SAFETY & SUSTAINABLE DEVELOPMENT

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT - 2014

DRAYTON MINE

AngloAmerican

Real Mining. Real People. Real Difference.

Annual Environmental Management Report - 2014

Name of Mine:	ANGLO COAL (DRAYTON MANAGEMENT) PTY LTD
Titles / Mining Leases:	CL229, CL395, ML153, A173
Current MOP	Mine Operations Plan – Amendment C
MOP Commencement Date:	OCTOBER 2014
MOP Completion Date:	30th OCTOBER 2015
AEMR Commencement Date:	1st JANUARY 2014
AEMR Completion Date:	31st DECEMBER 2014
Name of Leaseholder:	ANGLO COAL (DRAYTON MANAGEMENT) PTY LTD
Name of mine operator (if different):	
Reporting Officer:	JAMES BENSON
Title:	ENVIRONMENT COORDINATOR
Signature:	(*JBENSON*)
Date:	31/03/2015

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Abbreviations

Abbreviation	Meaning
ACARP	Australia Coal Association Research Program
ADL	Ash Dam Levee
AEMR	Annual Environmental Management Report
AHMP	Aboriginal Heritage Management Plan
ANE	Ammonium Nitrate Emulsion
CCC	Community Consultative Committee
CHPP	Coal Handling Preparation Plant
CL	Coal Lease
CTU	Coal Treatment Unit
dBA	Noise decibels (A-weighted)
dBL	Noise decibels (linear)
Drayton	Anglo Coal (Drayton Management) Pty Limited
DRE	Division of Resource and Energy
DP&E	Department of Planning and Environment
DSC	Dam Safety Committee
EA	Environmental Assessment
EC	Electrical Conductivity
EEC	Endangered Ecological Community
EIP	Environmental Improvement Plan
EMC	Environmental Management Committee
EMP **EPA**	Environmental Management Plan Environmental Protection Authority
EPL	Environmental Protection License
g/m2/mth	Grams per square metre per month
Ha	Hectare
HLRF	Hunter Lowland Redgum Forest
HVAS	High Volume Air Sampler
LAeq(15 min)	Average noise energy over a 15 minute period
LGA	Local Government Area
M	Metres
Mbcm	Million bank cubic meters
MOP	Mining Operations Plan
mg/L	Milligrams per litre

ML	Megalitre
ML	Mining Lease
mm	Millimetres
mm/s	Millimetres per second
MSC	Muswellbrook Shire Council
MSDS	Material Safety Data Sheet
Mtpa	Million tonnes per annum
m2	Square metres
m3	Cubic metres
NATA	National Association of Testing Authorities
NFR	Non-Filterable Residue
NSW	New South Wales
pH	Potential of hydrogen
PM_{10}	Particulate matter with a diameter of less than 10 microns
PPR	Preferred Project Report
PRP	Pollution Reduction Program
OEH	Office of Environment and Heritage
ROM	Run-of-Mine Coal
SHE	Safety, Health and Environment
SHE MS	Safety, Health and Environment Management System
SS	Suspended Solids
T	Tonne
TEOM	Tapered Element Oscillating Microbalance
TDS	Total Dissolved Solids
TSP	Total Suspended Particulates
µS/cm	Microsiemens per centimetre
µg/m3	Micrograms per cubic metre
°C	Degrees Celsius

1 INTRODUCTION

This Annual Environmental Management Report (AEMR) details production, environmental management and community relations for the operation during the 2014 calendar year period, and outlines any changes from the current Mine Operation Plan (MOP).

In doing so the AEMR consolidates Government reporting requirements relating to environmental management and rehabilitation of mines by addressing the current status of approvals, leases, licences, environmental risk management and control strategies for the reporting period in respect of mining, mine development, and rehabilitation in relation to the MOP as well as environmental performance in relation to the collective conditions of approvals, leases and licences and community relations and liaison.

It also looks to the next 12 months by proposing improvements in environmental performance and management systems, specifying environmental and rehabilitation targets to be achieved.

Environmental performance reported in this AEMR is evaluated **f**or mining operations with regard to the disturbance of land as proposed in the accepted MOP, progressive rehabilitation of land according to the MOP rehabilitation schedule, conduct of operations using methods proposed in the MOP, and compliance with environmental conditions of all consents leases and licences, including reporting requirements.

Drayton mine is located near the township of Muswellbrook in the Upper Hunter Valley of New South Wales. It is an open cut mine using both dragline and truck and shovel to produce thermal coal for export markets. Currently production is approximately five million tonnes per annum (Mtpa), employing approximately 410 permanent employees with contractors to support operations.

Drayton commenced operation in 1983 and has approval to mine until 2017. The site operated the mine 24 hours a day, 7 days a week throughout the first half of 2014, however due to uncertainty in approvals, operations have been reduced to 24 hours a day, 5 days a week since mid-year. Drayton is preparing a future application for development consent of the Drayton South Coal project to extend the mine life to approximately 2013.

Anglo American owns an 88.2 per cent share of the Drayton joint venture and other joint venture partners include: Mitsui Drayton Investment Pty Limited; NCE Australia Pty Limited; Hyundai Australia Pty Limited; and Daesung Australia Limited.

This Annual Environmental Management Report (AEMR) is required by Development Application 106-04-00 for the Antiene Rail Spur, Project Approval 06_0202 for the Drayton Mine, and Coal Lease's 229 and 395 and Mining Lease (ML) 1531.

The report is provided in accordance with the DGs guidelines for the 2014 calendar year, and outlines any changes from the current Mine Operation Plan (MOP). The current MOP covers a two year period from the 30th October 2013. This report will be distributed to:

- NSW Trade and Investment – Division of Resource and Energy (DRE);
- Muswellbrook Shire Council (MSC);
- Office of Environment and Heritage (OEH) and Environment Protection Authority (EPA);

- Department of Planning and Environment (DP&E);
- NSW Dam Safety Committee (DSC); and
- The Drayton Community Consultative Committee (CCC).

A copy of the AEMR is publicly available on the Drayton website http://australia.angloamerican.com/our-operations/operating-sites-subpage/drayton-environment.

1.1 Consents, Leases and Licences

Appendix A lists Drayton's consents, approvals, leases and licenses (Approvals), with the principle approvals being:

- Major Project approval granted under No.06_0202 issued on the 1st February 2008, under Section 75J of the (now repealed) Part 3A of the *Environmental Planning and Assessment Act 1979*,(EP&A Act) as modified under Section 75W in 2009 to add a further 8 hectares to the existing approval area and in 2012 for the construction of an explosive storage facility and placing tailings in the east pit.
- Development Consent No. DA 106-04-00 issued in 2000 under Section 76 (A), 9 and 80 of Part 4 of the EP&A Act authorising the Drayton mine use of the Antiene Joint Rail User Facility in conjunction with its joint use by the adjoining Mount Arthur coal mine.
- Coal Lease (CL) 395 granted on the 24th June 1992 by the Minister for Mineral Resources under the *Mining Act 1973*, which was renewed in 2003 to 2nd February 2024.
- Section 100 and Section 101 applications, relating to an emplacement area in regard to washery reject material, were granted in 2007 and 2011. This approval remained in place for 2014.
- Drayton's Mining Operations Plan was renewed in 2013 and covers the period of 30th October 2013 to 30th October 2015. A minor amendment to the existing MOP was approved on the 9th of October 2014 for a Maintenance Pad due to an anticipated reduction in mine life. As required by the DRE and the DP&E, Drayton is developing a 'mine closure plan' for the currently approved operations 30th October 2015.

Following the refusal of PA11_0062 for the Drayton South project, an application under Division 4.1 of the EP&A Act was submitted for the Drayton South Project with a reduced scale and off site effects. The Secretary of the DP&E issued his 'environmental assessment requirements' on 19 December 2014 (SEARs) and an application for a Gateway Certificate has been made.

An Environment Impact Assessment will be submitted in 2015 that addresses the 'environmental assessment requirements' of the Secretary (**SEARs**) as well as the requirements of EP&A Act and the *Environmental Planning and Assessment Regulation 2000*.

1.1.1 Mt Arthur Sublease

In 2006 Drayton Mine granted a sublease over part of CL229 to Mt Arthur Coal for the depositing of overburden and tailings. The sublease was registered by the Division of Resources and Energy (DRE) on 17th December 2008 and the Mt Arthur sublease area was

moved from the Drayton Mine colliery holding to the HVEC colliery holding. During the 2014 reporting period, Mt Arthur Coal had full management obligations over the Sublease. Mt Arthur Coal is responsible for holding a MOP and associated rehabilitation security deposit for the Sublease area.

1.2 Mine Contacts

Contact details of the current Mine Manager and the Safety Health and Environment (SHE) Manager are given in Table 1 below.

Table 1: Mine Contacts

Position	Name	Contact Numbers
Mine Manager	Darren Pisters	Ph (02) 6542 0203 M 0417 618 876
Safety, Health & Environment Manager	Peter Forbes	Ph (02) 6542 0256 M 0427 752 397

1.2.1 Site Personnel Responsible For Mining, Rehabilitation and the Environment

The SHE Manager at Drayton is supported by the:

- Environment Coordinator
- Environment Officer
- Environment Graduate

An Environmental Management Committee (EMC) has operated since 1995, which includes the General Manager, the Senior Leadership Team and the Environment Coordinator, Officer and Graduate. The committee meets on a monthly basis.

Other departments within the company are responsible for specific aspects of environmental management within their respective work areas under the advice of the SHE Department. Individual employees and contractors are accountable for their own environmental performance and have environmental requirements set within their position descriptions.

Drayton's Safety, Health and Environment Management System (SHE MS) is certified to both ISO 14001 for its environmental management practices and ASOHS 18001, AS/NZ4801 for health and safety.

1.3 Actions required at Previous AEMR Review

The DRE provided comment on the 2013 AEMR following a joint site inspection by DRE and DP&E on the 24th June 2014, and through consequent correspondence dated 22nd July 2014 and 11th November 2014. These comments and associated actions are presented in Table 2. Actions from the 2012 AEMR review that were included in the comments provided by DRE have also been included in Table 2 (Actions 1b 1 to 6).

DP&E provided feedback on the AEMR inspection through correspondence dated 10th July 2014. Several actions were included in this report

Table 2: Actions from the previous AEMR

Department / Action Number	Action Required from previous AEMR	Due Date specified in correspondence.	Response from Drayton
	22nd July 2014		
DRE / 1a	Investigate & provide DRE detailed report why Drayton failed to implement the 2012 AEMR Action Plan and reported against the same in the 2013 AEMR. Outline the strategies to prevent similar failures.	30/8/2014	Correspondence sent to DRE on 29th August 2014
DRE / 1b 1.	Provide DRE with a revised AEMR for approval that address Section 5 (Rehabilitation) of the AEMR guidelines – Due September 2013**.**	30/8/2014	An AEMR addendum report addressing Section 5 (Rehabilitation) was provided to DRE 30th September 2013
DRE / 1b 2.	Provide DRE with a justification and review of topsoil stockpile management to support and maintain seed and microbial viability. Demonstrate how the stockpiled material is tested and managed prior to re-spreading to determine ameliorant requirements – Due October 2013.	30/8/2014	A topsoil management justification letter was sent to DRE 31st October 2013
DRE / 1b 3.	1. The company is to cease all activities relating to the storage and disposal of contaminated material onsite until Drayton has DRE approval to operate a Bioremediation Area - Immediately 2. Drayton is to provide DRE with a justification and review for the management and disposal of contaminated material including offsite and onsite disposal options – September 2013 3. If Drayton propose to operate a Bioremediation Area a Management Plan must be submitted to the Department for approval prior to operation and shall incorporate • legislative review • management protocol and responsibilities • design and criteria • operating standards and inspection regime and • quarterly reporting to the DRE.	30/8/2014	Actions completed. Drayton reviewed practices relating to the existing Bioremediation Area and provided DRE with correspondence addressing the above matters on 19th August 2013. A Bioremediation Management Plan was sent to DRE on 22nd November 2013. Section 3.6, 3.18

Department / Action Number	Action Required from previous AEMR	Due Date specified in correspondence.	Response from Drayton
DRE / 1b 4.	1. Provide DRE with a justification and review of Old Tailings Cells with a plan for formally decommission the Cells – October 2013 2. Engage and expert Tailings Geotechnical Engineer to review and justify if the current tailings management system is designed and managed to facilitate consolidation of tailings to support an engineered cover capping structure for long-term rehabilitation to an agreed landform that minimises safety and environmental risk – October 2013 3. In consultation with DRE, develop and submit for approval a Tailings Management Plan that outlines operation strategies ie disposal options (design, minimal time between deposition layers), methodology, structure design, dimensions, decanting options, density and bench criteria, freeboards, spillways, etc – October 2013.	30/8/2014	A tailings management justification letter was sent to DRE 31st October 2013 which addressed the above matters. Enclosed with the letter was a tailings storage facility report by Henderson Geotech Pty Ltd and the Drayton Tailings Management Plan approved by DRE September 2011 Section 2.6.4
DRE / 1b 5.	In consultation with DRE and DPI commence the development of the full Closure Plan incorporating the DRE comments and Draft Guidelines – August 2013.	30/8/2014	In August 2013, Drayton met with DRE and DP&I to discuss requirements for Mine Closure Plan (MCP). A draft MCP was submitted in December 2014 Further detail provided in Section 5.5
DRE / 1b 6.	Provide DRE with a full Rehabilitation Calculation for Drayton against 2013 activities – September 2013.	30/8/2014	A full Rehabilitation Calculation for Drayton was provided to DRE on 11th October 2013. This was altered in June 2014 and provided to DRE.
DRE / 1c	Revise and resubmit the 2013 AEMR to all stakeholders.	30/8/2014	Amended Annual Environmental Management Report – 2013 was approved by DRE on 11th November 2014. Copies of the Amended AEMR were circulated to all stakeholders.

Department / Action Number	Action Required from previous AEMR	Due Date specified in correspondence.	Response from Drayton
DRE / 2	***Diesel Spill Area*** a) Provide the Department with a Final Investigation Report, outlining the cause of the event, the recommended actions and proposed implementations and inclusion of DRE in the formal notification process. **Diesel Spill Investigation Report dated 28th January 2014 was submitted to the DRE on 31st July 2014.** b) Provide a chronology of the activities have been undertaken since the event to the date of the site inspection. **Post Incident Chronology detailing activities between the spill and 24th June 2014 was submitted to the DRE on 31st July 2014.** c) Provide DRE and DP&E with a copy of the '*Independent Investigation into the Diesel Spill*" as identified by Drayton representatives. **Independent diesel spill investigation titled 'Preliminary Contamination Assessment of Diesel Spill' dated 17th April 2014 was submitted to DRE on 31st July 2014.** d) Provide a scope and schedule of remediation works to DRE and DP&E. If the scope of works is inconsistent with '*Independent Investigation into the Diesel Spill*', a justification must be provided outlining the logic for the inconsistencies. **Remediation Management Plan (dated 20th May 2014) was submitted to DRE on 31st July 2014, and Diesel Spill Monitoring Management Plan (dated 17th Oct 2014) was submitted to DRE on 17th Oct 2014.** e) Divert surface runoff away from the diesel spill area. **Listed as completed in Diesel Spill Monitoring Management Plan dated 17th Oct 2014.**	31/7/2014	All actions completed as detailed in correspondence provided to DRE on 31st July 2014 and 17th Oct 2014
DRE / 3	1. Include the expiry date of consents, leases and licenses within Appendix A Table 47. 2. List the individual MOP amendments within Appendix A Table 47. 3. MOP amendment to be noted in the title block. 4. Included the approvals associated with the exploration works within Appendix A Table 47. 5. Include a figure comparing the extent of rehabilitation shown in the MOP with that undertaken. 6. Provide Ore and Processing waste volumes within Table 4.	Next AEMR	This AEMR; Appendix A, Appendix A Section 5.2 Section 2.4.2
DRE / 4	List the exploration approval(s), the scope of the approved works and the status of the works.	Next AEMR	Appendix A, Section 1.1
DRE / 5	DRE suggests a discussion on the findings and the actions taken be included in the AEMR. **This action is in regards to the 3 yearly Independent Environmental Audit**		Section 3.22.1
DRE / 6	Detail how contaminated material was managed while the Bioremediation Area was closed.	30/8/2014	Correspondence sent to DRE on 29th August

Department / Action Number	Action Required from previous AEMR	Due Date specified in correspondence.	Response from Drayton
			2014.
DRE / 7a	Action the recommendations contained in ELA March 2014 report. Develop performance and completion criteria for each of the final land uses identified for the rehabilitation areas.	Next AEMR and /or MOP whichever occurs first	Section 5.2
DRE / 7b	DRE suggest that the progressive collection of information to demonstrate final landuse has being achieved should be undertaken. Such measures need to extend beyond traditional rehabilitation measures (e.g. presence absence of fodder species, % ground cover etc.) and could perhaps include measures such as stocking rates, grazing patterns, animal weight gain, shade trees, watering points (etc.).		Section 5.2
DRE / 7c	Consider the range of operational aspects (eg. Fencing/containment, stock access to water, shelter for stock, vehicle access, ease of traversing the landform (etc.) associated with the final landuse to allow the maximisation of potential future landuse options.		Section 5.2
DRE / 8a	Divert stormwater runoff away from the scour line shown in **Plate 4**	Immediately	Completed Section 3.2
DRE / 8b	Outline the strategies to prevent future failures.	Next AEMR	Section 3.2
DRE / 9	Investigate opportunities to undertake temporary stabilisation of exposed areas including dumps.	Next AEMR	Section 3.2
DRE / 10	Commence consultation with DRE regarding development of Drayton South MOP as the initial review of new MOP's generally takes 6 months.	September 2014	September 2014
DRE / 11	Confirm that valid development consent is held and that suitable material is being used in the construction of the Ash Dam wall.	Next AEMR	Section 7.3.1
	11th November 2014		
DRE / 1	Report on the status of all ongoing actions from previous AEMR's until the action is completed.	Next AEMR	Section 1.3
DRE / 2	Develop 'SMART' completion criteria and report on the mines performance against these criteria. Implement Eco Logical Australia recommendations.	Next AEMR	Section 5.2
DRE / 3	Compare the progression of operations with that predicted in the EIS and MOP (eg. Active mining, emplacement, shaped landform, rehabilitated areas (etc.).	Next AEMR	Section 2.4.4 Section 5.2
DRE / 4	Include expiry date and MOP amendment details in Appendix A Table 47 Note MOP amendment in the Title block.	Next AEMR	Appendix A
DRE / 5	Identify the (exploration) approvals which have been granted and the status of the works undertaken (if any).	Next AEMR	Appendix A Section 2.1
DRE / 6	Include ore and processing waste volume in Table 4.	Next AEMR	Section 2.4.2
DRE / 7	Drayton have committed to planting 6,000 tubestock over the last two years. Update as necessary and report on progress against this commitment.	Next AEMR	Section 5.2
	10th July 2014		

Department / Action Number	Action Required from previous AEMR	Due Date specified in correspondence.	Response from Drayton
DP&E	Ongoing water from the oil/water separator needs to be taken away from the site. **Diesel Spill Monitoring Report dated 17th October 2014 was submitted to the DRE on 17th October 2014. Action to divert water from oil/water separator away from spill site completed.**		Correspondence dated 17th Oct 2014
DP&E	Provide an outline of works to rehabilitate the area and a timeline to be provided. **Diesel Spill Monitoring Management Plan dated 17th October 2014 was submitted to the DRE on 17th October 2014 outlined detailed action plan including timeline.**		Correspondence dated 17th Oct 2014

2 OPERATIONS DURING THE REPORTING PERIOD

2.1 Exploration

No exploration drilling was completed throughout the reporting period.

2.2 Land Preparation

Throughout the 2014 reporting period Drayton increased the area of land cleared for mineral extraction activities by 2.7ha in the SPW area (see Figure 24).

2.3 Construction

No major construction works occurred during the 2014 reporting period.

2.4 Mining

The Drayton mining operation advances north and south, the majority of the remaining reserves are in the south pit area. Areas remaining to be mined at Drayton can contain complex geology including multiple faults, steeply dipping coal seams and silling.

As at 31st December 2014 the remaining total JORC resource is 5.961 million tonnes. Of this ~3.5 million tonnes is within the current mine plan with the balance outside the mine plan in the A 173 lease area. Inventory of coal outside of this is subject to economic and mining method assessment. Resources within the mine plan can be mined within the term of the existing MOP.

At the end of 2014, the planned mine life for Drayton is subject to economic conditions. The current Consent permits mining operations to continue to 2017. Drayton surface facilities are planned to be retained for use as part of potential future mining operations at Drayton South. Approval of the Drayton South application would extend Drayton's mine life to approximately 2031. If the Drayton South Project is not approved, Drayton will commence mine closure.

2.4.1 Changes in Mining Equipment and Method

During 2014, there were several changes to the Drayton fleet with the addition of new equipment and decommissioning of older machines.

Current major equipment consists of:

- BE 1370 Electric Dragline
- Two Hitachi EX 5500 Excavators
- Hitachi EX 3600 Excavator
- Hitachi EX 3500 Excavator
- One Le Tourneau L1100 Loader
- One Le Tourneau L1400 Loader
- One Cat 992 Front End Loader
- 26 Caterpillar 789B / 789C Trucks

- One Svendala SKF50 Drill (parked up in October 2014)
- One Sandvik DK45S
- One Sandvik DR460
- One Altas Copco PV235 Drill (in working order but parked up)
- Two Hire Drills
- Two Cat 777D water carts
- One Cat 777F Water Cart
- 7 D11R track dozers
- Three D10T track dozers
- One 834 rubber tyre dozer
- One Tiger 690/Cat 854 rubber tyre dozer (parked up in March 2014)
- 3 Cat 16H graders

2.4.2 Overburden Handling

Overburden and interburden is predominantly removed by the dragline and the excavators, with assistance where required from front-end loaders. Overburden, parting and coal thicker than two metres is blasted. All overburden and parting material is moved to tips located within the previously mined areas. Placement of this material follows the guidelines in Drayton's Spontaneous Combustion Management Plan. Detailed mining statistics for 2014 are shown in Table 3.

Table 3: Production and waste schedule

	Cumulative Production		
	Start of Reporting Period (1 Jan 2014)	End of reporting Period (31 Dec 2014)	End of Next Reporting Period (Estimated)
Topsoil stripped (m^3)	946,590	957,350	1,030,470
Topsoil used/spread (m^3)	502,640	506,640	546,640
Waste Rock (Mbcm) (approximate only)	688 Mbcm	715 Mbcm	740 Mbcm
Ore - ROM Coal (Mt)*	122.7	127.5	131
Processing Waste** (t)	1,201,180t	2,418,728t	3,219,728t
Product (saleable) (Mt) (approximate only)	85.8Mt	89.1Mt	91.4Mt

* *ROM coal is assumed to be the equivalent of Ore*

** *Total of rejects and dry tailings cumulative from 2013*

2.4.3 ROM Production History and Forecast

Run-of-Mine (ROM) product for the reporting period was 4,755,633 tonnes with a total prime waste and rehandle of 27.297 Million bank cubic meters (Mbcm). A comparison showing the ROM production at Drayton for the past reporting periods is provided in Table 4.

Table 4: History of ROM Coal production and target

Year	Production (Mt)
1985	1
1986	2
1987	3
1988	3
1989	3.55
1990	3.48
1991	3.96
1992	3.85
1993	3.97
1994	3.77
1995	3.85
1996	3.5
1997	4.2
1998	4.5
1999	4.8
2000	5.07

Year	Production (Mt)
2001	5.23
2002	4.84
2003	5.04
2004	4.98
2005	4.73
2006	5.021
2007	4.691
2008	4.171
2009	4.821
2010	5.425
2011	5.312
2012	5.456
2013	5.488
2014	4.758
2015*	2.9-3.5

** 2015 ROM target smaller as operations move to mine closure, unless Drayton South project approval is obtained extending the mine life.*

2.4.4 Comparison with Environmental Assessment Predictions

The coal and overburden that Drayton mined during 2014 varied to those reported in the 2007 Environmental Assessment. Table 5 shows a comparison of 2014 production figures compared to EA predictions.

Table 5: 2014 production figures compared to EA predictions

	Total Prime (Mbcm)	ROM Coal (Mtpa)	Product Coal (Mtpa)
2014	27.297	4.755	3.521
EA Prediction (Yr 7)	36.03	4.63	4.47

Product Coal figures for 2014 were below those predicted in the EA for year 7 of the operation. The main driver for lower production resulted as Drayton moved from operating 24 hours, 7 days per week, to 24 hours, 5 days per week during the reporting period in response to the initial rejections of the Drayton South project application in order to reassess and strive to achieve continuity for the current Drayton workforce.

2.5 Mineral Processing

Mineral processing at Drayton is undertaken through the Drayton Coal Handling Plant (CHP). This facility comprises of a series of small washery, fines plant, crushers, two stackers, two

bucket-wheel reclaimers and a series of overland conveyor belts. In 2011 a coal fines plant within the existing coal handling plant was commissioned.

Rear dump coal trucks deliver ROM coal into a 400 tonne capacity ROM hopper. ROM coal is crushed and then washed in the coal preparation plant or bypassed straight to product. This decision is based on the expected quality of the feed coal reconciled with online ash analyser trends. The washed product is then sampled before reporting to the export coal stockpiles.

In 2014, 3.521 million tonnes of saleable coal was produced, all of which was exported. Export coal from Drayton is loaded onto trains at the Drayton Rail Loop, transported via the Antiene Rail Spur to the Main Northern Railway line and then to the Port of Newcastle. Tailings disposal in 2014 totalled 475,983 tonnes

During the reporting period all tailings was placed in the ES void as discussed in Section 2.6.4.

2.6 Waste Management

Drayton has existing waste management systems which, where appropriate, incorporate waste reuse and recycling and addresses issues relevant to the management of waste.

The volumes of different waste streams generated during 2014 are outlined in Table 6.

Table 6: Waste stream volumes generated in 2014

Waste Stream	Treatment and Disposal	Volume	Unit
Metal	Recycled off-site	355.50	tonne
General Waste	Off-site landfill	233.02	tonne
Confidential document bins	Off-site document destruction	0.970	tonne
Batteries	Recycled off-site	14.99	tonne
Empty 205L gallon drums	Recycled off-site	17	each
Empty 20L drums	Recycled off-site	178	each
Oil Filters	Recycled / disposed of off-site	7,088	each
Oil	Recycled / disposed of off-site	336,570	litres
Sewage	On-site treatment and disposal	630,200	litres

2.6.1 General Waste

To assist in the separation of waste at source, designated waste storage areas, such as labelled bins or bunded areas, are in place across the site. Hazardous wastes are contained within bunds which drain into Drayton's pollution control system.

Remondis is currently contracted to dispose of all waste materials generated on site. Domestic rubbish generated on site is deposited in the Muswellbrook Waste Management Facility. Monthly inventories and reports ensure all waste movements are documented. Management strategies are in place for each of the major waste streams relevant to key work areas.

2.6.2 Recycling Initiatives

Drayton recycles or reuses specific waste streams to minimise the environmental effects of the product. Employees are encouraged to minimise their waste generation through regular updates on waste management and improved housekeeping strategies. Where possible, waste items are recycled by original equipment manufacturers or certified contractors. Machine batteries; mobile phone and radio batteries; waste oil; grease; empty drums; aluminium cans; and scrap metal are removed from site and recycled by Remondis. Used printer cartridges are returned to the manufacturer for recycling.

2.6.3 Sewerage Treatment / Disposal

There has been no significant change in demand for waste services as the number of employees has not significantly changed.

As described in the 2007 Environmental Assessment (EA), the original waste management system and sewage treatment plant has continued to be used for the project

All on site effluent is treated in Drayton's sewage treatment plant. The treated effluent is then distributed into two settlement ponds, and overflow from these ponds is pumped to an area of rehabilitation on the East Tip.

There are several septic tanks on site (e.g. those at the CHP and crib huts) which are not connected to the onsite treatment station. During the 2014 reporting period, Drayton's waste provider transported 630.20kL and effluent from these tanks and pumped into the on-site STP for treatment. The total volume of effluent treated in on-site during 2014 was 2,202kL.

2.6.4 Mineral Waste

During the reporting period, Drayton produced a total of 475,983t of tailings.

As described in the 2013-15 MOP, the primary area for placement of waste materials is the mined out areas in the South and East Pits. The Great North Tip is also used for waste material and extends over the ES, EN and NN strips as one active emplacement, albeit with several dumping faces at different levels. A similar arrangement exists in the South Pit areas as mining progressed.

Out-of-pit overburden emplacement has only occurred at Macquarie Generation's Liddell Ash Dam, where emplacement of waste material on their land has been required to raise the level of the levees for ash disposal purposes.

In 2012, Drayton received planning approval to deposit tailings from the Drayton Coal Handling Preparation Plant (CHPP) into the ES void. The tailings were approved to be deposited into water, and cumulated volumes were predicted using a conservatively low tailings density of 0.6t/m3. This was coupled with a forecast tailings production of 200,000 t/year to produce a facility life of 10 years for 3.35 million m3 (3,350ML) capacity.

During the reporting period all tailings were deposited into the ES void which is also the primary water storage location onsite. The tailings discharge point was moved on regular basis to build a tailings beach against the northern endwall of the ES void. Tailings disposal in 2014 totalled 475,983 tonnes. The increase in tailings production from that anticipated has been offset by a corresponding decrease in rejects production. The volumes will continue to be assessed to

understand the implication of higher tailings deposition rates on the tailings storage facility lifetime.

Coarse reject from the CHP is transported by truck to the ES void area or has been used in other areas of the mine to sheet haul roads. The total amount of rejects produced in 2014 was 788,899 tonnes.

A return water pump in the southern end of the ES void pumps water to the Access Road Dam which is then transferred to the CHP for reuse.

The tailings line from the CHP to the ES void is inspected on a weekly basis by a CHP operator. The ES void is inspected daily by the Open Cut Examiner with any tailings issues conveyed to the CHP supervisor.

In October 2014, a bathymetric survey was undertaken in the ES Void to reassess the tailings deposition rate. The survey demonstrated that Drayton had been overestimating the volume of tailings that were being deposited in the void. This survey was used to re-assess the storage capacity within the void and calibrate water storage models in order to be able to calculate the tailings and water split contained in the void on a monthly basis.

2.7 Ore and Product Stockpiles

Drayton has four product coal stockpiles each with a nominal capacity of 80,000 tonnes. Coal from different areas of the pit is blended on the stockpiles to meet customer specifications.

Export coal is stacked in piles of up to 40,000 tonnes. The reclaimer is transferred between stockpiles using a rail-mounted transfer car, which is located at the northern end of the stockpiles. Coal is typically not stored for longer than twelve weeks due to the risk of self-heating.

Drayton operates a ROM stockpile pad adjacent to the feed hopper to the CHP. This stockpile is used to temporarily store coal hauled from the pit during times when the CHP is not available. It is also used to store coal that must be mined due to sequencing issues but is inappropriate for the product stocks being assembled. The ROM stockpile pad is generally divided into five different areas to accommodate five different qualities of coal. It has a capacity of some 200,500 tonnes in total. This level of inventory allows some coal to be available for processing during periods of rain and poor weather conditions, which may shut down coal hauling from the pit. It also facilitates the final blending of export cargoes by proving a ready source of different quality coals.

There were no changes to the management of stockpiles during the reporting period.

2.8 Water Management

2.8.1 Water Management System

No changes were made to the mine water management system in the reporting period. The Drayton water management system is a closed system which sources all of its process water internally from within the existing mining operational area, rather than extraction from the Hunter River. Potable water however, is supplied by pipeline from the MSC. The Drayton water management system consists of a series of on-site dams and in-pit water storage areas (see Figure 1).

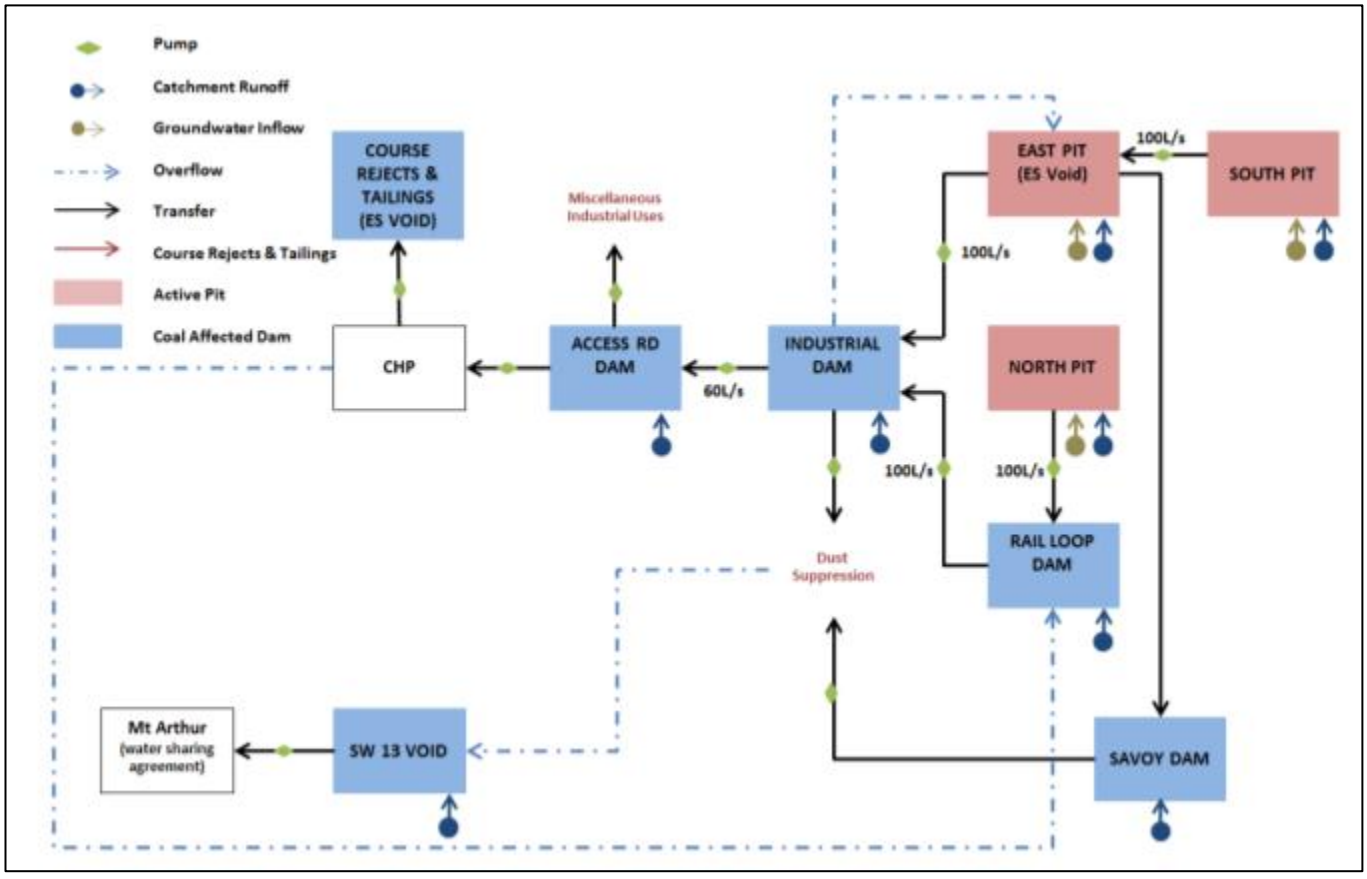


Figure 1: Water Management Flow Diagram

The total storage capacity of the water management system was 8,794ML at the end of the 2014 reporting period. This consisted of 1,553ML capacity in major mine water storage dams and 7,241ML in the voids. Water volumes in major storages are given in Table 7 below.

The Far East Tip Dam (Dam 1895) has a capacity of approximately 130ML however; it has no connection with mining activities. This dam exists principally to control runoff (clean water) from the Far East Tip, a rehabilitated out of pit overburden dump.

The Rail Loop Dam (Dam 2114) controls runoff from the CHP area. Water from the Rail Loop Dam is recycled back to the mine water system via the industrial dam. The 18ML capacity of the

Rail Loop Dam is maintained as close to zero volume as possible to prevent potential for offsite discharge of mine water.

Clean water is imported to site for drinking and bathing. Clean water is stored in a holding tank of 0.05ML capacity. The tank is maintained at capacity for use as needed.

Table 7: Stored Water – December 2014

		Volumes held (ML)		
		Start of Reporting Period	End of Reporting Period	Storage Capacity
Clean Water		0.05	0.05	0.05
Mine Water:	Savoy (1609) Dam	71	73	145
	Industrial (1969) Dam	377	405	750
	Access Road (2081) Dam	376	435	615
	Rail Loop (2114) Dam	5	5	18
	Other Surface Dams (transfer dams)	25	25	25
SW13 Void		374	590	1,000
NN Pit		370*	31	40
ES Void		3,858	3,948	6,201
Controlled discharge water (salinity trading scheme)		Nil	Nil	Nil
Contaminated Water		Nil	Nil	Nil

** NN pit filled with water while not mined, survey of 370ML in mid-July 2014 when decision made to dewater prior to recommencing mining in NN pit.*

Historically, Drayton's water balance has remained in surplus. Throughout drought periods, water storage levels have previously dropped however, water storage supplies still remained sufficient for normal mining operations to occur without adverse impacts on operations. At the end of the month water storage levels in dams and voids are surveyed. At the end of 2014, approximately 943ML was being stored in established dams and 4,569ML in pit voids. This equates to approximately 60% of available dam storage capacity and approximately 63% of available void storage capacity.

Drayton does not possess a discharge licence however, it has a water sharing arrangement which allows it to transfer up to 600ML of excess mine water to the neighbouring Mt Arthur Coal mine.

2.8.2 Water Sources

Drayton is situated in the headwaters of three creek catchments, namely Ramrod Creek, Bayswater Creek and Saddlers Creek. There is no major stream flowing through the mine that requires diversion.

All runoff from disturbed areas is intercepted by dams or by the respective pits. All final tips have associated catchment dams that allow runoff to be collected and suspended solids to settle. Water that enters the pit areas is pumped to mine water storage dams allowing this water then to be utilised for mining activities. During the 2014 reporting period approximately 1,933ML of runoff from rainfall was captured onsite. Any potentially contaminated rainfall runoff from the workshop area is diverted to the Oil Pollution Control Dam. The Oil Pollution Control Dam has an oil/water separator in place which removes oil residue from the water runoff prior to it being transferred into the Industrial Dam.

Drayton currently has several Water Licences issued by the NSW Office of Water, mostly relating to monitoring piezometers. Two of the groundwater licenses allow the extraction of up to 985ML per annum, and 402ML per annum (1,387ML combined) from the mining operations through ground water inflow.

Pit water extracted from Drayton's operation is a combination of both ground water and surface runoff from the areas within the pit during periods of rainfall, although groundwater is calculated to be only a small proportion of the total.

Table 8 below outlines the main water storages, the source of their water supply and where the water is consumed.

Table 8: Mine water storage dams – Water source and usage

Reference No.	Dam Names	Supply Source	Water Use
1969	Industrial Dam	Runoff from rehabilitated area, industrial areas and East Pit	Haul road dust suppression, industrial wash down water and supply to Access Road Dam
2081	Access Road Dam	Runoff from undisturbed and rehabilitated land and pumping in from Industrial Dam and ES Void	Industrial areas, CHP and fire system
2114	Rail Loop Dam	Runoff from CHP, coal stockpile area and fine rejects settling ponds, and direct pumping from Access Road Dam	Transfer to Industrial Dam
1609	Savoy Dam	Runoff from undisturbed and rehabilitated land, SW Void and ES Void transfer point	Mine water storage or transfer to tanker fill stations
ES Void	East Pit South Void	Tailings and water storage	Water extracted and transferred to Access Road Dam or Savoy Dam
SW13 Void	West Pit Void	This storage is key buffer storage for wet weather, a source of water in dry weather and contains a large volume of water which is otherwise unaccounted for in the system.	Key storage for Drayton and Mt Arthur Coal. This location will be available for both Drayton and Mt Arthur Coal to extract water from during the life of the mine.

2.8.3 Water Consumption

During 2014, total mine water consumption was approximately 1,682.9ML. Of this, 649.5ML consisted of industrial usage mainly through washdown in the workshop and truck wash bays and approximately 504.3ML was sprayed onto haul roads for dust suppression purposes. Approximately 529.1ML was used by the CHP to process coal through the Coal Treatment Unit (CTU), for washdown and in CHP dust suppression systems. Some of the CHP water consumed was pumped to the ES void in tailings slurry from the CTU. As the tailings settles, a proportion of this water is recovered from the ES void and recycled back into the mine water system via the Access Road Dam where it can be reused.

During the 2014 reporting period Drayton used 9.47ML of potable water for drinking, showering and toilets within the mining operation areas.

2.9 Hazardous Material Management

All dangerous and hazardous goods are stored in accordance with the appropriate legislation and standards. Regular inspections of the storage sites are undertaken to ensure compliance.

All chemicals that are used, or are proposed to be used on site, are checked and approved for their safety and environmental effects by the SHE Department. For each chemical a material safety data sheet (MSDS) is maintained in a central register, the ChemAlert Database.

All contractors working with chemicals must carry the relevant MSDS when using the chemical, and must follow any instructions given by the SHE Department with regard to personal protective equipment and handling requirements.

The ChemAlert Database is also used to log environmental hazards associated with the use of each chemical, and the necessary measures to control these hazards.

The applicable licences and registrations for the management of hazardous materials are listed in Table 9 below.

Table 9: Hazardous materials - Licence and registration details

Licence / Registration Description	Issuing Authority	Expiry Date
Licence to Store Explosives – XSTR100017 (For the storage of detonators, boosters, detonating cord, primers)	Work Cover	22/11/2016
Radiation Management Licence – RML31157 (For radioactive devices using in Coal Scan and the dense medium feed within the CHP)	EPA	18/06/2015
Acknowledgement of Notification of Dangerous Goods on Premises – NDG019387 (For the storage of liquid fuels and gases)	Work Cover	Perpetuity
Acknowledgement of Notification of Dangerous Goods on Premises – 35/038167 (Orica)	Work Cover	10/06/2016

The Drayton Radiation Management License was renewed during the reporting period.

At the beginning of 2015, WorkCover changed the duration of licences with the Acknowledgement of Notification of Dangerous Goods on Premises now not requiring renewal until changes in dangerous goods are made. This Acknowledgement covers fuel and gas storage. Fuel containment consists of a series of above ground storage tanks. The major containment for diesel is in a Class C1 above ground tank with a capacity of 860,000 litres. There are also two other above ground tanks located around the mine, each being Class C1, with 110,000 litre capacities. In addition, the acknowledgement covers cylinder stores of acetylene and liquid petroleum gas up to a volume of 500L each.

Orica Explosives operate an ammonium nitrate emulsion (ANE) storage facility on the mine site. They hold a Dangerous Goods licence issued by Work Cover for 80 tonnes of ANE and are authorised to store canola oil at the explosives reload area.

2.10 Other Infrastructure Management

The Antiene Joint Rail User facility has specific conditions of consent. These conditions are detailed in Section 7.1 of this report.

3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

Environmental monitoring is a key component of Drayton's operation. Monitoring undertaken includes air quality, surface and ground water quality, blasting, noise and meteorology. All monitoring follows the appropriate Australian Standard, with collection of samples by site personnel and the analysis of water and dust samples performed by an independent laboratory that is NATA accredited.

3.1 Air Quality

3.1.1 Management System

During 2014, Drayton was required to comply with a Pollution Reduction Program (PRP) related to dust management. This required Drayton to conduct on site monitoring and prepare a report on the results. The *2013-2014 Drayton Pollution Reduction Program Monitoring Report* was submitted to the Environmental Protection Agency on the 15th August 2014.

In addition, as required under condition U3.1 of EPL1323, Drayton was required to submit a report documenting an investigation and trial of best practice measures for the control of particulate matter from the use of equipment on overburden and load and dumping of overburden.

To meet this condition, throughout late 2013 and early 2014, Drayton joined with other mining companies, the NSW Minerals Council and ACARP to commission an investigation into best practice measures to control particulate matter from overburden movements. Drayton submitted a copy of the '*Coal Mine Pollution Reduction Program Condition U3 Assessment (NSW Minerals Council/ACARP Project C22027)*' report to the EPA on the 30th of July 2014.

On the 30th October 2014, aerial seeding was conducted on the spoils in areas which are expected to be inactive for a period of several months, and in areas with steep grades along haul roads. The purpose of the seeding was for effective dust control on temporarily inactive spoil materials, as well as providing temporary stabilisation of exposed areas. Germination and establishment of cover was assessed visually following rainfall. The aerial seeding was generally successful, with growth occurring in most of the seeded areas.

Figure 2: Aerial seeding vegetation on dragline spoils

Drayton runs a dust management system where upwind and downwind real time monitors provide feedback to a software package that assesses Drayton's dust contribution. This system alerts when Drayton's dust emissions are elevated and trigger actions for employees. This has been outlined in Drayton's Air Quality Management and Monitoring Plan.

Predictive weather modelling has also been used throughout 2014 to provide a forecast for dust enhancing weather and trigger preparatory actions prior to dusty conditions.

3.1.2 Monitoring System

Specific requirements relating to air quality monitoring are detailed in EPL 1323 and Development Approval 06_0202. As required by Section M2.1 of the EPL, the Drayton air quality monitoring program monitored depositional matter, Total Suspended Particulates (TSP) and particulate matter less than 10 micrometers in diameter (PM_{10}). Using the results from the monitoring program, Drayton is able to determine compliance with the licence conditions. Drayton also monitors regional air quality as well as $PM_{2.5}$ using the Upper Hunter Air Quality Monitoring Network (UHAQMN). The results from the air quality monitoring program are published monthly via the Anglo American website, reported internally to site management, and reported annually in the AEMR.

Deposited Dust

Dust depositional gauges have been in operation for the duration of the life of the mine. The eight depositional gauges used for compliance are situated to the north of the lease boundary, and in the vicinity of the residential areas around the mine (see Figure 3).

The dust gauges and measurement conform to 'AS3580.10.1 - 2003 - Methods 10.1 - Determination of Particulates - Deposited matter - Gravimetric Method'. Samples are collected, in accordance with AS 2724.5(1987), each calendar month. The samples are analysed by a National Association of Testing Authorities (NATA) certified laboratory for total solids, insoluble solids, ash residue and combustible matter. A field observational assessment is also noted as to possible contamination of samples. To determine compliance the depositional dust results are compared to the licence conditions outlined in Table 10.

Table 10: Long term impact assessment criteria for deposited dust

Pollutant	Averaging Period	Maximum Increase in Deposited Dust Levels	Maximum Total Deposited Dust Level
Deposited Dust	Annual	2 g/m²/month	4 g/m²/month

Total Suspended Particulates

Drayton operates two high volume air samplers (HVAS) at locations indicated in Figure 3 below. The Met Station monitor is located onsite in the CHP area and used to indicate TSP levels onsite. The Lot 22 monitor is located offsite, within the Antiene rural sub division close to

residential premises, and is used for compliance purposes. *Both monitors were calibrated every two months throughout the 2014 reporting period.*

Drayton's TSP sampling program follows the OEH guidelines of a six-day rotational cycle. The HVAS and measurement also conform to '*AS 2724.3 – 1984: Particulate Matter – Determination of Total Suspended Particulates (TSP), High Volume Sampler Gravimetric Method*'. Compliance is determined by comparing the results from the HVAS sampling to the licence conditions outlined in Table 11.

Table 11: Long term impact assessment criteria for TSP

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m³

PM10

Drayton's Tapered Element Oscillating Microbalance (TEOM) continuously monitors PM10, at a location between Drayton's mining operations and the near neighbour's boundaries (refer to Figure 3). It is used to indicate real time dust levels between the operation and near residents. The TEOM was calibrated, in accordance with AS3580.9.8-2008 and the TEOM Service Manual, in April, June, September and December 2014. It is required that dust levels at neighbouring residences fall below the criteria outlined in Table 12 in order to be compliant with licence conditions.

Table 12: Short and long term impact assessment criteria for PM10

Pollutant	Averaging period	Criterion
Particulate matter <10µm (PM_{10})	24 hour	50 µg/m³
Particulate matter <10µm (PM_{10})	Annual	30 µg/m³

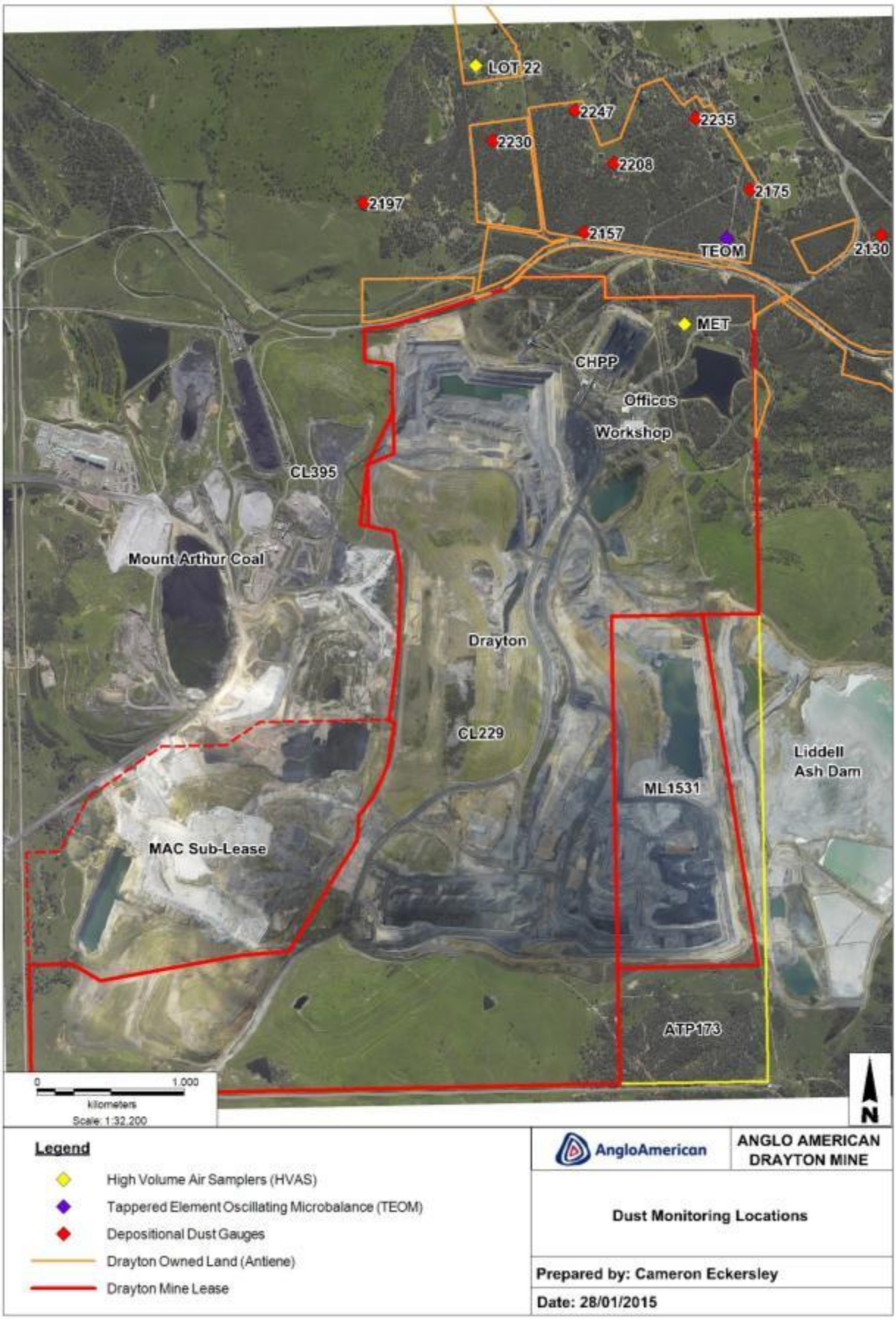


Figure 3: Dust monitoring sites

3.1.3 Results

Deposited Dust

The Drayton Mine Extension Environmental Assessment 2007 estimated emissions to air for years one, five and ten, and modelled the dispersion and deposition for emissions in these years. The 2014 reporting period coincides with year seven of the EA therefore the 2014 results will be compared to the closest year's (Year 5) prediction.

The 2007 EA predicted that no privately owned residences would experience dust deposition levels above the assessment criteria during year 5. The 2014 dust deposition levels displayed acceptable levels which generally fell below the maximum criteria outlined in Table 10 above. Most of the depositional dust levels remained similar to long term averages except for gauge 2130, 2197 and 2208. The 2014 average insoluble solids for gauge 2130, 2197 and 2208 were higher than the long term average. This is generally consistent with the 2013 results however in 2013 the 2208 gauge was lower than the long term average (see Table 13).

Table 13: 2014 Average Dust Deposition Gauge Results

Site Number	Ash (g/m².month)	Combustible Matter (g/m².month)	Insoluble Solids (g/m².month)	No of Samples	EPL Annual Limit	Long Term Average (Insoluble Solids)	
					g/m².month	g/m².month	Period
2130	1.58	0.79	2.41	12	4.00	1.96	May99 – Dec14
2157	1.43	0.66	2.08	12	4.00	2.08	Oct82 – Dec14
2175	1.43	0.65	2.08	12	4.00	1.77	Dec86 – Dec14
2197	2.08	1.04	3.12	12	4.00	2.77	Dec86 – Dec14
2208	2.56	1.0	3.55	12	4.00	2.35	Dec86 – Dec14
2230	1.65	0.81	2.46	12	4.00	2.39	Dec87 – Dec14
2235	1.49	0.64	2.13	12	4.00	1.99	Jan85 – Dec14
2247	1.58	0.53	2.09	12	4.00	1.66	Oct82 – Dec14

Note: Deposited dust is assessed as insoluble solids as defined by 'AS/NZS 3580.10.1.2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method'.

When compared to the previous reporting period gauge 2130 displayed an increase in average ash, combustible matter and insoluble solids. Dust gauge 2157 displayed an increase in average dust, a decrease in combustible matter and a steady trend for insoluble solids. Dust gauge 2175 showed an increase in average ash and insoluble solids, but was steady in regards to combustible matter. The remaining dust gauges (2197, 2208, 2230, 2235 and 2247) all showed increases in average ash and insoluble solids, but showed decreases in combustible matter. Despite experiencing above average annual rainfall, there rainfall was highly variable

month to month, with half experiencing above average and half experiencing below or well below average rainfall (January was one of the driest January's recorded). The drier months tended to correlate with much dustier conditions.

Figure 4 displays a prediction of the average annual dust (insoluble solids) deposition rate due to emissions from all sources for year 5 for the 2007 EA. In 2014 the overall average level of insoluble solids across all eight gauges from all sources was 2.49g/m². This was an increase of 0.08 g/m² compared to the 2013 average insoluble level of 2.41g/m².

The 2007 EA predicted the average dust (insoluble solids) deposition due to Drayton and other sources at specific residences would be within acceptable limits. The actual monitoring results compared to those predicted in the EA can be found in Table 14.

Table 14: Dust Deposition results compared with EA

Residence ID	Representative Dust Gauge	2014 Average Insoluble Solids (g/m^2/month)	EA Prediction Year 5 Average Insoluble Solids (g/m^2/month)
16	2235	2.13	1.5
61	2247	2.09	1.4
27	2230	2.46	1.3
71	2175	2.08	1.3

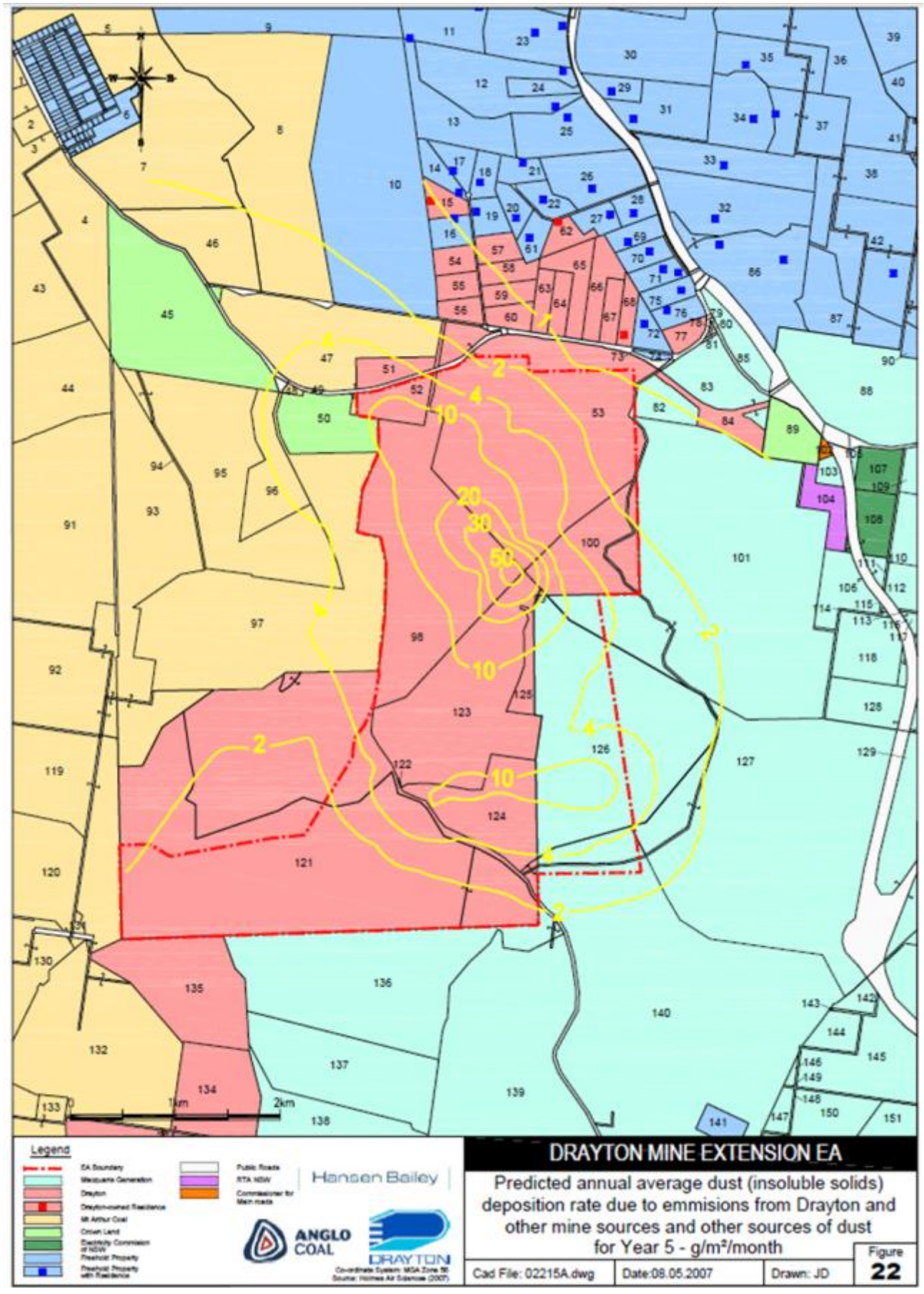


Figure 4: Predicted Annual Average Deposited Dust - Year 5

Figure 5 summarises the year's results of total solids, insoluble solids, ash and combustible matter in the eight compliance gauges. Out of the eight gauges, gauge 2208, located in the on Drayton land, had the highest average result levels which was a change from the previous reporting period where dust gauge 2197, located to the west of the Antiene area was the highest. Otherwise the general trend across the offsite dust gauges varied with some minor increases and other minor decreases. Due to the nature of Dust Deposition Gauges, contamination of samples by bird droppings, insects and vegetation is a common occurrence. Contamination may cause dust results to appear higher than they actually are. Details relating to each individual gauge on a monthly basis are outlined in Appendix C.

