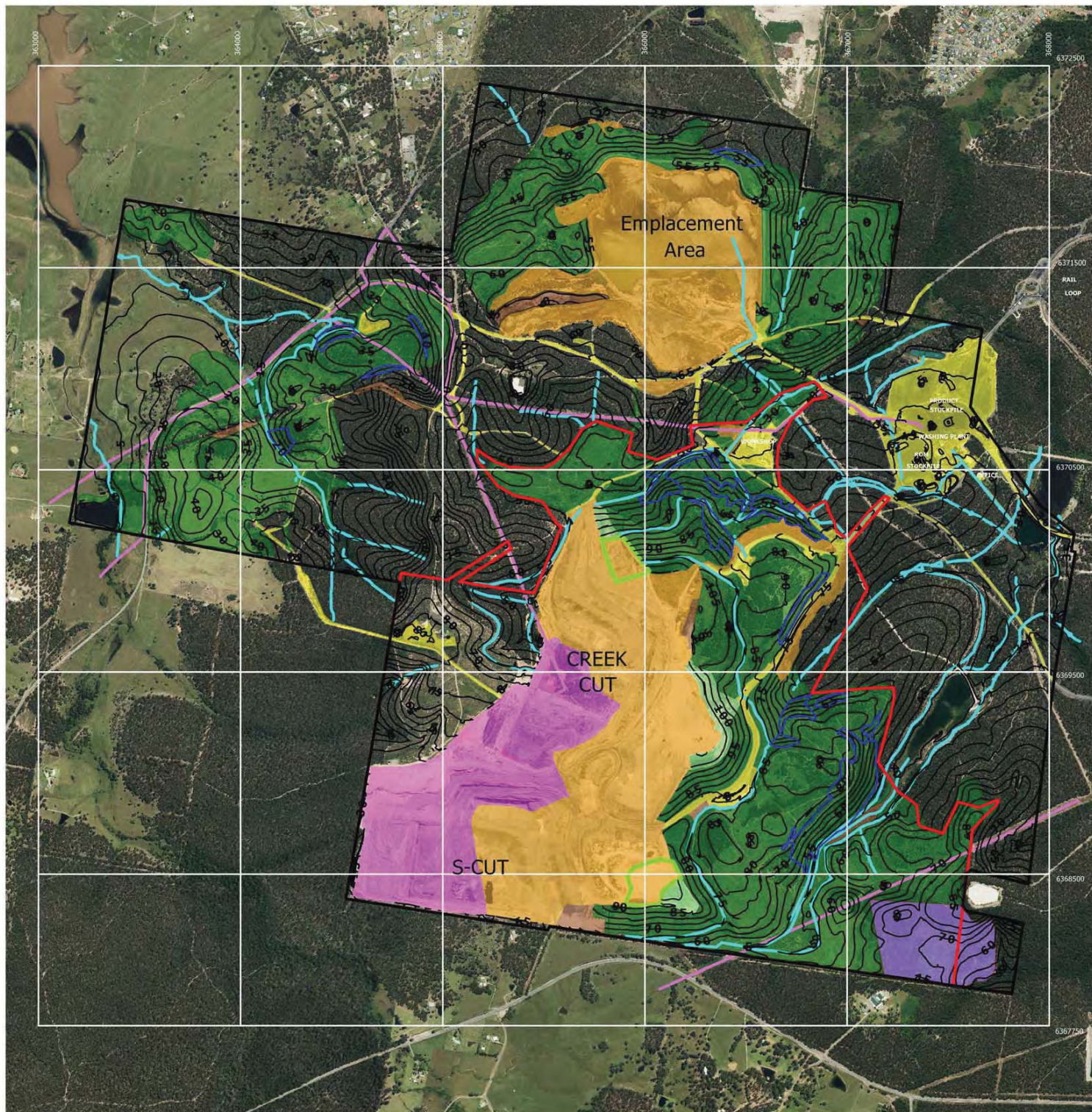
Annual Environmental Management Report

Plan 1 Environmental Monitoring Sites

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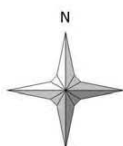
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LEGEND

0 1 km
Contour Interval 5m



— Contour (m AHD)	— Slopes 10 to 18 Degrees	Unshaped Areas
— Clean Water	— Power Lines	Shaped Areas
— Dirty Water	— Relinquished	Active Areas
— Approval Area	— Previous Rehabilitation	Infrastructure
— Colliery Holding	— 2014 Rehabilitation	2015 Rehabilitation



Bloomfield Colliery

Annual Environmental Management Report

Plan 2

Rehabilitation Plan 2014

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Date: February 2015
Photo: February 2015

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APPENDIX A

DUST MONITORING RESULTS

Figure A1

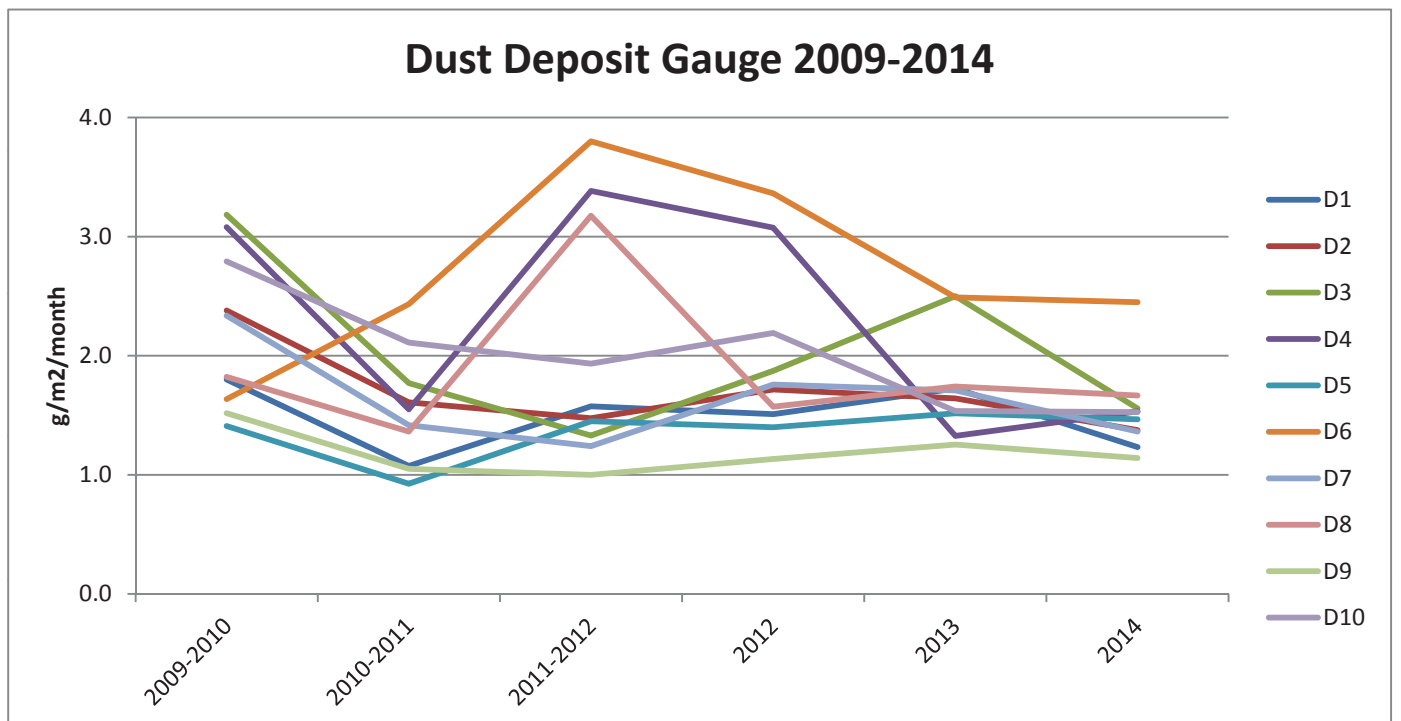


Table A1: PM10 and TSP Results 2014

Date	TSP Concentration (ug/m ³)	PM ₁₀ Concentration (ug/m ³)
4/01/2014	53	31
10/01/2014	-	15
16/01/2014	71	29
18/01/2014	38	-
22/01/2014	29	14
28/01/2014	29	13
3/02/2014	50	22
9/02/2014	27	13
15/02/2014	22	14
21/02/2014	37	22
27/02/2014	39	22
4/03/2014	28	19
10/03/2014	29	14
16/03/2014	21	11
22/03/2014	28	13
28/03/2014	17	5
4/04/2014	28	19
10/04/2014	29	14
16/04/2014	21	11
22/04/2014	28	13
28/04/2014	17	5
4/05/2014	15	2
10/05/2014	26	14
16/05/2014	21	7
22/05/2014	35	14
28/05/2014	34	9
3/06/2014	8	1
9/06/2014	3	1
15/06/2014	11	1
21/06/2014	15	3
27/06/2014	33	12
3/07/2014	30	19
9/07/2014	49	20
15/07/2014	22	9
21/07/2014	17	8
27/07/2014	10	4
2/08/2014	34	13
8/08/2014	28	15
14/08/2014	21	10
20/08/2014	24	15
26/08/2014	16	7
1/09/2014	22	12
7/09/2014	11	6
13/09/2014	26	11
19/09/2014	47	25
25/09/2014	23	10
1/10/2014	45	18

Date	TSP Concentration (ug/m3)	PM10 Concentration (ug/m3)
7/10/2014	56	25
13/10/2014	33	17
19/10/2014	19	10
25/10/2014	41	22
31/10/2014	59	26
6/11/2014	20	8
12/11/2014	39	19
18/11/2014	44	23
24/11/2014	47	27
30/11/2014	34	22
6/12/2014	21	12
12/12/2014	42	18
18/12/2014	75	36
24/12/2014	34	19
30/12/2014	66	32
Maximum 24 hr Average	-	36
EPA Limit 24hr Average	-	50
Annual Average	31	15
EPA Limit Annual Average	90	30

Figure A2

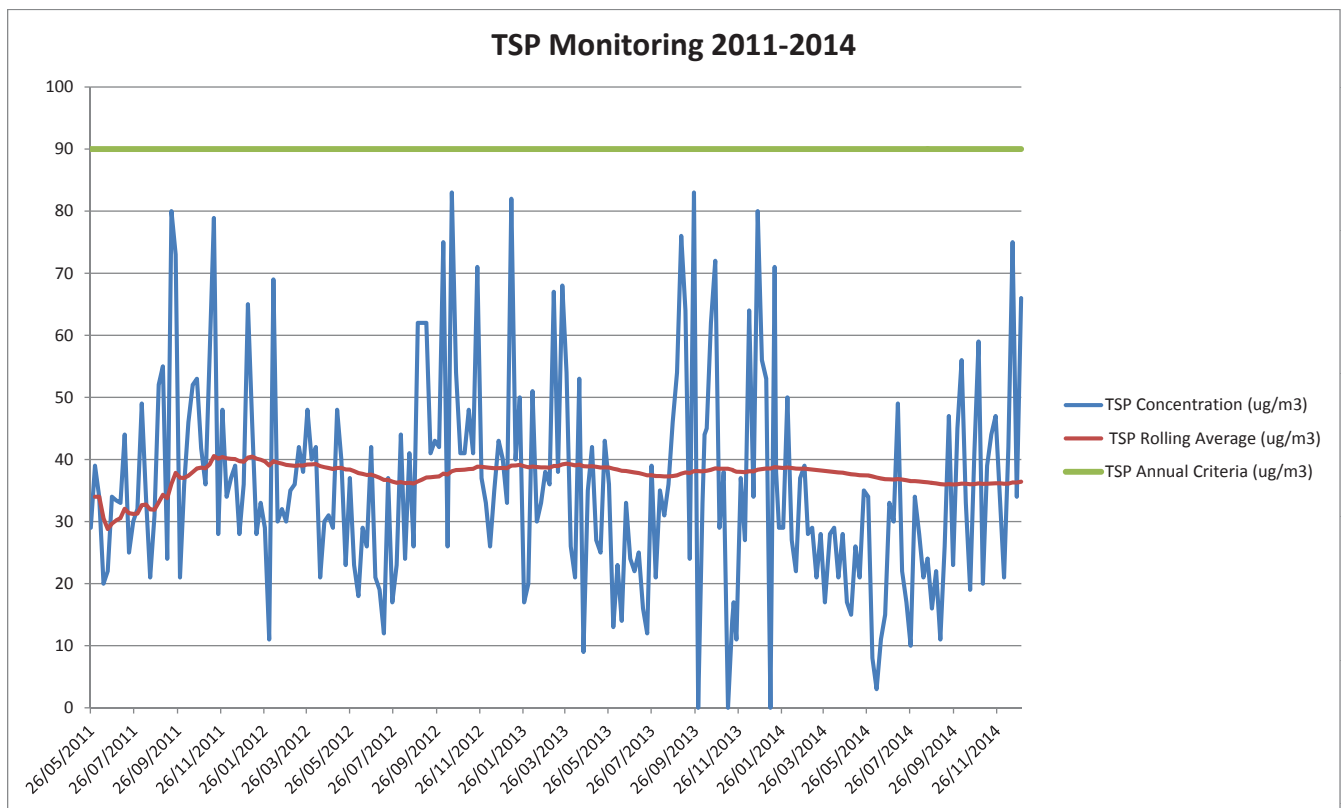
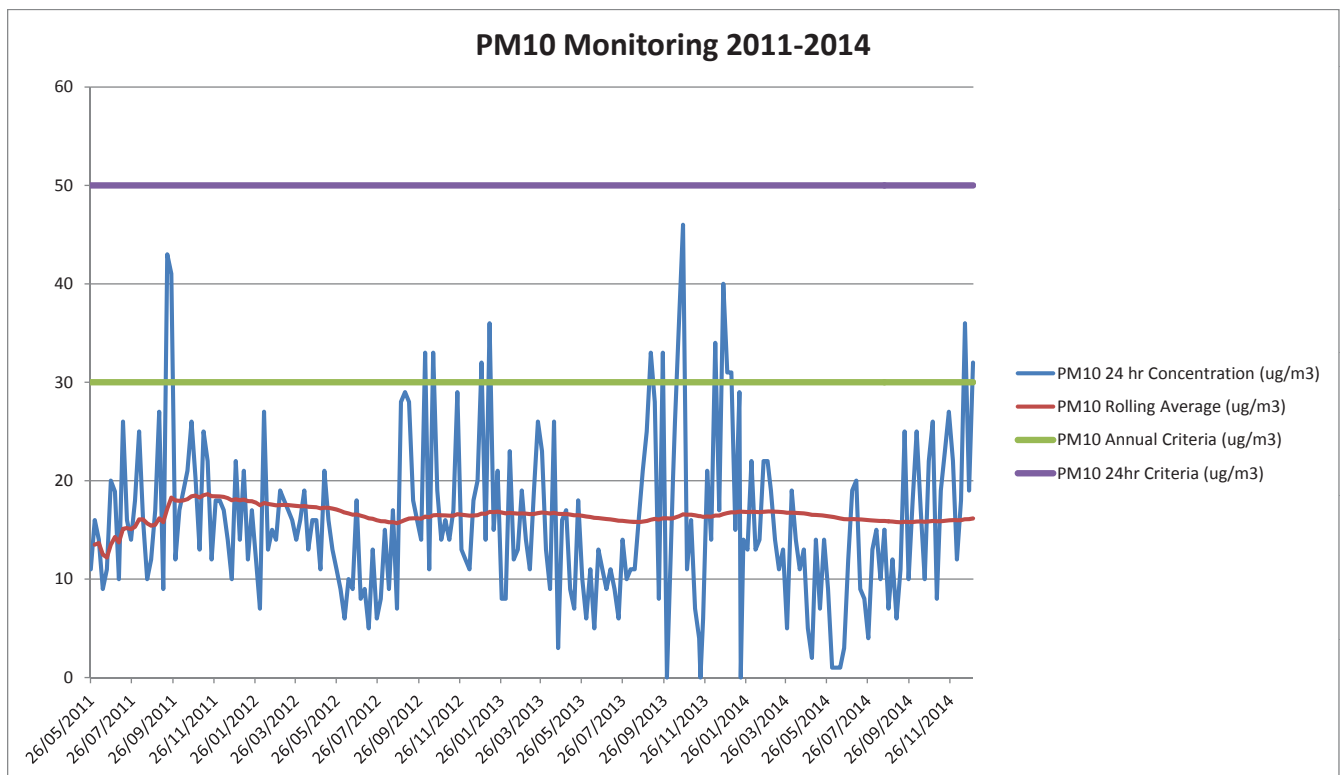


