Centennial Coal

Annual Review

1st January – 31st December 2014

Airly Mine

ML1331 & A232

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1. Introduction

Airly Mine is an underground coal mine located in the Western Coalfields, within the Sydney Basin, approximately 171 kilometres north of Sydney 40 kilometres north-northwest of Lithgow and 4km northeast of Capertee, as shown in **Figure 1.** The Mine's consent allows extraction of 1.8 million tonnes per annum for supply to both domestic and international markets by rail. Centennial Airly Pty Limited (Centennial Airly) is the operator of Airly Mine and is a wholly owned subsidiary of Centennial Coal Company Limited.

Access to Airly Mine is via the Castlereagh Highway to Capertee and then 3km along the Glen Davis Road to the private access road. The Wallerawang to Kandos railway line is situated 3km to the west of the pit top area. Centennial Coal Company Ltd (Centennial) owns Airly Mine as well as a substantial buffer zone (approximately 2,000 hectares) around the pit top.

Airly Mine's development consent (Development Application (DA) 162/91) was granted on 14 April 1993 pursuant to Section 101 of the *Environmental Planning and Assessment Act 1979.* DA 162/91 remains in force and authorises the extraction of up to 1.8 Mtpa of run-of-mine (ROM) coal within the existing mining lease area, Mining Lease (ML) 1331. Exploration activities are undertaken within Authorisation No.232 (A232) as shown on **Plan 1**.

Airly Mine operates under DA 162/91 which was modified (MOD 3) to allow an extension of time for the existing consent during 2014. A Development Application was also lodged in 2014 for the Airly Mine Extension Project.

The Airly Mine Extension Project proposes to extend mining operations into the eastern section of the existing Mining Lease while also seeking to renew the current planning consent. Using underground mining techniques it is proposed Airly continue to extract up to 1.8 million tonnes annually using the currently approved operations, facilities and infrastructure.

1.1 Airly Work Force

Coal production recommenced at Airly Mine during March 2014. At the completion of the 2014 reporting period the workforce at Airly Mine consisted of 60 full time staff.

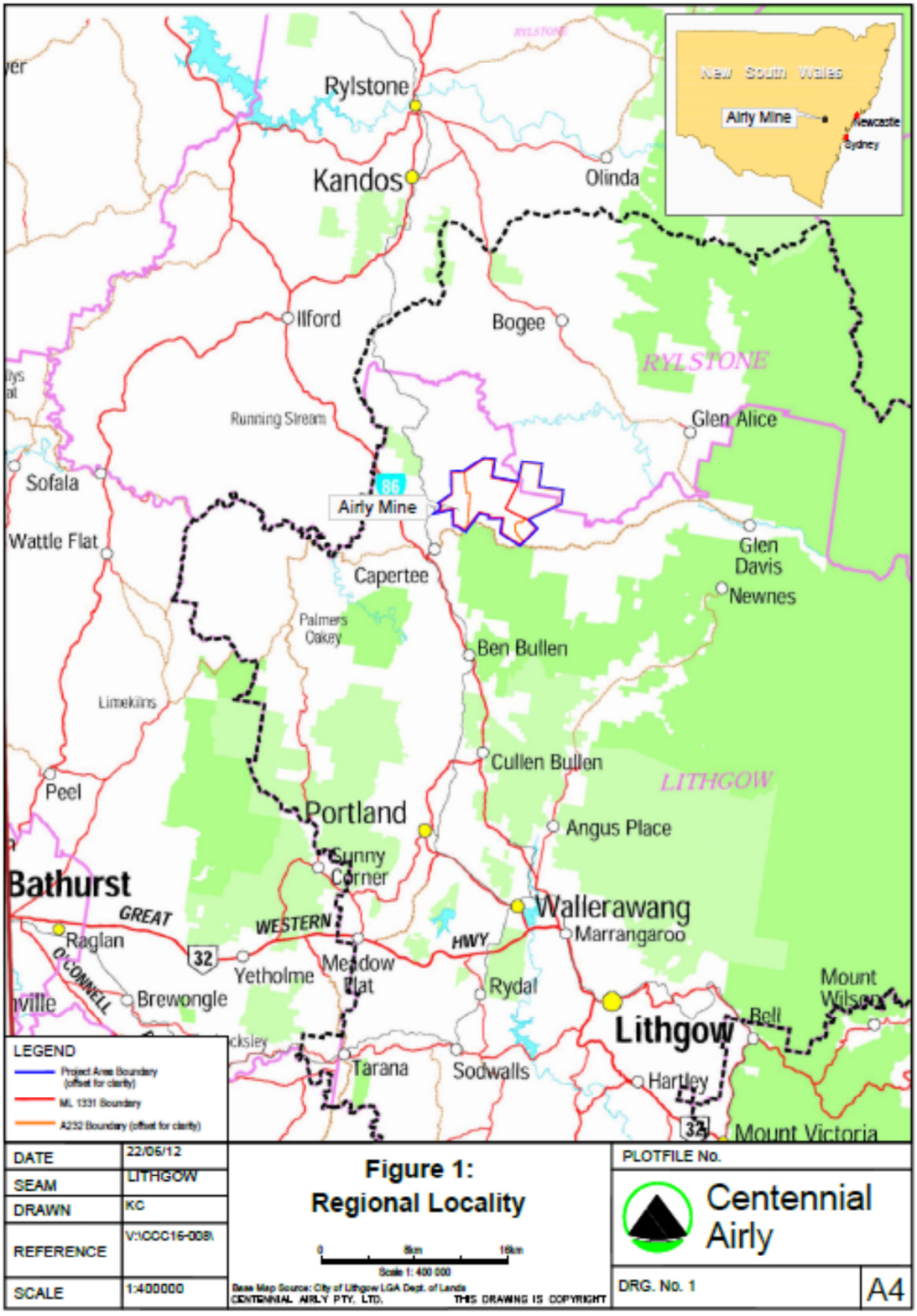


Figure 1 – Locality of Airly Mine

1.2 Consents, Leases and Licenses

A summary of the relevant leases, licenses and consents for Airly Mine are summarized below in **Table 1**.

Table 1: Airly Mine Leases, Licences and Consents

Leases (Department of Trade & Investment, Regional Infrastructure & Services)

Lease	Summary	Grant Date	Expiry Date
Mining Lease (ML) 1331	Mining lease area of approx 2745 hectares.	8/05/2014	20/10/2035
Authorisation (A) 232	Exploration area of approx 3054 hectares.	3/06/2010	20/10/2014 (renewal pending)

Consents (Department of Planning and Environment)

Consent	Summary	Grant Date	Expiry Date
Development Consent DA 162/91	Underground mine development to extract 1.8 million tonnes per annum	14/04/1993	12/10/2014
Development Consent Modification DA 162/91 MOD 1	Temporary coal transport by road for trial mine	20/10/1999	12/10/2014
Development Consent Modification DA 162/91 MOD 2	Construction of a 66kV Powerline and Associated Infrastructure	21/8/2009	12/10/2014
Development Consent Modification DA 162/91 MOD 3	Extension of operations until 31 October 2015	9/10/2014	31/10/2015

Mining Operations Plan (Department of Trade & Investment, Regional Infrastructure & Services)

MOP Period	Summary	Grant Date	Expiry Date
2014-2016	Covers activities at Airly Mine during operations.	14/03/14	1/03/2016

Environmental Protection Licence (NSW Environment Protection Authority)

EPL	Summary	Grant Date	Expiry Date
12374	3 licenced discharge points Production of coal >500,000T to 2,000,000T per annum	12/12/2005	Renewed Annually

Groundwater Monitoring Bore Licences (NSW Office of Water)

License Reference	Reference/Summary	Grant Date	Expiry Date
10BL604518	ARP01	14/02/2011	Perpetuity
10BL604520	ARP02A & ARP03A	14/02/2011	Perpetuity
10BL604521	ARP04 &ARP05	14/02/2011	Perpetuity
10BL605352	ARP06, ARP07, ARP08 & ARP09	28/03/2013	Perpetuity

Groundwater Extraction Licences (NSW Office of Water)

License Reference	Reference/Summary	Grant Date	Expiry Date
WAL 24386	Extract 158ML per annum	1/9/2014	Perpetuity
WAL 36565	Extract 120ML per annum	11/2/2014	Perpetuity

1.3 Mine Contacts

The contact details for personnel responsible for environmental management and community relations at Airly Mine are presented below in **Table 2.**

Table 2: Airly Mine Contact Details

Position	Key Contact	Contact Details
Manager of Mining Engineering (Mine Manager)	Bob Miller	(02) 6359 2101, Email: bob.miller@centennialcoal.com.au
Environment and Community Coordinator	Greg Brown	(02) 6359 2107, Email: gregory.brown@centennialcoal.com.au

Airly Mine publicises the community inquiries/complaints hotline (02 6959 2100) on the Centennial Coal website, as well as in the local phone directory. The complaints and enquiry web address (info.airly@centennialcoal.com) is available on Centennial's web page.

1.4 Actions Required at Previous AEMR Review

Comments on last years Annual Environmental Management Report were provided by the Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS) in a letter dated the 3rd June 2014. No significant areas of concern were noted.

2. Operations During The Reporting Period

2.1 Site Facilities

During 2014 some of the temporary office and bathhouse demountable buildings used during construction activity at the mine were disconnected from existing services and were relocated to a laydown area in proximity to the Coal Handling Plant. Roadbase material was transported to the mine and spread over the former site of the demountable buildings (**Plate 1**). The removal of these buildings has improved access to the Stores buildings at the mine.

Plate 1 – Improved Access to the Stores Area

2.2 Exploration

A Review of Environmental Factors (REF) Report was prepared for exploration boreholes proposed to be constructed and developed to be groundwater monitoring locations in Airly Gap and on Genowlan Mountain. The preparation of the report included an environmental assessment of the proposed activity and consultation with government agencies and the community.

There was no exploration drilling undertaken at Airly Mine during 2014. Exploration drilling undertaken in reporting periods prior to 2014 are shown on **Plan 3B**.

2.3 Construction

Construction activity during 2014 was generally associated with land preparation activity in the area of the stores buildings within the existing Surface Facilities due to the recommencement of operations at the mine site. Two concrete pads were constructed on the pit top during the 2014 reporting period. One pad was constructed adjacent to the above ground diesel tank for parking vehicles on whilst refueling. The second pad was constructed in the workshop area to be used for washing down plant and equipment.

2.4 Land Preparation

Stripping of topsoil began in early 2009 to facilitate the construction activities. A geotechnical investigation was carried out to determine appropriate construction materials for use in fill embankments and below the product coal stockpile. Silt fencing was erected downstream of all disturbed areas prior to earthworks commencing. Topsoil stripped was stockpiled in designated soil stockpile sites for respreading as part of the revegetation process. Designated sediment control ponds were installed before the construction activities commenced. After completion of major earthworks at the rail loop area and establishment of vegetation on the rail loop slopes, sediment retention basins were removed in February 2010. A designated long term topsoil stockpile containing approximately 20,000m^3 remains on site for reclaiming on site closure (**Plan 3A – Land Preparation**).

During 2012 an area of 0.3 ha was disturbed for the purpose of the installation of the life of mine effluent system and 0.3 ha of land was disturbed for the extension of the site car park. A total of 11,680m^3 of fill was excavated at the location of the future Ecomax effluent system. This fill recovered through the excavation was then placed in the vicinity of the carpark extension area, south east of the administration buildings. The helicopter pad that was previously in this vicinity was then relocated to the general area of the first aid room. In total an area of approximately 0.6 ha was disturbed during 2012. Due to both the carpark and septic system being utilised for the life of the mine, this land will remain disturbed until site decommissioning and final rehabilitation.

Land preparation during 2014 was generally associated with the placement of roadbase material in the area of the stores buildings within the existing Surface Facilities.

2.5 Mining

Coal production recommenced at Airly Mine during March 2014. **Plan 4A** shows the mining areas developed during 2014. The areas proposed to be mined in the environmental assessment prepared for Modification 3 of the development consent are also included on **Plan 4A**. Production planned during 2015 up until 31 October, is 460,000 tonnes. The production and waste summary is outlined in **Table 3** below:

Table 3: Production and Waste Summary at Airly Mine 2014

	Production (t)		
	Start of Reporting Period	**End of Reporting Period**	**End of Next Reporting Period (estimated)**
Topsoil Stripped	70,000 m^3	70,000 m^3	70,000 m^3
Topsoil Used/Spread	53,500 m^3	53,500 m^3	53,500 m^3
Waste Rock	157,930 m^3	157,930 m^3	157,930 m^3
ROM	1,229,535 t*	481,587 t 1,711,122 t*	460,000 t 2,171,122 t*
Processing Waste	Nil	Nil	Nil
Product	1,229,535 t*	481,587 t 1,711,122 t*	460,000 t 2,171,122 t*

*Cumulative production since mining began in December 2009

2.6 Mineral Processing

ROM coal is conveyed from the underground via the trunk conveyor (UC01) and fed directly onto a surface conveyor system to the existing coal crushing and screening plant. Crushed coal is then fed onto the CV02 conveyor which transfers coal directly to the Product Coal Stockpile.

The 30,000 tonne Emergency Stockpile, located adjacent to the transfer between UC01 and CV01 conveyors, either receives coal from a diversion conveyor at the UC01 and CV01 transfer point or via truck from the Product Coal Stockpile should it reach capacity. Coal can be fed back onto CV01 through an existing loading point by front end loader or dump truck.

Whilst a Coal Preparation Plant is currently approved, to date only the Coal Handling Plant portion has been constructed and land prepared for the Coal Preparation Plant. The Coal Preparation Plant is proposed to be constructed to the west of CV02 conveyor between the crushing and screening plant and the Product Coal Stockpile. Thus no coal was washed or rejects produced during 2014.

2.7 Waste Management

There are five main areas identified at Airly Mine as sources of general waste. These areas include:

- Administration buildings;
- Stores area;
- Pit top;
- Underground;

- Coal Handling (crusher building, conveyor, rail load out).

Airly Mine has implemented a waste minimization strategy to improve waste management procedures and to minimize wastage particularly in relation to general waste to landfill. All recyclable materials are stored on site for collection by a licensed waste contractor. Typical wastes that are generated and their disposal are indicated in **Table 4** below:

Table 4: Waste Streams and Disposal

Waste Stream	Disposal Method	2014 Quantity
Mixed Solid Waste	General consumable waste materials are stored in 2 x 4.5 m^3 and 2 x 20 m^3 waste skip bins and are collected regularly by a licenced waste contractor for offsite disposal to landfill.	68.8 tonnes
Paper and Cardboard	Recycling containers are placed in identified areas for the collection of cardboard and paper products. These and smaller receptacles in the administration building are emptied regularly into a 4.5 m^3 paper recycling skip bin. The skip bin is collected regularly by a licenced waste contractor for offsite disposal.	0.5 tonnes
Scrap Metal	All scrap metal is placed into a dedicated skip bin (1 x 20m^3 bin), which is sold to scrap steel merchants for recycling.	23.3 tonnes
Used oil filters	Used oil filters are stored in designated bins and are taken to a recycling facility by a licenced waste contractor.	0.2 tonnes
Waste Oil	Waste oil from 20 litre oil drums is drained into a waste oil collection 3m^3 drum drainer skip bin. The skip bin is emptied regularly by a licenced waste contractor for offsite disposal.	1.6 tonnes
Effluent	Sewage and grey water from the bathhouse and offices at the pit top is treated on site at the mine's effluent treatment system, the Ecomax Treatment System. Septic tanks have been installed at the Train Loader facility to manage sewage from the toilet located at the Train Loader.	N/A

2.7.1 Sewerage

The life of mine Ecomax effluent treatment system caters for the expected future workforce. The system consists or a duel cell EP150 anaerobic utilization treatment plant which has a treatment capacity of 20,000 litres per day with a peak load of

40,000 litres per day total. The unit is capable of removing 99% of both phosphorus and nitrogen.

2.7.2 Oil and Grease Containment and Disposal

Oil and grease used on site is managed by the following key elements:

- Plant and equipment must be inspected prior to commencement on site in accordance with the requirements of the Coal Mines Health and Safety Act;
- Plant and equipment must be inspected for fuel, oil or hydraulic fluid leakage, damaged or deteriorated hydraulic lines and other areas of potential failure on a daily basis;
- Any leakages or deteriorated hoses or similar areas of potential failure must be repaired before the plant or equipment is permitted to be used on the site;
- Servicing is undertaken in designated areas onsite;
- All road registered vehicles where possible are fuelled and serviced off site;
- Emergency response spill kits are available at all servicing, hydrocarbon storage and refuelling areas. Absorbent materials are to be available at all times on refuelling vehicles and during any fuelling activity of plant and equipment. Materials are to include, at a minimum absorbent materials, emergency bunding and absorbent pads. Spill kits shall be used to absorb any minor drips or spills that may occur;
- All incidents or uncontrolled spillages are reported immediately to the relevant supervisors and the Environmental Coordinator at Airly Mine;
- The operator must be in attendance at all times whilst fuelling vehicles;
- Should a major spill occur, it will be handled in accordance with the Pollution Incident Response Management Plan at Airly Mine.

2.8 Product Stockpiles

Coal from the underground workings is stored on the 200,000 tonne Product Coal Stockpile. The 30,000 tonne Emergency ROM stockpile in the pit top area adjacent to CV01 can also be utilised for coal storage.

2.9 Water Management

2.9.1 Water Supply and Use

No town water is available at Airly Mine. Water is currently stored in a series of tanks which harvest water off the administration and bathhouse buildings. During the reporting period bottled potable water was delivered to the site to use as drinking water in the administration building.

2.9.2 Surface Water Catchments

The mining and exploration lease areas have a drainage network which is divided into four sub-catchments (**Plan 2B – Pre MOP Environment)**, all of which drain to the Capertee River:

- Torbane – Oaky Creek sub-catchment;
- Airly – Coco Creek sub-catchment;
- Gap – Genowlan Creek sub-catchment; and
- Emu Swamp Creek sub-catchment.

The northwest section of the mining lease is drained by the Torbane-Oaky Creek system. Torbane Creek joins Oaky Creek approximately 2 km downstream of the mining lease boundary. Approximately 518 ha of the Torbane Creek catchment and 71 ha of the upper Oaky Creek catchment lie inside the area of the mining lease.

The Airly-Coco Creek system drains the southern sector of the mining lease. The headwaters of the Coco Creek are located in the south of the area. Airly Creek rises in the south western section of the mining lease. This system enters the Capertee River approximately 12 km upstream of Glen Davis. Approximately 1,400 ha of the area of the mining and exploration lease drain into Airly-Coco Creek. Centennial Airly is currently licensed under the Environment Protection Licence (EPL) 12374 to discharge water to Airly Creek. Based on water quality sampling data, Airly Creek is generally brackish and slightly alkaline in the vicinity of the Airly Mine surface facilities area. The water quality of Airly Creek is closely related to the natural geology of the catchment.

Surface flows in the north eastern sector flow eastwards via a series of drainage lines into Emu Swamp Creek, which drain into the Capertee River approximately 10 km downstream of the exploration lease. Approximately 355 ha of the area of the exploration lease drains into Emu Swamp Creek catchment.

Surface runoff from the northern section of the mining and exploration lease drains into Gap Creek and Genowlan Creek. The two creeks, which are groundwater fed in parts, drain northward approximately 2 kilometres before converging into the greater Genowlan Creek. Genowlan Creek continues to drain in a north easterly direction until its confluence with the Capertee River approximately 8 km downstream. The Gap-Genowlan Creek sub-catchment occupies the largest portion of the area of the mining and exploration lease with 1,558 ha draining to the creek system. Based on water quality sampling data, these creeks are generally fresh and slightly acidic.

All creeks within the area of the mining and exploration lease are ephemeral and do not have surface water flow for the entire year. Generally, these watercourses flow for relatively brief period following significant rainfall events. Flows within Airly, Oaky, Coco and Genowlan Creeks become perennial outside the area of the mining and exploration lease.

2.9.3 Erosion and Sediment Control

The storage capacity of the surface water dams have been designed to be greater than the minimum required to handle the sediment settling function. All drainage from the pit top and disturbed areas gravitate into this system. The dams consist of small primary dams to trap coarse sediment that can be readily cleaned out after storm events. The overflow from these dams discharges into the large (109 ML) secondary dam where fine sediments settle and finally the water discharges from the

secondary dam via a pontoon mounted pipe (so water is drawn from the surface) or spill way into the discharge dam (35 ML) where the water will either be utilised for process water or discharged via LDP1. The water management structures over the surface facilities area are shown on **Plans 7A and 7B**.

Drainage channels and associated banks constructed around the site have been grassed and jute meshed or concrete lined where necessary to assist with stability during water flows. Gabion baskets have been installed below the main Airly Creek crossing and side protection areas. Additional inlet protection has been provided to assist in upstream channel protection during high flow conditions. Permanent diversion drains have been constructed around the coal handling infrastructure and pit top area. These drains are in addition to the original clean water diversion system but have been designed to complement the original structures. Drains above the box cut highwall on the northern side have been concrete lined as were the previous channels. Other channels have been grassed and/or jute meshed according to grade and design flows. The main clean water diversion channel was jute-meshed and spray mulched, while the smaller collection drains were spray mulched. All dirty water drains along the conveyor sections were concrete lined to enable cleaning. Outlets of drainage structures have been protected with 150mm rock rubble while some inlets prior to culvert crossings have also been rock lined.

2.9.4 Groundwater

Within the area of the mining and exploration lease five main sources of groundwater have been identified. Stratigraphically, aquifers occur in the following strata (located in vertically descending order):

- alluvium
- Triassic sandstone strata
- Permian strata
- Shoalhaven strata
- Lower Devonian metamorphic strata.

The alluvium, Triassic and Permian aquifer systems are defined as localised sources of groundwater because they are isolated from the surrounding land by virtue of being elevated above the valley floor in the Mount Airly and Genowlan Mountain structures. The Shoalhaven and Devonian aquifers are defined as regional groundwater sources due to them being connected to the broader land mass of the valley floor.

Local groundwater sources within the area of the mining and exploration lease have been classified as ‘less productive’ according to the NSW Aquifer Interference Policy (NSW Office of Water, 2012) since the yields are typically less than 5 L/s and/or the groundwater salinity exceeds 1,500 mg/L. These sources are less productive due to low yield rather than high salt levels.

The regional groundwater source in the Shoalhaven unit is classified as less productive due to high salinity exceeding 2500 mg/L. By contrast the Devonian groundwater source is classified as highly productive due to high yield and salinity of less than 1500 mg/L.

Given the highly differing water qualities between the various aquifers, the amount of interconnectedness between aquifers is limited.

2.10 Hazardous Material Management

The electronic database "CHEMWATCH" is a material safety data sheet database available at the pit top. Hardcopies of material safety data sheets are also kept in a site Chemical Data Register. Prior to new chemicals being allowed on site, the Material Safety Data Sheet for the chemical is reviewed in terms of potential health, safety and environment issues.

Spill kits for the management of oil and diesel spills are available at strategic locations. All fuels and oils (engine, hydraulic, transmission) are stored in purpose built facilities with firefighting provisions. Diesel is stored in an above ground self-bunded tank (28,000 litre capacity) from where it is transferred to diesel pods for underground use or direct to machinery.

A licensed contractor is engaged to remove and recycle and/or dispose of used oil and grease products at licensed facilities.

2.11 Weeds and Feral Animal Control

During the reporting period a rodent treatment program was undertaken over the surface facilities area at Airly Mine.

During 2014 a spraying program was undertaken over the surface facilities area at Airly Mine to control weeds. Over the cleared grazing areas adjacent to the surface infrastructure (**Plan 2A**) a spraying campaign was also undertaken targeting blackberry bushes and serrated tussock.

The NSW National Parks and Wildlife Service coordinated an aerial pest control program over the State Conservation Area during 2014. NSW National Parks and Wildlife Service consulted with Airly Mine to coordinate environmental monitoring activity on Mt Airly and Genowlan Mountain whilst this program was being undertaken.

3. Environmental Management and Performance

This section discusses environmental management throughout the reporting period at Airly Mine.

3.1 Risk Management

Centennial Coal employs a risk-based approach to manage safety, environment and business at Airly Mine. This process involves its employees (and contractors where appropriate) identifying issues, or recognising areas where further information is required to identify these issues, and recommending any necessary additional controls to address identified risks. This practice is guided by the overarching Centennial Environmental Policy, which identifies:

- the vision to conduct business in an efficient and environmentally sustainable manner that is compatible with the expectations of shareholders, government, employees and the community;
- the belief that everyone has a responsibility for minimising impact to the environment and that environmental performance can always be improved;
- the guiding principles of environmental impacts being recognised and minimised, continual improvement of environmental performance and risk management strategies implemented based on clear science and valid data.

3.2 Meteorological Monitoring

Meteorological monitoring for the reporting period was obtained from the weather station at Airly Homestead which is located approximately 2km to the southwest of the mine surface facilities area on Airly Station. A brief description of rainfall and temperature is presented in the following sections. The weather station continuously monitors weather parameters including:

- Temperature
- Humidity
- Barometric Pressure
- Wind – speed and direction
- Rainfall and
- Solar radiation

3.2.1 Rainfall

A summary of rainfall data recorded at the Airly meteorological monitoring station during the reporting period January 2014 to December 2014 is shown in **Table 5** below. Monitoring data for rainfall for the last few days during December 2014 was recorded at the on-site meteorological monitoring station at Charbon Colliery. Rainfall for 2014 totalled 757 mm with the lowest recorded monthly rainfall being 6 mm in January and the highest recorded monthly rainfall being 174 mm in the month of March.

3.2.2 Temperature

A summary of temperature data recorded at the Airly meteorological monitoring station during the reporting period January 2014 to December 2014 is shown in **Table 5** below. The maximum temperature was 37°C which was recorded in January and November during 2014. The minimum temperature was -4°C recorded in July 2014.

Table 5: 2014 Monthly Rainfall (mm) and Temperature (°C)

Month	Total Rainfall (mm)	Minimum Temperature (°C)	Maximum Temperature (°C)
January	6	7	37
February	100	7	35
March	174	6	26
April	76	2	27
May	14	2	21
June	36	-1	16
July	30	-4	18
August	45	-3	17
September	33	-1	26
October	45	0	30
November	61	2	37
December	137	8	32
Total	**757**	**n/a**	**n/a**

3.3 Air Quality

Monthly air quality monitoring is undertaken at Airly Mine at four depositional dust gauges (the location of dust monitoring sites can be identified on **Plan 4B**). Depositional dust gauges are sampled monthly and the results are used to identify Total Insoluble Matter, Ash and Combustible Matter. The month represents the date the monitoring jar was replaced which can range between 28-32 days. All dust monitoring samples collected are analysed by a National Association of Testing Authorities (NATA) approved laboratory.

3.3.1 Monitoring Data

Monitoring results for Total Insoluble Solids measured in g/m^2/month obtained during the 2014 reporting period showed compliance with the normal deposition criteria rolling average of 4 g/m^2/month. Twelve monitoring samples from each depositional dust gauge were collected during the reporting period.

Monitoring data collected from the four dust monitoring stations are displayed in **Figure 2** below.