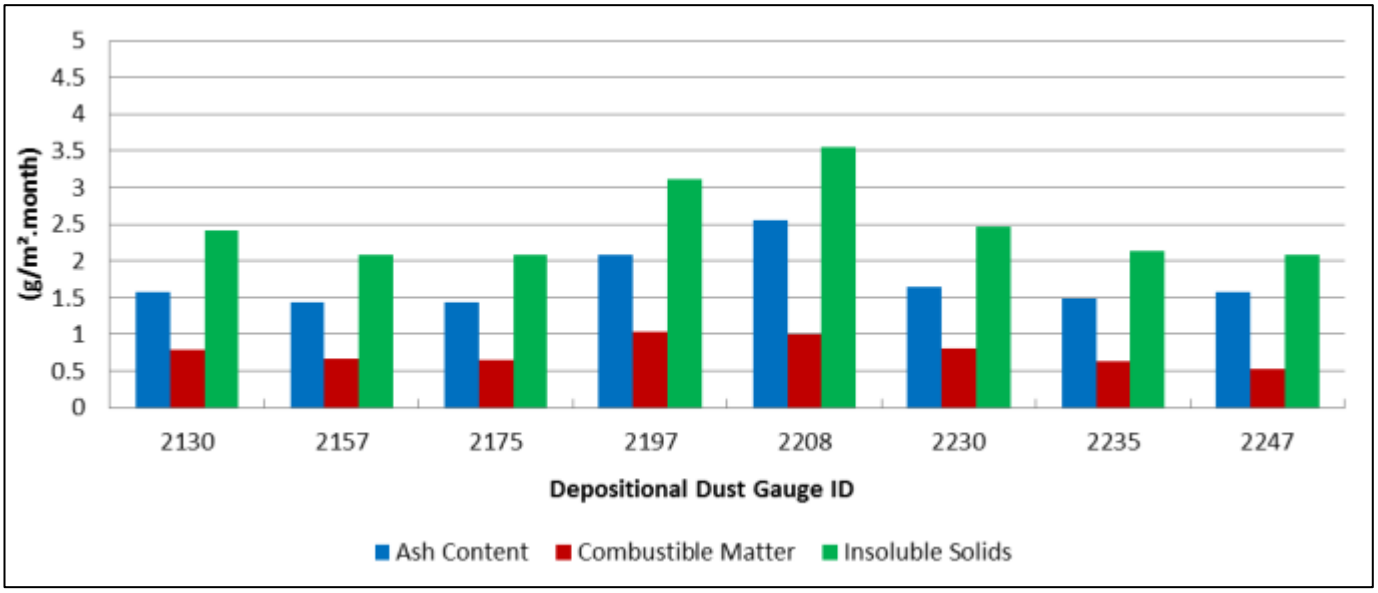


Figure 5: Average Depositional Dust Gauge Results 2014

Total Suspended Particulates

The 2014 annual mean TSP for the Antiene station was well below the annual mean limit of 90µg/m³ (see Figure 6). The 2014 annual mean displayed an increase of 9.1µg/m³ in comparison to 2013 figure. The annual mean results are summarised in Table 15 below and the complete results for the 2014 reporting period are in Appendix C. Again, while annual rainfall was above the long term average, it was not uniform and there were several months that experienced well below the average. These drier months correlate with the months with higher TSP results .

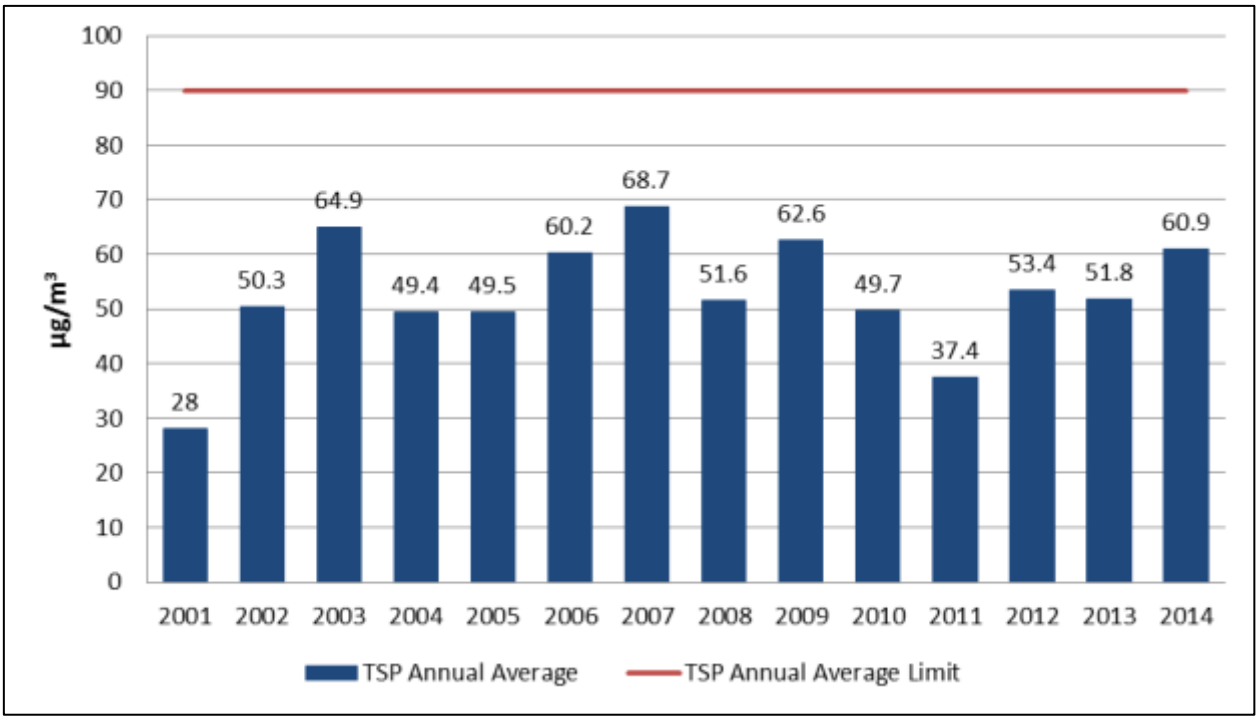


Figure 6: Long Term Annual Average TSP from Lot 22 HVAS

Table 15: Total Suspended Particulates 2014

Location	Yearly Average (µg/m³)	Range (µg/m³)	No. Samples	Long Term Average µg/m³	*EA Prediction Residence 14 Year 5*
Lot 22 Antiene	60.9	14 - 163	61	52.7 (2001 – 2014)	72.4

The 2007 EA prediction of the annual TSP concentrations due to emissions from Drayton and other sources for year 5 is presented in Figure 7. The EA predicted that annual average TSP concentrations due to Drayton and other sources for residence 14 in year 5 would be 72.4µg/m³. The 2014 annual concentration of 60.9µg/m³ and the long-term average of 52.7µg/m³ (see Table 15 above) are below the EA prediction.

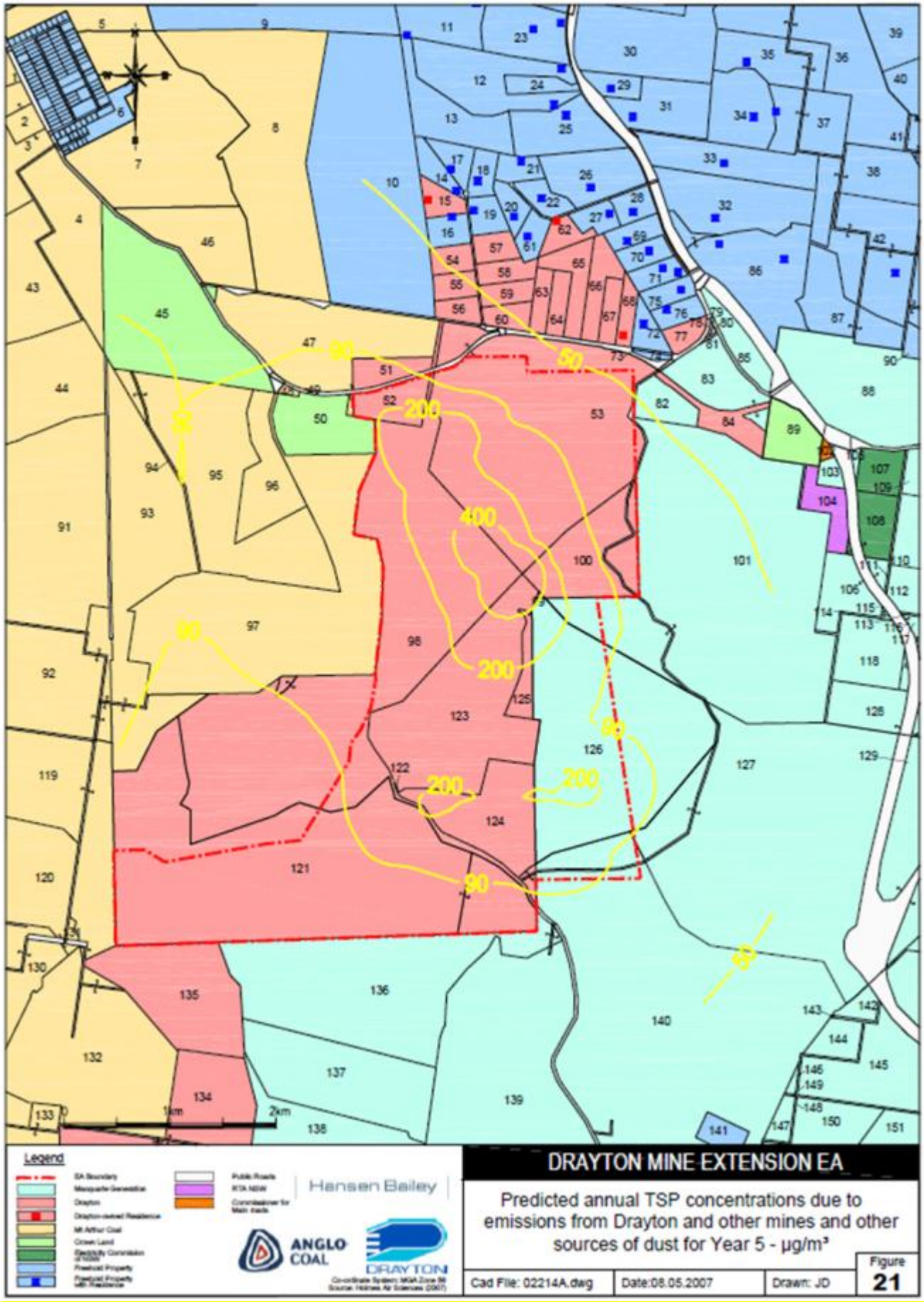


Figure 7: Predicted Annual TSP Concentrations - Year 5

Figure 8 indicates that TSP levels were higher during warmer summer months, particularly January and then building through October and November which were particularly dry. These results are generally consistent with previous reporting periods where hot dry weather tends to result in high TSP levels and cooler wet weather results in a reduced TSP load.

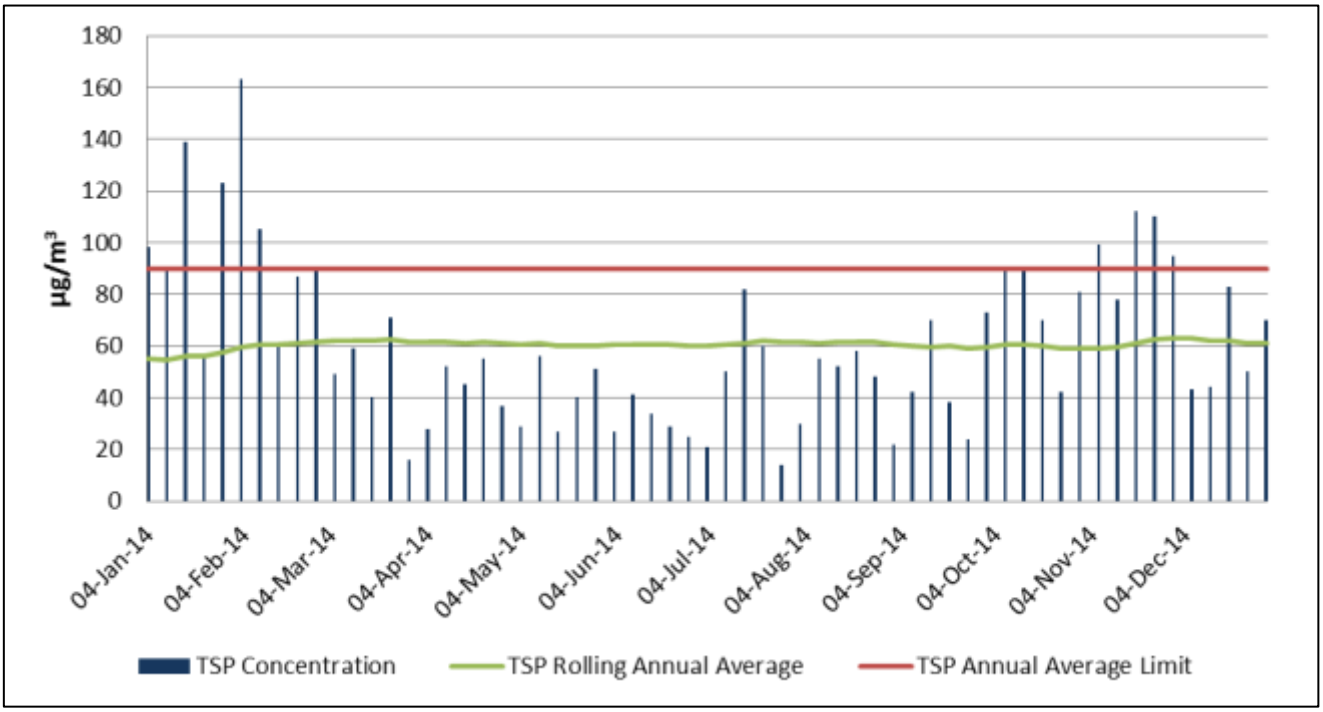


Figure 8: TSP from Lot 22 HVAS 2014

PM_{10}

The real time dust monitoring results show that the annual average criterion of 30µg/m^3 was not exceeded in 2014 (see Figure 9). The 24-hour average PM_{10} remained below the 50µg/m^3 criteria throughout the reporting period.

The 2014 PM_{10} data shows a similar trend to the 2013 data, with higher PM_{10} levels occurring from October to January. This trend is also apparent in the historical data in Figure 10 and could be attributed to the hot summer months. The 24 hour average PM_{10} results are presented in Appendix C and summarised in Figure 9.

The 2007 EA prediction of the annual PM_{10} concentrations due to emissions from Drayton and other sources for year 5 is presented in Figure 11. The EA predicted that the annual average PM_{10} concentrations from all sources for residence 72 would be 24.9µg/m³. The 2014 annual average concentration of PM_{10} at the Lot 9 TEOM was 16.15µg/m³ and is below the EA's predicted level.

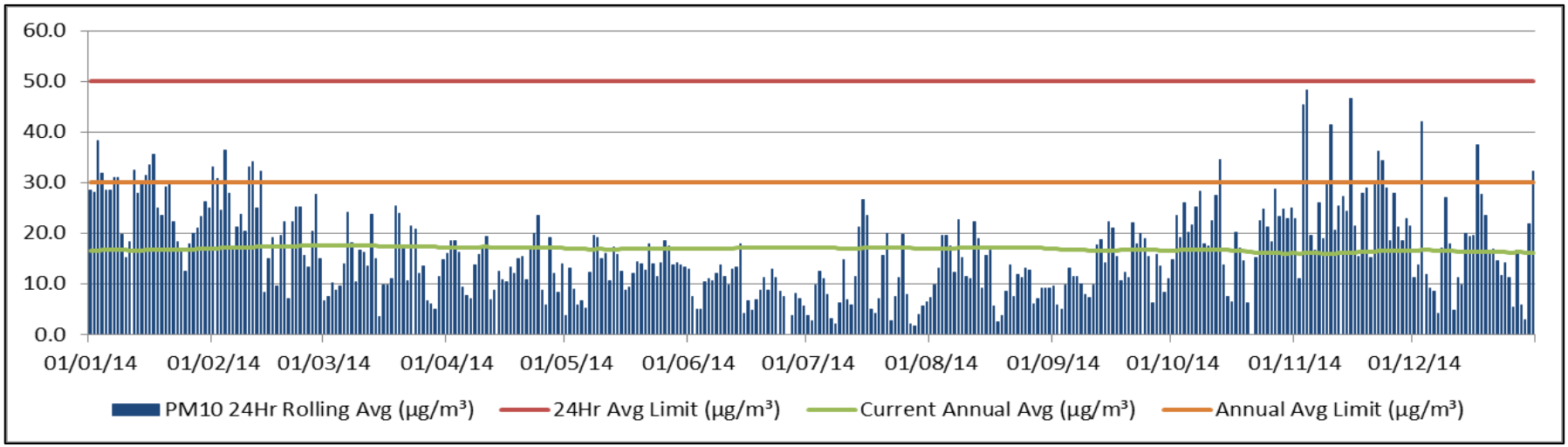


Figure 9: PM10 Data 2014

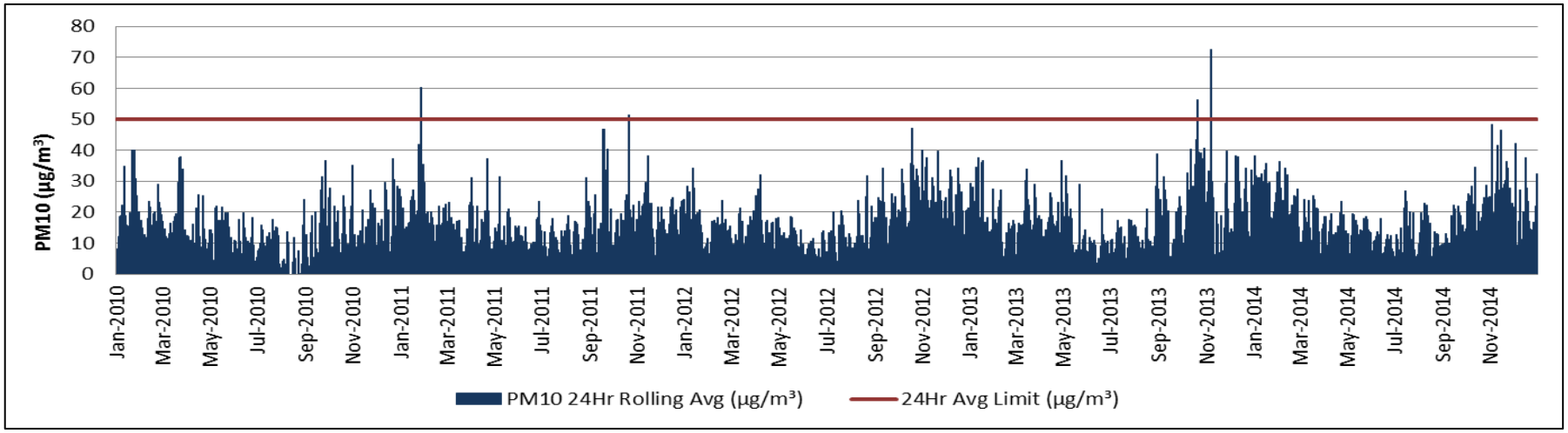


Figure 10: PM10 Historical Data

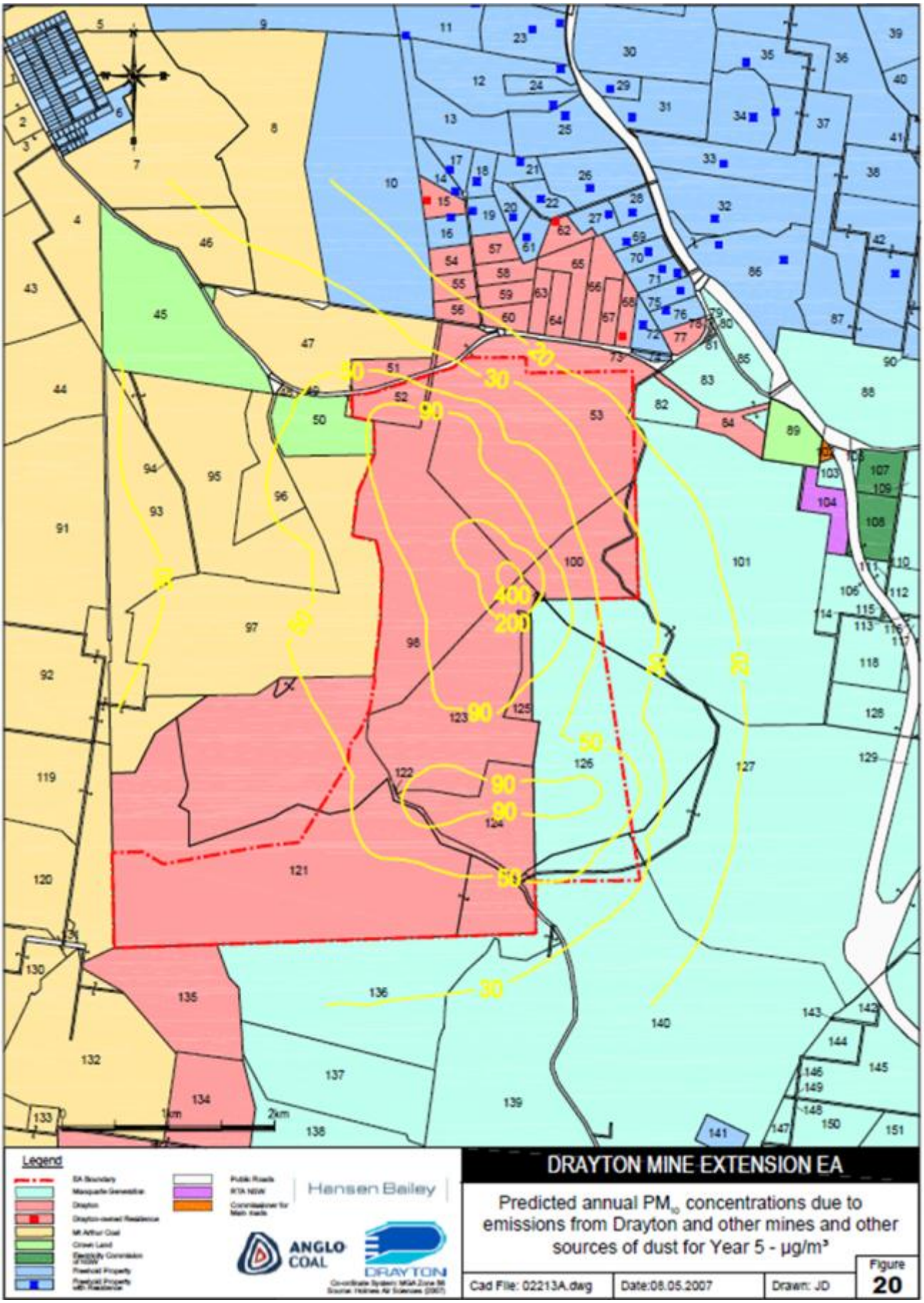


Figure 11: Predicted Annual PM10 Concentrations - Year 5

3.1.4 Greenhouse Gas and Energy Efficiencies

Drayton continued to focus on reducing greenhouse gases and improving energy efficiencies through key projects such as installing electrical and diesel metering, and increasing efficiencies of the dragline. During the 2013/2014 financial year Drayton reported to the Clean Energy Regulator a total of 86,811t CO2-e in scope 1 emissions and 33,394t CO2-e in scope 2 emissions. Also during this financial year, Drayton consumed 1,274,590 gigajoules of energy and produced 101,558,134 gigajoules of energy in the form of coal mined. These reductions can largely be attributed to the move from a 24/7 operation to 24/5 operation with the exception of the Dragline and CHP which still operate on a 24/7 basis).

3.2 Erosion and Sediment

During the 2014 reporting period, erosion and sediment control at Drayton was managed in accordance with the site Water Management Plan and the 2013-15 MOP. The control measures in place throughout the year included:

- Limiting the number of roads and tracks established;
- Limiting the extent of disturbance ahead of mining operations;
- Sediment traps and catch drains in the runoff zones from industrial areas;
- Collection of surface runoff in established dams downstream of disturbed areas;
- Progressive rehabilitation of disturbed areas as soon as practicable; and
- Contour banks on rehabilitated land designed at 0.5% - 1% grade and spaced to minimise down slope flows.

Water from washdown bays is collected in a series of sumps that are desilted on a regular basis. Any overflow from these sumps goes into the oil pollution control dam.

The rail loop dam, which collects runoff from the CHP area, has been designed so runoff water travels through a series of sediment ponds prior to entering the dam. Drayton does not possess a licence to discharge water off site so water and sediment is retained on site.

In 2014, an erosion gully on the face of the Great Northern Tip was identified as requiring some mitigation. The erosion had occurred following a large rainfall event towards the end of 2013. Review of aerial photographs indicates that there has been no change in the gully. A drainage bund was constructed to direct water away from this area towards existing drainage on nearby rehabilitation. In future, Drayton will be mindful of diverting rainwater away from steep slopes where required, and rehabilitated land will include contour banks developed in line with the Managing Urban Stormwater: Soils and construction guidelines to manage water flows.

3.3 Surface Water

3.3.1 Management System

Drayton maintains a Water Management Plan, which addresses surface water management and monitoring. As part of water management on site the site water balance is recalculated each month using the surveyed storage levels, meter readings and rainfall volumes recorded by

the onsite meteorological station. This information is provided to site managers at the monthly EMC meetings to enable effective surface water management through regular assessment of the current storage capacity and monthly water usage requirements.

Since all mine water is contained within the internal mine water management system and is not discharged off site, downstream management is minimal.

3.3.2 Monitoring System

As part of the surface water monitoring plan, monthly surface water monitoring was undertaken at eleven locations. These monitoring locations are illustrated in Figure 12. Most of these dams are mine water dams with the exception being dam 2221, which is located in the Antiene Rural Estate area.

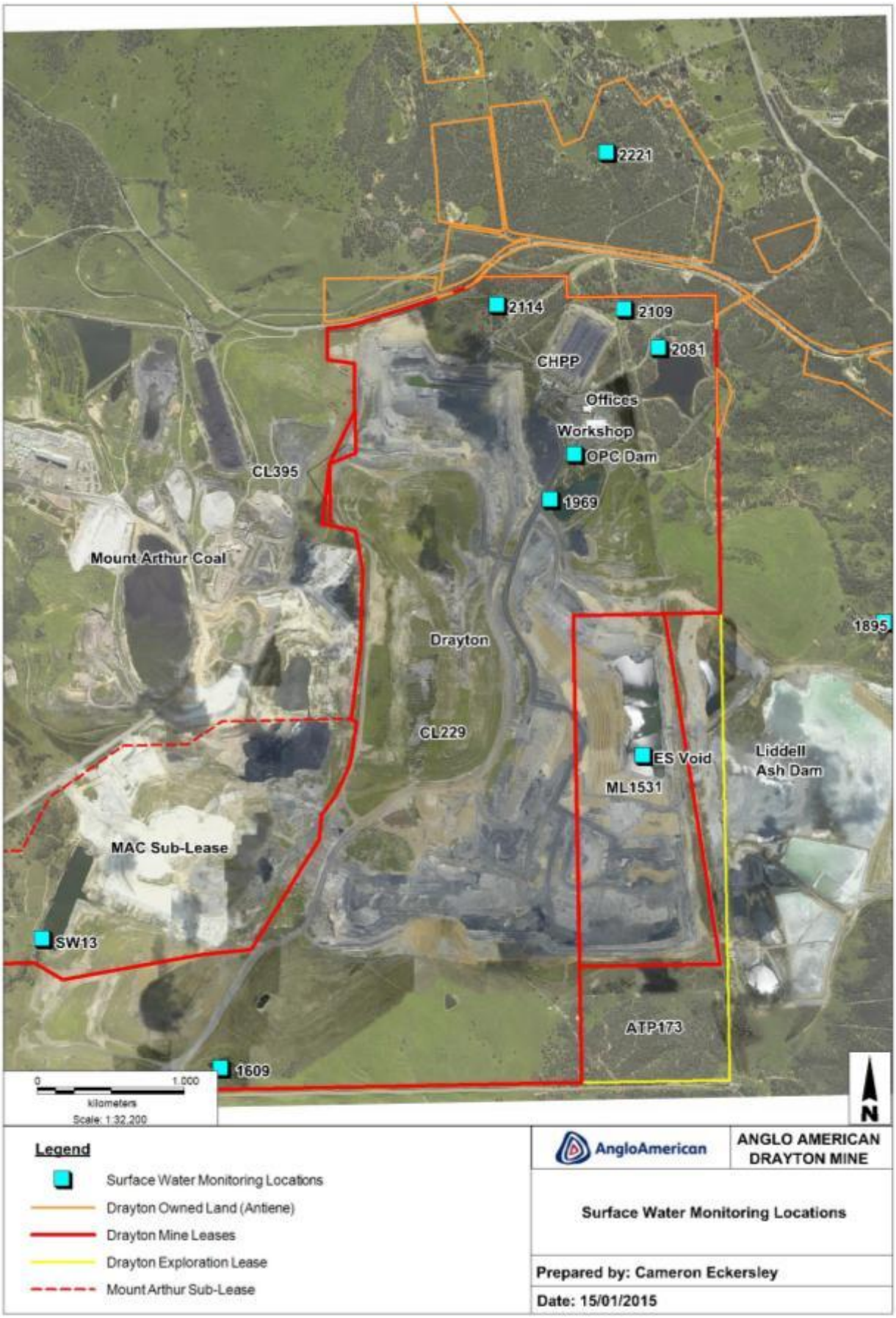


Figure 12: Surface water monitoring sites

Analysis undertaken on the samples collected from the main drainage basins and on-site dams include:

- pH
- Electrical Conductivity (EC)
- Total Dissolved Solids (TDS)
- Suspended Solids (SS)
- Bicarbonates
- Soluble Ions (Sodium, Magnesium, Chloride, Sulphate, Calcium and Potassium)

3.3.3 Results

During the reporting period Drayton received 768.6mm of rain, the majority of which fell during February, March, April and December. Water levels in the main dams remained stable throughout 2014 and water quality monitoring continued as in previous years. The Drayton Mine Extension EA 2007 notes that site water quality is typical of other mines in the area and is moderately saline.

Far East Tip Dam (1895)

Ongoing monitoring of the Far East Tip Dam (1895) has revealed that the water quality in this dam has an alkaline pH and is higher than background salinity levels. This reflects natural saline conditions typical of upper Hunter catchments. Dam 1895 collects runoff from rehabilitated land as well as undisturbed areas. The results of water quality sampling from the Dam 1895 are provided in Table 16.

Table 16: Water Quality – Far East Tip (1895) Dam

Date	EC µS/cm	pH	TDS mg/L	NFR* mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Sodium mg/L
Jan 14	5940	8.7	3790	5	324	738	1620	870
Feb 14	5840	8.6	4020	5	350	718	1630	970
Mar 14	5080	8.7	3300	5	291	649	1430	891
Apr 14	5470	8.6	3420	5	294	674	1260	787
May 14	5530	8.5	3480	5	323	697	1590	816
Jun 14	5590	8.4	3620	5	297	652	1610	893
Jul 14	5830	8.4	3770	5	329	688	1680	882
Aug 14	5760	8.4	3790	5	310	679	1600	881
Sep 14	5600	8.6	3490	5	304	753	1780	925
Oct 14	5930	8.8	3530	6	318	810	1470	826
Nov 14	6180	9.0	3040	5	356	793	1830	1090
Dec 14	6010	9.2	5050	5	356	793	1820	985
Average	5730	8.7	3692	6	321	720	1610	901

**Note: NFR is non-filterable residue.*

Access Road Dam (2081)

The Access Road Dam (2081) receives water from the ES Void tailings storage and the Industrial Dam. The Access Road Dam has a high turnover of water which is pumped to the CHP. During the reporting period the EC and TDS in the Access Road Dam remained stable. The results of water quality sampling from the Access Road Dam are provided in Table 17.

Table 17: Water Quality – Dam 2081

Date	EC µS/cm	pH	TDS mg/L	NFR mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Sodium mg/L
Jan 14	7420	8.1	7100	6	584	735	3640	654
Feb 14	7030	8.0	6170	10	583	680	3530	683
Mar 14	6220	8.2	5090	8	488	669	3100	672
Apr 14	6750	8.0	6040	5	514	637	3450	593
May 14	6850	8.0	6360	21	505	674	3410	614
Jun 14	6860	8.2	5890	5	521	670	3360	621
Jul 14	7230	8.1	5520	5	537	673	3550	604
Aug 14	6920	8.3	5740	5	518	650	3220	585
Sep 14	6580	8.2	4940	7	496	706	3380	614
Oct 14	6860	8.1	5120	5	478	755	2990	540
Nov 14	7250	8.0	6410	5	565	728	3810	691
Dec 14	6880	8.0	7580	11	554	708	3360	648
Average	6904	8.1	5997	8	529	690	3400	627

Antiene Dam

The Antiene Dam (2221) is located off site in the Antiene rural sub division area. This dam has no connection to mining activities and is monitored for background purposes only. The Antiene dam (2221) was traditionally a small farm dam however, its purpose now is to supply water to native animals. During the reporting period the Antiene Dam (2221) generally had noticeably lower EC, pH, TDS and metal concentrations in comparison to the mine water dams.

Other Dams

Dam 2114, located within the Drayton rail loop, collects surface runoff from the CHP and returns water to the internal water management system. Water quality in this dam fluctuated throughout 2014 consistent with rainfall events.

The heavy rainfall which occurred during December only resulted in a slight decrease in concentration levels of EC, TDS and metals, and was more prominent in the smaller dams than occurring uniformly across all dams. A summary of the results of the water quality sampling for the remaining water storages on site is presented in Table 18. The complete data is provided in Appendix B.

Table 18: Average Results of Water Quality Sampling for Remaining Dams

Dam	EC µS/cm	pH	TDS mg/L	NFR mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Sodium mg/L	No. Samples
1609	7549	8.3	6625	12	590	741	3782	666	12
1969	5983	8.1	4694	11	415	806	2666	580	12
2109	3246	7.3	2108	11	119	484	948	483	10
2114	6160	8.1	5079	13	455	638	2963	563	12
2221	1288	7.9	735	6	40	187	244	174	12
SW13	7107	8.0	6280	8	535	628	3585	688	10
ES Void	7230	7.9	6137	50	547	691	3703	601	3
OPC Dam	5499	7.7	4676	65	390	549	2517	541	12

3.4 Ground Water

3.4.1 Management System

Groundwater at Drayton is extracted only through infiltration to mine voids. It was predicted that the Permian coal seam aquifer would be impacted by Drayton's operations. As a result piezometers were established during the exploration-drilling program, and subsequently throughout the mining process as further exploration drilling was carried out.

3.4.2 Monitoring System

As part of the water management plan, Drayton monitors a network of 8 piezometers on and off site. Standing water levels and water quality are monitored on a monthly basis, with full water quality analysis being completed quarterly. Some piezometers could not be sampled on each monitoring occasion due to insufficient water. The locations of the piezometers are shown in Figure 13.

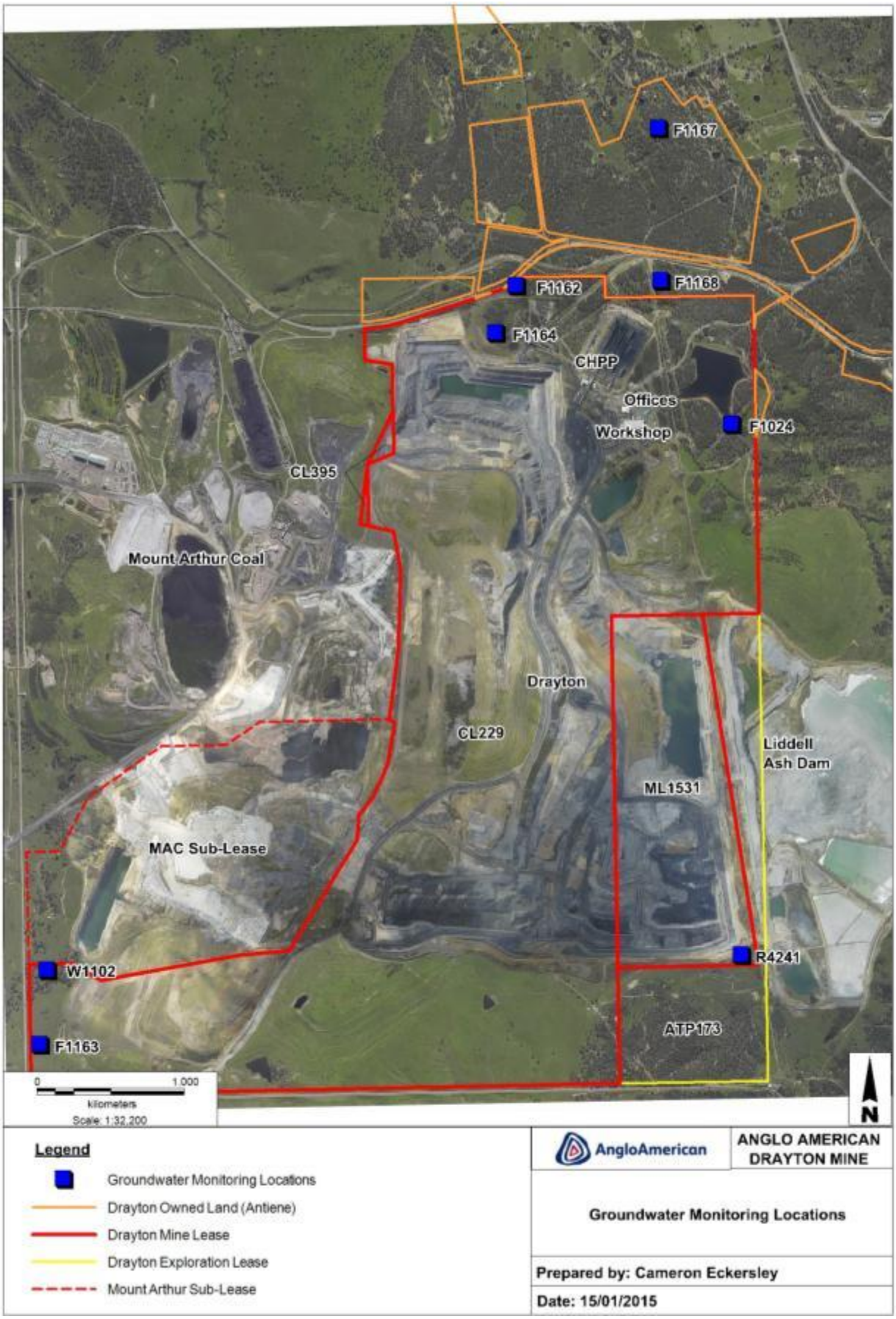


Figure 13: Groundwater Monitoring Sites

3.4.3 Results

A summary of the 2014 and long-term piezometer groundwater levels is presented in Table 19. The complete results from the 2014 groundwater monitoring program are shown in Table 50.

Table 19: Summary of Groundwater Levels

Location	Average Depth 2014 (RL)	No. of water levels monitored	No. Samples in 2014	Long Term Average Depth (RL)	Years of Data Available
F1024^	178.26	12	0	200.03	1982 – 2014
F1162*	115.60	12	0	155.36	1982 – 2014
F1163	177.36	12	8	177.59	1982 – 2014
F1164*	101.04	12	0	163.63	1982 – 2014
F1167	167.18	12	12	183.03	1982 – 2014
F1168	165.02	12	12	186.77	1982 – 2014
W1102	177.10	12	12	178.15	1982 – 2014
R4241	172.97	12	12	181.78	2005 – 2014

Note: All measurements adjusted with Relative Levels.

*^ Bore dry, no water to sample, *Sampled once with extra-long depth meter*

Piezometer levels from monitoring locations to the south of the mine were generally steady throughout the reporting period despite the progression of mining towards the south. Piezometer R4241 remains in close proximity to the limit of mining in the south and indicated a decrease in adjusted relative level of approximately 5m throughout the year.

Piezometer W1102 is also located to the south of the mining lease but is not in close proximity to current operations. This piezometer is located near Saddlers Creek and was closest to mining in the south west pit (now SW13 Void). This piezometer has exhibited a steady water level trend since monitoring at the location began in 1982.

Piezometers located in the northern areas of the mining lease generally display a gradual decline in level. Piezometer F1163 had insufficient water to take a sample in the months of February, June, July and September. Piezometer F1024 was dry throughout 2014, only collecting minor amounts of rainwater runoff and not providing a suitable volume to sample. The water levels in F1162 and F1164 were too deep to sample during the reporting period (except in November when an extra-long depth meter was used). Piezometer F1168 continued to display a slow decline in level during the reporting period. Piezometer F1167, located in the Antiene area further to the north of the mine, also gradually declined after a significant increase in water level in 2011, dropping approximately 2.5m throughout the reporting period. The level has not declined to the level prior to the increase but, at the end of 2014, was similar to the 2008 water level.

Drayton currently holds two groundwater licences for extraction purposes. These are:

Table 20: Drayton Groundwater Licences (Extraction)

Licence Number	Extraction Limit (ML)
20BL122620 (20BL111869)	402
20BL171958	985
Total	1,387

During the reporting period, it is calculated that a total of 240ML of groundwater was intercepted by the Drayton operation. This groundwater was intercepted by the north, south and east pits. The majority of groundwater is pumped out of the mine working for safe mining operations to take place. The calculated groundwater interception falls well below the groundwater extraction limit authorised by the 20BL112620 and 20BL171958 water licenses held by Drayton.

The groundwater inflow for the reporting period has been calculated using the site water balance (see Table 21). The water balance uses the difference in measured volumes in the dams at the beginning and end of each period (site inventory) and compares it against the difference between the known inputs and outputs for the site (net changes). Inputs and outputs include measured pump meter numbers, simulated rainfall and runoff volumes from mine water storage catchments, evaporation from the water storages, and measured moisture contents for raw and product coal, rejects and tailings transfers. As Drayton mine does not possess a release license, it is considered a closed system and therefore the difference in inventory should equal the net changes. If the numbers are not equal, the difference is considered to be due to groundwater.

Table 21: Water Balance Inputs and Outputs

Site Inventory			**ML**
V Start	(1 Jan 2014)		4081
V End	(31 Dec 2014)		4861
V End – V Start			**780**
Measured inputs (ML)		**Measured outputs (ML)**	
High quality third-party	9.5	Evaporation (passive from store, dust suppression, industrial use)	1149
R&R	1933	Entrainment – rejects, tailings, product	487
Entrainment	243	High quality third party (human consumption)	9.5
Total input	**2185.5**	**Total output**	**1645.5**
Net water gain/loss	(inputs - outputs)		540
Difference between inventory and net change		**Aquifer interception**	**240.0**

As Drayton is a non-discharge site no groundwater is pumped offsite. The majority of groundwater intercepted onsite is stored in the ES void for usages including dust suppression and washing of coal.

3.5 Water Accounting Framework

The Minerals Council of Australia (MCA) has recognised the vital role of water in mining both as an asset that produces value and as a shared natural resource that requires responsible stewardship. To assist its members in managing both of these roles the MCA has, in conjunction with the Sustainable Minerals Institute of the University of Queensland, developed a water accounting framework.

The MCA water accounting project has been undertaken as a research and development project in conjunction with the Sustainable Minerals Institute at the University of Queensland from 2007-11. The framework has been piloted in partnership with the NSW Minerals Council at a number of operations in Australia. The results have been used to develop the framework for use by the minerals industry in Australia.

The framework typically requires a combination of existing data, and modelled estimates, depending on an operation's existing data holdings. It is envisaged that with a standardised reporting platform across industry, government agencies may be amenable to reforming regulatory arrangements and enabling national consistency.

Further, it is likely that the process of generating water accounts will lead in the medium-term to the acquisition and communication of water data that helps manage an operation's water supply risks. Accuracy or reliability statements associated with water accounts are provided in a consistent format, with data collections fit-for-purpose and related to an operations water supply risks and regulatory requirements.

For the 2014 reporting period, Drayton mine has committed to reporting the *Input-Output Statement* listing flows for all input and output categories for the reporting period, along with the change in the total storage from start-end of the reporting period. Table 22 details the *Input-Output Statement* for Drayton mine for the reporting period spanning 1st January 2014 to 31st December 2014.

Table 22: Drayton Water Accounting Framework Input-Output Statment

INPUT - OUTPUT STATEMENT

Site Details:	Drayton

Reporting Period Details	Date (dd/mm/yyyy)	Storage (ML)
Start	01-January-2014	4,081
Finish	31-December-2014	4,861

INPUTS-OUTPUTS

Input-Output	Element (Source/Destination)	Sub-element (Inputs/Outputs)	Water Quality			Sub-Element Total (ML)	Accuracy (high, medium, low)			Notes (1,2..)
			Category 1 (ML)	Category 2 (ML)	Category 3 (ML)		Measured	Estimated	Simulated	
Inputs	Surface Water	*Precipitation and Runoff*			1933	1933			Medium	
		Rivers and Creeks								
		External Surface Water Storages								
	Groundwater	*Aquifer Interception*			240	240		Low		1
		Bore Fields								
		Entrainment			243	243	Medium			
	Sea Water	*Estuary*								
		Sea/Ocean								
	Third Party Water	*Contract/Municipal*	9.5			9.5	High			
		Waste Water								
	TOTAL INPUTS		**9.5**		2416	**2425.5**				
Outputs	Surface Water	*Discharge*								
		Environmental Flows								
	Groundwater	*Seepage*								
		Reinjection								
	Sea Water	*Discharge to Estuary*								
		Discharge to Sea/Ocean								
	Supply to Third Party									
	Other	*Evaporation*	1149			1149			High	
		Entrainment			487	487		Medium		
		Other: potable	9.5			9.5	High			
	TOTAL OUTPUTS		**1158.5**	0	**487**	**1645.5**				

DIVERSIONS

Inputs	Surface Water	*Precipitation and Runoff*								
		Rivers & Creeks								
	Groundwater	*Aquifer Interception*								
	TOTAL DIVERSION INPUTS									
Outputs	Surface Water	*Discharge*								
	Groundwater	*Reinjection*								
	TOTAL DIVERSION OUTPUTS									

Notes (user defined):	
1	*Groundwater input is estimated by reconciling the water balance over the whole year.*
2	
3	
4	
5	

3.6 Contaminated Land

Drayton maintains a register of locations onsite that are known or potential locations of land contamination. Throughout the reporting period there were no new areas of contaminated land added to the land contamination register. There was one existing area that was updated on the contaminated sites register due to a diesel spill.

On the 10th of January 2014, a diesel leak was discovered at the main fuel facility. An intake pump had failed leading to a leak of diesel from the intake pump. The diesel leak occurred in a bunded area, although due to the bund valve being open, the diesel travelled outside the bunded area.

The leaked diesel travelled via a drain and into the contaminated water control system. The diesel was removed from the contaminated water control system using booms and a pump truck. No contamination left site.

As a result of the spill, Drayton commissioned an investigation into the spill to determine the root cause, contributing factors and recommend corrective actions. Corrective actions included the installation of a non-return valve in the delivery line from the intake pump, replacing diesel pumps at the diesel facility every 12 months, placing locks on all hydrocarbon storage bund valves and conducting an audit on all other hydrocarbon storage areas.

Additionally, a contaminated land specialist was commissioned to provide a report into the impact of the diesel spill for remediation purposes. This resulted in the removal of approximately 676bcm of contaminated soil being excavated and moved to the bioremediation cells for treatment.

Inspections of the spill were conducted by the DP&E, DRE, and NSW EPA. As a result of the spill, Drayton received a Penalty Infringement Notice from the NSW EPA and several remedial actions from the DRE and DP&E.

DRE and DP&I officers attended site for the AEMR inspection on the 24th June 2013. Subsequent correspondence requested Drayton to cease using the Bioremediation Area until Drayton reviewed its Bioremediation Management Plan and received approval from DRE to recommence use of the Bioremediation Area. A review of the Bioremediation Management Plan was undertaken in late 2013 with approval received from DRE for the revised plan to be implemented in April 2014.

Contaminated material was removed from the oil pollution control dam lower sump, the apron drain around the workshop and lube bay and the main wash down bay sump has been placed in the bioremediation cells throughout the remainder of the reporting period.

Areas that Drayton continue to classify as contaminated did not change from 2013 AEMR and includes; all areas around the workshop, stores areas, west fuel bay, main diesel facility, East Pit, Industrial Dam, Savoy Dam, Oil Pollution Control Dam, Access Road Dam and its upstream catchment.

Refer to Section 3.18 for further information on Hydrocarbon Contamination.

3.7 Threatened Flora

Environmental assessment (EA) surveys undertaken on Drayton land in previous years have not identified any threatened flora species as being present on site, although the Endangered Ecological Community (EEC), Hunter Lowland Redgum Forest (HLRF) as listed under the *Threatened Species Conservation Act 1995,* was identified. Drayton has established offset areas to conserve plant communities in agreement with DP&E. The offsets are described in Drayton's Offset Strategy and management of these areas is detailed in the Rehabilitation and Offset Management Plan (ROMP).

Drayton Environmental Management Plans relating to threatened flora include:

- Offset Strategy;
- Rehabilitation and Offset Management Plan; and

- Flora and Fauna Management Plan.

Flora monitoring was undertaken during the reporting period in rehabilitation and offset areas. No threatened flora species were recorded during surveys.

3.8 Threatened Fauna

A total of sixteen threatened fauna species have been recorded at Drayton during EA and subsequent fauna monitoring surveys. Threatened species occurring at Drayton are listed in the Flora and Fauna Management Plan. Management and preservation of existing habitat forms the basis of protection of these threatened species. Known habitat occurs mainly in remnant and regenerating areas of woodland in the Drayton Wildlife Refuge, Northern Offset and Southern Offset.

Drayton Environmental Management Plans relating to threatened fauna include:

- Offset Strategy;
- Rehabilitation and Offset Management Plan; and
- Flora and Fauna Management Plan.

Fauna monitoring undertaken during 2014 recorded two new threatened species occurring in the Drayton Wildlife Refuge. The Varied Sittella (*Daphoenositta chrysoptera*) and the Little Eagle (*Hieraaetus morphnoides*) are listed as vulnerable under the *Threatened Species Conservation Act 1995.* The Speckled Warbler (*Chthonicola sagittatus)* was recorded again in the Wildlife refuge.

Two threatened microbat species, the Little Bentwing Bat (*Miniopterus australis*) and the Large-eared Pied Bat (*Chalinolobus dwyeri*), both listed as Vulnerable, were also recorded for the first time at site. The Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*) and the Eastcoast Freetail Bat (*Mormopterus norfolkensis*) were recorded in both the 2013 and 2014 monitoring.

3.8.1 Drayton Wildlife Refuge

In 1987 the Drayton Wildlife Refuge was gazetted. It allows for planned land use of all areas of the Drayton land holding, whilst still respecting wildlife values. In the Drayton EA it was predicted that the 'Natural Zone' of the Drayton Wildlife Refuge would not be impacted by the Project and that the management of this area will compensate for the impacts of the project on flora and fauna. Besides providing a buffer zone between residents and the mine, the Drayton Wildlife Refuge continues to provide remnant woodland for natural ecosystems.

3.8.2 Feral Animal Control

Feral animals, such as cats, dogs, rabbits and foxes, have been identified at Drayton. Control strategies undertaken include the use of poison baits to control these animal populations. Drayton implements a coordinated feral animal control program with neighbouring property holders. This integrated approach is designed to maximise effectiveness of control for target species across a broad area.

In May 2014, 1080 Wild Dog baits were laid in coordination with local land owners within the Mt Arthur Wild Dog Association area. The baiting was a success with a high percentage of baits

being taken. Young dogs were sighted again in the southern areas, and further baiting will focus on this area in 2015 to target on remaining feral animals. Where possible, baiting programs will again be coordinated with programs run by neighbouring land holders and the Mt Arthur Wild Dog Association.

Figure 14 shows a photo taken using motion detector camera during monitoring in May 2014 in the Southern Offset Area.

Figure 14: Photo taken during May baiting

3.8.3 Pest Animal Control

Kangaroo species, especially the Eastern Grey Kangaroo (*Micropus giganteus*), have reached high numbers in the areas to the south and south west of the main pit. In December 2014, a licenced commercial harvester was used to remove approximately 35 male kangaroos. Excessive kangaroo numbers have resulted on impacts to rehabilitated areas, especially on the survival rate of young trees.

3.9 Weeds

During 2014, an experienced weed control contractor was engaged to conduct a weed survey and undertake weed control. Weeds are targeted for control based on priority. High priority weeds include noxious weeds, weeds establishing on new rehabilitation areas and environmental weeds with the potential to spread to previously unaffected areas. Weed control is ongoing with control scheduled opportunistically throughout the year depending on weather conditions and life stage of the species being targeted. Treatment occurs during flowering, where possible, to assist with identification and ensure weeds are treated prior to seeding. Weeds are mapped and data collected regarding extent and density of infestations. A full list of weeds targeted during 2014 is provided in Table 23 below. The weed control program will continue for 2015 and beyond.

Table 23: Weeds treated 2014

Common Name	Scientific Name	Status	Control Method	Dates
Pampas Grass	*Cortaderia selloana*	Environmental	Foliar spray	May
Prickly Pear	*Opuntia spp.*	Noxious – C4	Foliar spray and manual removal	May, July
Castor Oil	*Ricinus communis*	Environmental	Foliar spray	May
African Boxthorn	*Lycium ferocissimum*	Environmental	Cut and paint	May, August
Galenia	*Galenia pubescens*	Environmental	Foliar spray	May
St John's Wort	*Hypericum perforatum*	Noxious – C4	Foliar spray	January

Prickly Pear was manually removed in the Drayton Wildlife Refuge during 2014. As Prickly Pear continues to be the dominant weed in and around Drayton, further removal work will occur in 2015.

In December 2013, Drayton received a Property Inspection Report from the Upper Hunter Weeds Authority regarding an infestation of St John's Wort on land north of Thomas Mitchell Drive. The infestation was mapped by Drayton staff in December 2013 and was treated in January 2014. Follow-up inspections did not identify any remaining plants, and the area will be monitored again in 2015 (see Figure 15).