Figure A3



APPENDIX B

WATER MONITORING RESULTS

Site W1

Adjacent Rathluba Colliery

[illegible]

Site
WM3 **Elwells Creek / Four Mile Creek Junction**

Date	pH	Specific Conductance (µS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Iron (mg/l)	Turbidity (NTU)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Comments
24-Sep-09	8.80	360	14	220	0.74	34								
13-Oct-09	8.10	310	370	210	0.61	46	52		38	15	10	39	3	
03-Nov-09	8.30	640	10	500	0.70	27								
13-Dec-09	7.60	410	8	140	0.23	18								
13-Jan-10	6.80	280	10	200	0.61	17	92		39	14	10	34	3	
09-Feb-10	7.30	220	14	130	0.28	14								
04-Mar-10	8.90	280	9	200	0.35	86								
08-Apr-10	8.70	323	7	220	0.20	23	54		42	18	9	33	3	
14-May-10	7.50	193	7	131	0.10	10								
10-Jun-10	6.80	462	41	370	0.14	65								
07-Jul-10	7.30	581	14	354	0.21	33	75		57	19	16	67	4	
25-Aug-10	6.10	419	10	266	0.29	28								
20-Sep-10	7.42	1,950	10	1,390	0.11		89	710	143	95	81	256	9	
19-Oct-10	7.38	336	7	166	0.15									
19-Nov-10	7.94	2,840	31	1,740	0.05									
21-Dec-10	7.44	1,150	9	674	0.30									
14-Jan-11	7.74	2,140	9	1,430	0.09		181	642	217	59	70	353	8	
22-Feb-11	7.93	4,590	10	3,730	0.05									
24-Mar-11	7.96	4,940	12	3,630	0.06									
27-Apr-11	7.01	326	16	234	0.46		60	52	39	14	9	41	3	
26-May-11	8.24	5,460	24	3,800	0.05									
27-Jun-11	7.44	2,950	21	2,230	0.05									
25-Jul-11	7.78	2,420	67	1,440	0.20		148	504	311	56	57	358	7	
26-Aug-11	7.24	780	20	514	0.32									
21-Sep-11	8.02	1497	15	934	0.12									
26-Oct-11	7.71	627	190	436	0.39		43	140	74	19	18	80	5	
22-Nov-11	7.43	1871	29	1330	0.13									
15-Dec-11	7.76	3180	32	2190	0.05									
25-Jan-12	8.17	4810	14	3770	0.07		327	1760	513	109	201	813	18	
17-Feb-12	6.9	442	45	372	0.72									
30-Mar-12	8	3150	17	2190	0.05									
27-Apr-12	7.17	426	24	314	0.95		45	84	48	14	13	49	6	
24-May-12	7.58	351	23	224	1.25									
27-Jun-12	8.21	4810	24	3740	0.63									
27-Jul-12	7.45	1912	35	1370	0.39		82	689	192	85	81	269	8	
30-Aug-12	7.68	711	30	508	0.42									
25-Sep-12	7.94	2140	15	1330	0.1									
25-Oct-12	7.78	786	17	458	0.36		86	147	91	22	23	104	5	
29-Nov-12	8.06	4790	14	3180	0.05									
20-Dec-12	8.14	3620	12	2420	0.05									
24-Jan-13	8.03	2290	6	1510	0.06		204	690	253	62	79	400	9	
25-Feb-13	7.96	2450	54	1560	0.09									
22-Mar-13	7.58	1640	8	1110	0.27									
22-Apr-13	8.29	4150	54	2940	0.09		286	1370	427	109	149	734	15	
17-May-13	7.64	935	54	498	0.59									
21-Jun-13	7.64	860	10	580	0.35									
24-Jul-13	7.48	650	49	416	0.44		52	150	57	19	19	78	4	
28-Aug-13	7.58	596	15	345	0.34									
17-Sep-13	7.52	1180	38	758	0.17									
22-Oct-13	7.79	1250	8	703	0.17		137	246	135	23	31	192	5	
14-Nov-13	7.94	4210	14	2820	0.05									
11-Dec-13	7.29	718	15	447	0.24									
24-Jan-14	8.47	3840	26		0.07									
20-Feb-14	8.1	2810	58		0.05									
25-Mar-14	7.98	1270	17		0.07									
30-Apr-14	7.78	2600	20	1860	0.05		189	965	240	100	109	452	12	
28-May-14	6.94	357	15		0.46									
26-Jun-14	7.85	667	6		0.31									
28-Jul-14	8.36	4960	19	3890	0.05									
31-Aug-14	7.84	1090	23		0.23									
22-Sep-14	7.4	750				62								
27-Oct-14	7.2	1100	17	702	0.26	20.6	108	323	116	25	32	163	5	
21-Nov-14	8	1000				19.3								
22-Dec-14	8	2700				15.9								

Site
WM4

Four Mile Creek @ Possums Puddle Discharge

Date	pH	Specific Conductance (µS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Iron (mg/l)	Turbidity (NTU)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Comments
24-Sep-09	8.70	160	6	120	0.72	5								
13-Oct-09	7.10	170	4	140	0.61	10	33		28	11	4	20	3	
03-Nov-09	8.80	150	6	130	0.44	22								
13-Dec-09	7.10	160	2	90	0.13	22								
13-Jan-10	7.10	150	6	120	0.17	8	46		24	12	4	14	2	
09-Feb-10	6.30	70	2	110	0.22	5								
04-Mar-10	9.30	190	4	120	0.18	12								
08-Apr-10	8.90	171	1	130	0.59	4	43		25	13	4	14	2	
14-May-10	7.40	157	2	117	0.05	2								
10-Jun-10	6.80	1,250	58	858	0.12	83								
07-Jul-10	7.30	190	13	148	0.24	31	34		27	11	4	13	2	
25-Aug-10	6.49	192	5	136	0.36	28								
20-Sep-10	7.74	180	2	128	0.46		31	15	22	13	4	13	2	
19-Oct-10	7.62	180	4	103	0.12									
19-Nov-10	7.69	332	12	226	0.63									
21-Dec-10	7.50	194	<5	164	0.70									
14-Jan-11	8.12	192	<5	123	0.37		39	14	30	10	4	18	3	
22-Feb-11	8.36	812	<5	656	0.12									
24-Mar-11	8.13	601	7	432	0.18									
27-Apr-11	7.43	185	12	116	0.50		41	12	21	13	4	16	2	
26-May-11	8.37	5,460	24	3,640	0.05									
27-Jun-11	8.04	3,250	20	2,480	0.05									
25-Jul-11	8.18	2,790	57	1,760	0.12		179	610	366	66	70	462	8	
26-Aug-11	7.36	319	14	257	0.41									
21-Sep-11	8.48	243	10	186	0.6									
26-Oct-11	8.71	4670	232	3480	0.5		328	1640	478	132	173	824	17	
22-Nov-11	7.94	760	126	534	0.37									
15-Dec-11	7.57	3340	22	2300	0.05									
25-Jan-12	8.65	2430	110	1770	0.36		126	733	250	52	87	373	10	
17-Feb-12	7.44	241	23	240	1.15									
30-Mar-12	7.8	521	5	374	0.69									
27-Apr-12	7.82	216	11	322	0.91		29	24	32	7	6	26	4	
24-May-12	7.73	206	6	163	1.02									
27-Jun-12	8.35	4710	29	3540	0.05									
27-Jul-12	7.09	342	15	289	47.7		42	52	50	14	10	41	4	
30-Aug-12	8.07	404	15	302	0.55									
25-Sep-12	7.68	255	10	160	0.58									
25-Oct-12	7.68	308	8	155	0.47		34	19	39	11	5	24	3	
29-Nov-12	8.23	550	5	364	0.33									
20-Dec-12	8.07	495	7	290	0.28									
24-Jan-13	8.25	290	6	229	0.14		51	38	32	16	7	30	3	
25-Feb-13	7.79	843	37	554	0.42									
22-Mar-13	7.54	764	8	474	0.63									
22-Apr-13	8.34	4430	16	3110	0.05		310	1510	463	119	159	810	16	
17-May-13	7.55	194	5	150	0.9									
21-Jun-13	7.6	261	5	174	0.62									
24-Jul-13	7.54	232	5	165	0.6		28	25	25	9	5	26	3	
28-Aug-13	7.69	179	5	136	0.37									
17-Sep-13	8.35	5750	25	4400	0.05									
22-Oct-13	8.05	180	5	136	0.41		37	12	22	10	3	16	2	
14-Nov-13	8.17	890	7	511	0.23									
11-Dec-13	7.67	202	5	160	0.56									
24-Jan-14	8.36	253	5		0.44									
20-Feb-14	7.56	413	18		0.23									
25-Mar-14	7.73	189	5		0.14									
30-Apr-14	7.74	493	9	321	0.39		53	120	45	17	16	74	4	
28-May-14	8.13	133	7		0.55									
26-Jun-14	7.91	187	5		0.47									
28-Jul-14	8.4	5220	8	3540	0.05									
31-Aug-14	8.17	297	6		0.32									
22-Sep-14	6.5	140				12.9								
27-Oct-14	7.9	230	3	112	0.24	5	30	10	30	10	3	15	2	
21-Nov-14	7	180				5								
22-Dec-14	8.3	140				3.7								