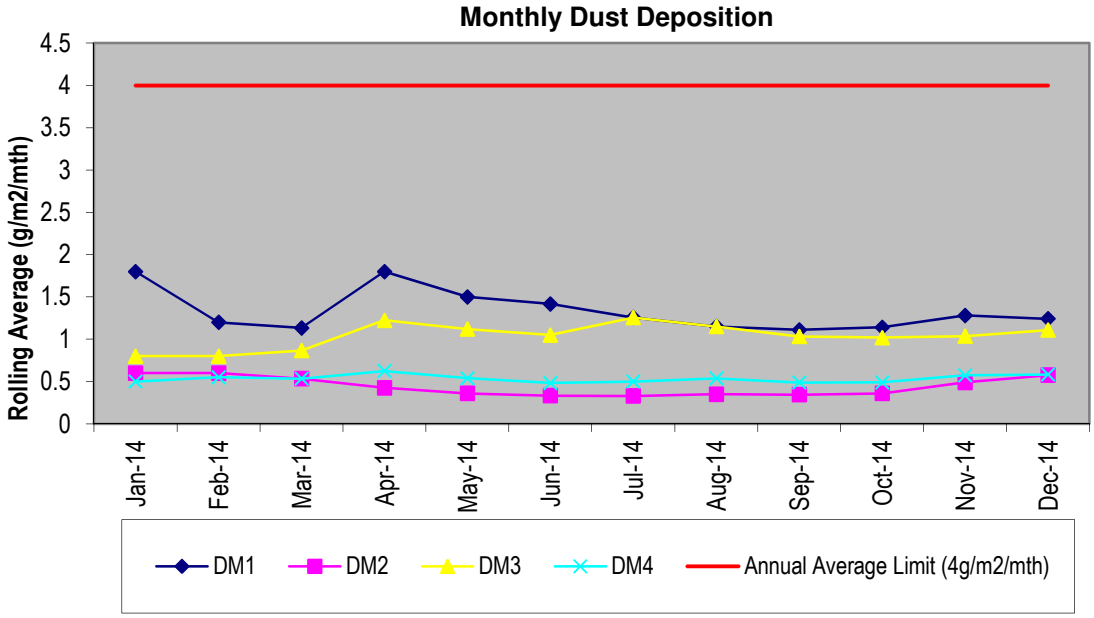


Figure 2: Monthly Dust Deposition Gauge Rolling Average

3.3.2 Environmental Performance

A number of control measures can be implemented at Airly Mine to manage air quality including:

- Signage to display speed limits on all unsealed roads in the surface facilities area;
- Spraying areas with a water truck;
- Using the sprinkler system on the coal product stockpile for dry and windy conditions.

The implementation of control measures can be triggered by a number of monitoring methods including:

- Monthly depositional dust gauge results;
- Site inspections of the surface facilities area;
- Meteorological data from the Airly weather station.

3.3.3 Non-Compliances and Corrective Actions

There were no non-compliances with regard to dust generated from Airly Mine during the reporting period.

3.4 Surface Water

Airly is licensed to discharge water under Environment Protection Licence (EPL) No.12374. A copy of the EPL can be found in **Appendix 1**. The licence for the mine

site stipulates that there are three Licensed Discharge Points (LDPs) for the discharge of water from the mine site:

1. LDP1 located on the 35 ML Discharge Dam;
2. LDP2 located on the 7 ML Dam ;
3. LDP3 located on the Train Loader Dam.

The locations of the licensed discharge points are shown on **Plan 4B**.

The Annual Return for EPL 12374 covering the EPL reporting period was submitted to the Environment Protection Authority during February 2014. A copy of the Annual Return is provided in **Appendix 2.**

3.4.1 Monitoring Data

EPL 12374 requires the licenced discharge points to be monitored monthly during discharge for the analytes listed in **Table 6** below.

Table 6: Water Monitoring Parameters

Water Monitoring Parameters	
Analyte	**Licence Limit**
Oil and Grease	10 mg/L
pH	6.5 – 9.0
Total Suspended Solids (TSS)	50 mg/L
Electrical Conductivity (EC)	n/a
Volume Discharged at LDP1	100,000 KL

The 35 ML Discharge Dam (LDP1) and the 7 ML Dam (LDP2) did not discharge water during 2014. The only discharge events occurred at the Train Loader Dam (LDP3) which discharged on three occasions during 2014. A water sample was collected during each discharge event and analysed by a National Association of Testing Authorities (NATA) approved laboratory. The monitoring results for pH, Oil and Grease, TSS, EC and the estimated volume of discharged water at LDP3 during each discharge event are discussed below and presented in **Figures 3** to **7**.

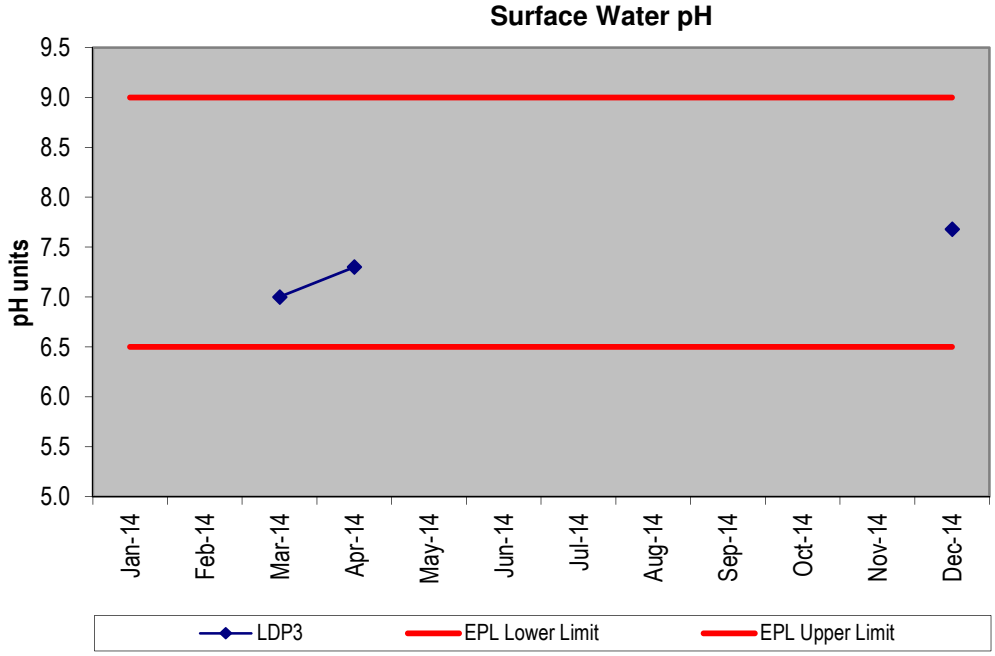


Figure 3: Monthly pH Results

pH monitoring data indicated that the pH results for the discharge of water at LDP3 on the 14th March, 4th April and 8th December 2014 were within the EPL 12374 limit 6.5 – 9.0 for pH.

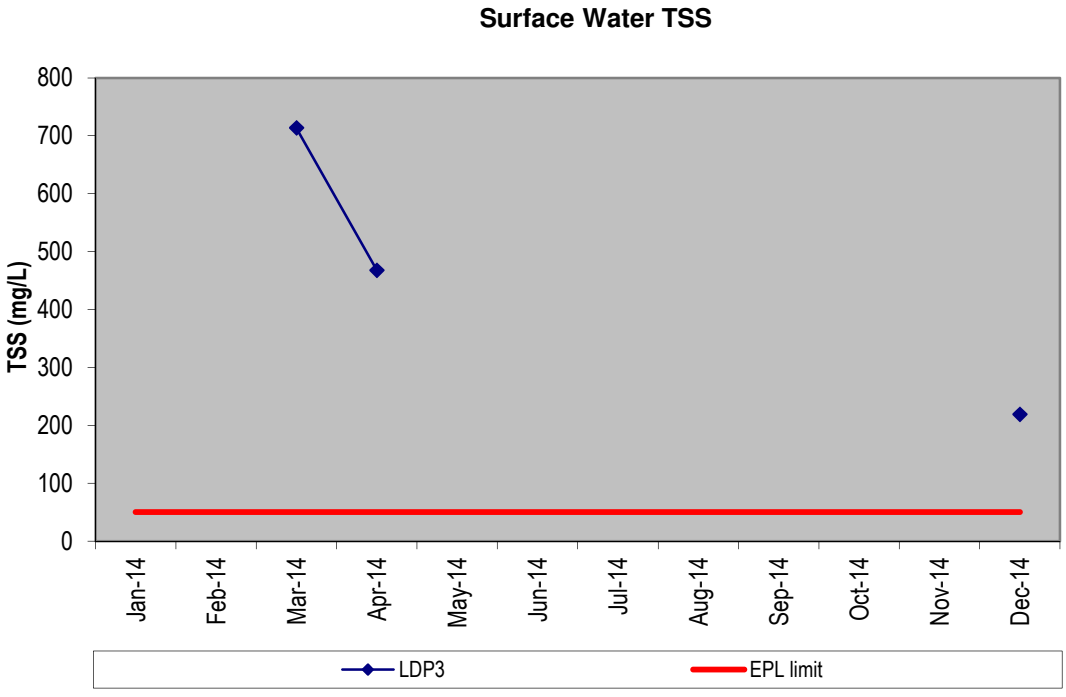


Figure 4: Monthly TSS Results

TSS monitoring data indicated that the TSS result for the discharge of water at LDP3 on the 14th March 2014 exceeded the EPL 12374 limit of 50 mg/L for TSS. The discharge of water followed a rainfall event during which approximately 25 mm of rain had fallen during an electrical storm. The electrical storm created power outages at the mine site and prevented safe access to the Train Loader Dam (LDP3). When it was safe to access to the Train Loader Dam a pump was used to transfer water to the 109 ML Dirty Water Dam.

TSS monitoring data indicated that the TSS result for the discharge of water at LDP3 on the 4th April 2014 exceeded the EPL 12374 limit of 50 mg/L for TSS. This discharge of water followed a rainfall event during which approximately 57 mm of rain had fallen earlier in the day prior to the discharge event. A pump at the Train Loader Dam was used to transfer water to the 109 ML Dirty Water Dam.

TSS monitoring data indicated that the TSS result for the discharge of water at LDP3 on the 8th December 2014 was 219 mg/L. The discharge of water followed a rainfall event during which more than 50 mm of rain had fallen within five days prior to the discharge event. Condition L2.5 in EPL 12374 outlines that the limits specified under condition L2.4 (including TSS), do not apply at LDP1, LDP2 and LDP3 when the discharge of water occurs as a result of a rainfall event at the premises which exceeds 44 mm of rainfall over any consecutive 5 day period.

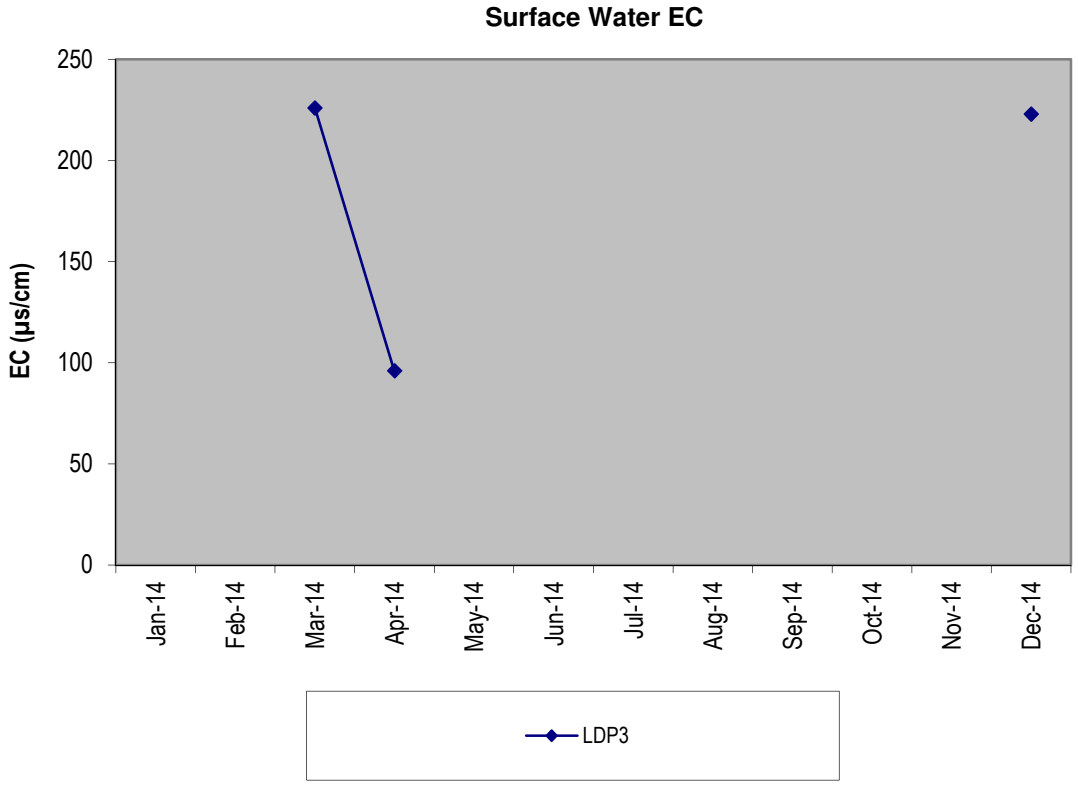


Figure 5: Monthly EC Results

EC monitoring data indicated that the EC result for the discharge of water at LDP3 on the 14th March 2014 was 226 µS/cm.

EC monitoring data indicated that the EC result for the discharge of water at LDP3 on the 4th April 2014 was 96 µS/cm.

EC monitoring data indicated that the EC result for the discharge of water at LDP3 on the 8th December 2014 was 223 µS/cm.

There is no limit prescribed for EC in EPL12374.

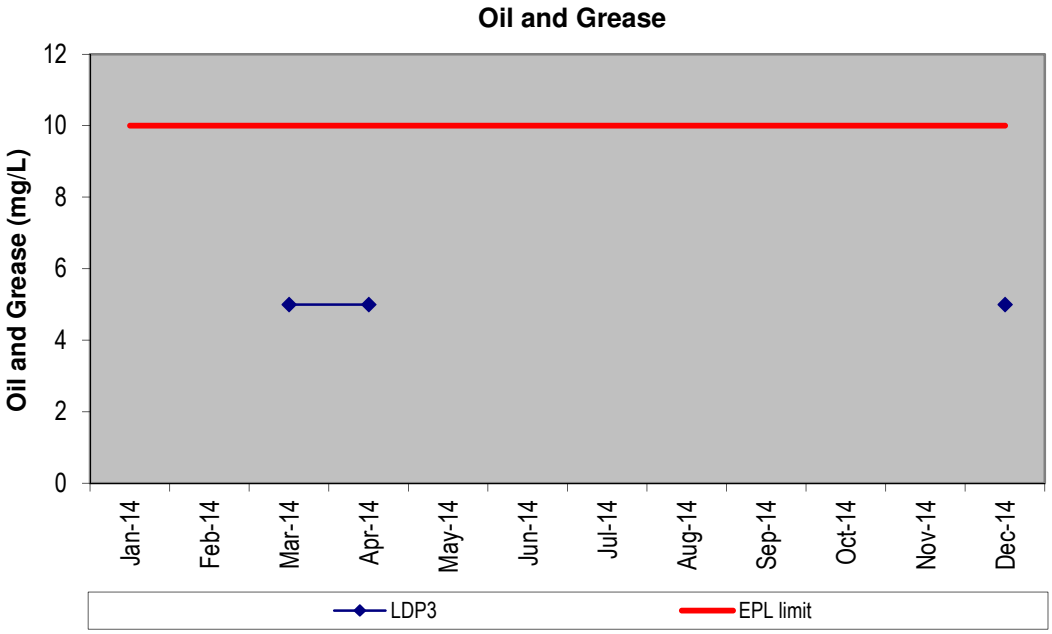


Figure 6: Monthly Oil and Grease Results

Oil and Grease monitoring data indicated that the Oil and Grease results for the discharge of water at LDP3 on the 14th March, 4th April and 8th December 2014 were within the EPL 12374 limit of 10 mg/L for Oil and Grease.

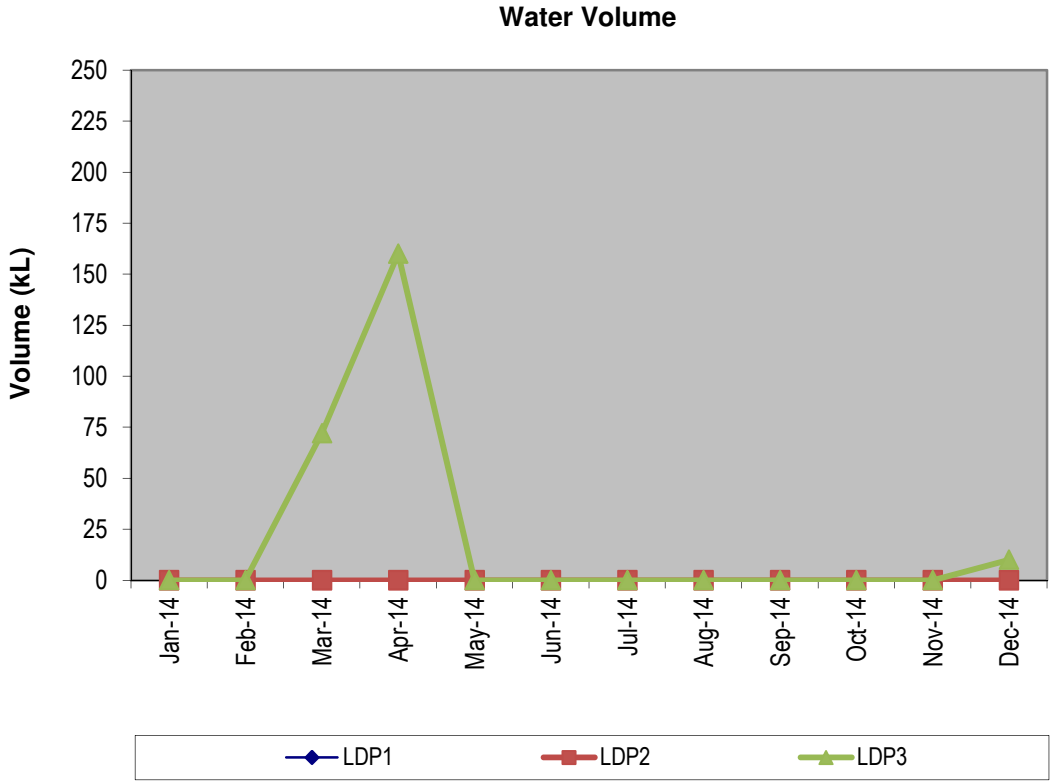


Figure 7: Monthly Water Volume Results

The volume of water discharged at LDP3 on the 14th March 2014 was estimated to be 72 kL.

The volume of water discharged at LDP3 on the 4th April 2014 was estimated to be 160 kL.

The volume of water discharged at LDP3 on the 8th December 2014 was estimated to be 10 kL.

3.4.2 Environmental Performance

A Surface Water Impact Assessment was completed for the assessment of the Modification 3 Extension of Time for DA 162/91. The assessment predicted discharges through LDP002 and LDP003 would be uncommon and occur only during very high rainfall events. During 2014 there were no discharges from LDP001, LDP002 and only three small discharges from LDP003 as outlined in section 3.4.1.

3.4.3 Non-Compliances and Corrective Actions

During the reporting period monitoring data indicated that the TSS result for the discharge of water at LDP3 on the 14th March and 4th April 2014 exceeded the EPL 12374 limit of 50 mg/L for TSS. The two non-compliances were reported in the Annual Return for EPL 12374.

3.5 Groundwater

The groundwater monitoring program during 2014 comprised of ARP01, ARP02A, ARP03A, ARP04, ARP05, ARP06, ARP07, ARP08 and ARP09. The monitoring program also included monitoring at the Production Bore (AM2B-1) located on the surface facilities area at the mine site and at the Village Spring monitoring site.

The groundwater monitoring network comprised seven deep boreholes installed with vibrating wire piezometers and two shallow boreholes installed with standpipes, which were all used to record groundwater levels.

The groundwater monitoring program also included monthly water quality sampling at the Production Bore (AM2B-1), the Village Spring, ARP05, ARP07, ARP08 and ARP09. Whilst water was available for sampling at the Production Bore, Village Spring, ARP05 and ARP09 on occasions, there has been no groundwater identified in the standpipes at ARP07 and ARP08.

The monitoring locations are shown on **Plan 4B** and detailed in **Table 7** below.

Table 7: Groundwater Monitoring Locations

Type	Monitoring Location	Frequency	Quality Monitoring
Vibrating wire piezometer	ARP01	Monthly data download	N/A
	ARP02A	Monthly data download	N/A
	ARP03A	Monthly data download	N/A
	ARP04	Monthly data download	N/A
	ARP06	Monthly data download	N/A
	ARP07	Monthly data download	N/A
	ARP08	Monthly data download	N/A
Bore	AM2B-1	Monthly Water Sample	Sample
	ARP05	Monthly data download	Sample
	ARP07	Monthly data download	Sample
	ARP08	Monthly data download	Sample
	ARP09	Monthly data download	Sample
Seepage	Village Spring	Monthly data download	Sample
	Mine Workings	Monthly Water Sample	Sample

3.5.1 Monitoring Data

The monitoring results for the 2014 reporting period for groundwater levels at boreholes ARP01 – ARP09 are discussed below and presented in **Figures 8** to **16**.

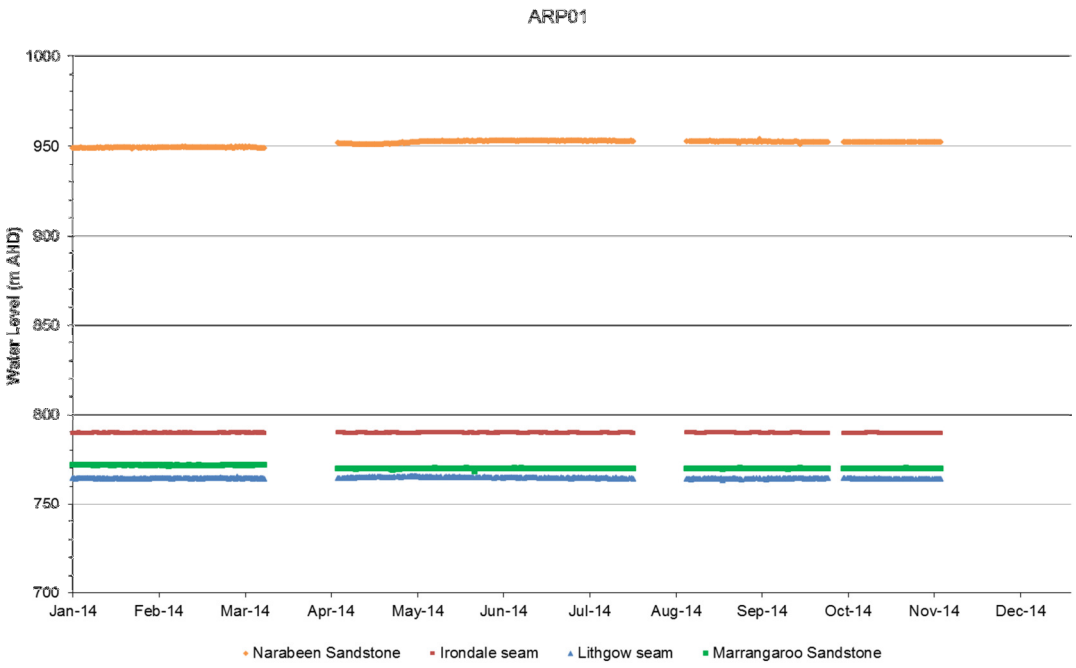


Figure 8: Borehole ARP01 Hydrograph

Piezometric pressure is generally low and stable at the existing VWP monitoring location ARP01, with little observable response to rainfall. The low piezometric pressure is considered to reflect the extensive groundwater seepage areas across the slopes of Mount Airly and Genowlan Mountain. Gaps in the datasets at borehole ARP01 were identified during 2014 due to data logger failure.

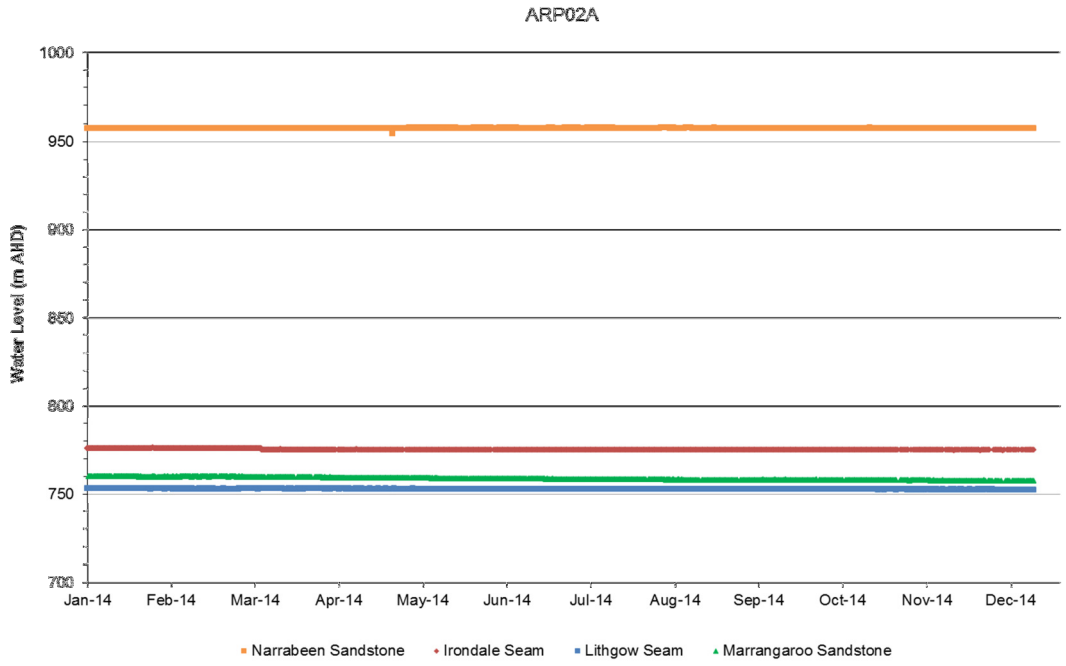


Figure 9: Borehole ARP02A Hydrograph

Piezometric pressure is generally low and stable at the existing VWP monitoring location ARP02, with little observable response to rainfall. The low piezometric pressure is considered to reflect the extensive groundwater seepage areas across the slopes of Mount Airly and Genowlan Mountain.