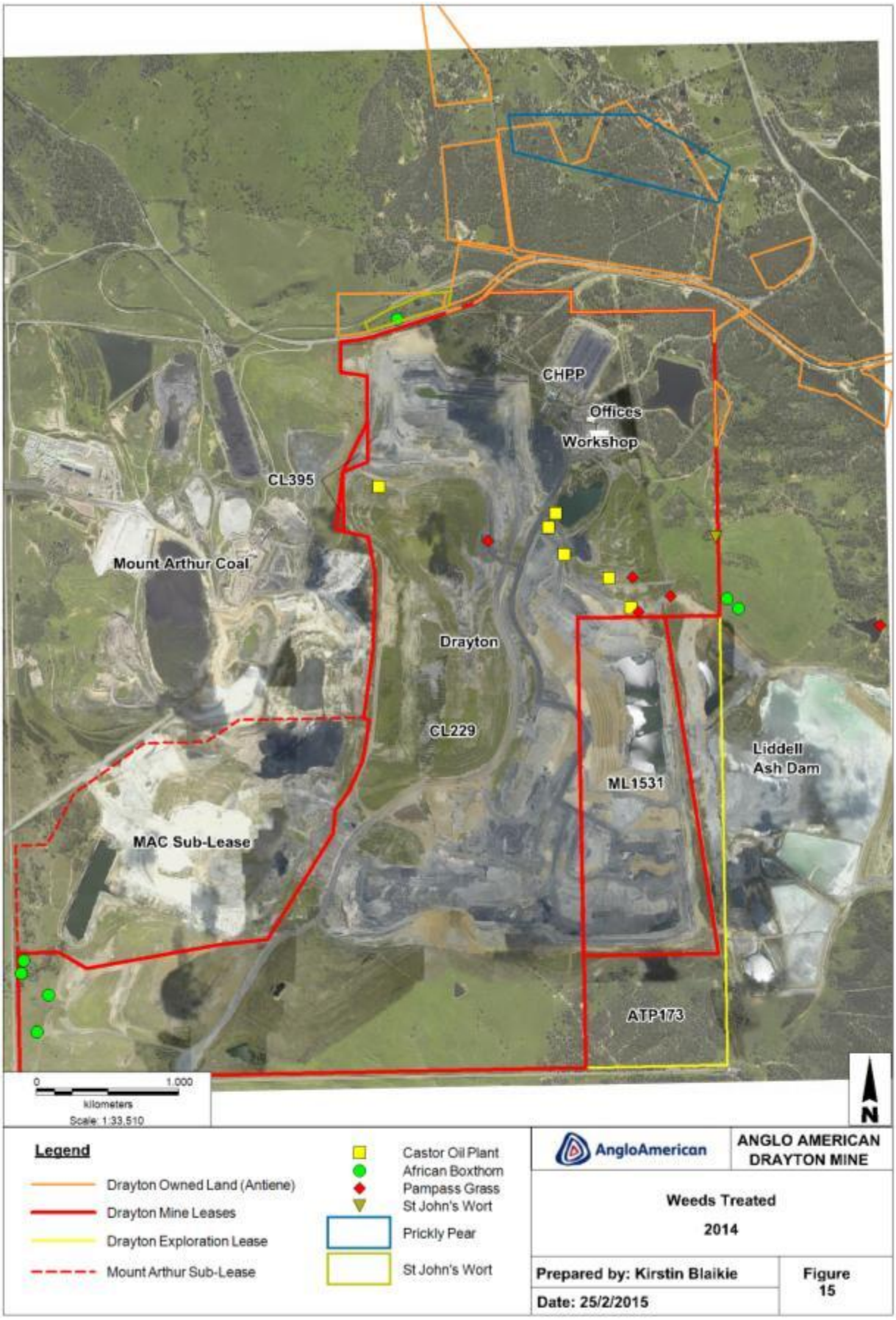


Figure 15: Weed infestations targeted during 2014

3.10 Blasting

3.10.1 Management System

Blasting is permitted under Drayton's Project Approval between the hours of 0900 and 1700 Monday to Saturday (EST) and 0900 – 1800 Monday to Saturday (DST). Drayton's Mining Lease, the Approval and the EPL include requirements for the monitoring and control of blasting impacts (see Table 24) at any residence on privately-owned land. A maximum of 2 blasts per day can be carried out with a limit of 8 blasts per week averaged over a 12 month period.

Table 24: Blasting and vibration criteria

Airblast Overpressure Level	
(dB(L)in Peak)	**Allowable Exceedance**
115	5% of the total number of blasts over a period of 12 months
120	0%

Peak Particle Velocity (Ground Vibration)	
mm/sec	**Allowable Exceedance**
5	5% of the total number of blasts over a period of 12 months
10	0%

Procedures have been implemented to ensure Drayton minimises the impact of blasting on near neighbours and operates within licence and project approval conditions. They include the following:

- Loading blasts according to Drill and Blast Engineer's design with attention given to factors such as:
    - charge weight per delay;
    - loading pattern of holes;
    - stemming used;
    - firing sequence and direction;
    - maximum instantaneous charge; and
    - type of blast.
- Accountability for blasting compliance lies primarily with the Mining Operations Department;
- Meteorological conditions are considered when firing shots;
- Waveforms of both air blast and vibration are available for all blasts;
- Implementing an NN Strategy for blasting in the north pit;
- Implementing a road closure process for closing Thomas Mitchell Drive during blasting in the north pit (within 500m of the road);
- Implementing electronic detonation on most blasts in the NN area; and
- Designing blasts to remain below internal limits and well below regulatory limits.

Drayton is also involved in a continuing research project, funded by the Australian Coal Association Research Program (ACARP), in regards to the identification of specific weather conditions relating to blasting activity. This is a joint research project involving a number of Upper Hunter mining companies. This project is referred to as the SODAR project.

During 2014, a new weather forecasting tool was implemented at Drayton which allows modelling of conditions at the proposed time of each blast and prediction of the blast dust or potential fume pathway. Inputs to this modelling system also allow prediction of actual fume levels expected for each blast. Multiple blast times can be modelled to ensure minimal impact to personnel and neighbouring residences. This system allows more accurate forecasting and prediction of potential impacts from blasting to assist in planning for optimal results.

3.10.2 Monitoring System

Drayton utilises an internet based blast monitoring system which gives access to immediate blasting information for all blasts. The blast monitoring units also allow additional monitoring to be undertaken in specific locations as required. The units operate between approved blasting hours and automatically trigger once a vibration or overpressure event is recorded. During the 2014 reporting period, all blast monitors were calibrated on an annual basis. There are three community based blast monitors at locations in the Antiene area and two monitors at the Ash Dam, one on the toe, and one on the crest of the wall. The locations of the five blast monitoring units are shown in Figure 16.

Figure 16: Blast Monitoring Sites

3.10.3 Results

A total of 121 blasts were fired at Drayton during the 2014 reporting period. The monitoring results of these blasts are summarised in Table 25 and displayed in Appendix E.

Table 25: Blast Monitoring Summary

Location	Antiene	DeBoer	Sharman
EN Area			
Avg Air blast dB(L)	96.2	98.4	96.9
Range dB(L)	89.3 – 106.5	89.5 – 106.9	88.9 – 105.0
Avg Vibration mm/sec	0.17	0.26	0.25
Range mm/sec	0.04 – 0.30	0.08 – 0.38	0.07 – 0.40
NN Area			
Avg Air blast dB(L)	98.5	99.0	97.6
Range dB(L)	90.8 – 106.9	91.7 – 107.1	92.3 – 107.7
Avg Vibration mm/sec	1.00	0.41	0.21
Range mm/sec	0.39 – 2.09	0.16 – 0.59	0.05 – 0.37
SPE Area			
Avg Air blast dB(L)	88.7	93.4	92.5
Range dB(L)	74.4 – 104.5	77.7 – 109.1	78.7 – 111.6
Avg Vibration mm/sec	0.06	0.16	0.10
Range mm/sec	0.00 – 0.19	0.00 – 0.54	0.00 – 0.34
SPW Area			
Avg Air blast dB(L)	91.3	95.7	92.6
Range dB(L)	76.7 – 104.0	85.4 – 106.5	79.9 – 103.6
Avg Vibration mm/sec	0.05	0.10	0.10
Range mm/sec	0.01 – 0.12	0.03 – 0.35	0.01 – 0.25

Figure 17 shows that the majority of the blasts occurring in 2014 were overburden shots accounting for just fewer than 71% of all blasts. The remaining shots were made up of pre-strip (~14.5%), partings (~10.5%), trim (~3.25%) and through seam shots (<1%).

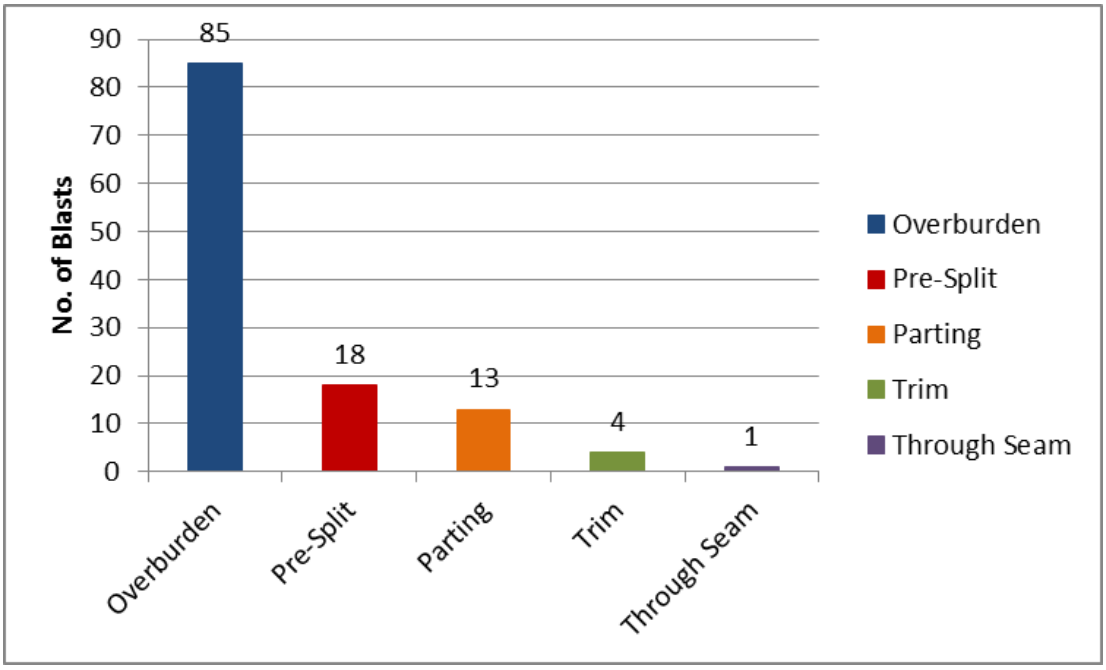


Figure 17: Number of blasts by type

During 2014, all monitoring results were below the maximum limit for ground vibration (10 millimetres per second) and the airblast/overpressure criteria (120 decibels (linear)).

Throughout 2014 a total of 4 blasting related enquiries were received. Two of the complaints and/or enquiries were in regards to blast induced dust clouds, one related to blast vibration felt at the complainant's residence and the other was in relation to a blast notification that was not received. All enquiries were investigated and responded to with enquirers given details of monitoring data recorded for the relevant Drayton blast where applicable. Details of enquiries received during 2014 are contained in Section 4.1 of this report.

3.11 Operational Noise

3.11.1 Management System

Drayton has implemented a number of noise management controls including mine planning, operational and engineering measures, and a real-time monitoring system. The mitigation measures outlined below were applied during the 2014 reporting period and revised as appropriate:

- Only one loading unit working in the North Pit during the evening or night;
- North and East pit trucks dump in shielded locations during evening and night;
- North pit pre-strip haul roads are shielded by pit walls or a berm in the direction of residences, during evening and night;
- Loading units within the North Pit pre-strip will be located in a shielded area below natural ground surface during the evening and night;

- The haul road from the South Pit has been realigned to the lowest possible elevation, with minimal long straight sections of road directly in line with a residence and effective shielding with earth berms along the sides of the road where possible;
- Mine planning schedules were developed to ensure no active dumping occurs at exposed locations during adverse weather conditions, where noise can be exacerbated toward neighbouring communities;
- Training of coordinators has being undertaken to ensure coordinators are familiar with the complaints response process;
- All trucks and the L1400 loader were fitted with noise attenuation mufflers to further reduce noise emissions for these units;
- Alternative reversing beepers including Broadband (Quacker) Reverse Alarms have been implemented on trucks, to further reduce noise emissions from these units across site; and
- Drayton has a second real-time noise monitor, which is located at the end of Balmoral Road.

3.11.2 Monitoring System

The EPL and approval criteria (Table 26) for Drayton's noise monitoring sites is measured in LAeq (15 min), which is the average noise energy over a 15 minute period. Drayton undertakes a combination of supplementary monitoring, independent monitoring and real-time monitoring in order to assess mine noise levels against these criteria.

Table 26: Noise Impact Assessment Criteria

Land Number	Day	Evening	Night	
	L_{Aeq}(15min)	L_{Aeq}(15min)	L_{Aeq}(15min)	L_{A1}(1min)
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76 *	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47

Land Number	Day	Evening	Night	
26	36	37	38	47
27 *	36	37	39	47
72 *	36	37	42	47
17	37	38	36	47
21, 22 *	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16 *	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

**Supplementary noise monitoring residence*

Independent Monitoring

Independent noise monitoring is undertaken to quantify the overall noise levels at the nearby residences and determine compliance with noise criteria by Drayton's operations. The monitoring is carried out on a monthly basis by an acoustic engineer who incorporates attended monitoring data into a site model to provide a compliance report. This has increased from a quarterly frequency in 2013. Additionally, under Condition M8.1 every six months noise must be monitored from the premises to determine compliance with the noise limits, the independent monitoring fulfils this requirement. Drayton currently undertakes independent attended noise monitoring on a monthly basis (starting in March 2014) to determine compliance against noise criteria. In 2014, independent attended noise monitoring was conducted monthly between March and December.

Drayton's Project Approval details noise impact assessment criteria for 28 specific residential locations (see Table 26 above). For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below:

- Doherty
- Kerr
- Wilson*
- Smith*

- Skinner
- Robertson
- Sharman
- Horder

** Additional locations contained in EPL 1323 but not in the Project Approval.*

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm).

Supplementary Monitoring

Attended noise monitoring is undertaken on a monthly basis at five residences (see Figure 18 below) that are typical noise receptors from the mining operation. Parameters measured at the attended monitoring locations include Leq, LAmax, LA1, LA10, LA50 and LA90 being measured over a 15 minute period. The Rion sound level meter, used to carry out the attended noise monitoring, was calibrated in June 2014 and requires calibration every two years. During each monitoring period, all noise is quantified and characterised. Throughout the 2014 reporting period, attended monitoring was conducted at various times of the day, evening and night to assess noise emissions throughout a 24 hour period.

Real Time Monitoring

Real-time noise monitoring involves the use of two BarnOwl® noise monitoring systems. Multiple microphones allow the BarnOwl® to distinguish the direction of noise sources. This is particularly important when assessing and managing cumulative noise impacts.

The BarnOwl® system facilitates production of graphical and numerical data as well as recording and maintaining noise emission files on a five minute basis. One BarnOwl® has been installed at Lot 9 Antiene, approximately 150m from the Drayton rail spur, and in close proximity to the mine's near neighbours (see Figure 18). This station enables proactive management to minimise noise emissions from the site.

A second BarnOwl® was installed at the end of Balmoral Road in the Antiene area. This monitor is operated in conjunction with Mt Arthur Coal and monitors noise levels representative of Balmoral Road residences. This monitor will send alerts to Drayton personnel in the event of elevated noise levels.

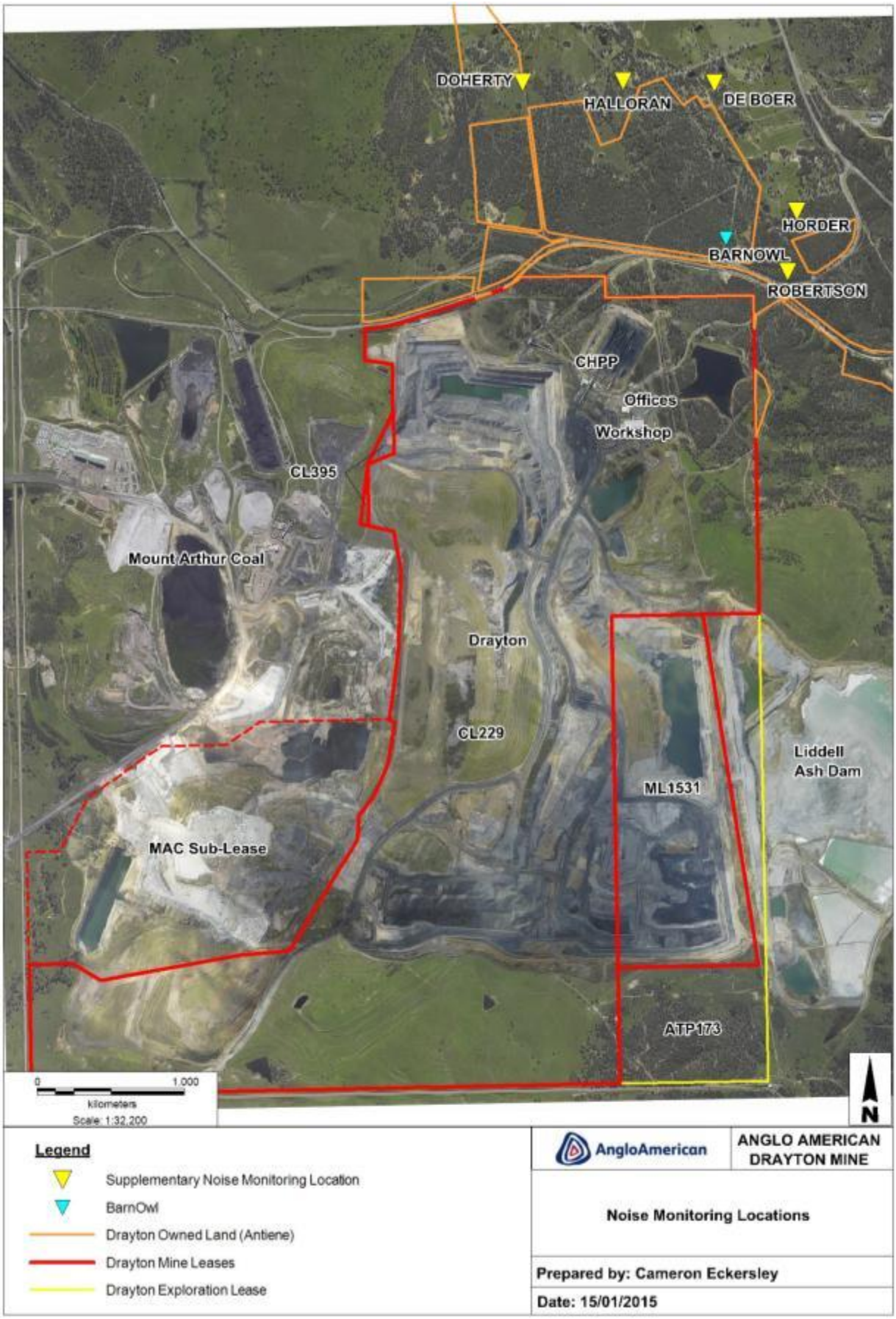


Figure 18: Supplementary and Real-time Noise Monitoring Locations

3.11.3 Results

Independent Attended Monitoring

In 2014 a noise compliance assessment report was submitted to the EPA with the Annual Return as set out in Condition R1 of the EPL. No exceedance of operational noise criteria was detected during monitoring with full reports in Appendix D.

Predicted noise levels in the 2007 Environmental Assessment were reported for years 1, 5 and 10 of the project. 2014 was year 7 for the project. As a result year 5 predictions have been used below to compare actual monitoring results to predicted noise levels. All of the results of the attended noise monitoring were below that of predicted noise levels in the Environmental Assessment which is a reflection of the minimal operations that have occurred in the North Pit as well as lower mining rates. Much of the monitoring resulted in Drayton being inaudible. The below tables present the results for day, evening and night monitoring together with the EA prediction for comparison.

Table 27: Noise Results Day Leq (15min)

Daytime Measured Noise Results – Drayton Contribution dB(A) $L_{eq\ (15min)}$													
Location (Criterion)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	EA Prediction (Yr 5)
Doherty (41)			29			29			24			IA	41
Kerr (36)			IA			IA			IA			IA	36
Skinner (39)			IA			IA			IA			IA	39
Robertson (36)			IA			31			FA			FA	36
Sharman (35)			IA			IA			IA			FA	34
Horder (35)			IA			IA			IA			26	35
Wilson (35)			IA			IA			IA			IA	30
Smith (35)			IA			IA			IA			IA	<30

IA= Inaudible, FA= Faintly audible

Table 28: Noise Results Evening Leq (15min)

Evening Measured Noise Results – Drayton Contribution dB(A) $L_{eq\ (15min)}$													
Location (Criterion)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	EA Prediction (Yr 5)
Doherty (41)			32	33	IA	IA	31	30	IA	35	IA	IA	41
Kerr (36)			35	36	IA	IA	29	28	IA	29	IA	IA	36
Skinner (39)			38	29	IA	IA	30	40	IA	36	IA	IA	39
Robertson (36)			28	IA	27	32	29	29	IA	28	IA	IA	37
Sharman (35)			33	FA	30	30	28	30	IA	IA	IA	IA	35
Horder (35)			26	32	29	31	27	27	IA	29	26	IA	36
Wilson (35)			IA	30	IA	32	IA	IA	IA	IA	IA	IA	30
Smith (35)			IA	33	IA	32	IA	26	IA	IA	IA	IA	<30

IA = Inaudible, FA= Faintly audible

Table 29: Noise Results Night Leq (15min)

Night Measured Noise Results – Drayton Contribution dB(A) $L_{eq\ (15min)}$													
Location (Criterion)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	EA Prediction (Yr 5)
Doherty (41)			34	36	IA	27	31	29	FA	34	26	FA	39
Kerr (36)			35	34	33	IA	27	28	27	30	IA	FA	36
Skinner (39)			35	36	32	27	33	39	FA	37	24	28	39
Robertson (36)			IA	28	30	29	28	28	32	IA	IA	IA	42
Sharman (35)			34	37	35	29	29	31	IA	IA	26	IA	40
Horder (35)			IA	34	35	27	28	32	28	30	IA	26	41
Wilson (35)			IA	34	34	35	26	IA	IA	IA	IA	IA	35
Smith (35)			IA	35	34	35	27	32	IA	IA	IA	IA	32

IA = Inaudible, FA= Faintly audible

Table 30: Noise Results Night L1(1min)

Night Measured Noise Results – Drayton Contribution dB(A) $L_{1\ (1min)}$													
Location (Criterion)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	EA Prediction (Yr 5)
Doherty (41)			40	40	n/a	30	36	34	23	40	28	21	n/a
Kerr (36)			38	43	37	n/a	32	31	32	33	n/a	23	n/a
Skinner (39)			45	40	36	31	42	42	23	45	27	n/a	n/a
Robertson (36)			n/a	32	34	32	35	31	n/a	n/a	n/a	n/a	n/a
Sharman (35)			36	40	39	32	35	36	n/a	n/a	28	n/a	n/a
Horder (35)			n/a	39	38	33	33	36	32	34	n/a	29	n/a
Wilson (35)			n/a	41	37	39	31	n/a	n/a	n/a	n/a	n/a	n/a
Smith (35)			n/a	38	38	38	34	36	n/a	n/a	n/a	n/a	n/a

n/a = not audible

Supplementary Attended Monitoring

Attended monitoring results include all noise recorded during a 15-minute period. Average background noise levels recorded at all residences during 2014 were either below the long term average or within 1dB(A) of the long term average. These results include noise from all sources including highway traffic; birds; insects; dogs; wind; rain; and domestic noise.

The de Boer residence is located north east of the mine and approximately 500m from the New England Highway. Major noise influences at this location consist of highway traffic, insects and birds. Attended noise monitoring indicates that noise from rail movements can be audible from this residence.

The Doherty residence is located on Balmoral Road. Attended noise monitoring at this residence indicates that the major influences on noise levels are insects, birds and traffic on New England Highway and Thomas Mitchell Drive. Drayton and other mining operations can be audible from this residence.

The Halloran residence is located on Pamger Drive. Several large native trees surround this site and are frequented by a variety of native birds such as cockatoos, king parrots, galahs and rosellas. This influences ambient background noise levels. Other influences include traffic from the New England Highway and Pamger Drive, wind, rail noise and mining operations.

The Robertson residence is the closest residence to the mining operation. This location is influenced predominantly by traffic on Thomas Mitchell Drive and rail noise with mining related noise also audible during attended noise monitoring. This residence is within a modelled acquisition zone.

The Horder residence, is located east of the mine and west of the New England Highway. Attended noise monitoring at this location commonly detects traffic, birds and wind through the trees. Mine related noise is occasionally audible at this location however the noise is generally not intrusive. This residence also falls into a modelled acquisition zone.

Real Time Monitoring

A total of 4 noise related complaints were made during the 2014 reporting period. The audio recordings from the BarnOwl® are used to investigate the source of the noise when elevated levels occur. Noise compliance monitoring is conducted by attended noise monitoring whereas Barnowl® monitoring is used to trigger when elevated levels occur as well as recording noise for later assessment. For a summary of the 2014 BarnOwl® data that demonstrates monthly trends see Table 31, for the complete dataset see Appendix D.

Table 31: BarnOwl® Monthly Average Noise Levels

Month	Day dB(A) (36.0)	Evening dB(A) (37.0)	Night dB(A) (42.0)
January	29.15	32.47	33.47
February	28.37	32.11	32.57
March*	28.00	28.82	30.41
April	29.82	31.22	32.69
May	31.97	33.65	34.99
June	32.90	32.85	33.99
July	33.08	34.76	36.26
August*	36.15	36.53	34.08
September	34.82	35.59	37.6
October	34.69	35.74	36.49
November*	33.50	35.11	35.36
December	34.03	34.84	34.70

**The BarnOwl® experienced power outages for several days throughout the year. An electrical storm caused an outage from 14-17th March. Catastrophic programming failure experienced at start of August, taking nearly a month to fix (averages from only 5 or 6 days). Electrical storms cause power outages from 1-10th and 21-24th November. No valid results were obtained during these times and therefore the averages for these months must be viewed as indicative.*

3.12 Visual Aesthetics and Lighting

As predicted in the EA assessments Drayton's operations have a low visual impact as a result of judicious clearing during initial construction. Remnants of the initial woodland have been retained around and throughout the site by careful layout of infrastructure and clearing of the minimum area required. Mature trees provide effective screening of areas such as the CHP, Rail Loadout facilities and general administration area.

Tree planting continues to be a component of rehabilitation programmes. In the future these plantings will provide additional screening of mining activities as well as a corridor for wildlife movement between refuge and offset areas. During 2007, some 2,060 native tree seedlings were planted along Thomas Mitchell Drive to act as visual barrier for future mining developments. The seedlings were successfully established and now provide a screened barrier for travellers along Thomas Mitchell Drive. Further tree plantings occurred throughout 2012. Trees were planted in areas that are visible to both the New England Highway and Thomas Mitchell Drive to provide future relief from linear rehabilitated contours.

Mobile lighting was actively managed during 2014 to prevent impacts on both Thomas Mitchell Drive and the New England Highway. Potential impacts from lighting plants located on high dumps are an issue discussed by managers at monthly EMC meetings. These lights, essential for night-time operations, are carefully positioned to prevent glare from impacting drivers.

3.13 Aboriginal Heritage

Drayton maintains an Aboriginal Heritage Management Plan (AHMP) in accordance with the development consent. The AHMP provides a set of operational procedures that guides Drayton in the management of Aboriginal cultural heritage issues within the mine development context.

The EA predicted that 29 of the 39 Aboriginal sites identified would likely be impacted on by the project. The Aboriginal heritage sites consisted of isolated artefacts and areas where transient communities may have travelled. Of the 39 sites located within the Open Cut and Services Corridor development zone, 13 sites were conserved as part of the Drayton Mine Extension area development. In 2009 the remaining 26 sites were subject to various mitigation salvage procedures prior to impact from mining development. The majority of these sites are considered to be of low scientific significance, however Ramrod Creek R3 is considered to be of medium-high scientific significance following salvage works on a local level.

As indicated in the 2013-15 MOP amendment, no additional surveys or salvage programmes were required in 2014.

3.14 Natural Heritage

No natural heritage sites have been identified on the mine site or on land under the control of Drayton.

3.14.1 Non-Aboriginal Heritage

The EA field survey identified five non-Aboriginal heritage sites within the EA boundary, none of which were statutory listed. One of these sites was determined to be of high local significance. It was predicted in the EA that this site would not be impacted by mining activities however a

physical barrier was installed around the site to prevent accidental damage and maintain its heritage value.

3.15 Spontaneous Combustion

Drayton, along with other open cut coal mines mining the Greta Coal Measures, experiences spontaneous combustion problems within spoil, coal stockpiles and coal seams. As a result, a Spontaneous Combustion Management Plan is followed on site in order to meet both statutory and company requirements. This plan indicates the causes of spontaneous combustion, determines accountabilities for its management, lists remediation work to prevent recurrences, and specifies monitoring and reporting requirements. Drayton also completes six monthly reports to the EPA regarding spontaneous combustion management.

Throughout the 2014 reporting period, mining activities were concentrated within South Pit East, South Pit West, North Pit and East Pit North. The spontaneous combustion activity during this period has occurred in both the northern and southern pits. Carbonaceous material from the South Pit was selectively dumped on the lower faces of the expanding Great North Tip area, in an attempt to bury high risk material and reduce exposure time. This work has been occurring for several years and is selectively controlling spontaneous combustion.

Table 32: Area affected by spontaneous combustion by year

Year	Area Affected (m^2)	Year	Area Affected (m^2)
1998	82,837	**2007**	3,720
1999	57,854	**2008**	1,870
2000	26,251	**2009**	1,020
2001	6,745	**2010**	1,170
2002	1,870	**2011**	1,070
2003	3,140	**2012**	1,160
2004	3,940	**2013**	1,090
2005	3,370	**2014**	1,060*
2006	3,480		

** As at Apr-Sep 6-monthly report to EPA on 8th Dec 2014.*

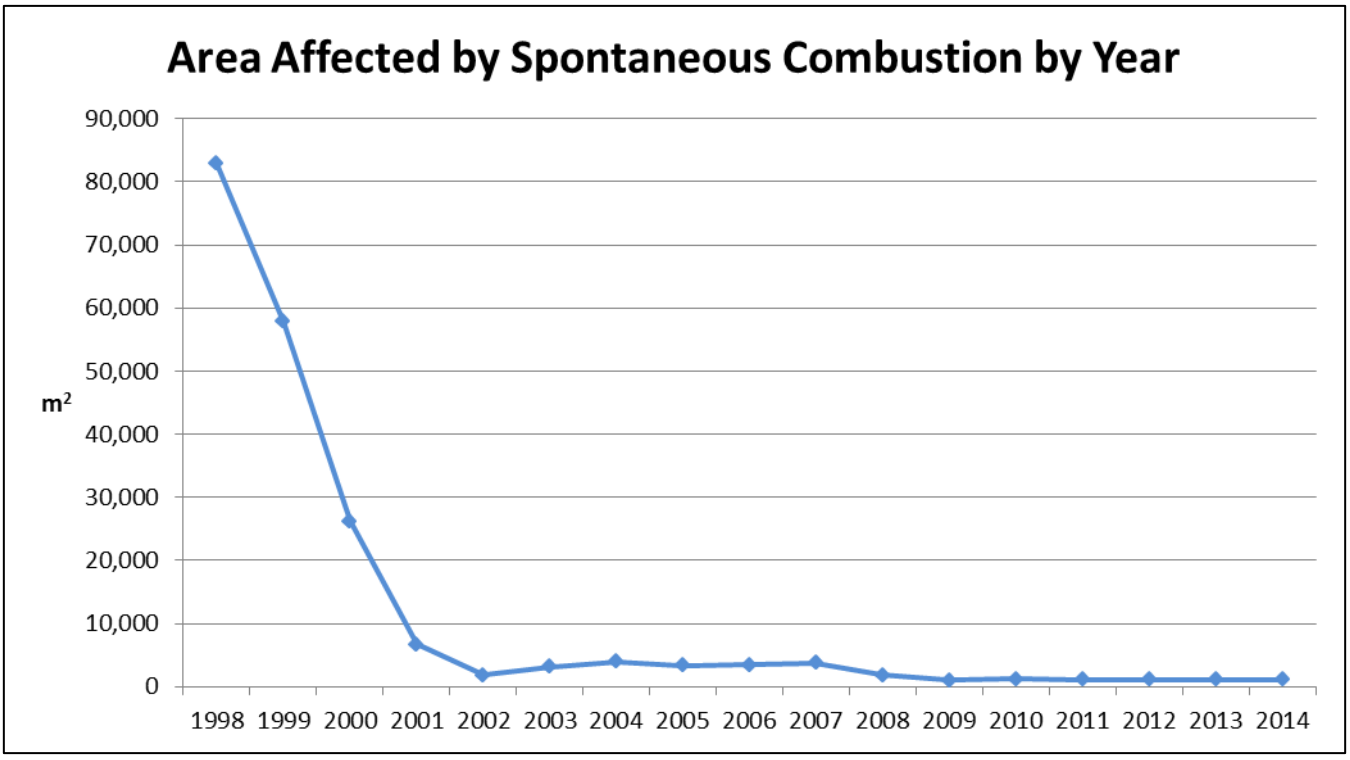


Figure 19: Area affected by spontaneous combustion by year

Table 32 and Figure 19 outline the areas that have been affected by spontaneous combustion since 1998. This demonstrates that spontaneous combustion reduced substantially from the late 1990's. At the end of the reporting period, it was assessed that approximately 1060m^2 of surface area were visibly affected by spontaneous combustion. The areas that continued to burn at the end of the reporting period are being managed through a process of active dumping and/or clay capping.

As reported in the 2013 AEMR, spontaneous combustion was identified as an issue on the South West Tip rehabilitation. Remediation activities were undertaken in these areas during 2014, which included clay capping works to smother spontaneous combustion in the area. Clay capping activities were completed, and the area has been reshaped and seeded. Further remediation works will continue during 2015, and the area will continue to be monitored to ensure spontaneous combustion is no longer a threat.

3.16 Bushfire

During the 2014 reporting period, bushfire mitigation works were carried out in accordance with the Bushfire Management Plan. As part of the management plan mine equipment such as water carts, graders and dozers were available for on-site fires. The risk of on-site bushfires was managed through a system of peripheral roads that act as firebreaks. Additionally, weeds and grasses growing around electrical substations, explosives magazine and fuel storages were kept to a minimum. An inspection was carried out to assess the status of the Drayton property boundary and neighbouring properties regarding the potential for bushfires. The southern boundary fence line was slashed in August and clearing under power lines occurred across the site prior to bushfire season.

3.17 Mine Subsidence

Subsidence is not an issue at Drayton as it is an open cut coal mine with no underground workings or highwall mining.

3.18 Hydrocarbon Contamination

Drayton has various hydrocarbon storages. The primary diesel tank, with a capacity of 860,000 litres, is located near the workshop. Additionally, there is an in pit fuel facility, with above ground diesel storage tanks with a total 220,000 litre capacity.

All bulk storage tanks and containers of hydrocarbons are stored within appropriate bunding and kept in a neat and tidy condition. Contamination is kept at a minimum, with any moderate spillages (20L) being reported internally through Drayton's incident reporting system. Tanks and storage areas are located such that any incidents will not lead to offsite discharge and impacts. Concrete and earthen bunds were inspected throughout the reporting period for structural integrity and cleanliness. After rainfall events, rainwater is removed from bunds to ensure sufficient storage capacity in the bund in the event of a spill.

Audits on hydrocarbon management were conducted during 2014 by Bureau Veritas (15-17/07/2014) and Anglo American Environmental Auditors (16-18/06/2014). Audits found general compliance with hydrocarbon management with further focus on hydrocarbon management awareness and training required.

In addition to the permanent bunded areas, portable bunds are used for transient storage or transportation of oils and fuels around the site. Various spill kits and/or bins containing oil absorbent material are located around the site in areas where there is highest potential for a spill to occur. Site personnel are made aware of the locations of these spills kits and absorbent material bins in their work area. The contents of the spill kits and the oil absorbent material bins are checked on a weekly basis by the site's waste contractor. Materials contaminated by hydrocarbons are put into oily rag bins that are located next to all spill kits and throughout the workshop areas.

Drayton has an area dedicated bioremediating hydrocarbon contaminated soil which is located to the south of the workshop area. Following feedback from DRE, the bioremediation cells were closed in July 2013 to allow for the development, review and approval (by DRE) of a Bioremediation Management Plan. The management plan was finalised and implemented in April 2014, with the redesigned bioremediation cells completed during the reporting period. The facility has been built to receive hydrocarbon contaminated material, primarily from spills that may occur on the mining lease as well as contaminated soils that accumulate in several sediment sumps. Contaminated material is transported to the facility by small rear dump trucks at the direction of the Maintenance Supervisor.

Prior to the re-opening of the bioremediation cells, contaminated material that was generated during this period was taken to an offsite waste management facility by Drayton's waste contractor.

The amount of contaminated material that was taken offsite to a contaminated waste facility in Windsor between 2 July 2013 and 2 May 2014 totalled 192.48 tonnes, 55.18t in 2013 and the balance (137.3t), in the 2014 reporting period.

In 2014 approximately 1,347 m^3 was put into the bioremediation cells with no material being removed from the cells. Inspections of the facility are conducted by the environmental officer or environmental graduate on a weekly to fortnightly with sediment samples being taken and analysed on a monthly basis. The facility is the responsibility of the Maintenance Supervisor and the Environmental Graduate who have varying responsibilities within this area.

Small hydrocarbon spills that occur onsite are cleaned up using materials from emergency spill kits. These materials are then placed in 'Oily Rag' bins that are located near spill kits. During 2014 a total of 5,294kg of contaminated materials was removed from site by Remondis. A breakdown of weight by month can be seen in Table 33.

Drayton continued the operation of its oil pollution control dam throughout 2014. This dam is located below the main workshop, vehicle wash down bays and lube facilities. Any runoff from the industrial area reports to this dam via an oil separator that removes hydrocarbons from the water. From the Oil Pollution Control Dam, water passes through a second oil separator before flowing into the Industrial Dam for reuse on site. Hydrocarbons are collected in storage tanks which are serviced by a waste contractor on a regular basis and removed from site. This system is inspected on a weekly basis.

Table 33: Hydrocarbon contaminated material removed from site in 2014

Month	Contaminated material removed in bins (kg)	Contaminated material removed by vacuum truck/skips (t)
January	600	137.3*
February	540	
March	522	
April	463	
May	411	
June	420	0
July	423	0
August	457	0
September	324	0
October	402	0
November	259	0
December	473	0
2014 Total	**5,294**	**137.3**

**The total amount of contaminated material taken offset between 2 July 2013 and 2 May 2014 totalled 192.48 tonnes. 55.18t in 2013 and the balance (137.3t) in 2014*

3.19 Methane Drainage / Ventilation

Methane drainage and ventilation is not an issue at Drayton as it is an open cut coal mine with no underground workings.

In June 2014, Drayton reported fugitive emissions from the operation in accordance with the National Greenhouse and Energy Reporting (NGER) guidelines. In order to determine fugitive emissions from Drayton, seven boreholes were selected for gas testing according to Australian

Standard 3980/1999 and International Standards ASTM D1945-03 and ISO6976-1995. Investigations revealed the existence of a single gas domain at Drayton which is a carbon dioxide 'depleted' zone where the ramp up of gas content starts to occur at depth greater than 240m.

It was determined that Drayton has lower gas emissions than the government default of 0.045 CO2-e (t/t) for NSW coal mines. The scope 1 fugitive emissions figure that Drayton reported for the 2013/2014 financial year was 7,717t CO2-e.

3.20 Public Safety

Public and workplace safety is a major consideration in achieving the Anglo American corporate goal of zero harm. Drayton offers no access to the public of any mine working areas. Signage around the mining lease boundary fences has been erected notifying the public not to enter the mine site. This signage was updated and increased during 2012. Boundary gates are kept locked except for the main entrance and construction pad. A boom gate system on key access routes restricts on-site access to employees and inducted contractors. Contract security is in place during weekends and public holidays. There were no incidents of public safety concerns during 2014.

3.21 Meteorological Monitoring

Real-time meteorological monitoring is a crucial component of Drayton's environmental monitoring system. Meteorological data including wind speed, wind direction, temperature, rainfall, solar radiation and humidity are monitored using an onsite automatic weather station located at the CHP.

The data from the station in the CHP area is collected at five minute intervals and transferred directly into a log file located on Drayton's electronic database. The data allows Drayton employees to assess the prevailing weather conditions and modify the operation where necessary to best suit the current conditions. It also plays a vital role in planning blasting events for appropriate weather conditions.

3.21.1 Results

Rainfall

Total annual rainfall for 2014 was 768.6 millimetres, an increase from the previous year and above the long term average. The driest January since 1981 was recorded, followed by above average rainfall from February to April, August and December (see Figure 20).

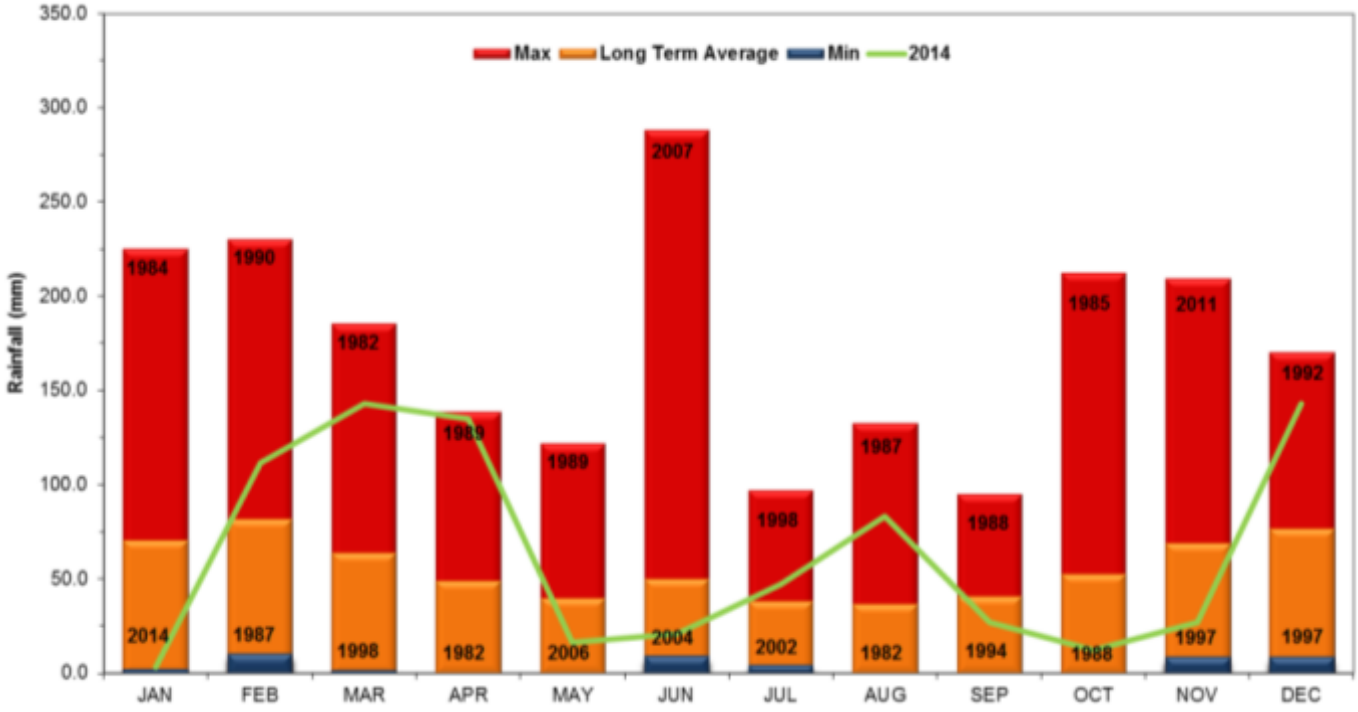


Figure 20: Rainfall history 1981 to 2014

The total monthly rainfall and the total number of rain days during the 2014 reporting period are shown in Table 34. Despite an increase in the total volume of rainfall from the previous year, there were fewer rain days indicating an increase in the intensity of rainfall duration this reporting period.

Table 34: Total Monthly Rainfall for 2014

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Rainfall (mm)	3	111.6	143.2	135	16	20.6	47	83.2	27	12	27	143	**768.6**
No. of rain days	1	6	12	9	5	7	4	11	8	3	5	17	**88**

Note: A rain day is a day in which more than 0.2 mm of water is recorded by the onsite meteorological station

Temperature

Ambient temperature was monitored at the CHP meteorological station. The maximum temperature recorded during the year was 44.1°C on the 23rd of November 2014 and the minimum was -0.2°C on 9th of July 2014. Temperatures in 2014 followed a similar trend to 2013 however 2014 experienced slightly warmer summer temperatures and slightly cooler winter temperatures. The temperature range per month throughout 2014 and a comparison of the 2013 and 2014 average temperatures is shown in Table 35 below.

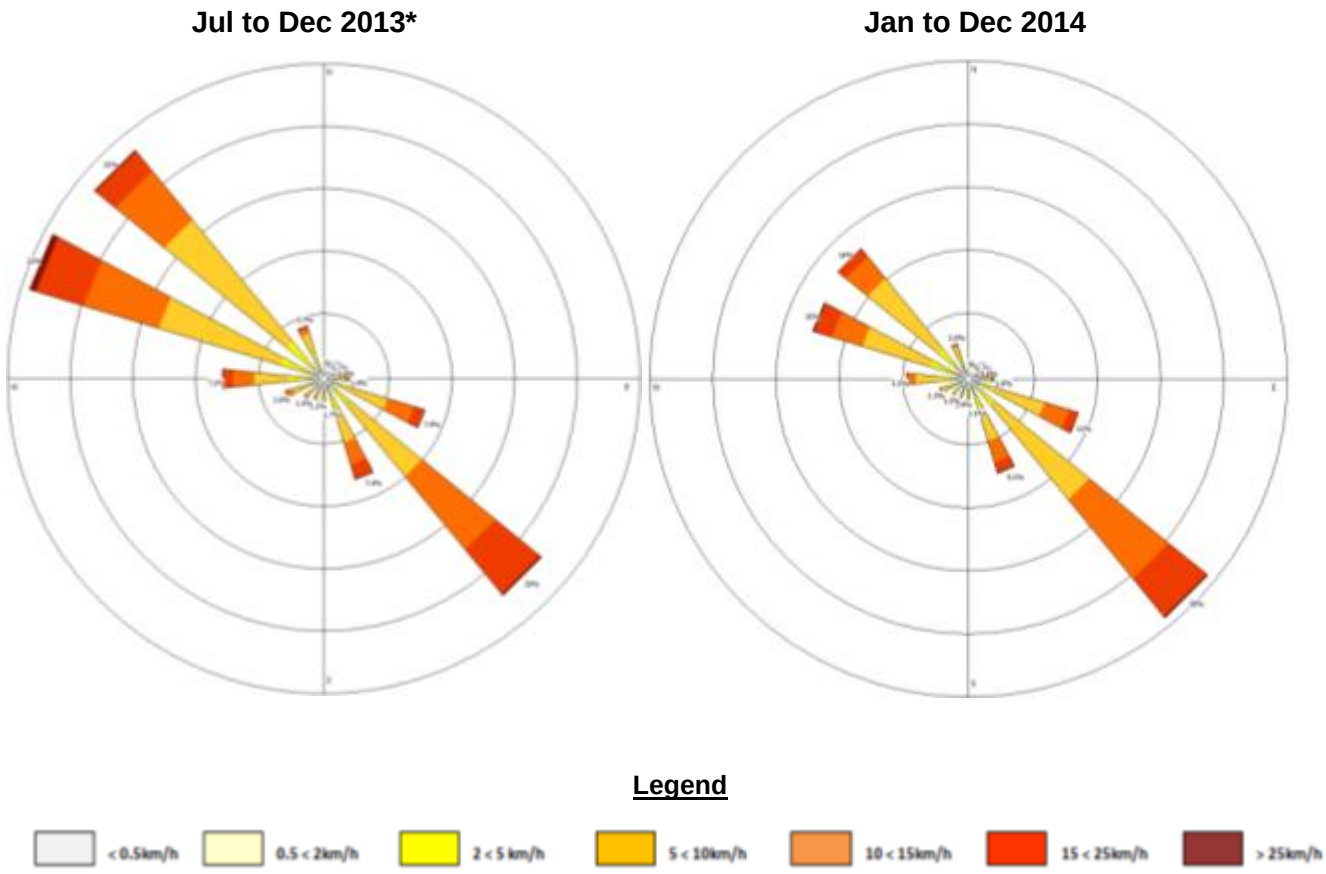
Table 35: 2014 Monthly temperature range and average daily temperature

Month	Monthly Temp Range 2014 (°C)	Average Daily Temp 2014 (°C)	Average Daily Temp 2013 (°C)
January	14.5 - 38.9	24.6	22.7
February	11.1 - 38.1	23.0	22.0
March	11.2 - 31.1	20.8	21.0
April	6.9 - 31.5	18.2	17.6
May	4.8 - 26.7	14.6	14.3
June	4.7 - 20.6	12.0	12.1
July	-0.2 - 21.8	10.6	11.2
August	1.5 - 20.9	11.7	13.2
September	3.4 - 30.6	14.9	17.7
October	3.3 - 39.7	19.6	19.7
November	9.8 - 44.1	22.5	19.8
December	12.7 - 38.1	22.7	22.9

Wind Speed and Direction

Similar to previous years, the prominent wind directions at Drayton during 2014 were north westerly and south easterly (see Figure 21 and Table 36). The 2014 summer season (January, February and December) was dominated by south easterly (SE) winds from the Lake Liddell direction. The late autumn and early winter months (May to July) were dominated by north westerly (NW) winds from the direction of between Muswellbrook and Denman. Autumn (March to May) and spring months (September to November) experienced a change in dominant wind direction from SE to NW during autumn, while the dominant winds fluctuated between NW and SE during spring. Monthly windroses for 2014 can be found in Appendix I.

In 2014 the maximum wind speed recorded at Drayton was 42.16 km/hr on the 4th of February. Average wind speeds were highest throughout January and February, although they also spiked through November as well. For the majority of the year, wind speeds generally remained between 2 and 15km/h (see Table 37).



** Please note that the 2013 windrose (above) currently only shows data from Jul-Dec due to a change in environmental database. Below is the Jan-Dec 2013 windrose from the 2013 Drayton Annual Environmental Management Report for comparison (showing the predominant wind directions for the Jul-Dec 2013 period are in line with the full Jan-Dec 2013 period.*

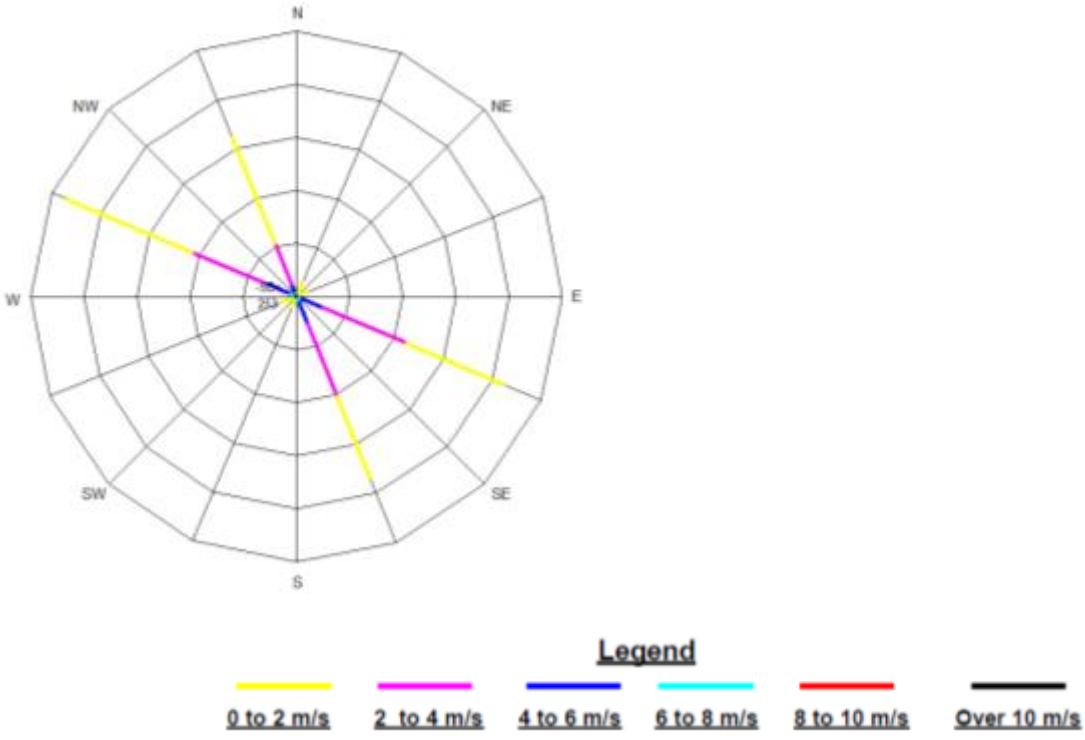


Figure 21: Annual Windroses 2013 and 2014

Table 36: Monthly wind direction and duration (hours)

Month	N	NE	E	SE	S	SW	W	NW
January	1.9	2.2	47.8	543.1	33.9	13.4	38.8	56.9
February	4.0	3.0	56.8	477.3	34.1	11.1	33.0	46.2
March	4.8	3.3	44.6	466.9	37.3	16.8	56.8	107.2
April	7.8	6.1	36.2	308.2	43.5	28.3	97.9	184.8
May	10.0	4.1	23.2	157.5	30.3	25.1	142.6	344.8
June	8.8	4.0	20.0	130.2	31.5	22.6	133.7	364.2
July	8.8	2.5	14.1	120.4	16.3	22.3	125.6	427.0
August	5.7	4.3	41.8	374.2	54.3	23.2	70.3	164.9
September	9.5	5.7	32.3	241.8	45.3	28.0	122.3	231.2
October	6.4	5.8	36.4	256.9	48.5	41.0	132.5	211.5
November	3.5	3.9	38.3	391.3	32.7	23.5	91.7	127.0
December	3.4	6.0	42.8	381.2	46.6	35.3	87.4	126.6

Table 37: Monthly wind velocity and duration (hours)

Month	< 0.5 km/h	0.5 < 2 km/h	2 < 5 km/h	5 < 10 km/h	10 < 15 km/h	15 < 25 km/h	> 25 km/h
January	2.0	9.8	67.8	238.3	231.8	182.3	6.3
February	3.6	18.8	77.5	234.8	224.9	99.6	6.3
March	4.3	24.2	141.4	343.6	183.2	40.7	0.1
April	10.3	58.7	181.7	333.2	112.5	16.3	0.0
May	11.3	50.8	224.4	340.8	71.5	37.4	1.3
June	8.0	47.8	201.4	260.2	113.5	77.9	5.9
July	8.1	36.8	126.0	348.1	152.6	65.0	0.4
August	10.8	45.3	152.8	351.2	141.0	35.8	1.8
September	12.3	44.1	152.8	329.3	149.8	27.1	0.3
October	6.3	38.1	147.8	327.4	150.1	68.2	0.8
November	1.3	15.5	99.5	277.2	186.3	125.8	6.2
December	2.8	35.6	129.4	289.7	182.6	84.6	4.6

3.22 Other Issues and Risks

3.22.1 Environmental Risk

Environmental risks associated with the Drayton Operations are recorded in an Environmental Aspects and Impacts Register. The Environmental Aspects and Impacts Register is reviewed on an annual basis and is the basis of the Environmental Improvement Plan (EIP). The current version of the Aspects and Impacts Register and the EIP are available to be viewed by all site personnel via the document control system, Drayton SHEC MS Explorer. Table 38 shows the primary aspects of mining rated against the Anglo American Risk Matrix (Appendix G).

The last independent environmental compliance report occurred in 2012 and assessed environmental compliance of the operation and recommendation to reduce environmental risk. This audit was conducted by Parsons Brinkerhoff and included specialist in the fields of air quality, spontaneous combustion, noise and rehabilitation. Recommendations from this audit focused on reviewing and updating management plans. Drayton is required to conduct another independent environmental audit in 2015. The actions and findings of this report will be included in the 2015 Annual Environmental Management Plan.

Table 38: Environmental Risk Review

Aspect	Normal Operations		Abnormal Operations		Shut Down		Emergency	
	Env	Rep	Env	Rep	Env	Rep	Env	Rep
Spontaneous Combustion	18S	8M			18S	13S	8M	
Decommissioning of Mine					18S	9M		
Water Management	8M	8M	8M	8M			9M	9M
Availability of Inert Material	9M		9M		9M		9M	
Management of Topsoil	12M		5L				5L	
Final Void	8M	13S			8M	13S		
Waste Management	4L	2L	2L	2L			2L	
Equipment Noise	8M	4L	8M	5L			3L	
Vibration/Noise from Blasting	12M	12M		8M				
Air Quality - Dust	12M	17S	13S					
Groundwater	12M	5L	5L		5L		9M	9M
Sewerage Treatment Plant	5L	5L						
Erosion and Sediment Control	12M	8M			13S	13S	9M	13S
Rehabilitation	12M	8M			17S	13S		
Contaminated Land	4L		7M		7M		4L	

Aspect	Normal Operations		Abnormal Operations		Shut Down		Emergency	
	Env	Rep	Env	Rep	Env	Rep	Env	Rep
Hydrocarbon Spills	14S	9M	5L		17S	5L	6M	6M
Cultural Heritage	9M	9M	9M	14S	9M	9M	10M	
Light emissions	4L	4L	4L	5L			4L	5L
Greenhouse Gases	11M	5L						
Fauna management	8M	5L	5L	5L			6M	
Flora management	9M	14S					6M	
Uncapped exploration holes	4L				4L			
Coal transport – rail		7M		4L			2L	
Radiation devices	1L							
Weed Infestation	12M	8M			12M	13S		
Feral Animals	8M	8M			8M	8M		

4 COMMUNITY RELATIONS

Drayton is bounded to the north by Thomas Mitchell Drive, to the south-east by the Liddell and Bayswater power stations and to the west by Mt Arthur Coal. The privately owned, rural-residential land holdings to the north-east of Thomas Mitchell Drive (Antiene Estate) represent Drayton's immediate local community.

Drayton falls entirely within the Muswellbrook Local Government Area (LGA), which represents Drayton's wider local community. The Singleton LGA adjoins the Muswellbrook LGA immediately to the south of Drayton mine.