Site
WM6 **Four Mile Creek U/S Possums Puddle**

Date	pH	Specific Conductance (µS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Iron (mg/l)	Turbidity (NTU)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Comments
24-Sep-09	9.10	120	10	80	0.86	42								
13-Oct-09	8.30	110	10	85	0.54	23	38		13	12	2	8	1	
03-Nov-09	8.80	120	12	120	0.40	31								
13-Dec-09	7.90	120	5	50	0.19	13								
13-Jan-10	6.70	110	5	88	0.62	110	47		12	13	2	8	1	
09-Feb-10	7.60	150	38	130	0.77	52								
04-Mar-10	8.90	140	90	350	0.24	24								
08-Apr-10	9.00	122	29	200	0.50	10	35		13	14	2	6	1	
14-May-10	8.20	124	6	87	0.17	18								
10-Jun-10	6.70	250	73	268	0.67	122								
07-Jul-10	7.40	130	10	75	0.19	6	35		11	13	2	6	1	
25-Aug-10	6.87	156	13	103	0.22	20								
20-Sep-10	7.35	141	9	101	0.23		32	9	12	15	2	8	1	
19-Oct-10	7.14	127	5	69	0.19									
19-Nov-10	6.80	274	65	417	1.59									
21-Dec-10	7.13	164	24	156	0.94									
14-Jan-11	6.91	135	7	85	0.71		40	2	19	13	2	8	2	
22-Feb-11	7.16	129	<5	83	0.57									
24-Mar-11	7.34	119	5	94	0.18									
27-Apr-11	7.07	125	78	175	0.42		30	8	15	12	2	10	2	
26-May-11	7.17	125	40	144	0.05									
27-Jun-11	7.38	272	22	214	0.31									
25-Jul-11	6.84	305	30	238	0.79		21	20	60	6	6	40	5	
26-Aug-11	7.11	245	70	256	0.46									
21-Sep-11	7.15	158	18	115	0.18									
26-Oct-11	8.04	185	30	139	0.38		33	12	25	12	4	19	2	
22-Nov-11	7.53	167	51	157	0.38									
15-Dec-11	6.78	225	95	246	1.13									
25-Jan-12	8.21	171	9	105	1.06		45	3	24	13	4	13	2	
17-Feb-12	6.68	189	38	242	1.31									
30-Mar-12	7.3	284	21	230	0.94									
27-Apr-12	7.03	248	37	268	1.16		39	15	41	8	6	30	4	
24-May-12	7.32	176	28	107	0.52									
27-Jun-12	8.18	324	22	190	0.72									
27-Jul-12	7.15	292	44	270	1.14		38	17	57	9	7	34	4	
30-Aug-12	6.5	147	9	121	0.15									
25-Sep-12	7.27	166	14	97	0.23									
25-Oct-12	7.53	144	164	89	0.24		39	7	14	14	3	11	2	
29-Nov-12	7.44	141	12	121	0.69									
20-Dec-12	8.19	499	8	278	0.14									
24-Jan-13	7.4	160	54	109	0.59		50	3	14	18	3	10	2	
25-Feb-13	8.24	2780	31	1760	0.05									
22-Mar-13	7.23	297	8	200	1.25									
22-Apr-13	7.41	166	136	198	0.25		28	17	22	9	4	17	2	
17-May-13	7.29	173	69	115	0.24									
21-Jun-13	7.28	161	9	114	0.18									
24-Jul-13	7.24	159	16	114	0.33		27	7	13	10	3	14	2	
28-Aug-13	7.29	130	5	89	0.1									
17-Sep-13	7.36	138	7	82	0.21									
22-Oct-13	7.3	138	5	111	0.15		43	5	10	11	2	8	1	
14-Nov-13	7.12	271	5	165	0.16									
11-Dec-13	6.97	206	11	145	0.59									
24-Jan-14	7.81	237	5		1.11									
20-Feb-14	8.13	196	38		0.55									
25-Mar-14	7.39	145	5		0.25									
30-Apr-14	7.75	141	14	154	0.77		18	13	28	6	3	24	3	
28-May-14	8.22	112	6		0.15									
26-Jun-14	7.57	136	16		0.1									
28-Jul-14	7.47	109	7	79	0.13									
31-Aug-14	7.87	233	30		0.64									
22-Sep-14	6.9	150				34.7								
27-Oct-14	7.9	150	6	84	0.32	11.5	32	10	23	10	2	9	1	
21-Nov-14	6.3	120				10.8								
22-Dec-14	7.5	130				14.9								

Site WM7		Possums Puddle												
Date	pH	Specific Conductance (µS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Iron (mg/l)	Turbidity (NTU)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Comments
24-Sep-09	8.50	170	7	110	0.81	82								
13-Oct-09	7.10	170	6	130	0.57	41	36		27	10	4	19	3	
03-Nov-09	8.70	160	4	140	0.38	108								
13-Dec-09	7.00	160	3	40	0.45	67								
13-Jan-10	6.80	150	2	110	0.16	11	44		24	12	4	14	2	
09-Feb-10	6.50	160	10	120	0.11	7								
04-Mar-10	8.80	170	9	97	0.81	12								
08-Apr-10	8.60	187	1	130	0.25	6	43		25	14	4	13	1	
14-May-10	7.30	158	2	119	<0.05	4								
10-Jun-10	6.80	167	46	161	0.16	75								
07-Jul-10	7.30	186	8	128	0.33	30	34		25	11	4	13	2	
25-Aug-10	6.93	188	6	145	0.37	32								
20-Sep-10	7.41	174	2	132	0.42		34	14	21	13	4	12	2	
19-Oct-10	7.40	174	6	107	0.12									
19-Nov-10	6.95	211	14	197	0.68									
21-Dec-10	7.08	194	12	159	0.77									
14-Jan-11	7.53	193	6	131	0.29		39	14	30	11	4	18	3	
22-Feb-11	7.69	175	<5	119	0.18									
24-Mar-11	7.29	164	<5	128	0.24									
27-Apr-11	7.03	178	5	133	0.49		41	8	22	13	4	15	2	
26-May-11	7.08	173	15	176	0.27									
27-Jun-11	6.94	235	50	270	0.48									
25-Jul-11	6.70	231	35	228	0.74		13	16	42	4	4	28	4	
26-Aug-11	7.01	247	16	230	0.38									
21-Sep-11	6.54	229	10	147	0.56									
26-Oct-11	8.45	202	5	142	0.35		34	10	24	11	4	18	2	
22-Nov-11	7.61	187	14	151	0.59									
15-Dec-11														No access
25-Jan-12	8.71	217	8	172	0.54		27	12	28	6	5	26	3	
17-Feb-12	6.9	194	38	218	0.94									
30-Mar-12	7.29	215	6	187	0.84									
27-Apr-12	7.41	219	26	152	0.89		28	11	29	6	4	23	4	
24-May-12	7.44	211	6	154	1.12									
27-Jun-12														No access
27-Jul-12	7.51	215	14	202	0.8		27	17	40	8	5	23	4	
30-Aug-12	7.02	202	9	191	0.66									
25-Sep-12	7.43	230	5	133	0.57									
25-Oct-12	7.8	204	5	143	0.44		32	14	35	11	4	21	3	
29-Nov-12	8.04	213	5	130	0.35									
20-Dec-12	7.84	213	5	133	0.21									
24-Jan-13	7.81	213	5	137	0.19		41	13	24	14	5	20	3	
25-Feb-13														No access
22-Mar-13	7.08	209	5	161	0.74									
22-Apr-13														No access
17-May-13	7.25	196	5	155	0.9									
21-Jun-13	8.06	4960	5	3580	0.05									
24-Jul-13	7.27	197	6	147	0.61		28	13	24	8	4	21	3	
28-Aug-13	7.44	179	5	137	0.44									
17-Sep-13	7.38	162	6	83	0.23									
22-Oct-13	7.64	182	5	127	0.43		38	12	22	9	3	16	3	
14-Nov-13	7.6	184	5	118	0.28									
11-Dec-13	7.37	204	5	156	0.5									
24-Jan-14	8.17	279	5		0.39									
20-Feb-14	7.6	202	8		0.25									
25-Mar-14	7.59	188	5		0.13									
30-Apr-14	7.65	163	5	106	0.48		34	13	25	7	4	24	4	
28-May-14	7.79	127	5		0.66									
26-Jun-14	7.6	176	5		0.42									
28-Jul-14	7.49	128	5	92	0.36									
31-Aug-14	7.91	210	2		0.33									
22-Sep-14	6.8	150				11.3								
27-Oct-14	7.7	190	3	107	0.23	12.4	30	10	30	10	3	15	2	
21-Nov-14	7.2	170				7.8								
22-Dec-14	8	150				3.4								

Site WM8		Lake Foster												
Date	pH	Specific Conductance (µS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Iron (mg/l)	Turbidity (NTU)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Comments
24-Sep-09	8.30	5,900	10	4,400	0.06	51								
13-Oct-09	8.10	5,900	11	4,700	0.05	6	340		456	213	251	846	28	
03-Nov-09	8.50	5,000	3	3,600	0.06	29								
13-Dec-09	8.10	6,300	3	6,200	0.08	45								
13-Jan-10	7.80	6,600	14	5,600	0.05	9	271		497	265	290	1050	30	
09-Feb-10	7.60	9,300	13	5,200	0.05	11								
04-Mar-10	8.70	9,700	1	110	0.16	8								
08-Apr-10	8.70	7,720	4	6,100	0.05	6	315		556	302	318	1210	32	
14-May-10	8.20	7,670	9	5,730	0.05	7								
10-Jun-10	7.50	4,800	8	4,320	0.05	7								
07-Jul-10	8.10	5,610	6	4,390	0.05	3	325		459	237	270	988	23	
25-Aug-10	8.08	6,000	5	4,730	0.05	3								
20-Sep-10	8.15	5,110	5	4,610	0.05		375	2100	478	192	245	887	20	
19-Oct-10	8.31	5,710	2	4,600	0.05									
19-Nov-10	7.94	5,670	6	4,420	0.05									
21-Dec-10	7.89	6,110	<5	4,960	0.05									
14-Jan-11	8.26	6,410	8	4,890	0.05		275	2840	489	286	397	960	29	
22-Feb-11	8.28	5,700	<5	5,500	0.05									
24-Mar-11	8.33	6,560	8	5,530	0.09									
27-Apr-11	8.05	4,960	9	3,650	0.05		200	1640	508	136	179	811	18	
26-May-11	8.10	6,330	23	5,120	0.05									
27-Jun-11	8.03	4,160	6	3,210	0.05									
25-Jul-11	6.83	2,410	22	1,630	0.11		55	848	163	94	87	291	9	
26-Aug-11	8.10	4,750	7	3,710	0.05									
21-Sep-11	8.29	5720	12	4510	0.05									
26-Oct-11	8.5	5360	12	4330	0.05		245	2210	414	224	234	843	25	
22-Nov-11	8.1	5500	12	4670	0.06									
15-Dec-11														No access
25-Jan-12	8.47	5710	10	4950	0.05		307	2330	486	186	259	903	25	
17-Feb-12	7.02	5150	8	4170	0.05									
30-Mar-12	8.27	4070	11	3130	0.05									
27-Apr-12	7.77	3980	8	3490	0.05		122	2010	277	206	205	646	21	
24-May-12	8.12	5310	26	4480	0.05									
27-Jun-12	7.7	4160	12	3460	0.05									
27-Jul-12	7.43	4960	35	4220	0.05		235	2250	440	237	246	857	24	
30-Aug-12	7.95	5770	18	4840	0.05									
25-Sep-12	8.1	6060	50	4340	0.05									
25-Oct-12	8.36	5910	21	4330	0.05		329	2340	561	157	232	953	25	
29-Nov-12	8.31	6750	6	5100	0.05									
20-Dec-12	8.36	6750	18	5290	0.05									
24-Jan-13	8.28	7070	12	5350	0.05		428	2990	648	144	260	1460	22	
25-Feb-13	7.79	2110	68	1420	0.12									
22-Mar-13	8.25	5360	15	3850	0.05									
22-Apr-13	7.75	5200	12	4160	0.05		213	2310	404	182	221	945	25	
17-May-13	8.17	6580	12	5020	0.05									
21-Jun-13	7.99	6230	5	4930	0.05									
24-Jul-13	7.96	5810	6	4320	0.05		131	2580	374	232	201	1030	22	
28-Aug-13	8.24	5940	5	2910	0.05									
17-Sep-13	8.21	7090	10	5690	0.05									
22-Oct-03	8.25	7140	5	5920	0.05		354	3090	569	246	324	1160	31	
14-Nov-13	8.45	6230	5	4730	0.05									
11-Dec-13	8.23	4910	5	3910	0.05									
24-Jan-14	8.32	8200	5		0.05									
20-Feb-14	8.42	5610	23		0.05									
25-Mar-14	8.41	6860	5		0.05									
30-Apr-14	8.45	4130	21	2570	0.05		94	1620	282	155	149	619	18	
28-May-14	7.86	4510	5		0.05									
26-Jun-14	8.1	5940	5		0.05									
28-Jul-14	8.28	5260	9	3730	0.05									
31-Aug-14	7.33	4050	10		0.05									
22-Sep-14	7.5	5400				4.6								
27-Oct-14	7.7	5500	7	4980	0.12	4.7	176	2420	422	266	262	829	26	
21-Nov-14	8	6900				34								
22-Dec-14	8.5	6100				5.7								