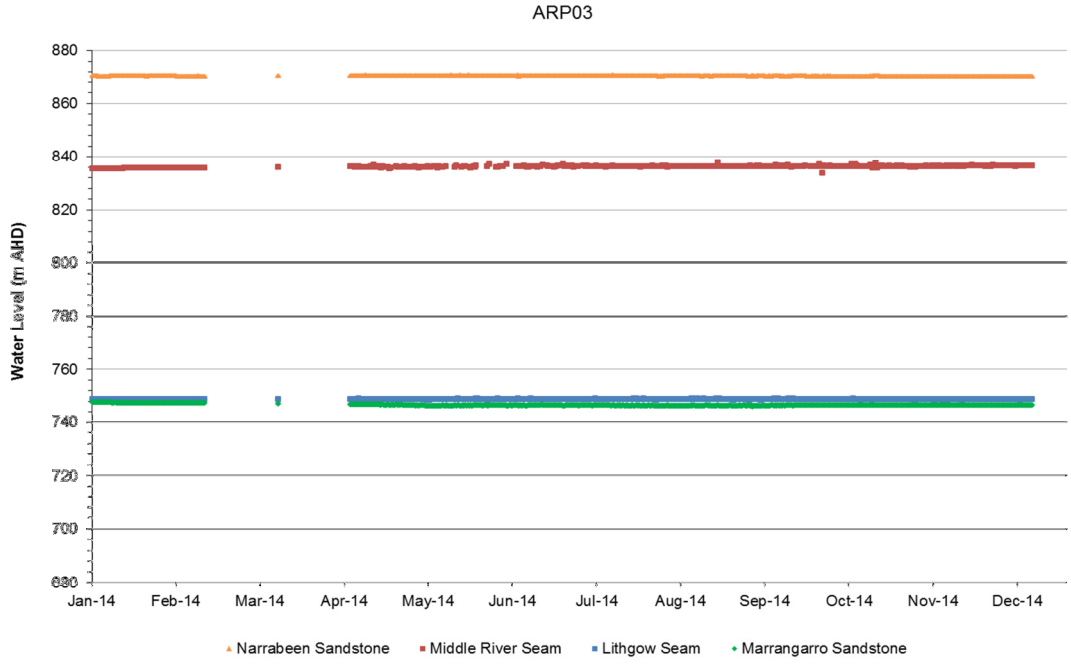


Figure 10: Borehole ARP03 Hydrograph

Piezometric pressure is generally low and stable at the existing VWP monitoring location ARP03, with little observable response to rainfall. The low piezometric pressure is considered to reflect the extensive groundwater seepage areas across the slopes of Mount Airly and Genowlan Mountain. Gaps in the datasets at borehole ARP03 were identified during 2014 due to data logger failure.

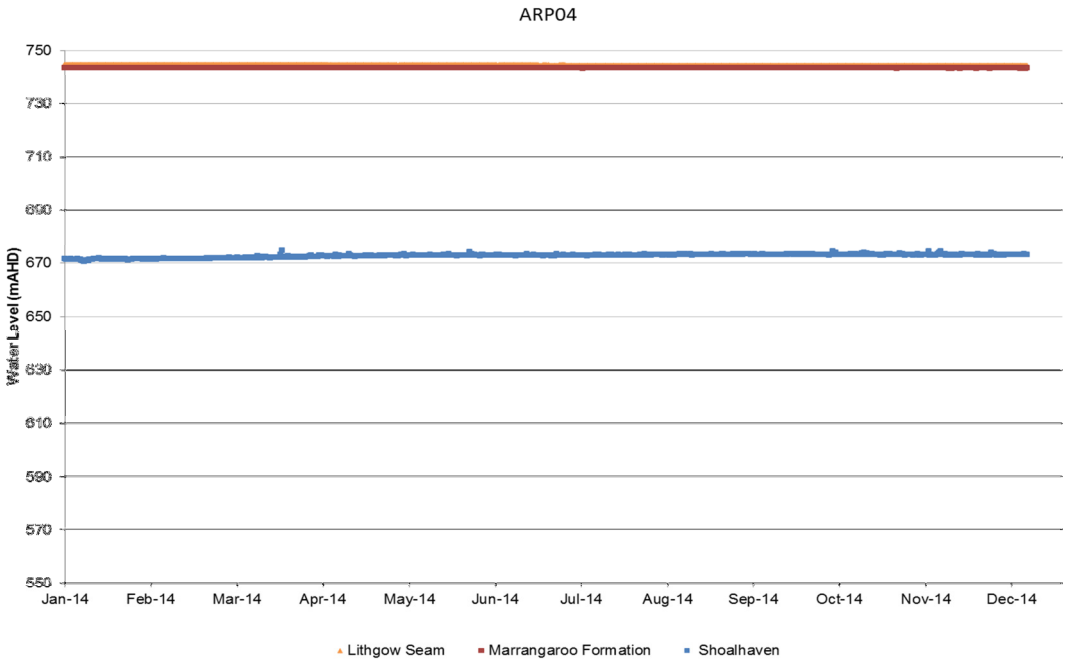


Figure 11: Borehole ARP04 Hydrograph

Piezometric pressure is generally low and stable at the existing VWP monitoring location ARP04, with little observable response to rainfall. The low piezometric pressure is considered to reflect the extensive groundwater seepage areas across the slopes of Mount Airly and Genowlan Mountain.

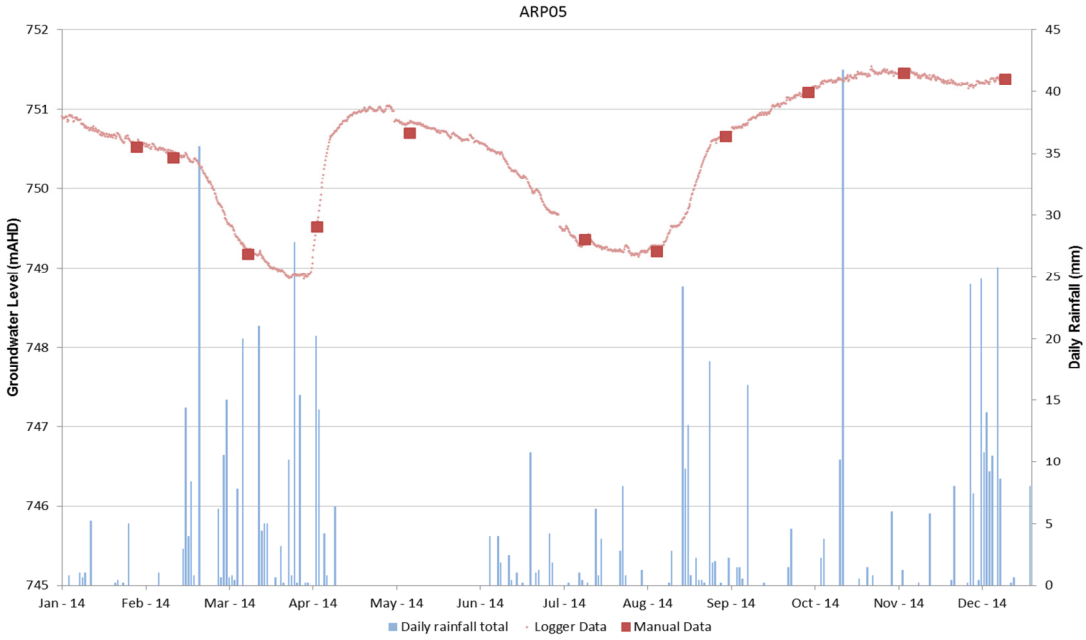


Figure 12: Borehole ARP05 Hydrograph

Groundwater at ARP05 showed some (often delayed) response to rainfall, indicating that aquifer transfer from Permian strata is also a source of recharge to the alluvium. Alluvial groundwater at site ARP05 is fresh and slightly acidic and is sodium-chloride/bicarbonate type water.

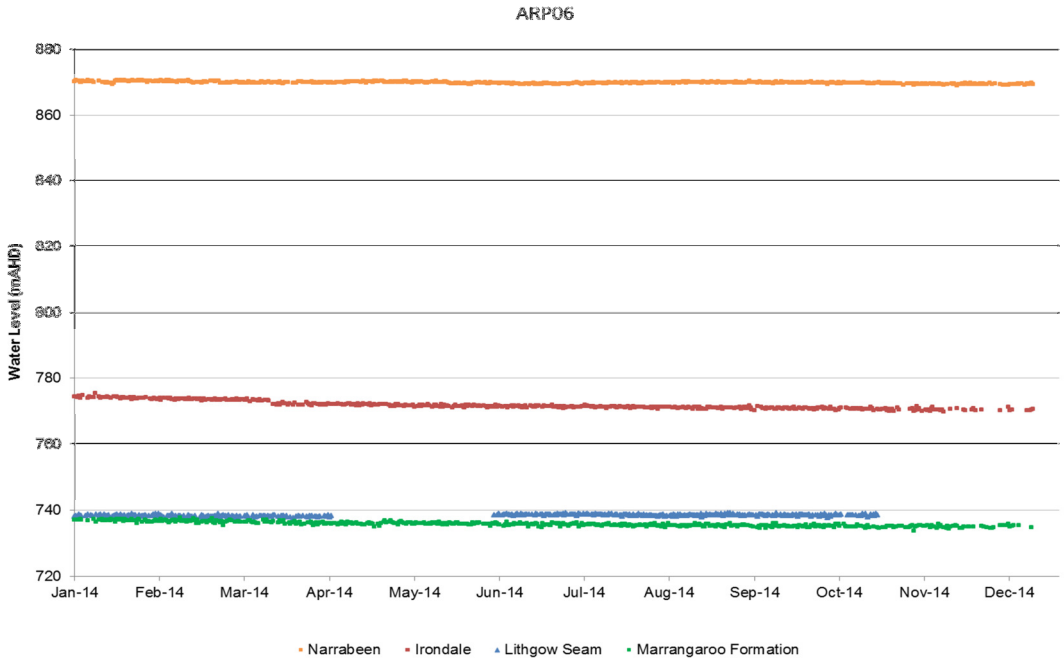


Figure 13: Borehole ARP06 Hydrograph

Piezometric pressure is generally low and stable at the existing VWP monitoring location ARP06, with little observable response to rainfall. The low piezometric pressure is considered to reflect the extensive groundwater seepage areas across the slopes of Mount Airly and Genowlan Mountain.

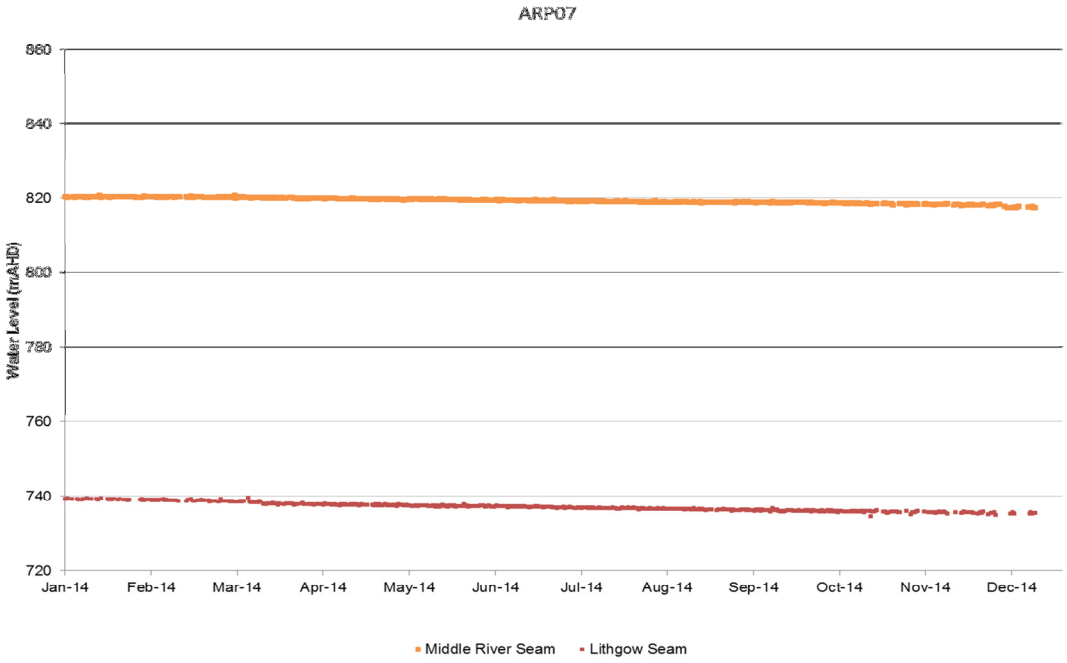


Figure 14: Borehole ARP07 Hydrograph

Piezometric pressure is generally low and stable at the existing VWP monitoring location ARP07, with little observable response to rainfall. The low piezometric pressure is considered to reflect the extensive groundwater seepage areas across the slopes of Mount Airly and Genowlan Mountain.

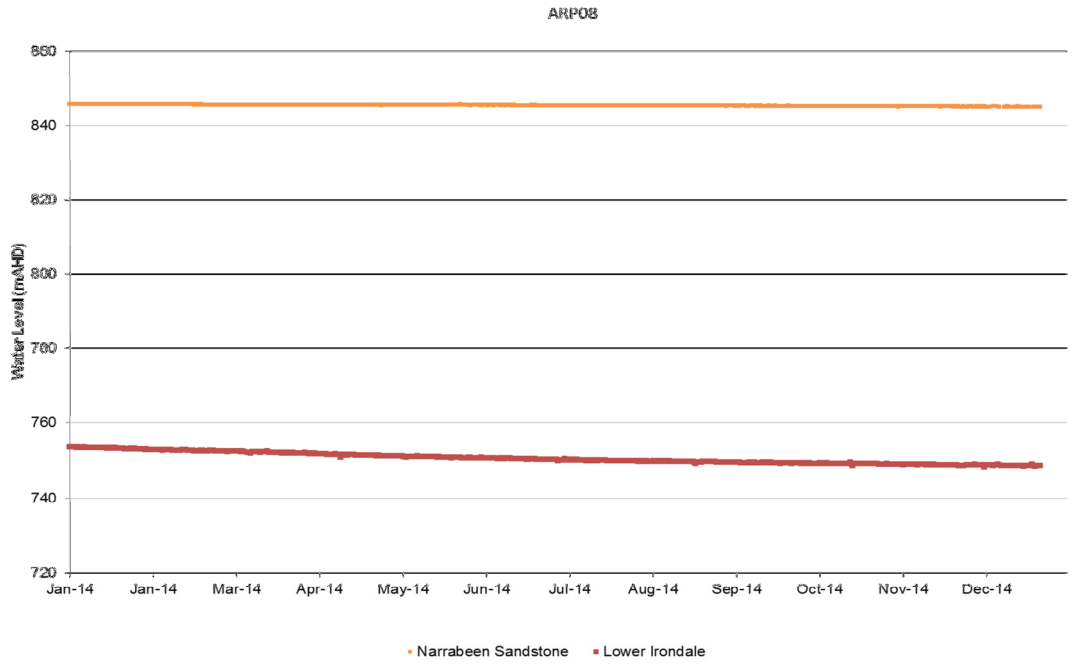


Figure 15: Borehole ARP08 Hydrograph

Piezometric pressure is generally low and stable at the existing VWP monitoring location ARP08, with little observable response to rainfall. The low piezometric pressure is considered to reflect the extensive groundwater seepage areas across the slopes of Mount Airly and Genowlan Mountain.

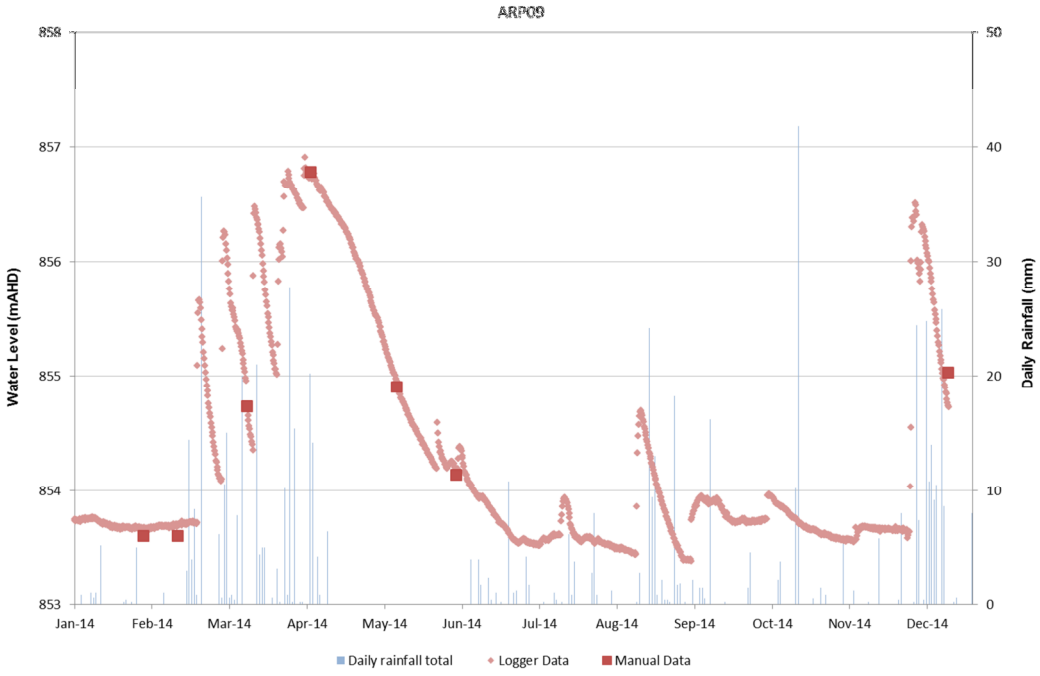


Figure 16: Borehole ARP09 Hydrograph

The standpipe within Genowlan Creek alluvium at ARP09 responded to periods of heavy rainfall in March, April and December 2014. For the remainder of 2014 the standpipe ARP09 was dry, with the exception of small temporary responses to rainfall. Based on the four samples collected in 2014, the alluvial groundwater at ARP09 is fresh and slightly acidic and is of sodium-chloride/bicarbonate type water.

Based on the monitoring data at the Production Bore, regional groundwater from the Shoalhaven Group is slightly acidic and highly brackish to saline. The groundwater is very hard and of magnesium sulfate type.

Seepage at the Village Spring is fresh and slightly alkaline and calcium/magnesium-bicarbonate water type. The Village Spring monitoring location was vandalised on two occasions (April and December) during the 2014 reporting period.

3.5.2 Environmental Performance

A Groundwater Impact Assessment was completed for the assessment of the Modification 3 Extension of Time for DA 162/91. The assessment predicted groundwater extraction and interception from the Sydney Basin North groundwater source up to 31 October 2015 to be below Airly Mine's existing Water Access Licences for the Sydney Basin North groundwater source of 278 ML/year. During 2014 there were no measurable groundwater inflows into the mine and no groundwater was transferred from the underground mine to the surface facilities area.

3.5.3 Non-compliances and Corrective Actions

There were no non-compliances with regard to groundwater during the reporting period.

3.6 Flora and Fauna

Mount Airly and Genowlan Mountain are included in the area declared as the Mugii Murum-ban State Conservation Area. In accordance with the Development Consent at Airly Mine a regime of flora and fauna monitoring has been established. The monitoring program involves flora and fauna studies in areas likely to be affected by subsidence (before, during and after undermining). Since its inception, seasonal surveys have been targeted over the initial five year mine plan area. A summary of the flora and fauna monitoring species are listed in **Table 8** below.

3.6.1 Monitoring Data

Table 8: Summary of Flora and Fauna Monitoring Species

Description	Common Name	Scientific Name
Birds	Regent honeyeater	*Anthochaera phrygia*
	Black-chinned honeyeater	*Melithreptus gularis*
	Brown treecreeper	*Climacteris picumnus*
	Diamond firetail	*Stagonopleura guttata*
	Flame robin	*Petroica phoenicea*
	Gang-gang cockatoo	*Callocephalon fimbriatum*
	Gilbert's whistler	*Pachycephala inornata*
	Glossy black-cockatoo	*Calyptorhynchus lathami*
	Little lorikeet	*Glossopsitta pusilla*
	Painted honeyeater	*Grantiella picta*
	Powerful owl	*Ninox strenua*
	Scarlet robin	*Petroica boodang*
	Sooty owl	*Tyto tenebricosa*
	Speckled warbler	*Chthonicola sagittatus*
	Varied sittella	*Daphoenositta chrysoptera*
	Grey-crowned babbler	*Pomatostomus termporalis*
	Rockwarbler	*Origma solitaria*
Cave-dwelling microbats	Eastern bentwing-bat	*Miniopterus schriebersii oceanensis*
	Eastern horseshoe bat	*Rhinolophus megaphyllus*
	Large-eared pied bat	*Chalinolobus dwyeri*
Flora	Capertee Stringybark	*E. macrorhyncha subsp. cannonii*
	Mount Vincent Mintbush	*Prostanthera stricta*

During 2014 fauna monitoring at Airly mine was conducted by the Centre for Mined Land Rehabilitation (CMLR), The University of Queensland to determine potential impacts of undermining on the fauna of Mt Airly in the Mugii Murum-ban State Conservation Area. A number of bird species, seventeen in total, and three species of cave-dwelling microbats were targeted for monitoring on the mining lease at the beginning of 2014. Data on all bird species observed was also collected as bird community composition can potentially detect the impact of habitat degradation where there is not enough data for statistical analysis of threatened species.

A similar number of Glossy black cockatoos were observed during 2014 compared to 2013, suggesting there has been no population change between years. The observation of four fledglings in the mining lease confirmed breeding is continuing within the area. Little overlap of individual Glossy black cockatoos was observed between 2013 and 2014, suggesting that either not all the sheoak stands have been found and monitored on Mt Airly and Genowlan Mountain; or the foraging range of Glossy black cockatoos is larger than the area currently being monitored and is potentially outside of the Airly Mine lease.

Powerful owls and Sooty owls were recorded opportunistically during 2014, with roost searches finding pellets at one known permanent roost site. Three roost sites where Powerful owls have been observed previously showed no continual occupation suggesting that these were only temporary or transient roosts.

During 2014 bird species richness, density and abundance were similar between control and impact zones at each of the four broad habitat types. As was determined in 2013, an analysis of general bird composition within undermining, infrastructure and associated buffers found no significant difference between these areas and the surrounding undisturbed control areas; although, community composition was slightly more dissimilar at the pagoda impact sites in winter, which may suggest some changes in bird composition in these sensitive areas.

Monitoring of cave-dwelling microbats identified that there was increased activity and emergence numbers at the Lower adit and Doored adit monitoring sites during 2014 compared to previous monitoring. In addition, pregnant female Eastern bentwing bats were captured emerging from the Lower adit, indicating this adit is potentially a maternity roost. Large-eared pied bat observations provided further information on foraging distance and locations, as well as roosts of non-breeding females and males.

During 2014 flora monitoring at Airly mine was also undertaken by the Centre for Mined Land Rehabilitation (CMLR), The University of Queensland to determine potential impacts of undermining on flora species in the Mugii Murum-ban State Conservation Area.

The Capertee Stringybark *E. macrorhyncha subsp. cannonii* listed as vulnerable in NSW's *Threatened Species Conservation Act 1995* (TSC Act); was also listed as vulnerable under the federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) until December 2013 when it was delisted. Three condition assessment variables Crown Density, Crown Extent and Crown Epicormic Extent were used due to their repeatability and the monitoring data they provided to indicate plant stress. Monitoring sites revisited in spring 2014 showed differences in values observed from 2013 to 2014 which included a 4% decrease in Crown Density, a 17% increase in Crown Extent and a 28% decrease in Crown Epicormic Extent. The monitoring season in spring 2013 had above-average temperatures matched with below-average rainfall compared with spring 2014 which had much higher rainfall and more moderate temperatures. As the monitoring program has recently been established, the monitoring data is essentially capturing natural fluctuations in the condition of the trees prior to any reported subsidence.

The Mount Vincent Mintbush *Prostanthera stricta* is a shrub listed as vulnerable in the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the NSW Threatened Species Conservation Act 1995. The results from three years of monitoring have identified that there was a statistically significant reduction

in the abundance of *P. stricta.* For the past two seasons of monitoring data (2013 and 2014), there was a not statistically significant difference in the combined mean values however when compared on a site-by-site basis, the mean difference in cover values across all transects at each monitoring site were as follows; 11% increase (Airly 3 ways), 11% decrease (Airly NE), 23% decrease (Comm Tower) and 35% decrease (Point Hatteras). The declining trend can be seen further when comparing summer values in 2013 with spring 2014 at the Comm Tower and Point Hatteras. In 2013, there was widespread dieback of *P. stricta* populations, which may have been linked to above-average temperatures and below-average rainfall experienced through much of winter and spring 2013. The dieback affected part or all of individual plants in response to drought-stress. In spring 2014, it appeared many plants had recovered with signs of new growth sprouting. This may be related to the much higher rainfall and more moderate temperatures seen in spring and early summer during 2014.

The Capertee Rough-Barked Apple – Redgum – Yellow Box Grassy Woodland (MU20) is a vegetation community mapped in *The Vegetation of the Western Blue Mountains* (DEC 2006) as shown on **Plan 2C**. The variables used in the monitoring program include canopy cover, understorey plant lifeform cover, species richness, species frequency, recruitment density and weed frequency. The field sampling unit design has also been based on an aggregation of established methods using three levels of sampling intensity: rapid, intermediate and full. The monitoring plots are designed to be permanent as this reduces the number of replicates needed and will provide more powerful data when comparing before and after impacts.

3.6.2 Environmental Performance

The type of mining activity undertaken during 2014 was first workings only. Analysis of general bird composition within undermining, infrastructure and associated buffers found no significant difference between these areas and the surrounding undisturbed control areas. As the flora monitoring program has recently been established, the monitoring data is essentially capturing natural fluctuations in the condition of the trees prior to any reported subsidence.

3.6.3 Non-compliances and Corrective Actions

There were no non-compliances with regard to flora and fauna during the reporting period.

3.7 Noise

A noise survey was conducted at Airly Mine during August 2014. Mine operating noise measurements comprised of operator-attended noise surveys and continuous noise logging. The noise monitoring locations are shown on **Plan 4B**.

3.7.1 Monitoring Data

The noise monitoring Locations A, C, D, E and F correspond to mine owned residences or mine boundaries and therefore the 35 dBA criterion does not apply to these locations. However, these locations have been selected to provide an indication of the contribution of the current mine noise emissions and to evaluate the

potential exceedance of the criteria at the residences located in the same direction from Airly Mine.

A criterion of 35 dBA was considered to be appropriate to assess the contribution to the noise level from Airly Mine at all non-mined owned residences. Monitoring Location B corresponded to a non-mined owned residence therefore the 35 dBA criterion applied to this residence.

The daytime, evening and night-time operator-attended noise surveys were conducted over 1 day and 1 night (5th and 6th August 2014) at all noise monitoring locations in order to qualify and quantify the noise environment in the vicinity of the mine site.

Unattended continuous noise loggers were positioned at the monitoring locations B (Parr Residence) and F (Bernina) from the 5th – 15th August 2014. The loggers were used to quantify the noise environment in the vicinity of mine site. Due to a noise logger malfunction at Location F, no data was available to be used to quantify the overall noise amenity at this location.

A summary of the results from the operator attended monitoring for LAeq(15 minute) are included in **Table 9** below.

Table 9: $LA_{eq(15minute)}$ Airly Mine Noise Emission Levels

Monitoring Locations	AM Contributed LAeq(15minute)		
	Day	Evening	Night
Location A - Cnr of Glen Davis Road[1]	N/A (<21), N/A (<20)	N/A (<20), N/A (<20)	<23, <24
Location B - Parr Residence	N/A(<20), <21	N/A(<20), N/A(<20)	N/A (<20), <15
Location C - Rail Loop[1]	30, 32	33, 33	27, 24
Location D - Near Leishman Residence[1]	N/A (<20), N/A (<20)	N/A (<20), N/A (<20)	N/A (<20), <20
Location E - Carinya[1]	N/A (<20), N/A (<20)	N/A (<20), N/A (<20)	N/A (<20), N/A (<20)
Location F - Bernina[1]	N/A (<20), N/A (<20)	N/A (<23), N/A (<24)	24, 26

Note 1: Mine owned residence or mine site.
Note 2: N/A – Not Discernible

At monitoring Location A, the Airly Mine noise emissions were only audible during the night-time monitoring periods and were estimated to be less than 24 dBA.