Drayton currently employs approximately 410 permanent employees and engages contractors to assist in some areas of the operation. Approximately 52% of the permanent workforce lives in Muswellbrook and the Upper Hunter with the remaining 48% from Singleton and the Lower Hunter towns of Maitland and Cessnock (see Table 39).

Table 39: 2014 Workforce Shire of Origin

Shire	Number of Employees
Muswellbrook/ Upper Hunter	213
Singleton/Cessnock/ Maitland/Other	197
TOTAL	410

4.1 Environmental Complaints

At any time, the community and other stakeholders can find information on Drayton's environmental management and performance by visiting the Anglo Coal website. The Drayton Environment web page features details of Drayton's approvals, proposed blasting times and environmental management plans. Drayton publishes a monthly update of environmental monitoring data to the web page and the AEMR can also be found there for download.

Drayton maintains a 24 hour hotline (1800 814 195) for complaints and enquiries as well as a complaints form on its web page (http://www.angloamerican.com.au/~/media/Files/A/Anglo-American-Australia-V2/Attachments/content/Community%20complaints%20form%20-%20Drayton.pdf). You can also find this by searching for "complaints form" at www.angloamerican.com.au. The hotline allows the community to request and provide feedback about operational activities and lodge complaints on any aspect of the Drayton operations. The hotline number has been advertised in the local newspapers throughout the reporting period and is available on the Drayton Website (http://australia.angloamerican.com/our-operations/operating-sites-subpage/drayton-environment).

An initial call back is provided for all calls to the hotline within 24 hours of the call being received. All complaints are investigated and the details, including any follow-up actions

required, are recorded in Enablon, Anglo's internal reporting system. The community member is notified of the response and/or outcome of the complaint once the investigation has been completed. Complaint information is also discussed at Drayton's Community Consultative Committee meetings (see section 4.2).

Over the past three years, the number of complaints receive has shown a decreasing trend (Figure 22). A total of 14 complaints were received during the 2014 reporting period. Of these, the majority were noise related complaints (Figure 23).

The four odour related complaints are not believed to be related to Drayton operations, but are logged as complaints due to the source of the odour being unknown. All of odour related complaints were received from the same complainant, a resident of Scone, located approximately 30km from Drayton.

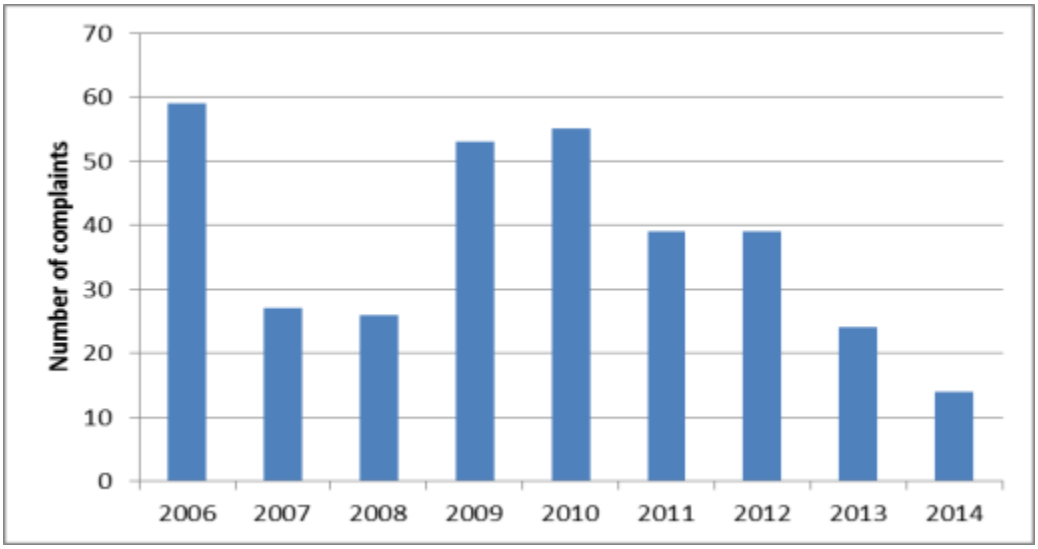


Figure 22: Community Complaints Associated with Drayton (2006 – 2014)

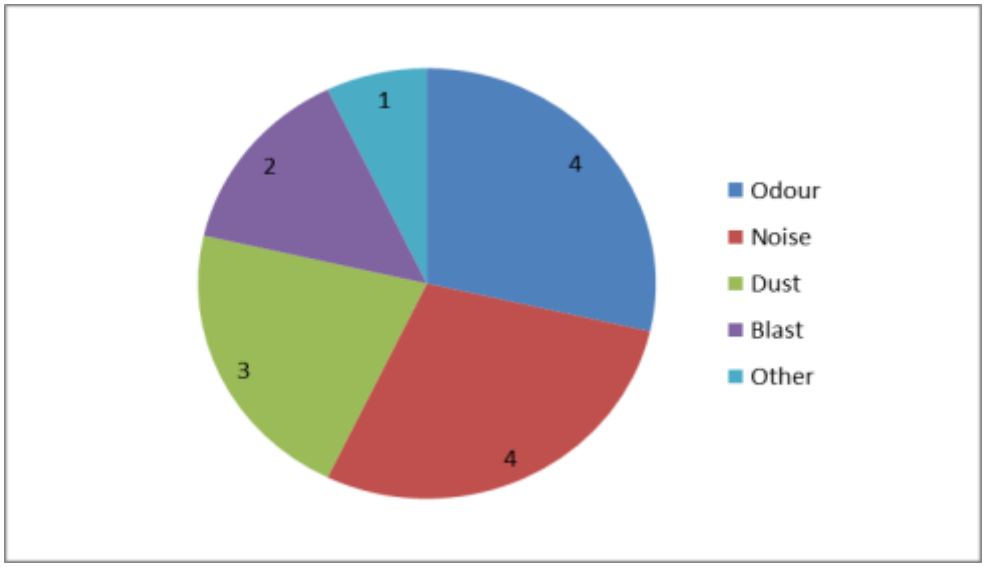


Figure 23: Community Complaints by Type for the 2014 Reporting Period

Further information on community complaints can be found in Table 57 of Appendix F.

4.2 Community Liaison

Drayton's CCC meets quarterly to discuss environmental performance and community issues. Members of this committee consist of local council representatives and near neighbours in addition to the General Manager, SHE Manager and the Environmental Coordinator. Drayton also operates, in conjunction with Mount Arthur Coal, a joint CCC where discussions are held regarding the shared Antiene Rail Spur. Members of the joint CCC meet on a six monthly basis. The joint CCC consists of the members of both operations' individual CCCs.

Key aspects discussed at the CCC meetings include environmental complaints and enquiries, air quality, blasting and vibration, waste management, rehabilitation and new developments. The minutes from CCC meetings are published on the Drayton web page.

4.2.1 Social / Economic Contributions and Achievements

Drayton supports a diverse range of projects benefiting the communities of Muswellbrook, Singleton and Upper Hunter LGAs. Contributions are made regularly through application rounds which are advertised in the local papers. Community members belonging to schools and organisations requiring funding for projects, equipment or events are encouraged to complete the application form (available on the Anglo American website) for consideration.

Drayton regularly supports projects relating to: education and training; health and welfare; sport; arts, culture and heritage; and environment. Health and education are the key areas of focus for Anglo American.

In 2014, as part of a 3 year agreement, a donation of $10,000 was presented by Anglo American to the Upper Hunter Education Fund. This fund allocates funding assistance to those local students in need who are pursuing studies post year 12.

A further $4,500 was donated to Upper Hunter Community Services in recognition of their swift response to a need on site at Drayton mine.

Anglo American also committed to becoming a major sponsor and supporter of the 2015 Hunter Coal Festival being organised by the local communities of Singleton and Muswellbrook to highlight the benefits and contributions mining makes to the region.

These selected projects (and many more have not been included), demonstrate Anglo American's commitment to improving social infrastructure for the ongoing benefit of our local communities. 'Giving back' to the local community in which we live and operate is our commitment.

In 2014 Drayton once again sponsored the annual Muswellbrook Chamber of Commerce Business Awards and Presentation evening and participated in the annual Bursting with Energy Expo in order to connect with the community in a positive and educational environment. Drayton also supports the annual Solar Boat Challenge organised by the Muswellbrook Shire Council for local primary and secondary schools.

5 REHABILITATION

Drayton has conducted rehabilitation activities since 1983 with a focus on achieving a safe, sustainable and non-polluting landform. The foremost objective of mine rehabilitation at Drayton is to create a landform which is compatible with the surrounding land use practices, is stable in the long term and is capable of a productive post mining land use. Rehabilitation is designed to align with the conservation objectives of the Drayton offset areas as well as those of neighbouring land holders. The objectives of local strategies including the Muswellbrook Shire Council Mining Rehabilitation Policy have been incorporated where possible and the general principles of the NSW Department of Resources and Energy - Mineral Resources 'Synoptic Plan of Integrated Landscapes' have been accounted for in the plan with respect to the creation of wildlife habitat corridors.

The Drayton area was traditionally used for beef cattle grazing, so maintaining grazing capacity in pasture areas is a key objective. Another key objective is to maintain ecosystems and biodiversity through the establishment of trees native to the region. Attainment of both goals will result in land that has good grazing potential and high wildlife amenity.

5.1 Buildings

No buildings are scheduled for removal during the 2012-17 MOP period however some buildings may require removal if Drayton mine is closed at the end of the MOP term. All buildings undergo routine inspections and maintenance. No buildings were renovated or removed at Drayton during the 2014 reporting period.

5.2 Rehabilitation of Disturbed Land

Drayton achieved the area proposed in the MOP of 41.2 ha of rehabilitation in 2014. The areas that were rehabilitated in 2014 were in the west pit, South Pit East (SPE) and the East Pit (ES). These areas are shown in Figure 24.

The areas that were rehabilitated in 2014 varied compared to Plan 5 in the Drayton MOP. According to the plan, the area completed in the West Pit was due for completion in 2016. The areas completed in the South Pit and in ES were scheduled for rehabilitation in 2013, 14 and 15. These areas were rehabilitated in 2014 due to opportunities arising where areas were no longer needed for operational activities.

The areas indicated on Plan 5 of the Drayton MOP to be rehabilitated in 2014 were located in the ES area and the North Pit. As noted in the 2013 AEMR, areas in the ES were bulk shaped, and part of this area was rehabilitated in 2014. The area to the north still requires significant drainage works to be completed. This remaining area of ES will be rehabilitated in 2015. Due to changes in the mine plan, the North Pit area will now be rehabilitated later in the mine life.

Areas rehabilitated during the reporting period were bulk shaped, and where necessary capped with inert material at a minimum depth of two metres to minimise the risk of spontaneous combustion. Contour banks designed with a 1 degree slope were constructed in the ES rehab area, with all runoff being collected in the mine water system. During 2014, this methodology was adapted to include greater depth of capping material along contour banks to ensure bank construction and subsequent erosion does not cause thinning of the capping to an inadequate

depth over time. Bulk shaping, compaction works, and construction of the contour drains were conducted by D11 dozers and finished using an excavator. Some areas were spread with Organic Growth Medium (OGM), using a tractor drawn spreader. The OGM used came from a green waste recycling plant in Sydney and provides additional organic material to the soil. Seeding was conducted by the NSW Soil Conservation Service.

Post mining land use for the site is low intensity grazing with biodiversity values being protected via the establishment of a habitat corridor. Of the 41.2 ha completed in 2014, 28.2 ha were seeded to pasture. The Pasture seed mix used is detailed in Table 40**,** and the mix was applied with fertiliser at a rate of 250kg/ha, which also acted as a bulking agent to ensure even spread of the seed.

Table 40: Pasture Species Mix

Species	Kg/Ha	Species	Kg/Ha
Millet (cover crop)	40	Haifa Clover Coated	5
Kangaroo Valley Rye	5	Vetch	5
Lucerne Aurora Coated	10	Sephic Medic Coated	5
Couch	5	Granulock 15 (fertilizer)	250
Panic	2		

The proposed land capability classifications for the pasture areas ranges from Class IV to Class VI. Class IV and V lands are suitable for well managed grazing, and Class VI and VII lands are not suitable for grazing, but can be used for native woodlands. Post mining rural land capability classification has not yet been fully assessed for these areas. Pasture areas continue to exhibit high groundcover establishment levels. Completion criteria based on palatable species establishment, diversity of grazing species and soil characteristics have been developed. Future monitoring will include assessment of these parameters against the completion criteria. Rural land capability classification assessment will be completed for areas where grazing has been identified as the final land use. An assessment of the grazing areas will be completed in 2015, and will consider measures such as stocking rates, shade trees, water access, etc. Section 5.4 discusses a trial currently underway grazing horses on rehabilitated pasture.

The remaining 13 ha of the rehabilitation completed during the reporting period was seeded to native woodland to expand and enhance the habitat corridor being established across site. This corridor is designed to link the Southern Offset area to the Northern Offset area and is consistent with the MOP. These areas will in turn link to other offsite conservation areas. The native woodland species used are outlined in Table 41. All seeding mixtures included millet, couch and rye as cover crops to aid soil stabilisation. Germination and growth of native species sown on rehabilitation areas will be monitored over time.

Table 41: Native species seed mix Woodland rehab 2014

Species	Vegetation Community	Kg/Ha
Angophora floribunda	Narrow-leaved Ironbark Woodland	0.1
Eucalyptus crebra	Narrow-leaved Ironbark Woodland	0.4
Brachychiton populneus	Narrow-leaved Ironbark Woodland	0.1
Corymbia maculata	Narrow-leaved Ironbark Woodland	0.6
Eucalyptus moluccana	Narrow-leaved Ironbark Woodland	0.2
Acacia falcata	Narrow-leaved Ironbark Woodland	0.8
Acacia decora	Narrow-leaved Ironbark Woodland	0.8
Acacia parvipinnula	Narrow-leaved Ironbark Woodland	0.8
Acacia salicina	Narrow-leaved Ironbark Woodland	0.2
Eucalyptus tereticornis/blakelyi	Narrow-leaved Ironbark Woodland	0.4
Aristida ramosa	Narrow-leaved Ironbark Woodland	0.1
Bothriochla macra	Narrow-leaved Ironbark Woodland	0.1
Bursaria spinosa	Narrow-leaved Ironbark Woodland	0.1
Chloris truncata	Narrow-leaved Ironbark Woodland	0.1
Chloris ventricosa	Narrow-leaved Ironbark Woodland	0.1
Dicanthium	Narrow-leaved Ironbark Woodland	0.1
Hardenbergia violacea	Narrow-leaved Ironbark Woodland	0.1
Lomandra multiflora	Narrow-leaved Ironbark Woodland	0.1
Microlaena stipoides	Narrow-leaved Ironbark Woodland	0.1
Themeda australis	Narrow-leaved Ironbark Woodland	0.1
Millet	Cover crop	5
Couch	Light pasture	1
Perennial Rye Grass	Light pasture	1
Kitty Litter	Bulking agent	62.5

A total of 6000 trees were planted in rehabilitation areas targeted for native woodland during 2013. Of these, 2000 were planted in the Southern Offset area. The planting was timed to coincide with periods of reliable rainfall however establishment was hampered by prolonged periods of hot, dry weather. Total tree mortality from the areas planted in 2012 and 2013 will be

assessed in 2015 with replacement trees to be planted in equal numbers as required. The species planted are provided in Table 42.

Table 42: Tubestock Species Planted

Species	Vegetation Community	Location Planted
Angophora floribunda	Narrow-leaved Ironbark Woodland	Crests – Great North Tip
Eucalyptus crebra	Narrow-leaved Ironbark Woodland	Crests – Great North Tip
Eucalyptus canaliculata	Narrow-leaved Ironbark Woodland	Crests – Great North Tip
Eucalyptus tereticornis	Narrow-leaved Ironbark Woodland	Crests – Great North Tip
Acacia falcata	Narrow-leaved Ironbark Woodland	Crests – Great North Tip
Corymbia maculata	Spotted Gum – Grey Box Woodland	Upper Slopes – Great North Tip
Acacia falcata	Spotted Gum – Grey Box Woodland	Upper Slopes – Great North Tip
Lomandra longifolia	Spotted Gum – Grey Box Woodland	Upper Slopes – Great North Tip
Eucalyptus moluccana	Spotted Gum – Grey Box Woodland	Upper Slopes – Great North Tip
Eucalyptus moluccana	Yellow Box – Grey Gum Woodland	Southern Offset Area
Eucalyptus melliodora	Yellow Box – Grey Gum Woodland	Southern Offset Area

The 2014 annual flora and fauna monitoring addressed vegetation establishment; presence of weeds; habitat for native fauna; and any further works required to meet completion criteria.

Table 43 gives a summary of mining and rehabilitation areas located at Drayton for 2014.

Maintenance activities conducted on rehabilitated land during the reporting period are outlined in Table 44.

Table 43: Rehabilitation Summary

		Area Affected / Rehabilitated (hectares)		
		To Date	Last Report	Next Report (Estimated)
A:	**MINE LEASE AREA**			
A1	Mine Lease(s) Area	1767.5		
B:	**DISTURBED AREAS**			
B1	Infrastructure area (other disturbed areas to be rehabilitated at closure including facilities, roads)	101.1	101.1	100.5
B2	Active Mining Area (excluding items B3 – B5 below)	554.5	554.5	529.3
B3	Waste emplacements (active/unshaped/in or out-of-pit)	77.8	77.8	74.0
B4	Tailing emplacements (active/unshaped/in or out-of-pit)	16.2	16.2	16.2
B5	Shaped waste emplacement (awaits final vegetation)	25.1	25.1	13.7
ALL DISTURBED AREAS		774.7	774.7	733.7
C:	**REHABILITATION PROGRESS**			
C1	Total Rehabilitated area (except for maintenance)	514.2	473.0	622.7
D:	**REHABILITATION ON SLOPES**			
D1	14 to 18 degrees	200.8	180.3	211.3
D2	Greater than 18 degrees	27	27	35.1
E:	**SURFACE OF REHABILITATED LAND**			
E1	Pasture and grasses	347.1	318.9	425.4
E2	Native forest/ecosystems	162.6	149.6	188.1
E3	Plantations and crops	4.5	4.5	4.5
E4	Other (include no vegetative outcomes)	0	0	0

Table 44: Maintenance Activities on Rehabilitated Land

	Area Treated (ha)		
NATURE OF TREATMENT	**Report period**	**Next period**	**Comment/control strategies/ treatment detail**
Additional erosion control works (drains re-contouring, rock protection**)**	**17**	**40**	**Contour banks installed on newly rehabilitated areas around EN void.**
Re-covering (detail - further topsoil, subsoil sealing etc)	**60**	**108**	**Topsoil and clay spread on newly rehabilitated areas and in Southern Offset area.**
Soil treatment (detail - fertiliser, lime, gypsum etc)	**40**	**40**	**Fertiliser used with pasture seed mix – species and OGM used with woodland species.**
Treatment/Management (detail - grazing, cropping, slashing etc)	**0**	**0**	**No grazing cropping or slashing on rehabilitated areas during 2013 reporting period**
Re-seeding/Replanting (detail - species density, season etc)	**30**	**30**	**Replanting on Southern Offset.**
Adversely Affected by Weeds (detail - type and treatment)	**5**	**50**	**Ongoing weed control conducted – target species on rehabilitated areas during 2014 were castor oil plant and African boxthorn.**
Feral animal control (detail - additional fencing, trapping, baiting etc)	**200**	**200**	**Wild dog baiting and kangaroo culling. South Tip and Southern Offset areas targeted 2014.**

The current extent of rehabilitated areas at Drayton including those completed during the 2014 reporting period are shown below in Figure 24. Figure 25 indicates the contours and drainage of rehabilitated areas completed in 2014, and Figure 26 below outlines target vegetation communities on the 2013 rehabilitation areas.

Figure 27 to Figure 34 show cross sections of rehabilitated areas with all areas generally less than 18 degrees.

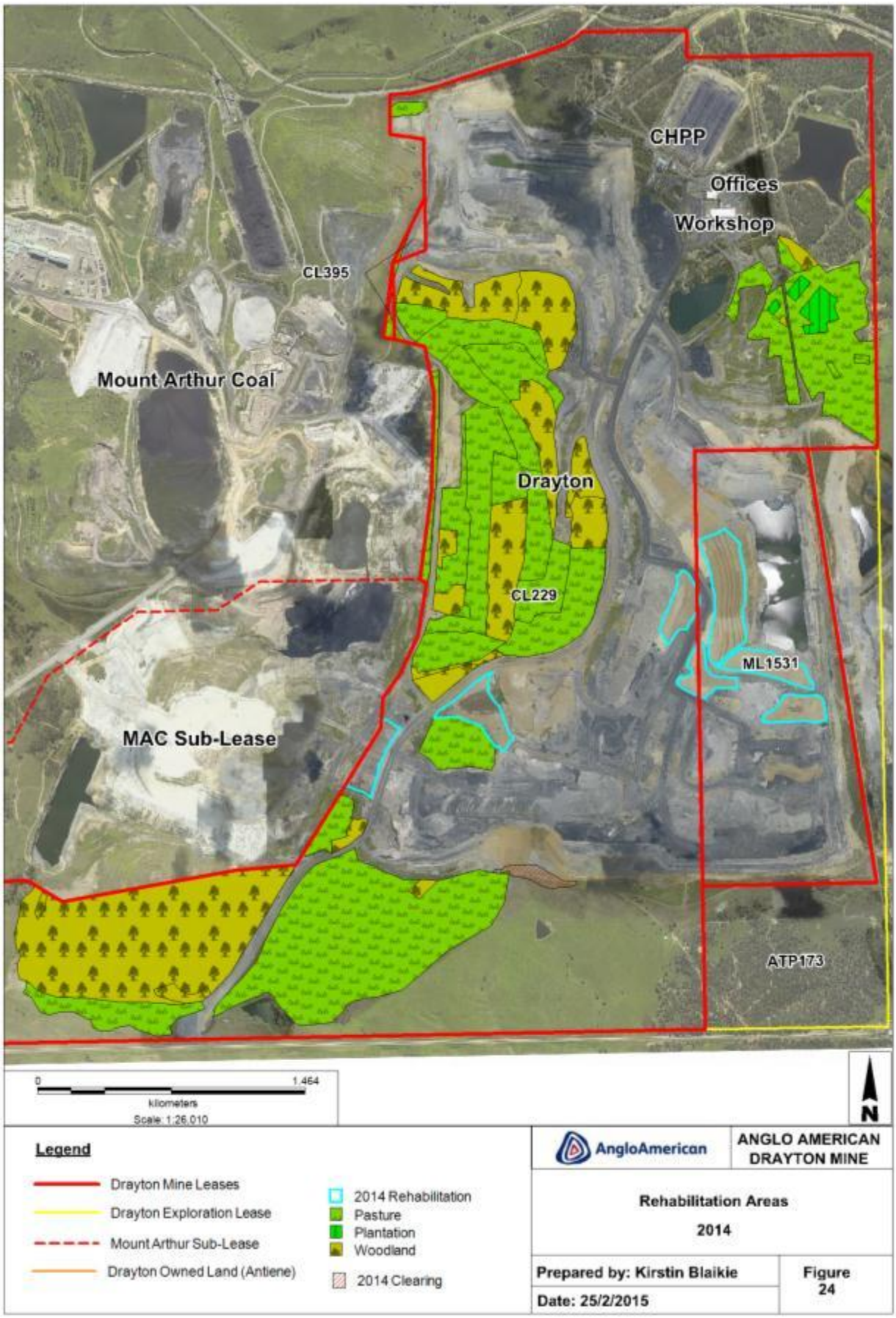


Figure 24: Rehabilitation Areas to end 2014

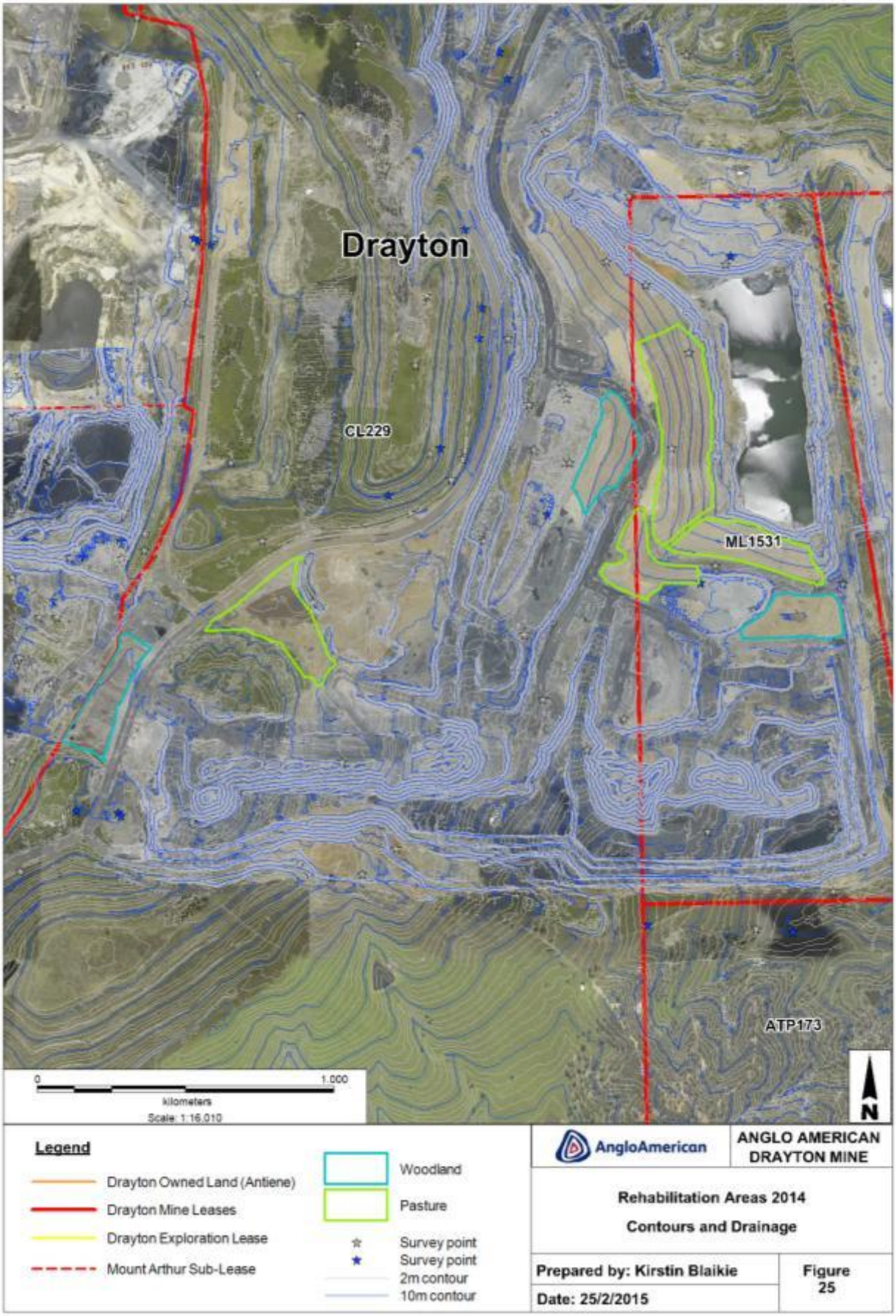


Figure 25: Rehabilitation Area Contours

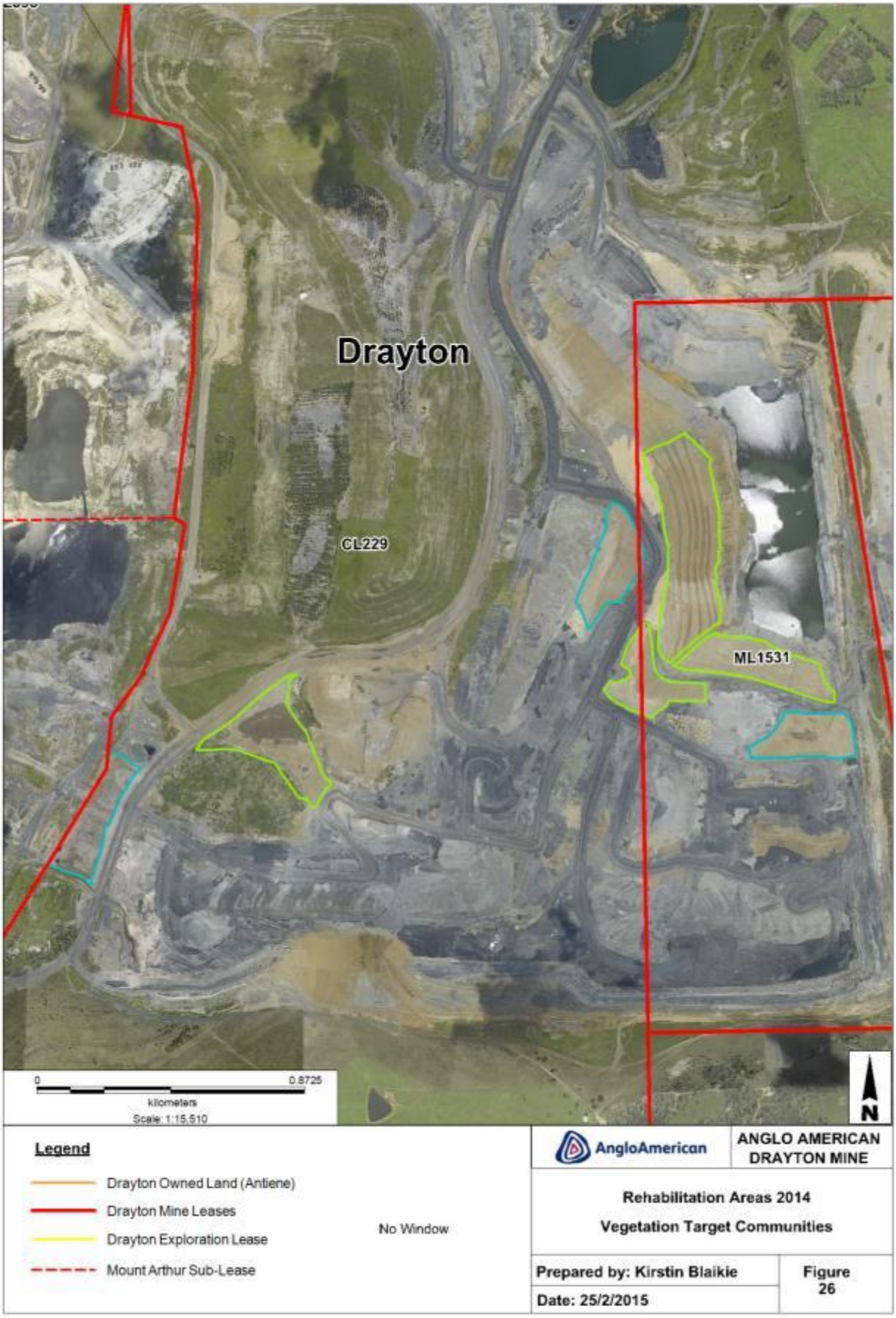


Figure 26: Rehabilitation Area Target Vegetation Communities

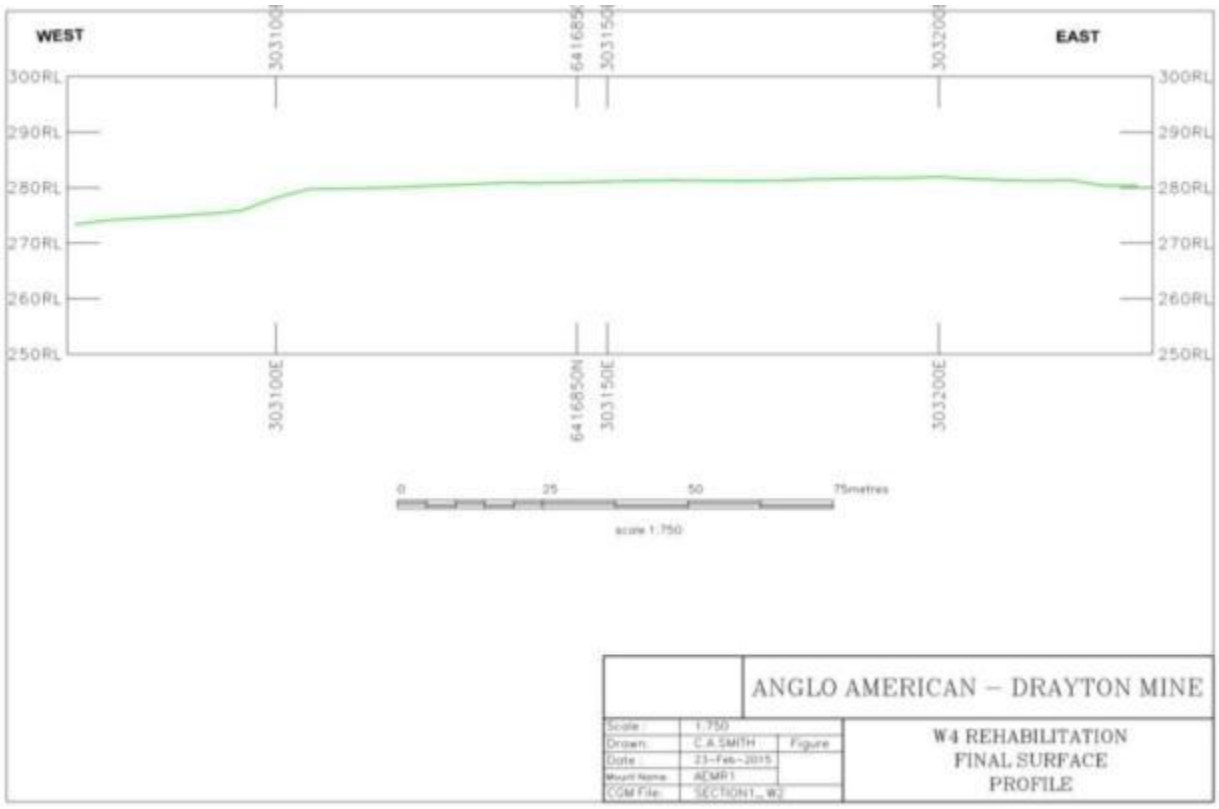


Figure 27: Cross Section of W2 rehabilitation area

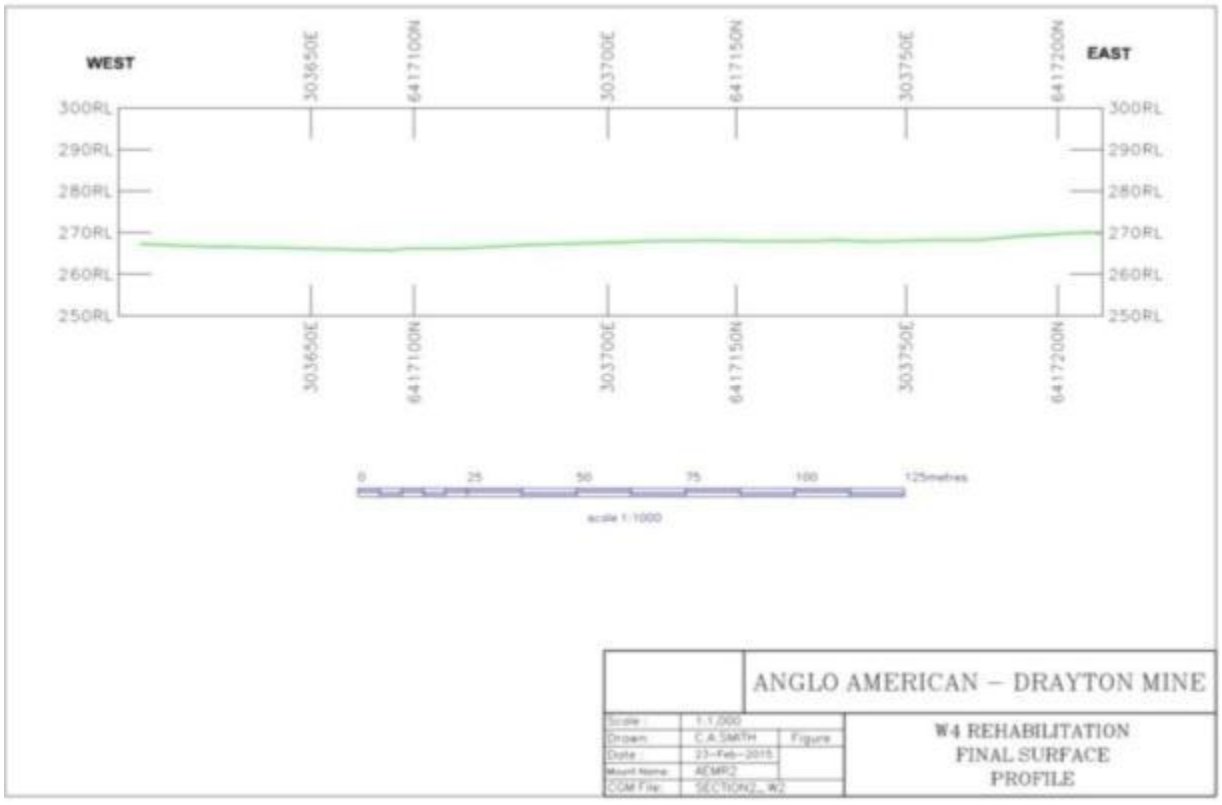


Figure 28: Cross Section of W4 rehabilitation area

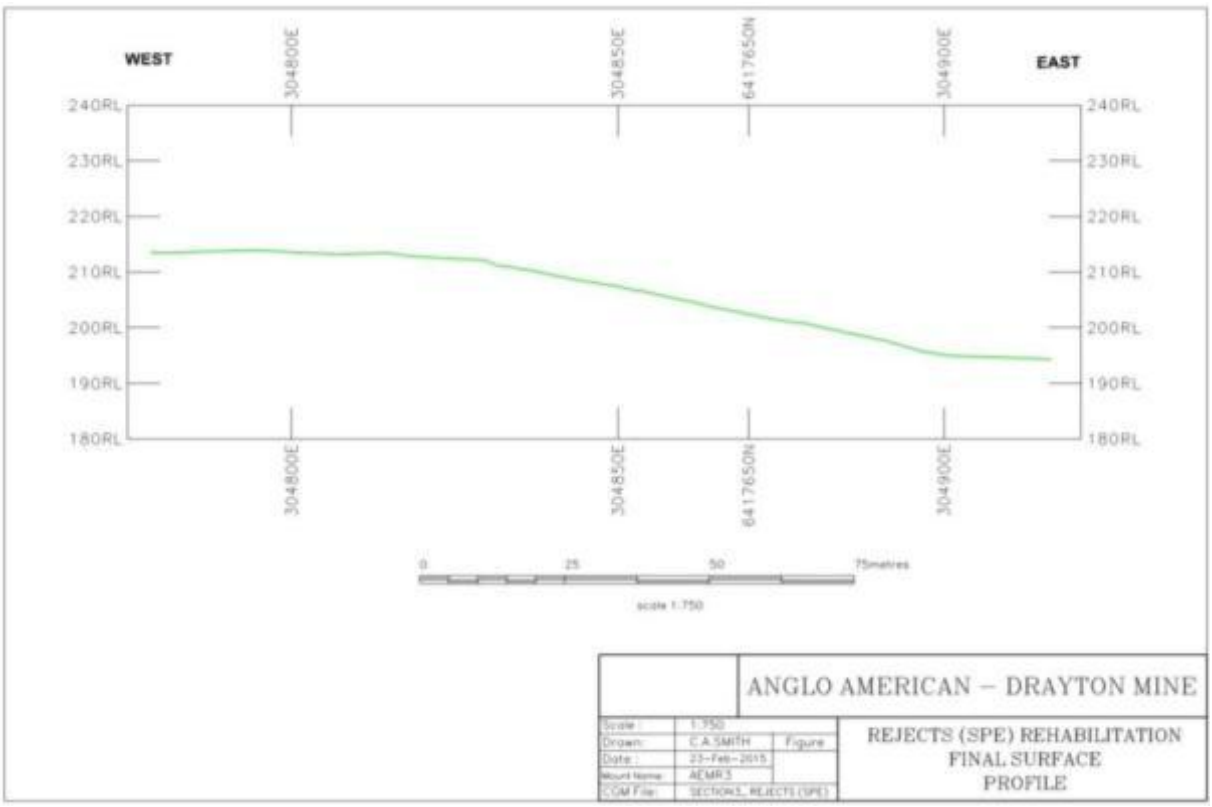


Figure 29: Cross Section of Rejects (SPE) rehabilitation area

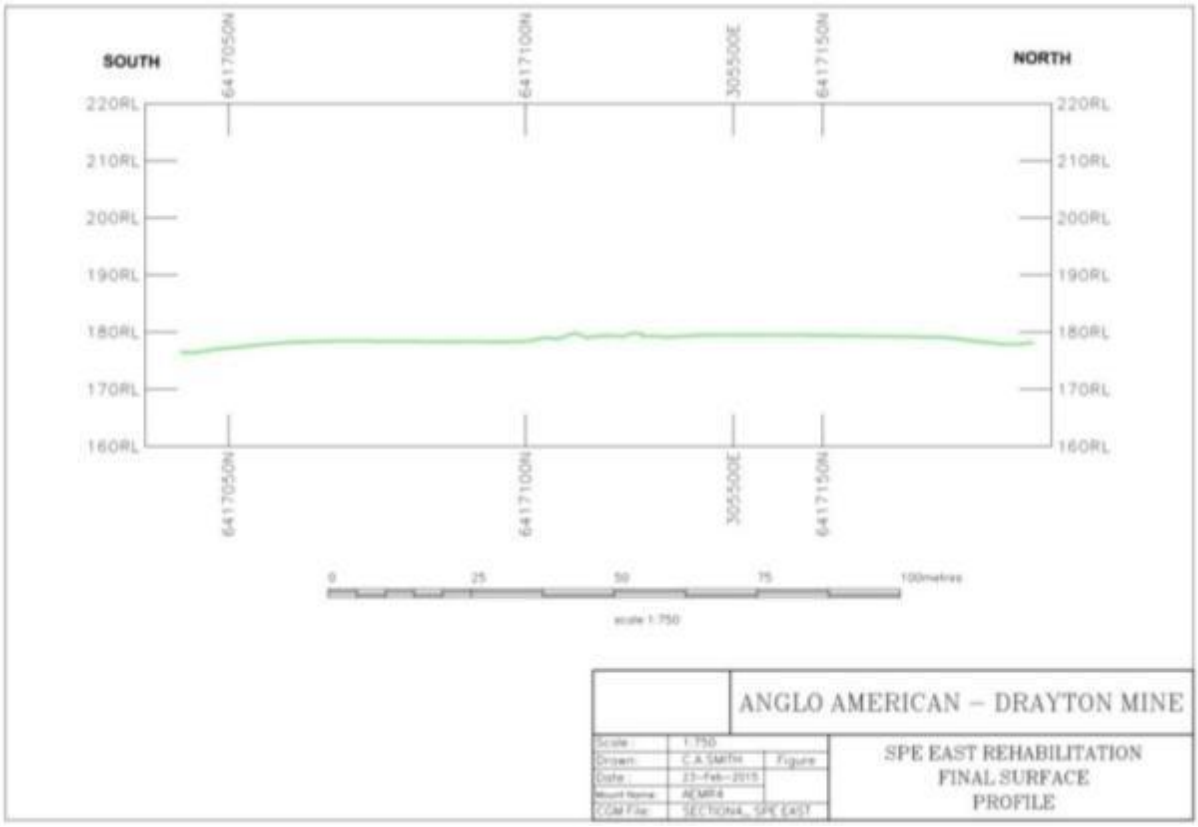


Figure 30: Cross Section of SPE East rehabilitation

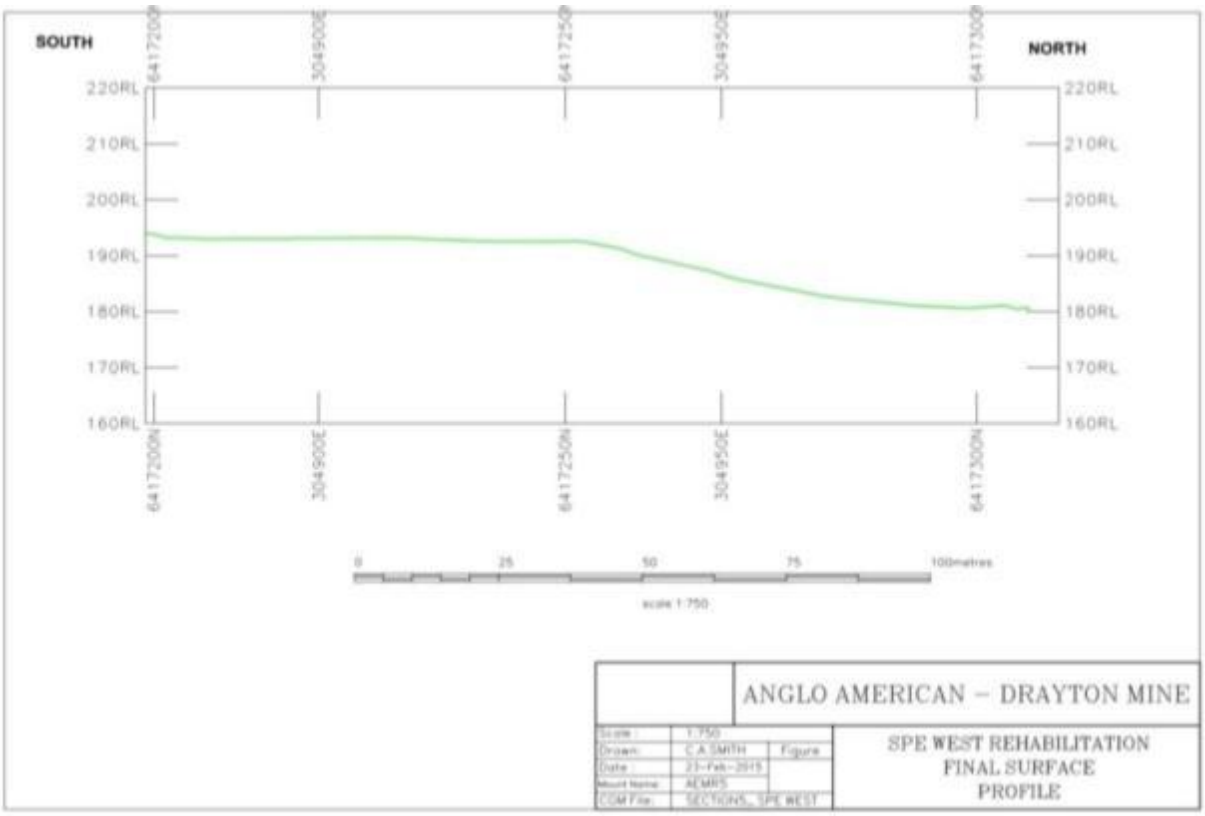


Figure 31: Cross Section of SPE West rehabilitation area

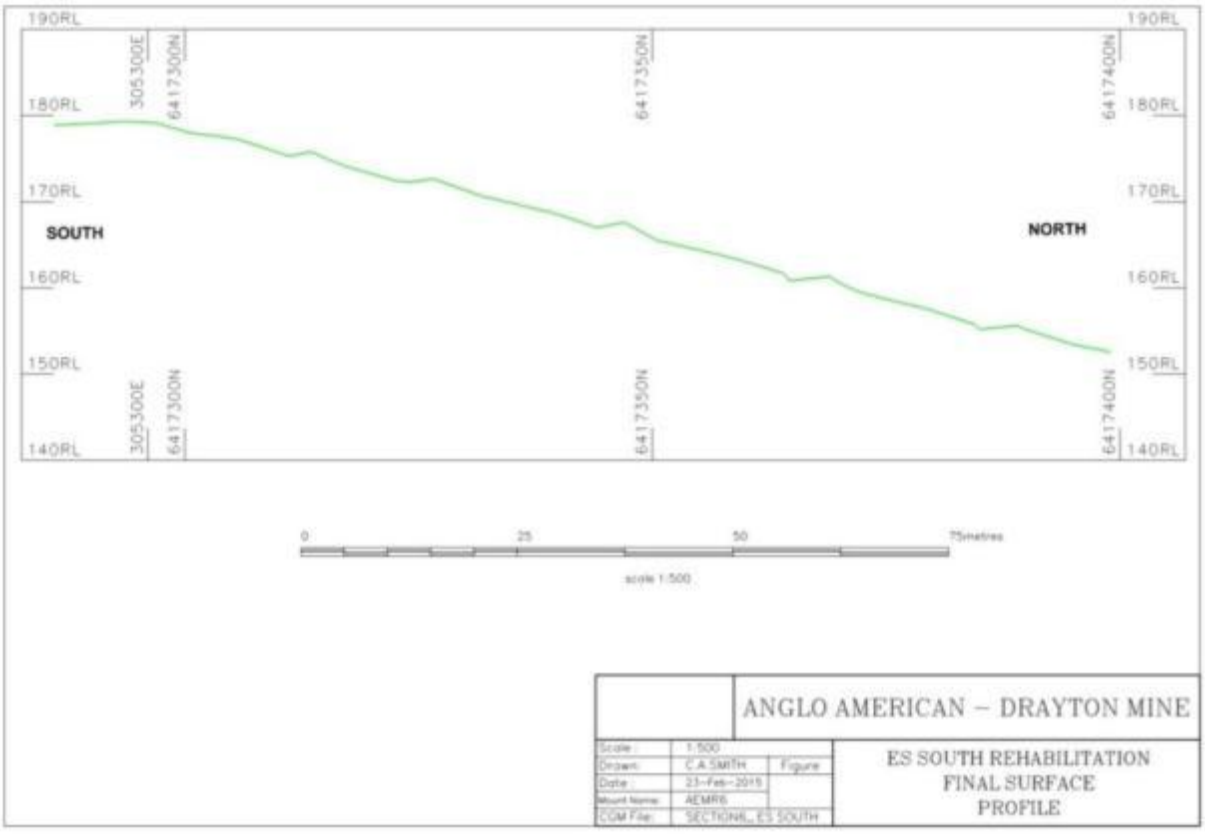


Figure 32: Cross Section of ES South Rehabilitation

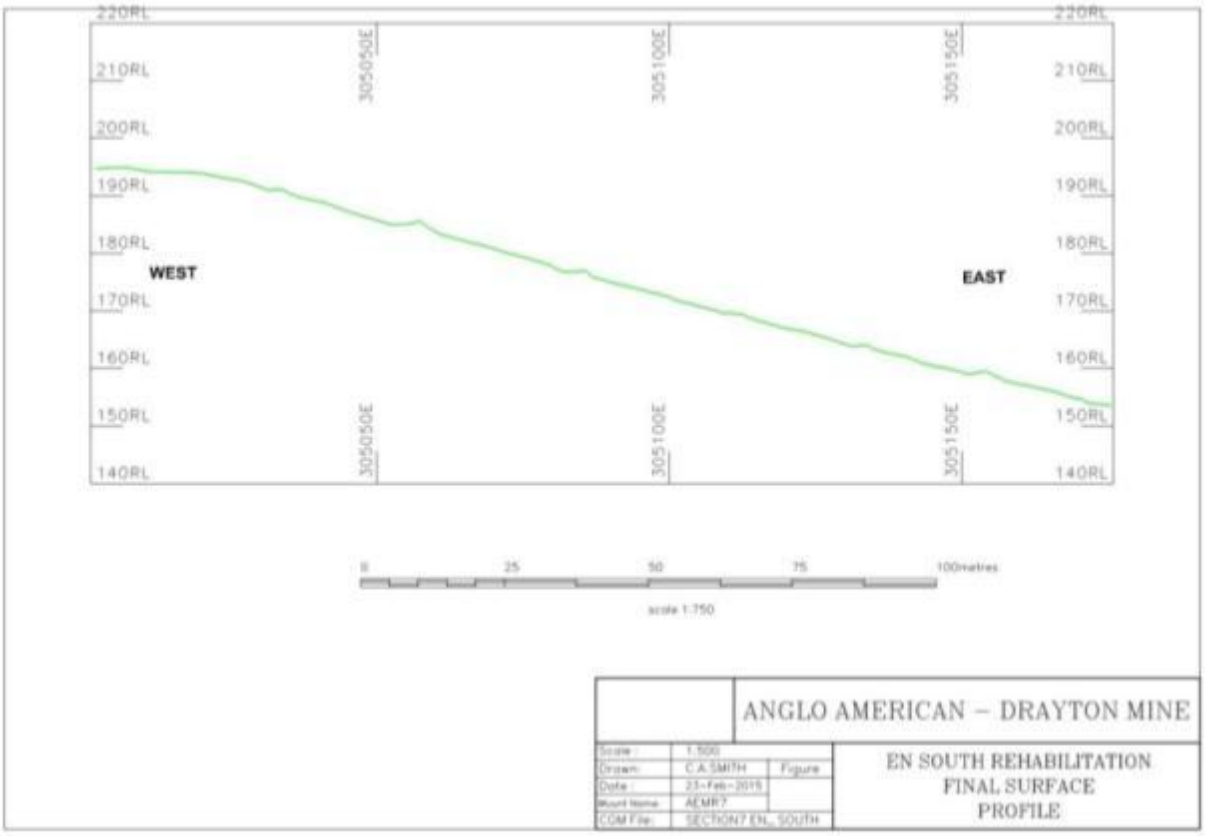


Figure 33: Cross Section of EN South rehabilitation area

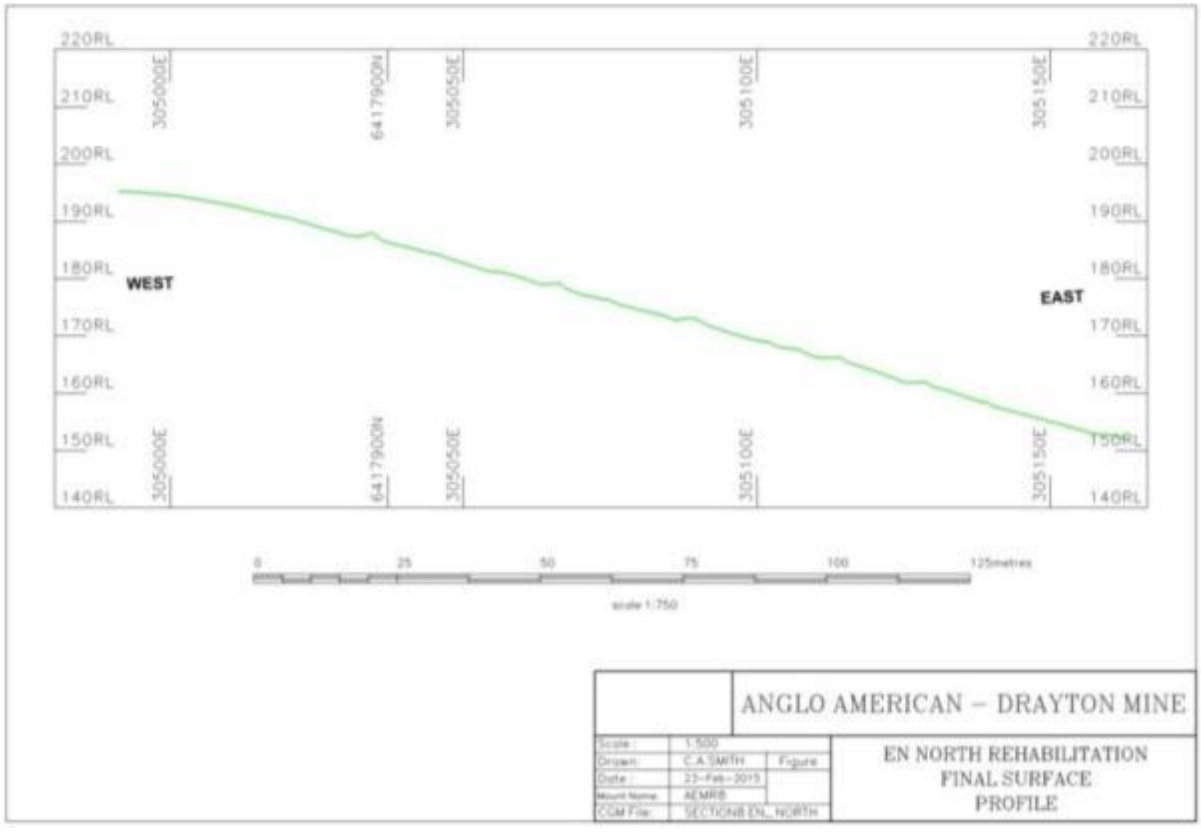


Figure 34: Cross Section of EN North rehabilitation

In 2008, 88Ha of land within the Drayton lease was dedicated as an offset area. This land, named the Southern Offset area, is located in the Saddlers Creek catchment and includes both remnant woodland within the creek and an area of post mining rehabilitation. The rehabilitation area is being progressively replanted to establish target vegetation communities outlined in the Offset Strategy. Monitoring of the Southern Offset area during 2013 identified areas where previously existing vegetation was no longer present. Areas of poor vegetation growth were also observed. Further investigation identified the presence of steam in localised areas and a thermography survey of the Southern Offset area was conducted in June 2013. The Thermography Survey Report revealed an area of approximately 11Ha exhibiting active surface heating.

A proposed restoration strategy was developed and presented in the Southern Offset Area Restoration Report. The report outlined proposed restoration of the 11Ha area with active surface heating and a further 14Ha not exhibiting active surface heating but with poor vegetation establishment. The restoration work commenced in 2014 and involved capping of the surface heating areas with at least 2m of clay, spreading topsoil in all areas, reconstructing the contour banks, and seeding.

Further seeding and planting of tubestock will occur in 2015, and there will be ongoing flora and fauna monitoring of the areas, and thermal surveys to ensure no heating is apparent. Areas found to have surface heating will be subject to further restoration works.