Site
WM9 **Lake Kennerson**

Date	pH	Specific Conductance (µS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Iron (mg/l)	Turbidity (NTU)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Comments
24-Sep-09	10.00	3,000	23	1,900	0.05	11								
13-Oct-09	9.90	3,600	8	2,400	0.21	19	38		355	45	131	528	12	
03-Nov-09	9.60	4,500	29	3,200	0.05	31								
13-Dec-09	8.10	6,000	5	5,500	0.05	27								
13-Jan-10	7.70	5,600	18	4,300	0.05	6	355		602	122	257	1100	24	
09-Feb-10	8.30	8,500	14	4,400	0.05	18								
04-Mar-10	8.90	8,800	15	530	0.05	6								
08-Apr-10	9.00	8,830	6	4,700	0.06	20	331		652	110	251	1130	23	
14-May-10	8.10	9,000	6	4,800	0.05	14								
10-Jun-10	7.80	2,190	30	1,800	0.06	48								
07-Jul-10	8.30	2,790	8	1,840	0.05	2	177		237	74	98	488	12	
25-Aug-10														
20-Sep-10	8.36	4,100	2	3,080	0.05		242	1440	373	105	167	648	15	
19-Oct-10	8.64	4,090	2	2,760	0.05									
19-Nov-10	9.15	2,990	3	1,680	0.05									
21-Dec-10	8.44	3,850	5	2,200	0.05									
14-Jan-11	8.59	4,440	7	2,970	0.05		310	983	638	88	132	816	15	
22-Feb-11	8.53	4,820	16	3,770	0.05									
24-Mar-11	8.68	5,070	6	3,690	0.08									
27-Apr-11	8.48	3,600	7	2,350	0.05		244	864	484	56	113	636	13	
26-May-11	8.65	4,730	78	2,790	0.07									
27-Jun-11	8.70	3,060	5	1,890	0.05									
25-Jul-11	8.20	2,770	58	1,640	0.05		186	435	482	50	55	497	7	
26-Aug-11	8.59	3,310	26	1,920	0.05									
21-Sep-11	8.68	4320	5	2900	0.05									
26-Oct-11	8.92	3960	6	2760	0.05		280	1350	419	118	134	673	13	
22-Nov-11	8.73	3250	36	2250	0.10									
15-Dec-11	7.90	2350	48	1370	0.05									
25-Jan-12	8.76	4900	12	4070	0.05		305	1780	575	97	204	852	18	
17-Feb-12	7.34	2389	20	1460	0.05									
30-Mar-12	8.35	2320	18	1410	0.05									
27-Apr-12	8.92	2,140	8	1,430	0.05		169	499	307	59	59	368	9	
24-May-12	8.55	2,910	18	1,810	0.05									
27-Jun-12	8.67	2,510	20	1,580	0.05									
27-Jul-12	8.25	2,620	12	1,630	0.05		224	418	549	50	46	532	8	
30-Aug-12	8.61	3,860	102	2,650	0.05									
25-Sep-12	8.52	4,270	5	2,800	0.05									
25-Oct-12	8.87	3,860	6	2,590	0.05		204	853	623	32	106	722	12	
29-Nov-12	9.2	4,450	6	2,920	0.05									
20-Dec-12	8.63	5,270	103	3,520	0.05									
24-Jan-13	8.39	6,650	8	4,770	0.05		505	2500	672	59	214	1440	16	
25-Feb-13	8.44	5,000	30	3,230	0.05									
22-Mar-13	8.36	4,240	5	3,040	0.05									
22-Apr-13	8.44	4,010	294	2,670	0.05		272	1070	501	80	115	738	13	
17-May-13	8.35	5,090	8	3,560	0.05									
21-Jun-13	8.38	4,460	5	2,770	0.05									
24-Jul-13	8.29	4,800	5	3,320	0.05		384	1430	525	126	159	873	14	
28-Aug-13	8.52	4,270	5	1,820	0.05									
17-Sep-13	8.66	4,640	5	2,910	0.05									
22-Oct-13	8.83	5,470	8	3,740	0.05		256	1880	571	74	225	938	17	
14-Nov-13	9.07	5,710	5	4,030	0.05									
11-Dec-13	8.23	5,370	5	3,760	0.05									
24-Jan-14	8.63	7,520	5		0.05									
20-Feb-14	8.23	4,910	38		0.05									
25-Mar-14	8.27	6,190	6		0.05									
30-Apr-14	8.44	4,070	19	3,000	0.05		365	1610	395	139	178	809	20	
28-May-14	8.51	3,790	5		0.05									
26-Jun-14	8.45	4,290	6		0.05									
28-Jul-14	8.39	5,190	5	3,530	0.05									
31-Aug-14	8.39	5,430	6		0.05									
22-Sep-14	8.4	6,000				3.8								
27-Oct-14	8.3	6,700	4	4,360	0.05	8.6	534	2020	605	85	210	1060	19	
21-Nov-14	8.5	6,000				3.8								
22-Dec-14	8.3	6,300				17								

Site
WM10 Four Mile Creek @ John Renshaw Drive

Date	pH	Specific Conductance (µS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Iron (mg/l)	Turbidity (NTU)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Comments
24-Sep-09	8.50	460			2.33									
13-Oct-09	8.30	440			1.26	66	84		109	10	13	73	7	
03-Nov-09	8.50	380	18	430	2.10	120								
13-Dec-09														Dry
13-Jan-10														Dry
09-Feb-10														Dry
04-Mar-10														Dry
08-Apr-10	8.70	241	17	230	1.28	21	74		29	9	7	31	4	
14-May-10	8.00	255	50	210	0.61	21								
10-Jun-10	7.70	408	14	324	0.69	47								
07-Jul-10	7.80	470	28	262	0.77	16	52		88	12	11	63	5	
25-Aug-10	7.74	512	4	308	0.90	17								
20-Sep-10	7.42	516	5	306	1.07		63	17	109	14	10	72	6	
19-Oct-10	7.47	512	12	268	0.42									
19-Nov-10	7.07	448	13	312	1.21									
21-Dec-10	7.20	505	8	352	2.91									
14-Jan-11	7.13	478	32	294	1.96		73	1	92	9	10	60	8	
22-Feb-11														Dry
24-Mar-11														Dry
27-Apr-11	6.96	258	21	174	0.73		60	21	25	11	7	29	4	
26-May-11	7.03	261	17	251	0.63									
27-Jun-11	7.23	559	16	308	0.62									
25-Jul-11	6.53	401	14	282	0.67		24	23	87	5	8	52	6	
26-Aug-11	7.25	411	8	290	0.86									
21-Sep-11	7.65	527	8	250	1.3									
26-Oct-11	7.32	595	42	362	0.98		56	22	138	14	14	83	7	
22-Nov-11	7.72	446	26	306	2.36									
15-Dec-11	8.29	369	12	268	1.34									
25-Jan-12	7.03	514	10	322	3.55		79	1	100	11	12	64	7	
17-Feb-12	5.68	316	8	272	1.16									
30-Mar-12	7.24	456	6	278	1.28									
27-Apr-12	7.78	375	10	280	1.6		46	14	85	8	10	54	6	
24-May-12	7.6	525	12	202	1.64									
27-Jun-12	7.51	501	18	324	1.22									
27-Jul-12	7.42	352	21	298	1.5		46	15	77	6	9	51	6	
30-Aug-12	6.08	527	11	348	1.86									
25-Sep-12	7.18	432	20	254	0.86									
25-Oct-12	7.92	470	84	302	1.32		72	10	95	10	11	60	8	
29-Nov-12	7.51	4,900	24	3,390	0.05									
20-Dec-12														Dry
24-Jan-13	7.63	428	5	260	1.08		106	10	75	12	12	55	12	
25-Feb-13	6.86	388	41	360										
22-Mar-13	6.94	353	7	268	1.1									
22-Apr-13	7.31	238	92	262	1.13		31	10	41	4	5	39	5	
17-May-13	7.32	274	36	276	1.2									
21-Jun-13	7.22	328	5	244	1.09									
24-Jul-13	6.97	382	10	249	1.24		45	12	70	6	8	49	6	
28-Aug-13	7.24	373	15	258	0.98									
17-Sep-13	7.4	362	14	234	1.1									
22-Oct-13	7.39	475	21	334	2.31		88	10	86	9	10	60	10	
14-Nov-13	6.75	199	6	197	1									
11-Dec-13	6.69	328	5	262	0.95									
24-Jan-14	7.94	465	18		1.52									
20-Feb-14														Dry
25-Mar-14	7.33	187	5		0.46									
30-Apr-14	7.35	168	17	217	1.17		29	11	34	4	4	31	5	
28-May-14	6.39	175	8		0.65									
26-Jun-14	7.14	194	7		0.57									
28-Jul-14	7.01	144	6	188	0.38									
31-Aug-14	7.16	348	7		0.88									
22-Sep-14	7.5	400				38.7								
27-Oct-14	7.2	250	19	207	1.63	32.1	51	10	50	7	6	34	6	
21-Nov-14	7.3	260				37.6								
22-Dec-14	7.2	230				36								

Site WM11 Four Mile Creek U/S New England Highway

Date	pH	Specific Conductance (µS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Iron (mg/l)	Turbidity (NTU)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Comments
24-Sep-09	8.10	3,100	8	2,100	0.23	14								
13-Oct-09	7.40	3,500	24	2,700	0.10	16	166		240	139	136	452	17	
03-Nov-09	8.10	4,400	33	3,200	0.10	17								
13-Dec-09	7.30	3,100	55	3,500	0.05	27								
13-Jan-10	6.50	530	18	370	0.38	11	146		63	22	18	81	6	
09-Feb-10	6.10	320	45	310	0.33	10								
04-Mar-10	8.40	550	16	4,500	0.05	15								
08-Apr-10	8.60	356	10	260	0.32	18	76		49	16	10	48	4	
14-May-10	8.20	818	27	202	0.08	117								
10-Jun-10	6.60	721	21	476	0.18	30								
07-Jul-10	7.80	2,840	10	2,050	0.05	8	114		203	110	113	438	13	
25-Aug-10	6.59	3,240	6	2,430	0.05	8								
20-Sep-10	7.59	3,860	5	3,020	0.05		145	1590	264	168	163	509	16	
19-Oct-10	7.43	712	8	402	0.11									
19-Nov-10	7.70	3,630	12	2,410	0.13									
21-Dec-10	7.60	3,080	5	2,200	0.20									
14-Jan-11	7.70	5,420	11	4,030	0.05		284	2330	472	217	231	843	23	
22-Feb-11	7.68	4,530	<5	3,840	0.07									
24-Mar-11	7.86	5,040	6	3,750	0.06									
27-Apr-11	7.18	671	14	432	0.26		89	109	72	17	18	89	4	
26-May-11	8.02	5,710	16	4,470	0.05									
27-Jun-11	7.47	2,690	16	1,920	0.08									
25-Jul-11	7.69	2,510	41	1,580	0.14		138	586	299	61	65	388	9	
26-Aug-11	7.26	2,580	30	1,880	0.10									
21-Sep-11	8.17	3560	10	2630	0.05									
26-Oct-11	7.90	890	22	524	0.15		51	184	125	23	23	126	5	
22-Nov-11	7.92	1243	32	832	0.32									
15-Dec-11	8.14	3160	40	2180	0.05									
25-Jan-12	8.29	4950	24	4050	0.08		318	1910	546	115	209	841	19	
17-Feb-12	6.98	1428	24	1140	0.72									
30-Mar-12	8.04	3430	16	2390	0.05									
27-Apr-12	7.74	3000	15	1490	0.21		133	1190	244	133	138	438	16	
24-May-12	7.72	2650	24	1880	0.18									
27-Jun-12	8.12	4680	42	3570	0.05									
27-Jul-12	7.23	3040	25	2250	0.07		228	938	400	105	120	525	12	
30-Aug-12	6.48	1,043	25	724	0.27									
25-Sep-12	7.94	4,240	14	2,900	0.06									
25-Oct-12	7.52	1,706	32	1,000	0.18		163	332	222	40	52	257	9	
29-Nov-12	7.90	4,580	19	3,000	0.05									
20-Dec-12	8.18	5,020	12	3,510	0.07									
24-Jan-13	7.78	2,940	34	1,970	0.18		242	825	301	82	103	475	13	
25-Feb-13	7.80	2,530	47	1,580	0.14									
22-Mar-13	7.72	4,150	8	3,070	0.05									
22-Apr-13	8.24	4,120	30	2,880	0.05		275	1310	415	104	149	716	15	
17-May-13	7.92	3,370	14	2,510	0.06									
21-Jun-13	8.06	2,480	5	1,610	0.05									
24-Jul-13	7.78	2,710	5	1,920	0.08		107	1020	205	109	116	386	12	
28-Aug-13	7.86	1,960	5	1,270	0.09									
17-Sep-13	7.75	1,710	7	1,040	0.12									
22-Oct-13	7.86	2,420	6	1,500	0.06		247	537	297	46	67	141	10	
14-Nov-13	7.84	5,270	15	3,570	0.06									
11-Dec-13	7.48	3,790	17	2,730	0.06									
24-Jan-14	7.65	8,070	5		0.27									
20-Feb-14	6.74	1,582	22		0.09									
25-Mar-14	7.82	2,830	43		0.37									
30-Apr-14	8.01	3,970	14	2,960	0.05		328	1610	379	154	176	757	19	
28-May-14	7.61	880	8		0.09									
26-Jun-14	7.98	2,840	6		0.05									
28-Jul-14	8.41	4,890	5	3,990	0.05									
31-Aug-14	7.75	2,551	13		0.07									
22-Sep-14	6.90	4,050				15.7								
27-Oct-14	7.90	2,650	9	1,700	0.06	14.2	237	756	259	49	76	398	9	
21-Nov-14	7.20	1,300				73								
22-Dec-14	8.00	3,950				14.5								