At monitoring Location B, the Airly Mine noise emissions were only audible during the daytime and night-time monitoring periods and were estimated to be less than 21 dBA during the daytime and less than 20 dBA during the night-time period.

At monitoring Location C, the Airly Mine noise emissions were audible during all monitoring periods, contributing noise levels of up to 33 dBA.

At monitoring Location D, the Airly Mine noise emissions were only audible during the night-time monitoring periods and were estimated to be less than 20 dBA.

At monitoring Location E, the Airly Mine noise emissions were not discernible and below 35 dBA respectively.

At monitoring Location F, the Airly Mine noise emissions were only audible during the night-time monitoring periods contributing noise levels of 24 dBA to 26 dBA, it was likely that an inversion was taking place during this monitoring period.

A comparison of ambient noise levels indicated that there was a decrease of 20 dB during the evening and 11 dB during the night-time period at Location B compared to monitoring undertaken during 2013.

A copy of the August 2014 Noise Monitoring report is included as **Appendix 3.**

3.7.2 Environmental Performance

The measures employed to control and limit noise emissions at Airly Mine include:

- Hard noise buffering controls on the crusher building, screens, conveyors and ventilation fans;
- Correct and efficient operation of all surface machinery;
- Regular servicing and maintenance of all machinery;
- Registering all noise related complaints to identify any actions that may be necessary to further reduce noise emissions from the site.

The noise monitoring surveys were conducted in accordance with the NSW Environment Protection Authority's Industrial Noise Policy, 2000 (INP) noise survey and assessment requirements. The noise emissions from Airly Mine were determined to be below the 35 dBA criterion during all monitoring periods in 2014.

3.7.3 Non-compliances and Corrective Actions

There were no non-compliances with regard to noise during the reporting period.

3.8 Visual

The Airly Mine surface facilities area and the surrounding areas contain moderate to dense tree cover, which in combination with the surrounding mountains and ridgelines provide an enclosed visual character. Land use in the vicinity of Airly Mine consists of rural residential land, grazing, underground coal mining, coal handling infrastructure, transport infrastructure, commercial forestry, and recreation and nature conservation.

3.8.1 Monitoring Data

Tree plantings to provide visual screening of the existing surface facilities area at Airly Mine have been undertaken at the following locations:

- Bernina Station;
- Torbane Road;
- Pit Top.

During the 2014 reporting period two inspections were undertaken at the location of each of the tree screens. At each location the following items were inspected to identify and record their condition:

- Fencing;
- Weeds;
- Tree health.

3.8.2 Environmental Performance

The tree plantings at Bernina Station, Torbane Road and the Pit Top were determined to have adequate management relating to weeds and tree health. The condition of fencing at Bernina Station and Torbane Road will need to be monitored.

3.8.3 Non-compliances and Corrective Actions

There were no non-compliances with regard to visual amenity during the reporting period.

3.9 Aboriginal Cultural Heritage

Management of Aboriginal cultural heritage at Airly Mine is undertaken in accordance with Centennial's Western Holdings Aboriginal Cultural Heritage Management Plan (RPS 2014). The management plan was prepared in consultation with the Office of Environment and Heritage, the Department of Planning and Environment and with registered Aboriginal parties for Centennial's western operations.

3.9.1 Monitoring Data

During 2014 sites identified as proposed exploration boreholes were inspected by archaeologists. An Aboriginal Due Diligence Assessment Report was completed and appended to a Review of Environmental Factors (REF) Report for the proposed exploration drilling activity.

3.9.2 Environmental Performance

During the 2014 reporting period a Cultural Heritage Impact Assessment was submitted to the Department of Planning and Environment as an appendix to the Environmental Impact Statement for the Airly Mine Extension Project. The Aboriginal Heritage Information Management System (AHIMS) has a record of Aboriginal sites identified within the area of the mining and exploration lease as shown on **Plan 2D**.

3.9.3 Non-compliances and Corrective Actions

There were no non-compliances with regard to Aboriginal cultural heritage during the 2014 reporting period.

3.10 Historic Cultural Heritage

3.10.1 Monitoring Data

During 2014 sites identified as proposed exploration boreholes were inspected by archaeologists. A Review of Environmental Factors (REF) Report for the proposed exploration drilling activity was prepared which included an assessment of the potential impact of the drilling activity on Historic cultural heritage.

3.10.2 Environmental Performance

During the 2014 reporting period a Cultural Heritage Impact Assessment was submitted to the Department of Planning and Environment as an appendix to the Environmental Impact Statement for the Airly Mine Extension Project.

3.10.3 Non-compliances and Corrective Actions

There were no non-compliances with regard to Historic cultural heritage during the 2014 reporting period.

3.11 Spontaneous Combustion

The Lithgow coal seam has a low propensity for spontaneous combustion. Typically, for the Lithgow seam coal, the highest risk of spontaneous combustion is during stockpiling for longer than one year. This is not an issue at Airly Mine, as coal is stockpiled for short periods.

3.11.1 Monitoring Data

Airly Mine has a fixed gas monitoring network to monitor indicator gas levels for spontaneous combustion in the underground mine workings. Management of spontaneous combustion is undertaken in accordance with the Spontaneous Combustion Major Hazard Management Plan.

3.11.2 Environmental Performance

There have been no spontaneous combustion issues in relation to in-situ or extracted Lithgow seam coal, and no incidences of spontaneous combustion to date at Airly Mine.

3.11.3 Non-compliances and Corrective Actions

There were no non-compliances with regard to spontaneous combustion during the 2014 reporting period.

3.12 Bushfire

Existing infrastructure at the pit top adjoins woodland and forest type vegetation to the north, east and southeast. The remainder of the pit top is bounded by open grazing land with minimal tree cover. The vegetation in the State Conservation Area is a mix of Woodlands (Grassy) and Short Heath (Open Scrub) (after Keith (2004) in

RFS (2006a)). For the purposes of determining the bushfire risk, the vegetation is classified as dry sclerophyll forests (open forest).

The Fire Danger Index for Lithgow LGA is 80. The slopes around the pit top are up slope with a range 10 to 45 degrees. Infrastructure at the pit top is in excess of 40 m from the surrounding vegetation. This means that the pit top has a defined bushfire attack level of 12.5 (RFS, 2006b). This bushfire attack level requires actions to provide ember protection and prevent accumulations of debris.

3.12.1 Monitoring Data

The majority of the land within the Mugii Murum-ban State Conservation Area is heavily forested with native vegetation and has been identified as Bushfire Prone Land. Fire history data from the National Parks and Wildlife Service, who manage the State Conservation Area, indicate that the majority of bushfires in the area spread from the north and east of the State Conservation Area due to the direction of dominant winds throughout the bushfire season. A number of fire trails exist across the State Conservation Area including Mount Airly, Airly Gap, Genowlan Mountain, Point Hatteras and Genowlan Point. These act as containment lines mitigating a degree of bushfire risk to Airly Mine's infrastructure.

3.12.2 Environmental Performance

During the 2014 reporting period an Environmental Impact Statement which included a Bushfire assessment was submitted to the Department of Planning and Environment for the Airly Mine Extension Project.

3.12.3 Non-compliances and Corrective Actions

There were no non-compliances with regard to bushfire management during the 2014 reporting period.

3.13 Mine Subsidence

3.13.1 Monitoring Data

During 2014 a Review of Environmental Factors (REF) Report was completed for an area identified for the proposed installation of a subsidence monitoring line within the Mugii Murum-ban State Conservation Area.

3.13.2 Environmental Performance

The type of mining activity undertaken during 2014 was first workings only. Inspections were undertaken of pillars after formation in the underground mine workings and no pillar instability was observed. During the 2014 reporting period a Pillar Stability and Subsidence Assessment was completed as a component of the Environmental Assessment for the Extension of Time Modification to Development Consent DA 162/91 that was submitted to the Department of Planning and Environment.

3.13.3 Non-compliances and Corrective Actions

There were no non-compliances with regard to subsidence during the 2014 reporting period.

3.14 Public Safety

Public safety is a priority at Airly Mine. Centennial Coal recognises the proximity of the township of Capertee to Airly Mine and the mine's location within the Mugii Murum-ban State Conservation Area. Measures are implemented within the surface facilities area to ensure the safety of visitors, contractors and the workforce at Airly Mine. Unauthorised access to the underground operations is prohibited.

3.14.1 Monitoring Data

All visitors and contractors to Airly Mine are required to log on using an electronic registration program at the administration building. At the completion of their visit to Airly Mine they are required to log off using the same electronic system.

3.14.2 Environmental Performance

Airly Mine has an existing Borehole Construction Environmental Management Plan that is used during exploration activities in the State Conservation Area. This plan includes the controls to manage public safety in all areas where exploration activity is undertaken.

3.14.3 Non-compliances and Corrective Actions

There were no non-compliances with regard to subsidence during the 2014 reporting period.

3.15 Greenhouse Gas

3.15.1 Monitoring Data

Greenhouse gas emissions reported through the National Greenhouse and Energy Reporting (NGER) program for the 2013 - 2014 financial year are listed in **Table 10** below.

Scope 1 emissions refer to the greenhouse gas emissions released into the atmosphere through activities conducted on site. These emissions can be controlled and managed by the mine.

Scope 2 emissions refer to the greenhouse gases emitted by a secondary facility. For the 2014 Annual Review the scope 2 emissions are directly related to the amount of electricity used by the mine.

Table 10: 2013 - 2014 Greenhouse Gas Emission Data Summary

Emission Summary (C02-eT)	
Total Emissions	**2013 – 2014 FY**
Scope 1	1502
Scope 2	1461

3.15.2 Environmental Performance

Airly Mine currently implements an Energy and Greenhouse Management System that monitors and reports energy usage. Key performance indicators including energy demand and GHG emissions per tonne of ROM coal produced are tracked.

3.15.3 Non-compliances and Corrective Actions

There were no non-compliances with regard to greenhouse gas emissions during the 2014 reporting period.

4. Community Relations

4.1 Environmental Complaints

There were five community complaints received during the 2014 reporting period.

The first community complaint was recorded during the reporting period April 2014. The complaint was received from a resident with regard to noise generated from the surface facilities. The resident reported that an alarm could be heard from the mine site that was creating a nuisance. The concerned resident was contacted to communicate that action had been taken at the mine site to identify the cause for the alarm to be triggered and that repairs to the failed equipment that had triggered the alarm had been completed.

The second community complaint was recorded during the reporting period May 2014. A complaint was received from a member of the community on 15 May 2014 with regard to noise generated from the surface facilities. The person reported that an alarm could be heard from the mine site that was creating a nuisance. As a consequence the audible alarm on the ventilation fan was disabled and was replaced by a communications system whereby an SMS message is now sent to the appropriate personnel.

The third community complaint was also received from a member of the community on 15 May 2014 with regard to noise generated from a train that was heard tooting its horn at times as it travelled along the railway line near Capertee Village. It was identified that the likely use of a horn was for safety considerations due to the risk of a collision on the railway line in tunnels and at road crossings.

The fourth community complaint was again received from a member of the community on 15 May 2014 with regard to the visual impact of the Product Coal Stockpile on the community when driving along the Glen Davis Road. Airly Mine recommenced coal production on 17 March 2014 following a period of “Care and Maintenance”. On the 15 May 2014 there was approximately 65,000 tonnes of coal stockpiled on the Product Coal Stockpile. The Product Coal Stockpile is described as having a capacity of 200,000 tonne in the Environmental Impact Statement for the mine site.

The fifth community complaint was recorded during the reporting period September 2014. A complaint was received from a member of the community on 19 September 2014. The person reported that when a phone call was made to Airly Mine at approximately 4.30pm on Friday 19 September 2014, the person was unable to speak to the Mine Manager, Project Engineer or the Environment and Community Coordinator. At approximately 5.30pm on Friday 19 September 2014 the Environment and Community Coordinator received the message from the person making the

complaint and returned their phone call leaving a message on their answering machine.

4.2 Community Liaison

4.2.1 Special Monitoring Committee

The Airly Special Monitoring Committee (SMC) was a requirement under Condition 31 of DA 162/91 (MOD 2). The purpose of the Committee was to provide a forum for open discussions between, the mine site and community representatives and to assist the mine with communication to the greater community.

Three Special Monitoring Committee meetings were held during the reporting period on the 20th February, 15th May and the 21st of August 2014.

Presentations discussing the mining operations at Airly, environmental management, community activity and updates on the progress of the Airly Mine Extension Project were provided at the meetings with open discussions with all Special Monitoring Committee members.

The requirement to have a Special Monitoring Committee at Airly Mine was removed from the consent conditions of DA 162/91 following approval of Modification 3 on the 9th October 2014.

4.2.2 Community Consultative Committee

Following approval of Modification 3 to the development consent at Airly Mine on 9th October 2014 and in accordance with Schedule 2, Condition 41 of DA162/91 (MOD 3) Centennial Coal is required to have a Community Consultative Committee (CCC) at Airly Mine.

A Community Consultative Committee provides a forum for open discussion between representatives of the company, the community, the council and other stakeholders on issues directly relating to the mine's operations, environmental performance and community relations, and to keep the community informed on these matters.

During November 2014 a chair was appointed to the Airly Community Consultative Committee. Expressions of interest were also sought from representatives of the local community to establish the Airly Mine Community Consultative Committee.

4.2.3 Stakeholder Engagement

The Airly Mine Manager, Airly Environment and Community Coordinator, the Project Manager for the Airly Mine Extension Project and other representatives from the mine have been active in the community over the reporting period at a number of community meetings, events and activities. These have included:

- Capertee and District Progress Association monthly meetings;
- Capertee Public School events;
- Capertee Valley Landcare meetings;

During the reporting period, Airly Mine has maintained a very close relationship with the Capertee Public School, attending a number of events at the school, including the Schools Presentation Day. Airly Mine were also active in supporting the Capertee community through involvement with the Capertee and District Progress Association meetings that were held on a Sunday afternoon following the market day each month.

5. Rehabilitation

5.1 Buildings

During 2014 some of the temporary office and bathhouse demountable buildings used during construction activity at the mine were disconnected from existing services and were relocated to a laydown area in proximity to the Coal Handling Plant.

5.2 Rehabilitation of Disturbed Land

Rehabilitation summaries are presented in **Tables 11** and **12**. Areas of rehabilitation carried out in 2010, 2012 and 2013 reporting periods are shown on **Plan 5A** and **Plan 5B**.

5.3 Other Infrastructure

There was no other infrastructure decommissioned or rehabilitated during the 2014 reporting period.

5.4 Rehabilitation Trials and Research

There were no rehabilitation trials and research undertaken during the reporting period.

5.5 Conceptual Rehabilitation Plan

5.5.1 Rehabilitated Areas and Features

There is still an extensive coal resource to be mined at Airly and therefore it is not considered necessary to provide a final rehabilitation plan. The conceptual final rehabilitation plan however will include:

- removal of all surface infrastructure;
- sealing all mine entries in accordance with DTIRIS standards at the time;
- disconnecting all services and removal of incoming power lines;
- re-contouring the box cut to blend with the surrounding topography. This would require pushing some material below the surface infrastructure up against the existing highwall; and
- ripping and revegetating access roads and remaining hardstand areas.

The principal objective of the final rehabilitation plan is to form a stable landform which will not pose a long-term environmental hazard.

5.5.2 Rehabilitation Objectives

The key rehabilitation objectives for the mine site are to:

- successfully rehabilitate existing disturbed areas and disturbance
- create a final landform that is:
    - self-sustaining and stable which poses no long term environmental hazard
    - free draining and preserves downstream water quality
    - commensurate with the applicable land zonings proposed in the Draft Lithgow LEP 2013
- integrate, where applicable, biodiversity values with the final land use options for the site
- develop a re-vegetation program for rehabilitation areas
- develop preliminary success criteria for decommissioning and rehabilitation
- develop an effective monitoring program to assess performance of the rehabilitated areas.

5.5.3 Remaining Features

Following the cessation of all mining activities associated with Airly Mine, all plant and infrastructure will be removed. It is anticipated that the only features to remain will be sediment ponds associated with the water management system for the site. These will be necessary until a stable landform is created following removal of all other infrastructure. Once revegetation works for the site are advanced, the remaining sediment ponds will provide a valuable water resource.

5.5.4 Rehabilitation Planning Criteria

The principal objective of the rehabilitation plan is to form a stable landform which will pose no long-term environmental hazard. However, when determining the appropriate final land use for the site, a number of other factors will need to be taken into account, namely:

- Rehabilitation outcomes are to be consistent with the commitments made in the Environmental Impact Statement which formed the basis of approval;
- Requirements identified through stakeholder consultation;
- Compatibility with surrounding land uses;
- Physical constraints;
- Soil availability or suitability of alternative top dressing materials;
- Visual implications and landscape compatibility;
- Existing ecological values;
- Existing land capability for the site and surrounding areas; and
- Requirements of state and local authorities and community organizations.

It was therefore proposed to rehabilitate the site to areas of general grazing land and areas of natural forest ecosystem, similar to that immediately surrounding the site.

5.5.5 Completion Criteria

Ultimately, the work will be considered successful if the objectives of the rehabilitation plan for the Airly Mine site have been achieved.

A final Closure Plan for Airly will include the principles of Landscape Function Analysis (LFA) in order to provide a predictive understanding of how well the rehabilitation landscapes are working. LFA is essentially a monitoring procedure, using simple indicators, to assess how well an ecosystem works as a biogeochemical system. It is intended for repeated measurements to present the data as a time series (trajectory). The normal monitoring of revegetation performance includes:

- Floristic analysis including species composition;
- Structure including height and distribution; and
- Health and vigour of the plants.

These parameters are sufficient to determine ongoing maintenance requirements such as sowing specific species, additional fertilizer or soil conditioning treatments. However with the addition of LFA methods, the function of the landscape system can also be assessed and tracked.

Ultimately, the decision on whether or not the revegetation works have succeeded rests with the DTIRIS, however it is anticipated that some expert advice will be sought at the time of lease relinquishment.

5.5.6 Monitoring and Research

Photo and monitoring points will be established for rehabilitation areas, so that Airly can keep accurate records of plant growth and site recovery, as well as track the progress of rehabilitation works. Regular monitoring has already enabled the early detection of rilling or erosion of some batters which have been repaired.

5.5.7 Post-closure Maintenance

Responsible management of the site does not assume that once seeds have been sown and tube stock planted the site is stable and rehabilitation is completed. Centennial is committed to ongoing monitoring of the success of final landform development and revegetation to ensure the success of such activities, or identify areas where further works are required.

It is anticipated that biannual inspections of the rehabilitation areas will be undertaken or following severe rainfall events where the potential for erosion is significantly increased. Follow up work expected to be required includes ongoing weed and feral animal control, repair of any erosion, replacement of dead vegetation and possible additional application of fertilizer if required. It is expected this follow up work will continue by the leaseholder for a number of years after the completion of the final rehabilitation works.

Table 11: Rehabilitation Summary

		Area Affected / Rehabilitated (ha)		
A:	**MINE LEASE AREA**	**To Date**	**Last Report**	**Next Report (proposed)**
A1	Mine lease Area (approximate)	2,745 ha		
B:	**DISTURBED AREAS**			
B1	Infrastructure area (other disturbed areas to be rehabilitated at closure including facilities, roads)	39.1	39.1	39.1
B2	Active Mining Area (excluding items B3-B5 below)	0	0	0
B3	Waste Emplacements, (active/unshaped/in or out-of-pit)	3.7	3.7	3.7
B4	Tailings Emplacements, (active/unshaped/uncapped)	0	0	0
B5	Shaped waste emplacement (awaits final vegetation)	0	0	0
	ALL DISTURBED AREAS	42.8	42.8	42.8
C:	**REHABILITATION**			
C1	Total Rehabilitated area (to date)	41.7	41.7	42.0
D:	**REHABILITATION ON SLOPES**			
D1	10 to 18 degrees	8	8	8
D2	Greater than 18 degrees	0	0	0
E:	**SURFACE OF REHABILITATED LAND**			
E1	Pasture and grasses	17.1	17.1	17.1
E2	Native forest/ecosystems	24.6*	24.6*	24.9*
E3	Plantations and crops	0	0	0
E4	Other	0	0	0

* Note: this includes tree screen and habitat planting which was not part of the land disturbed by mining.

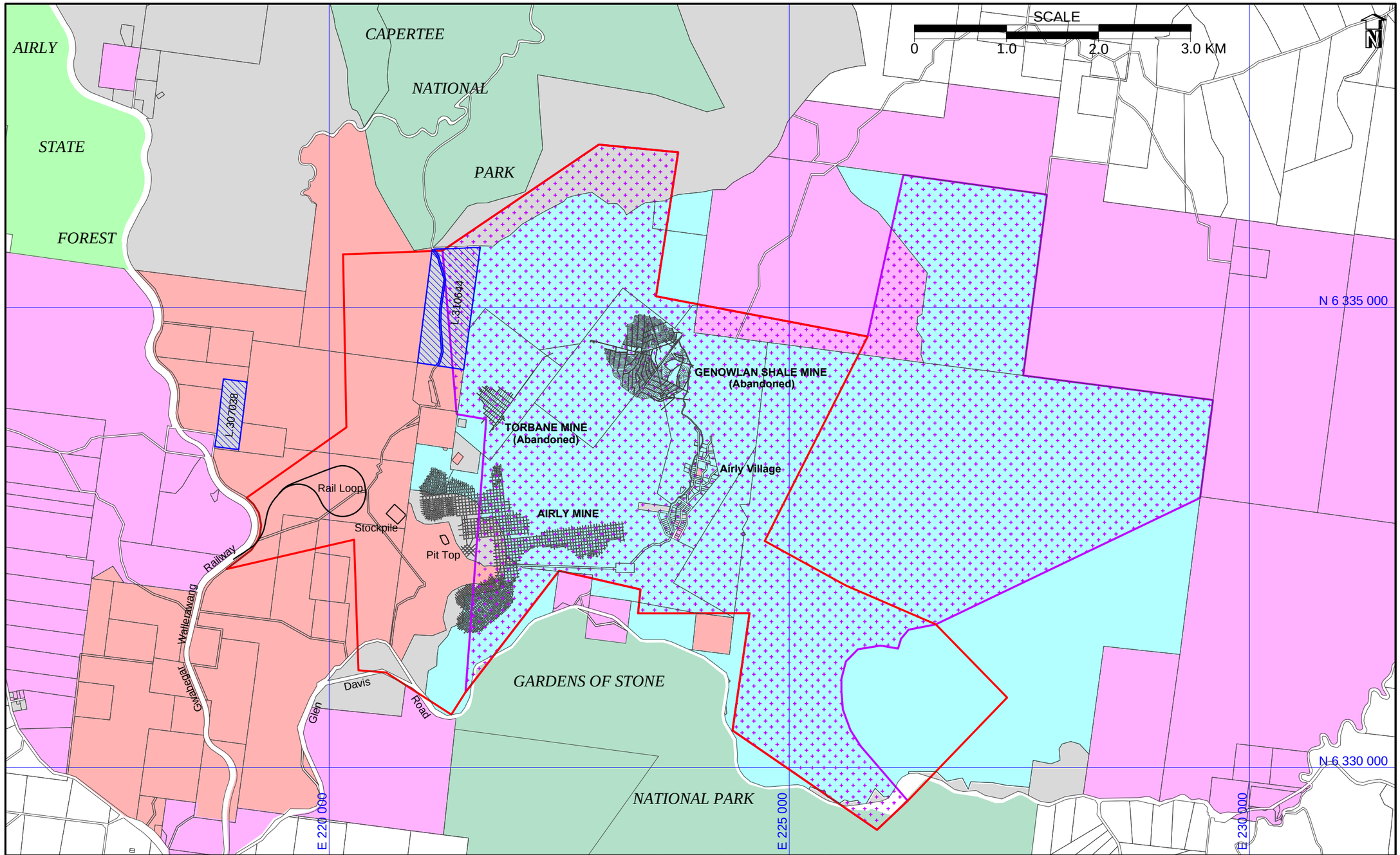
Table 12: Maintenance Activities on Rehabilitated Land

NATURE OF TREATMENT	Area Treated (ha)		
	Report Period	Next Period	Comment/control strategies/ treatment detail
Additional erosion control (drains re-contouring, rock protection)	0	0	
Re-covering (detail-further topsoil, subsoil sealing etc)	0	0	
Soil Treatment (fertilizer, lime, gypsum etc)	0	0	
Treatment/Management (grazing, cropping, slashing etc)	0	1	
Re-seeding/Replanting (species density, season etc)	0	0	
Adversely Affected by Weeds (type and treatment)	70	70	Spraying of blackberry and serrated tussock.
Feral animal control (additional fencing, trapping, baiting etc)	0	0	

6. Activities Proposed in the Next Reporting Period

The activities proposed for 2015 are summarised below:

- Ongoing flora and fauna monitoring work over the lease areas;
- Installation of groundwater monitoring sites across the lease areas after completion of exploratory drilling;
- Coal mining activity;
- Annual noise monitoring;
- Continued weed and pest management;
- Surface Water Monitoring;
- Groundwater Monitoring;
- Depositional Dust Gauge monitoring;
- Maintenance of erosion and sediment control structures;
- Community Consultative Committee meetings;
- Ongoing consultation with the community to be maintained.