Flora and fauna monitoring of the rehabilitation, Wildlife Refuge and offset areas occurred in October and November 2014 (Ecological Australia, February 2015). Some of the sites monitoring on the Southern Offset during 2013 were disturbed during the restoration work, and had to be re-established. New sites were set up in the Geofluv rehabilitation and the Far East tip rehabilitation to collect further pasture information. A total of 28 sites were sampled for flora, and eight of these sites were sampled for fauna. The monitoring results compared species diversity, and cover in native woodland rehabilitation with analogue sites in the Wildlife Refuge and Northern Offset. Exotic species and weeds were also assessed.

As expected, the Southern Offset was considered not to be performing as most of the sites monitored had been subject to restoration. The performance is expected to improve in future years as planted native species start to develop. Monitoring in all areas will continue to track progress against criteria.

The report recommended a number of items which will be considered and implemented if considered advantageous. Performance criteria for soils, fauna monitoring and pasture areas have been developed. These were submitted as part of the Mine Closure Plan in 2014. As a result subsequent correspondence from DRE has requested further detail on performance criteria. They are currently being reviewed to add further detail and will be included in the revised closure plan.

The results of the soil samples collected in the 2013 monitoring were reviewed by Dr. Mark Burns of Global Soil Systems, and generally all sites did not require further work, although ongoing monitoring is suggested.

5.3 Other Infrastructure

No other infrastructure was subject to rehabilitation during the period.

5.4 Rehabilitation Trials and Research

Drayton has conducted various trials on-site over the life of the mine, and been involved in a number of in-house and industry sponsored research projects.

In the 2014 rehabilitation, Drayton trialled the use of an organic growth medium. This material has been used as a growth medium, and was spread at a rate of up to 100t/ha in three areas of the rehabilitation. Two of these areas were planted with native woodland species, and one with pasture species. Monitoring will be completed in 2015 to identify any improvements in establishment related to the use of this material.

In August 2014, Drayton introduced horses into a 40 acre area on the Far East Tip of primarily pasture rehabilitation with a small area of virgin land. At the end of the reporting period there were six horses, four adults and two foals, in this area. The area has been fenced to safely contain the horses and a watering point installed for their wellbeing. There are a number of treed areas to provide shade and cover. During the 2014 flora monitoring, two new sites were set up in this area to monitor pasture response to grazing. During the 2015 reporting period, Drayton will continue to monitor the seasonal pasture response to grazing and adjust stocking rates if required.

Figure 35: Horse grazing trial

5.5 Further Development of the Final Rehabilitation Plan

Rehabilitation inspections during 2014 assessed risk to rehabilitation areas including competition from weeds, insufficient rainfall, erosion, spontaneous combustion and predation by animals.

Rehabilitation areas were assessed for weed infestations in 2014 and treated for African Boxthorn and Castor Oil as detailed in Section 3.9.

Rainfall during late 2014 caused erosion in the newly restored area in the Southern Offset. To combat this, contour banks were extended or re-installed where necessary. The erosion will be monitored and addressed using ripping and seeding depending on the extent and severity of the erosion in the area.

The 2014 rehabilitation areas will be assessed for spontaneous combustion using thermal imaging techniques to ensure any outbreaks in rehabilitation areas are identified and managed.

An assessment of tree growth in woodland rehab areas from seed or tubestock will be conducted during 2015 with replacement tubestock to be planted in as required.

Flora, fauna and soils on rehabilitation areas were monitored during 2014 by Eco Logical Australia (ELA). The 2014 Flora and Fauna Monitoring Report (ELA, February 2015) recommended:

- Continued monitoring and control of noxious and environmental weed species;
- Revising performance and completion criteria for target flora;
- Developing performance and completion criteria for fauna and soils;
- Developing performance and completion criteria for pasture areas incorporating palatable species diversity;
- Engaging a soil scientist to review monitoring results and identify limiting factors;

Soil sampling was conducted in 2013 and in 2014 Global Soil Systems reviewed and provided an interpretation of the results.

Organic waste compost product was trialled as growth medium establishment on three areas in 2014 rehabilitation, being W2 rehab, W4 rehab and SPE North woodland. Monitoring will occur in 2015 to determine the success of plant establishment using this product.

During the reporting period Drayton compiled a Mine Closure Plan. This plan was drafted after consultation with:

- Muswellbrook Shire Council
- NSW Department of Planning and Infrastructure
- Office of Environment and Heritage
- Division of Resources and Energy

The plan was developed assuming that the Drayton South Project is not successful and mining at Drayton finishes in 2017. The Mine Closure Plan identifies areas of rehabilitation through to 2018. The rehabilitation targets for the following years detailed below and include the completed rehab areas for each reporting period (see Table 45).

Table 45: Rehabilitation Plan Target and Actual Completed

Year	Rehabilitation Target (ha)	Rehabilitation Completed (ha)
2014	40	41.2
2015	108	
2016	230	
2017	237	

The rehabilitation targets outlined in the draft Mine Closure Plan show a progressive increase in area up to 2017 when Drayton's development approval expires. Under current approvals Drayton will cease mining operations in 2017. If the Drayton South operation is approved, rehabilitation targets will change to account for infrastructure and disturbed areas that will be required for the Drayton South operation.

The Drayton Mine Closure Plan is yet to be approved by the DRE and DP&E. There is still several outstanding issues that Drayton has been asked to address prior to approval. Key areas were further detail has been requested include the development and maintenance of proposed sustainable highwalls as well as rehabilitation planning, management and implementation detail.

6 ACTIVITIES PROPOSED FOR THE NEXT AEMR PERIOD

6.1 Environmental Performance

Drayton's environmental targets for the 2015 reporting period include:

- Maintaining full compliance with environmental legislation;
- Full implementation of a new Dust Management System
- Comply with an 80% dust control efficiency on all haul roads;
- Nil discharge of mine water;
- All blasts to be less than 5 mm/sec ground vibration and 115 dB(L) at the nearest residence;
- Dust emissions to be below the statutory limits of 4g/m2.month and 50 μg/m3 TSP at nearby residences;
- Noise emissions to be below statutory requirements;
- Reduction in spontaneous combustion emissions by continued improvement in application of the spontaneous combustion management plan;
- Continuation of the CCC meetings;
- Continuation of the waste management plan and continued improvement in the application of the waste management practices;
- Continuous improvement of the documentation associated with the Environmental Management System;
- Conduct 108 ha of rehabilitation;
- Maintain compliance with ISO14000 systems Targets and Objectives for the operation of the Antiene Rail Loop and Drayton Rail Spur will remain consistent with those detailed for the Drayton mining operation;
- 3 Year Independent Environmental Compliance Audit
- Regulatory approval of revised Mine Closure Plan

7 ADDITIONAL INFORMATION

7.1 Antiene Joint Rail User Facility

The Antiene Rail Spur is wholly owned and operated by Drayton Mine. Development Consent S99/010170 was obtained in November 2000 to increase the authorised tonnage of the Drayton Loop to 7Mtpa and the Antiene Spur to 20Mtpa. The increased tonnage over the Antiene Spur allows for the output from a potential future Drayton South mine on the Drayton rail loop.

There were no variations to Drayton approvals relating to the rail facility during the 2014 reporting period.

Additionally, condition 8.1 of Department of Urban Affairs and Planning (now DP&I) development consent S99/01070 requires that the following additional information is supplied in relation to environmental management of the Drayton Rail Loop and Antiene Rail Spur development.

7.1.1 Management

Dust mitigation measures were proposed in the EA for both the construction and operation of the Bayswater Rail Loading Facility and operation of the Antiene Joint User Rail Facility. Mitigation measures have included enclosing conveyors, loading trains using a telescopic chute, train carriages designed with small aperture and equipping transfer points with dust suppression structures.

In addition to the dust mitigation measures, which can assist with noise abatement, noise barricades have been constructed at the northern face at the base of the rail loadout bins. In the 2014 reporting period, one noise related complaint was made in regards to rail activity. The complaint is indicated in Table 46 below and is listed in Appendix F.

Table 46: Rail Related Noise Complaints Received in 2014

Date	Enquiry, Concern OR Complaint	Nature	Outcome
23/07/2013	Complaint	Noise	Excessive noise complaint received for noise occurring on the 19th, 20th and 23rd of July heard at the complainant's property. The 19th and 20th were a weekend when there was minimal Drayton activity (no CHP operations either). On the 23rd of July there was a train being loaded from 7:20am to 10:20am. Property was immediately visited and no noise exceedance was occurring. Complainant was contacted by the Environmental Coordinator and the results of investigation communicated.

Offsite lighting is restricted to certain parts of the rail loader and rail loop. The lighting is similar to street lighting and was predicted to have minimal impacts. A dense surrounding of native trees is in place to mitigate the impacts on the surrounding residents. In 2014 no complaints were made in regards to lighting.

The joint Drayton and Mt Arthur Coal CCC held two scheduled meetings during 2014 where the environmental performance of the rail spur was discussed and reviewed, together with any environmental enquiries and other issues.

Environmental targets and strategies are detailed in Drayton's Environment Management Plans (EMP) and include:

- Adhere to all conditions as set out in development consent;
- Ensure all monitoring is undertaken per EMP and consent conditions;
- Ensure all enquiries are dealt with promptly and efficiently;
- Ensure all reporting requirements are met within the required timeframe;
- Ensure, if required, that any requirements outside of this consent, as directed by the Director General are undertaken; and
- Ensure active community consultation continues on a regular basis.

7.2 Monitoring

Under the consent condition 6.1 (e) coal haulage reports are required on a six monthly basis. These reports were provided to the DP&I at the appropriate time, with a summary report being contained in Appendix H. Condition 6.1(b) states that Coal transported along the Antiene Rail Spur is limited to twenty (20) million tonnes per annum. In the 2014 reporting period, 21,639,600 tonnes of coal was transported on the Antiene Rail Spur. This comprised of 3,557,762 tonnes from Drayton and 18,081,383 tonnes from Mt Arthur Coal. Mt Arthur Coal has a more recent development approval allowing up to 27 million tonnes of coal to be transported along the Antiene Rail Spur.

General environmental monitoring also continued throughout 2014 with regards to both Drayton's mining operation and the use of the Drayton Rail Loop Facility. Impacts to water quality within the Rail Loading Facility and the Rail Spur have been minimal. There have been fluctuations observed in some of the monitoring characteristics however these have been within limits.

The EA predicted only low level air quality impacts as a result of the construction of the Bayswater Rail Loading Facility and operation of the Antiene Joint User Rail Facility. As predicted, no significant amounts of dust have been observed from the rail loop or spur. Data collected indicate no increase in dust emissions in the period since the consent was granted.

Noise assessments indicated that there would not be a significant noise impact from these areas provided that appropriate noise abatement measures were adopted. During 2014, train noise was audible on 7 out of 26 different attended noise monitoring occasions. The trains were most commonly heard at the Lot 7 (Antiene) residence. On all occasions it was noted that train noise did not comprise more than 40% of the total noise recorded during supplementary noise monitoring (see Table 47).

Table 47: Train Noise Perceived during Attended Noise Monitoring

Location	Date	Time	LEQ	L10	L50	L90	Comments
De Boer	-	-	-	-	-	-	Nil train noise perceived at De Boer resident during attended monitoring in 2014.
Doherty	06/03/2014	09:38	39.4	39.9	36.4	34.1	55% birds, **40% trains/mine/CHP noise**, 5% insects
	26/11/2014	12:45	36.9	38.0	35.4	32.3	60% insects/birds, **30% low rumble (incl. train horn)**, 10% traffic along TMD
Halloran	-	-	-	-	-	-	Nil train noise perceived at De Boer resident during attended monitoring in 2014.
Horder	21/03/2013	14:04	38.1	39.4	35.9	32.7	50% indiscriminate road noise, 50% birds, **train horn @ 1min 46sec**
Robertson	25/03/2014	13:45	42.9	45.8	41.3	32.5	6x trucks, 36x light vehicles, 80% road noise, 20% insects, **train @ 1:52PM**
	02/04/2014	13:38	46.2	51.1	41.6	32.9	15x trucks, 20x light vehicles, 70% road noise, 20% mine noise, 10% birds/insects, **train @ 1:49PM**
	12/11/2014	08:00	47.7	52.3	40.9	33.3	14x trucks, 17x light vehicles, 70% traffic, 25% birds, 5% wind, **distant train horn (*wind >3m/s*)**
	26/11/2014	11:10	46.3	50.9	39.8	34.5	12x trucks, 20x light vehicles, 50% insects/birds, 40% traffic (TMD), 5% wind, **5% train horn**

7.3 Dams Safety Committee Requirements

7.3.1 Liddell Ash Dam

The Liddell Ash Dam Levee (ADL) was constructed to retain ash produced by the Bayswater Power Station. The DSC issued Drayton with requirements for monitoring and reporting regarding the ADL.

In 2014 Drayton complied with the DSC requirements by carrying out:

- An annual independent Type 2 engineering assessment;
- Tri-weekly inspections conducted by a competent person;
- An annual review of the Ash Dam Management System;
- Having an appointed a DSC Liaison Officer;
- Inspecting the ADL after each blast in the notification area;
- Reporting significant changes in seepage to DSC immediately;
- Reporting blast vibrations in excess of 50mm/sec to DSC immediately; and
- Providing monthly reports on:
    - seepage
    - ash deposition status
    - blast monitoring results within the notification area
    - mining face positions
    - compliance statement

In mid-2014, seepage at the south end of the Ash Dam increased. This increase was thought to be due to a rising water level in the upstream pond and the absence of ash against the wall in this area. An inspection of the levee was conducted in June 2014 and several actions were agreed with the DSC and implemented, including pumping free water from the upstream pond. The seepage was brought under control and has remained steady since September 2014 Deposition of ash against the levee in early 2015 will help to prevent a further occurrence, although seepage is likely to increase for a period when the ash is first deposited.

The vibration limit at the ADL for blasting, set by the DSC, is 50mm/sec with all blast results over the limit to be reported immediately to the DSC. During 2014, no blasts exceeded the 50mm/s, however there were three blasts that recorded results between 30mm/s and 50mm/s.

During the reporting period Drayton supplied overburden material for further upgrade works to the Liddell Ash Dam levees. Drayton also conducted works that included both extending and raising the western levee using selected inert overburden material. The extension works are being conducted under Development Application 1/2011 from Muswellbrook Shire Council. The current Drayton MOP includes the hauling of 2 Mbcm to Macquarie Generation for the ‘containment of ash disposal’.

7.3.2 Access Road Dam

The Drayton Access Road (2081) Dam is also a DSC prescribed dam. This dam is a 13 metre high significant consequence category dam. A Type 3 surveillance inspection is conducted every five years and results reported to the DSC. The last Type 3 surveillance report for this dam was submitted to the DSC in September 2010. The next report is due in June 2015. The dam is inspected weekly and no issues were found during the reporting period.

APPENDICES

Appendix A: Consents, Leases and Licenses

Table 48: Drayton's Consents, Leases and Licenses

Consents, Leases and Licences	Date of Issue	Date of Expiry	Approval Authority
Licence / Approval Title			
DUAP Conditions re Antiene Rail Spur Development	02/11/2000	02/11/2025	Minister for Planning
PA – Drayton Mine Extension (06_0202)	01/02/2008		Minister for Planning
Modification to Drayton Mine Extension	16/10/2009		Minister for Planning
Modification 2 to Drayton Mine Extension	17/02/2012		Minister for Planning
Lease Conditions			
Exchange of Parts of Coal Lease 229 & Coal Lease 744	25/06/1992		Minister for Mineral Resources and Energy
Coal Lease 395	08/03/2007	Jan 2029	Minister for Mineral Resources and Energy
Renewal of Authorisation 173	12/05/2014		Minister for Mineral Resources and Energy
Mining Operation Plan	01/08/2012	31/12/2017	Division of Resources and Energy (DRE)
Mining Operation Plan - Amendment A	15/04/2013	30/04/2015	Division of Resources and Energy (DRE)
Mining Operation Plan - Amendment B	11/10/2013	2017	Division of Resources and Energy (DRE)
Mining Operation Plan - Amendment C	9/10/2014	30/10/2015	Division of Resources and Energy (DRE)
Coal Lease 229	28/05/2003	May 2024	Minister for Mineral Resources and Energy
Mining Lease ML 1531	26/02/2003	Feb 2024	Minister for Mineral Resources and Energy
Ministerial Approval of an Emplacement Area	22/09/2004		Minister for Mineral Resources and Energy
Anglo Sub Lease	29/01/2008		Minister for Mineral Resources and Energy
Ministerial Approval of an Emplacement Area	28/10/2011		Minister for Mineral Resources and Energy
Current Licence Conditions			
Environmental Protection Licence 1323	26/02/2013		NSW Environmental Protection Authority
Bore Licence 20BL111869	23/04/2000	23/04/2015	NSW Office of Water
Bore Licence 20BL122620	24/05/1997	23/05/2017	NSW Office of Water
Bore Licence 20BL171956	27/08/2008	Perpetuity	NSW Office of Water
Bore Licence 20BL171957	27/08/2008	Perpetuity	NSW Office of Water

Consents, Leases and Licences	Date of Issue	Date of Expiry	Approval Authority
Bore Licence 20BL171958	22/02/2015	(pending)	NSW Office of Water
Bore Licence 20BL171955	27/08/2008	Perpetuity	NSW Office of Water
Bore Licence 20BL171954	27/08/2008	Perpetuity	NSW Office of Water
Bore Licence 20BL171953	27/08/2008	Perpetuity	NSW Office of Water
Licence to Store Explosives (XSTR100017)	22/11/2011	08/05/2016	Work Cover NSW
Radiation Management License (RML31157)	18/06/2014	18/06/2015	EPA
Acknowledgement of Notification of Dangerous Goods on Premesis (NDG019387)	04/03/2014	Perpetuity	Work Cover NSW
Hunter River Salinity Trading Scheme (Credit purchase arrangement)	Nov 1998	No current credits	Department Environment & Climate Change (EPA)
Other Agreements			
NPWS Wildlife Refuge	1987		National Parks and Wildlife
Bayswater/Drayton Boundary Licence No 5	02/02/1999		
Licence Agreement for Liddell – Macquarie Generation Water Bores	14/10/1986		Electricity Commission NSW
Agreement to Access & Occupy Property (Water Bores)	04/06/2001		AGL - Macquarie
Agreement to Access & Occupy Property (Far East Tip)	04/06/2001		AGL - Macquarie
Licence Agreement with Muswellbrook Pistol Club	Aug 2001		Drayton Coal Pty Ltd

Appendix B: 2014 Water Sampling Results

Table 49: 2014 Surface Water Results

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
1609	Jan	7820	8.3	6200	5	565	644	750	3840	125	682	98
	Feb	7580	8.3	6580	14	577	622	715	3760	106	694	91
	Mar	6810	8.4	5900	5	510	571	706	3570	88	712	57
	Apr	7590	8.3	7290	5	539	556	719	3530	105	677	73
	May	7490	8.1	7280	10	579	584	755	4010	114	679	81
	Jun	7480	8.1	6150	69	482	565	699	3950	114	646	81
	Jul	7660	8.1	6380	5	554	596	699	3790	138	649	91
	Aug	7560	8.2	6590	5	519	548	705	3630	147	609	92
	Sep	7370	8.3	6260	5	536	568	782	3770	146	670	69
	Oct	7680	8.3	6040	7	520	571	817	3560	138	604	96
	Nov	7830	8.2	7570	5	554	643	770	3950	132	727	77
	Dec	7720	8.3	7260	7	565	606	777	4020	151	644	80
	Average	7549	8.3	6625	12	542	590	741	3782	125	666	82
1969	Jan	6690	8.1	5760	24	417	470	701	2830	183	720	58
	Feb	6280	8.0	4740	6	420	463	671	2500	183	655	66
	Mar	4750	8.1	3690	10	326	332	514	2070	151	439	44

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
	Apr	5120	8.2	3690	5	347	342	500	2380	175	470	45
	May	5820	8.1	4690	7	426	421	621	2770	261	598	54
	Jun	5890	8.2	4620	29	370	409	605	2780	250	524	53
	Jul	6040	8.2	3970	7	397	428	592	2670	235	551	55
	Aug	5990	8.3	4920	16	399	405	592	2410	248	542	53
	Sep	6050	8.2	4330	5	419	409	663	2960	306	610	40
	Oct	6420	7.7	4360	11	435	428	727	2620	294	572	54
	Nov	6640	8.0	5920	5	463	461	675	3140	238	698	46
	Dec	6100	8.24	5640	8	461	410	622	2860	273	579	46
	Average	5983	8.1	4694	11	407	415	624	2666	233	580	51
2109	Jan	2630	7.7	1670	8	82	92	371	713	80	343	9
	Feb	1950	7.2	1300	14	70	68	263	530	26	258	7
	Mar	*Unable to sample due to lack of safe access*										
	Apr	846	6.8	595	20	32	27	112	217	17	92	5
	May	1900	7.2	1150	18	63	63	268	482	45	278	8
	Jun	*Dam dry, no sample taken*										
	Jul	2610	7.21	1410	5	80	93	371	751	31	352	7
	Aug	2600	7.28	1680	7	75	89	382	668	32	368	7
	Sep	3810	7.33	2310	5	102	138	633	1270	56	609	6

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
	Oct	5710	7.51	3420	9	136	210	921	1520	87	784	12
	Nov	8000	7.77	6130	5	218	329	1160	2640	101	1410	13
	Dec	2400	7.25	1410	20	79	85	360	692	32	339	6
	Average	3246	7.3	2108	11	94	119	484	948	51	483	8
2114	Jan	7680	8.2	7190	13	535	599	758	3750	157	695	98
	Feb	4920	8.0	3780	14	354	379	749	2170	86	444	51
	Mar	2980	8.1	2270	17	189	182	294	1300	82	310	26
	Apr	6410	8.0	5490	5	473	473	582	3260	189	586	60
	May	6830	8.1	6380	22	542	537	697	3290	177	644	73
	Jun	6890	8.1	5790	5	464	496	664	3510	187	640	70
	Jul	6300	8.1	5590	24	452	473	590	3240	166	531	64
	Aug	6000	8.2	4590	5	406	424	552	2820	161	520	62
	Sep	6230	8.1	4790	8	436	452	684	3130	150	586	49
	Oct	7190	8.1	5150	5	463	503	798	3210	148	607	77
	Nov	7390	8.1	5670	18	502	574	741	3500	117	717	68
	Dec	5100	8.18	4260	15	354	370	542	2380	113	474	42
	Average	6160	8.1	5079	13	431	455	638	2963	144	563	62
2221	Jan	1750	7.9	1050	5	51	53	259	302	157	216	13

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
	Feb	1720	7.8	1030	13	50	55	243	305	169	240	17
	Mar	1530	8.2	936	6	46	50	237	292	145	200	13
	Apr	1050	7.4	601	5	30	30	150	213	81	136	9
	May	1070	7.5	606	5	36	34	146	227	92	152	9
	Jun	1100	7.8	588	5	32	32	158	219	92	144	6
	Jul	1100	7.7	590	5	31	34	154	221	89	140	8
	Aug	1100	7.7	594	5	29	33	147	206	83	149	8
	Sep	1120	8.0	652	5	27	33	165	259	82	152	5
	Oct	1210	7.9	574	5	22	36	186	214	78	151	6
	Nov	1370	8.1	781	5	30	43	205	251	116	212	7
	Dec	1340	8.26	812	5	37	46	199	220	152	196	8
	Average	1288	7.9	735	6	35	40	187	244	111	174	9
1895	Jan	5940	8.7	3790	5	50	324	738	1620	483	870	27
	Feb	5840	8.6	4020	5	51	350	718	1630	500	970	33
	Mar	5080	8.7	3300	5	48	291	649	1430	460	891	24
	Apr	5470	8.6	3420	5	53	294	674	1260	559	787	28
	May	5530	8.5	3480	5	65	323	697	1590	632	816	32
	Jun	5590	8.4	3620	5	69	297	652	1610	632	893	23
	Jul	5830	8.4	3770	5	72	329	688	1680	615	882	29

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
	Aug	5760	8.4	3790	5	73	310	679	1600	650	881	27
	Sep	5600	8.6	3490	5	70	304	753	1780	588	925	20
	Oct	5930	8.8	3530	6	45	318	810	1470	467	826	26
	Nov	6180	9.0	3040	5	32	356	793	1830	345	1090	21
	Dec	6010	9.2	5050	18	32	361	793	1820	268	985	22
	Average	5730	8.7	3692	6	55	321	720	1610	517	901	26
2081	Jan	7420	8.1	7100	6	517	584	735	3640	149	654	103
	Feb	7030	8.0	6170	10	480	583	680	3530	123	683	82
	Mar	6220	8.2	5090	8	457	488	669	3100	133	672	50
	Apr	6750	8.0	6040	5	477	514	637	3450	160	593	72
	May	3850	8.0	6360	21	485	505	674	3410	186	614	77
	Jun	6860	8.2	5890	5	480	521	670	3360	178	621	80
	Jul	7230	8.1	5520	5	530	537	673	3550	192	604	84
	Aug	6920	8.3	5740	5	485	518	650	3220	186	585	86
	Sep	6580	8.2	4940	7	456	496	706	3380	158	614	55
	Oct	6860	8.1	5120	5	417	478	755	2990	136	540	70
	Nov	7250	8.0	6410	5	490	565	728	3810	122	691	67
	Dec	6880	8.0	7580	11	510	554	708	3360	172	648	66
	Average	6904	8.1	5997	8	482	529	690	3400	158	627	74

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
SW 13	Jan	7530	8.1	7180	5	562	568	676	3760	212	696	85
	Feb	7080	8.1	6530	5	512	558	618	3490	208	736	64
	Mar	6420	8.2	6020	5	518	498	630	3290	213	753	51
	Apr	6920	8.1	6110	5	532	508	598	3650	250	645	64
	May	6910	8.0	6340	8	577	513	646	3550	262	686	61
	Jun	7140	7.9	6310	6	517	538	597	3730	266	686	64
	Jul	7320	8.0	6300	25	551	536	620	3580	258	660	64
	Aug	7280	7.9	4900	5	518	536	613	3480	270	621	61
	Sep	*Unable to gain access, no sample taken*										
	Oct	*Unable to gain access, no sample taken*										
	Nov	7430	8.1	5790	5	547	572	665	3760	229	742	53
	Dec	7040	8.2	7320	6	540	523	618	3560	250	652	54
	Average	7107	8.0	6280	8	537	535	628	3585	242	688	62

Oil Pollution Control Dam	Jan	8400	8.0	7650	91	553	646	886	3750	434	808	102
	Feb	3130	7.1	2190	28	228	198	295	1290	183	655	66
	Mar	2120	7.4	1680	16	141	113	216	790	68	217	15
	Apr	4340	7.7	2850	39	301	280	398	1970	246	354	41

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
	May	6710	7.5	6350	76	500	513	677	3290	310	654	68
	Jun	7000	7.9	5790	89	456	501	665	3410	294	691	82
	Jul	5830	7.5	5170	27	409	437	540	2640	173	491	61
	Aug	5450	7.5	4290	28	358	363	490	2290	180	455	50
	Sep	5540	8.2	4540	106	378	387	597	2740	164	530	42
	Oct	7250	8.1	6520	96	456	508	816	3200	212	627	79
	Nov	7490	8.2	6930	142	492	579	752	3730	180	783	70
	Dec	2730	7.86	2150	36	197	159	255	1100	99	230	20
	Average	5499	7.7	4676	65	372	390	549	2517	212	541	58
ES Void	Jan											
	Feb											
	Mar											
	Apr											
	May	7580	8.0	6910	28	534	582	734	4200	207	580	76
	Jun	7110	7.9	6140	88	534	539	657	3480	260	638	98
	Jul											
	Aug											
	Sep											

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
	Oct											
	Nov											
	Dec	7000	7.91	5360	34	556	520	682	3430	294	586	74
	Average	7230	7.9	6137	50	541	547	691	3703	254	601	83

Table 50: 2014 Piezometer Results

Drill Number	Date	Water Level (m)	pH	Electrical Conductivity	Salinity	Total Dissolved Solids
F1024	January	177.42		*Bore dry – unable to sample*		
	February	177.42		*Bore dry – unable to sample*		
	March	178.67		*Bore dry – unable to sample*		
	April	178.77		*Bore dry – unable to sample*		
	May	177.75		*Bore dry – unable to sample*		
	June	178.68		*Bore dry – unable to sample*		
	July	178.10		*Bore dry – unable to sample*		
	August	178.10		*Bore dry – unable to sample*		
	September	178.10		*Bore dry – unable to sample*		
	October	178.70		*Bore dry – unable to sample*		
	November	178.70		*Bore dry – unable to sample*		
	December	178.65		*Bore dry – unable to sample*		
	Average	179.07		*Bore dry – unable to sample*		
F1162	Jan – Oct			*Too deep – unable to sample*		
	November	115.60				
	December			*Too deep – unable to sample*		
	Average	115.60				
F1163	January	177.00	6.82	1050	487	735
	February	177.45		*Insufficient water to sample*		
	March	177.40	6.79	1490	732	1042
	April	177.46	6.94	1229	525	765
	May	177.39	7.12	1226	598	854
	June	177.27		*Insufficient water to sample*		
	July	177.31		*Insufficient water to sample*		
	August	177.38	6.52	1156	578	814
	September	177.39		*Insufficient water to sample*		
	October	177.42	6.76	1077	521	755
	November	177.45	7.27	1652	818	1148
	December	177.41	6.99	1044	513	743
	Average	177.40	6.91	1878	1031	2564

Drill Number	Date	Water Level (m)	pH	Electrical Conductivity	Salinity	Total Dissolved Solids
F1164	Jan – Oct			*Too deep – unable to sample*		
	November	101.40				
	December			*Too deep – unable to sample*		
	Average	101.40				
F1167	January	168.06	6.58	986	479	702
	February	167.61	6.89	573	271	417
	March	167.39	6.44	1086	533	799
	April	167.95	6.06	558	258	428
	May	168.26	6.54	926	430	653
	June	167.64	6.69	753	362	530
	July	167.29	6.52	728	341	502
	August	167.17	6.49	709	324	491
	September	166.64	6.18	689	315	480
	October	166.68	6.06	695	341	487
	November	166.03	5.78	759	363	533
	December	165.46	5.65	150.5	82.3	142
	Average	167.18	6.32	718	342	514
F1168	January	162.14	7.02	3500	210	2450
	February	163.86	7.38	5310	2850	3700
	March	161.63	6.98	5440	2890	3800
	April	161.95	7.09	5540	2980	3840
	May	161.92	6.91	5030	2720	3540
	June	161.70	6.94	5110	2750	3550
	July	161.53	6.86	5090	2760	3480
	August	161.46	7.08	5450	2860	3670
	September	161.50	7.07	5450	2870	3660
	October	161.25	6.96	5170	2800	3660
	November	160.85	7.01	5390	2880	3750
	December	161.30	6.85	5240	2730	3620
	Average	165.02	7.01	5143	2608	3560
R4241	January	176.45	6.88	3500	1860	2450
	February	175.42	7.24	5390	2990	3750

Drill Number	Date	Water Level (m)	pH	Electrical Conductivity	Salinity	Total Dissolved Solids
	March	173.30	6.75	5680	3120	3970
	April	174.66	6.88	5820	3050	3890
	May	173.81	6.73	5890	3130	4070
	June	173.15	6.54	5780	3070	4010
	July	172.82	6.74	5580	3000	3820
	August	172.61	6.69	5410	2871	3750
	September	172.56	7.03	4950	2590	3540
	October	167.15	6.96	5160	2730	3590
	November	171.91	7.07	5120	2730	3570
	December	171.79	6.94	4920	2670	3410
	Average	172.97	6.87	5267	2818	3652

W1102	January	178.13	6.93	1914	1380	1480
	February	178.10	7.41	7650	4380	5610
	March	178.22	6.76	8660	4830	5990
	April	178.53	6.96	8130	5670	5660
	May	178.51	7.00	8710	4780	6080
	June	178.41	6.68	8390	4610	5880
	July	178.28	6.86	8270	4580	5810
	August	178.45	6.98	8270	4480	5740
	September	178.57	6.91	8420	4580	5850
	October	178.34	6.94	7920	4590	5780
	November	179.20	6.93	8130	4540	5760
	December	178.34	6.99	7930	4330	5500
	Average	177.10	6.95	7700	4396	5428

Appendix C: 2014 Dust Sampling Results

Table 51: Depositional Dust Gauge Results

Site Number	Period	Ash Content (g/m².month)	Combustible Matter (g/m².month)	Total Insoluble Matter (g/m².month)	Total Solids (g/m².month)	Comments
2130	January	1.8	0.7	2.5	3.1	Dust and leaf matter present.
	February	3.1	1.1	4.2	5.9	Dust present
	March	1.6	1.0	2.6	4.3	Dust, insects and leaf matter present.
	April	1.1	0.6	1.7	2.9	Dust and insects present.
	May	0.6	1.1	1.7	1.8	Insects and leaf matter present.
	June	0.9	0.5	1.4	4.2	Dust, insects and leaf matter present.
	July	0.9	0.3	1.2	1.3	Dust and insects present.
	August	1.2	0.6	2.2	3.0	Dust present.
	September	1.5	0.7	2.2	2.7	Dust and insects present.
	October	1.8	0.8	2.6	2.7	Dust and insects present.
	November	3.0	1.4	4.4	4.6	Dust, insects and leaf matter present.
	December	1.2	0.4	2.2	2.5	No comment recorded.
	Average	1.56	0.76	2.41	3.25	
2157	January	1.3	0.3	1.6	2.2	Dust, algae, leaves and mould present.
	February	2.5	0.8	3.3	3.5	Dust and insects present.
	March	1.7	1.0	2.7	3.0	Dust and insects present.
	April	1.4	0.4	1.8	3.7	Dust and insects present, dust gauge full.
	May	0.6	0.9	1.5	1.8	Leaf matter present.

Site Number	Period	Ash Content (g/m².month)	Combustible Matter (g/m².month)	Total Insoluble Matter (g/m².month)	Total Solids (g/m².month)	Comments
	June	1.0	0.6	1.6	4.1	Dust and insects present.
	July	1.0	0.5	1.5	1.9	Dust and insects present.
	August	1.4	0.6	2.0	2.0	Dust present.
	September	1.1	0.7	1.8	2.3	Dust and leaf matter present.
	October	1.3	0.7	2.0	2.3	Dust, leaf matter and dead spider present.
	November	2.3	0.9	3.2	4.0	Leaf matter present.
	December	1.5	0.5	2.0	2.3	No comment recorded.
	Average	1.43	0.66	2.08	2.76	
2175	January	1.2	0.3	1.5	2.4	Dust and insects present.
	February	2.3	0.9	3.2	4.5	Dust and insects present.
	March	1.6	0.2	1.8	3.4	Dust present.
	April	0.8	0.4	1.2	4.2	Dust and insects present.
	May	0.9	0.9	1.8	1.8	Dust and insects present.
	June	1.2	0.5	1.7	4.5	Dust present.
	July	0.8	0.3	1.1	1.4	Dust and insects present.
	August	1.2	0.6	1.8	2.0	Dust present.
	September	1.3	0.6	1.9	2.5	Dust and insects.
	October	2.0	1.3	3.3	3.4	Dust and insects present.
	November	2.5	1.0	3.5	4.0	Insects present.
	December	1.4	0.8	2.2	3.7	No comment recorded.
	Average	1.43	0.65	2.08	3.15	

Site Number	Period	Ash Content (g/m².month)	Combustible Matter (g/m².month)	Total Insoluble Matter (g/m².month)	Total Solids (g/m².month)	Comments
2197	January	2.3	0.9	3.2	3.8	Dust and insects present.
	February	4.2	2.0	6.2	7.3	Dust and insects present.
	March	1.8	1.2	3.0	5.0	Dust and insects present.
	April	1.3	0.5	1.8	2.9	Dust and insects present, dust gauge full.
	May	0.6	0.8	1.4	1.8	Dirt and algae present.
	June	1.2	0.4	1.6	1.7	Dust, insects, algae and leaf matter present.
	July	1.5	0.7	2.2	3.0	Dust, dirt and insects present.
	August	2.4	1.2	3.6	3.6	Dust, insects and moths present.
	September	1.5	0.8	2.3	2.8	Dust and insects present.
	October	2.1	1.4	3.5	4.2	Dust, insects, leaf matter and bird poo present.
	November	3.8	2.0	5.8	6.5	Insects present.
	December	2.2	0.6	2.8	3.2	No comment recorded.
	Average	2.08	1.04	3.12	3.82	

2208	January	1.6	0.3	1.9	2.5	Dust, insects and leaf present, ***funnel damaged***
	February	2.2	1.0	3.2	4.6	Dust present.
	March	15.2	5.7	20.9	27.3	Dirt and algae at bottle, insects present.
	April	1.2	0.7	1.9	3.9	Dust and insects present, dust gauge full.
	May	0.9	0.8	1.7	1.9	Dust, dirt and insects present.
	June	1.0	0.5	1.5	3.9	Dust and insects present.
	July	0.9	0.3	1.2	1.4	Dust present.
	August	1.3	0.6	1.9	2.3	Dust present.
	September	1.3	0.5	1.8	2.1	Dust present.

Site Number	Period	Ash Content (g/m².month)	Combustible Matter (g/m².month)	Total Insoluble Matter (g/m².month)	Total Solids (g/m².month)	Comments
	October	1.4	0.5	1.9	1.9	Dust and insects present.
	November	2.5	1.0	3.5	3.8	Insects present.
	December	1.2	0.1	1.2	3.7	No comment recorded.
	Average	2.56	1.0	3.55	4.94	
2230	January	1.8	0.6	2.4	2.9	Dust, insects and leaf present
	February	3.0	1.1	4.1	4.2	Dust and insects present.
	March	1.7	1.0	2.7	3.1	Dust and insects present.
	April	1.2	0.2	1.4	3.1	Dust and insects present, dust gauge full.
	May	0.7	1.0	1.7	2.0	Dust and insects present.
	June	1.1	0.4	1.5	1.5	Dust and spider present.
	July	1.0	0.4	1.4	3.4	Dust and insects present.
	August	1.4	0.7	2.1	2.2	Dust and large dead spider present.
	September	1.9	1.8	3.7	4.2	Dust, dead spider and leaf matter present.
	October	1.9	0.9	2.8	3.1	Dust and insects present.
	November	2.4	1.0	3.4	4.4	Dead spider and leaf matter present.
	December	1.7	0.6	2.3	3.9	No comment recorded.
	Average	1.65	0.81	2.46	3.17	
2235	January	1.4	0.5	1.9	2.5	Dust and ants present.
	February	2.2	0.9	3.1	3.5	Dust, fly and leaf present.
	March	1.7	0.2	1.9	2.0	Dust present.
	April	1.0	0.5	1.5	4.7	Dust and insects present.

Site Number	Period	Ash Content (g/m².month)	Combustible Matter (g/m².month)	Total Insoluble Matter (g/m².month)	Total Solids (g/m².month)	Comments
	May	0.9	1.1	2.0	2.1	Dust, insects and a spider present.
	June	1.4	0.6	2.0	4.6	Dust and insects present.
	July	1.0	0.3	1.3	1.6	Dust and a fly present.
	August	1.3	0.5	1.8	1.9	Dust present.
	September	1.3	0.6	1.9	2.3	Dust present.
	October	1.8	0.6	2.4	2.7	Dust and insects present.
	November	2.7	1.5	4.2	6.0	Insects present.
	December	1.2	0.4	1.6	1.7	No comment recorded.
	Average	1.49	0.64	2.13	2.97	

2247	January	1.5	0.4	1.9	3.8	Dust, insects and leaves present.
	February	2.1	0.9	3.0	4.3	Dust and insects present.
	March	2.8	<0.1	2.8	3.9	Dust present.
	April	1.0	0.6	1.6	4.5	Dust, large dead spider.
	May	0.8	0.8	1.6	1.8	Dust, insects and algae present.
	June	1.3	0.6	1.9	4.3	Dust and a spider present.
	July	0.9	0.2	1.1	1.3	Dust, insects and algae present.
	August	1.2	0.3	1.5	1.7	Dust and seed matter present.
	September	1.5	0.4	1.9	2.2	Dust present.
	October	1.9	0.6	2.5	3.1	Dust, leaf matter and dead spider present.
	November	2.7	1.0	3.7	4.3	Insects present.
	December	1.2	0.4	1.6	3.9	No comment recorded.
	Average	1.58	0.53	2.09	3.26	

Table 52: TEOM Real Time PM10 Monitoring Results

January	PM10 24Hr Av µg/m³
1/01/2014	28.5
2/01/2014	28.2
3/01/2014	38.2
4/01/2014	31.9
5/01/2014	28.5
6/01/2014	28.5
7/01/2014	31.0
8/01/2014	31.0
9/01/2014	19.8
10/01/2014	15.2
11/01/2014	18.3
12/01/2014	32.4
13/01/2014	28.0
14/01/2014	29.8
15/01/2014	31.5
16/01/2014	33.5
17/01/2014	35.6
18/01/2014	24.9
19/01/2014	23.5
20/01/2014	29.2
21/01/2014	29.7
22/01/2014	22.2
23/01/2014	18.3
24/01/2014	16.9
25/01/2014	12.6
26/01/2014	18
27/01/2014	20
28/01/2014	21
29/01/2014	23.3
30/01/2014	26.2
31/01/2014	25

February	PM10 24Hr Av µg/m³
1/02/2014	33.1
2/02/2014	30.9
3/02/2014	24.5
4/02/2014	36.5
5/02/2014	27.8
6/02/2014	16.8
7/02/2014	21.3
8/02/2014	23.7
9/02/2014	20.5
10/02/2014	33
11/02/2014	34.1
12/02/2014	24.9
13/02/2014	32.2
14/02/2014	8.3
15/02/2014	15
16/02/2014	19.1
17/02/2014	9.7
18/02/2014	19.5
19/02/2014	22.3
20/02/2014	7.2
21/02/2014	22.2
22/02/2014	25.2
23/02/2014	25.1
24/02/2014	15.6
25/02/2014	13.4
26/02/2014	20.5
27/02/2014	27.6
28/02/2014	15.1

March	PM10 24Hr Av µg/m³
1/03/2014	6.6
2/03/2014	7.5
3/03/2014	10.2
4/03/2014	8.7
5/03/2014	9.7
6/03/2014	14
7/03/2014	24.1
8/03/2014	18.2
9/03/2014	10.5
10/03/2014	16.6
11/03/2014	16.3
12/03/2014	13.5
13/03/2014	23.7
14/03/2014	15
15/03/2014	3.5
16/03/2014	9.9
17/03/2014	9.9
18/03/2014	11
19/03/2014	25.4
20/03/2014	24
21/03/2014	17.2
22/03/2014	10.6
23/03/2014	21.4
24/03/2014	20.9
25/03/2014	12.1
26/03/2014	13.6
27/03/2014	6.6
28/03/2014	6
29/03/2014	5.1
30/03/2014	11.5
31/03/2014	14.7

April	PM10 24Hr Av µg/m³
1/04/2014	16
2/04/2014	18.5
3/04/2014	18.5
4/04/2014	16.3
5/04/2014	9.5
6/04/2014	7.8
7/04/2014	7.1
8/04/2014	13.7
9/04/2014	15.9
10/04/2014	17.3
11/04/2014	19.4
12/04/2014	6.9
13/04/2014	8.7
14/04/2014	12.6
15/04/2014	10.8
16/04/2014	10.4
17/04/2014	13.3
18/04/2014	12.1
19/04/2014	15
20/04/2014	15.4
21/04/2014	10.9
22/04/2014	17
23/04/2014	19.9
24/04/2014	23.6
25/04/2014	8.7
26/04/2014	5.9
27/04/2014	19.1
28/04/2014	12.1
29/04/2014	8.4
30/04/2014	14*

**Routine maintenance was conducted on the TEOM on this date and the value was 53139.3, which was due to the filters being removed and the unit being calibrated by CBE. The UHAQMN value has been substituted to maintain consistency in the data averages.*

May	PM10 24Hr Av µg/m³
1/05/2014	3.7
2/05/2014	13.2
3/05/2014	8.9
4/05/2014	5.8
5/05/2014	6.7
6/05/2014	5.2
7/05/2014	12.4
8/05/2014	19.6
9/05/2014	19.1
10/05/2014	15
11/05/2014	16
12/05/2014	10.7
13/05/2014	17.3
14/05/2014	15.9
15/05/2014	12.6
16/05/2014	8.7
17/05/2014	9.4
18/05/2014	12
19/05/2014	14.3
20/05/2014	14
21/05/2014	12.8
22/05/2014	17.9
23/05/2014	13.9
24/05/2014	11.5
25/05/2014	14.1
26/05/2014	18.5
27/05/2014	17.6
28/05/2014	13.8
29/05/2014	14.2
30/05/2014	13.7
31/05/2014	13.3

June	PM10 24Hr Av µg/m³
1/06/2014	13
2/06/2014	7.6
3/06/2014	5
4/06/2014	5.1
5/06/2014	10.5
6/06/2014	11
7/06/2014	10.7
8/06/2014	12.1
9/06/2014	13.8
10/06/2014	11.5
11/06/2014	9.9
12/06/2014	12.9
13/06/2014	13.4
14/06/2014	17.9
15/06/2014	4.3
16/06/2014	6.7
17/06/2014	4.8
18/06/2014	6.9
19/06/2014	8.7
20/06/2014	11.3
21/06/2014	8.8
22/06/2014	12.9
23/06/2014	11.3
24/06/2014	8.6
25/06/2014	7.6
26/06/2014	12.5*
27/06/2014	3.7
28/06/2014	8.1
29/06/2014	7.1
30/06/2014	5.7

**Routine maintenance was conducted on the TEOM on this date and the value was 53139.3, which was due to the filters being removed and the unit being calibrated by CBE. The UHAQMN value has been substituted to maintain consistency in the data averages.*

July	PM10 24Hr Av µg/m³
1/07/2014	3.7
2/07/2014	2.7
3/07/2014	9.9
4/07/2014	12.6
5/07/2014	11.1
6/07/2014	7.9
7/07/2014	3.2
8/07/2014	2.1
9/07/2014	6.2
10/07/2014	14.8
11/07/2014	6.8
12/07/2014	5.8
13/07/2014	11.4
14/07/2014	21.3
15/07/2014	26.7
16/07/2014	23.6
17/07/2014	5.1
18/07/2014	4.2
19/07/2014	7.2
20/07/2014	15.6
21/07/2014	20.1
22/07/2014	2.7
23/07/2014	7.4
24/07/2014	11.3
25/07/2014	19.9
26/07/2014	7.8
27/07/2014	2.1
28/07/2014	1.6
29/07/2014	3.9
30/07/2014	5.6
31/07/2014	6.4

August	PM10 24Hr Av µg/m³
1/08/2014	7.3
2/08/2014	9.8
3/08/2014	13.2
4/08/2014	19.6
5/08/2014	19.7
6/08/2014	17.4
7/08/2014	12.4
8/08/2014	22.8
9/08/2014	15.3
10/08/2014	11.5
11/08/2014	11.0
12/08/2014	22.2
13/08/2014	19.0
14/08/2014	9.1
15/08/2014	15.7
16/08/2014	16.6
17/08/2014	5.6
18/08/2014	2.5
19/08/2014	3.7
20/08/2014	8.6
21/08/2014	13.7
22/08/2014	7.6
23/08/2014	11.8
24/08/2014	11.2
25/08/2014	13.1
26/08/2014	12.7
27/08/2014	6.1
28/08/2014	7.2
29/08/2014	9.1
30/08/2014	9.3
31/08/2014	9.3

September	PM10 24Hr Av µg/m³
1/09/2014	9.7
2/09/2014	5.8
3/09/2014	5.1
4/09/2014	9.9
5/09/2014	13.2
6/09/2014	11.5
7/09/2014	11.4
8/09/2014	10.1
9/09/2014	8.0
10/09/2014	7.2
11/09/2014	9.9
12/09/2014	17.8
13/09/2014	18.8
14/09/2014	14.1
15/09/2014	22.3
16/09/2014	21.1
17/09/2014	15.5
18/09/2014	10.7
19/09/2014	12.4
20/09/2014	11.4
21/09/2014	22.0
22/09/2014	17.8
23/09/2014	19.9
24/09/2014	19.0
25/09/2014	15.5
26/09/2014	6.3
27/09/2014	15.9
28/09/2014	13.6
29/09/2014	8.3
30/09/2014	11.1

October	PM10 24Hr Av µg/m³
1/10/2014	14.7
2/10/2014	23.5
3/10/2014	19.1
4/10/2014	25.9
5/10/2014	20.2
6/10/2014	21.8
7/10/2014	25.3
8/10/2014	28.4
9/10/2014	18.0
10/10/2014	17.5
11/10/2014	22.5
12/10/2014	27.4
13/10/2014	34.5
14/10/2014	13.8
15/10/2014	7.6
16/10/2014	6.5
17/10/2014	20.2
18/10/2014	17.1
19/10/2014	14.5
20/10/2014	6.3
21/10/2014	18.4*
22/10/2014	15.3
23/10/2014	22.5
24/10/2014	24.8
25/10/2014	21.3
26/10/2014	18.4
27/10/2014	28.6
28/10/2014	23.4
29/10/2014	24.8
30/10/2014	23.0
31/10/2014	24.9

**Routine maintenance was conducted on the TEOM on this date and the value was -1.9, which was due to the filters being removed and the unit being calibrated by CBE. The UHAQMN value has been substituted to maintain consistency in the data averages.*

November	PM10 24Hr Av µg/m³
1/11/2014	22.90
2/11/2014	11.11
3/11/2014	45.31*
4/11/2014	48.32*
5/11/2014	19.68
6/11/2014	16.66
7/11/2014	25.93
8/11/2014	19.03
9/11/2014	29.83
10/11/2014	41.5^
11/11/2014	20.57
12/11/2014	25.45
13/11/2014	27.18
14/11/2014	24.36
15/11/2014	46.62
16/11/2014	21.50
17/11/2014	15.53
18/11/2014	27.86
19/11/2014	28.94
20/11/2014	15.27
21/11/2014	30.31
22/11/2014	36.24
23/11/2014	34.3
24/11/2014	29.0
25/11/2014	18.6
26/11/2014	27.91
27/11/2014	21.19
28/11/2014	18.62
29/11/2014	22.86
30/11/2014	21.54

December	PM10 24Hr Av µg/m³
1/12/2014	11.36
2/12/2014	13.77
3/12/2014	42.09
4/12/2014	11.82
5/12/2014	9.26
6/12/2014	8.56
7/12/2014	4.26
8/12/2014	17.13
9/12/2014	27.03
10/12/2014	17.91
11/12/2014	4.75
12/12/2014	11.29
13/12/2014	9.82
14/12/2014	19.98
15/12/2014	19.44
16/12/2014	19.51
17/12/2014	37.51
18/12/2014	27.67
19/12/2014	23.45
20/12/2014	16.22
21/12/2014	16.90
22/12/2014	14.63
23/12/2014	11.61
24/12/2014	14.16
25/12/2014	11.24
26/12/2014	5.41
27/12/2014	16.77
28/12/2014	5.79
29/12/2014	2.92
30/12/2014	21.95
31/12/2014	32.37

** Multiple bushfire/grassfires in the Hunter Valley region (NSW RFS website) contributing to the high values.*
^ Routine maintenance was conducted on the TEOM to change out filter with a value of 0.00, the UHAQMN value has been substituted to maintain consistency in the data averages.
** Power outage due to excessive temperatures (>40 degrees) over weekend, TEOM rebooted following Tuesday after identifying issues. The UHAQMN value has been substituted to maintain consistency in the data averages.*

Table 53: High Volume Air Sampler Results

Lot 22	
Start Date	Particulate Matter µg/m³
04-Jan-14	149.80
10-Jan-14	142.40
16-Jan-14	139.00
22-Jan-14	55.00
28-Jan-14	123.00
03-Feb-14	250.80
09-Feb-14	162.30
15-Feb-14	93.30
21-Feb-14	134.30
27-Feb-14	139.10
05-Mar-14	77.20
11-Mar-14	92.10
17-Mar-14	63.40
23-Mar-14	110.10
29-Mar-14	24.70
04-Apr-14	44.40
10-Apr-14	82.50
16-Apr-14	71.10
22-Apr-14	88.10
28-Apr-14	58.40
04-May-14	46.20
10-May-14	91.40
16-May-14	43.90
22-May-14	64.20
28-May-14	80.60
03-Jun-14	43.60
09-Jun-14	66.40
15-Jun-14	54.50
21-Jun-14	46.80
27-Jun-14	41.00
03-Jun-14	34.60

Lot 22	
Start Date	Particulate Matter µg/m³
09-Jul-14	80.40
15-Jul-14	54.50
21-Jul-14	46.80
27-Jul-14	41.00
02-Aug-14	34.60
08-Aug-14	80.40
14-Aug-14	133.70
20-Aug-14	98.00
26-Aug-14	23.10
01-Sep-14	49.80
07-Sep-14	91.40
13-Sep-14	84.90
19-Sep-14	94.00
25-Sep-14	78.40
01-Oct-14	35.60
07-Oct-14	68.60
13-Oct-14	114.40
19-Oct-14	63.00
25-Oct-14	37.80
31-Oct-14	115.20
06-Nov-14	137.20
12-Nov-14	138.80
18-Nov-14	112.00
24-Nov-14	64.90
30-Nov-14	126.40
06-Dec-14	66.80
12-Dec-14	68.60
18-Dec-14	127.80
24-Dec-14	76.10
30-Dec-14	106.70

Appendix D: 2014 Noise Monitoring Results

Table 54: Supplementary Noise Monitoring Results

de Boer	Date	Time	MAX	LEQ	L1	L10	L50	L90	Comments
	09/01/2014	08:41	55.6	40.0	44.5	42.6	39.3	35.6	40% wind, 20% birds, 40% traffic **(wind >3m/s)**
	16/01/2014	11:16	52.8	34.4	39.6	36.3	33.6	31.7	35% birds, 25% insects, 40% traffic
	24/01/2014	09:00	73.2	40.6	49.5	37.3	31.2	28.7	60% birds, 20% insects, 20% traffic
	6/02/2014	10:06	55.7	31.9	41.8	34.4	29.1	26.8	70% birds, 20% highway noise, 10% cars
	13/02/2014	15:25	65.9	32.0	40.0	32.8	30.0	27.8	75% highway noise, 15% road works, 10% birds/insects
	19/02/2014	08:40	68.6	38.2	42.2	37.6	35.7	34.4	30% mine noise, 40% highway noise, 30% birds
	26/02/2014	11:33	51.7	36.2	41.9	39.9	35.3	32.3	40% highway noise, 40% road works, 20% insects
	06/03/2014	12:46	59.9	31.9	41.6	37.8	35.0	32.2	60% birds, 20% insects, 20% highway noise
	12/03/2014	14:53	58.3	30.8	36.7	32.6	29.4	27.1	80% birds, 20% Highway and road works noise
	21/03/2014	14:29	57.6	33.6	40.7	35.6	32.5	29.7	70% highway noise, 20% birds, 10% insects.
	25/03/2014	14:55	64.4	39.8	51.3	40.5	35.4	32.1	80% road noise, 20% birds
	2/04/2014	14:30	61.5	37.0	41.5	38.4	36.5	34.9	Neighbour mowing, 50% road noise, 50% insects
	9/04/2014	10:52	65.0	43.3	54.5	47.5	33.9	31.4	50% birds, 10% road/highway noise, 40% industrial noise (road works were rock breaking with excavator during sampling)
	16/04/2014	07:34	60.7	40.2	46.7	41.8	39.1	37.1	50% industrial noise, 20% highway noise, 30% birds
	24/04/2014	07:23	64.0	44.8	50.4	46.6	44.1	41.9	40% highway noise, 40% industrial/mine noise, 20% birds
	30/04/2014	06:53	50.3	39.2	44.1	40.9	38.7	36.5	30% road noise, 10% industrial noise, 60% birds
	8/05/2014	10:25	49.5	40.0	45.1	42.1	39.6	36.3	40% road works noise, 20% Highway noise, 40% Birds
	27/06/2014	07:20	66.7	61.1	63.4	62.2	61.0	59.3	50% highway noise, 20% mine noise (truck), 30% birds, meter was recently calibrated and reading are higher than usual.
	17/07/2014	08:26	68.6	57.6	61.9	59.4	57.1	55.6	70% birds, 20% road noise, 10% mine noise

de Boer	Date	Time	MAX	LEQ	L1	L10	L50	L90	Comments
	24/07/2014	07:56	60.1	42.5	49.3	44.1	41.7	39.8	40% Highway noise, 30% mine, 30% birds
	7/08/2014	07:44	56.7	42.2	48.5	44.3	41.6	38.9	80% birds, 20% highway noise
	5/09/2014	09:13	53.9	40.8	48.1	43.8	39.3	36.9	80% highway noise, 20% birds
	18/09/2014	05:56	57.8	44.2	51.6	46.4	43.3	39.5	80% highway noise, 20% birds
	12/11/2014	07:35	57.9	42.6	51.7	44.3	41.4	38.8	60% highway noise, 30% birds, 10% wind, dog barking in distance (>3m/s wind)
	26/11/2014	12:20	61.8	35.3	41.7	37.6	33.4	30.0	50% traffic (NEH), 30% birds/insects, 20% distant lawn mover
	17/12/2014	11:30	60.2	40.0	45.3	42.4	39.2	36.6	50% traffic (NEH), 20% wind, 25% insects/birds, 5% cows ***(wind >3m/s)***