Site
WM12 Shamrock Creek / Four Mile Creek Junction

Date	pH	Specific Conductance (µS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Iron (mg/l)	Turbidity (NTU)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Comments
24-Sep-09	8.00	2,800	16	1,800	0.74	52								
13-Oct-09	7.10	3,500	16	2,500	0.22	20	193		217	139	139	448	17	
03-Nov-09	8.30	6,200	2	5,200	<0.05	5								
13-Dec-09	7.30	550	64	300	<0.05	10								
13-Jan-10	6.10	310	6	190	0.30	16	90		39	13	8	32	4	
09-Feb-10	5.50	230	22	150	0.29	58								
04-Mar-10														
08-Apr-10	8.70	276	10	190	0.19	21	55		37	16	8	27	3	
14-May-10	7.50	200	6	171	0.07	9								
10-Jun-10	7.10	1,560	36	1,380	0.09	44								
07-Jul-10	7.70	2,750	16	1,960	0.09	17	110		194	111	110	414	13	
25-Aug-10	7.54	3,150	10	2,360	<0.05	20								
20-Sep-10	7.58	2,650	8	1,970	0.14		106	1050	183	116	111	364	12	
19-Oct-10	7.40	1,520	8	936	0.07									
19-Nov-10	7.86	4,370	30	3,080	0.06									
21-Dec-10	7.67	3,920	10	3,010	0.55									
14-Jan-11	7.78	5,840	12	4,420	<0.05		252	2230	462	245	244	813	26	
22-Feb-11	7.91	4,680	12	3,720	<0.05									
24-Mar-11	8.07	5,060	16	3,670	0.07									
27-Apr-11	7.41	420	26	304	0.43		66	66	44	14	11	51	3	
26-May-11	8.24	5,690	24	3,980	<0.05									
27-Jun-11	7.49	3,390	16	2,640	<0.05									
25-Jul-11	7.81	2,800	44	1,860	0.13		160	702	327	75	77	434	10	
26-Aug-11	7.62	2,130	22	1,510	0.17									
21-Sep-11	7.14	1,943	16	1,230	0.05									
26-Oct-11	8.17	774	134	502	0.33		43	189	86	25	25	93	5	
22-Nov-11	8.13	2,341	58	1,630	0.18									
15-Dec-11	8.12	3,440	30	2,420	0.05									
25-Jan-12	8.17	4,940	12	4,050	0.05		333	1910	527	116	216	843	19	
17-Feb-12	6.62	1,582	18	1,200	0.7									
30-Mar-12	8.03	4,510	18	3,470	0.05									
27-Apr-12	7.76	3,300	18	2,700	0.3		147	1580	254	166	171	532	18	
24-May-12	7.66	1,066	63	684	0.62									
27-Jun-12	8	4,860	32	3,800	0.14									
27-Jul-12	6.48	2,180	43	2,270	0.25		104	824	232	91	95	331	10	
30-Aug-12	6.83	1,029	62	712	0.26									
25-Sep-12	7.92	2,930	22	1,910	0.05									
25-Oct-12	7.57	728	145	446	0.15		92	138	89	21	22	98	5	
29-Nov-12	7.95	4,950	24	3,270	0.05									
20-Dec-12	6.4	4,480	12	3,040	0.05									
24-Jan-13														Dry
25-Feb-13														No Access
22-Mar-13	7.69	3,430	6	2,530	0.17									
22-Apr-13														No access
17-May-13														No access
21-Jun-13														No access
24-Jul-13	7.87	3,280	19	2,530	0.12		124	1350	228	144	151	477	15	
28-Aug-13	7.74	1,040	5	669	0.29									
17-Sep-13														Dry
22-Oct-13	7.75	1,370	5	742	0.06		160	270	152	25	34	217	6	
14-Nov-13	7.98	5,140	7	3,700	0.05									
11-Dec-13	7.44	1,830	6	1,250	0.13									
24-Jan-14	8.2	8,260	8		0.05									
20-Feb-14	8.42	4,170	29		0.05									
25-Mar-14	7.95	3,910	5		0.06									
30-Apr-14	7.85	4,390	10	3,250	0.05		306	2000	397	199	210	817	22	
28-May-14	7.34	1,752	6		0.11									
26-Jun-14	8	2,790	5		0.05									
28-Jul-14	8.44	5,000	18	3,660	0.05									
31-Aug-14	7.6	2,570	15		0.12									
22-Sep-14	7.3	5,030				8.1								
27-Oct-14	7.6	1,200	9	778	0.76	13.8	124	340	122	26	35	175	5	
21-Nov-14	7.4	1,000				8.8								
22-Dec-14	8	2,640				6.8								

Site
WM13 Buttai Ceek @ Buchanan Road

Date	pH	Specific Conductance (µS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Iron (mg/l)	Turbidity (NTU)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Comments
20-Sep-10	7.33	556	5	378	1.54		56	28	120	10	12	81	7	
19-Oct-10	7.36	603	4	320	0.81									
19-Nov-10	6.75	359	13	260	2.17									
21-Dec-10	7.36	525	5	338	2.00									
14-Jan-11	7.17	542	5	320	1.05		86	14	101	11	12	74	5	
22-Feb-11	7.38	495	5	480	0.62									
24-Mar-11	7.63	594	10	416	0.39									
27-Apr-11	6.07	1100	24	766	0.05		5	378	76	39	44	118	8	
26-May-11	6.59	1110	22	880	0.05									
27-Jun-11	7.02	826	10	518	0.28									
25-Jul-11	6.39	413	22	302	0.57		17	35	83	6	8	54	5	
26-Aug-11	7.01	593	35	372	0.76									
21-Sep-11	7.19	868	24	490	0.34									
26-Oct-11	7.84	949	21	554	0.48		55	44	237	15	22	145	6	
22-Nov-11	7.47	1,323	27	860	0.37									
15-Dec-11	8.46	386	74	380	1.03									
25-Jan-12	7.82	906	36	612	0.52		83	113	170	18	24	137	6	
17-Feb-12	6.37	291	50	339	1.06									
30-Mar-12	7.42	966	40	548	0.13									
27-Apr-12	7.3	459	26	384	1.2		51	41	96	11	13	69	5	
24-May-12	7.39	1,044	37	550	0.3									
27-Jun-12	7.44	882	32	526	0.78									
27-Jul-12	6.36	575	50	591	0.78		43	42	150	13	16	85	5	
30-Aug-12	6.89	135	37	788	0.19									
25-Sep-12														Dry
25-Oct-12	7.58	1,573	18	844	0.05		105	91	408	27	37	242	9	
29-Nov-12														Dry
20-Dec-12														Dry
24-Jan-13														Dry
25-Feb-13	6.94	475	35	358	0.62									
22-Mar-13	7.21	1,010	5	574	0.48									
22-Apr-13	6.78	1,600	14	1,020	0.25		22	407	253	51	48	248	11	
17-May-13	7.38	907	38	540	0.05									
21-Jun-13	7.24	1,120	6	646	0.16									
24-Jul-13	7.28	727	11	417	0.46		54	45	151	11	15	105	6	
28-Aug-13	7.53	869	5	443	0.11									
17-Sep-13	7.59	930	6	469	0.06									
22-Oct-13	7.53	1,080	8	541	0.05		74	74	218	19	23	155	9	
14-Nov-13	7.39	1,100	15	577	0.05									
11-Dec-13	6.81	599	18	364	0.56									
24-Jan-14	8.05	941	30		0.05									
20-Feb-14	8.35	957	22		0.05									
25-Mar-14	7.59	849	12		0.05									
30-Apr-14	6.89	282	6	204	0.91		33	21	66	4	6	55	7	
28-May-14	6.63	472	5		0.93									
26-Jun-14	7.65	475	5		0.3									
28-Jul-14	7.32	580	5	384	0.11									
31-Aug-14	7.57	352	13		0.73									
22-Sep-14	7.7	570				41.8								
27-Oct-14	7.4	560	60	337	1.33	15.9	69	10	116	9	12	74	8	
21-Nov-14	7.6	660				18.6								
22-Dec-14	7.5	690				16.4								

Table B1 - Discharge Monitoring Results 2014

DATE	pH	TOTAL SUSPENDED SOLIDS (mg/l)	TOTAL DISSOLVED SOLIDS (mg/l)	SPECIFIC CONDUCTANCE (uS/cm)	IRON (mg/l)	DISCHARGE VOLUME (ML/day)
25-Jan-14	8.1	12	4,640	5,120	<0.05	40
16-Feb-14	8.0	7	4,550	5,820	<0.05	40
17-Feb-14	8.2	6	4,206	5,650	<0.05	40
20-Feb-14	8.2	8	4,380	5,820	<0.05	40
28-Feb-14	8.2	16	3,960	5,140	<0.05	40
01-Mar-14	8.2	13	4,160	5,500	<0.05	20
27-Mar-14	8.1	10	4,310	5,750	<0.05	40
29-Mar-14	8.1	16	4,020	5,460	<0.05	20
01-Apr-14	8.2	23	3,610	5,060	<0.05	10
05-Apr-14	8.2	23	4,020	5,360	<0.05	20
06-Apr-14	8.2	24	3,620	4,960	<0.05	20
25-Apr-14	8.1	6	4,380	5,790	<0.05	40
26-Apr-14	8.2	9	4,200	5,530	<0.05	40
27-Apr-14	8.3	10	3,930	5,220	<0.05	5
30-May-14	8.1	6	4,550	5,690	<0.05	40
31-May-14	8.2	3	4,410	5,690	<0.05	40
02-Jun-14	8.4	6	3,500	4,890	<0.05	40
03-Jun-14	8.4	11	2,550	3,860	<0.05	20
04-Jun-14	8.4	16	2,630	3,920	<0.05	5
10-Jun-14	8.2	6	4,340	5,880	<0.05	10
26-Jul-14	7.9	3	4,040	5,820	<0.05	40
27-Jul-14	7.8	4	4,280	5,970	<0.05	40
17-Aug-14	8.2	3	4,200	5,780	<0.05	40
18-Aug-14	8.4	2	3,630	5,640	<0.05	40
19-Aug-14	8.5	4	3,940	5,370	<0.05	20
20-Aug-14	8.0	10	3,860	5,360	<0.05	20
21-Aug-14	8.0	12	3,580	4,750	<0.05	10
27-Aug-14	8.2	13	4,370	5,820	<0.05	20
28-Aug-14	8.2	12	3,700	4,960	<0.05	20
29-Aug-14	8.3	16	3,470	4,740	<0.05	10
14-Oct-14	8.3	2	4,400	5,620	<0.05	40
15-Oct-14	8.2	1	4,330	5,560	<0.05	40
16-Oct-14	8.1	1	4,070	5,650	<0.05	30
17-Oct-14	8.4	1	4,050	5,710	<0.05	10
12-Dec-14	8.4	3	4,010	5,700	<0.05	40
Max	8.5	24	4,640	5,970	<0.05	40
Min	7.8	1	2,550	3,860	<0.05	5
Average	8.2	9	3,997	5,387	<0.05	28

Wednesday, May 21, 2014

Regional Manager, Hunter
Environment Protection Authority
PO Box 488G,
NEWCASTLE, NSW 2300.

Attention: - Bill George ,Rebecca Akhurst



PO Box 4
East Maitland NSW 2323

Four Mile Creek Road
Ashtonfield NSW 2323
AUSTRALIA

TEL +61 2 4930 2600
FAX +61 2 4933 8940

Dear Bill,

Report of Incident to Pollution Line - 10.20 am Thursday 8th May
Reference: - C07411-2014.
Bloomfield Collieries Pty Limited – License No: - 396.
Request for incident report – email Wednesday 14th May.

In relation to the incident reported to the Pollution line at 10.20 am on Thursday 8th May, the following investigation report is submitted.

The report followed an internal investigation into the incident as a requirement of the management systems in place for the operation.

If you require any further information or wish to discuss any aspect of the report please do not hesitate contact me.

Yours faithfully

John Hindmarsh
Senior Environmental Officer
Rix's Creek Pty. Limited

(02) 65788806 (02) 65711066 0427 436285
E-mail jhindmarsh@rixs.com.au

Bloomfield Mining Operations

Significant Incident Investigation

Bloomfield Collieries – Mine Water Release

8th May 2014

INVESTIGATION TEAM

Brendon Clements	Mine Manager
Renata Roberts	Group Manager Human Resources & Systems
John Hindmarsh	Senior Environmental Officer
Daniel Wong	Human Resources & Safety
Greg Lamb	Environmental Officer

COPIES TO

John Richards	Environmental Protection Authority (EPA)
Renata Roberts	Dept. Planning & Environment
Brendon Clements	NSW Trade & Investment, Resources & Energy
John Hindmarsh	
Daniel Wong (File)	
Greg Lamb	

INCIDENT DESCRIPTION

On 8th May at approximately 9am, Mine Surveyor - Jeff Dunn, noted that there was water running alongside the recycled water pipe line from the tailings dam and was potentially discharging off site into Four Mile Creek. The pump was shut down and the pipe inspected. A 4cm split was found at the bottom of the pipe.

Water from the leak in the pipeline ran into the drainage line known as Elwells Creek and possibly into Four Mile Creek and off site.

This incident was reported to the EPA Pollution Line at 10.20 am on Thursday 8th May 2014. The report was logged and Reference Number: - C136793 issued.

INCIDENT OUTCOME

- ☐ The released water did not have any measured effect on background salinity levels at the logger point (5 - Four Mile Ck Logger Site (WM11)) in Four Mile Creek.
- ☐ There was no visible damage observed to have occurred to Elwells Creek or Four Mile Creek.
- ☐ Water samples were taken from Elwells Creek, Four Mile Creek and of the recycle water on Thursday 8th May 2014.
- ☐ The sample results are provided in Table 1.