LEGEND

- ML1331 Lease Boundary
- A232 Authorisation Boundary
- National Park
- Mugii Murum-Ban SCA
- State Forest
- Centennial Land
- Private Freehold Land
- Crown Land
- Crown Licence

LEASES: ML1331, A232		MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013		SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020		DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited		SCALE	Refer to Scale Bar
REPORTING OFFICER	---------- Greg Brown - Environment & Community Coordinator		

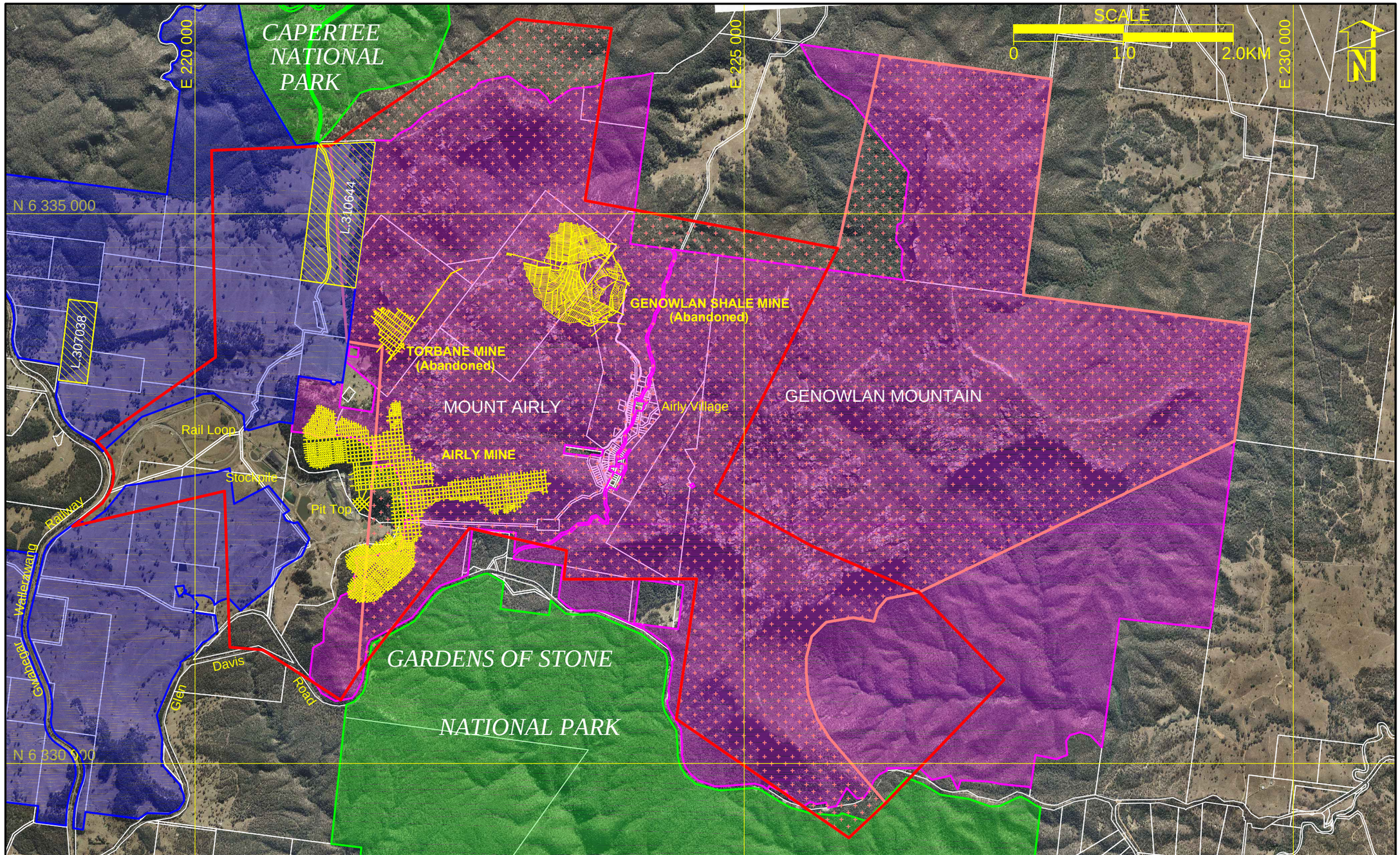
ANNUAL REVIEW 2014

PLAN 1
MINE & CONTEXT

Centennial Coal

DATE: 24-Mar-2015

PC5771



LEGEND

- ML1331 Lease Boundary
- A232 Authorisation Boundary
- National Park
- Mugii Murum-Ban SCA
- Grazing Land
- Crown Licence
- Cadastral Boundary

LEASES: ML1331, A232		MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013		SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020		DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited		SCALE	Refer to Scale Bar
REPORTING OFFICER	Greg Brown - Environment & Community Coordinator		

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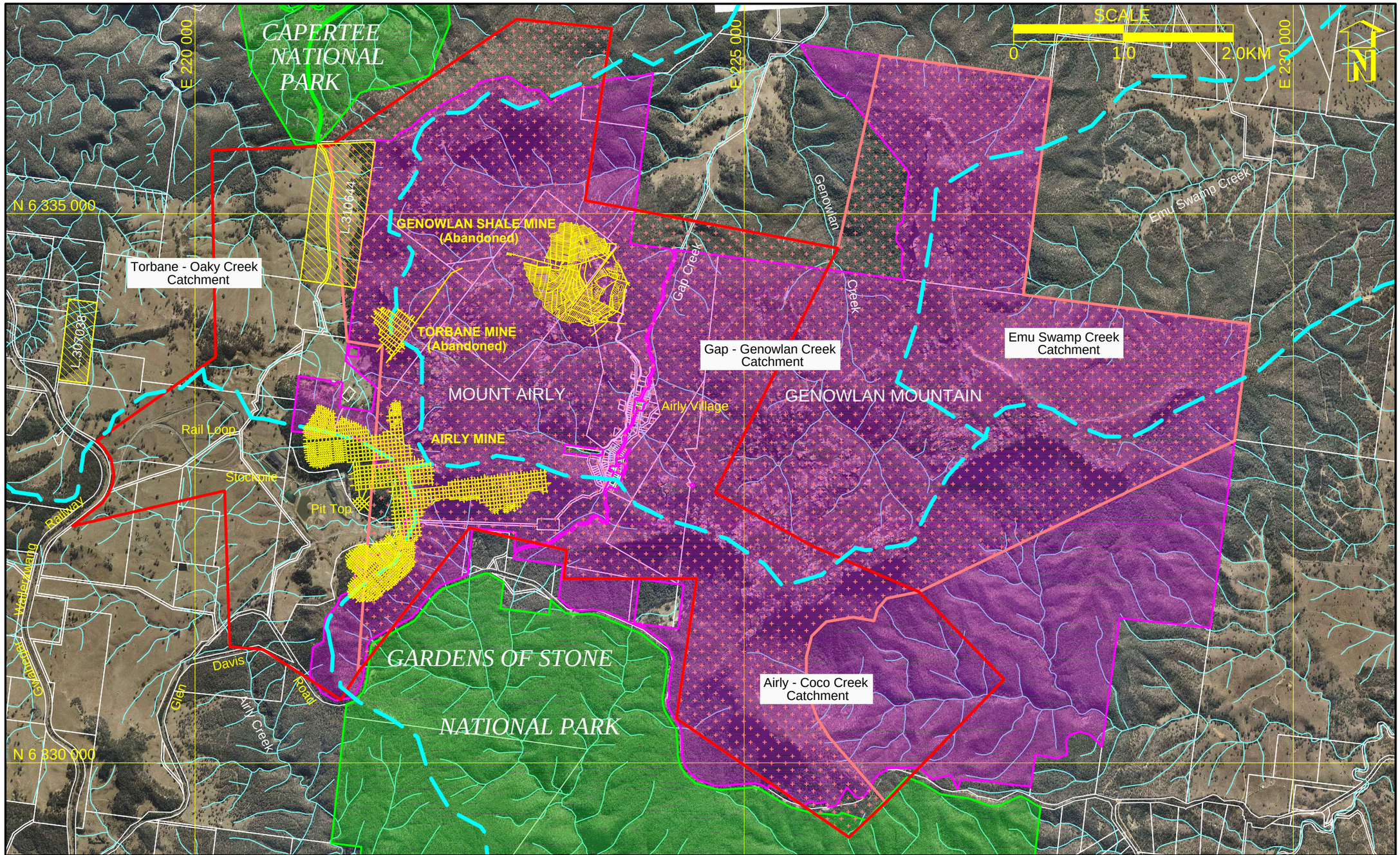
PLAN 2A
PRE MOP ENVIRONMENT
LAND USE

Centennial Coal

DATE: 24-Mar-2015

PC5772



LEGEND

- ML1331 Lease Boundary
- A232 Authorisation Boundary
- National Park
- Mugii Murum-Ban SCA
- Crown Licence
- Catchment Boundary
- Natural Watercourse
- Cadastral Boundary

LEASES: ML1331, A232		MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013		SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020		DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited		SCALE	Refer to Scale Bar
REPORTING OFFICER	---------- Greg Brown - Environment & Community Coordinator		

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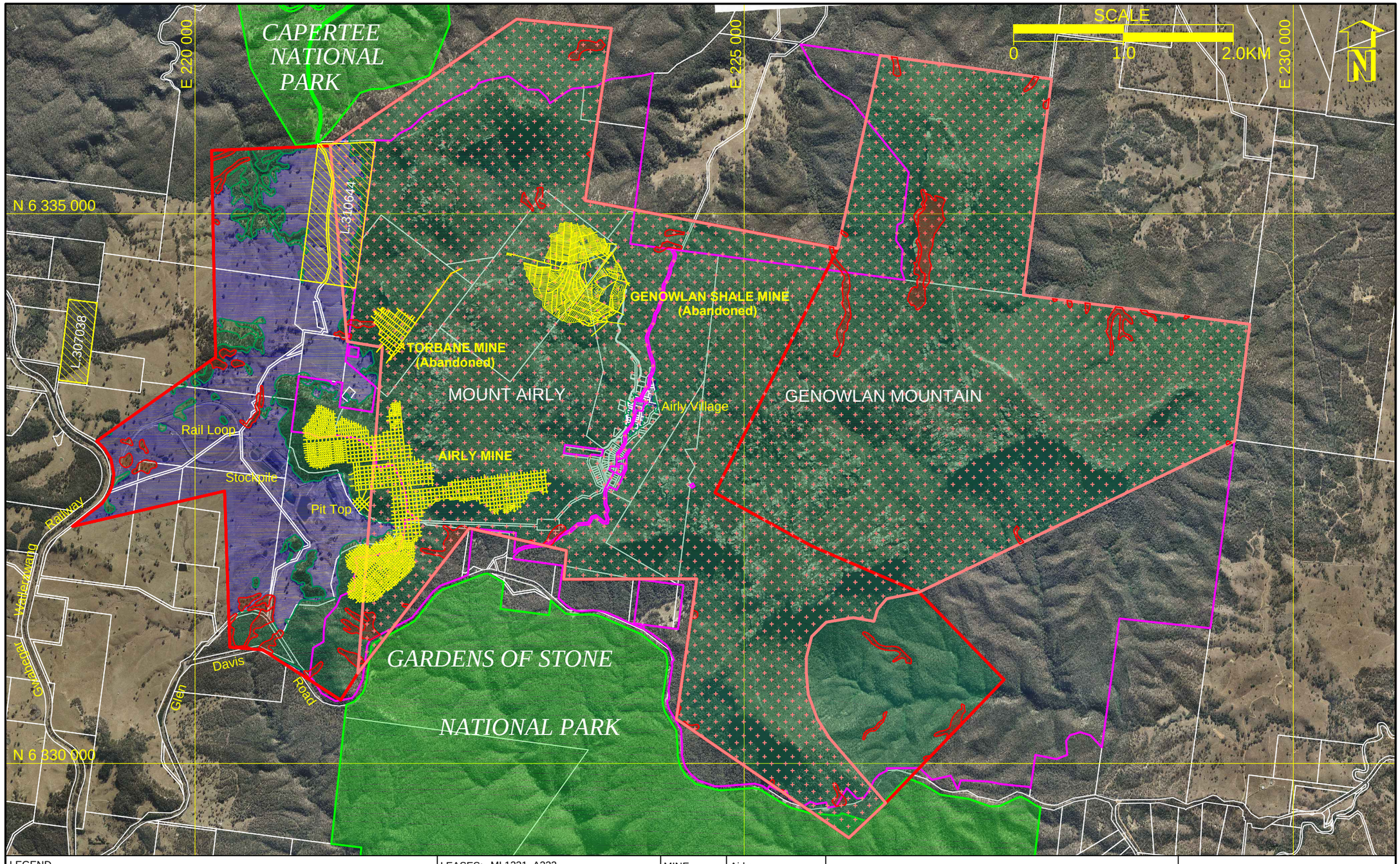
PLAN 2B
PRE MOP ENVIRONMENT
HYDROLOGY

Centennial Coal

DATE: 24-Mar-2015

PC5772



LEGEND

- ML1331 Lease Boundary
- A232 Authorisation Boundary
- National Park
- Mugii Murum-Ban SCA
- Crown Licence
- Disturbed Area DECC Mapping
- Vegetation Communities DECC Mapping
- EEC Areas DECC Mapping
- Cadastral Boundary

LEASES: ML1331, A232		MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013		SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020		DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited		SCALE	Refer to Scale Bar
REPORTING OFFICER	---------- Greg Brown - Environment & Community Coordinator		

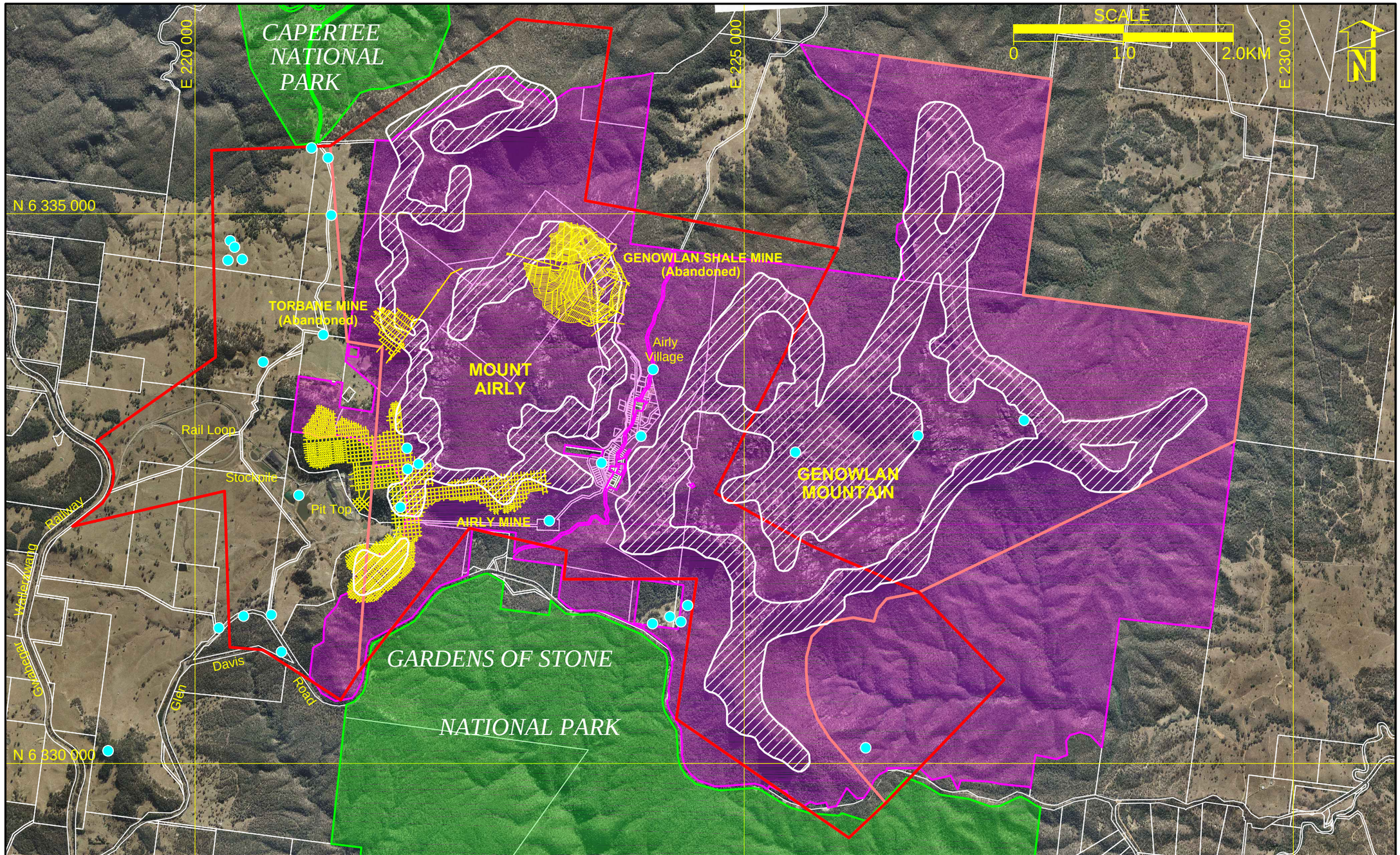
ANNUAL REVIEW 2014

PLAN 2C
PRE MOP ENVIRONMENT VEGETATION BOUNDARIES

Centennial Coal

DATE: 24-Mar-2015

PC5774



LEGEND

- ML1331 Lease Boundary
- A232 Authorisation Boundary
- National Park
- Mugii Murum-Ban SCA
- Environmental Protection Zone
- Aboriginal Archaeological Site
- Cadastral Boundary

LEASES: ML1331, A232		MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013		SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020		DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited		SCALE	Refer to Scale Bar
REPORTING OFFICER	Greg Brown - Environment & Community Coordinator		

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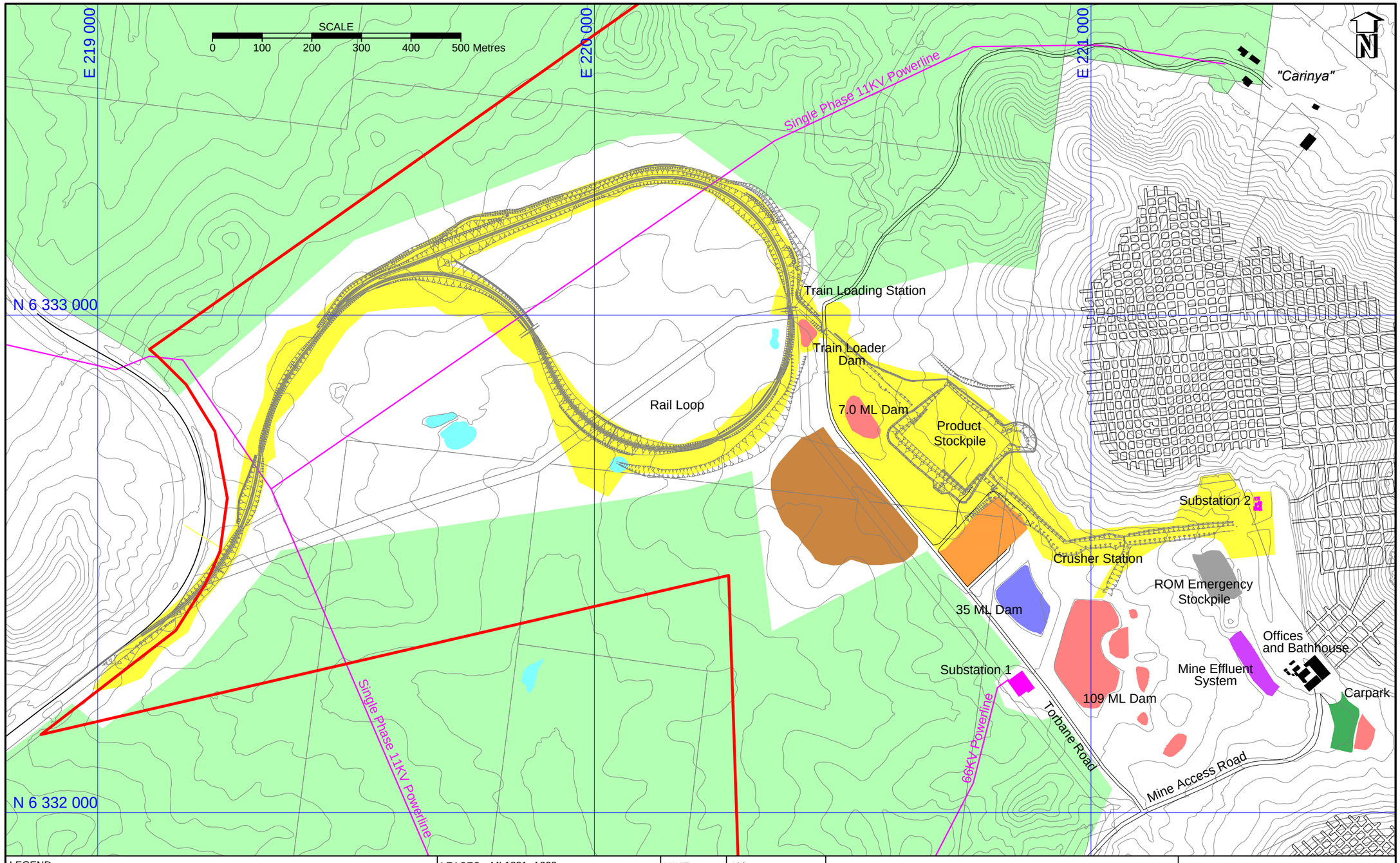
PLAN 2D
PRE MOP ENVIRONMENT
ARCHAEOLOGY & ENVIRONMENTAL PROTECTION ZONES

Centennial Coal

DATE: 24-Mar-2015

PC5775



LEGEND

- ML1331 Lease Boundary
- Grazing Licence
- Landscape Bund & Topsoil 2008
- Contractor Laydown Area 2008
- Rail Loop & Coal Handling 2009
- Emergency Stockpile 2012
- Mine Effluent System 2012
- Car Park Extension 2012
- Settling Dam
- Discharge Dam
- Farm Dam
- Cadastral Boundary

LEASES: ML1331, A232		MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013		SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020		DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited		SCALE	Refer to Scale Bar
REPORTING OFFICER	---------- Greg Brown - Environment & Community Coordinator		

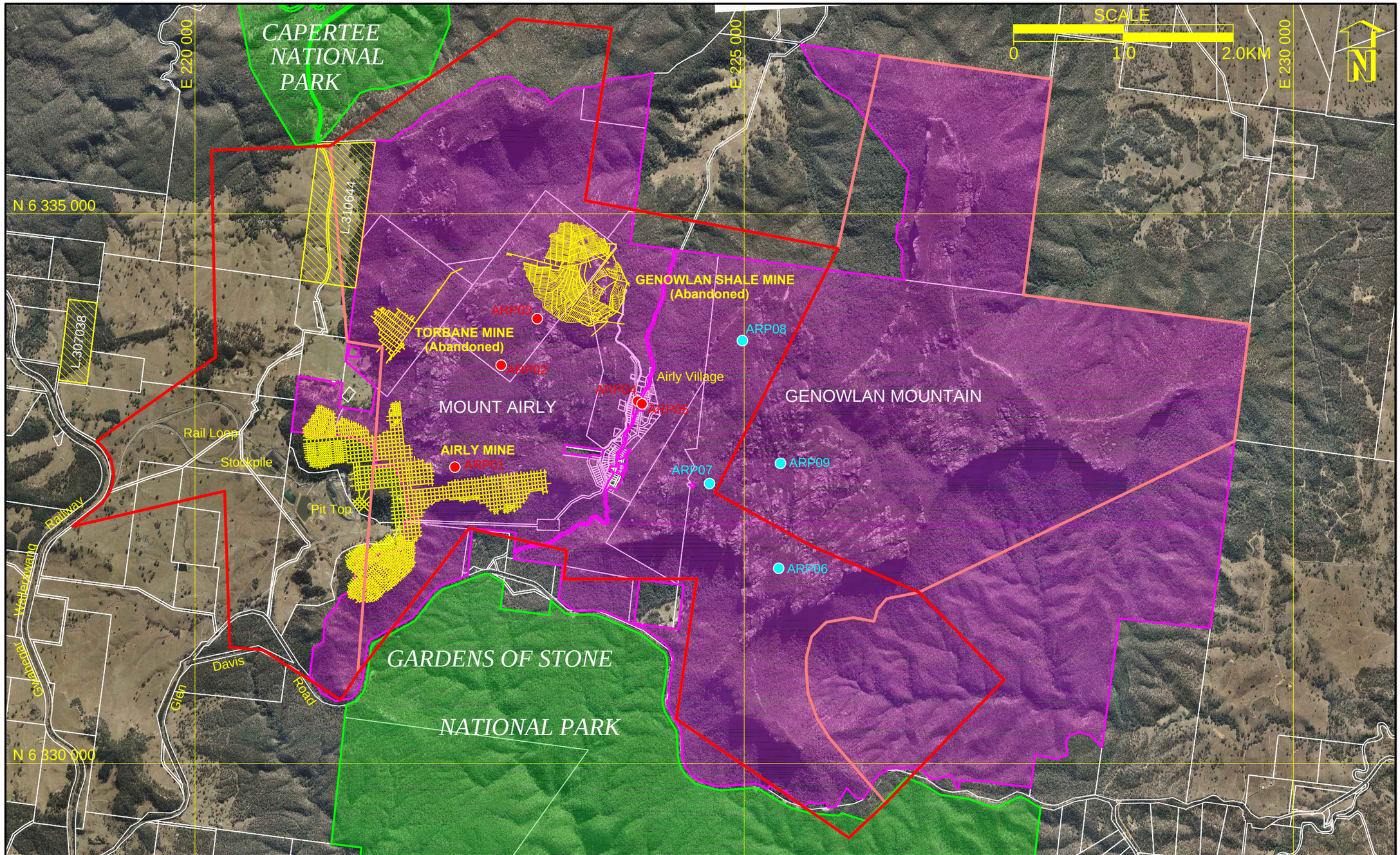
ANNUAL REVIEW 2014

PLAN 3A
LAND PREPARATION
PIT TOP & COAL HANDLING

Centennial Coal

DATE: 24-Mar-2015

PC5776



LEGEND

- ML1331 Lease Boundary
- A232 Authorisation Boundary
- National Park
- Mugii Murum-Ban SCA
- Exploration Site 2012
- Exploration Site 2013
- Cadastral Boundary

LEASES: ML1331, A232		MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013		SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020		DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited		SCALE	Refer to Scale Bar
REPORTING OFFICER	Greg Brown - Environment & Community Coordinator		

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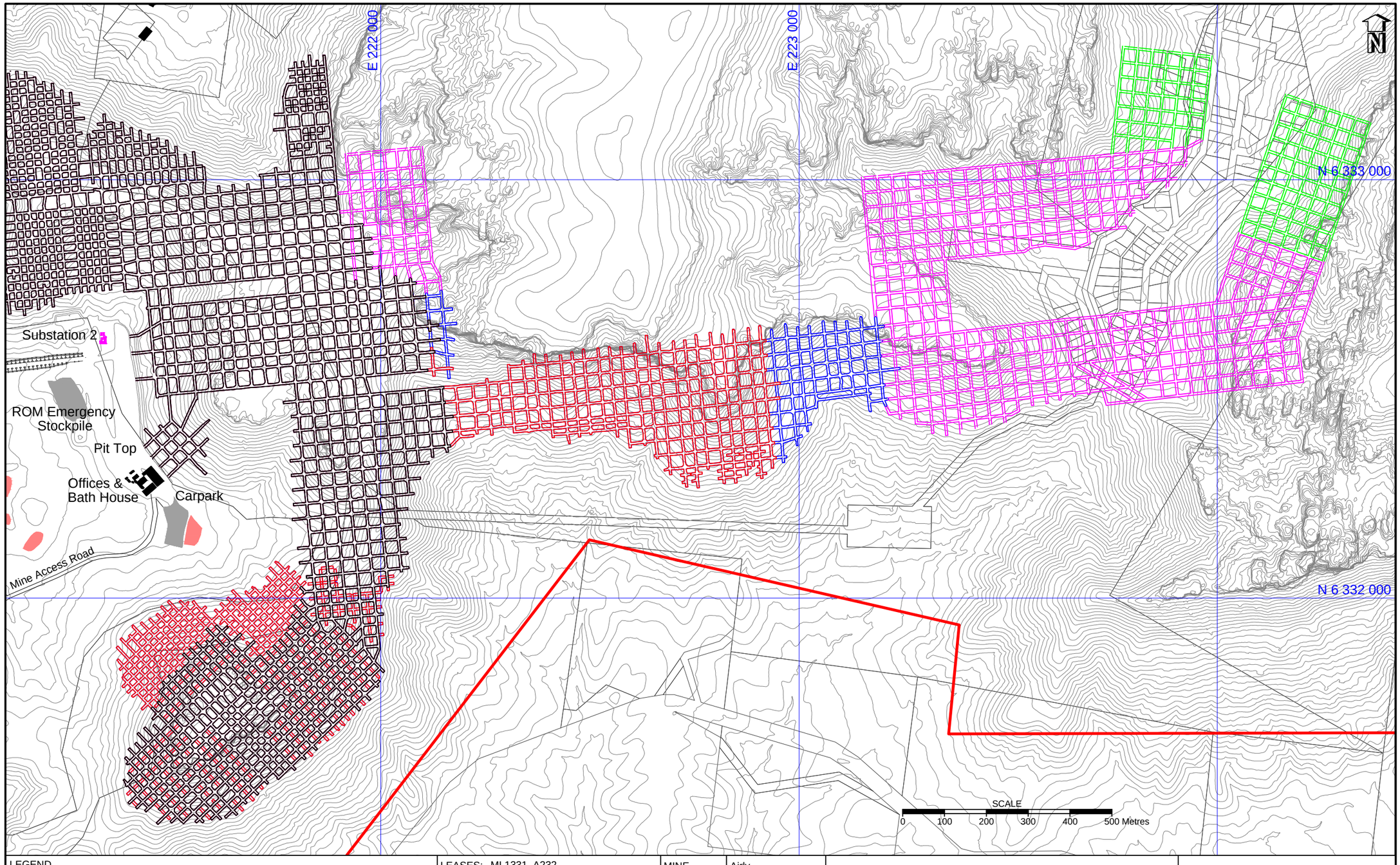
PLAN 3B
LAND PREPARATION
EXPLORATION SITES