Doherty	Date	Time	MAX	LEQ	L1	L10	L50	L90	Comments
	09/01/2014	07:20	74.9	46.3	55.8	38.7	34.9	32.8	60% birds, 30% car on Balmoral Rd, 10% dog barking
	16/01/2014	09:55	57.4	52.5	55.8	54.8	52.3	47.9	60% insects, 30% birds, 10% neighbour's radio
	24/01/2014	07:30	59.5	35.5	44.4	39.8	31.0	27.5	60% birds, 15% neighbour's talking, 25% insects
	6/02/2014	08:50	65.9	36.7	47.0	39.9	31.0	28.0	60% birds, 10% neighbour's talking, 20% cows, 10% mine noise
	13/02/2014	13:29	67.6	47.7	51.8	50.8	47.5	29.2	80% insects, 20% birds
	19/02/2014	07:44	62.8	40.7	52.9	42.5	35.8	33.7	40% birds, 5% plane, 5% lawn mower, 50% mine noise (conveyor, dozer tracking noise)
	26/02/2014	09:45	54.0	37.3	45.7	40.2	35.5	31.1	80% tractor on neighbouring property, 10% birds, 10% insects **(wind >3m/s)**
	06/03/2014	09:38	69.2	39.4	49.0	39.9	36.4	34.1	55% birds, **40% trains/mine/CHP noise**, 5% insects
	12/03/2014	16:25	52.7	32.9	41.7	35.1	30.9	25.9	20% birds, 75% lawnmower, 5% mine noise
	21/03/2014	11:35	65.2	34.2	43.2	34.7	28.7	26.7	5% dogs barking, 25% road noise, 30% birds, 10% insects, 10% mine noise, 20% road works
	25/03/2014	13:20	62.9	32.5	40.5	33.7	30.6	28.9	40% mine noise, 40% insects, 5% Birds, 15% road works
	2/04/2014	13:14	60.9	32.9	41.1	34.4	31.0	29.3	40% insects, 40% indiscriminate mine noise, 20% birds
	9/04/2014	13:13	52.9	33.1	42.1	36.5	30.0	27.7	70% birds, 10% insects, 20% mine noise

Doherty	Date	Time	MAX	LEQ	L1	L10	L50	L90	Comments
	24/04/2014	08:15	53.2	40.6	46.3	43.0	39.6	37.6	60% industrial noise (reverse beepers, tracked equipment), 40% birds
	8/05/2014	08:33	58.2	40.9	48.4	42.6	39.8	38.1	30% mine noise, 70% birds
	27/06/2014	06:32	68.0	62.5	64.7	63.7	62.5	61.3	50% indiscriminate industrial noise (mine), 40% birds, 10% dog barking, meter had recently been calibrated.
	17/07/2014	07:21	65.0	59.3	61.8	60.5	59.3	58.2	50% mine, 40% birds, 10% industrial
	24/07/2014	07:09	62.0	41.2	50.2	43.2	39.8	37.7	70% birds, 30% Mine noise
	7/08/2014	09:00	57.8	37.8	47.0	40.9	35.1	31.5	60% birds, 30% neighbour's whiper snipper, 10% mine noise
	5/09/2014	07:47	68.8	41.7	53.5	44.0	36.0	34.3	70% birds, 20% dog barking, 10% mine noise
	18/09/2014	06:43	64.7	49.1	57.2	53.1	46.7	37.2	80% road noise, 10% dog barking, 10% mine noise
	12/11/2014	06:45	55.5	37.0	41.1	38.4	36.5	34.9	60% birds, 30% road noise, 10% mine/industry (>3m/s wind)
	26/11/2014	12:45	65.4	36.9	44.8	38.0	35.4	32.3	60% insects/birds, **30% low rumble (incl. train horn)**, 10% traffic along TMD
	17/12/2014	10:45	47.5	36.7	42.4	40.2	33.6	27.3	50% insects, 30% birds, 10% traffic (TMD), 10% mine noise

Halloran	Date	Time	MAX	LEQ	L1	L10	L50	L90	Comments
	09/01/2014	08:23	58.7	40.2	50.4	42.1	38.0	35.8	35% wind, 35% birds, 30% traffic **(wind >3m/s)**
	16/01/2014	11:00	67.6	46.8	52.5	47.9	45.4	42.5	40% birds, 20% insects, 20% traffic, 20% wind
	24/01/2014	08:45	81.9	49.6	5.05	52.4	46.1	40.2	60% birds, 20% insects, 20% traffic
	6/02/2014	09:43	63.7	39.3	50.5	43.0	31.9	27.5	90% birds, 10% plane
	13/02/2014	15:01	57.7	35.7	42.5	39.4	33.9	27.0	80% road works, 20% insects
	19/02/2014	08:15	63.1	38.2	47.4	40.6	35.6	33.2	70% birds, 5% neighbours, 25% mine noise (dozer/conveyor alarm)
	26/02/2014	11:12	55.0	38.7	49.4	38.4	32.8	30.6	50% highway noise, 30% insects, 20% birds **(wind >3m/s)**
	06/03/2014	11:00	62.7	43.3	56.5	42.2	37.5	34.9	90% birds, 10% road works
	12/03/2014	15:13	42.2	32.0	37.8	34.4	31.2	28.7	60% birds, 10% insects, 20% highway noise
	21/03/2014	14:51	54.9	37.6	47.4	40.2	35.0	32.2	70% birds, 20% power line tree loppers, 10% highway noise

Halloran	Date	Time	MAX	LEQ	L1	L10	L50	L90	Comments
	2/04/2014	14:50	61.2	27.4	34.5	29.2	25.5	23.7	90% birds, 10% insects
	9/04/2014	10:30	53.9	32.0	41.8	34.0	29.4	27.4	70% birds, 30% industrial noise (roadworks were rock breaking nearby during monitoring)
	16/04/2014	06:55	59.0	43.4	50.9	45.7	41.8	39.7	70% Industrial noise, 30% birds
	24/04/2014	07:03	68.9	45.8	51.3	47.0	44.6	42.2	80% industrial noise (sounds like busy highway), 20% birds
	30/04/2014	06:34	61.8	38.5	49.3	40.4	34.9	32.6	60% industrial noise, 40% birds
	8/05/2014	09:43	59.3	40.2	50.6	40.4	37.4	36.1	20% indiscriminate industrial noise (mine probably), 80% birds
	27/06/2014	06:59	67.8	62.2	64.4	63.5	62.1	61.1	50% birds, 50% indiscriminate industrial noise (mine?), meter was recently calibrated and readings are higher than usual.
	17/07/2014	08:07	67.6	57.1	61.3	58.2	56.9	55.8	60% birds, 30% industrial/mine noise, 10% road noise
	24/07/2014	07:35	60.8	42.9	54.7	43.9	39.8	37.6	30% mine noise, 60% birds, 10% highway noise
	7/08/2014	07:24	62.6	40.3	48.4	42.1	39	36.9	70% birds, 20% road noise, 10% mine noise
	5/09/2014	08:54	54.2	38.7	45.3	41	37.5	35.2	95% birds, 5% mine noise
	18/09/2014	05:38	54.6	40.3	46.7	42.4	39.6	37.3	95% birds, 5% mine noise
	12/11/2014	07:15	56	39	44.4	41.3	38.5	35.1	50% birds, 40% traffic, 10% wind (>3m/s wind)
	26/11/2014	12:00	47.5	33.3	39.3	36.6	32	29.2	60% insects/birds, 30% traffic (NEH), 10% wind
	17/12/2014	11:10	64.6	38.1	43.9	39.0	37.0	34.9	50% pump (JR Richards trucks on neighbour's property), 20% insects, 30% birds

Horder	Date	Time	MAX	LEQ	L1	L10	L50	L90	Comments
	09/01/2014	08:02	64.9	42.5	53.2	44.8	38.2	34.9	50% birds, 5% insects, 25% traffic, 20% machinery
	16/01/2014	10:40	69.8	44.8	539	43.6	38.7	35.7	30% birds, 10% insects, 35% traffic, 25% road works (beepers)
	24/01/2014	08:22	65.0	39.5	51.7	39.9	34.1	32.2	55% birds, 15% insects, 30% traffic
	6/02/2014	08:00	68.7	46.8	59.8	47.7	39.1	37	60% birds, 40% non-descript mine noise
	13/02/2014	14:34	60.6	39.9	48.3	43.5	35.5	31.6	90% road works, 5% birds, 5% insects

Horder	Date	Time	MAX	LEQ	L1	L10	L50	L90	Comments
	19/02/2014	09:05	64.1	40.8	49.4	43.6	38.8	34.1	30% birds, 40% insects, 20% mine noise, 10% road noise
	26/02/2014	10:47	56.9	47.4	53.3	51.9	41.5	37.1	40% highway noise, 40% road works, 10% birds, 10% insects **(wind >3m/s)**
	06/03/2014	10:31	58.5	39.2	50.9	40.5	34.2	31.9	70% birds, 30% road works
	12/03/2014	15:37	56.4	37.1	44.5	41.9	33.6	31.6	10% birds, 90% neighbours tractor noise
	21/03/2014	14:04	56.4	38.1	51.5	39.4	35.9	32.7	50% indiscriminate road noise, 50% birds, **train @ 1min 46sec**
	25/03/2014	14:09	62.9	35.3	51.3	40.5	35.4	32.1	80% road noise, 20% birds and insects
	2/04/2014	14:00	65.9	34.9	41.4	35.6	31.8	29.5	40% road works, 40% highway/TMD noise, 10% birds and insects, 10% mine noise
	9/04/2014	11:18	65.2	39.7	49.5	41.4	36.6	32.4	50% mine noise, 20% birds, 30% road noise.
	16/04/2014	08:03	62.5	38.7	48.4	39.4	36.9	35.4	10% road works/road noise, 70% birds, 20% industrial noise
	23/04/2014	07:17	66.1	45.9	56.1	45.9	43.8	42.3	60% mine noise, 40% birds
	24/04/2014	07:47	63.9	46	55.1	46.7	44.6	43.1	20% road noise, 70% CHP/industrial noise (tracked equip. can be heard), 10% birds
	8/05/2014	09:20	53.8	37.6	42.5	38.7	37	35.8	80% Birds, 20% mine, Train @ 9:25am
	27/06/2014	07:43	66.9	60.7	62.9	61.9	60.7	59.4	60% Highway, 20% mine/industrial noise, 20% birds, meter was recently calibrated and readings are higher than usual
	17/07/2014	08:52	80.3	65.3	73.2	69.2	62.7	59.7	
	24/07/2014	08:20	63.5	44.4	51.6	45.3	43	41.6	70% mine noise, 30% birds
	7/08/2014	08:12	59.9	41.6	50.8	44.5	39.3	37.1	70% birds, 20% mine noise, 10% dog barking
	5/09/2014	08:32	55.8	40.1	48.2	41.7	39	37	70% birds, 30% mine noise
	18/09/2014	06:17	59.6	46.9	51.1	48.5	46.6	43.4	50% mine/industrial noise, 30% road noise, 20% birds
	26/11/2014	11:30	61.4	38.9	49.4	42.4	34.5	31	70% birds/wind, 30% traffic (NEH, TMD)
	17/12/2014	11:50	65.9	42.9	48.5	45.1	41.7	39.6	50% wind, 20% birds/insects, 30% (NEH, TMD) ***(wind > 3m/s)***

Robertson	Date	Time	MAX	LEQ	L1	L10	L50	L90	Comments
	09/01/2014	07:40	57.1	41.7	48.6	44.5	40.3	36.3	3x trucks, 35x light vehicles during sample period,15% birds, 5% insects, 40% traffic, 40% road works (beepers)
	16/01/2014	10:15	71.1	67.5	70.0	69.2	67.7	64.1	19x trucks, 40x light vehicles during sample period, 40% insects, 30% traffic, 20% road works (beepers), 10% train
	24/01/2014	08:00	65.7	46.5	55.0	50.1	43.5	39.7	10x trucks, 23x light vehicles during sample period, 50% road works (beepers), 30% traffic, 10% birds, 10% insects/
	6/02/2014	09:15	67.5	46.2	56.9	48.3	42.6	34.1	4x trucks, 19x light vehicles during sample period, 70% birds, 20% highway noise, 10% cars
	13/02/2014	14:10	58.2	38.5	47.1	41.8	36.1	33.5	5x trucks, 26x light vehicles during sample period, 75% highway noise, 15% road works, 10%birds/insects
	19/02/2014	09:32	58.5	42.8	51.8	46.1	40.8	36.3	6x trucks, 19x light vehicles during sample period, 80% insects, 20% mine noise (haul trucks)
	26/02/2014	10:15	62.3	46.9	54.5	50.4	40.3	36.8	23x trucks, 25x light vehicles during sample period, 100% road works ***(wind >3m/s)***
	06/03/2014	09:51	58.9	44.1	51.1	45.9	43.0	40.4	9x trucks, 21x light vehicles, 95% road works, 5% mine noise (beepers)
	12/03/2014	16:03	60.9	46.6	52.7	49.4	45.5	41.8	15x trucks, 51x light vehicles, 100% road works
	21/03/2014	13:40	64.4	43.3	52.2	47.6	39.6	30.2	11x trucks and 28x light vehicles during sample period, 80% birds, 20% road noise
	25/03/2014	13:45	60.6	42.9	51.6	45.8	41.3	32.5	6x trucks, 36x light vehicles, **train at 13:52**, 80% road noise, 20% insects
	2/04/2014	13:38	65.3	46.2	55.3	51.1	41.6	32.9	15x trucks, 20x light vehicles, 70% road noise, 20% mine noise, 10% birds and insects, **train at 1:49PM**
	9/04/2014	13:34	66.5	44.1	54.8	47.7	38.3	31.9	8x trucks, 22x light vehicles, 70% birds, 20% mine noise, 10% generator running demountable office
	16/04/2014	08:26	62.9	44.6	53.1	48.0	41.5	38.1	13x trucks, 15x light vehicles, 70% road noise, 20% generator at road works office, 10% industrial/mine noise
	24/04/2014	08:39	68.2	45.7	54.6	48.5	43.1	39.4	17x trucks, 20x light vehicles, 20% Mine/industrial noise, 40% birds, 40% road works
	30/04/2014	07:40	60.5	49.3	54.3	52.7	48.5	40.3	19x trucks, 42x light vehicles, 100% Road works noise, Sample stopped at 12 min 40 sec due to rain

Robertson	Date	Time	MAX	LEQ	L1	L10	L50	L90	Comments
	8/05/2014	08:58	57.6	43.3	53.3	45.8	39.2	36.2	8x trucks, 15x light vehicles, 10% Birds, 90% road noise
	27/06/2014	08:09	79.7	62.0	67.0	62.5	60.8	59.6	8x trucks, 24x light vehicles, 50% highway noise, 20% mine noise, 30% birds
	17/07/2014	07:45	80.8	67.7	76.4	71.8	63.8	61.3	12x trucks, 25x light vehicles, 60% road noise, 20% birds, 20% industrial/mine noise
	24/07/2014	08:41	60.9	48.1	58.1	51.7	44.6	42.3	5x trucks, 14x light vehicles, 60% Haul trucks and mine noise, 40% birds.
	7/08/2014	08:36	58.5	45.5	55.7	49.5	41.8	35.6	9x trucks, 27x light vehicles, 80% birds, 20% road noise
	5/09/2014	08:10	56.9	46.0	54.3	50.4	42.1	36.4	9x trucks, 22x light vehicles, 80% bird/wind/car noise, 20% mine noise
	12/11/2014	08:00	62.0	47.7	58.4	52.3	40.9	33.3	14x trucks, 17x light vehicles, 70% traffic, 25% birds, 5% wind, **distant train horn *(wind >3m/s)***
	26/11/2014	11:10	62.6	46.3	56.7	50.9	39.8	34.5	12x trucks, 20x light vehicles, 50% insects/birds, 40% traffic (TMD), 5% wind, **5% train horn**
	17/12/2014	12:15	63.2	46.1	55.6	49.0	43.6	40.6	7x trucks, 16x light vehicles, 60% traffic (TMD), 10% wind, 30% insects/birds ***(wind >3m/s)***

Independent Noise Monitoring Report March 2014

SPECTRUM ACOUSTICS
NOISE AND VIBRATION CONSULTANTS

3 April 2014

Ref: 03012/5143

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: MARCH 2014 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Monday 31st March 2014. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

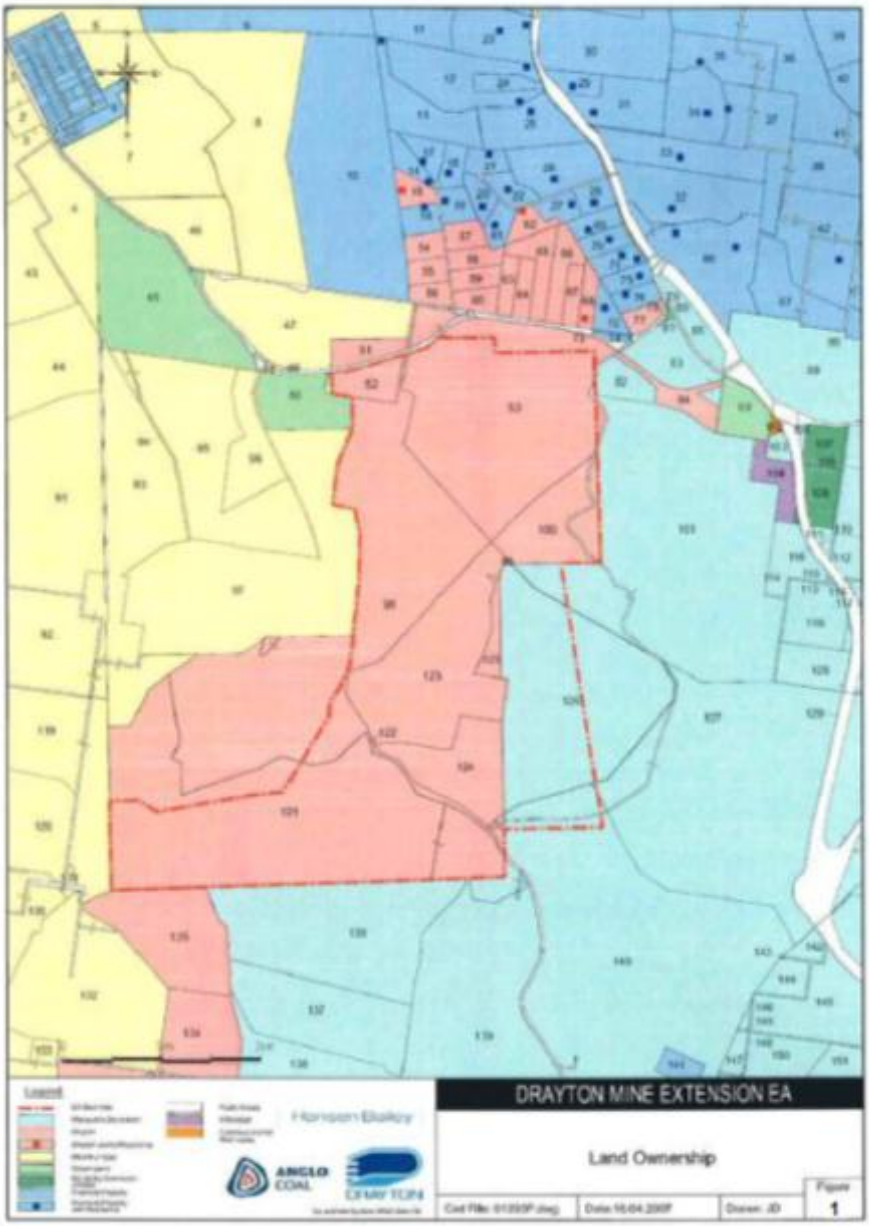
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were inaudible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Routh Street, Cardiff NSW 2285
PO Box 374 Wallsend NSW 2287
Phone: (02) 4954 2276
Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{Aeq} is shown in **Tables 1**-3 and night time $L_{A1(1minute)}$ – approximated as measured L_{Amax} – in **Table 4**. Table 4 shows the overall LA1 and the contributing source as well as the LA1 From DCM, where this was measurable.

Data was analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 31 March 2014 (Day)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	4:07 pm	37	1.6/117	Traffic (33), insects & frogs (30), road works (29), **DCM (29)**
Kerr (36)	4:46 pm	49	1.9/137	Birds (47), traffic (44), road works (35), **DCM inaudible**
Skinner (39)	4:19 pm	38	1.9/150	Birds (35), road work (32), traffic (31), **DCM inaudible**
Robertson (36)	4:59 pm	41	1.7/117	Traffic (40), birds & insects (32), **DCM inaudible**
Sharman (35)	3:44 pm	49	2.1/131	Traffic (48), insects (42), **DCM inaudible**
Horder (35)	4:36 pm	41	1.7/143	Traffic (39), birds & insects (35), road works (27), **DCM inaudible**
Wilson (35)	5:15 pm	36	1.6/121	Traffic (35), birds (28), **DCM inaudible**
Smith (35)	3:53 pm	35	2.3/124	Birds (31), power station (30), traffic (28), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 31 March 2014 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	7:40 pm	47	2.2/127	Frogs & insects (46), traffic (37), train (32), **DCM (32)**
Kerr (37)	9:11 pm	45	2.4/136	Traffic (44), **DCM (35)**, insects (34)
Skinner (40)	8:45 pm	42	2.8/144	**DCM (38)**, traffic (37), insects & frogs (37)
Robertson (37)	9:03 pm	39	2.5/141	Traffic (37), frogs & insects (30), **DCM (28)**
Sharman (35)	8:16 pm	45	2.3/119	Traffic (44), frogs & insects (34), **DCM (33)**
Horder (36)	8:38 pm	40	2.6/144	Traffic (36), train (34), frogs & insects (33), **DCM (26)**
Wilson (35)	7:54 pm	42	2.3/123	Frogs & insects (40), traffic (37), **DCM inaudible**
Smith (35)	8:21 pm	51	2.1/123	Insects (51), train (34), traffic (29), **DCM inaudible**

Table 3 DCM Noise Monitoring Results – 31 March 2014 (night)				
Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:03 pm	47	2.4/138	Frogs & insects (46), traffic (38), DCM (34)
Kerr (37)	11:15 pm	43	2.5/137	Traffic (40), frogs & insects (38), DCM (35)
Skinner (39)	10:50 pm	43	3.3/143	Traffic (38), frogs & insects (37), train (36), DCM (35)
Robertson (42)	10:28 pm	43	2.9/146	Train (40), traffic (39), frogs & insects (43), DCM inaudible
Sharman (41)	11:12 pm	44	2.6/142	Traffic (42), DCM (34), insects (34), train (33)
Horder (42)	10:51 pm	41	3.2/143	Train (37), traffic (35), frogs & insects (35), DCM inaudible
Wilson (36)	10:01 pm	42	2.3/138	Frogs & insects (40) traffic (37), DCM inaudible
Smith (36)	10:25 pm	40	2.8/147	Insects & frogs (38), traffic (31), train (31), DCM inaudible

Table 4 DCM Noise Monitoring Results – 31 March 2014 (night)					
Location (Criterion)	Time	dB(A), $L_{1(1minute)}$	Wind speed/ direction	L_{A1} source	Identified Mine Sources (L_{A1})
Doherty (47)	10:03 pm	51	2.4/138	Insects	Hum (40)
Kerr (47)	11:15 pm	50	2.5/137	Highway	Hum (38)
Skinner (47)	10:50 pm	49	3.3/143	Train	Haul Trucks (45)
Robertson (47)	10:28 pm	50	2.9/146	Highway	n/a
Sharman (47)	11:12 pm	53	2.6/142	Highway	Hum (36)
Horder (47)	10:51 pm	46	3.2/143	Train	n/a
Wilson (47)	10:01 pm	46	2.3/138	Highway	n/a
Smith (47)	10:25 pm	52	2.8/147	Insects	n/a

The results in Tables 1 to 4 show that the noise criteria were not exceeded at any location.

Trains were audible at some monitoring locations during both the evening and night time monitoring periods. A train was loaded at DCM between 4:40 pm to 9:30 pm. Train noise outside of this these times was not associated with DCM.

Data from those times where DCM operations were audible were analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

The results in Table 4 show that the noise sleep disturbance criteria ($L_{A1(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

Because the $L_{A1(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{A1(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Neil Pennington
Acoustical Consultant

Review:

Ross Hodge
Acoustical Consultant

Independent Noise Monitoring Report April 2014

29 April 2014

Ref: 03012/5156

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: APRIL 2014 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Tuesday 16th April 2014. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

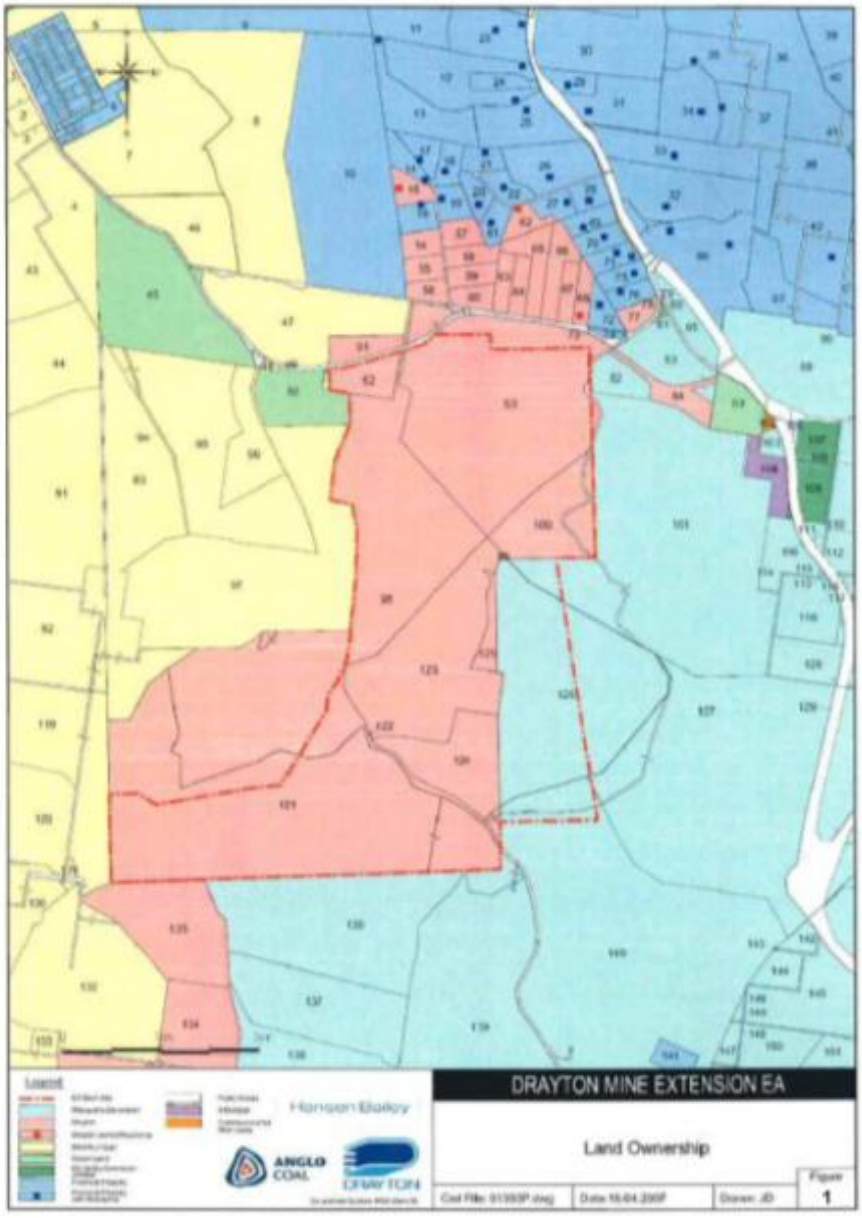
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm).

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
PO Box 374 Wallsend NSW 2287
Phone: (02) 4954 2276
Fax: (02) 4954 2257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Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{Aeq} is shown in **Tables 1-3** and night time $L_{A1(1minute)}$ – approximated as measured L_{Amax} – in **Table 4**. Table 4 shows the overall LA1 and the contributing source as well as the LA1 From DCM, where this was measurable.

Data was analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 16 April 2014 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:15 pm	46	1.0/125	Traffic (43), frogs & insects (43), **DCM (33)**
Kerr (37)	8:35 pm	49	1.4/126	Traffic (48), **DCM (36)**, frogs & insects (35), mines (35)
Skinner (40)	8:06 pm	44	0.8/108	Frogs & insects (42), traffic (39), **DCM (29)**
Robertson (37)	7:14 pm	42	1.4/135	Traffic (42), frogs & insects (31), **DCM inaudible**
Sharman (35)	6:50 pm	50	2.0/120	Traffic (50), insects (32), **DCM faintly audible**
Horder (36)	7:39 pm	45	1.2/121	Frogs & insects (44), traffic (37), **DCM (32)**
Wilson (35)	9:03 pm	38	1.4/142	Traffic (36), frogs & insects (31), **DCM (30)**
Smith (35)	9:35 pm	40	1.5/145	Trains (35), traffic (34), **DCM (33)**, frogs & insects (34)

Table 2
DCM Noise Monitoring Results – 16 April 2014 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	44	1.5/132	Traffic (42), **DCM (36)**, frogs & insects (36)
Kerr (37)	11:46 pm	46	0.5/207	Traffic (45), **DCM (34)**, mine (35), frogs & insects (28)
Skinner (39)	11:22 pm	42	0.6/231	Frogs & insects (40), **DCM (36)**, traffic (34)
Robertson (42)	10:21 pm	41	1.2/133	Traffic (40), frogs & insects (34), **DCM (28)**
Sharman (41)	11:01 pm	52	0.6/217	Traffic (52), **DCM (37)**, frogs & insects (28)
Horder (42)	10:42 pm	46	0.8/117	Frogs & insects (45), **DCM (34)**, traffic (32)
Wilson (36)	12:10 am	39	0.6/159	Trains (35), **DCM (34)**, traffic (32), frogs & insects (21)
Smith (36)	12:36 am	36	0.3/285	**DCM (35)**, traffic (29), frogs & insects (22)

Table 3 DCM Noise Monitoring Results – 16 April 2014 (night)					
Location (Criterion)	Time	dB(A), $L_{1(1minute)}$	Wind speed/ direction	L_{A1} source	Identified Mine Sources (L_{A1})
Doherty (47)	10:00 pm	47	1.5/132	Highway	Haul Trucks (40)
Kerr (47)	11:46 pm	53	0.5/207	Highway	Hum (43)
Skinner (47)	11:22 pm	41	0.6/231	Highway	Hum (40)
Robertson (47)	10:21 pm	46	1.2/133	Highway	Hum (32)
Sharman (47)	11:01 pm	54	0.6/217	Highway	Hum (40)
Horder (47)	10:42 pm	46	0.8/117	Highway	Hum (39)
Wilson (47)	12:10 am	45	0.6/159	Plane	Hum (41)
Smith (47)	12:36 am	41	0.3/285	Insects	Hum (38)

The results in Tables 1 to 3 show that the noise criteria were not exceeded at any location.

Trains were audible at some monitoring locations during both the evening and night time monitoring periods. A train was loaded at DCM between 4:40 pm to 9:30 pm. Train noise outside of this these times was not associated with DCM.

Data from those times where DCM operations were audible were analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

The results in Table 4 show that the noise sleep disturbance criteria ($L_{A1(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

Because the $L_{A1(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{A1(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Neil Pennington
Acoustical Consultant

Review:

Ross Hodge
Acoustical Consultant

Independent Noise Monitoring Report May 2014

SPECTRUM ACOUSTICS
NOISE AND VIBRATION CONSULTANTS

27 May 2014

Ref: 03012/5203

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: MAY 2014 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Tuesday 20th May 2014. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

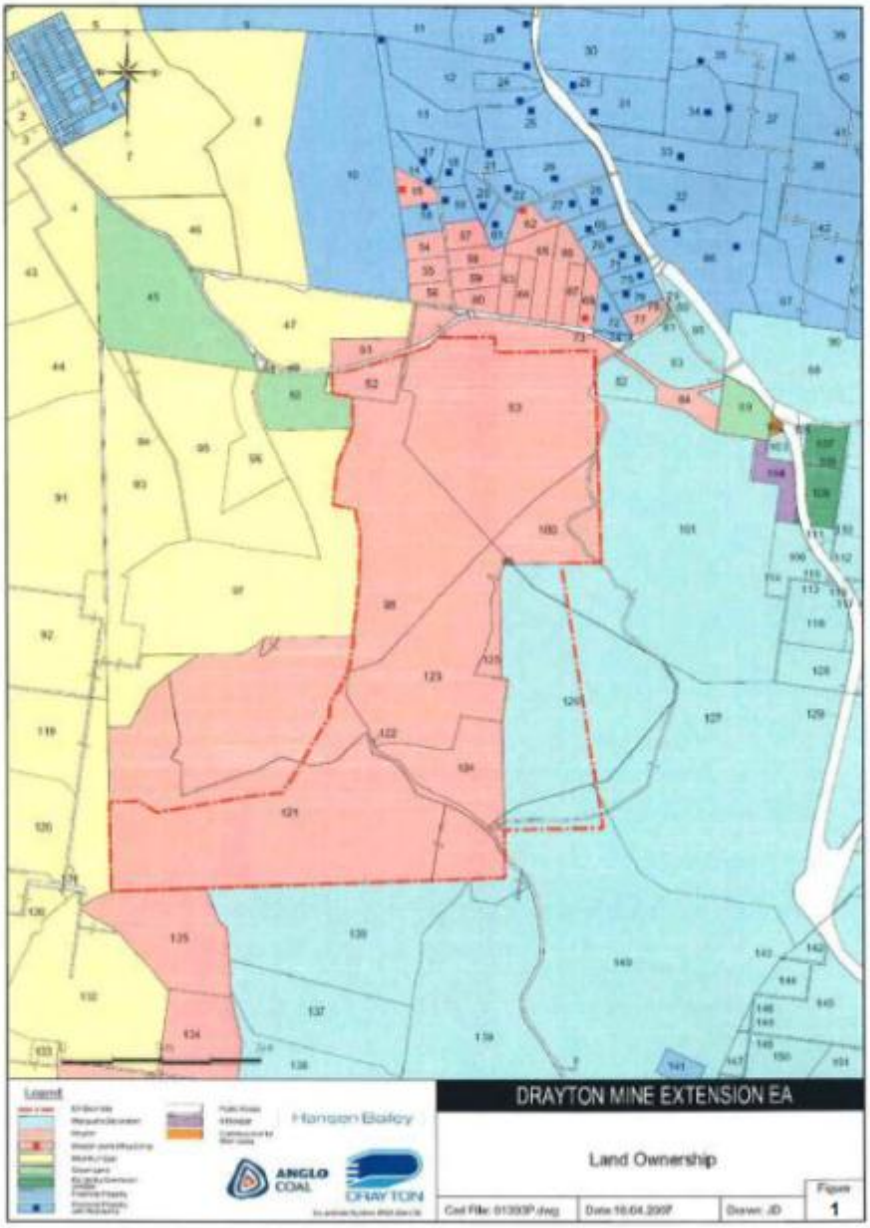
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Routh Street, Cardiff NSW 2285
PO Box 374 Wallsend NSW 2287
Phone: (02) 4954 2276
Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
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Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{Aeq} is shown in **Tables 1-3** and night time $L_{A1(1minute)}$ – approximated as measured L_{Amax} – in **Table 4**. Table 4 shows the overall LA1 and the contributing source as well as the LA1 From DCM, where this was measurable.

Data was analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 20 May 2014 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:47 pm	40	1.8/318	Traffic (38), other mine (33), frogs & insects (32), **DCM inaudible**
Kerr (37)	8:48 pm	49	1.6/314	Traffic (49), other mine (35), frogs & insects (30), **DCM inaudible**
Skinner (40)	8:24 pm	42	1.6/309	Traffic (40), other mine (34), frogs & insects (34), **DCM inaudible**
Robertson (37)	7:11 pm	46	1.6/316	Traffic (46), frogs & insects (31), other mine (30), **DCM (27)**
Sharman (35)	7:59 pm	50	1.5/312	Traffic (50), **DCM (30)**, other mine (30), frogs & insects (28)
Horder (36)	7:37 pm	48	1.7/283	Traffic (48), **DCM (29)**, frogs & insects (28), other mine (28)
Wilson (35)	9:13 pm	42	1.9/304	Traffic (42), other mine (31), frogs & insects (26), **DCM inaudible**
Smith (35)	9:39 pm	41	1.6/312	Traffic (41), other mine (33), frogs & insects (33) **DCM inaudible**

Table 2 DCM Noise Monitoring Results – 20 May 2014 (night)				
Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:05 pm	42	1.4/314	Traffic (41), other mine (34), frogs & insects (32), DCM inaudible
Kerr (37)	12:46 am	44	2.2/311	Traffic (42), other mine (37), DCM (33), frogs & insects (30)
Skinner (39)	11:35 pm	44	1.9/303	Traffic (41), frogs & insects (38), other mine (36), DCM (32)
Robertson (42)	10:27 pm	47	1.6/282	Traffic (47), DCM (30), frogs & insects (30), other mine (27)
Sharman (41)	11:11 pm	48	1.4/314	Traffic (48), DCM (35), other mine (30), frogs & insects (25)
Horder (42)	10:50 pm	45	1.8/313	Traffic (44), DCM (35), other mine (35), frogs & insects (31)
Wilson (36)	12:24 am	44	2.2/307	Traffic (43) DCM (34), other mine (29), frogs & insects (26)
Smith (36)	11:58 pm	41	2.2/302	Traffic (40),DCM (34), frogs & insects (27)

Table 3 DCM Noise Monitoring Results – 20 May 2014 (night)					
Location (Criterion)	Time	dB(A), $L_{1(1minute)}$	Wind speed/ direction	L_{A1} source	Identified Mine Sources (L_{A1})
Doherty (47)	10:05 pm	46	1.4/314	Highway	n/a
Kerr (47)	12:46 pm	50	2.2/311	Highway	Hum (37)
Skinner (47)	11:35 pm	51	1.9/303	Highway	Hum (36)
Robertson (47)	10:27 pm	50	1.6/282	Highway	Hum (34)
Sharman (47)	11:11 pm	53	1.4/314	Highway	Hum (39)
Horder (47)	10:50 pm	52	1.8/313	Highway	Hum (38)
Wilson (47)	12:24 am	49	2.2/307	Highway	Hum (37)
Smith (47)	11:58 am	49	2.2/302	Highway	Hum (38)

The results in Tables 1 to 3 show that the noise criteria were not exceeded at any location.

Data from those times where DCM operations were audible were analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

The results in Table 4 show that the noise sleep disturbance criteria ($L_{A1(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

Because the $L_{A1(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{A1(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Neil Pennington
Acoustical Consultant

Review:

Ross Hodge
Acoustical Consultant

Independent Noise Monitoring Report June 2014

SPECTRUM ACOUSTICS
NOISE AND VIBRATION CONSULTANTS

23 July 2014

Ref: 03012/5269

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: JUNE 2014 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Monday 30th June 2014. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

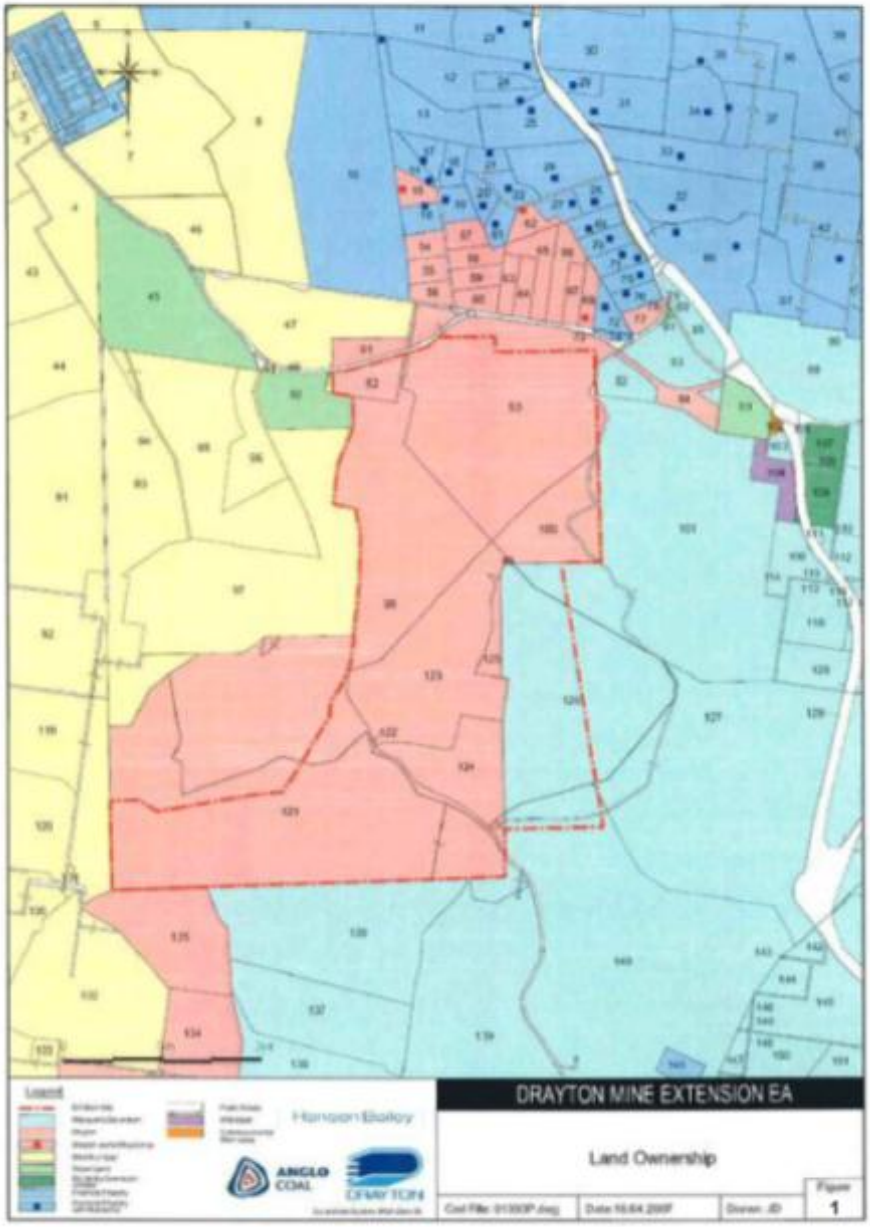
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
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Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-3** and night time $L_{1(1minute)}$ – approximated as measured L_{max} – in **Table 4**. Table 3 shows the overall $L_{1(1minute)}$ and the contributing source as well as the $L_{1(1minute)}$ From DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 30 June 2014 (Day)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	3:04 pm	41	2.2/288	Traffic (40), birds (32), **DCM (29)**
Kerr (36)	4:08 pm	45	2.5/292	Traffic (43), wind (38), **DCM inaudible**
Skinner (39)	3:10 pm	38	3.0/283	Birds & insects (36), traffic (31), **DCM inaudible**
Robertson (36)	3:29 pm	43	3.9/291	Traffic (41), birds (38), **DCM (31)**
Sharman (35)	4:10 pm	50	3.8/293	Traffic (48), dogs (41), birds & insects (40), **DCM inaudible**
Horder (35)	3:45 pm	45	2.7/289	Birds (44), traffic (37), **DCM inaudible**
Wilson (35)	3.52 pm	41	3.0/300	Birds (40), traffic (32), **DCM inaudible**
Smith (35)	3.30 pm	38	3.9/291	Birds (37), traffic (31), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 30 June 2014 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6.50 pm	37	2.2/297	Other mine (36), traffic (28), frogs (27), **DCM inaudible**
Kerr (37)	8.43 pm	45	3.9/308	Traffic (45), other mine (29), **DCM inaudible**
Skinner (40)	7.58 pm	41	2.8/325	Frogs (37), traffic (36), other mine (34), **DCM inaudible**
Robertson (37)	7:12 pm	44	2.1/326	Traffic (44), **DCM (32)**
Sharman (35)	8:20 pm	51	3.1/304	Traffic (51), **DCM (30)**
Horder (36)	7.32 pm	44	2.3/310	Traffic (44), **DCM (31)**, frogs (27)
Wilson (35)	9:09 pm	43	4.7/296	Traffic (42), **DCM (32)**, other mine (30)
Smith (35)	9.33 pm	42	3.1/290	Traffic (41), **DCM (32)**

Table 3 DCM Noise Monitoring Results – 30 June 2014 (night)				
Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:03 pm	40	4.5/285	Other mine (37), traffic (35), frogs (28), **DCM (27)**
Kerr (37)	11:51 pm	45	3.8/292	Traffic (45), other mine (35), **DCM inaudible**
Skinner (39)	11:29 pm	44	3.3/298	Birds (42), traffic (36), other mine (35), **DCM (27)**
Robertson (42)	10:24 pm	41	3.8/303	Traffic (40), other mine (31), **DCM (29)**
Sharman (41)	11:06 pm	47	4.1/292	Traffic (47), **DCM (29)**, other mine (26)
Horder (42)	10:45 pm	44	4.2/298	Traffic (44), other mine (30), **DCM (27)**
Wilson (36)	12:14 am	41	3.8/307	Traffic (38), **DCM (35)**, other mine (33)
Smith (36)	12:38 am	40	4.1/300	Traffic (37),**DCM (35)**, other mine (31)

Table 4 DCM Noise Monitoring Results – 30 June 2014 (night)					
Location (Criterion)	Time	dB(A), $L_{1(1minute)}$	Wind speed/ direction	L_{A1} source	Identified Mine Sources ($L_{1\,(1\,min)}$)
Doherty (47)	10:03 pm	42	4.5/285	Highway	Hum (30)
Kerr (47)	11:51 pm	56	3.8/292	Highway	n/a
Skinner (47)	11:29 pm	56	3.3/298	Bird	Hum (31)
Robertson (47)	10:24 pm	47	3.8/303	Highway	Hum (32)
Sharman (47)	11:06 pm	58	4.1/292	Highway	Hum (32)
Horder (47)	10:45 pm	49	4.2/298	Highway	Hum (33)
Wilson (47)	12:14 am	45	3.8/307	Highway	Hum (39)
Smith (47)	12:38 am	44	4.1/300	Highway	Hum (38)

The results in Tables 1 to 4 show that the noise criterion was not exceeded at any location.

Data from those times where DCM operations were audible were analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

The results in Table 4 show that the noise sleep disturbance criteria ($L_{1(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Neil Pennington
Acoustical Consultant

Review:

Ross Hodge
Acoustical Consultant

Independent Noise Monitoring Report July 2014

SPECTRUM ACOUSTICS
NOISE AND VIBRATION CONSULTANTS

1 August 2014

Ref: 03012/5284

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: JULY 2014 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Monday 21st July 2014. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

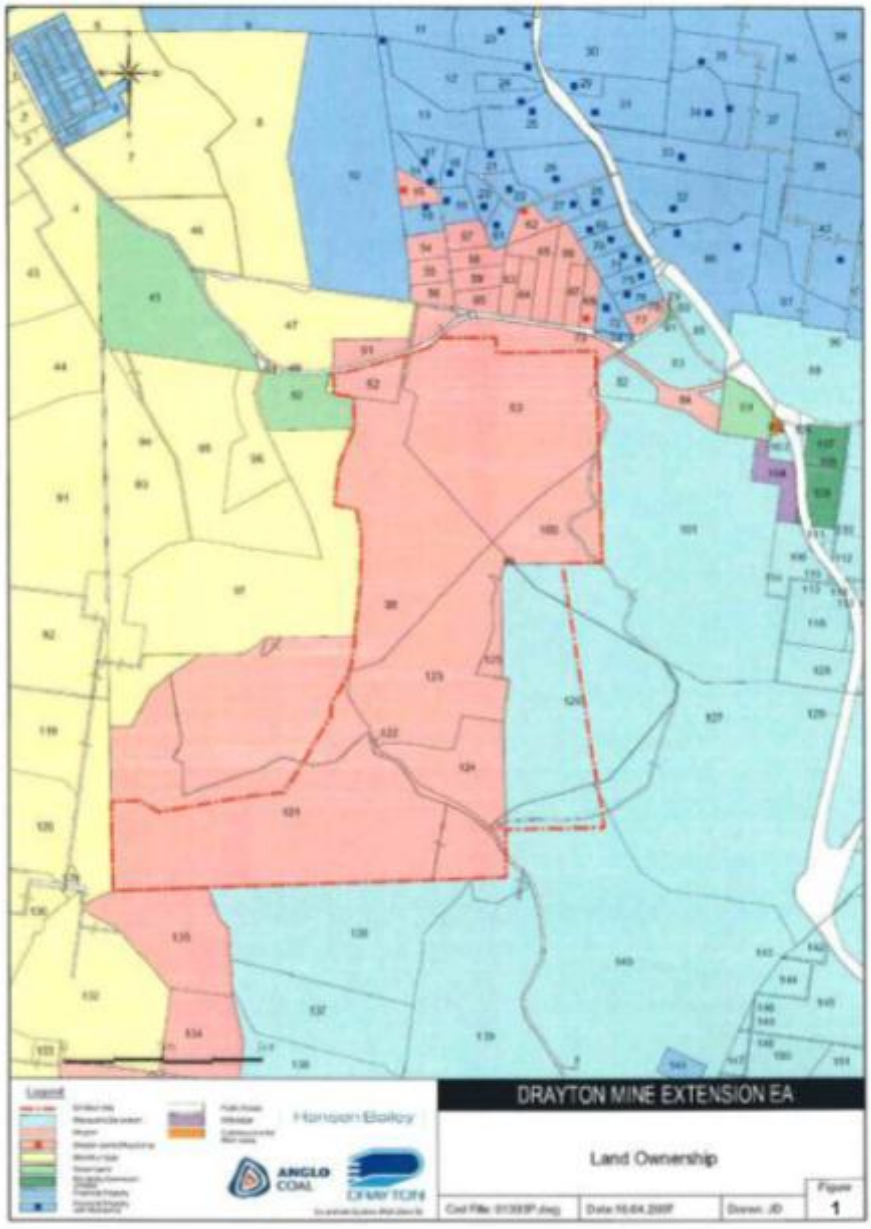
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257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Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-2** and night time $L_{1(1minute)}$ – approximated as measured L_{max} – in **Table 3**. Table 3 shows the overall $L_{1(1minute)}$ and the contributing source as well as the $L_{1(1minute)}$ From DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 21 July 2014 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:42 pm	43	2.5/125	Traffic (41), frogs (38), **DCM (31)**
Kerr (37)	8:38 pm	48	2.4/127	Traffic (48), frogs (33), **DCM (29)**
Skinner (40)	8:12 pm	42	2.3/131	Frogs (39), traffic (38), **DCM (30)**
Robertson (37)	7:05 pm	40	2.6/124	Traffic (39), **DCM (29)**, frogs (29)
Sharman (35)	7:50 pm	46	2.2/129	Traffic (46), **DCM (28)**
Horder (36)	7:28 pm	40	2.5/125	Traffic (39), frogs (31), **DCM (27)**
Wilson (35)	9:03 pm	40	2.3/133	Traffic (39), frogs (34), **DCM inaudible**
Smith (35)	9:28 pm	34	1.9/132	Power station (31), traffic (28), frogs (27), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 21/22 July 2014 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	42	1.9/124	Traffic (40), frogs (37), **DCM (31)**
Kerr (37)	11:52 pm	45	2.8/142	Traffic (45), frogs (33), **DCM (27)**
Skinner (39)	11:30 pm	41	2.7/144	Frogs (38), traffic (37), **DCM (33)**
Robertson (42)	10:23 pm	41	2.1/130	Traffic (40), frogs (31), **DCM (28)**
Sharman (41)	11:06 pm	44	1.9/141	Traffic (44), **DCM (29)**
Horder (42)	10:45 pm	40	2.3/138	Traffic (37), frogs (36), **DCM (28)**
Wilson (36)	12:14 am	37	2.6/143	Frogs (34), traffic (33), **DCM (26)**
Smith (36)	12:37 am	34	2.3/135	Train (31), traffic (27), **DCM (27)**, frogs (24)

Table 3 DCM Noise Monitoring Results – 21/22 July 2014 (night)					
Location (Criterion)	Time	dB(A), $L_{1(1minute)}$	Wind speed/ direction	L_{A1} source	Identified Mine Sources ($L_{1(1\,min)}$)
Doherty (47)	10:00 pm	47	1.9/124	Highway	Truck revs (36)
Kerr (47)	11:52 pm	54	2.8/142	Highway	Hum (32)
Skinner (47)	11:30 pm	45	2.7/144	Highway	Load dropped (42)
Robertson (47)	10:23 pm	47	2.1/130	Highway	Hum (35)
Sharman (47)	11:06 pm	53	1.9/141	Highway	Hum (35)
Horder (47)	10:45 pm	44	2.3/138	Frogs	Hum (33)
Wilson (47)	12:14 am	42	2.6/143	Frogs	Hum (31)
Smith (47)	12:37 am	38	2.3/135	Train	Hum (34)

The results in Tables 1 to 3 show that the noise criterion was not exceeded at any location.

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The results in Table 3 show that the noise sleep disturbance criteria ($L_{1(1minute)}$) was not exceeded at any monitoring location during the night time period.

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Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Neil Pennington
Acoustical Consultant

Review:

Ross Hodge
Acoustical Consultant

Independent Noise Monitoring Report August 2014

SPECTRUM ACOUSTICS
NOISE AND VIBRATION CONSULTANTS

5 September 2014

Ref: 03012/5359

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: AUGUST 2014 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Tuesday 26th August 2014. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

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* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257

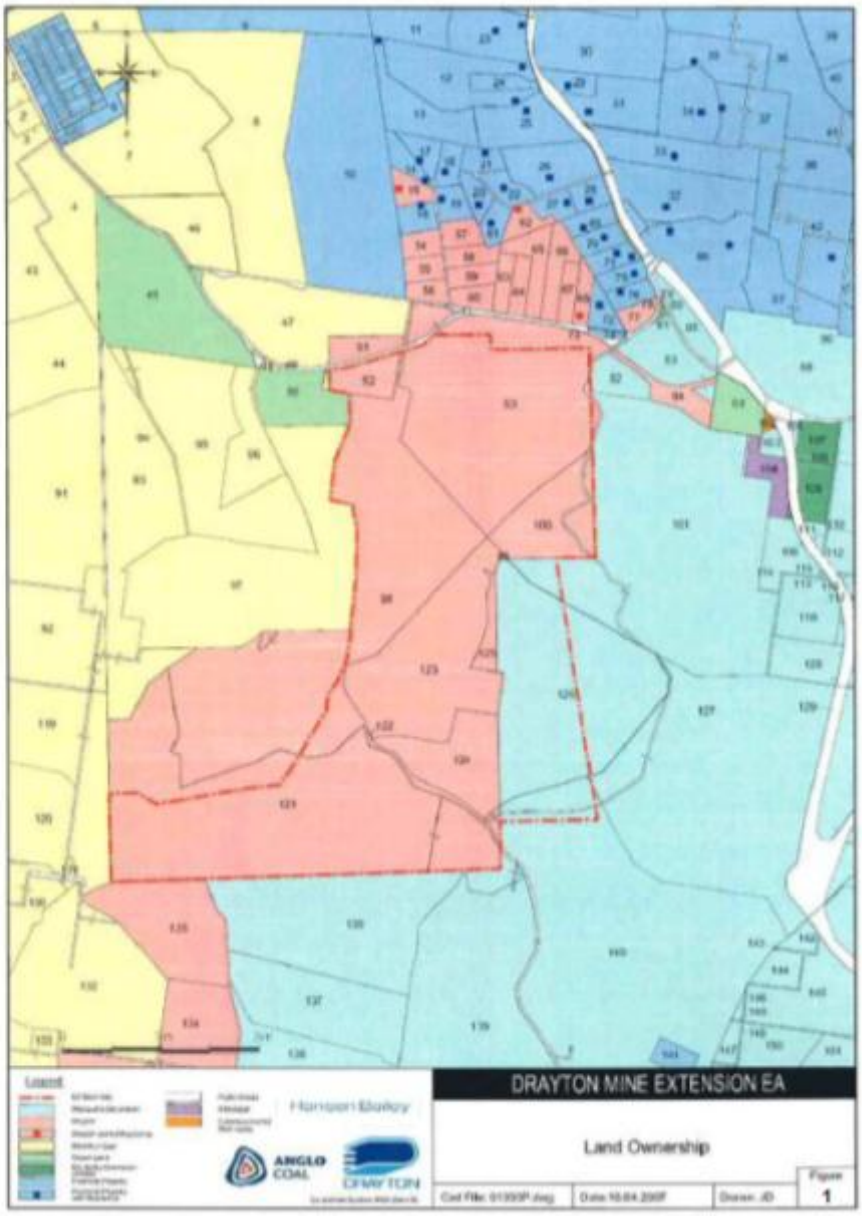
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Figure
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Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-2** and night time $L_{1\ (1minute)}$ – approximated as measured L_{max} – in **Table 3**. Table 3 shows the overall $L_{1\ (1minute)}$ and the contributing source as well as the $L_{1\ (1minute)}$ From DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 26 August 2014 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	7:00 pm	57	2.8/135	Frogs (57), traffic (36), **DCM (30)**
Kerr (37)	8:48 pm	48	2.8/132	Traffic (48), frogs (34), **DCM (28)**, other mine (26)
Skinner (40)	8:27 pm	44	2.1/124	Traffic (40), **DCM (40)**, frogs (37)
Robertson (37)	7:23 pm	40	1.9/137	Traffic (39), **DCM (29)**, frogs (27)
Sharman (35)	8:06 pm	47	2.3/134	Traffic (47), **DCM (30)**
Horder (36)	7:44 pm	44	1.6/108	Traffic (41), frogs (41), **DCM (27)**
Wilson (35)	9:10 pm	44	2.5/132	Traffic (43), frogs (38), **DCM inaudible**
Smith (35)	9:32 pm	34	4.3/149	Traffic (32), frogs (27), **DCM (26)**

Table 2
DCM Noise Monitoring Results – 26/27 August 2014 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	57	2.9/150	Frogs (57), traffic (31), **DCM (29)**, other mine (27)
Kerr (37)	11:46 pm	46	2.0/130	Traffic (46), frogs (33), **DCM (28)**
Skinner (39)	11:26 pm	43	2.4/127	**DCM (39)**, frogs (38), traffic (35), wind in trees (30)
Robertson (42)	10:21 pm	44	3.7/156	Train (42), traffic (39), **DCM (28)**, frogs (24)
Sharman (41)	11:04 pm	47	3.6/156	Traffic (47), **DCM (31)**
Horder (42)	10:45 pm	47	3.4/144	Frogs (46), traffic (36), **DCM (32)**
Wilson (36)	12:07 am	41	2.6/145	Traffic (40), frogs (33), **DCM inaudible**
Smith (36)	12:31 am	33	3.0/147	**DCM (32)**, traffic (26), frogs (25)

Table 3
DCM Noise Monitoring Results – 26/27 August 2014 (night)

Location (Criterion)	Time	dB(A), $L_{1\,(1min)}$	Wind speed/ direction	$L_{1\,(1\,min)}$ source	Identified Mine Sources ($L_{1\,(1\,min)}$)
Doherty (47)	10:00 pm	62	2.9/150	Frogs	Truck revs (34)
Kerr (47)	11:46 pm	53	2.0/130	Highway	Hum (31)
Skinner (47)	11:26 pm	42	2.4/127	Mine	Hum (42)
Robertson (47)	10:21 pm	49	3.7/156	Train	Hum (31)
Sharman (47)	11:04 pm	60	3.6/156	Highway	Hum (36)
Horder (47)	10:45 pm	50	3.4/144	Frogs	Hum (36)
Wilson (47)	12:07 am	49	2.6/145	Highway	n/a
Smith (47)	12:31 am	36	3.0/147	Mine	Hum (36)

The results in Tables 1 and 2 show that the noise criterion was not exceeded at any location.