Bloomfield Mining Operations

Significant Incident Investigation

Bloomfield Collieries – Mine Water Release

8th May 2014

Table 1:

Note: Locations shown in Figure 1

Location	Date	pH	Electrical Conductivity (uS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)
1 - Flow below Leak	8/05/2014 10:42	7.5	5,680	1	4,710
2 – Below Junction of Elwells Ck & Four Mile Ck (WM3)	8/05/2014 10:46	7.4	2,100	13	1,490
3 - Recycle Water Pump	8/05/2014 10:58	8.1	5,700	5	4,660
4 - Leak Site	8/05/2014 11:42	8	5,640	6	4,660
5 - Four Mile Ck Logger Site (WM11)	8/05/2014 11:22	7.8	3,900	7	3,190
6 - Up Stream of leak Elwells Ck	8/05/2014 11:42	8	296	17	195
7 - Possum's Puddle Dam (WM7)	8/05/2014 11:48	7.8	174	3	126

Bloomfield Mining Operations

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Bloomfield Collieries – Mine Water Release

8th May 2014



Figure 1: Location Diagram.

- ☐ Four Mile Creek was flushed with clean water from Possum's Puddle Dam located upstream of the release on Four Mile Creek to negate any possible impact of the recycle water leak into the Creek. Field samples taken from Four Mile Creek after flushing on Friday 9th May 2014 are tabulated In Table 2.
- ☐ Possums Puddle Dam is a clean water dam located on Four Mile Creek and is not part of the mine water system.

Table 2:

Location	Date	pH	Electrical Conductivity (uS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)
2 – Below Junction of Elwells Ck & Four Mile Ck (WM3)	9/05/2014 12:36	7.8	667	63	438
7 - Possum's Puddle Dam (WM7)	9/05/2014 12:06	7.6	177	3	136
5 - Four Mile Ck Logger Site (WM11)	9/05/2014 10:46	8.0	3,760	5	3,090

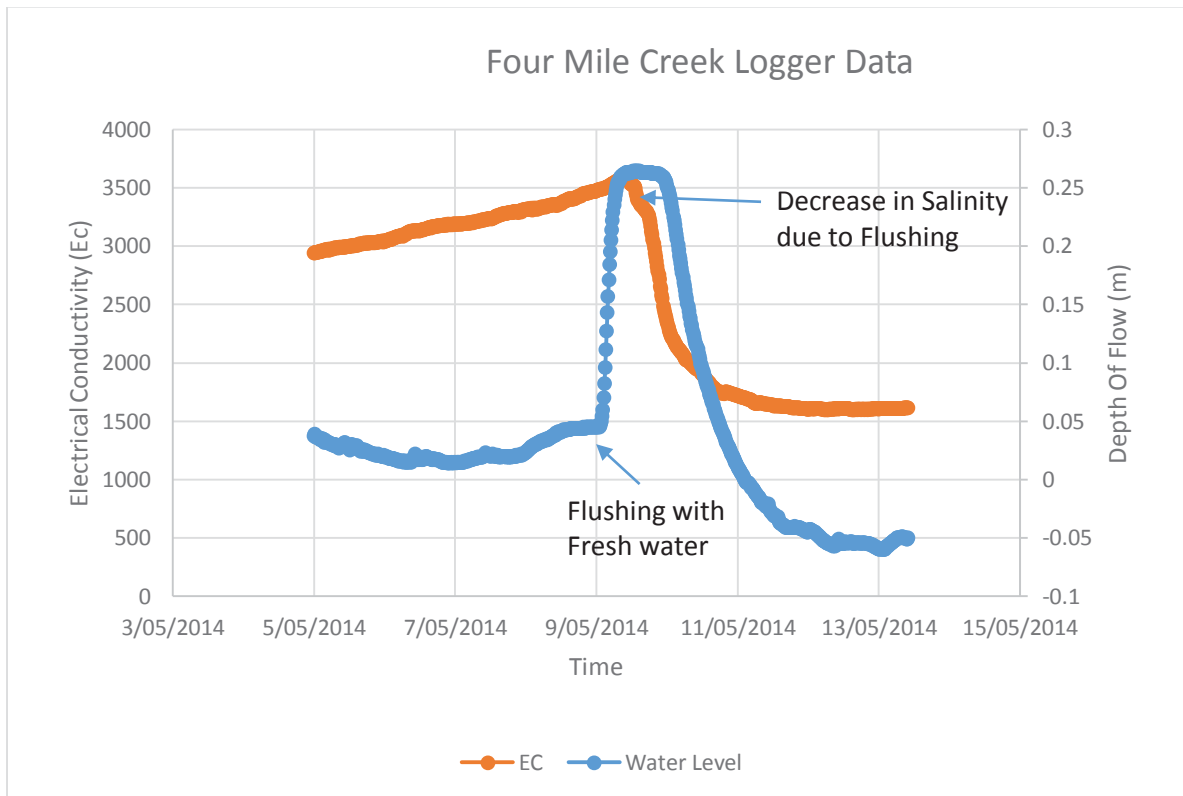
Bloomfield Mining Operations

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Bloomfield Collieries – Mine Water Release

8th May 2014

- ❑ Monitoring results indicate the release of recycle water had no detectable impact on water quality in Four Mile Creek. See Graph 1 below.



Graph 1 – Four Mile Creek Logger Data

EVENTS RELATED TO THE INCIDENT

- ❑ An old original metal pipeline that was prone to rust was replaced with a poly welded pipeline. Poly welded pipe pose a lower risk of failure and is installed for the following reasons:-
 - High-density polyethylene pipe (poly pipe) is used instead of other materials eg. Metal. Because poly pipe has the advantages of reliability, durability and versatility through toughness and corrosion resistance. Pumping saline mine water corrosion resistance is very important. Poly pipe is taken to have a design life of 50 years to comply with AS/NZS4130. Making poly pipe ideally suited for this application.
- ❑ It is not known when poly welded pipeline was installed. Approximately 10-15 years ago.
- ❑ The poly welded pipe was not new when installed.
- ❑ The section of pipe where leak occurred was PM8 rating and part of an approximately 100m length of PM8 pipe.
- ❑ Air valve installed at high point in line at road crossing approximately 5 years ago.
- ❑ The leak from the recycle water pipeline was detected approximately 9.00 am Thursday 8th May 2014 and the pump turned off.

Bloomfield Mining Operations

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Bloomfield Collieries – Mine Water Release

8th May 2014

- ❑ The leak occurred after Tuesday 6th May at 1.30pm as Jeff Dunn was in the same area and did not notice any water running down alongside the pipe.
- ❑ The leak resulted from a split approximately 4 cm in length on the bottom side of the pipe. See Photograph 1.



Photograph 1: Split in Pipe.

- ❑ It is unknown how much recycled water discharged. It is estimated the flow from the split was approximately 5 litres per second.
- ❑ The amount of recycle water estimated to have been released from split in pipe is between 450-700 cubic metres. The 700 m³ is a worse case figure calculated back to when Jeff Dunn inspected the area on Tuesday 6th May 2014 when no water was running.
- ❑ There was no detectable impact on Four Mile Creek water quality as shown from the logger situated at sample Site 5 in Figure 1 and shown in Graph 1.
- ❑ A previous split in the pipe occurred some 3-4 years earlier adjacent to the current leak. An employee who started the pump on return noticed the spray in the air and immediately shut the pump down and repaired the leak using a metal stainless steel clamp (See Photograph 2). No recycle water reached Elwells Creek.
- ❑ The entire 6 m length of pipe is to be replaced with PM 10 rating poly pipe when repaired.

Bloomfield Mining Operations Significant Incident Investigation

Bloomfield Collieries – Mine Water Release

8th May 2014



Photograph 2: Previous Repair Clamp & Hole Caused by Leak

- ❑ It should be noted that under EPL 396 Bloomfield is permitted to discharge mine water after certain rainfall events. Table 3 below shows the discharge pollutant limits along with sample results taken at the water source and from the water leak site. It demonstrates that the water released would have met EPL 396 quality limits had a rainfall event allowed a discharge.

Table 3:

Pollutant	EPL Limit	Return Water Source (Site 3)	Pipe Leak Site (Site 4)
EC (u/s)	6,000	5,680	5,640
pH	6.5 – 8.5	7.5	7.9
TSS (mg/L)	30	1	6
Filterable Fe (mg/L)	1	<0.05	-

Bloomfield Mining Operations

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Bloomfield Collieries – Mine Water Release

8th May 2014

INVESTIGATION CONCLUSIONS

The incident was investigated and the following conclusions drawn:

- ☐ The pipe split sometime between 6th May 1.30pm and 7th May 1.45pm, causing a leak of recycled water and a possible discharge into Four Mile Creek.
 - ☐ The pipe was PN8 grade and second hand when installed some years ago.
 - ☐ There was no air valve installed until only five years ago, possibly resulting in the distortion of the pipe when filling and draining weakening the wall.
 - ☐ No evidence that the release water reached or had an impact on water quality in Four Mile Creek from sample results.
 - ☐ As a precaution immediately after discovery of the leak clean water was pumped into Four Mile Creek to flush the creek and negate any possible impact.
 - ☐ Sample results have demonstrated that the recycle water released would have met EPL 396 quality limits had a rainfall event allowed an approved discharge.
-

FOLLOW-UP

- ☐ Replace the pipe and the entire remaining PN8 quality pipe with PN10 where practical.
 - ☐ Conduct a review of all pipes and ensure that those with a higher risk ranking have sensors at each end of the pipe with appropriate warning systems installed. Small size of leak may not have been detected by flow monitoring sensors. Also consider if these pipes should be buried in the event of a bush fire.
 - ☐ Have the areas around the pipe maintained and sprayed to assist with visibility (if decision is not to bury the pipes as above).
 - ☐ It was noted that the air valve was leaking as well. Move the position of the valve to the opposite side of the road so if there is a leakage it goes into the tailings and doesn't discharge off site.
 - ☐ Review the location of the pipe to investigate the opportunity to include the pipe in formal inspection.
 - ☐ Investigate the option of automatic shut downs with the warning systems to avoid manual error.
-

APPENDIX C

GROUNDWATER MONITORING RESULTS

Buttai Reservoir

[illegible]

Bore
PD2.2

Buttai Reservoir

[illegible]

Shamrock Lane

[illegible]

Bore
PD4.1

Product Stockpile Pad

[illegible]

Product Stockpile Pad

[illegible]

Bore
PD7.1

South Cut Boundary

Date	RL	Depth (m)	pH	EC (uS/cm)	TDS (mg/L)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Iron (mg/L)	Comments
20-Sep-10	17.13	10.37	6.71	4620										
19-Oct-10	16.94	10.56	6.57	4760	2640	418	477	1020	160	124	731	14	8.66	
14-Jan-11	16.78	10.72												No sample
27-Apr-11														No access
25-Jul-11														No access
26-Oct-11														No access
25-Jan-12	17.65	9.85	6.67	3020	1720	508	99	693	73	69	455	14	0.74	
27-Apr-12	19.08	8.42	5.71	2670	1850	30	434	571	75	77	408	11	13.9	
27-Jul-12	20.14	7.36	4.84	4840	1540	2	290	741	40	58	415	10	22.7	
31-Oct-12	17.48	10.02	6.44	3560	2340	211	507	848	132	110	587	14	32	
24-Jan-13	17.11	10.39	6.86	3620	2340	234	559	756	125	104	557	14	13.4	
22-Apr-13	19.52	7.98	5.15	1754	1210	7	243	446	25	36	340	7	0.27	
24-Jul-13	17.96	9.54	6.18	2220	1240	74	289	475	45	46	376	9	1.91	
28-Oct-13	17.31	10.19	6.32	7120	4680	95	444	1810	208	217	904	21	28.1	
02-May-14	17.36	10.14	5.87	12000										
29-Nov-14	17.05	10.45	6.5	8650	6420	187	562	2870	237	270	1130	19	31.3	

APPENDIX D

BLAST MONITORING RESULTS

BLAST RESULTS 2014

EPL No. 396
Licencee: Bloomfield Collieries Pty Ltd
Premises: Bloomfield Colliery
 Four Mile Creek Rd
 Astonfield NSW 2323

Monitoring Frequency: Every blast
Airblast Overpressure Limit: 120 dB(Lin Peak)
Ground Vibration Limit: 10 mm/s