Centennial Coal

DATE: 24-Mar-2015

PC5777



LEGEND

- ML1331 Lease Boundary
- Settling Dam
- Workings 30-11-12
- Production 2014
- Production Jan-Feb 2015
- Proposed Development Mar-Oct 2015
- Proposed Development Nov-Dec 2015
- Cadstral Boundary

LEASES: ML1331, A232	MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013	SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020	DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited	SCALE	Refer to Scale Bar
REPORTING OFFICER	---------- Greg Brown - Environment & Community Coordinator	

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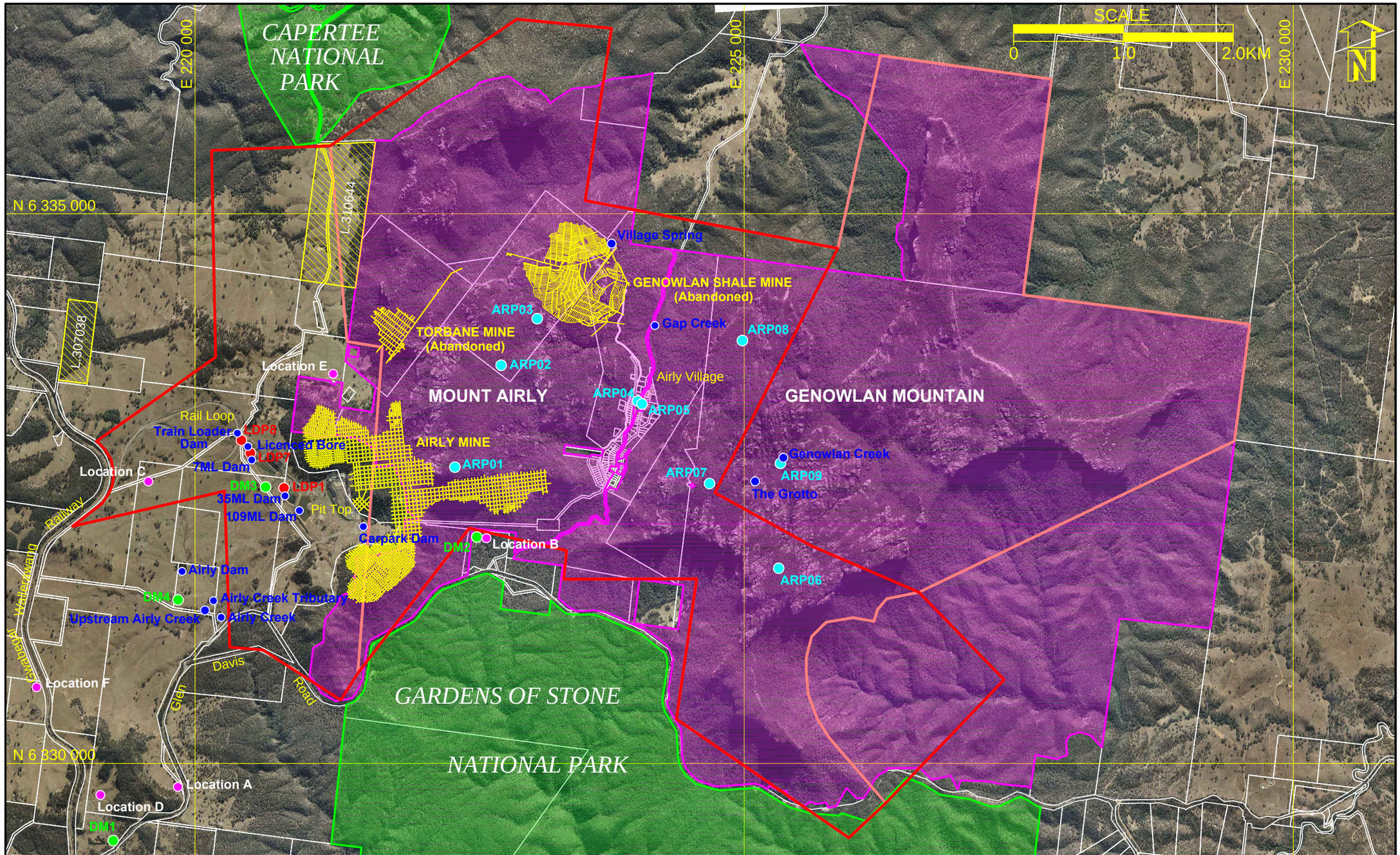
PLAN 4A
PROPOSED MINING ACTIVITIES
PRODUCTION 2015

Centennial Coal

DATE: 24-Mar-2015

PC5778



LEGEND

- ML1331 Lease Boundary
- A232 Authorisation Boundary
- National Park
- Mugii Murum-Ban SCA
- Licenced Discharge
- Dust Monitoring
- Water Monitoring
- Groundwater Monitoring
- Noise Monitoring

LEASES: ML1331, A232		MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013		SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020		DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited		SCALE	Refer to Scale Bar
REPORTING OFFICER	Greg Brown - Environment & Community Coordinator		

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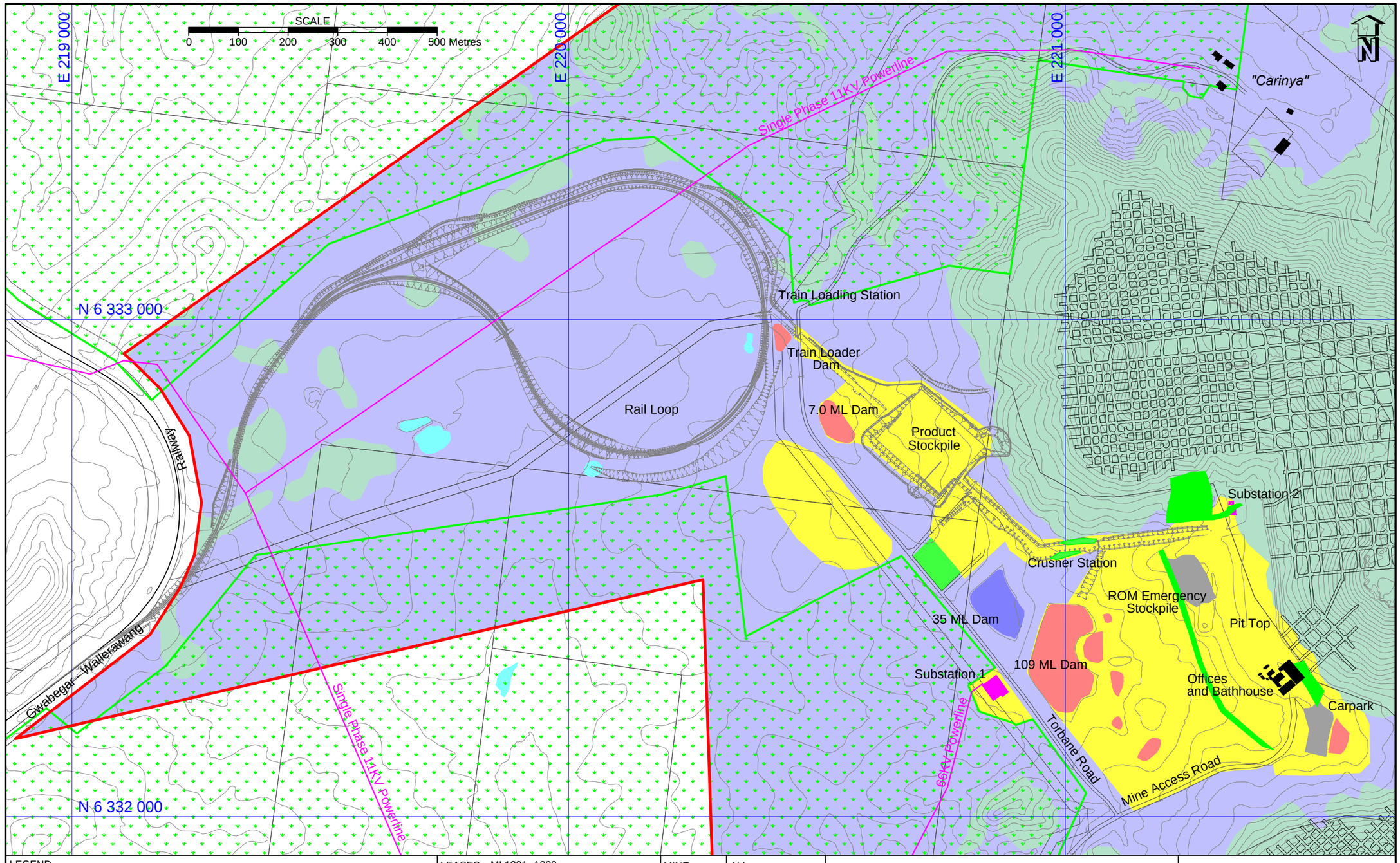
PLAN 4B
PROPOSED MINING ACTIVITIES
ENVIRONMENTAL MONITORING POINTS

Centennial Coal

DATE: 24-Mar-2015

PC5779



LEGEND

- ML1331 Lease Boundary
- Grazing Licence
- Disturbed Area Mine Infrastructure
- Rehabilitation 2010
- Disturbed Area DECC Mapping
- Vegetation DECC Mapping
- Farm Dam
- Settling Dam
- Discharge Dam
- Cadastral Boundary

LEASES: ML1331, A232		MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013		SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020		DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited		SCALE	Refer to Scale Bar
REPORTING OFFICER	---------- Greg Brown - Environment & Community Coordinator		

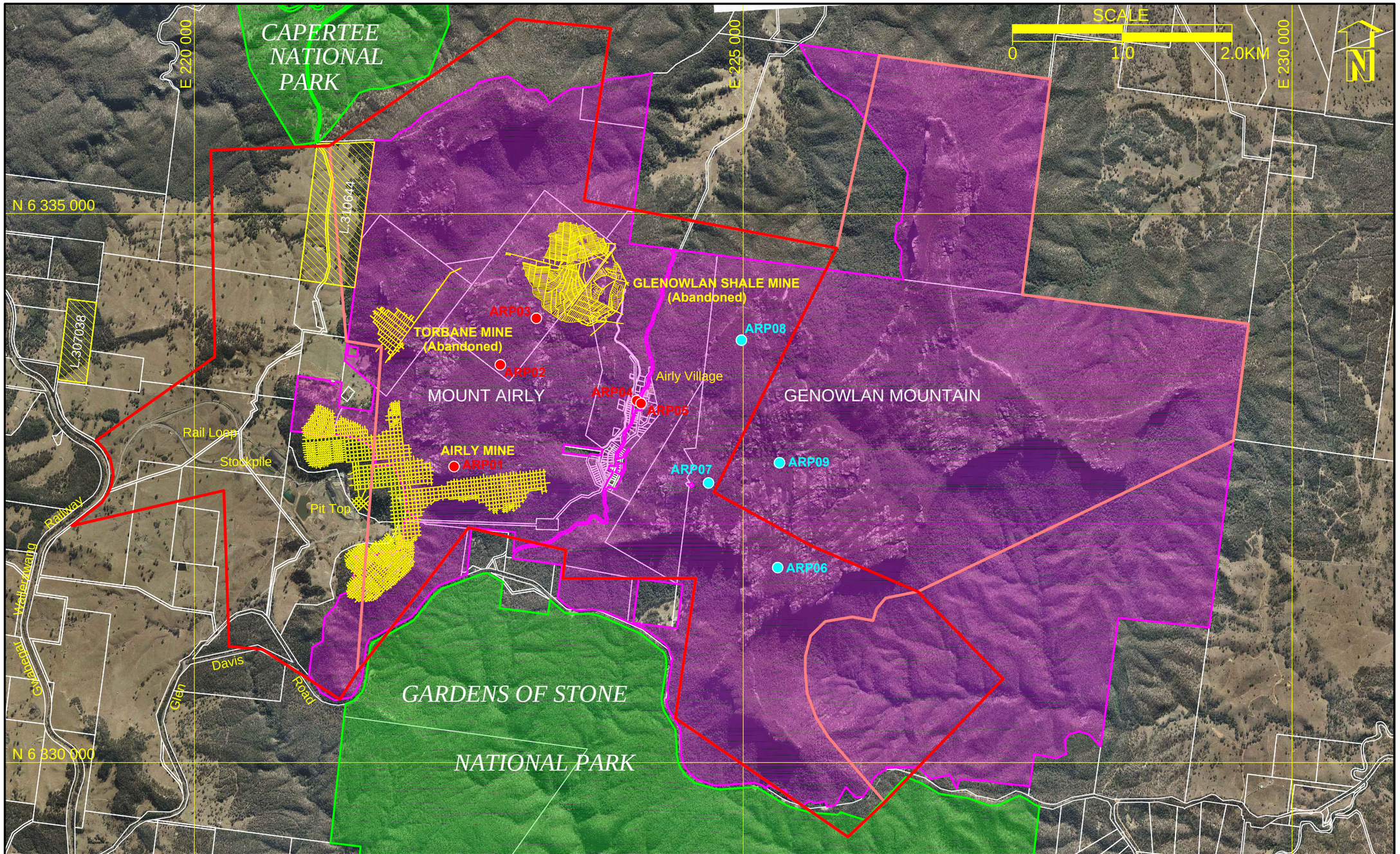
ANNUAL REVIEW 2014

PLAN 5A
REHABILITATION
PIT TOP & COAL HANDLING

Centennial Coal

DATE: 24-Mar-2015

PC5780



LEGEND

- ML1331 Lease Boundary
- A232 Authorisation Boundary
- National Park
- Mugii Murum-Ban SCA
- Rehabilitation Bore Site 2012
- Rehabilitation Bore Site 2013

LEASES: ML1331, A232		MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013		SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020		DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited		SCALE	Refer to Scale Bar
REPORTING OFFICER	---------- Greg Brown - Environment & Community Coordinator		

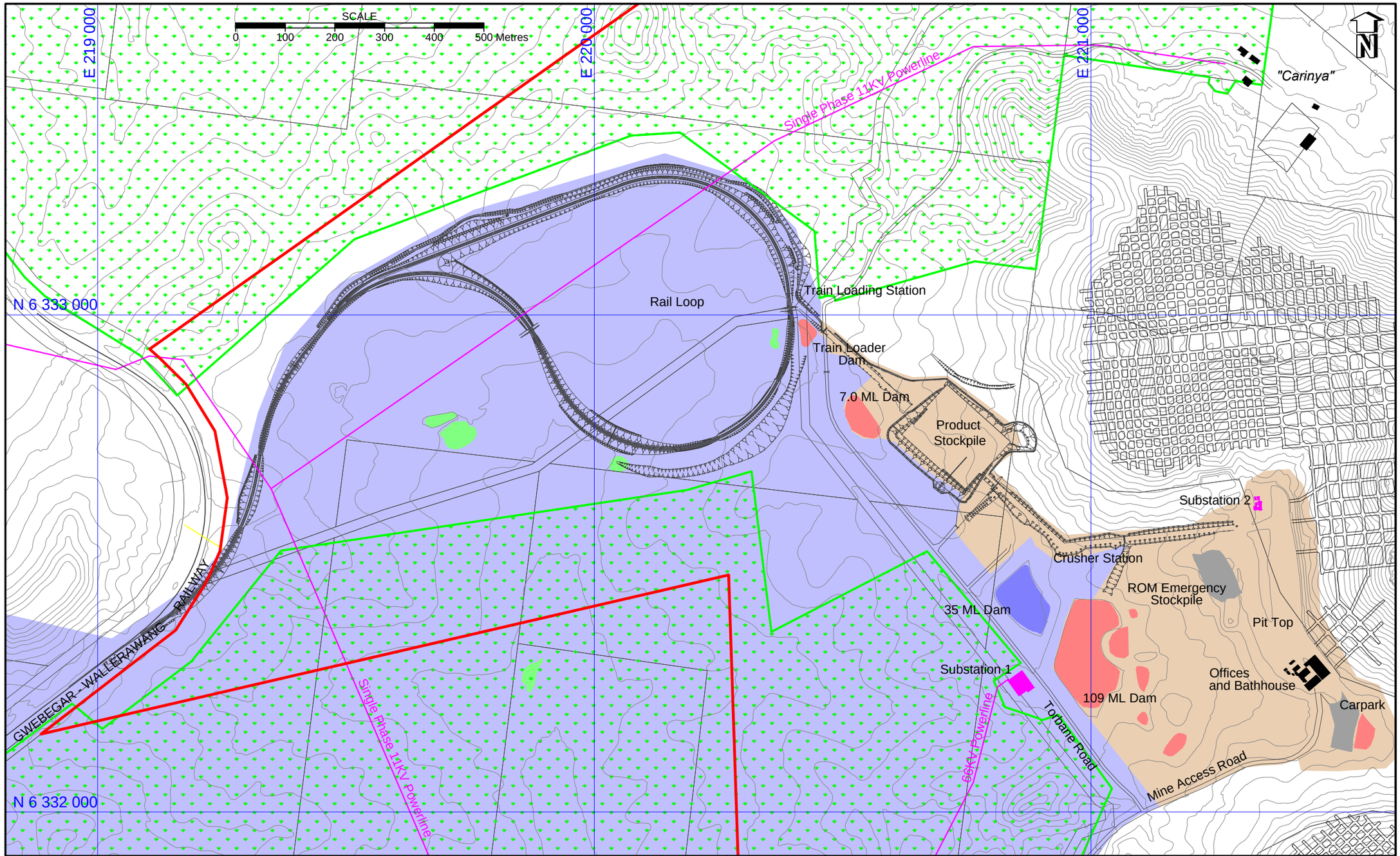
ANNUAL REPORT 2014

PLAN 5B
REHABILITATION
EXPLORATION SITES

Centennial Coal

DATE: 19-Mar-2015

PC5781



LEGEND

- ML1331 Lease Boundary
- Grazing Licence
- Dirty Water Catchment
- Clean Water Catchment
- Settling Dam
- Discharge Dam
- Farm Dam
- Cadastral Boundary

LEASES: ML1331, A232		MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013		SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020		DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited		SCALE	Refer to Scale Bar
REPORTING OFFICER	Greg Brown - Environment & Community Coordinator		

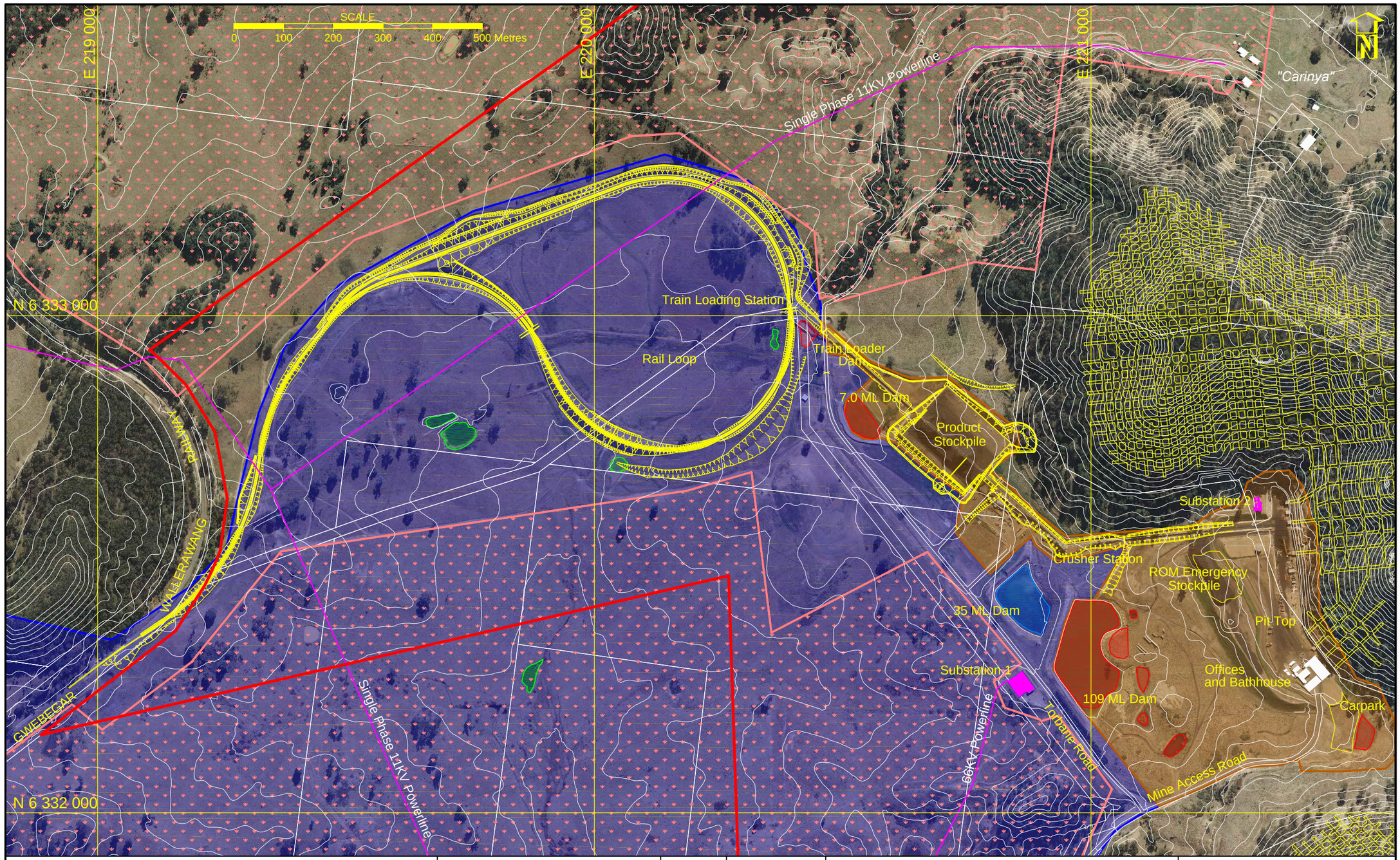
ANNUAL REVIEW 2014

PLAN 7A
WATER MANAGEMENT OVERVIEW

Centennial Coal

DATE: 24-Mar-2015

PC5782



LEGEND

- ML1331 Lease Boundary
- Grazing Licence
- Dirty Water Catchment
- Clean Water Catchment
- Settling Dam
- Discharge Dam
- Farm Dam
- Cadastral Boundary

LEASES: ML1331, A232		MINE	Airly
MOP COMMENCEMENT DATE: 30-June-2013		SEAM	Lithgow
MOP COMPLETION DATE: 30-June-2020		DRAWN	PJM
LEASEHOLDER: Airly Coal Pty Limited		SCALE	Refer to Scale Bar
REPORTING OFFICER	---------- Greg Brown - Environment & Community Coordinator		

ANNUAL REVIEW 2014

PLAN 7B
WATER MANAGEMENT
OVERVIEW - AERIAL PHOTO

Centennial Coal

DATE: 24-Mar-2015

PC5783

7. Appendices

Appendix 1: Environment Protection Licence 12374

Environment Protection Licence

Licence - 12374

Licence Details	
Number:	12374
Anniversary Date:	12-December

Licensee
AIRLY COAL PTY LIMITED
LEVEL 18, BT TOWER, 1 MARKET STREET
SYDNEY NSW 2000

Premises
AIRLY MINE
319 GLEN DAVIS ROAD
CAPERTEE NSW 2846

Scheduled Activity
Coal Works
Mining for Coal

Fee Based Activity	Scale
Coal works	0-2000000 T handled
Mining for coal	> 500000-2000000 T produced

Region
South - Bathurst
Lvl 2, 203-209 Russell Street BATHURST NSW 2795
Phone: (02) 6332 7600
Fax: (02) 6332 7630
PO Box 1388 BATHURST
NSW 2795

Environment Protection Licence

Licence - 12374

Environment Protection Licence

Licence - 12374

Environment Protection Licence

Licence - 12374

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

Environment Protection Licence

The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

AIRLY COAL PTY LIMITED
LEVEL 18, BT TOWER, 1 MARKET STREET
SYDNEY NSW 2000

subject to the conditions which follow.

Environment Protection Licence

Licence - 12374

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Coal Works	Coal works	0 - 2000000 T handled
Mining for Coal	Mining for coal	> 500000 - 2000000 T produced

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
AIRLY MINE
319 GLEN DAVIS ROAD
CAPERTEE
NSW 2846
MINING LEASE NO. 1331

A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to Air and Water and Applications to Land

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P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

Air

EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
3	Dust Monitoring Point		DM1 as indicated on Plan2 "Airly Coal Pty Ltd Monitoring Points" Supporting Documentation 20 June 2005.
4	Dust Monitoring Point		DM2 as indicated on Plan 2 "Airly Coal Pty Ltd Monitoring Points" Supporting Documentation 20 June 2005
5	Dust Monitoring Point		DM3 as indicated on Plan 2 "Airly Coal Pty Ltd Monitoring Points" Supporting Documentation 20 June 2005
6	Dust Monitoring Point		DM4 as indicated on Plan 2 "Airly Coal Pty Ltd Monitoring Points" Supporting Documentation 20 June 2005

P1.2 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

P1.3 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Discharge to water	Discharge to water	Point 1 located adjacent to secondary settling dam as detailed on Dawing No. AM00016a "Monitoring and Discharge Points" provided to the EPA on 23 August 2012
7	Discharge to water	Discharge to water	Point 7 located at the "7ML Dirty Water Dam" and labelled as LDP2 on Drawing No. AM00016a "Monitoring and Discharge Points" provided to the EPA on 23 August 2012
8	Discharge to water	Discharge to water	Point 8 located at dam adjacent to Rail Loading Point and labelled as LDP3 on Drawing No. AM00016a "Monitoring and Discharge Points" provided to the EPA on 23 August 2012

Environment Protection Licence

Licence - 12374

3 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

L2.1 For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.

L2.4 Water and/or Land Concentration Limits

POINT 1,7,8

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Oil and Grease	milligrams per litre				10
pH	pH				6.5 - 9.0
Total suspended solids	milligrams per litre				50

L2.5 The limits specified under Condition L2.4 for the sediment basins identified as EPA licence discharge points 1, 7 and 8 do not apply when the discharge occurs soley as a result of rainfall measured at the premises which exceeds;

- a total of 44 millimetre of rainfall over any consecutive 5 day period.

Note: A 44mm rainfall depth is defined by the publication "Managing Urban Stormwater: Soils and Construction" (Landcom 2006) as the rainfall depth in millimetres for a 95th percentile 5 day rainfall event for the Central Tablelands consistent with the storage capacity (recommended minimum design criteria) for Type D sediment retention basins for mines and quarries (Vol 2E of Landcom 2008).