Data from those times where DCM operations were audible were analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

The results in Table 3 show that the noise sleep disturbance criterion ($L_{1\,(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1\,(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1\,(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Neil Pennington
Acoustical Consultant

Review:

Ross Hodge
Acoustical Consultant

Independent Noise Monitoring Report September 2014

SPECTRUM ACOUSTICS
NOISE AND VIBRATION CONSULTANTS

26 September 2014

Ref: 03012/5402

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: SEPTEMBER 2014 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Wednesday 24th September 2014. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

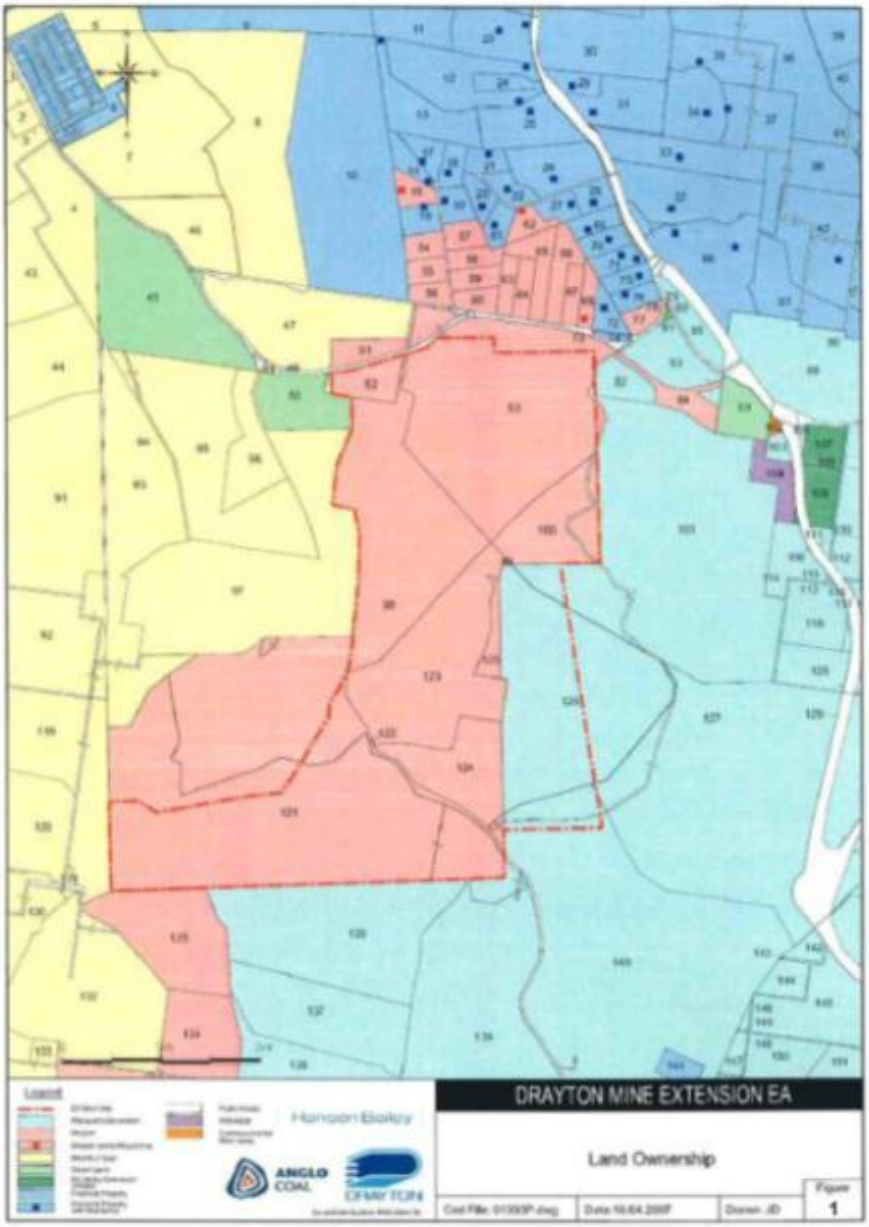
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Rooth Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257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Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-3** and night time $L_{1(1minute)}$ – approximated as measured L_{max} – in **Table 4**. Table 3 shows the overall $L_{1(1minute)}$ and the contributing source as well as the $L_{1(1minute)}$ From DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 24 September 2014 (Day)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	2:15 pm	40	0.7/310	Birds (40), traffic (27), **DCM (24)**
Kerr (36)	4:07 pm	47	2.0/316	Traffic (46), birds (39), **DCM inaudible**
Skinner (39)	3:43 pm	38	1.7/286	Birds (37), traffic (31), **DCM inaudible**
Robertson (36)	2:37 pm	41	1.4/293	Traffic (40), birds &insects (35), **DCM faintly audible**
Sharman (35)	3:21 pm	52	1.5/288	Traffic (52), birds (38), **DCM inaudible**
Horder (35)	3:00 pm	43	1.5/307	Birds (41), traffic (39), **DCM inaudible**
Wilson (35)	4: 37pm	40	1.9/293	Traffic (38), birds (32), tractor (32), **DCM inaudible**
Smith (35)	5:03 pm	39	2.3/290	Traffic (39), birds (24), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 24 September 2014 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:40 pm	40	1.5/299	Traffic (38), frogs & insects (36), **DCM inaudible**
Kerr (37)	8:32 pm	49	2.0/316	Traffic (49), frogs & insects (38), other mine (25), **DCM inaudible**
Skinner (40)	8:08 pm	46	1.7/286	Traffic (44), frogs & insects (42), other mine (28), **DCM inaudible**
Robertson (37)	7:02 pm	46	1.4/293	Traffic (46), frogs & insects (32), **DCM inaudible**
Sharman (35)	7:46 pm	51	1.5/288	Traffic (51), insects (29), **DCM inaudible**
Horder (36)	7:23 pm	53	1.5/307	Frogs & insects (52), traffic (46), **DCM inaudible**
Wilson (35)	8:56 pm	47	1.9/293	Frogs & insects (46), traffic (40), **DCM inaudible**
Smith (35)	9:23 pm	38	2.3/290	Traffic (36), frogs & insects (33), **DCM inaudible**

Table 3 DCM Noise Monitoring Results – 24/25 September 2014 (night)				
Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	42	2.4/302	Traffic (41), frogs & insects (35), other mine (27), **DCM faintly audible**
Kerr (37)	11:47 pm	42	2.7/269	Traffic (41), frogs & insects (31), **DCM (27)**, other mine (25)
Skinner (39)	11:26 pm	38	2.8/298	Traffic (34), frogs & insects (34), dog (30), **DCM faintly audible**
Robertson (42)	10:21 pm	42	2.5/282	Traffic (41), **DCM (32)**, frogs & insects (28)
Sharman (41)	11:03 pm	46	2.1/291	Traffic (46), insects (29), **DCM inaudible**
Horder (42)	10:42 pm	44	2.3/280	Traffic (41), frogs & insects (41), **DCM (28)**
Wilson (36)	12:08 am	42	2.1/282	Traffic (41), frogs & insects (35), train (28), **DCM inaudible**
Smith (36)	12:32 am	39	1.5/254	Traffic (38), frogs & insects (29), train (26), **DCM inaudible**

Table 4 DCM Noise Monitoring Results – 24/25 September 2014 (night)					
Location (Criterion)	Time	dB(A), $L_{1(1minute)}$	Wind speed/ direction	L_{A1} source	Identified Mine Sources ($L_{1(1\ min)}$)
Doherty (47)	10:00 pm	48	2.4/302	Highway	Hum (23)
Kerr (47)	11:47 pm	50	2.7/269	Highway	Hum (32)
Skinner (47)	11:26 pm	39	2.8/298	Bird	Hum (23)
Robertson (47)	10:21 pm	46	2.5/282	Highway	n/a
Sharman (47)	11:03 pm	56	2.1/291	Highway	n/a
Horder (47)	10:42 pm	51	2.3/280	Frogs	Hum (32)
Wilson (47)	12:08 am	49	2.1/282	Highway	n/a
Smith (47)	12:32 am	49	1.5/254	Highway	n/a

The results in Tables 1 to 4 show that the noise criterion was not exceeded at any location.

Data from those times where DCM operations were audible were analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

The results in Table 4 show that the noise sleep disturbance criteria ($L_{1(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Neil Pennington
Acoustical Consultant

Review:

Ross Hodge
Acoustical Consultant

SPECTRUM ACOUSTICS
NOISE AND VIBRATION CONSULTANTS

10 October 2014

Ref: 03012/5424

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: OCTOBER 2014 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Wednesday 8th October 2014. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
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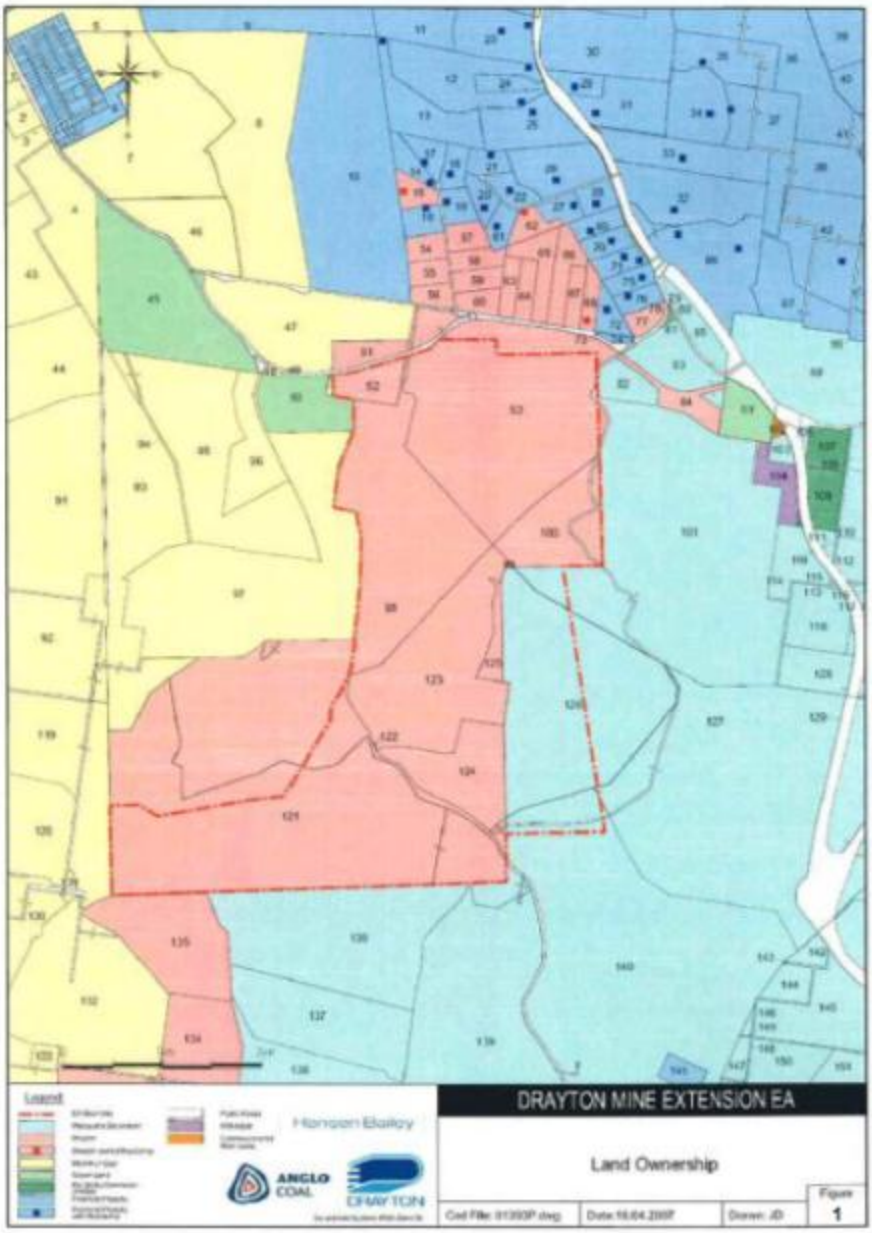
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Routh Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257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Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-2** and night time $L_{1\ (1minute)}$ – approximated as measured L_{max} – in **Table 3**. Table 3 shows the overall $L_{1\ (1minute)}$ and the contributing source as well as the $L_{1\ (1minute)}$ From DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 8 October 2014 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	7:04 pm	44	4.0/128	Wind in trees (42), birds (36), **DCM (35)**, traffic (33)
Kerr (37)	8:53 pm	44	4.2/133	Traffic (44), **DCM (29)**, insects (27)
Skinner (40)	8:29 pm	45	4.2/132	Train (42), frogs & insects (39), **DCM (36)**, traffic (34), wind in trees (34)
Robertson (37)	7:27 pm	44	3.5/128	Traffic (42), wind in trees (37), birds (32), **DCM (28)**
Sharman (35)	8:07 pm	48	4.7/139	Traffic (48), wind in trees (35), **DCM inaudible**
Horder (36)	7:48 pm	49	4.1/133	Frogs (47), traffic (43), wind in trees (35), **DCM (29)**
Wilson (35)	9:14 pm	47	3.9/132	Frogs & insects (46), traffic (39), **DCM inaudible**
Smith (35)	9:37 pm	40	2.7/129	Frogs & insects (36), wind (36), traffic (32), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 8/9 October 2014 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:02 pm	42	3.5/130	Train (39), frogs & insects (35), **DCM (34)**, traffic (32)
Kerr (37)	11:43 pm	42	2.1/144	Traffic (41), frogs & insects (31), **DCM (30)**
Skinner (39)	11:22 pm	41	2.8/145	**DCM (37)**, traffic (37), frogs & insects (33)
Robertson (42)	10:23 pm	43	3.3/135	Traffic (40), train (40), frogs & insects (28), **DCM inaudible**
Sharman (41)	11:02 pm	43	2.3/130	Traffic (43), frogs & insects (25), **DCM inaudible**
Horder (42)	10:43 pm	46	2.6/137	Frogs & insects (45), traffic (37), **DCM (30)**
Wilson (36)	12:06 am	39	1.8/142	Frogs & insects (37), traffic (35), **DCM inaudible**
Smith (36)	12:30 am	35	1.1/120	Train (32), frogs & insects (28), power plant (27) traffic (25), **DCM inaudible**

Table 3
DCM Noise Monitoring Results – 8/9 October 2014 (night)

Location (Criterion)	Time	dB(A), $L_{1\,(1min)}$	Wind speed/ direction	$L_{1\,(1\,min)}$ source	Identified Mine Sources ($L_{1\,(1\,min)}$)
Doherty (47)	10:02 pm	52	3.5/130	Train	Truck revs (40)
Kerr (47)	11:43 pm	51	2.1/144	Highway	Hum (33)
Skinner (47)	11:22 pm	47	2.8/145	Highway	Load dumped (45)
Robertson (47)	10:23 pm	48	3.3/135	Train	n/a
Sharman (47)	11:02 pm	55	2.3/130	Highway	n/a
Horder (47)	10:43 pm	54	2.6/137	Frogs	Hum (34)
Wilson (47)	12:06 am	43	1.8/142	Highway	n/a
Smith (47)	12:30 am	37	1.1/120	Train	n/a

The results in Tables 1 and 2 show that the noise criterion was not exceeded at any location.

Data from those times where DCM operations were audible were analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

The results in Table 3 show that the noise sleep disturbance criterion ($L_{1\,(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1\,(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1\,(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Neil Pennington
Acoustical Consultant

Review:

Ross Hodge
Acoustical Consultant

Independent Noise Monitoring Report November 2014

SPECTRUMACOUSTICS
NOISE AND VIBRATION CONSULTANTS

17 November 2014

Ref: 03012/5472

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: NOVEMBER 2014 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Wednesday 5th November 2014. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

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Location R42: Smith*
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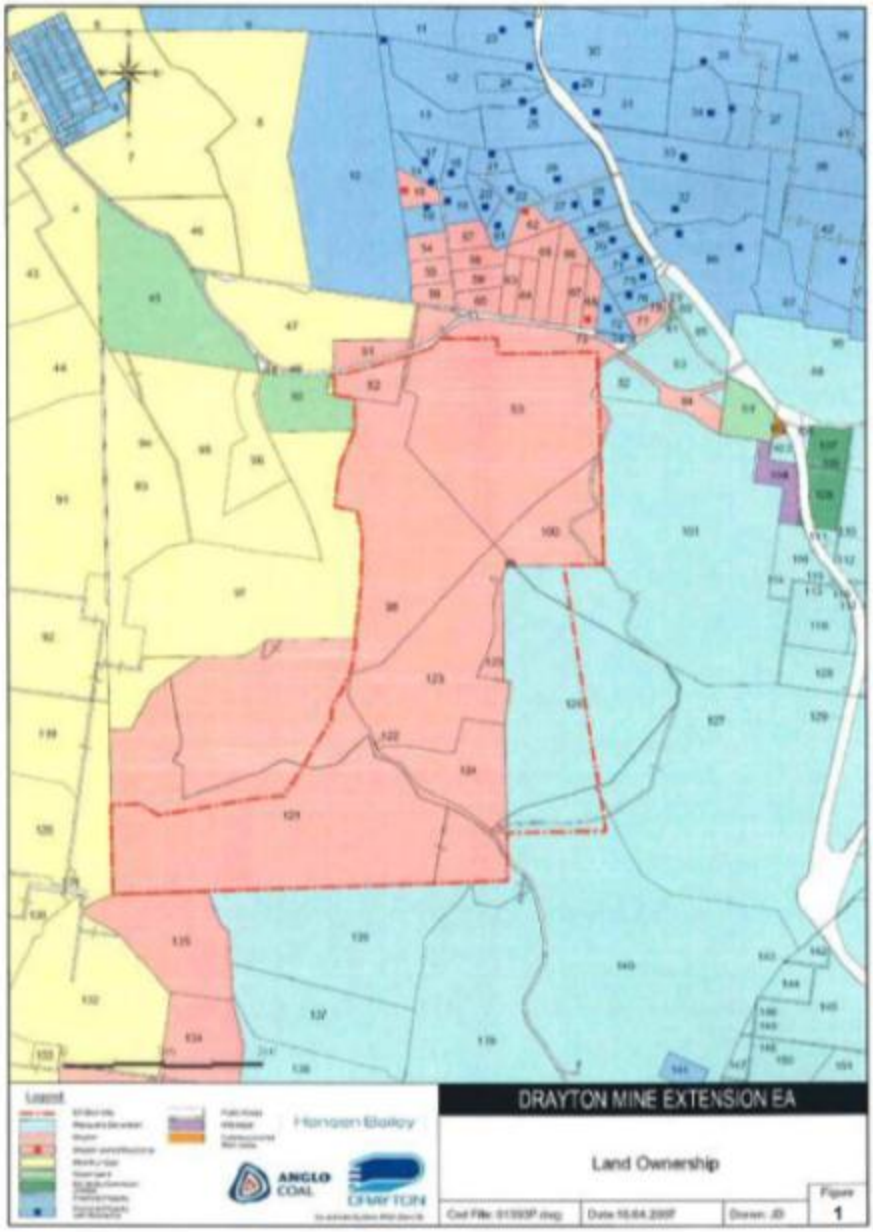
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited | 1 Routh Street, Cardiff NSW 2285 | Phone: (02) 4954 2276
ABN: 40 106 435 554 | Fax: (02) 4954 2257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Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-2** and night time $L_{1\ (1minute)}$ – approximated as measured L_{max} – in **Table 3**. Table 3 shows the overall $L_{1\ (1minute)}$ and the contributing source as well as the $L_{1\ (1minute)}$ From DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 5 November 2014 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	7:08 pm	41	0.9/244	Traffic (39), birds & insects (36), **DCM inaudible**
Kerr (37)	8:17 pm	46	2.6/131	Traffic (45), frogs & insects (40), **DCM inaudible**
Skinner (40)	6:22 pm	45	1.7/179	Traffic (44), birds (38), wind (28), **DCM inaudible**
Robertson (37)	7:30 pm	47	1.2/186	Birds (45), traffic (42), frogs & insects (33), **DCM inaudible**
Sharman (35)	6:45 pm	54	1.5/297	Traffic (52), birds (49), wind in trees (33), **DCM inaudible**
Horder (36)	7:52 pm	43	1.5/100	Frogs & insects (41), traffic (38), **DCM (26)**
Wilson (35)	8:39 pm	42	2.4/129	Frogs & insects (39), traffic (37), wind (33), **DCM inaudible**
Smith (35)	9:05 pm	34	2.5/129	Frogs & insects (30), traffic (29), plane (28), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 5/6 November 2014 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	37	0.7/199	Frogs & insects (34), traffic (33), **DCM (26)**
Kerr (37)	11:42 pm	41	0.2/217	Traffic (40), frogs & insects (34), other mine (26), **DCM inaudible**
Skinner (39)	11:20 pm	39	0.7/237	Frogs & insects (37), traffic (32), other mine (27), **DCM (24)**
Robertson (42)	10:21 pm	37	0.4/204	Traffic (37), frogs & insects (25), **DCM inaudible**
Sharman (41)	11:01 pm	43	0.6/327	Traffic (43), frogs & insects (29), **DCM (26)**
Horder (42)	10:42 pm	45	0.6/252	Frogs & insects (44), traffic (37), **DCM inaudible**
Wilson (36)	12:05 am	44	1.1/285	Frogs & insects (44), traffic (33), **DCM inaudible**
Smith (36)	12:29 am	37	1.8/313	Train (34), traffic (32), frogs & insects (29), **DCM inaudible**

Table 3 DCM Noise Monitoring Results – 5/6 November 2014 (night)					
Location (Criterion)	Time	dB(A), $L_{1\,(1\,min)}$	Wind speed/ direction	$L_{1\,(1\,min)}$ source	Identified Mine Sources ($L_{1\,(1\,min)}$)
Doherty (47)	10:00 pm	42	0.7/199	Highway	Hum (28)
Kerr (47)	11:42 pm	48	0.2/217	Highway	n/a
Skinner (47)	11:20 pm	42	0.7/237	Frogs	Hum (27)
Robertson (47)	10:21 pm	42	0.4/204	Highway	n/a
Sharman (47)	11:01 pm	53	0.6/327	Highway	Hum (28)
Horder (47)	10:42 pm	52	0.6/252	Frogs	n/a
Wilson (47)	12:05 am	48	1.1/285	Highway	n/a
Smith (47)	12:29 am	43	1.8/313	Highway	n/a

The results in Tables 1 and 2 show that the noise criterion was not exceeded at any location.

Data from those times where DCM operations were audible were analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

The results in Table 3 show that the noise sleep disturbance criterion ($L_{1\,(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1\,(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1\,(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Neil Pennington
Acoustical Consultant

Review:

Ross Hodge
Acoustical Consultant

SPECTRUM ACOUSTICS
NOISE AND VIBRATION CONSULTANTS

7 January 2015

Ref: 03012/5569

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: DECEMBER 2014 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Wednesday 17th December 2014. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

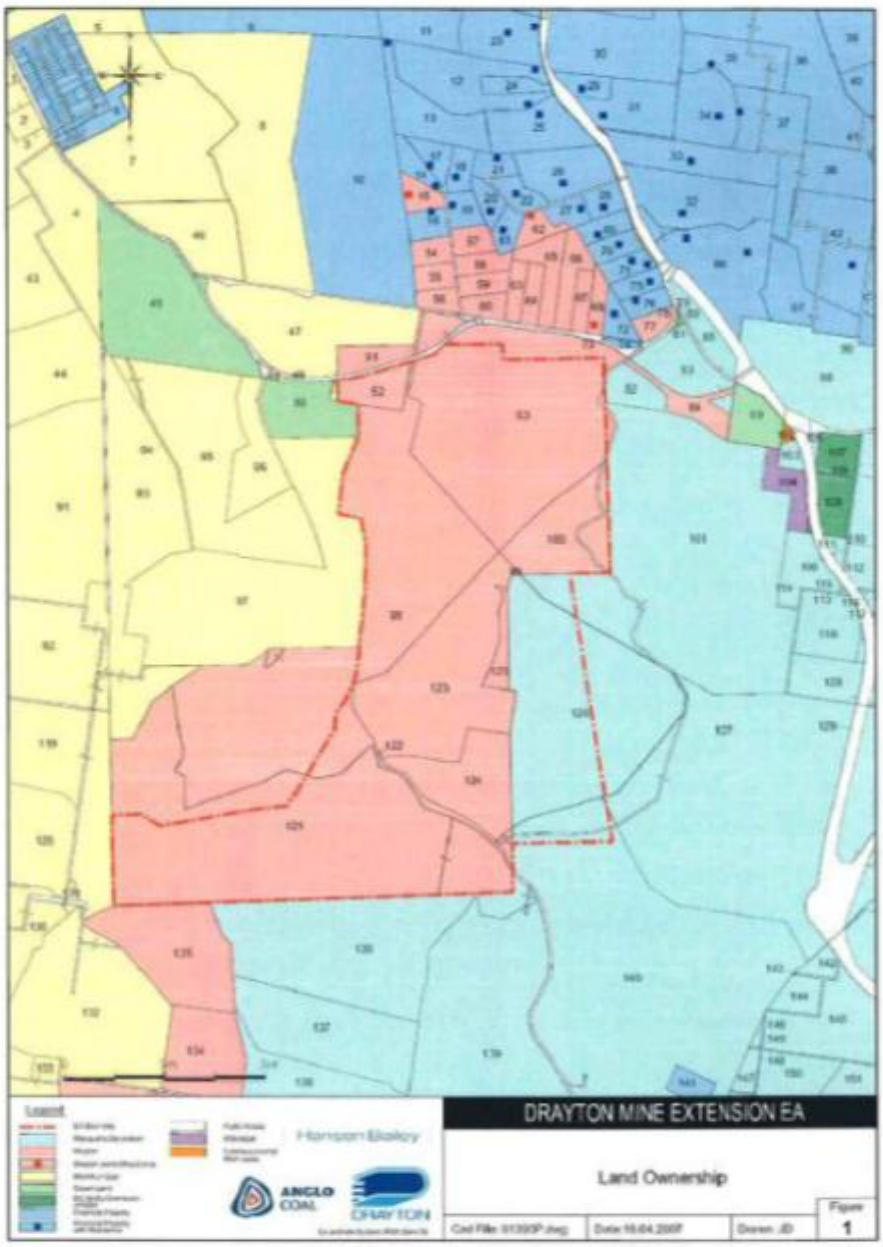
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Routh Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-3** and night time $L_{1(1minute)}$ – approximated as measured L_{max} – in **Table 4**. Table 3 shows the overall $L_{1(1minute)}$ and the contributing source as well as the $L_{1(1minute)}$ From DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 17 December 2014 (Day)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	3:08 pm	55	5.6/121	Wind (55), birds (41), **DCM inaudible**
Kerr (36)	4:57 pm	58	6.1/132	Wind (58), traffic (40), birds & insects (31), **DCM inaudible**
Skinner (39)	4:35 pm	56	5.6/124	Wind (56), birds (36), **DCM inaudible**
Robertson (36)	3:30 pm	55	6.2/126	Birds (53), traffic (48), wind (48), **DCM faintly audible**
Sharman (35)	4:11 pm	56	6.0/139	Traffic (55), wind (50), birds (34), **DCM faintly audible**
Horder (35)	3:50 pm	54	6.5/135	Traffic (51), birds (51), wind (45), **DCM (26)**
Wilson (35)	5:21pm	54	6.7/133	Wind (54), birds (41), traffic (27), **DCM inaudible**
Smith (35)	5:44 pm	53	6.1/131	Wind (53), birds (29), traffic (25), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 17 December 2014 (Evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:46 pm	51	6.3/126	Wind (50), traffic (39), birds & insects (38), **DCM inaudible**
Kerr (37)	8:33 pm	52	4.7/137	Traffic (51), insects (44), wind (38), **DCM inaudible**
Skinner (40)	8:11 pm	52	4.8/136	Wind (52), birds & insects (40), traffic (27), **DCM inaudible**
Robertson (37)	7:07 pm	55	5.0/132	Birds & insects (52), wind (50), traffic (48), **DCM inaudible**
Sharman (35)	7:47 pm	53	5.6/132	Traffic (53), birds & insects (50), wind (49), **DCM inaudible**
Horder (36)	7:27 pm	57	5.2/130	Birds & insects (57), wind (44), traffic (40), **DCM inaudible**
Wilson (35)	8:58 pm	48	4.6/131	Wind (46), frogs & insects (43), traffic (30), **DCM inaudible**
Smith (35)	9:21 pm	50	4.3/131	Wind (50), frogs & insects (33), traffic (24), **DCM inaudible**

Table 3 DCM Noise Monitoring Results – 17/18 December 2014 (Night)				
Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	48	4.7/129	Wind (46), frogs & insects (44), traffic (28), DCM faintly audible
Kerr (37)	11:42 pm	48	4.0/126	Traffic (46), frogs & insects (44), wind (28), DCM faintly audible
Skinner (39)	11:21 pm	46	4.1/131	Wind (43), frogs & insects (42), DCM (28), traffic (25)
Robertson (42)	10:20 pm	50	5.1/132	Frogs & insects (47), traffic (45), wind (40), DCM inaudible
Sharman (41)	10:59 pm	52	4.4/127	Traffic (51), frogs & insects (46), wind (33), DCM inaudible
Horder (42)	10:40 pm	49	4.2/123	Frogs & insects (46), traffic (44), wind (40), DCM (26)
Wilson (36)	12:06 am	48	3.6/123	Frogs & insects (48), traffic (29), wind (26), DCM inaudible
Smith (36)	12:31 am	45	3.5/132	Wind (44), insects (37), traffic (24), DCM inaudible

Table 4 DCM Noise Monitoring Results – 17/18 December 2014 (night)					
Location (Criterion)	Time	dB(A), $L_{1(1minute)}$	Wind speed/ direction	L_{A1} source	Identified Mine Sources ($L_{1\,(1\,min)}$)
Doherty (47)	10:00 pm	48	4.7/129	Frogs	Hum (21)
Kerr (47)	11:42 pm	55	4.0/126	Highway	Hum (23)
Skinner (47)	11:21 pm	50	4.1/131	Wind	n/a
Robertson (47)	10:20 pm	51	5.1/132	Frogs	n/a
Sharman (47)	10:59 pm	58	4.4/127	Highway	n/a
Horder (47)	10:40 pm	51	4.2/123	Frogs	Hum (29)
Wilson (47)	12:06 am	50	3.6/123	Frogs	n/a
Smith (47)	12:31 am	49	3.5/132	Wind	n/a

The results in Tables 1 to 3 show that the applicable operational noise criteria were not exceeded at any location or at any time throughout the monitoring survey.

Data from those times where DCM operations were audible were analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

The results in Table 4 show that the noise sleep disturbance criteria ($L_{1(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

We trust this report fulfils your requirements at this time, however, should you require additional information, or assistance, please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Neil Pennington
Acoustical Consultant

Review:

Ross Hodge
Acoustical Consultant

Table 55: Real Time Noise Monitoring – *Leq Selected Source: Leq Period* (All sources from 180º - 225º)

January	Day dB(A)	Evening dB(A)	Night dB(A)
1-Jan-14	28.9	36	36.5
2-Jan-14	32.6	34.3	35.8
3-Jan-14	31.6	35.4	32.3
4-Jan-14	34	38.8	33.6
5-Jan-14	33.2	33.1	33.4
6-Jan-14	41.9	35	35.2
7-Jan-14	31.7	33.7	31.9
8-Jan-14	28.3	28.7	27.4
9-Jan-14	26.1	30.9	32.1
10-Jan-14	26.5	30.5	28.8
11-Jan-14	24.1	27.3	31.8
12-Jan-14	27	30.3	36.4
13-Jan-14	26.1	31.6	31.8
14-Jan-14	28.6	27.2	33.7
15-Jan-14	27.7	30.9	33.4
16-Jan-14	26.5	29.8	27.5
17-Jan-14	24.1	33.5	38.4
18-Jan-14	30.2	35.2	37.4
19-Jan-14	29.4	37.1	29.3
20-Jan-14	27.7	32.6	35.4
21-Jan-14	25.1	31.4	30.6
22-Jan-14	28.4	30.4	30.3
23-Jan-14	35.7	35.7	30.5
24-Jan-14	34.1	38	38.2
25-Jan-14	31.9	35.5	31.4
26-Jan-14	29	31.8	35.4
27-Jan-14	26.6	31	37.2
28-Jan-14	29	33.7	40.7
29-Jan-14	26.7	27.3	36.4
30-Jan-14	23	28.9	30.3
31-Jan-14	27.9	31.1	34.7

February	Day dB(A)	Evening dB(A)	Night dB(A)
01-Feb-14	23.6	32.1	33
02-Feb-14	27.4	41.5	34.2
03-Feb-14	25	28.1	33.2
04-Feb-14	34.7	34.5	32.6
05-Feb-14	27.7	28.9	25.1
06-Feb-14	29.1	36.7	35
07-Feb-14	29.5	37.3	37.9
08-Feb-14	31	31.5	33.9
09-Feb-14	30.3	30.7	33.7
10-Feb-14	26.1	29.7	30
11-Feb-14	24.9	31.6	31.5
12-Feb-14	27.3	33.1	38.3
13-Feb-14	25.1	32.5	32.7
14-Feb-14	27.9	26.1	29.8
15-Feb-14	28.4	32.5	34.4
16-Feb-14	30.8	28.2	35
17-Feb-14	26	25.9	26.6
18-Feb-14	25.3	30.4	29.8
19-Feb-14	34.9	25.5	31.5
20-Feb-14	31.4	37.2	33.8
21-Feb-14	24.5	36.7	32.1
22-Feb-14	30.3	27.5	27.4
23-Feb-14	31.2	28.8	34.6
24-Feb-14	26.6	36.5	32.9
25-Feb-14	25.7	34	37.2
26-Feb-14	31.3	35.5	35.1
27-Feb-14	27.4	33.8	30.7
28-Feb-14	31.1	32.3	30

March	Day dB(A)	Evening dB(A)	Night dB(A)
01-Mar-14	27.6	25.1	28.3
02-Mar-14	27.9	33.6	36.3
03-Mar-14	25.6	27.6	27.1
04-Mar-14	25.2	29.2	29.5
05-Mar-14	33.3	35.9	32.4
06-Mar-14	26.9	26.8	29.6
07-Mar-14	28.5	30.9	32.3
08-Mar-14	25.5	31.6	33.9
09-Mar-14	29	32.9	37.5
10-Mar-14	25.8	24.7	26.4
11-Mar-14	22.8	24.5	31.2
12-Mar-14	24.6	22.8	29.9
13-Mar-14	22.3	25.4	25.7
14-Mar-14*	36.8	*BarnOwl down.*	
15-Mar-14*		*BarnOwl down.*	
16-Mar-14*		*BarnOwl down.*	
17-Mar-14	27.3	31.2	30.4
18-Mar-14	31.7	29.4	33.4
19-Mar-14	26.7	27.3	30.9
20-Mar-14	26.3	28.6	30.7
21-Mar-14	30.3	24.2	26.5
22-Mar-14	21.9	30.3	29.4
23-Mar-14	30.6	37.5	26.2
24-Mar-14	34.4	34.1	30.4
25-Mar-14	26.1	28.3	32.1
26-Mar-14	25.7	26.3	30.3
27-Mar-14	32.5	23.9	26.2
28-Mar-14	32	27.8	27.7
29-Mar-14	30.3	28.6	33.3
30-Mar-14	27.4	27.9	32
31-Mar-14	27.1	30.6	32

April	Day dB(A)	Evening dB(A)	Night dB(A)
01-Apr-14	30.3	32.3	34.9
02-Apr-14	30.1	31.6	30.9
03-Apr-14	27.2	39.4	34.9
04-Apr-14	27.8	26	24.3
05-Apr-14	25.1	26	27.6
06-Apr-14	26.7	25.2	26.5
07-Apr-14	26.8	22.9	25.1
08-Apr-14	26.5	27	28.4
09-Apr-14	32.1	35.4	26.7
10-Apr-14	29.6	30.3	34.4
11-Apr-14	35.2	37.8	37
12-Apr-14	35.9	29.8	32
13-Apr-14	28.3	26.7	29.8
14-Apr-14	29.7	26.2	33.4
15-Apr-14	25.5	27.2	30.7
16-Apr-14	32.3	29.6	31.2
17-Apr-14	28	27.9	33
18-Apr-14	27.7	36.6	35.3
19-Apr-14	34.8	38.8	35.2
20-Apr-14	27.4	37.3	32.8
21-Apr-14	30	33.7	35.6
22-Apr-14	33.1	34.6	38
23-Apr-14	31.3	33.7	37.6
24-Apr-14	29.2	31.2	42.7
25-Apr-14	32.3	35.7	38
26-Apr-14	33.5	35.6	38.5
27-Apr-14	31.5	30	28.2
28-Apr-14	29.2	31.5	32.5
29-Apr-14	27.3	23	30.2
30-Apr-14	30.3	33.7	35.5

** Power outage resulting from electrical storm.*

May	Day dB(A)	Evening dB(A)	Night dB(A)
01-May-14	29.8	29.9	30.5
02-May-14	35.1	38.8	35.8
03-May-14	36.9	41.7	33.4
04-May-14	39.6	39.8	42.3
05-May-14	33.4	32.7	41.2
06-May-14	27.5	39.4	37.4
07-May-14	34	34.2	34.8
08-May-14	35.5	30.2	35.6
09-May-14	34.1	39	38.7
10-May-14	31.9	34.9	38
11-May-14	30.6	31.9	35.5
12-May-14	28.9	30	29.8
13-May-14	29.3	31.6	31.2
14-May-14	29.1	32.9	35.3
15-May-14	28.9	35.8	37
16-May-14	27	34.7	38.1
17-May-14	32.6	34.3	33.5
18-May-14	29.8	26.8	33
19-May-14	32.4	28.6	32.5
20-May-14	32.6	33.3	30.6
21-May-14	28.4	34	38.3
22-May-14	35.7	33.7	39.3
23-May-14	29.1	33.3	35.5
24-May-14	34.7	33.5	36.2
25-May-14	38.6	36.5	34
26-May-14	33	33.2	35.1
27-May-14	30.7	31.2	39.1
28-May-14	39.4	41.8	37.7
29-May-14	28.3	28.5	29.7
30-May-14	28.5	25	23.4
31-May-14	25.9	32	32.4

June	Day dB(A)	Evening dB(A)	Night dB(A)
01-Jun-14	32.7	35	33
02-Jun-14	33.3	38.2	34.2
03-Jun-14	42.7	38.3	42.9
04-Jun-14	30.3	37	36.6
05-Jun-14	30.7	30.8	38.6
06-Jun-14	36.1	35.1	34.1
07-Jun-14	31.7	31.1	37.6
08-Jun-14	32.7	32.5	35.5
09-Jun-14	29.8	31.4	31
10-Jun-14	28.9	29.9	29.8
11-Jun-14	28.4	29.9	31.4
12-Jun-14	30.4	30.1	32
13-Jun-14	29.1	24.9	25.5
14-Jun-14	25.5	29.7	26.2
15-Jun-14	32.8	31.6	29.2
16-Jun-14	31.8	27.2	28.3
17-Jun-14	33.8	33.4	30.7
18-Jun-14	31.3	29.7	30.4
19-Jun-14	35.5	41.5	40.1
20-Jun-14	28.5	35.5	35.5
21-Jun-14	39.9	35.1	43.4
22-Jun-14	33.9	35.5	37.9
23-Jun-14	32.5	31.7	35.5
24-Jun-14	37.4	33.7	34.4
25-Jun-14	37.2	33.7	33.3
26-Jun-14	32.8	30.7	31.1
27-Jun-14	32.1	32.3	35.3
28-Jun-14	33.4	31.2	36.6
29-Jun-14	36.4	34.3	33.7
30-Jun-14	35.6	34.5	35.9

July	Day dB(A)	Evening dB(A)	Night dB(A)
01-Jul-14	35.1	33	41.7
02-Jul-14	31.1	44.9	31.1
03-Jul-14	33.7	35	42.2
04-Jul-14	34.8	36	40.9
05-Jul-14	37.5	28.4	25.2
06-Jul-14	28.5	32.3	34.3
07-Jul-14	31.8	34.3	33.7
08-Jul-14	31.8	35.3	43.3
09-Jul-14	33.7	39.2	39.2
10-Jul-14	40	33.4	34.2
11-Jul-14	33.3	34	32.1
12-Jul-14	33.9	42.1	34.2
13-Jul-14	26.8	31.6	41.6
14-Jul-14	30.9	25.5	36
15-Jul-14	30.1	30.8	37.2
16-Jul-14	39.2	40.7	39.7
17-Jul-14	37.7	39.7	38
18-Jul-14	36.3	25.6	31.7
19-Jul-14	29	29.4	28.7
20-Jul-14	26.2	26.3	30.4
21-Jul-14	31.3	26.6	29.3
22-Jul-14	28.2	33.5	39.7
23-Jul-14	31.7	31.5	39.3
24-Jul-14	30.4	42	39.1
25-Jul-14	40.2	30.5	43
26-Jul-14	35.9	42.4	31.2
27-Jul-14	31.4	43.4	33.6
28-Jul-14	32.3	32.3	40.1
29-Jul-14	34	37.8	42.4
30-Jul-14	35	42.4	39.6
31-Jul-14	33.9	37.8	31.6

August	Day dB(A)	Evening dB(A)	Night dB(A)
01-Aug-14	39.8	41.1	*BarnOwl down.*
02-Aug-14	*BarnOwl down.*		
03-Aug-14	*BarnOwl down.*		
04-Aug-14	*BarnOwl down.*		
05-Aug-14	*BarnOwl down.*		
06-Aug-14	*BarnOwl down.*		
07-Aug-14	*BarnOwl down.*		
08-Aug-14	*BarnOwl down.*		
09-Aug-14	*BarnOwl down.*		
10-Aug-14	*BarnOwl down.*		
11-Aug-14	*BarnOwl down.*		
12-Aug-14	*BarnOwl down.*		
13-Aug-14	*BarnOwl down.*		
14-Aug-14	*BarnOwl down.*		
15-Aug-14	*BarnOwl down.*		
16-Aug-14	*BarnOwl down.*		
17-Aug-14	*BarnOwl down.*		
18-Aug-14	*BarnOwl down.*		
19-Aug-14	*BarnOwl down.*		
20-Aug-14	*BarnOwl down.*		
21-Aug-14	*BarnOwl down.*		
22-Aug-14	*BarnOwl down.*		
23-Aug-14	*BarnOwl down.*		
24-Aug-14	*BarnOwl down.*		
25-Aug-14	*BarnOwl down.*		
26-Aug-14	*BarnOwl down.*		
27-Aug-14	43.7	37	31
28-Aug-14	35.1	37.3	37.1
29-Aug-14	35.4	40.1	34.7
30-Aug-14	33.2	30.7	31.8
31-Aug-14	29.7	33	35.8

BarnOwl experienced catastrophic program failure on the night of 1st August, repaired by 26th August

September	Day dB(A)	Evening dB(A)	Night dB(A)
01-Sep-14	35.2	32.4	34.3
02-Sep-14	38.1	43	40.9
03-Sep-14	42.4	38.3	38.2
04-Sep-14	36.7	41.7	37.4
05-Sep-14	37.6	35	35
06-Sep-14	28.9	33.8	36.1
07-Sep-14	31	31.1	38.7
08-Sep-14	33.8	35.2	40.1
09-Sep-14	33.5	33.1	34.3
10-Sep-14	35.3	38.9	38.1
11-Sep-14	34	38.4	41
12-Sep-14	35.2	40.5	32.8
13-Sep-14	30.1	27.4	33.1
14-Sep-14	33.3	43.5	36.9
15-Sep-14	35.3	34.5	38
16-Sep-14	39.2	40.7	39.2
17-Sep-14	39.3	40.9	44.1
18-Sep-14	35.9	39.1	41.7
19-Sep-14	37.8	35.3	38.4
20-Sep-14	32.5	33	38.3
21-Sep-14	37.6	31.9	36.1
22-Sep-14	32.2	33.3	39.8
23-Sep-14	31.5	33.7	34.1
24-Sep-14	35.7	35.1	37
25-Sep-14	35.4	34.3	36.4
26-Sep-14	33.2	32.8	32.1
27-Sep-14	33.9	30.3	41
28-Sep-14	34.6	37.7	41.1
29-Sep-14	34	34.1	36.1
30-Sep-14	31.6	28.9	37.7

October	Day dB(A)	Evening dB(A)	Night dB(A)
01-Oct-14	34.2	29.5	34.1
02-Oct-14	32	34.3	35.6
03-Oct-14	33.8	34.7	35.5
04-Oct-14	30	41.2	38.5
05-Oct-14	36.9	46.5	35.7
06-Oct-14	31.6	32.5	35.8
07-Oct-14	39.2	36.5	38
08-Oct-14	34.7	40.1	36
09-Oct-14	30.4	36.9	38.4
10-Oct-14	34.8	35.9	31.1
11-Oct-14	33.8	29.9	38.6
12-Oct-14	34.8	35	39.5
13-Oct-14	35.8	30.7	35.5
14-Oct-14	40.2	39.6	38.6
15-Oct-14	42.1	43.4	42
16-Oct-14	39.3	46	39.8
17-Oct-14	31.1	30.8	33
18-Oct-14	31	28.4	32.2
19-Oct-14	29.9	33.7	35.8
20-Oct-14	32.9	28.3	33.6
21-Oct-14	31.6	29.7	30.4
22-Oct-14	32.6	35.8	36.5
23-Oct-14	35.5	37.4	40.6
24-Oct-14	34.4	36.3	34.3
25-Oct-14	29.5	30.3	36.5
26-Oct-14	36.3	34.9	36.3
27-Oct-14	38.9	38.6	38.5
28-Oct-14	38.2	38.5	40.3
29-Oct-14	36.4	37.4	36.2
30-Oct-14	39.2	39.4	38
31-Oct-14	34.5	*BarnOwl down.*	

November	Day dB(A)	Evening dB(A)	Night dB(A)
01-Nov-14		*BarnOwl down.*	
02-Nov-14		*BarnOwl down.*	
03-Nov-14		*BarnOwl down.*	
04-Nov-14		*BarnOwl down.*	
05-Nov-14		*BarnOwl down.*	
06-Nov-14		*BarnOwl down.*	
07-Nov-14		*BarnOwl down.*	
08-Nov-14		*BarnOwl down.*	
09-Nov-14		*BarnOwl down.*	
10-Nov-14		*BarnOwl down.*	
11-Nov-14	32.8	30.5	36.7
12-Nov-14	34.0	36.1	36.4
13-Nov-14	33.5	36.9	35.4
14-Nov-14	35.8	31.7	32.4
15-Nov-14	34.4	42.0	29.2
16-Nov-14	38.4	44.5	40.6
17-Nov-14	33.6	36.3	33.8
18-Nov-14	32.3	31.4	32
19-Nov-14	32	31	33.9
20-Nov-14	32.7	31.2	39.3
21-Nov-14	33.1	*BarnOwl down.*	
22-Nov-14		*BarnOwl down.*	
23-Nov-14		*BarnOwl down.*	
24-Nov-14		*BarnOwl down.*	
25-Nov-14	34.1	34.5	38.1
26-Nov-14	33.5	39.9	33.3
27-Nov-14	33.6	38.7	33.5
28-Nov-14	33.2	34.8	36.6
29-Nov-14	31.4	29	36.4
30-Nov-14	31.1	33.3	38.2

December	Day dB(A)	Evening dB(A)	Night dB(A)
1/12/2014	34.8	39.6	39.7
2/12/2014	34.7	34.6	35.4
3/12/2014	37.8	35.1	31.9
4/12/2014	33.2	39.1	37.3
5/12/2014	36.6	37.5	34.2
6/12/2014	35.6	33.1	34.5
7/12/2014	34.4	29.4	36.2
8/12/2014	43.7	43.3	34.2
9/12/2014	33.9	34.3	35.9
10/12/2014	36.1	38.4	35.8
11/12/2014	36.1	37.4	37.5
12/12/2014	38.7	36.1	35.1
13/12/2014	31.1	30.2	39.1
14/12/2014	30.1	38.5	36.1
15/12/2014	33.6	32.7	34.8
16/12/2014	36.6	30.0	36.6
17/12/2014	34.9	33.7	32.9
18/12/2014	33.1	33.1	41.7
19/12/2014	35.1	33.3	31.7
20/12/2014	32.4	31.5	34.4
21/12/2014	32.5	31.0	36.2
22/12/2014	34.7	32.6	36.7
23/12/2014	33.6	34.9	34.2
24/12/2014	38.2	37.2	33.6
25/12/2014	26.7	48.4	19.7
26/12/2014	31.3	31.5	32.9
27/12/2014	33.9	32.1	36.8
28/12/2014	29.7	31.2	30.2
29/12/2014	31.2	31.3	36.5
30/12/2014	35.5	39.8	36.9
31/12/2014	31.0	35.1	35.8

BarnOwl experienced two separate power outages resulting from electrical storms through November.