Shot No.		Date & Time	Blast Monitor Location											
			Elliot's Residence			McNaughton's Residence			Mt Vincent Rd Residence			Richards Residence		
			Vibration (mm/s)	Airblast (dB)	Distance	Vibration (mm/s)	Airblast (dB)	Distance	Vibration (mm/s)	Airblast (dB)	Distance	Vibration (mm/s)	Airblast (dB)	Distance
6461		10/01/2014 9.56am	1.17	107.40	812	0.30	98.70	1657	0.28	85.00	3258	0.38	101.20	1994
6462		13/01/2014 11.07am	DNR	DNR	1774	DNR	DNR	1804	0.10	104.40	2552	0.07	104.80	2784
6463		16/01/2014 1.02pm	DNR	DNR	1842	DNR	DNR	1996	0.09	94.90	2365	0.09	97.30	2615
6464		20/01/2014 12.50pm	DNR	DNR	1989	DNR	DNR	2164	0.09	99.10	2196	0.09	98.60	2603
6465		23/01/2014 12.17pm	DNR	DNR	1837	DNR	DNR	1953	0.07	100.90	2404	0.08	99.60	2671
6466		28/01/2014 11.11am	DNR	DNR	1978	DNR	DNR	2148	0.14	97.90	2212	0.09	105.10	2608
6467		29/01/2014 9.56am	0.35	106.50	1123	0.36	101.10	1848	0.11	86.90	2943	0.36	99.60	1920
6468		4/02/2014 9.43am	DNR	DNR	891	DNR	DNR	1884	0.03	109.2	3297	Fault*		1741
6469		13/02/2014 12.31pm	0.37	99.8	1976	0.24	104.4	2217	0.11	95.8	2158	0.12	97	2492
6470		14/02/2014 9.58am	0.46	104.8	1783	0.37	104.4	1823	0.17	100.5	2532	0.18	104.2	2771
6471		14/02/2014 12.33pm	DNR	DNR	1933	DNR	DNR	2102	0.14	84.2	2259	0.13	89.7	2603
6472		19/02/2014 11.56am	0.2	99	1891	0.32	98.3	2081	0.1	92.8	2285	0.11	88.9	2565
6473		21/02/2014 11.15am	DNR	DNR	1891	DNR	DNR	2081	0.12	95.7	2285	0.13	94.1	2565
6474		25/02/2014 12.37pm	0.44	101.7	1783	0.48	104.9	1823	0.22	103.2	2532	0.16	96.9	2771
6475		27/02/2014 9.29am	0.26	99.1	1891	0.29	101.5	2081	0.17	103.4	2285	0.16	97.7	2565
6476		27/02/2014 12.04pm	DNR	DNR	1891	DNR	DNR	2081	0.07	94.1	2285	0.09	96.8	2565
6477		4/03/2014 11.48am	4.59	107.3	813	0.7	98.7	1550	0.21	102.2	3240	0.37	105.7	2125
6478		5/03/2014 12.35pm	1.64	104	1018	0.56	100.1	1783	0.59	93.3	3050	0.47	93.6	1935
6479		6/03/2014 12.36pm	5.67	103.2	813	0.7	99.7	1550	0.17	91.4	3240	0.46	101.2	2125
6480		7/03/2014 11.33am	2.07	102.9	942	0.6	98.5	1644	0.18	96.4	3111	0.47	103.4	2074
6481		10/03/2014 1.35pm	1.16	100.7	1036	0.3	92.9	1776	0.22	87.8	3026	0.28	101.7	1958
6482		12/03/2014 11.52am	3.63	103.2	1036	0.44	103.3	1776	0.15	82.7	3026	0.46	93.4	1958
6483		13/03/2014 12.55pm	3.78	101.3	1036	1.03	100.3	1776	0.27	93.1	3026	0.55	106.6	1958
6484		17/03/2014 1.26pm	2.46	105.5	857	0.44	99.2	1652	0.05	90.2	3204	0.36	96.1	2019
6485		19/03/2014 12.20pm	Fault*		768	0.87	97.9	1611	0.2	88.8	3296	0.45	101.2	2034
6486		21/03/2014 12.53pm	2.66	103.5	887	0.49	99.2	1727	0.19	88.6	3191	0.43	100.5	1937
6487		28/03/2014 12.53pm	7.18	101.3	743	0.87	99.9	1639	0.2	86.1	3336	0.5	92.8	1994
6488		14/04/2014 10.14pm	DNR	DNR	1064	DNR	DNR	1732	0.05	90.5	2990	0.09	95.7	2039
6489		16/04/2014 11.42am	1.34	96	1775	1.1	93.9	1777	0.02	83	2580	0.6	92.9	2821
6490		29/04/2014 12.39pm	DNR	DNR	1064	DNR	DNR	1732	DNR	DNR	2990	0.42	90.3	2039
6491		1/05/2014 12.41pm	1.05	98.5	1956	1.5	100.9	2092	0.72	97.6	2265	0.61	94.9	2659
6492		6/05/2014 11.21am	1.01	98.5	1956	0.97	103.1	2092	0.49	92.2	2265	0.85	91.2	2659
6493		9/05/2014 11.50am	1.35	98.3	1863	1.31	101.3	1979	0.94	92.4	2378	1.02	85.8	2675

BLAST RESULTS 2014

EPL No. 396
Licencee: Bloomfield Collieries Pty Ltd
Premises: Bloomfield Colliery
 Four Mile Creek Rd
 Astonfield NSW 2323

Monitoring Frequency: Every blast
Airblast Overpressure Limit: 120 dB(Lin Peak)
Ground Vibration Limit: 10 mm/s



Shot No.		Date & Time		Blast Monitor Location											
				Elliot's Residence			McNaughton's Residence			Mt Vincent Rd Residence			Richards Residence		
				Vibration (mm/s)	Airblast (dB)	Distance	Vibration (mm/s)	Airblast (dB)	Distance	Vibration (mm/s)	Airblast (dB)	Distance	Vibration (mm/s)	Airblast (dB)	Distance
6494		13/05/2014	1.00pm	0.81	98.8	1994	1.13	98.2	2141	0.67	86.1	2215	0.68	91.5	2647
6495		15/05/2014	1.43pm	1.26	99.6	1829	0.93	101.8	1994	0.68	88.9	2369	0.67	91.8	2598
6496		21/05/2014	12.04pm	0.9	111.1	1864	0.99	110.2	2057	0.57	101.4	2310	0.9	101	2557
6497		26/05/2014	1.34pm	DNR	DNR	1050	DNR	DNR	1995	0.02	83.1	3140	0.03	97.5	1656
6498		29/05/2014	12.22pm	DNR	DNR	959	DNR	DNR	1878	0.02	96.9	3181	0.06	99.1	1772
6499		5/06/2014	12.54pm	DNR	DNR	968	DNR	DNR	1898	0.03	99.8	3184	NRA	NRA	1749
6500		18/06/2014	11.30am	1.06	103.4	778	0.29	100.7	1499	0.08	86.3	3276	0.06	86.9	2170
6501		19/06/2014	1.25pm	1.04	105.5	758	0.15	99.4	1524	0.06	86.9	3295	0.1	97.1	2134
6502		2/07/2014	1.33pm	0.96	103.7	882	0.16	102.8	1642	0.08	88.7	3175	0.16	94.9	2044
6503		7/07/2014	1.51pm	0.81	106.9	822	0.16	106.8	1672	0.03	97	3251	0.06	80.3	1979
6504		14/07/2014	12.29pm	0.54	106.4	1005	0.23	101.1	1762	0.08	91.1	3059	0.15	97.5	1956
6505		21/07/2014	1.01pm	0.41	102.2	1179	0.27	101.5	1759	0.17	92.8	2875	0.2	102.7	2099
6506		23/07/2014	1.50pm	0.69	107.3	1052	0.17	100.3	1935	0.05	88.5	3082	0.08	105.2	1743
6507		23/07/2014	2.05pm	DNR	DNR	713	DNR	DNR	1478	0.02	89.1	3340	0.07	109.4	2172
6508		28/07/2014	1.05pm	DNR	DNR	1772	DNR	DNR	1814	0.03	90.4	2541	0.04	95.6	2767
6509		4/08/2014	1.50pm	0.51	104.1	920	0.19	101.8	1632	0.05	84.1	3133	0.12	99	2076
6510		7/08/2014	1.48pm	1.91	108.2	778	0.27	106	1556	0.09	92.7	3276	0.16	103.9	2103
6511		8/08/2014	12.05pm	0.36	105.9	778	0.12	101.8	1556	0.06	89.1	3276	0.09	97.3	2103
6512		21/08/2014	12.44pm	0.92	106.4	919	0.3	108.7	1667	0.1	100	3138	0.13	107	2030
6513		1/09/2014	12.32pm	0.35	108.2	808	0.05	109.3	1666	0.09	90.8	3266	0.2	94.1	1982
6514		2/09/2014	12.12pm	0.52	111.2	1169	0.23	114.6	1751	0.2	86.3	2885	0.27	91.5	2101
6515		4/09/2014	12.31pm	0.98	96.2	737	0.23	99.9	1620	0.03	90.3	3336	0.07	88	2015
6516		8/09/2014	1.51pm	0.91	112.5	1003	0.38	109.5	1772	0.15	88	3064	0.21	104.5	1941
6517		15/09/2014	9.47am	DNR	DNR	1801	DNR	DNR	1849	0.03	93.1	2506	0.04	90.3	2763
6518		18/09/2014	1.48pm	DNR	DNR	962	DNR	DNR	1869	0.02	94.6	3168	0.07	95.1	1786
6519		22/09/2014	1.14pm	0.27	98.6	962	0.09	99.6	1869	0.05	88.6	3168	0.1	103.7	1786
6520		24/09/2014	12.33pm	0.29	105.7	1005	0.09	104.4	1955	0.04	90.6	3177	0.1	98	1690
6521		26/09/2014	12.41pm	0.4	99.2	819	0.12	98.3	1524	0.03	89	3235	0.07	103.1	2158
6522		1/10/2014	1.00pm	0.43	98.6	805	0.11	95.5	1554	0.03	90.9	3249	0.06	96.9	2117
6523		2/10/2014	9.58am	DNR	DNR	805	DNR	DNR	1554	0.09	86.1	3249	0.06	93.9	2117
6524		9/10/2014	1.08pm	0.3	99.5	806	0.07	95.5	1625	0.03	92.6	3256	0.05	96.9	2031
6525		14/10/2014	12.04	0.3	101.3	806	0.07	99.4	1625	0.03	91.4	3256	0.04	90.3	2031
6526		21/10/2014	9.45am	DNR	DNR	952	DNR	DNR	1654	0.04	86.5	3102	0.05	103.9	2066

BLAST RESULTS 2014

EPL No. 396
 Licencee: Bloomfield Collieries Pty Ltd
 Premises: Bloomfield Colliery
 Four Mile Creek Rd
 Astonfield NSW 2323

Monitoring Frequency: Every blast
 Airblast Overpressure Limit: 120 dB(Lin Peak)
 Ground Vibration Limit: 10 mm/s



Shot No.		Date & Time		Blast Monitor Location											
				Elliot's Residence			McNaughton's Residence			Mt Vincent Rd Residence			Richards Residence		
				Vibration (mm/s)	Airblast (dB)	Distance	Vibration (mm/s)	Airblast (dB)	Distance	Vibration (mm/s)	Airblast (dB)	Distance	Vibration (mm/s)	Airblast (dB)	Distance
6527		22/10/2014	1.22pm	DNR	DNR	952	DNR	DNR	1654	0.05	97.8	3102	0.07	96.8	2066
6528		27/10/2014	9.47am	DNR	DNR	1093	DNR	DNR	1969	0.03	97.9	3046	0.02	79.9	1718
6529		29/10/2014	1.52pm	DNR	DNR	982	DNR	DNR	1753	0.03	99.3	3084	0.04	107	1954
6530		5/11/2014	1.37pm	0.92	105.5	1088	0.58	104.1	1893	0.33	87.5	3004	0.7	106.7	1827
6531		7/11/2014	1.33pm	DNR	DNR	1805	DNR	DNR	2000	0.07	93.4	2370	TBA	TBA	2550
6532		11/11/2014	1.48pm	DNR	DNR	1975	DNR	DNR	2079	0.09	92.2	2276	0.09	98.6	2710
6533		12/11/2014	1.06pm	1.42	106.7	937	0.4	101.6	1805	0.24	82	3162	0.54	104.9	1859
6534		13/11/2014	1.46pm	DNR	DNR	1874	DNR	DNR	2048	0.08	103.1	2315	0.05	98.2	2589
6535		17/11/2014	12.08pm	1.59	105.3	1112	DNR	DNR	1939	0.29	91.4	2997	0.56	101.1	1777
6536		18/11/2014	12.13pm	DNR	DNR	1823	DNR	DNR	1898	0.24	82	2458	0.55	104.9	2729
6537		19/11/2014	1.50pm	DNR	DNR	1823	DNR	DNR	1898	0.08	93.8	2458	0.07	99.6	2729
6538		20/11/2014	12.51pm	DNR	DNR	1985	DNR	DNR	2135	0.04	87.9	2222	0.04	90.3	2642
6539		24/11/2014	12.55pm	DNR	DNR	1822	DNR	DNR	1951	0.08	98.2	2407	0.05	95	2651
6540		25/11/2014	11.13am	1.76	108.7	983	0.73	102.7	1868	0.61	90	3137	0.87	95.6	1797
6541		26/11/2014	12.35pm	5.09	102.8	728	0.86	106.5	1449	0.25	92.2	3327	0.65	102.4	2210
6542		27/11/2014	10.45am	1.25	101.1	995	0.51	100.2	1696	0.31	96.2	3059	0.84	109.9	2039
6543		9/12/2014	10.35am	4.54	105.3	892	1.27	115	1585	0.28	92.2	3161	0.71	102	2121
6544		9/12/2014	10.51am	4.21	104.6	1086	0.88	107.9	1905	0.35	92.1	3013	1.1	105.8	1808
6545		15/12/2014	9.55am	6.99	102.1	739	0.77	102.6	1500	0.27	94.5	3313	0.53	99.8	2155
6546		15/12/2014	1.17pm	2.46	105.5	982	0.46	100.8	1913	0.25	101	3174	0.66	108.4	1736
6547		17/12/2014	12.30pm	3.61	108.1	859	0.89	98	1606	0.24	91.3	3196	0.59	101.5	2078

DNR - Did not register. Blast too small to trigger monitor.