L3 Volume and mass limits

L3.1 For each discharge point or utilisation area specified below (by a point number), the volume/mass of:
a) liquids discharged to water; or;
b) solids or liquids applied to the area;
must not exceed the volume/mass limit specified for that discharge point or area.

Point	Unit of Measure	Volume/Mass Limit
1	kilolitres	100000

L4 Waste

L4.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below.
Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below.
Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below.
This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	General or Specific exempted waste	Waste that meets all the conditions of a resource recovery exemption under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2005	As specified in each particular resource recovery exemption	NA

4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.
This includes:
a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
a) must be maintained in a proper and efficient condition; and
b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.

O4 Other operating conditions

O4.1 The sediment basins identified as EPA identification no. (licence discharge points) 1, 7 and 8 under condition P1.3 must be drained or pumped out within 5 days following rainfall in order to maintain each basins design storage capacity.

O4.2 Water discharged to comply with condition O4.1 may only be discharged from sediment basins to waters via licence discharge points 1, 7 and 8 where the water complies with the discharge limit specified under condition L2.4 for licence discharge points 1, 7 and 8.

O4.3 The licensee must undertake maintenance to desilt all sediment basins to retain their design storage capacities.

5 Monitoring and Recording Conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
a) in a legible form, or in a form that can readily be reduced to a legible form;
b) kept for at least 4 years after the monitoring or event to which they relate took place; and
c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
a) the date(s) on which the sample was taken;
b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and
d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

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M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Water and/ or Land Monitoring Requirements

POINT 1,7,8

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Monthly during discharge	Grab sample
Oil and Grease	milligrams per litre	Monthly during discharge	Grab sample
pH	pH	Monthly during discharge	Grab sample
Total suspended solids	milligrams per litre	Monthly during discharge	Grab sample

M3 Testing methods - concentration limits

M3.1 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Recording of pollution complaints

M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M4.2 The record must include details of the following:
a) the date and time of the complaint;
b) the method by which the complaint was made;
c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
d) the nature of the complaint;
e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M5.3 The preceding two conditions do not apply until 3 months after:
a) the date of the issue of this licence or
b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.

M6 Requirement to monitor volume or mass

M6.1 For each discharge point or utilisation area specified below, the licensee must monitor:
a) the volume of liquids discharged to water or applied to the area;
b) the mass of solids applied to the area;
c) the mass of pollutants emitted to the air;
at the frequency and using the method and units of measure, specified below.

POINT 1

Frequency	Unit of Measure	Sampling Method
Continuous during discharge	kilolitres per day	Level sensor and continuous logger

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
a) a Statement of Compliance; and
b) a Monitoring and Complaints Summary.
At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:
a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of

the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
a) the licence holder; or
b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R1.8 A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.

R2 Notification of environmental harm

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
a) where this licence applies to premises, an event has occurred at the premises; or
b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,

and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
a) the cause, time and duration of the event;
b) the type, volume and concentration of every pollutant discharged as a result of the event;
c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environmen t Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder describe d at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 mo nths. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste

Mr Darryl Clift

Environment Protection Authority

(By Delegation)

Date of this edition: 12-December-2005

End Notes

1	Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
2	Licence varied by notice 1103175, issued on 18-Aug-2009, which came into effect on 18-Aug-2009.
3	Licence varied by notice 1502722 issued on 19-Dec-2011
4	Licence varied by notice 1508458 issued on 31-Aug-2012
5	Licence varied by notice 1513730 issued on 27-May-2014

Appendix 2: Annual Return for Environment Protection Licence 12374

ANNUAL RETURN

LICENCE NO	**12374**
LICENCE HOLDER	AIRLY COAL PTY LIMITED
REPORTING PERIOD	12-Dec-2013 to 11-Dec-2014

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

REVISED REPORTING PERIOD _____ / _____ / _____ **to** _____ / _____ / _____

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

THIS ANNUAL RETURN MUST BE RECEIVED BY THE EPA BEFORE 10-Feb-2015

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

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

- **the issue of a Penalty Notice for $1500 (individuals) or $3000 (corporations);**

OR

- **prosecution.**

Please send your completed Annual Return by **Registered Post** to:

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

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

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

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

Annual Return

AIRLY COAL PTY LIMITED

Use the checklist below to ensure that you have completed your Annual Return correctly.

(✓ the boxes)

CHECKLIST		
☑	Section A:	All licence details are correct
☑	Section B1:	You have entered the correct number in the complaints table
☑	Section B2 – B3:	If there are tables, you have provided the required details
☑	Section C:	You have answered question 1, and 2 if applicable
☑	Section D:	If applicable, you have completed all load calculation worksheets
☑	Section E:	You have answered question 1, 2, 3, 4, 5 and 6 if applicable
☑	Section F:	You have answered question 1, 2 and 3 if applicable
☑	Section G:	The Annual Return has been signed by appropriate person(s) and, if applicable, the revised reporting period entered
☑	Make a copy of the completed Annual Return and keep it with your licence records	
☑	Attach a cheque (unless you have paid separately) for the payment of the administrative fee for the next licence fee period (Paid by EFT)	

Please send your completed Annual Return by **Registered Post** to:

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

A Statement of Compliance - Licence Details

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

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

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

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

A1 Licence Holder

Licence Number	12374
Licence Holder	AIRLY COAL PTY LIMITED
Trading Name *(if applicable)*	
ABN	84 078 693 722

A2 Premises to which Licence Applies (if applicable)

Common Name (if any)	AIRLY MINE
Premises	319 GLEN DAVIS ROAD CAPERTEE NSW 2846

A3 Activities to which Licence Applies

Mining for Coal
Coal Works

A4 Other Activities (if applicable)

A5 Fee-Based Activity Classifications

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

Fee-based activity	Activity scale	Unit of measure
Mining for coal	> 500,000.00 - 2,000,000.00	T produced
Coal works	> 0.00 - 2,000,000.00	T handled

A6 Assessable Pollutants (Not Applicable)

B Monitoring and Complaints Summary

B1 Number of Pollution Complaints

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

Pollution Complaint Category	Number of Complaints
Air	nil
Water	nil
Noise	nil
Waste	nil
Other	nil

B2 Concentration Monitoring Summary

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

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

Discharge & Monitoring Point 1

Discharge to water, Point 1 located adjacent to secondary settling dam as detailed on Dawing No. AM00016a "Monitoring and Discharge Points" provided to the EPA on 23 August 2012

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Conductivity	microsiemens per centimetre	0*	N/A	N/A	N/A	N/A

Oil and Grease	milligrams per litre	0*	N/A	N/A	N/A	N/A
pH	pH	0*	N/A	N/A	N/A	N/A
Total suspended solids	milligrams per litre	0*	N/A	N/A	N/A	N/A

*No discharge from Discharge & Monitoring Point 1 during the reporting period.

Discharge & Monitoring Point 7

Discharge to water, Point 7 located at the "7ML Dirty Water Dam" and labelled as LDP2 on Drawing No. AM00016a "Monitoring and Discharge Points" provided to the EPA on 23 August 2012

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Conductivity	microsiemens per centimetre	0*	N/A	N/A	N/A	N/A
Oil and Grease	milligrams per litre	0*	N/A	N/A	N/A	N/A
pH	pH	0*	N/A	N/A	N/A	N/A
Total suspended solids	milligrams per litre	0*	N/A	N/A	N/A	N/A

*No discharge from Discharge and Monitoring Point 7 during the reporting period.

Discharge & Monitoring Point 8

Discharge to water, Point 8 located at dam adjacent to Rail Loading Point and labelled as LDP3 on Drawing No. AM00016a "Monitoring and Discharge Points" provided to the EPA on 23 August 2012

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Conductivity	microsiemens per centimetre	3	3	96	182	226
Oil and Grease	milligrams per litre	3	3	<5	<5	<5
pH	pH	3	3	7.0	7.3	7.7

Total suspended solids	milligrams per litre	3	3	219	467	714

B3 Volume or Mass Monitoring Summary

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

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

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

Discharge & Monitoring Point 1

Discharge to water

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Continuous during discharge	0*	N/A	N/A	N/A

*No discharge from Discharge & Monitoring Point 1 during the reporting period.

C Statement of Compliance - Licence Conditions

C1 Compliance with Licence Conditions

(☑ the boxes)

1 Were all conditions of the licence complied with (including monitoring and reporting requirements)? ☐ Yes ☑ No

(✓ a box)

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

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

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

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

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

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

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

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

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

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

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

3. How many pages have you attached?

Each attached page must be initialled by the person(s) who signs Section G of this Annual Retum

2

C2 Details of Non-Compliance with Licence

Licence condition number not complied with
See attached C2 Forms.
Summary of particulars of the non-compliance **(NO MORE THAN 50 WORDS)**
If required, further details on particulars of non-compliance
Date(s) when the non-compliance occurred, if applicable
If relevant, precise location where the non-compliance occurred (attach a map or diagram)
If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance
Cause of non-compliance
Action taken or that will be taken to mitigate any adverse effects of the non-compliance
Action taken or that will be taken to prevent a recurrence of the non-compliance

D Statement of Compliance - Load-Based Fee Calculation Worksheets

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

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

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

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

PENALTIES APPLY FOR SUPPLYING FALSE OR MISLEADING INFORMATION

D1 - D8 (Not Applicable)

E Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan (PIRMP) Under Section 153A of the POEO Act 1997

1 Have you prepared a PIRMP as required under s153A of the Protection of the Environment Operations Act 1997?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Is the PIRMP available at the premises?

(✓ a box) ☑ Yes ☐ No

3 Is the PIRMP available in a prominent position on a publicly accessible web site?

(✓ a box) ☑ Yes ☐ No

If the PIRMP is available on a publicly accessible web site please indicate clearly below the address of the web site where the PIRMP can be accessed:

Web site Address: http://www.centennialcoal.com.au/Environment/Airly.aspx

4 Has the PIRMP been tested?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 4 please indicate clearly below the date that the PIRMP was last tested:

The PIRMP was last tested on: 12/11/2014

5 Has the PIRMP been updated?

(✓ a box) ☑ Yes ☐ No If

you answered 'Yes' to question 5 please indicate clearly below the date that the PIRMP was last updated:

The PIRMP was last updated on: 13/11/2014

6 How many times has the PIRMP been activated in this reporting period? nil

If the PIRMP has been activated, please indicate clearly below the date/s when the PIRMP was activated:

The PIRMP was activated on: nil

The EPA's guidelines for preparation of pollution incident response management plans are available at

http://www.epa.nsw.gov.au/legislation/20120227egpreppirmp.htm

F Statement of Compliance - Requirement to Publish Pollution Monitoring Data Under Section 66(6) of the POEO Act 1997

1 Are there any conditions attached to your licence that require pollution monitoring to be undertaken?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Do you operate a web site?

(✓ a box) ☑ Yes ☐ No

3 Is the pollution monitoring data published on your web site in accordance with the EPA's written requirements for publishing pollution monitoring data?

(✓ a box) ☑ Yes ☐ No

If you publish pollution monitoring data on a web site please indicate clearly below the address of the web site where the pollution monitoring data can be accessed:

Web site address http://www.centennialcoal.com.au/Environment/Airly.aspx

The EPA's written requirements for publishing pollution monitoring data are available at http://www.epa.nsw.gov.au/legislation/20120263reqpubpmdata.htm

Note - if you do not maintain a web site, you must provide a copy of any monitoring data that relates to pollution, to any person requests a copy of the data at no charge to the person requesting the data.

G Signature and Certification

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

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

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

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

I/We

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

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

For the reporting period 12-Dec-2013 to 11-Dec-2014 or ___/___/___ to ___/___/___

SIGNATURE: Tony Macko

NAME: (printed) Tony Macko

POSITION: Company Secretary

DATE: 29/01/2015

SIGNATURE: Ian Williams

NAME: (printed) **Ian J. Williams**

POSITION: G.M. Marketing

DATE: 29/1/15

SEAL(if signing under seal)

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

C2 Details of Non – Compliance with Licence

Licence condition number not complied with
L2.4
Summary of particulars of the non-compliance **(NO MORE THAN 50 WORDS)**
A discharge of water with high total suspended solids from LDP3.
If required, further details on particulars of non-compliance
LDP3 discharged water with high total suspended solids (714 mg/L) on 14 March 2014 (EPL limit for total suspended solids 50 mg/L).
Date(s) when the non-compliance occurred, if applicable
14/03/2014
If relevant, precise location where the non-compliance occurred (attached a map or diagram)
LDP3 – Point 8 located at dam adjacent to Rail Loading Point and labelled as LDP3 on Drawing No. AM00016a.
If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance
N/A
Cause of non-compliance
Surface runoff from an electrical storm event during which approximately 25 mm of rainfall was received over approximately a 3 hour period which caused the Train Loader Dam to discharge water through LDP3 with a level of total suspended solids higher than the EPL limit. During the electrical storm the electrical supply to the mine dropped out a number of times. The lightning strikes in the vicinity of the mine meant it was unsafe for personnel to be working at the dams and thus prevented safe access to the pump located at the Train Loader Dam.
Action taken or that will be taken to mitigate any adverse effects of the non-compliance
A water sample was taken of the discharge event on the 14/03/2014. When it was safe to access the Train Loader Dam a pump was used to transfer water to the 109 ML Dirty Water Dam.
Action taken or that will be taken to prevent a reoccurrence of the non-compliance.
Review the inspection program for back shift inspections of the surface facilities area including LDP1, LDP2 and LDP3 to identify the water levels in dams and to coordinate pumping of water if required.

C2 Details of Non – Compliance with Licence

Licence condition number not complied with
L2.4
Summary of particulars of the non-compliance **(NO MORE THAN 50 WORDS)**
A discharge of water with high total suspended solids from LDP3.
If required, further details on particulars of non-compliance
LDP3 discharged water with high total suspended solids (468 mg/L) on 4 April 2014 (EPL limit for total suspended solids 50 mg/L).
Date(s) when the non-compliance occurred, if applicable
04/04/2014
If relevant, precise location where the non-compliance occurred (attached a map or diagram)
LDP3 – Point 8 located at dam adjacent to Rail Loading Point and labelled as LDP3 on Drawing No. AM00016a.
If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance
N/A
Cause of non-compliance
Surface runoff from a rain event during which approximately 58 mm of rainfall was received over approximately a 16 hour period which caused the Train Loader Dam to discharge water through LDP3 with a level of total suspended solids higher than the EPL limit.
Action taken or that will be taken to mitigate any adverse effects of the non-compliance
A water sample was taken of the discharge event on the 04/04/2014. A pump was used to pump water from the Train Loader Dam to the 109 ML Dirty Water Dam.
Action taken or that will be taken to prevent a reoccurrence of the non-compliance.
The installation of a mobile phone aerial to provide an appropriate alert system to facilitate notification of rising dam water levels to prevent the discharge of water that would be practically feasible to install at the Train Loader Dam (LDP3) is currently being considered.

Appendix 3: 2014 Noise Monitoring

global environmental solutions

Airly Mine

Noise Monitoring

August 2014

Report Number 610.09070.30600

13 October 2014

Centennial Airly Pty Ltd
Glen Davis Road
CAPERTEE NSW 2846

Version: Revision 0

Airly Mine

Noise Monitoring

August 2014

PREPARED BY:

SLR Consulting Australia Pty Ltd
ABN 29 001 584 612
2 Lincoln Street Lane Cove NSW 2066 Australia

(PO Box 176 Lane Cove NSW 1595 Australia)
T: 61 2 9428 8100 F: 61 2 9427 8200
E: sydney@slrconsulting.com www.slrconsulting.com

DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
610.09070.30600	Revision 0	13 October 2014	Nicholas Vandenberg	Yang Liu/ Dick Godson	Mark Blake

Table of Contents

TABLES

APPENDICIES

1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Centennial Coal to conduct monitoring of the Airly Mine (AM) current noise emissions.

An explanation of acoustic terminology and descriptors discussed throughout the report is included in **Appendix A**. The site map showing the noise monitoring locations is presented in **Appendix B2**.

2 SITE DESCRIPTION

AM is an underground coal mining operation. Operation started in December 2009 with approval to mine up to 1.8 million tonnes per annum.

AM is located northeast of the village of Capertee, 43 km to the north-northwest of Lithgow. A site map showing the location of the mine is presented in **Appendix B1**. The site map showing the noise monitoring locations is presented in **Appendix B2**.

First coal production for the purposes of developing the main portals and roadways to the underground mine occurred on the 14 December 2009. Production was gradually increased during 2011 in line with the completion of Stage 1 construction of the mine infrastructure with the completion of the mine ventilation fans and surface to underground trunk conveyor. Stage 2 construction at Airly during 2012 included the completion of the pit top bathhouse and administration buildings. Coal production continued to increase during 2012 with Airly surpassing the first million tonnes of coal produced at the mine since inception during June 2012. Centennial Coal decided to place Airly Mine on "*Care and Maintenance*" commencing January 2013. Production re-commenced on 17 March 2014.

3 APPROVAL REQUIREMENTS

AM's Licence (EPL 12374) does not nominate any specific noise monitoring requirements. Accordingly, Centennial Coal engaged SLR Consulting in 2009 to undertake an Existing Information Review and Gap Analysis (refer to Existing Information Review and Gap Analysis Report, dated 31 March 2009) in order to conduct background noise surveys and determine the appropriate noise criteria for the AM. The study identified a minimum background noise level (RBL) of 30 dBA at all noise sensitive receivers surrounding AM. Accordingly, the INP minimum intrusive noise criterion of 35 dBA is considered to be appropriate for the purpose of assessing AM's noise emissions at all non-mine owned residences (valid during daytime, evening and night-time periods).

The noise monitoring surveys have been conducted in accordance with the NSW Environment Protection Authority's Industrial Noise Policy, 2000 (INP) noise survey and assessment requirements.

4 WEATHER MONITORING PROGRAM

4.1 Prevailing Metrological Conditions

4.1.1 Wind

The NSW INP Section 5.3, Wind Effects, states that:

> *"Wind effects need to be assessed where wind is a feature of the area. Wind is considered to be a feature where source to receiver wind speeds (at 10 m height) of 3 m/s or below occur for 30% of the time or more in any assessment period in any season."*

AM has operated an on-site meteorological monitoring station since April 2010. An assessment of the prevailing wind conditions was prepared for the period August 2011 to August 2014. Note, the weather data between July 2013 and October 2013 from Charbon Coal Mine weather station (approximately 24 km north to AM site) was used for this assessment as the data was not available from the AM on-site weather station.

The frequencies of occurrence of the dominant prevailing winds and estimated atmospheric stability conditions have been determined and are presented in **Appendix C**.

The INP defines prevailing winds of velocity less than (or equal to) 3 m/s with a frequency of occurrence greater than (or equal to) 30% of the time to be relevant to the site for noise assessment purposes.

The analysis of the meteorological data revealed that low wind speeds from the east prevailed during the summer daytime period (in accordance with the INP procedures) for the period August 2011 to August 2014 and this condition is consequently considered to be a feature of the AM site.

4.1.2 Temperature Inversions

The INP Section 5.2, Temperature Inversions, states:

> *"Assessment of impacts is confined to the night noise assessment period (10.00 pm to 7.00 am), as this is the time likely to have the greatest impact - that is, when temperature inversions usually occur and disturbance to sleep is possible."*
>
> *"Where inversion conditions are predicted for at least 30% (or approximately two nights per week) of total night-time in winter, then inversion effects are considered to be significant and should be taken into account in the noise assessment."*

An assessment of atmospheric stability has also been prepared from the meteorological data set described above. The evening and night-time frequency of occurrences of atmospheric stability classes for the period August 2011 to August 2014 are presented in **Table 1** together with the estimated Environmental Lapse rates (ELR).

Table 1 Prevailing Atmospheric Stability Frequency – Evening and Night-time – August 2011 to August 2014

Stability Class	Frequency of Occurrence				Estimated ELR °C/100 m	Qualitative Description
	Summer	Autumn	Winter	Spring		
A	0.0%	0.0%	0.0%	0.0%	<-1.9	Lapse
B	0.0%	0.0%	0.0%	0.0%	-1.9 to -1.7	Lapse
C	0.0%	0.0%	0.0%	0.0%	-1.7 to -1.5	Lapse
D	30.7%	18.8%	28.0%	19.6%	-1.5 to -0.5	Neutral
E	15.2%	10.5%	10.0%	10.8%	-0.5 to 1.5	Weak inversion
F	23.6%	22.2%	25.1%	15.7%	1.5 to 4	Moderate inversion
G	30.5%	48.6%	37.0%	54%	>4.0	Strong inversion
F+G	54.1%	70.8%	62.1%	69.6%	>1.5	Moderate to strong inversion

Note 1: ELR (Environmental Lapse Rate).

In accordance with the INP, the frequency of occurrence of strong (ie >4.0˚C/100 m) temperature inversions is greater than 30% during the combined evening and night-time period and therefore considered to be a feature of the site.

4.1.3 Site Specific Weather Conditions

In view of the foregoing, the site specific weather conditions relevant to the August 2014 survey are:

- Daytime period: moderately windy conditions ie wind velocity up to 5 m/s at 10 m above ground level and temperature inversion conditions of up to 0˚C/100 m.
- Evening period: slightly windy conditions ie wind velocity up to 2.5 m/s at 10 m above ground level and temperature inversion conditions of 8˚C/100 m.
- Night-time period: slightly windy conditions ie wind velocity up to 2 m/s at 10 m above ground level and temperature inversion conditions up to 8˚C/100 m.

4.2 Meteorological Conditions during Noise Surveys – August 2014

AM operates an on-site meteorological monitoring station and the weather data (including 15-minute average wind speed, wind direction, air temperature, relative humidity, solar radiation and rainfall) have been used for this assessment.

The weather station data used for the August 2014 survey allowed the identification of periods when wind speeds of up to 5 m/s at 10 m above ground level were experienced.

In addition, hand held instrumentation was used to quantify the wind speed and direction at each operator-attended noise monitoring location. Observations of cloud cover were also taken during the survey period in order to establish the likely presence of a temperature inversion.

5 NOISE MONITORING RESULTS

5.1 Monitoring Locations

Mine operating noise measurements comprised operator-attended noise surveys and continuous unattended noise logging. The noise monitoring locations are listed in **Table 2** together with the monitoring programme. The noise monitoring locations are also identified on the site map in **Appendix B2**.

Table 2 Noise Monitoring Locations and Noise Survey Programme

Location	Receiver Identification	Operator Attended Surveys			Continuous Logging
		Daytime	Evening	Night-time	
A	Corner of Glen Davis Road	2 surveys	2 surveys	2 surveys	No
B	Parr Residence	2 surveys	2 surveys	2 surveys	Yes
C	Rail Loop	2 surveys	2 surveys	2 surveys	No
D	Near Leishman Residence	2 surveys	2 surveys	2 surveys	No
E	Carinya	2 surveys	2 surveys	2 surveys	No
F	Bernina	2 surveys	2 surveys	2 surveys	Yes

The noise monitoring Locations A, C, D, E and F correspond to mine owned residences or mine boundaries and therefore the 35 dBA criterion does not apply at these locations. However, these locations have been selected in order to provide an indication of the contribution of the current mine noise emissions and evaluate any potential exceedance of the criteria at the residences located in the same direction from AM operations.

Monitoring Location B corresponds to a non-mined owned residence, therefore the 35 dBA criterion applies to this residence.

5.2 Noise Survey Procedures

Noise measurement procedures were generally guided by the requirements of AS 1055-1997 "*Acoustics - Descriptions and Measurement of Environmental Noise*" and the INP.

Operator-Attended Noise Surveys

The daytime, evening and night-time operator-attended noise surveys were conducted over two days and 1 night (5 August to 6 August 2014) at the locations presented in **Table 2** in order to qualify and quantify the noise environment in the vicinity of AM.

Unattended Continuous Noise Logging

Unattended continuous noise loggers were positioned at the monitoring locations presented in **Table 2** from 5 August to 15 August 2014. The loggers were used to quantify the noise environment in the vicinity of AM.

5.3 Instrumentation and Measurement Parameters

All acoustic instrumentation employed throughout the monitoring programme complies with the requirements of AS IEC 61672.2-2004 "*Electroacoustics - Sound Level Meters - Pattern Evaluation Tests*", which replaces AS 1259.2-1990 "*Sound Level Meters*", and carries current NATA calibration certificates.

A description of the instrumentation, designated type and serial numbers are presented in **Table 3**.

Table 3 Acoustic Instrumentation

Description	Type or Class	Serial Number
Brüel & Kjær 2250L Sound Level Meter	Type 1	3003389
Brüel & Kjær 4231Sound Level Calibrator	Type 1	2482669
ARL Environmental Noise Logger Type 316	Type 1	16-207-020
ARL Environmental Noise Logger Type 316	Type 1	16-203-508

All instrumentation was programmed to continuously record statistical noise level indices in 15 minute intervals including the L_{Amax}, L_{A1}, L_{A10}, L_{A50}, L_{A90}, L_{Amin} and the L_{Aeq} indices.

Instrument calibration was checked before and after each measurement survey, with the variation in calibrated levels not exceeding the acceptable variation of ±0.5 dBA (AS 1055).

5.4 Operator – Attended Noise Surveys Results

The results of the daytime, evening and night-time operator-attended noise surveys for the monitoring locations are presented in **Table 4** to **Table 9** together with a description of the contributed noise levels and weather conditions at the time of the measurement. Weather conditions at 1.5 m were measured by the operator and compared with the 10 m weather conditions recorded at the AM weather station to establish its effect on the mine noise propagation.

Note: All noise levels presented in this report are in dBA re 20 µPa.

Table 4 Operator Attended Noise Measurements – Location A – Corner of Glen Davis Road

Date/Start Time Weather		Primary Noise Descriptor						Typical Maximum Noise Levels
		LAeq	LAmax	LA1	LA10	LA50	LA90	
Day 06/08/14 1442 hrs 0 okta Wind at 1.5 m : 2-3 m/s Wind at 10 m : 5 m/s WSW	Ambient	43	61	56	44	35	31	Traffic ~ 56 to 61 dBA Birds ~ 36 to 52 dBA Trees Rustling ~ 37 to 44 dBA
	AM	AM not discernible LAeq AM estimated < 21 dBA						
Day 06/08/14 1457 hrs 0 okta Wind at 1.5 m : 2-3 m/s Wind at 10 m : 4.5 m/s WSW	Ambient	42	62	56	36	33	30	Birds ~ 31 to 56 dBA Trees Rustling ~ 31 to 36 dBA Plane <25 dBA Traffic ~ 35 to 62 dBA
	AM	AM not discernible LAeq AM estimated < 20 dBA						
Evening 05/08/14 2007 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 1 m/s WNW	Ambient	30	63	39	29	30	<20	Insects ~ <20 dBA Traffic ~ 24 dBA Cow ~ 34 to 38 dBA Car ~ 45 dBA Operator ~ 63 dBA
	AM	AM not discernible LAeq AM estimated < 20 dBA						
Evening 05/08/14 2023 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 1.2 m/s NW	Ambient	24	42	34	27	<20	<20	Plane ~ 34 to 39 dBA Operator ~ 42 dBA Traffic ~ 22 to 25 dBA Insects ~<23 dBA
	AM	AM not discernible LAeq AM estimated < 20 dBA						
Night 06/08/14 0025 hrs 0 okta Wind at 1.5 m : 0.5 m/s Wind at 10 m : 1.2 m/s W	Ambient	37	60	52	35	28	23	Wind ~ 31 dBA Traffic ~ 57 dBA Operator ~ 50 to 60 dBA Animal ~ 31 to 38 dBA Airly hum in lulls <20 dBA
	AM	AM discernable in lulls LAeq AM measured < 20 dBA						
Night 06/08/14 0040 hrs 0 okta Wind at 1.5 m : 0.5 m/s Wind at 10 m : 1.2 m/s W	Ambient	30	48	37	32	28	24	Trees Rustling ~ 27 to 42 dBA Cow ~ 30 to 45 dBA Operator ~ 48 dBA Airly hum in lulls < 20 dBA
	AM	AM discernable in lulls LAeq AM measured < 20 dBA						

Note: The measured **overall ambient** (**Ambient**) noise levels include contributions from all noise sources which may include traffic, animals, birds, insects, domestic activity, wind in trees, aircraft and mine operations.
The **AM** emission levels are the overall ambient noise levels adjusted to remove (as far as practical) the noise contribution from extraneous noise sources.