Appendix E: 2014 Blast Monitoring Results

Table 56: Blast Monitoring Results

Date	Location	Type	Antiene (AB) dB(L)	Antiene (R) mm/sec	DeBoer (AB) dB(L)	DeBoer (R) mm/sec	Sharman (AB) dB(L)	Sharman (R) mm/sec
04/01/14	SPE14	Overburden	95.3	0.06	97.8	0.19	96.8	0.14
06/01/14	SPE12	Parting	94.2	0.03	90.4	0.10	95.5	0.08
07/01/14	SPE12	Overburden	96.7	0.01	109.1	0.06	98.3	0.03
08/01/14	SPE12	Pre-split	104.5	0.05	107.6	0.07	94.0	0.12
13/01/14	SPW15	Overburden	94.7	0.04	106.5	0.16	94.1	0.14
17/01/14	SPE12	Overburden / Pre-split	90.6	0.05	92.1	0.12	89.3	0.05
18/01/14	SPE13/SPE09	Overburden / Pre-split	85.3	0.01	93.7	0.03	78.7	0.02
20/01/14	SPE08	Parting	88.3	0.01	87.8	0.02	85.0	0.01
20/01/14	SPW13	Pre-split	94.5	0.05	86.9	0.05	100.0	0.03
24/01/14	SPE14	Overburden	88.0	0.05	92.1	0.13	93.0	0.11
25/01/14	SPW13	Pre-split	95.7	0.03	105.9	0.03	79.9	0.03
29/01/14	SPW13	Parting	97.2	0.02	97.7	0.05	95.8	0.03
31/01/14	SPE09/SPE12	Overburden	96.1	0.05	98.0	0.15	96.4	0.10
01/02/14	SPE13	Trim	85.3	0.01	95.1	0.02	100.2	0.02
03/02/14	SPW13	Overburden	94.2	0.03	95.6	0.06	92.0	0.03
06/02/14	SPE13	Overburden	91.8	0.05	91.8	0.14	93.0	0.09
08/02/14	SPW13	Overburden	101.9	0.06	101.2	0.10	94.8	0.08
11/02/14	SPE12	Overburden	88.4	0.02	102.8	0.06	90.4	0.05
20/02/14	SPW15	Overburden	82.0	0.05	89.0	0.10	94.1	0.06

Date	Location	Type	Antiene (AB) dB(L)	Antiene (R) mm/sec	DeBoer (AB) dB(L)	DeBoer (R) mm/sec	Sharman (AB) dB(L)	Sharman (R) mm/sec
25/02/14	SPE10	Overburden	91.1	0.07	95.9	0.20	95.0	0.10
26/02/14	SPW	Trim	90.5	0.04	93.8	0.08	89.6	0.04
05/03/14	SPE10/SPE13	Overburden / Pre-split	86.4	0.09	85.8	0.44	85.9	0.09
08/03/14	SPE13/SPW13	Overburden / Pre-split	97.1	0.05	104.4	0.11	81.8	0.07
12/03/14	SPE12	Overburden	86.3	0.05	93.4	0.12	93.3	0.10
18/03/14	SPE13/SPE14	Overburden / Pre-split	95.6	0.06	96.2	0.26	95.0	0.14
21/03/14	SPE13	Overburden	90.1	0.05	92.8	0.11	93.7	0.10
25/03/14	SPE10	Parting	85.9	0.01	89.9	0.03	87.3	0.02
31/03/14	SPW13	Overburden	96.7	0.04	99.3	0.07	98.3	0.05
05/04/14	SPE13	Overburden / Pre-split	82.0	0.09	88.0	0.27	92.1	0.15
08/04/14	SPE13/SPE14	Overburden	87.8	0.07	91.3	0.22	91.9	0.19
10/04/14	SPE14	Overburden	87.6	0.08	91.5	0.28	90.7	0.10
10/04/14	SPE12	Trim	77.6	0.01	82.5	0.03	81.8	0.02
11/04/14	SPW13	Overburden	86.0	0.02	92.4	0.03	92.3	0.01
17/04/14	SPE10	Overburden	85.3	0.01	92.1	0.04	91.4	0.01
17/04/14	SPE14	Overburden	94.5	0.08	99.5	0.18	97.9	0.13
22/04/14	SPE12	Pre-split	81.2	0.09	89.3	0.16	88.9	0.17
24/04/14	SPE14	Overburden	98.5	0.10	101.9	0.36	101.9	0.19
28/04/14	SPW13	Overburden	90.8	0.03	96.3	0.06	95.3	0.03
28/04/14	SPE10	Overburden	89.7	0.02	94.4	0.06	92.4	0.02
06/05/14	SPE12	Overburden	94.8	0.12	97.6	0.32	92.1	0.17

Date	Location	Type	Antiene (AB) dB(L)	Antiene (R) mm/sec	DeBoer (AB) dB(L)	DeBoer (R) mm/sec	Sharman (AB) dB(L)	Sharman (R) mm/sec
09/05/14	SPE13	Overburden	89.0	0.10	93.5	0.16	92.1	0.18
10/05/14	SPE10	Parting	82.3	0.02	80.9	0.06	80.6	0.02
13/05/14	SPE14	Pre-split	81.8	0.06	90.3	0.19	94.6	0.10
14/05/14	NN13	Pre-split	91.2	0.75	91.7	0.17	97.0	0.20
17/05/14	SPE10	Parting	86.4	0.02	90.0	0.07	89.9	0.02
21/05/14	SPE14	Pre-split	84.2	0.08	95.8	0.15	90.8	0.11
26/05/14	SPE13	Pre-split	78.2	0.06	77.7	0.12	82.9	0.11
28/05/14	NN13	Through seam	98.5	1.40	106.0	0.47	101.8	0.19
29/05/14	SPE13	Overburden	91.3	0.04	96.2	0.10	91.4	0.07
30/05/14	SPW13	Pre-split	96.5	0.05	94.6	0.10	98.8	0.05
02/06/14	SPE12	Overburden	79.7	0.11	87.3	0.26	92.9	0.22
06/06/14	SPW13	Overburden	94.3	0.08	103.3	0.21	102.4	0.06
07/06/14	SPE14	Overburden	87.1	0.04	93.5	0.12	92.1	0.05
10/06/14	SPE14	Pre-split	84.8	0.04	95.7	0.14	94.3	0.06
10/06/14	SPE10/SPE13/SPE14	Trim/Overburden	92.5	0.03	-	-	97.0	0.07
13/06/14	SPE14	Overburden	87.7	0.04	92.5	0.07	96.2	0.05
16/06/14	SPW13	Pre-split	82.0	0.06	91.3	0.09	94.6	0.07
17/06/14	SPE12	Overburden	81.8	0.02	88.8	0.07	86.4	0.04
19/06/14	SPE14	Pre-split	85.7	0.04	92.6	0.07	92.0	0.04
20/06/14	SPW13	Overburden	89.9	0.07	92.6	0.13	85.2	0.07
21/06/14	SPE12	Overburden	74.4	0.01	80.9	0.02	88.1	0.01
21/06/14	SPE12	Overburden	75.6	0.00	79.3	0.00	93.7	0.00
23/06/14	NN14	Overburden	97.1	1.03	101.0	0.35	97.2	0.14

Date	Location	Type	Antiene (AB) dB(L)	Antiene (R) mm/sec	DeBoer (AB) dB(L)	DeBoer (R) mm/sec	Sharman (AB) dB(L)	Sharman (R) mm/sec
25/06/14	SPE14	Overburden	92.9	0.04	91.4	0.18	91.9	0.11
25/06/14	SPW13	Presplit	87.3	0.06	98.7	0.06	99.8	0.05
26/06/14	SPW13	Parting	92.2	0.04	99.5	0.09	93.3	0.11
01/07/14	SPW13	Overburden	96.8	0.08	95.2	0.20	95.3	0.09
04/07/14	SPW13	Overburden	80.4	0.07	87.7	0.12	97.4	0.06
09/07/14	SPW14	Overburden	104.0	0.09	97.7	0.19	96.9	0.10
09/07/14	SPE12	Overburden	82.1	0.02	85.0	0.09	90.0	0.04
11/07/14	SPE12	Parting	90.3	0.02	88.8	0.04	91.1	0.02
15/07/14	SPE14	Overburden	90.6	0.11	94.0	0.25	92.6	0.16
18/07/14	SPE14	Overburden	86.2	0.06	90.3	0.11	97.6	0.09
21/07/14	SPE 13	Pre-split	86.3	0.11	91.1	0.16	93.0	0.17
22/07/14	SPW13	Parting	90.5	0.02	92.0	0.04	89.8	0.01
25/07/14	SPE13	Overburden	84.9	0.08	92.2	0.34	91.9	0.21
30/07/14	SPE13/SPW14	Overburden	85.2	0.15	91.1	0.32	85.5	0.20
01/08/14	SPE12	Overburden	95.4	0.01	86.2	0.05	104.1	0.02
05/08/14	SPE14	Overburden	85.8	0.05	95.1	0.12	92.2	0.07
06/08/14	SPW13	Overburden	87.3	0.01	94.2	0.03	91.9	0.01
07/08/14	SPW13	Overburden	92.6	0.03	97.2	0.07	99.8	0.03
12/08/14	SPE12	Overburden	89.9	0.01	95.7	0.05	90.6	0.02
13/08/14	NN14	Overburden	106.4	1.35	99.9	0.45	93.9	0.15
18/08/14	SPW13	Overburden	88.8	0.01	95.7	0.03	92.6	0.02
25/08/04	NN	Overburden	95.5	0.58	93.7	0.59	92.3	0.23
26/08/14	EN01	Pre-split	96.5	0.30	102.4	0.33	105.0	0.32
28/08/14	SPE13	Pre-split	98.4	0.10	105.7	0.43	106.2	0.20

Date	Location	Type	Antiene (AB) dB(L)	Antiene (R) mm/sec	DeBoer (AB) dB(L)	DeBoer (R) mm/sec	Sharman (AB) dB(L)	Sharman (R) mm/sec
05/09/14	SPE14	Overburden	89.1	0.05	97.4	0.07	97.9	0.12
09/09/14	EN01	Overburden	92.3	0.20	92.2	0.37	90.2	0.25
16/09/14	SPE14	Overburden	97.9	0.19	100.4	0.38	111.6	0.28
17/09/14	SPW13	Overburden	94.7	0.02	102.7	0.04	99.6	0.02
18/09/14	SPE13	Parting	95.2	0.02	101.0	0.09	102.2	0.05
22/09/14	SPE14	Overburden	88.1	0.05	92.9	0.24	88.7	0.10
23/09/14	EN01	Trim	106.5	0.16	106.9	0.15	102.0	0.18
29/09/14	NN01	Trim/Pre-split	90.8	0.40	92.6	0.55	93.7	0.37
01/10/14	SPW13	Overburden	92.7	0.12	96.0	0.35	92.9	0.25
02/10/14	SPE14	Pre-split	84.8	0.10	91.7	0.15	90.5	0.11
03/10/14	SPW13	Parting	100.0	0.02	102.6	0.03	97.5	0.02
08/10/14	EN01	Overburden	102.8	0.12	103.8	0.24	100.8	0.30
10/10/14	SPE13	Parting	85.6	0.04	88.4	0.28	85.7	0.07
15/10/14	SPW13	Overburden	82.1	0.09	87.1	0.10	85.4	0.11
22/10/14	NN14	Overburden	106.9	2.09	99.6	0.54	97.3	0.31
22/10/14	SPW13	Overburden	81.2	0.08	87.8	0.11	82.1	0.10
29/10/14	SPE14	Overburden	103.8	0.16	104.6	0.54	100.0	0.34
30/10/14	SPW13	Overburden	87.6	0.03	94.3	0.08	89.9	0.07
03/11/14	SPE14	Pre-split	94.9	0.13	91.8	0.13	85.7	0.16
05/11/14	SPW13	Overburden	83.5	0.04	86.8	0.10	91.7	0.05
11/11/14	SPE14	Overburden	99.0	0.11	104.2	0.33	98.1	0.14
12/11/14	SPE14	Overburden	93.5	0.13	94.0	0.20	87.9	0.18
18/11/14	SPE14	Overburden	88.7	0.12	96.0	0.23	100.1	0.19
19/11/14	SPE13	Overburden	81.6	0.02	102.1	0.07	92.5	0.05

Date	Location	Type	Antiene (AB) dB(L)	Antiene (R) mm/sec	DeBoer (AB) dB(L)	DeBoer (R) mm/sec	Sharman (AB) dB(L)	Sharman (R) mm/sec
19/11/14	NN-ROM1	Overburden	110.4	0.11	108.4	0.13	100.3	0.08
25/11/14	EN01	Overburden	89.3	0.22	95.3	0.38	94.2	0.40
26/11/14	SPW13	Overburden	98.0	0.02	101.8	0.05	102.5	0.04
03/12/14	EN01	Overburden	89.8	0.04	89.5	0.08	88.9	0.07
11/12/14	SPW14	Overburden	76.7	0.02	85.4	0.07	87.4	0.02
18/12/14	SPW14	Overburden	98.1	0.10	102.0	0.19	103.6	0.09
22/12/14	SPE14	Parting	88.8	0.05	101.9	0.33	87.4	0.12
23/12/14	SPW14	Overburden / Pre-split	88.5	0.07	91.2	0.11	88.3	0.06
29/12/14	NN14	Overburden	101.5	0.39	107.1	0.16	107.7	0.05
31/12/14	SPE14	Overburden	93.6	0.04	102.2	0.20	100.3	0.05

Appendix F: 2014 Enquiries, Concerns and Complaints

Table 57: List of Enquiries, Concerns and Complaints Received throughout 2014

Date	Location	Enquiry, Concern OR Complaint	Nature	Outcome
January				
				Nil enquiries, concerns or complaints recorded.
February				
04/02/2014	External call to Dispatch	Complaint	Dust	Complaint received via a phone call to Dispatch at 4pm about elevated levels of dust coming from the direction of Drayton. James Benson conducted dust inspection at 4:10PM. CHP were creating elevated levels of dust. The pit was comparably ok. The CHP fire water system was down due to a pump failure. The pump was operational at 4:10PM. The stockpile sprays were turned on at 4:30PM and the CHP stopped direct crushing for half an hour. CHP control room to monitor dust for the rest of the shift. Production 3 had shortened the 306 run during the day to prevent dust during the day. Environmental graduate investigated wind speed and direction. For the afternoon (Noon-5PM) wind speed averaged 25km/h, and direction was from the SE. Complainant not called back as they verified they would be happy with JB doing an inspection that afternoon.
06/02/2014	Scone Resident	Complaint	Odour	Resident stated that they could smell spon com odour at their house yard and believes it comes from Drayton. Complaint received by SHE Manager approx. 10pm. SHE Manager assured resident that Drayton manage their spon com and there were no exceedences of SOx recorded at the UHAQMN Muswellbrook SO2 monitor on the day in question. No further follow up required.
13/02/2014	Scone Resident	Complaint	Odour	Resident stated that they could smell spon com odour at their house yard and believes it comes from Drayton. Complaint received by SHE Manager approx. 10pm. SHE Manager assured resident that Drayton manages their spon com and there were no exceedences of SOx recorded at the UHAQMN Muswellbrook SO2 monitor on the day in question. SHE Manager also investigated the possibility of the Upper Hunter sewerage treatment works being the source of the odour at the resident's property as it is closer (~1.5km) to her house and also upwind of the prevailing SE winds. No further action taken.
March				
05/03/2014	Mooranbrook Resident	Enquiry	Radio Chatter	Resident called Drayton with concerns that there was continual chatter on UHF channel 31. Apparently has been happening for months but they heard Drayton mentioned on it today. They live at Moonanbrook (Scone area). Dispatcher followed up as Drayton uses its own channel. After asking around the dispatcher can to the conclusion that it may be contractors on the UHF frequency.

Date	Location	Enquiry, Concern OR Complaint	Nature	Outcome
				Resident was called back and told that it could be contracting companies but it is not coming from Drayton. The contractor company's numbers were not given out. The main concern is that UHF 31 is a private channel the residents have paid to access and there is constant chatter on it.
18/03/2014	Pamger Drive, Muswellbrook	Complaint	Blast - Dust	A concerned enquiry about dust was received on the 18/3/14 after a blast fired at 4:11pm. The resident could see a black cloud of dust from his residence at 7 Pamger Drive, Muswellbrook. Call received at 4:25pm. Environmental Coordinator called back at 9am on the 19/3/14 and discussed the blast on the 18th. It was found that dust from the blast in south pit went up and hung above the GNT for approx 10mins after the blast before dispersing to the west. The resident said it was "more and enquiry than a complaint". Environmental Coordinator visited the resident's house to discuss dust mitigation measures on the 19th.
18/03/2014	Pamger Drive, Muswellbrook	Enquiry	Blast - Dust	Resident called the hotline on the 18/3/2014 at 4:20pm to report he could see a big cloud of dust which was black and hanging over the ROM area. The resident lives at 44 Pamger Drive. Environmental Coordinator called back on the 19/3/2014 and left a message at 9:11am. Environmental Coordinator then attended the resident's property at 5:40pm to discuss dust mitigation strategies.
April				
9/04/2014	Pamger Drive, Muswellbrook	Complaint	Noise	The resident called the hotline at 9:20am to lodge a complaint about noise coming from the Drayton direction which sounded similar to a "jet engine". The resident had been hearing the noise for over a week now in the mornings up to 11am. Ambient noise was measured outside the resident's property on Pamger Dr at 10:30am that morning and no excessive noise was recorded (LEQ 36.2dBl). Something similar to tracked equipment could be heard in the distance but Environmental Graduate found that road crews were rock breaking at the road works on Thomas Mitchell Drive during time of noise monitoring. The Environmental Coordinator contacted the resident who said "it wasn't the tracked equipment he could hear, it was a continual roar". The Environmental Coordinator went to Pamger Dr the following morning (10/4/14) to listen and found there was a hum/groan like a conveyor that could be heard. CHP was shutdown and all production equipment was shutdown due to monthly TBT. Noise still heard onsite and coming from Mac Gen's Liddel Power Plant feed belts from MAC. Further complaints made on the 10th, 12th, 17th, 25th, and 27th of April relating to the same issue. Independent noise monitoring to take place during May.
27/04/2014	Scone Resident	Complaint	Odour	Resident called dispatch to complain of a sulphur smell at their house and believed comes from Drayton. The resident requested someone to go and walk her dog and wanted to speak to the General Manager after hours. The Environmental Coordinator called the resident and spoke to their daughter. The Environmental Coordinator provided a number to call back if a response was required. There were no spon com outbreaks in the pit during the time of the alleged incident (6PM) and the UHAQMN Muswellbrook SOx monitor recorded no SO_2 at the time of the complaint.

Date	Location	Enquiry, Concern OR Complaint	Nature	Outcome
May				
1-21/05/2014	Pamger Drive, Muswellbrook	Complaint	Noise	Ongoing noise complaint about early morning noise coming from the direction of Drayton mine. Complainant believes it is excessive at his residence of a morning and believes it is coming from the CHP conveyors. Independent noise monitoring was conducted at the residence on the 21st of May by Spectrum Acoustics. No noise from Drayton over allowable limits, further monitoring is to be conducted during June. The Environmental Coordinator called back after each complaint received and also communicated results to of the independent noise monitoring results.
June				
20/06/2014	Pamger Drive, Muswellbrook	Complaint	Blast - Vibration	Complaint received via phone call about vibrations felt at the complainant's residence on the 20/6/2014 approx. 12:15 to 12:30pm. Blast SPW13-H-BK16-19 occurred at 12:35 on this date. No exceedances were recorded at any of the monitors including the monitor closest to the neighbour. Noise and vibration levels for this blast at closest monitor were 92.6dBl and 0.13mm/sec respectively. Complainant contacted and results discussed.
10/06/2014 & 18/06/2014	Pamger Drive, Muswellbrook	Complaint	Noise	Ongoing noise complaint about early morning noise coming from the direction of Drayton mine. Complainant believes it is excessive at his residence of a morning and believes it is coming from the CHP conveyors. Independent noise monitoring was conducted at the residence during June by Spectrum Acoustics. No noise from Drayton over allowable limits. The Environmental Coordinator called back after each complaint received and also communicated independent noise monitoring results.
July				
23/07/2014	Pamger Drive, Muswellbrook	Complaint	Noise	Excessive noise complaint received for noise occurring on the 19th, 20th and 23rd of July heard at the complainant's property. The 19th and 20th were a weekend when there was minimal Drayton activity (no CHP operations either). On the 23rd of July there was a train being loaded from 7:20am to 10:20am. Property was immediately visited and no noise exceedance was occurring. Complainant was contacted by the Environmental Coordinator and the results of investigation communicated.
August				
				Nil enquiries, concerns or complaints recorded.
September				
				Nil enquiries, concerns or complaints recorded.
October				
4/10/2013	Scone Resident	Complaint	Noise	Complainant rang complaining of a "dirty filthy smell" and wishing to talk to management. The

Date	Location	Enquiry, Concern OR Complaint	Nature	Outcome
				complainant lives in Scone, ~30km from the mine site. SHE Manager explained that there is very little spon com currently at Drayton and that the source of the smell could be from another source. Complainant was convinced that the smell originated from Drayton and in the end hung up.
16/10/2013	Balmoral Road, Muswellbrook	Complaint	Blast	Complaint received via phone call about blast at 0900hrs on 22/10/2014. Neighbour stated that they had just gone to bed, and had not been notified about the blast. Noise and vibration at Antienne - 106.0 dBL and 2.09mm/s respectively. Neighbour contacted and results discussed.
November				
				Nil enquiries, concerns or complaints recorded.
December				
				Nil enquiries, concerns or complaints recorded.

Appendix G: Anglo American Safety, Health and Environment Risk Matrix

Table 58: Anglo American Risk Matrix

AAplc Risk Matrix	Hazard Effect/ Consequence				
Loss Type	**1. Insignificant**	**2. Minor**	**3. Moderate**	**4. High**	**5. Major**
(S/H) **Harm to people (safety /health)**	First aid case / Exposure to minor health risk	Medical Treatment case / Exposure to major health risk	Lost time injury / Reversible impact on health	Single fatality or loss of quality of life / Irreversible impact on health	Multiple fatalities / Impact on health ultimately fatal
(EI) **Environmental Impact**	Minimal environmental harm – L1 incident	Material environmental harm – L2 incident remediable short term	Serious environmental harm – L2 incident remediable within LOM	Major environmental harm – L2 incident remediable post LOM	Extreme environmental harm – L3 incident irreversible
(BI/MD) **Business interruption / Material damage and other consequential losses**	No disruption to operation 5% loss of budgeted operating profit / listed assets	Brief disruption to operation 10% loss of budgeted operating profit / listed assets	Partial shutdown / 15% loss of budgeted operating profit / listed assets	Partial loss of operation / 20% loss of budgeted profit / listed assets	Substantial or total loss of operation 25% loss of budgeted profit / listed assets
(L&R) **Legal and regulatory**	Low level legal issue	Minor legal issue: non- compliance and breaches of the law	Serious breach of law: investigation / report to authority, prosecution and/or moderate penalty possible	Major breach of the law: considerable prosecution and penalties	Very considerable penalties & prosecutions. Multiple law suits & jail terms
(R/S/C) **Impact on reputation, social and community**	Slight impact – public awareness may exist but no public concern	Limited impact – local public concern	Considerable impact – regional public concern	National impact – national public concern	International impact - international public attention

Likelihood	Examples	Risk Rating				
5 (Almost Certain)	The unwanted event has occurred frequently: occurs in order of one or more times per year & is likely to reoccur within 1 year	11 (M)	16 (S)	20 (S)	23 (H)	25 (H)
4 (Likely)	The unwanted event has occurred infrequently: occurs in order of less than once per year & is likely to reoccur within 5 years	7 (M)	12 (M)	17 (S)	21 (H)	24 (H)
3 (Possible)	The unwanted event has happened in the business at some time: or could happen within 10 years	4 (L)	8 (M)	13 (S)	18 (S)	22 (H)
2 (Unlikely)	The unwanted event has happened in the business at some time: or could happen within 20 years	2 (L)	5 (L)	9 (M)	14 (S)	19 (S)
1 (Rare)	The unwanted event has never been known to occur in the business: or it is highly unlikely that it will occur within 20 years	1 (L)	3 (L)	6 (M)	10 (M)	15 (S)

Risk Rating	Risk Level	Guidelines for Risk Matrix
21 to 25	High (H)	Eliminate, avoid, implement specific action plans / procedures to manage & monitor
13 to 20	Significant (S)	Proactively manage
6 to 12	Medium (M)	Actively manage
1 to 5	Low (L)	Monitor & manage as appropriate

Appendix H: 2014 Rail Activity Statement

RAIL ACTIVITY STATEMENT

FOR PERIOD 1/1/2014 - 31/12/2014

(Destination for all trains was Port of Newcastle)

	Drayton Coal		Mt Arthur Coal		Total Rail Activity	
Date	Total Train Movements/ day	Total tonnage/ day	Total Train Movements/ day	Total tonnage/ day	Total Train Movements / day	Total Tonnage/ day
1-Jan-14	6	19835	15	*value not provided*	21	
2-Jan-14	2	8759.4	15	*value not provided*	17	
3-Jan-14	6	25159.2	14	*value not provided*	20	
4-Jan-14	6	25713	19	*value not provided*	25	
5-Jan-14	6	25599	19	*value not provided*	25	
6-Jan-14	6	26120.6	17	*value not provided*	23	
7-Jan-14	6	26192.2	14	*value not provided*	20	
8-Jan-14			12	*value not provided*	12	
9-Jan-14			16	*value not provided*	16	
10-Jan-14			18	*value not provided*	18	
11-Jan-14			16	*value not provided*	16	
12-Jan-14			20	*value not provided*	20	
13-Jan-14			17	*value not provided*	17	
14-Jan-14			14	*value not provided*	14	
15-Jan-14			19	*value not provided*	19	
16-Jan-14			17	*value not provided*	17	
17-Jan-14	2	8768.8	11	*value not provided*	13	
18-Jan-14	6	25202.6	20	*value not provided*	26	
19-Jan-14	4	17290.4	13	*value not provided*	17	
20-Jan-14			14	*value not provided*	14	
21-Jan-14			11	*value not provided*	11	
22-Jan-14			17	*value not provided*	17	
23-Jan-14	4	18553.6	7	*value not provided*	11	
24-Jan-14	8	37340			8	
25-Jan-14	4	27259.4			4	
26-Jan-14	2	8592			2	
27-Jan-14	4	17952.4	14	*value not provided*	18	
28-Jan-14	4	17995	10	*value not provided*	14	
29-Jan-14	6	24704.8			6	
30-Jan-14					0	
31-Jan-14	4	16307.8	13	*value not provided*	17	

	Drayton Coal		Mt Arthur Coal		Total Rail Activity	
Date	Total Train Movements/ day	Total tonnage/ day	Total Train Movements/ day	Total tonnage/ day	Total Train Movements / day	Total Tonnage/ day
1-Feb-14	2	8853.4	19	*value not provided*	21	
2-Feb-14	2	8100.8	18	*value not provided*	20	
3-Feb-14			17	*value not provided*	17	
4-Feb-14	2	8774.4	15	*value not provided*	17	
5-Feb-14	2	8666	12	*value not provided*	14	
6-Feb-14	8	34372	13	*value not provided*	21	
7-Feb-14	6	26062	16	*value not provided*	22	
8-Feb-14	4	18627.6	16	*value not provided*	20	
9-Feb-14	2	8604.4	16	*value not provided*	18	
10-Feb-14			16	*value not provided*	16	
11-Feb-14	2	8471.4	16	*value not provided*	18	
12-Feb-14	4	17751.8	17	*value not provided*	21	
13-Feb-14	2	8559.4	19	*value not provided*	21	
14-Feb-14			19	*value not provided*	19	
15-Feb-14	2	9693.6	18	*value not provided*	20	
16-Feb-14	4	17051.2	16	*value not provided*	20	
17-Feb-14			15	*value not provided*	15	
18-Feb-14			12	*value not provided*	12	
19-Feb-14	2	9705.4	11	*value not provided*	13	
20-Feb-14			12	*value not provided*	12	
21-Feb-14	4	18048.2	11	*value not provided*	15	
22-Feb-14	6	27900.6	11	*value not provided*	17	
23-Feb-14	6	26163.4	10	*value not provided*	16	
24-Feb-14	2	7866	9	*value not provided*	11	
25-Feb-14			12	*value not provided*	12	
26-Feb-14	2	8260.8	12	*value not provided*	14	
27-Feb-14			9	*value not provided*	9	
28-Feb-14			8	*value not provided*	8	
1-Mar-14			5	*value not provided*	5	
2-Mar-14	2	9067.5	7	*value not provided*	9	
3-Mar-14			10	*value not provided*	10	
4-Mar-14			9	*value not provided*	9	
5-Mar-14			11	*value not provided*	11	
6-Mar-14			16	*value not provided*	16	
7-Mar-14			17	*value not provided*	17	
8-Mar-14			17	*value not provided*	17	
9-Mar-14	2	8374.4	17	*value not provided*	19	
10-Mar-14					0	
11-Mar-14					0	
12-Mar-14					0	

	Drayton Coal		Mt Arthur Coal		Total Rail Activity	
Date	Total Train Movements/ day	Total tonnage/ day	Total Train Movements/ day	Total tonnage/ day	Total Train Movements / day	Total Tonnage/ day
13-Mar-14					0	
14-Mar-14	2	8764.6	8	*value not provided*	10	
15-Mar-14	4	18527.4	12	*value not provided*	16	
16-Mar-14			15	*value not provided*	15	
17-Mar-14			11	*value not provided*	11	
18-Mar-14	4	11525.6	8	*value not provided*	12	
19-Mar-14			9	*value not provided*	9	
20-Mar-14			10	*value not provided*	10	
21-Mar-14	4	16828.9	12	*value not provided*	16	
22-Mar-14			11	*value not provided*	11	
23-Mar-14	4	14112.2	11	*value not provided*	15	
24-Mar-14	4	16476.6	11	*value not provided*	15	
25-Mar-14	2	8383.6	11	*value not provided*	13	
26-Mar-14			11	*value not provided*	11	
27-Mar-14	2	8080.8	10	*value not provided*	12	
28-Mar-14	2	8848.4	8	*value not provided*	10	
29-Mar-14	2	8019.2	8	*value not provided*	10	
30-Mar-14	4	17485.6	10	*value not provided*	14	
31-Mar-14	2	5978.4	12	*value not provided*	14	
1-Apr-14	4	16715.2	14	*value not provided*	18	
2-Apr-14	4	17009.4	13	*value not provided*	17	
3-Apr-14	2	8568	14	*value not provided*	16	
4-Apr-14			14	*value not provided*	14	
5-Apr-14			14	*value not provided*	14	
6-Apr-14			15	*value not provided*	15	
7-Apr-14			12	*value not provided*	12	
8-Apr-14			12	*value not provided*	12	
9-Apr-14	4	18037.4	15	*value not provided*	19	
10-Apr-14	4	17959.6	16	*value not provided*	20	
11-Apr-14	8	34250	16	*value not provided*	24	
12-Apr-14	2	8686.9	17	*value not provided*	19	
13-Apr-14			18	*value not provided*	18	
14-Apr-14	2	8477	16	*value not provided*	18	
15-Apr-14			8	*value not provided*	8	
16-Apr-14	2	8742.2	6	*value not provided*	8	
17-Apr-14			16	*value not provided*	16	
18-Apr-14			20	*value not provided*	20	
19-Apr-14			18	*value not provided*	18	
20-Apr-14			15	*value not provided*	15	
21-Apr-14			13	*value not provided*	13	

	Drayton Coal		Mt Arthur Coal		Total Rail Activity	
Date	Total Train Movements/ day	Total tonnage/ day	Total Train Movements/ day	Total tonnage/ day	Total Train Movements / day	Total Tonnage/ day
22-Apr-14			16	*value not provided*	16	
23-Apr-14			16	*value not provided*	16	
24-Apr-14			14	*value not provided*	14	
25-Apr-14	2	8629.6	15	*value not provided*	17	
26-Apr-14	4	18284	13	*value not provided*	17	
27-Apr-14	2	8289.4	12	*value not provided*	14	
28-Apr-14			8	*value not provided*	8	
29-Apr-14					0	
30-Apr-14					0	
1-May-14					0	
2-May-14	4	17338.4	18	*value not provided*	22	
3-May-14	4	16998.4	17	*value not provided*	21	
4-May-14	8	36798.45	13	*value not provided*	21	
5-May-14	4	17861.6	15	*value not provided*	19	
6-May-14	4	17901	15	*value not provided*	19	
7-May-14	4	17940.2	16	*value not provided*	20	
8-May-14	10	43639.4	14	*value not provided*	24	
9-May-14	6	25269.2	13	*value not provided*	19	
10-May-14			15	*value not provided*	15	
11-May-14			13	*value not provided*	13	
12-May-14			10	*value not provided*	10	
13-May-14			11	*value not provided*	11	
14-May-14			16	*value not provided*	16	
15-May-14			16	*value not provided*	16	
16-May-14			14	*value not provided*	14	
17-May-14			14	*value not provided*	14	
18-May-14			15	*value not provided*	15	
19-May-14			16	*value not provided*	16	
20-May-14			15	*value not provided*	15	
21-May-14	2	9304.2	11	*value not provided*	13	
22-May-14	4	18627.7	10	*value not provided*	14	
23-May-14			12	*value not provided*	12	
24-May-14			11	*value not provided*	11	
25-May-14	4	18075.2	11	*value not provided*	15	
26-May-14	2	8439	13	*value not provided*	15	
27-May-14	2	8536.2	12	*value not provided*	14	
28-May-14	2	8589.8	9	*value not provided*	11	
29-May-14			10	*value not provided*	10	
30-May-14			14	*value not provided*	14	
31-May-14			15	*value not provided*	15	

	Drayton Coal		Mt Arthur Coal		Total Rail Activity	
Date	Total Train Movements/ day	Total tonnage/ day	Total Train Movements/ day	Total tonnage/ day	Total Train Movements / day	Total Tonnage/ day
1-Jun-14	4	17832.4	14	*value not provided*	18	
2-Jun-14	2	8427	13	*value not provided*	15	
3-Jun-14	6	24328.4	8	*value not provided*	14	
4-Jun-14	4	17787.8	7	*value not provided*	11	
5-Jun-14	4	18221.6	14	*value not provided*	18	
6-Jun-14	2	9079.6	17	*value not provided*	19	
7-Jun-14			15	*value not provided*	15	
8-Jun-14			14	*value not provided*	14	
9-Jun-14			13	*value not provided*	13	
10-Jun-14			12	*value not provided*	12	
11-Jun-14			13	*value not provided*	13	
12-Jun-14			14	*value not provided*	14	
13-Jun-14			17	*value not provided*	17	
14-Jun-14			16	*value not provided*	16	
15-Jun-14			14	*value not provided*	14	
16-Jun-14			13	*value not provided*	13	
17-Jun-14	2	9000.6	13	*value not provided*	15	
18-Jun-14	4	17115.4	14	*value not provided*	18	
19-Jun-14	6	26662.2	16	*value not provided*	22	
20-Jun-14	4	17460.6	17	*value not provided*	21	
21-Jun-14	6	25932	15	*value not provided*	21	
22-Jun-14	4	17406	15	*value not provided*	19	
23-Jun-14	4	16715.6			4	
24-Jun-14					0	
25-Jun-14					0	
26-Jun-14			5	*value not provided*	5	
27-Jun-14			7	*value not provided*	7	
28-Jun-14			8	*value not provided*	8	
29-Jun-14			11	*value not provided*	11	
30-Jun-14	4	15403.8			4	*10599691.25**
1-Jul-14	4	17699	6	23900.6	10	41599.6
2-Jul-14	4	18503.4	6	23907.8	10	42411.2
3-Jul-14	4	17873.2	12	48145.6	16	66018.8
4-Jul-14	6	25608.4	16	64868.1	22	90476.5
5-Jul-14	2	9057	16	64124.6	18	73181.6
6-Jul-14			12	47964.7	12	47964.7
7-Jul-14			12	48168.2	12	48168.2
8-Jul-14	2	9129.3	12	48518.3	14	57647.6
9-Jul-14	4	17787.8	10	39949.5	14	57737.3
10-Jul-14	2	9196	6	24646.4	8	33842.4

	Drayton Coal		Mt Arthur Coal		Total Rail Activity	
Date	Total Train Movements/ day	Total tonnage/ day	Total Train Movements/ day	Total tonnage/ day	Total Train Movements / day	Total Tonnage/ day
11-Jul-14			12	48050.8	12	48050.8
12-Jul-14	2	8567.8	18	72591	20	81158.8
13-Jul-14	2	8718.4	14	56423.9	16	65142.3
14-Jul-14	4	17133.2	10	40538.5	14	57671.7
15-Jul-14	2	8928	10	40272.9	12	49200.9
16-Jul-14	6	25093	18	72218.9	24	97311.9
17-Jul-14	6	25540.8	22	87783.9	28	113324.7
18-Jul-14			10	40043.6	10	40043.6
19-Jul-14			16	63422.6	16	63422.6
20-Jul-14			18	71478.6	18	71478.6
21-Jul-14	2	8377	8	31960.9	10	40337.9
22-Jul-14	2	8718.6	12	47403.4	14	56122
23-Jul-14	4	17718.8	14	55448.5	18	73167.3
24-Jul-14	2	8632	10	39683	12	48315
25-Jul-14			16	65270.8	16	65270.8
26-Jul-14	4	17477.2	14	57616.6	18	75093.8
27-Jul-14	4	17495.2	16	65289.4	20	82784.6
28-Jul-14	4	11570.8	12	48306	16	59876.8
29-Jul-14	6	26189.2	8	32651.2	14	58840.4
30-Jul-14	6	25354.2	4	16304.7	10	41658.9
31-Jul-14			16	65345	16	65345
1-Aug-14	6	24206.8	16	65384.4	22	89591.2
2-Aug-14	6	25890.2	16	65962.8	22	91853
3-Aug-14	6	27465.6	14	59170.7	20	86636.3
4-Aug-14			14	58881.8	14	58881.8
5-Aug-14			10	41448.2	10	41448.2
6-Aug-14	4	18121.4	4	16542	8	34663.4
7-Aug-14	2	8345.4	10	40803.7	12	49149.1
8-Aug-14	4	18233.45	14	56103.4	18	74336.85
9-Aug-14	2	8552.8	12	49136.7	14	57689.5
10-Aug-14			14	58080.1	14	58080.1
11-Aug-14			10	41449.8	10	41449.8
12-Aug-14			14	57153.4	14	57153.4
13-Aug-14			10	42235.1	10	42235.1
14-Aug-14			6	24563	6	24563
15-Aug-14			10	41342	10	41342
16-Aug-14			18	74120.4	18	74120.4
17-Aug-14			8	33114	8	33114
18-Aug-14			12	49863.8	12	49863.8
19-Aug-14					0	0

	Drayton Coal		Mt Arthur Coal		Total Rail Activity	
Date	Total Train Movements/ day	Total tonnage/ day	Total Train Movements/ day	Total tonnage/ day	Total Train Movements / day	Total Tonnage/ day
20-Aug-14					0	0
21-Aug-14			2	7954	2	7954
22-Aug-14	2	7798.2	12	48276.7	14	56074.9
23-Aug-14	6	25346	12	48611	18	73957
24-Aug-14	4	15776.1	12	49307.8	16	65083.9
25-Aug-14	4	17493.6	8	33122.6	12	50616.2
26-Aug-14	2	8674.6	12	49284.2	14	57958.8
27-Aug-14	4	18732.6	10	41663.3	14	60395.9
28-Aug-14			8	32043.2	8	32043.2
29-Aug-14			16	68145	16	68145
30-Aug-14	2	8419.4	12	49573.4	14	57992.8
31-Aug-14	4	16270.6	12	48597.4	16	64868
1-Sep-14	2	8972.8	10	42652	12	51624.8
2-Sep-14			6	24796.8	6	24796.8
3-Sep-14	2	8733.6	16	66276.8	18	75010.4
4-Sep-14	4	15665.2	8	32715.8	12	48381
5-Sep-14	4	13555.2	20	82505.8	24	96061
6-Sep-14	2	8115.6	14	58312.7	16	66428.3
7-Sep-14	2	8996	16	66598.8	18	75594.8
8-Sep-14	4	17759.8	12	49860.6	16	67620.4
9-Sep-14	2	5281.2	18	75070.8	20	80352
10-Sep-14			10	40981.6	10	40981.6
11-Sep-14	2	8878.4	8	32932.2	10	41810.6
12-Sep-14	4	18057.4	8	32972	12	51029.4
13-Sep-14	2	8770.2	8	33612.8	10	42383
14-Sep-14	2	9210.6	14	57805	16	67015.6
15-Sep-14	6	27132.4	10	42548.8	16	69681.2
16-Sep-14	2	8906.2	10	41602	12	50508.2
17-Sep-14	6	25952	16	65775.7	22	91727.7
18-Sep-14	4	17171.2	18	74964.2	22	92135.4
19-Sep-14	4	17281.6	14	58718.1	18	75999.7
20-Sep-14	6	25926.8	18	73785.6	24	99712.4
21-Sep-14	2	8987	8	32536.4	10	41523.4
22-Sep-14	2	8334.6	16	65122.8	18	73457.4
23-Sep-14			6	24790.4	6	24790.4
24-Sep-14	2	8305.8	10	41425.2	12	49731
25-Sep-14	2	9056.4	10	41829	12	50885.4
26-Sep-14	4	8856	10	41887.6	14	50743.6
27-Sep-14	2	8921.4	10	40861.2	12	49782.6
28-Sep-14	4	18776.4	12	49207	16	67983.4

	Drayton Coal		Mt Arthur Coal		Total Rail Activity	
Date	Total Train Movements/ day	Total tonnage/ day	Total Train Movements/ day	Total tonnage/ day	Total Train Movements / day	Total Tonnage/ day
29-Sep-14	2	8856	8	32621.6	10	41477.6
30-Sep-14					0	0
1-Oct-14					0	0
2-Oct-14					0	0
3-Oct-14	4	17138.4	8	32838.2	12	49976.6
4-Oct-14	4	17041.3	12	49714.4	16	66755.7
5-Oct-14	6	27806.5	12	49252	18	77058.5
6-Oct-14	2	8801.3	8	31764.2	10	40565.5
7-Oct-14	6	24560	12	49664.7	18	74224.7
8-Oct-14	6	27169	12	48489	18	75658
9-Oct-14	2	9595	8	33821.5	10	43416.5
10-Oct-14	2	9222.8	14	56272.5	16	65495.3
11-Oct-14	2	8687	18	73134.2	20	81821.2
12-Oct-14	6	25425.2	14	56426.3	20	81851.5
13-Oct-14	2	8181.9	18	72387.5	20	80569.4
14-Oct-14	2	8202.2	18	72120.9	20	80323.1
15-Oct-14	6	27460.7	18	73913.8	24	101374.5
16-Oct-14	6	27268	16	64256.2	22	91524.2
17-Oct-14			18	73863.6	18	73863.6
18-Oct-14	2	8472.8	18	74487.9	20	82960.7
19-Oct-14			18	73189.3	18	73189.3
20-Oct-14			14	57389.4	14	57389.4
21-Oct-14			14	57424	14	57424
22-Oct-14			10	40837.4	10	40837.4
23-Oct-14	2	8854	16	65668.2	18	74522.2
24-Oct-14	2	8328.5	16	65690	18	74018.5
25-Oct-14			18	74618.7	18	74618.7
26-Oct-14	4	18452.6	12	50787	16	69239.6
27-Oct-14			16	68272.8	16	68272.8
28-Oct-14			14	60348.4	14	60348.4
29-Oct-14	6	25219.2	14	60536.6	20	85755.8
30-Oct-14	4	16880.2	16	67912.9	20	84793.1
31-Oct-14	2	7712	14	60564.6	16	68276.6
1-Nov-14			12	51134.9	12	51134.9
2-Nov-14			18	76824	18	76824
3-Nov-14			12	51216	12	51216
4-Nov-14	2	3613.2	4	17072	6	20685.2
5-Nov-14			4	17072	4	17072
6-Nov-14	2	7956	2	8577.6	4	16533.6
7-Nov-14			10	42891.2	10	42891.2

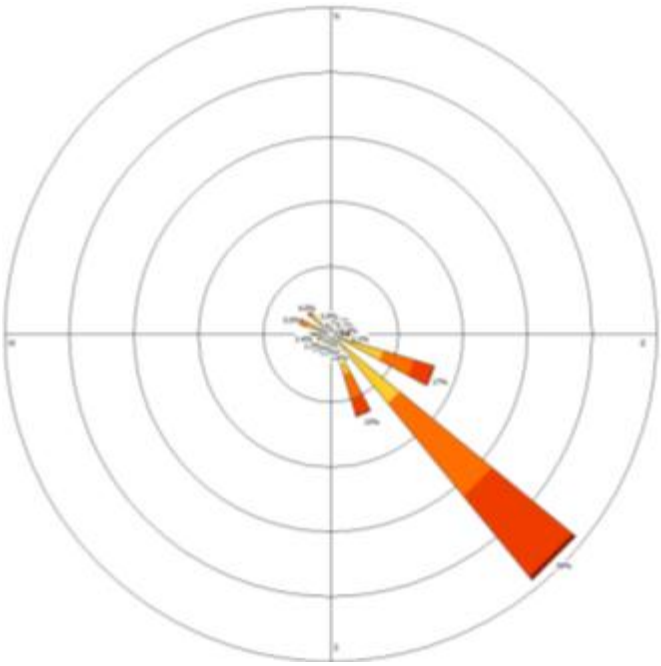
	Drayton Coal		Mt Arthur Coal		Total Rail Activity	
Date	Total Train Movements/ day	Total tonnage/ day	Total Train Movements/ day	Total tonnage/ day	Total Train Movements / day	Total Tonnage/ day
8-Nov-14	4	17636.2	8	34662.9	12	52299.1
9-Nov-14			12	51959.6	12	51959.6
10-Nov-14			14	59908.3	14	59908.3
11-Nov-14	2	9090.6	10	42553.8	12	51644.4
12-Nov-14	6	25737.8	8	34100.8	14	59838.6
13-Nov-14	4	18262.8	12	51652.2	16	69915
14-Nov-14	4	17402.9	12	51929.8	16	69332.7
15-Nov-14	2	9183.4	14	59871	16	69054.4
16-Nov-14	4	18449	12	50822	16	69271
17-Nov-14					0	0
18-Nov-14					0	0
19-Nov-14					0	0
20-Nov-14					0	0
21-Nov-14	4	16835.8	4	17072.0	8	33907.8
22-Nov-14	4	16285	14	59486.4	18	75771.4
23-Nov-14	6	26447.2	18	76939.8	24	103387
24-Nov-14	2	8744.2	14	59742.6	16	68486.8
25-Nov-14	4	17686.6	12	51139.2	16	68825.8
26-Nov-14	2	9379.4	14	58444.8	16	67824.2
27-Nov-14	6	25836.4	12	50982.2	18	76818.6
28-Nov-14	4	17280.6	14	59752.1	18	77032.7
29-Nov-14	6	25413.4	18	76660.3	24	102073.7
30-Nov-14	4	16523.4	18	77440.6	22	93964
1-Dec-14	4	17154.4	12	51122.5	16	68276.9
2-Dec-14	2	8610	14	59915	16	68525
3-Dec-14	4	17285.2	14	60124.5	18	77409.7
4-Dec-14	4	18282.6	8	34325.5	12	52608.1
5-Dec-14	4	17476.4	14	59767.6	18	77244
6-Dec-14	6	26080.5	16	68490.4	22	94570.9
7-Dec-14	4	19303.65	12	51045.2	16	70348.85
8-Dec-14	4	17475.4	10	41557.9	14	59033.3
9-Dec-14	4	16297.8	14	60331.2	18	76629
10-Dec-14	6	26387.55	10	42562.1	16	68949.65
11-Dec-14	4	15114.45	8	34033.8	12	49148.25
12-Dec-14	4	17247.2	12	51161.7	16	68408.9
13-Dec-14	4	16729.4	10	43052.2	14	59781.6
14-Dec-14	4	17602.3	16	68330.5	20	85932.8
15-Dec-14	4	17512	10	42720.1	14	60232.1
16-Dec-14	2	9498.8	12	51245.8	14	60744.6
17-Dec-14	2	8824.4	6	25489.6	8	34314

	Drayton Coal		Mt Arthur Coal		Total Rail Activity	
Date	Total Train Movements/ day	Total tonnage/ day	Total Train Movements/ day	Total tonnage/ day	Total Train Movements / day	Total Tonnage/ day
18-Dec-14	4	17157	10	42770.2	14	59927.2
19-Dec-14	2	8686	20	85390.1	22	94076.1
20-Dec-14	6	25046.8	20	84848.8	26	109895.6
21-Dec-14	6	25947.1	16	68899.8	22	94846.9
22-Dec-14	6	25665.6	18	75971.2	24	101636.8
23-Dec-14	4	16469.65	18	77097.5	22	93567.15
24-Dec-14	2	8112.6	10	43057.5	12	51170.1
25-Dec-14					0	0
26-Dec-14	4	17029.6	4	17343.2	8	34372.8
27-Dec-14	4	18977.4	18	76780.3	22	95757.7
28-Dec-14			16	68400.1	16	68400.1
29-Dec-14			14	60132.7	14	60132.7
30-Dec-14			12	51163.6	12	51163.6
31-Dec-14	4	15699.6	12	50151.7	16	65851.3

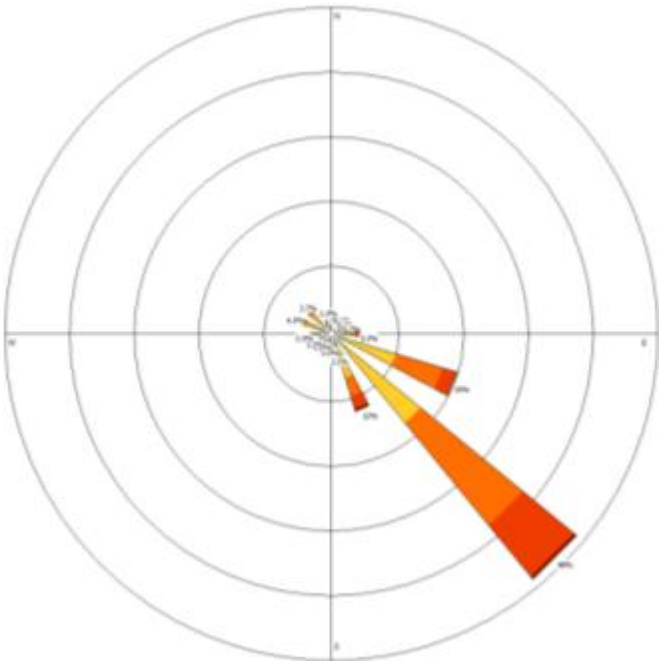
PERIOD SUMMARY			
Maximum train movements / day (Drayton)	8	Limit	12
Maximum train movements / day (MAC)	22	Limit	No limit
Maximum combined train movements	30	Limit	30
Total Tonnes (Drayton)	3,557,762.00	Tonnes	
Total Tonnes (Mt Arthur Coal)	18,081,837.80	Tonnes	
Combined Tonnes (Antiene Rail Spur)	***21,639,599.80***	Tonnes	

Appendix I: Monthly Wind Speed and Direction 2014

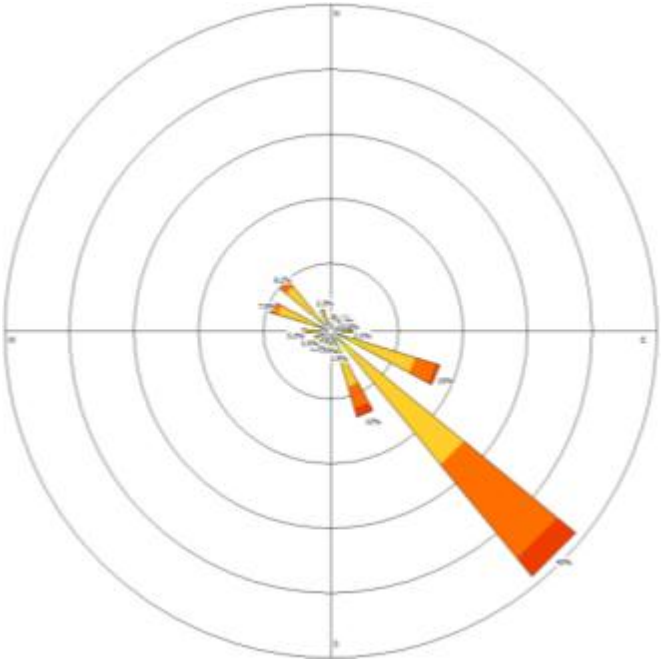
January 2014



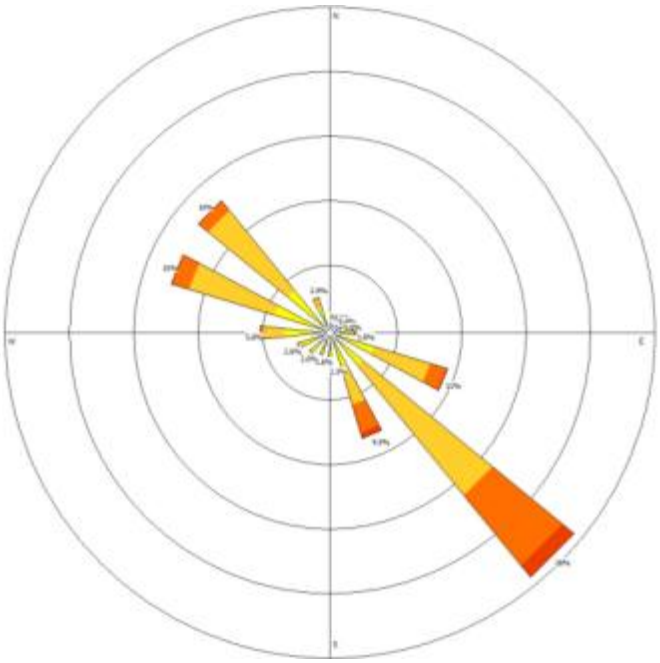
February 2014



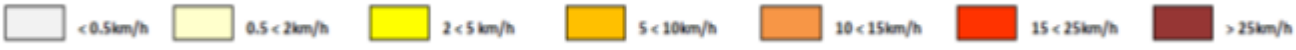
March 2014



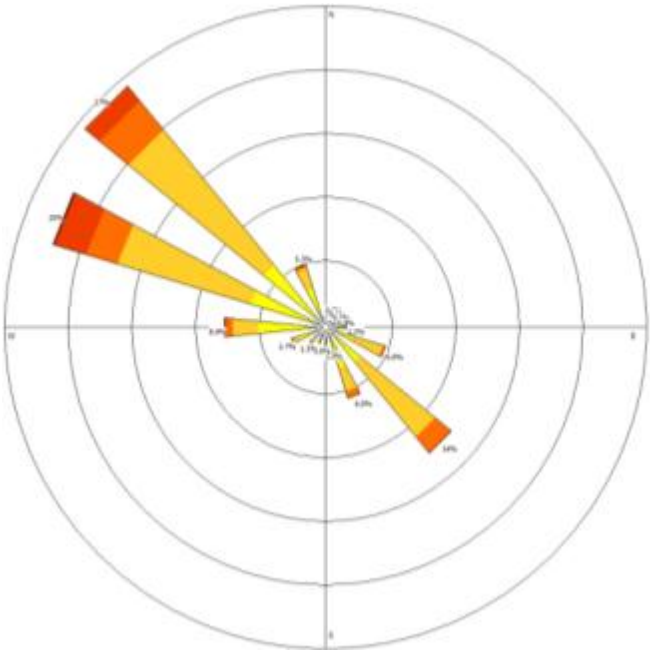
April 2014



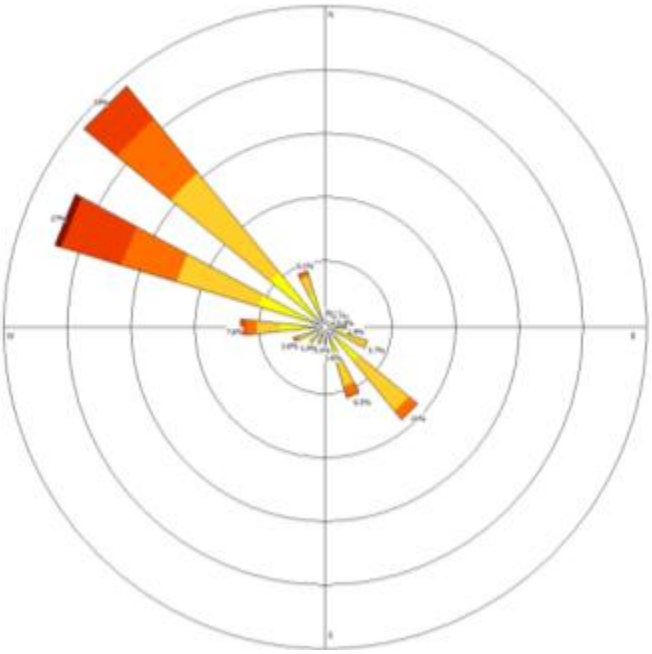
Legend



May 2014

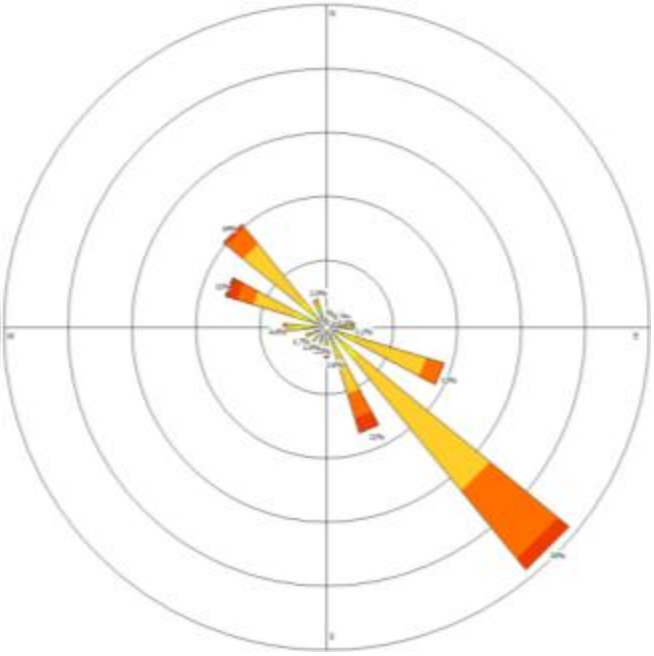


June 2014



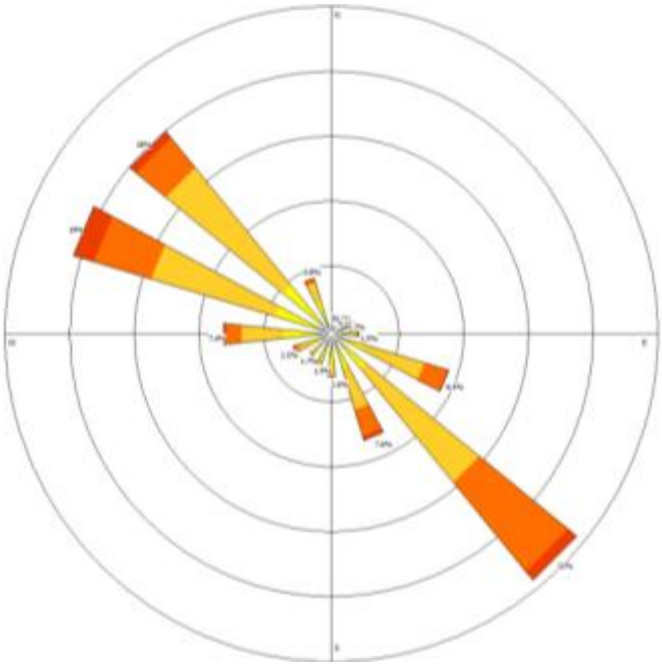
July 2014

August 2014

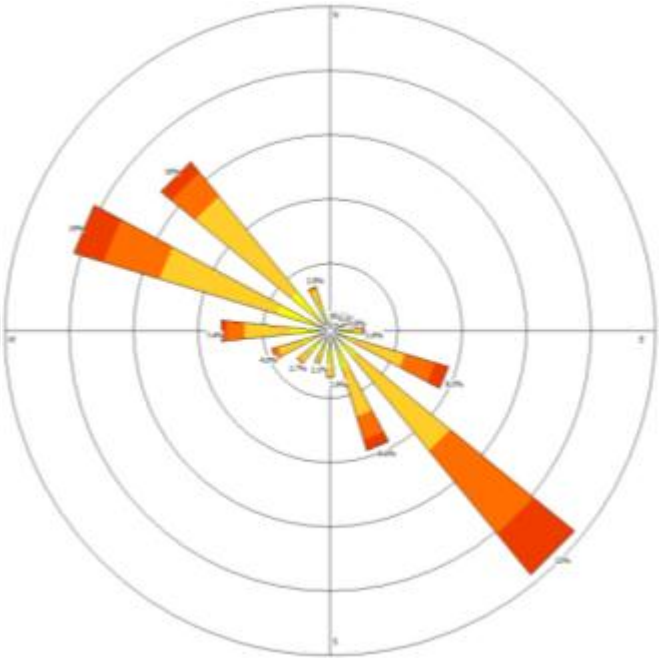


Legend

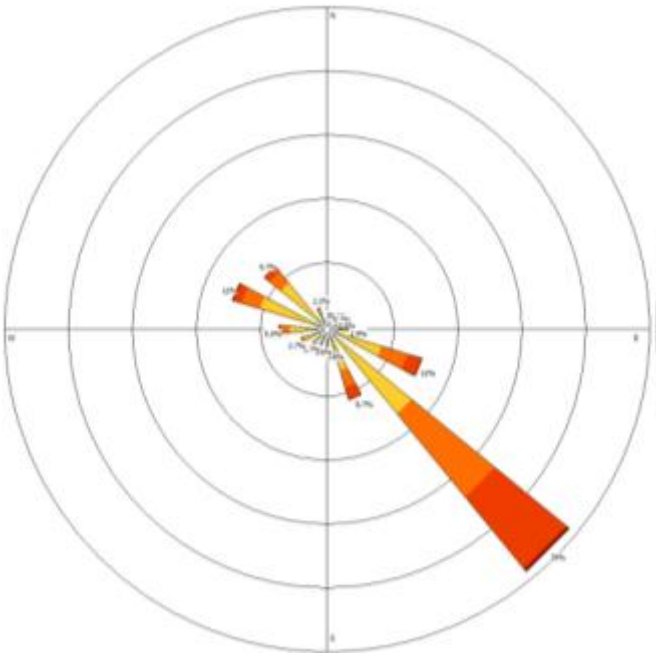
September 2014



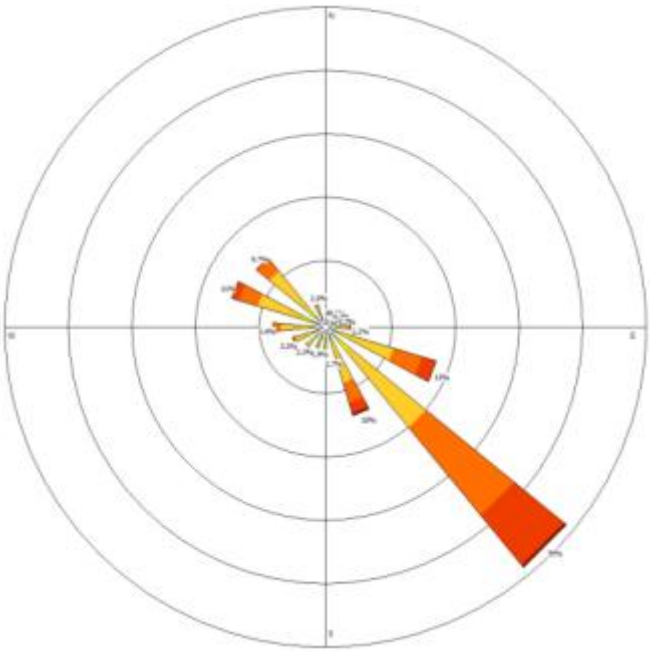
October 2014



November 2014



December 2014



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