* Logger failure

APPENDIX E

QUARTERLY NOISE MONITORING REPORTS

APPENDIX F

COMPLAINTS REGISTER

BLOOMFIELD COLLIERY

COMPLAINTS REGISTER

2014



No.	About *	Time/Date	Location	Details	Action Taken / Findings
14_01	N	11/3/2014 9:31pm	Ashtonfield	Complaint received via 'Website Feedback' email address. Complained about reversing beepers on loaders.	Mine Manager contacted complainant and made a home visit on 12/3/14. Washery was not operating at the time however loader on top pad was operating. Likely that without background noise generated by the washery then reversing beepers would be more audible than normal. Committed to undertake additional evening/night noise monitoring in Ashtonfield. Additional monitoring results were within allowable limits.
14_02	N	24/3/2014 11:26pm	Ashtonfield	Complaint received via 'Hotline'. Complained about truck grinding noise from washery during night of 24/3/14. Also commented that has been happening on previous couple nights.	Mine Manager contacted complainant and made a home visit on 25/3/14. Committed to undertake additional evening/night noise monitoring in Ashtonfield. Additional monitoring results were within allowable limits.
14_03	O	28/4/2014 10:37am	Black Hill	Complaint received via phone call to Environmental Officer. Complained about odour believed to coming from the mine.	Mine Manager spoke with complainant on 28/4/14 and explained remediation efforts on spon com area. Complainant was satisfied with this approach.
14_04	N	8/6/2014 7:57am	Ashtonfield	Complaint received via 'Hotline'. Complained about noise from washery during early hours of Sunday 8/6/14.	Mine Manager phoned complainant on 10/6/14. Determined that noise most likely to be track slap noise from reversing dozer. Nightshift operators instructed only to use first gear while reversing down stockpiles at night.
14_05	N	28-Jul-14	Buttai	Complaint raised in CCC meeting by community representative on behalf of other resident. Complaint concerning mining noise of an evening during previous week. No times or dates were able to be provided.	No action able to be taken due to delay in raising complaint. Bloomfield have previously issued contact details to residents requesting residents to contact Bloomfield directly regarding any complaints.

No.	About *	Time/Date	Location	Details	Action Taken / Findings
14_06	N	27/8/2014 10:13pm	Ashtonfield	Complaint received via 'Hotline'. Complained about revving truck or loader noise from washery during night of 27/8/14.	OCE contacted complainant at 10:26 pm to confirm details. Complainant said noise had reduced slightly since 9pm but still present. Modified operations on product coal stockpile pad. Stockpile face was turned 90 degrees so stockpile was between loader and Ashtonfield.
14_07	N	18/9/2014 4:00pm	Black Hill	Contacted Environmental Officer to comment about unusually loud noise from S-Cut around 9pm on the night of 17/9/14. Said she noticed when she went outside her house and it seemed unusually noisy. She has lived there 2.5 years.	No action able to be taken due to delay in raising complaint.
14_08	B	27/10/2014 11:33am	Unknown	Complaint received via 'Hotline'. Complained about blast on morning of the 27th October. Poor quality message, unable to discern contact number or further details of complaint.	Blast within limits. Not able to contact complainant due to poor quality phone message.
14_09	O	13/11/14	Louth Park	Contacted Environmental Officer to comment about wild dogs being seen leaving Bloomfield lease area.	Committed to undertake dog baiting program in near future. Regional baiting program being organized by Hunter Land Services.
14_10	B	26/11/14	Buchanan	Complaint received via 'Website Feedback' email address. Complained about blast impact knocked a tile off her bathroom wall. Said she doesn't normally feel blasts but hears the odd blast. Commented it is only the second blast felt since moving in April 2014.	Environmental Officer responded via email stating that blast was within limits and offered to install blast monitor at complainant's residence. No reply received from complainant.

* D = Dust, N = Noise, B = Blasting, V = Visual, L = Lighting, W = Weeds, O = Other

APPENDIX G

2013 REHABILITATION MONITORING

Summary

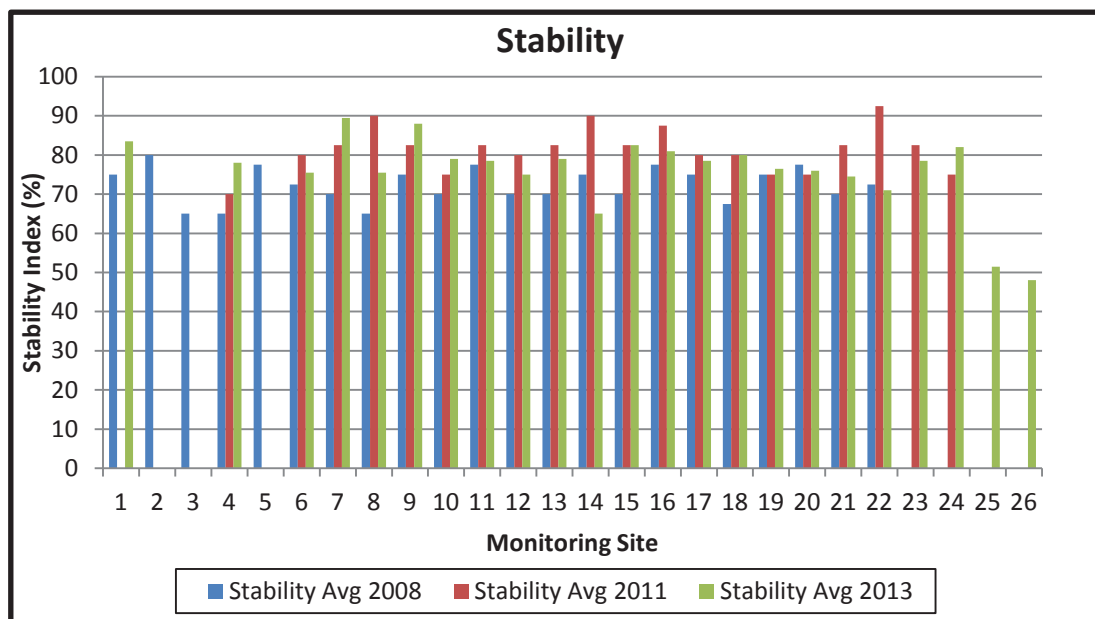
The Bloomfield rehabilitation monitoring program is based on Landscape Function Analysis (LFA) developed by the CSIRO. LFA is the core of the monitoring procedures and uses visually assessed indicators of soil surface processes that gauge how effectively a hillslope is operating as a biophysical system. It is the synthesis of much published material from a variety of sources and is based mainly on processes involved in surface hydrology: rainfall, infiltration, runoff, erosion, plant growth and nutrient cycling.

The data collected by the LFA method has a predictive capacity when regular monitoring provides a time series record of ecosystem change or development. LFA does not automatically classify a site into good, moderate or poor. The significance of a particular numerical value comes from comparing sites over time.

At Bloomfield rehabilitation monitoring is carried every 2 years and did not commence until 2008. Much of the rehabilitated areas were completed before 2008. There are currently 23 established monitoring sites within the rehabilitated areas. Additional sites will be added as rehabilitation progresses. In the following graphs there are 26 sites listed. Three of these sites (2, 3 and 5) have since been removed as that location was used for additional overburden dumping room. Sites 25 and 26 were established in 2013 and were rehabilitated during 2013 which reflects the lower index results.

Stability

Stability is defined as the ability of the soil to withstand erosive forces, and to reform after disturbance.



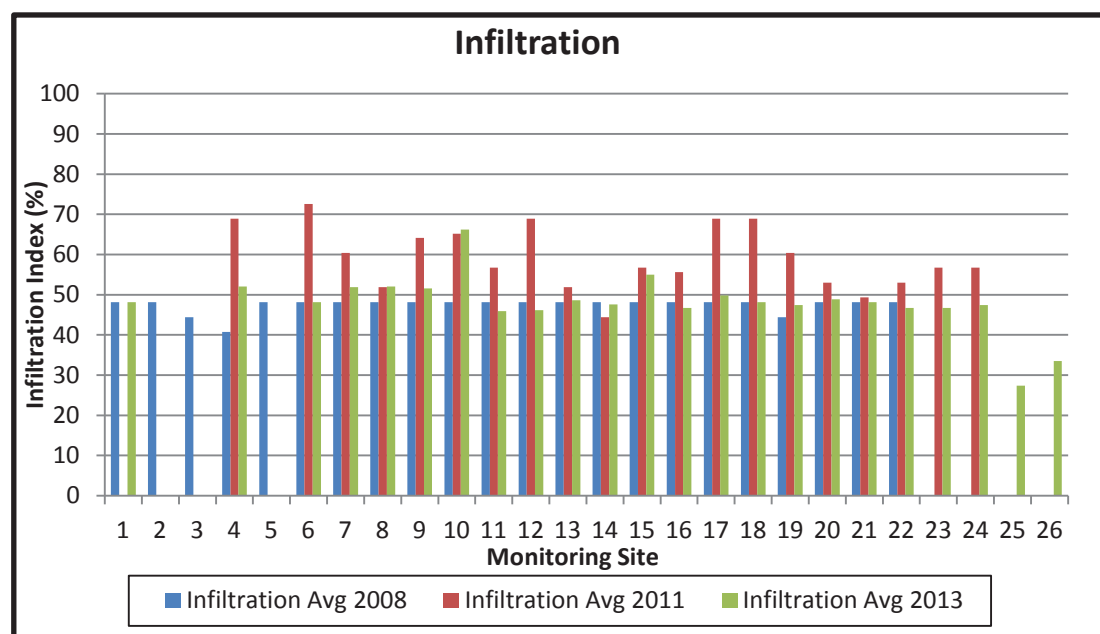
The older established sites are fairly consistent and the variation in the stability index can be put down to inconsistent annual rainfall. In 2011 monthly rainfall was above average for

most of the year resulting in many sites having a spike in the stability index when compared with other years. The second half of 2013 was below average rainfall in the lead up to the rehabilitation monitoring.

However for nearly all sites the stability index improved between 2008 and 2013. The low LFA index scores seen for the two new rehabilitation sites (25 and 26) correspond to low vegetative cover and recently disturbed topsoil.

Infiltration

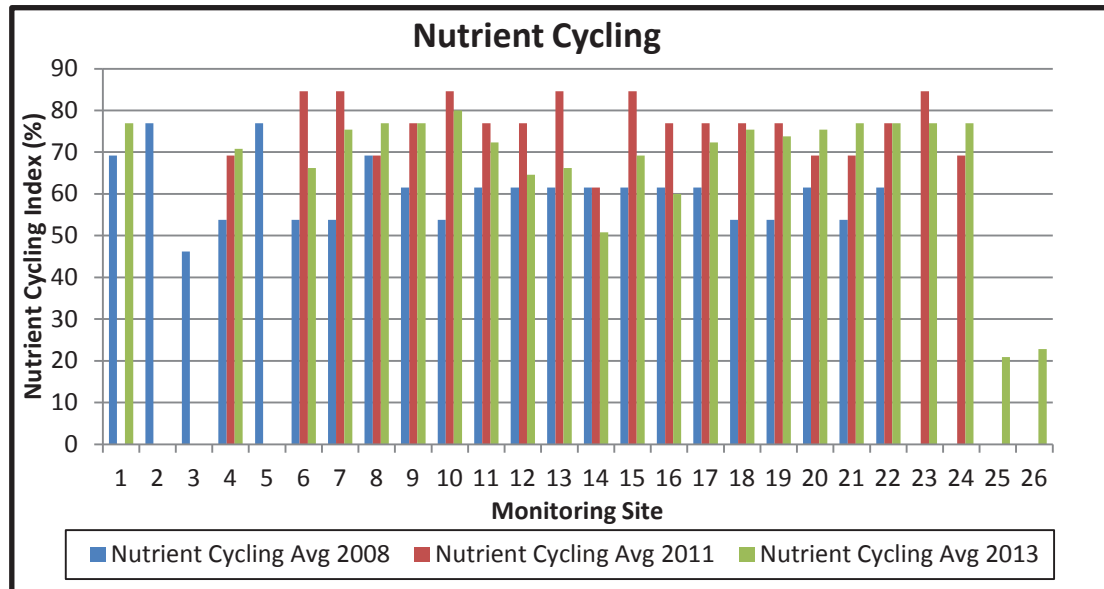
Infiltration is defined as how the soil partitions rainfall into soil-water (water available for plants to use), and runoff water which is lost from the local system, or may also transport materials (soil, nutrients and seed) away.



The index demonstrates the impact of the above average monthly rainfall in 2011 having higher infiltration rates. Alternatively the 2013 results are linked with hard surface-setting (crusting) soils following a dryer than average period.

Nutrient Cycling

Nutrient cycling is defined as how efficiently organic matter is cycled back into the soil.



For nearly all sites the nutrient cycling index improved between 2008 and 2013, with a spike in 2011 due to the above average monthly rainfall.

The slight variation in results (stability / infiltration / nutrient) from 2011 to 2013 for the established rehabilitation sites shows the resilience of the rehabilitation sites in a drier than average year i.e. if monitoring results dramatically decreased this would indicate the rehabilitation areas are not long-term sustainable due to various factors. The planned 2015 rehabilitation monitoring will more than likely validate the linear LFA trends seen to date.