Table 5 Operator Attended Noise Measurements – Location B – Parr Residence

Date/Start Time Weather		Primary Noise Descriptor						Typical Maximum Noise Levels
		LAeq	LAmax	LA1	LA10	LA50	LA90	
Day 05/08/14 1511 hrs 0 okta Wind at 1.5 m : 0.5 m/s Wind at 10 m : 4.5 m/s SW	Ambient	36	52	42	39	34	29	Traffic ~ 40 to 44 dBA trees Rustling ~ 38 to 42 dBA Birds ~ 35 to 52 dBA Animal ~ 35 to 36 dBA Operator ~ 45 dBA
	AM	AM not discernible L_{Aeq} AM estimated < 19 dBA						
Day 05/08/14 1526 hrs 0 okta Wind at 1.5 m : 0.5 m/s Wind at 10 m : 3.6 m/s SW	Ambient	38	55	45	41	36	31	Birds ~ 32 to 55 dBA Trees Rustling ~ 38 to 43 dBA Traffic ~ 36 to 41 dBA Resident ~ 40 to 46 dBA AM Engine Noise ~ <30 dBA
	AM	AM faintly audible for an instance L_{Aeq} AM measured < 21 dBA						
Evening 05/08/14 2129 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 1.7 m/s WSW	Ambient	29	49	38	32	27	22	Insects ~ 24 dBA Car creak~ 35 to 49 dBA Traffic ~ 31 to 40 dBA
	AM	AM not discernible L_{Aeq} AM estimated < 20 dBA						
Evening 05/08/14 2145 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 0.6 m/s WSW	Ambient	24	45	33	27	21	<20	Insects ~ 20 dBA Owl ~ 30 dBA Operator ~ 45 dBA
	AM	AM not discernible L_{Aeq} AM estimated < 20 dBA						
Night 05/08/14 2201 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 2 m/s WSW	Ambient	26	52	34	27	21	<20	Owl ~ 30 dBA Insects ~ 28 to 29 dBA Operator ~ 36 to 52 dBA
	AM	AM not discernible L_{Aeq} AM estimated < 20 dBA						
Night 05/08/14 2218 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 1 m/s SW	Ambient	27	51	39	27	22	<20	Insects ~ 24 to 27 dBA Operator ~ 35 to 51 dBA Plane ~ 33 dBA Resident ~ 31 dBA Airly fainly audible in lulls ~ <20 dBA
	AM	AM discernable in lulls L_{Aeq} AM measured < 20 dBA						

Note: The measured **overall ambient** (**Ambient**) noise levels include contributions from all noise sources which may include traffic, animals, birds, insects, domestic activity, wind in trees, aircraft and mine operations.
The **AM** emission levels are the overall ambient noise levels adjusted to remove (as far as practical) the noise contribution from extraneous noise sources.

Table 6 Operator Attended Noise Measurements – Location C – Rail Loop

Date/Start Time Weather		Primary Noise Descriptor						Typical Maximum Noise Levels
		LAeq	LAmax	LA1	LA10	LA50	LA90	
Day 06/08/14 1351 hrs 0 okta Wind at 1.5 m : 2-3 m/s W Wind at 10 m : 2.8 m/s WSW	Ambient	31	47	37	33	30	28	Wind ~ 36 to 44 dBA Birds ~ 30 to 35 dBA Operator ~ 37 dBA AM Pit ~ <30 to 35 dBA
	AM	AM Audible LAeq AM measured 30 dBA						
Day 06/08/14 1407 hrs 0 okta Wind at 1.5 m : 1-2 m/s W Wind at 10 m : 1.5 m/s NW	Ambient	34	46	43	37	32	28	Birds ~ 33 to 50 dBA Wind ~ 32 to 56 dBA AM Pit top ~ 31 to 43 dBA
	AM	AM Audible LAeq AM measured 32 dBA						
Evening 05/08/14 1853 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 2.2 m/s WSW	Ambient	35	50	40	37	35	32	Insects ~ 33 to 35 dBA Cow ~ 41 to 44 dBA Operator ~ 44 to 50 dBA AM Pit ~ <30 to 38 dBA
	AM	AM Audible LAeq AM measured 33 dBA						
Evening 05/08/14 1908 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 1.8 m/s W	Ambient	36	52	40	38	36	34	Animal ~ 43 dBA Insects ~ 33 to 36 dBA Operator ~ 47 to 52 dBA AM Pit ~ <30 to 38 dBA
	AM	AM Audible LAeq AM measured 33 dBA						
Night 05/08/14 2335 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 1.2 m/s W	Ambient	30	53	38	33	27	23	Insects ~ 20 to 25 dBA Operator ~ 37 to 53 dBA Cow ~ 30 to 43 dBA Mine Vehicle ~ 40 dBA AM hum ~ 23 to 29 dbA
	AM	AM Audible LAeq AM measured 27 dBA						
Night 05/08/14 2351 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 1 m/s WNW	Ambient	26	48	33	29	25	21	Operator ~ 34 dBA Cow ~ 28 to 32 dBA Traffic ~ 27 to 32 dBA AM Hum ~ <20 dBA Mine Vehicles ~ 27 to 35 dBA
	AM	AM Audible LAeq AM measured 24 dBA						

Note: The measured **overall ambient** (**Ambient**) noise levels include contributions from all noise sources which may include traffic, animals, birds, insects, domestic activity, wind in trees, aircraft and mine operations.
The **AM** emission levels are the overall ambient noise levels adjusted to remove (as far as practical) the noise contribution from extraneous noise sources.

Table 7 Operator Attended Noise Measurements – Location D – Near Leishman Residence

Date/Start Time Weather		Primary Noise Descriptor						Typical Maximum Noise Levels
		LAeq	LAmax	LA1	LA10	LA50	LA90	
Day 06/08/14 1522 hrs 0 okta Wind at 1.5 m : 2-3 m/s Wind at 10 m : 5.3 m/s WSW	Ambient	35	53	42	39	32	28	Traffic ~ 30 to 44 dBA Birds ~ 28 to 53 dBA Insects ~ 33 dBA Trees rustling ~ 29 to 32 dBA
	AM	AM not discernible LAeq AM estimated < 20 dBA						
Day 06/08/14 1537 hrs 0 okta Wind at 1.5 m : 2-3 m/s Wind at 10 m : 5.2 m/s WSW	Ambient	36	54	45	39	32	29	Resident ~ 31 dBA Birds ~ <30 to 49 dBA Traffic ~ 33 to 44 dBA Trees Rustling ~ <30 dBA Insects ~ 28 to 31 dBA Horse ~ 33 dBA Plane ~ 54 dBA
	AM	AM not discernible LAeq AM estimated < 20 dBA						
Evening 05/08/14 2047 hrs 0 okta Wind at 1.5 m : 0.5 m/s Wind at 10 m : 1.5 m/s WSW	Ambient	33	49	42	36	32	26	Insects ~ 32 to 40 dBA Traffic ~ 33 to 49 dBA Cow ~ 38 dBA Birds ~ 43 dBA
	AM	AM not discernible LAeq AM estimated < 20 dBA						
Evening 05/08/14 2102 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 0.4 m/s NW	Ambient	34	53	42	36	32	27	Traffic ~ 36 to 53 dBA Insects ~ 34 to 37 dBA Cow ~ 36 to 38 dBA Birds 38 to 43 dBA
	AM	AM not discernible LAeq AM estimated < 20 dBA						
Night 06/08/14 0101 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 1.6 m/s WNW	Ambient	29	43	36	32	27	22	Birds ~ 43 dBA Insects ~ 27 to 38 dBA Traffic ~ <20 dBA
	AM	AM not discernible LAeq AM estimated < 20 dBA						
Night 06/08/14 0117 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 1.6 m/s W	Ambient	28	41	36	32	25	20	Insects ~ 26 to 35 dBA Operator ~ 35 dBA Traffic ~ 36 to 39 dBA AM Engine Noise ~ <20 dBA
	AM	AM discernible at times LAeq AM measured < 20 dBA						

Note: The measured **overall ambient** (**Ambient**) noise levels include contributions from all noise sources which may include traffic, animals, birds, insects, domestic activity, wind in trees, aircraft and mine operations.
The **AM** emission levels are the overall ambient noise levels adjusted to remove (as far as practical) the noise contribution from extraneous noise sources.

Table 8 Operator Attended Noise Measurements – Location E – Carinya

Date/Start Time Weather		Primary Noise Descriptor						Typical Maximum Noise Levels
		LAeq	LAmax	LA1	LA10	LA50	LA90	
Day 06/08/14 1306 hrs 0 okta Wind at 1.5 m : 2-3 m/s Wind at 10 m : 4 m/s NW	Ambient	38	61	45	40	34	29	Birds ~ 35 to 61 dBA Trees Rustling ~ 36 to 48 dBA Plane ~ 25 dBA
	AM	AM not discernible LAeq AM estimated ~ < 20 dBA						
Day 06/08/14 1321 hrs 0 okta Wind at 1.5 m : 2-3 m/s Wind at 10 m : 5.6 m/s NW	Ambient	33	52	41	36	31	27	Birds ~ 30 to 52 dBA Tress Rustling ~ 33 to 41 dBA
	AM	AM not discernible LAeq AM estimated ~ < 20 dBA						
Evening 05/08/14 1932 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 2.5 m/s W	Ambient	25	54	34	26	21	20	Insects ~ 21 dBA Owl ~ 29 to 31 dBA Operator ~ 54 dBA Car creaking ~ 29 dBA
	AM	AM not discernible LAeq AM estimated ~ < 20 dBA						
Evening 05/08/14 1948 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 0.9 m/s N	Ambient	23	39	32	25	21	<20	Insects ~ 21 to 23 dBA Operator ~ 29 to 39 dBA Car Creaking ~ 31 dBA
	AM	AM not discernible LAeq AM estimated ~ < 20 dBA						
Night 05/08/14 2253 hrs 0 okta Wind at 1.5 m : 0.5 m/s Wind at 10 m : 1.9 m/s W	Ambient	24	47	35	26	<20	<20	Operator ~ 35 to 47 dBA Stick Falling ~ 25 dBA Birds ~ 24 dBA
	AM	AM not discernible LAeq AM estimated ~ < 20 dBA						
Night 05/08/14 2308 hrs 0 okta Wind at 1.5 m : 0.5 m/s Wind at 10 m : 1.3 m/s W	Ambient	20	37	28	22	<20	<20	Birds ~ 30 to 37 dBA Operator ~ 28 to 33 dBA
	AM	AM not discernible LAeq AM estimated ~ < 20 dBA						

\Note: The measured **overall ambient** (**Ambient**) noise levels include contributions from all noise sources which may include traffic, animals, birds, insects, domestic activity, wind in trees, aircraft and mine operations.
The **AM** emission levels are the overall ambient noise levels adjusted to remove (as far as practical) the noise contribution from extraneous noise sources.

Table 9 Operator Attended Noise Measurements – Location F – Bernina

Date/Start Time Weather		Primary Noise Descriptor						Typical Maximum Noise Levels
		LAeq	LAmax	LA1	LA10	LA50	LA90	
Day 05/08/14 1605 hrs 0 okta Wind at 1.5 m : 2 m/s Wind at 10 m : 4.7 m/s SW	Ambient	40	62	53	40	34	30	Plane ~ 40 to 60 dBA Birds ~ 33 to 62 dBA Traffic ~ <30 to 34 dBA Trees rustling ~ 33 dBA
	AM	AM not discernible LAeq AM estimated < 20 dBA						
Day 05/08/14 1621 hrs 0 okta Wind at 1.5 m : 2 m/s Wind at 10 m : 3.3 m/s WSW	Ambient	36	59	50	35	29	27	Operator ~ 44 dBA Traffic ~ 28 to 45 dBA Trees Rustling ~ 32 to 33 dBA Birds ~ <30 to 58 dBA
	AM	AM not discernible LAeq AM estimated < 20 dBA						
Evening 05/08/14 1800 hrs 0 okta Wind at 1.5 m : 1 m/s Wind at 10 m : 2 m/s SSW	Ambient	36	47	41	38	35	33	Insects ~ 33 to 38 dBA Traffic ~ 35 to 45 dBA Operator ~ 40 to 47 dBA Cow ~ 37 dBA Plane ~ <30 dBA
	AM	AM not discernible LAeq AM estimated < 23 dBA						
Evening 05/08/14 1815 hrs 0 okta Wind at 1.5 m : 1 m/s Wind at 10 m : 2.3 m/s SW	Ambient	46	60	58	50	37	34	Train ~ 57 to 60 dBA Insects ~ 38 dBA Traffic ~ 39 to 43 dBA
	AM	AM not discernible LAeq AM estimated < 24 dBA						
Night 06/08/14 0146 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 0.9 m/s WNW	Ambient	26	51	36	27	22	20	Traffic ~ 35 dBA Insects ~ 22 dBA Operator ~ 51 dBA Birds ~27 to 28 Mine Vehicle ~ <20 to 32 dBA Compressor hum ~ <20 Airly Bangs ~ 26 to 39 dBA
	AM	AM audible LAeq AM measured 24 dBA						
Night 06/08/14 0201 hrs 0 okta Wind at 1.5 m : 0 m/s Wind at 10 m : 1.6 m/s WSW	Ambient	26	48	37	25	22	20	Insects ~ 23 dBA Traffic ~ 32 to 38 dBA Operator ~ 32 to 48 dBA Compressor hum ~ <20 dBA Airly Bangs ~ 45 to 46 dBA
	AM	AM audible LAeq AM measured 26 dBA						

Note: The measured **overall ambient** (**Ambient**) noise levels include contributions from all noise sources which may include traffic, animals, birds, insects, domestic activity, wind in trees, aircraft and mine operations.
The **AM** emission levels are the overall ambient noise levels adjusted to remove (as far as practical) the noise contribution from extraneous noise sources.

5.4.1 Noise Impact Assessment

The daytime, evening and night-time operator attended noise survey results are summarised in **Table 10**.

Table 10 $L_{Aeq(15minute)}$ AM Noise Emission Levels – dBA

Monitoring Locations	AM Contributed $L_{Aeq(15minute)}$		
	Day	Evening	Night
Location A - Cnr of Glen Davis Road[1]	N/A (<21), N/A (<20)	N/A (<20), N/A (<20)	<23, <24
Location B - Parr Residence	N/A(<20), <21	N/A(<20), N/A(<20)	N/A (<20), <15
Location C - Rail Loop[1]	30, 32	33, 33	27, 24
Location D - Near Leishman Residence[1]	N/A (<20), N/A (<20)	N/A (<20), N/A (<20)	N/A (<20), <20
Location E - Carinya[1]	N/A (<20), N/A (<20)	N/A (<20), N/A (<20)	N/A (<20), N/A (<20)
Location F - Bernina[1]	N/A (<20), N/A (<20)	N/A (<23), N/A (<24)	24, 26

Note 1: Mine owned residence or mine site.
Note 2: N/A – Not Discernible

The AM noise emissions were below the applicable 35 dBA criteria during operator attended daytime, evening and night-time noise surveys at all monitoring locations.

5.5 Unattended Continuous Noise Logging

5.5.1 Pre-Mine Background Noise Monitoring (February/March 2009)

The $L_{A90(15minute)}$ background noise levels, as presented in the Heggies report "*Airly Coal Project, Existing Information Review and Gap Analysis*", dated 31 March 2009, are summarised in **Table 11**.

Table 11 Pre-Mine Rating Background Noise Levels (Feb/March 2009)

Receiver Identification	Daytime $L_{A90(15minute)}$ (0700-1800 hours)	Evening $L_{A90(15minute)}$ (1800-2200 hours)	Night-time $L_{A90(15minute)}$ (2200-0700 hours)
Location A - Cnr of Glen Davis Road	30 dBA	30 dBA	30 dBA
Location B - Parr Residence	30 dBA	30 dBA	30 dBA
Location C - Rail Loop	30 dBA	30 dBA	30 dBA
Location D - Near Leishman Residence	30 dBA	30 dBA	30 dBA

Note: Background noise levels were measured at equal or less than 30 dBA. When noise levels are less than 30 dBA, the INP nominates that the Rating Background Level should be assumed to be 30 dBA.

5.5.2 Ambient Noise Monitoring Results (August 2014)

Unattended continuous noise loggers were positioned at Location B – Parr Residence and Location F – Bernina from 5 August 2014 to 15 August 2014. Due to a noise logger malfunction at Location F, no data was available to be used to quantify the overall noise amenity at this location. The unattended ambient noise and weather data at Location B are presented graphically in **Appendix D1.**

The median value of the L_{A1} and L_{A10} noise exceedance levels have been used to quantify the "maximum" and "average maximum" levels respectively and the L_{A90} represents the Rating Background Level (RBL). The L_{Aeq} is the equivalent continuous noise level which is equal in energy to the fluctuating level over the 15 minute interval.

In order to derive the statistical noise levels for various daily time periods, the data was processed for the periods 0700 hours to 1800 hours (daytime), 1800 hours to 2200 hours (evening) and 2200 hours to 0700 hours (night-time). The calculated statistical ambient noise levels for each location are presented in **Table 12**.

It should be noted that the ambient noise levels presented in **Table 12** are not necessarily the contributed noise emissions arising from AM operations alone. The ambient noise level data quantifies the overall noise level at a given location independent of its source or character. The noise logger calculates the statistical noise indices and does not "record" the actual noise. Precautions can be taken to minimise the influences from extraneous noise sources at a given location (eg optimum placement of the loggers away from localised noise source ie pumps, houses, trees, etc), however not all these sources or their effects can be eliminated. Consequently, if the unattended noise levels for any given 15 minute period are above the noise criteria determined in accordance with the INP, it does not necessarily indicate an exceedance of the mine's contribution noise criteria.

Table 12 Unattended Statistical Ambient Noise Level Summary (August 2014)

Logger Location	Daytime (dBA)				Evening (dBA)				Night-time (dBA)			
	LAeq	LA1	LA10	LA90	LAeq	LA1	LA10	LA90	LAeq	LA1	LA10	LA90
Location B Parr Residence	40	48	39	24	45	47	45	26	37	41	36	22
Location F Bernina	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]

Note 1: Noise logger malfunction.

5.5.3 Noise Impact Assessment

The range of the $L_{A90(15minute)}$ daytime, evening and night-time ambient noise levels for the August 2014 monitoring period at the monitored residential locations are presented in **Table 13** ,**Table 14** and **Table 15** respectively, together with the previous monitored noise levels from 2009 to 2013.

Table 13 Daytime[1] $L_{A90(15minute)}$ Ambient Noise Levels

Receiver Identification	Pre-Mine	Operational				
	Feb/ March 2009	September 2010	August/ September 2011	September 2012	July/August 2013	August 2014
Location B - Parr Residence	26 dBA	26 dBA	24 dBA	27 dBA	25 dBA	24 dBA
Location D - Near Leishman Residence	26 dBA	26 dBA	-	-	-	-
Location F - Bernina	-	-	26 dBA	22 dBA	23 dBA	n/a[2]

Note 1: Daytime - 0700 to 1800 hours.
Note 2: Noise logger malfunction.

Comparison of the noise levels indicates that there has been a slight decrease (of up to 2 dB) during the daytime monitoring period since the commencement at the mine operations.

Due to a noise logger malfunction, no comparison can be made for Location F.

Table 14 Evening $L_{A90(15minute)}$ Ambient Noise Levels

Receiver Identification	Pre-Mine	Operational				
	Feb/ March 2009	September 2010	August/ September 2011	September 2012	July/August 2013	August 2014
Location B - Parr Residence	30 dBA	29 dBA[2]	39 dBA	48 dBA	46 dBA	26 dBA
Location D - Near Leishman Residence	26 dBA	32 dBA	-	-	-	-
Location F - Bernina	-	-	39 dBA	32 dBA	31 dBA	n/a[3]

Note 1: Evening - 1800 to 2200 hours.

Note 2: The house generator at Location B was operational during some of the evenings of the monitoring period. Periods corresponding to operation of the house generator were disregarded.

Note 3: Noise logger malfunction.

Comparison of the noise levels indicates that there has been a decrease (of up to 4 dB) during the evening monitoring period since the commencement at the mine operations. It should be noted that a significant decrease has been recorded from previous monitoring periods (of up to 22 dB). This is likely due to reduced insect activity at this location at the time of monitoring.

Due to a noise logger malfunction, no comparison can be made for Location F.

Table 15 Night-time $L_{A90(15minute)}$ Ambient Noise Levels

Receiver Identification	Pre-Mine	Operational				
	Feb/ March 2009	September 2010	August/ September 2011	September 2012	July/August 2013	August 2014
Location B - Parr Residence	24 dBA	32 dBA	28 dBA	30 dBA	33 dBA	22 dBA
Location D - Near Leishman Residence	26 dBA	28 dBA	-	-	-	-
Location F - Bernina	-	-	29 dBA	29 dBA	21 dBA	n/a[2]

Note 1: Night-time - 2200 to 0700 hours.

Note 2: Noise logger malfunction.

Comparison of the noise levels indicates that there has been a slight decrease (of up to 2 dB) during the night-time monitoring period since the commencement at the mine operations. It should be noted that an 11 dB decrease was recorded from the previous monitoring period. This is likely attributed to reduced insect activity during the monitoring period.

Due to a noise logger malfunction, no comparison can be made for Location F.

Train Noise Assessment

Periods corresponding to a train being loaded on site have been identified in **Appendix D2**. Location F has been chosen in order to assess the train noise contribution because of its direct line of site to the rail loop. However, due to the logger malfunction, further analysis was not able to be conducted.

5.6 Discussion of the Results

AM's Licence (EPL 12374) does not nominate any specific noise monitoring requirements. Consequently, noise monitoring surveys were conducted in accordance with the EPA's INP noise survey and assessment requirements: A criterion of 35 dBA is considered to be appropriate to assess the AM noise level contribution at all non-mined owned residences.

The site specific weather conditions relevant to the August 2014 survey are:

- Daytime period: moderately windy conditions ie wind velocity up to 5 m/s at 10 m above ground level and temperature inversion conditions of up to 0˚C/100 m.
- Evening period: slightly windy conditions ie wind velocity up to 2.5 m/s at 10 m above ground level and temperature inversion conditions of 8˚C/100 m.
- Night-time period: slightly windy conditions ie wind velocity up to 2 m/s at 10 m above ground level and temperature inversion conditions up to 8˚C/100 m.

At monitoring Location E, the AM noise emissions were not discernible and below 35 dBA respectively. At Location A, the AM noise emissions were only audible during the night-time monitoring periods and estimated to be less than 24 dBA and below the 35 dBA criterion respectively.

At Location B, the AM noise emissions were only audible during the daytime and night-time monitoring periods and estimated to be less than 21 dBA during the daytime and less than 20 dBA during the night-time period.

At Location C, the AM noise emissions were audible during all monitoring periods, contributing noise levels of up to 33 dBA, which complies with the criterion of 35 dBA.

At Location D, the AM noise emissions were only audible at times during the night-time period contributing noise levels less than 20 dBA.

At Location F, the AM noise emissions were only audible during the night-time noise monitoring surveys contributing noise levels of 24 dBA to 26 dBA, it was likely that an inversion was taking place.

A comparison of ambient noise levels indicates that there has been a decrease of 20 dB during the evening and 11 dB during the night-time period at Location B compared to the previous year. Noise levels have remained similar (within 2 dB) to the night-time ambient noise level recorded prior to mining operating commencing.

Due to a logger malfunction at Location F, no comparison of ambient background noise levels can be made.

1 Sound Level or Noise Level

The terms 'sound' and 'noise' are almost interchangeable, except that in common usage 'noise' is often used to refer to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. The human ear responds to changes in sound pressure over a very wide range. The loudest sound pressure to which the human ear responds is ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols SPL, L or L_P are commonly used to represent Sound Pressure Level. The symbol L_A represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is 2×10^{-5} Pa.

2 'A' Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an 'A-weighting' filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People's hearing is most sensitive to sounds at mid frequencies (500 Hz to 4000 Hz), and less sensitive at lower and higher frequencies. Thus, the level of a sound in dBA is a good measure of the loudness of that sound. Different sources having the same dBA level generally sound about equally loud.

A change of 1 dBA or 2 dBA in the level of a sound is difficult for most people to detect, whilst a 3 dBA to 5 dBA change corresponds to a small but noticeable change in loudness. A 10 dBA change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerbside of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to quiet
50	General Office	
40	Inside private office	Quiet to very quiet
30	Inside bedroom	
20	Recording studio	Almost silent

Other weightings (eg B, C and D) are less commonly used than A-weighting. Sound Levels measured without any weighting are referred to as 'linear', and the units are expressed as dB(lin) or dB.

3 Sound Power Level

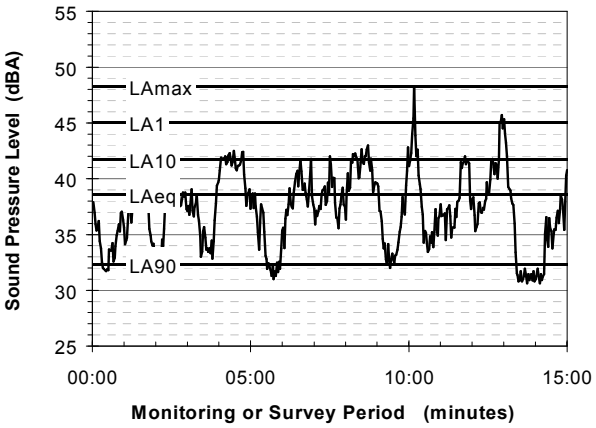
The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or L_W, or by the reference unit 10^{-12} W.

The relationship between Sound Power and Sound Pressure may be likened to an electric radiator, which is characterised by a power rating, but has an effect on the surrounding environment that can be measured in terms of a different parameter, temperature.

4 Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels L_{AN}, where L_{AN} is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the L_{A1} is the noise level exceeded for 1% of the time, L_{A10} the noise exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

L_{A1} The noise level exceeded for 1% of the 15 minute interval.

L_{A10} The noise level exceed for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

L_{A90} The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

L_{Aeq} The A-weighted equivalent noise level (basically the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

When dealing with numerous days of statistical noise data, it is sometimes necessary to define the typical noise levels at a given monitoring location for a particular time of day. A standardised method is available for determining these representative levels.

This method produces a level representing the 'repeatable minimum' L_{A90} noise level over the daytime and night-time measurement periods, as required by the EPA. In addition the method produces mean or 'average' levels representative of the other descriptors (L_{Aeq}, L_{A10}, etc).

5 Tonality

Tonal noise contains one or more prominent tones (ie distinct frequency components), and is normally regarded as more offensive than 'broad band' noise.

6 Impulsiveness

An impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.

7 Frequency Analysis

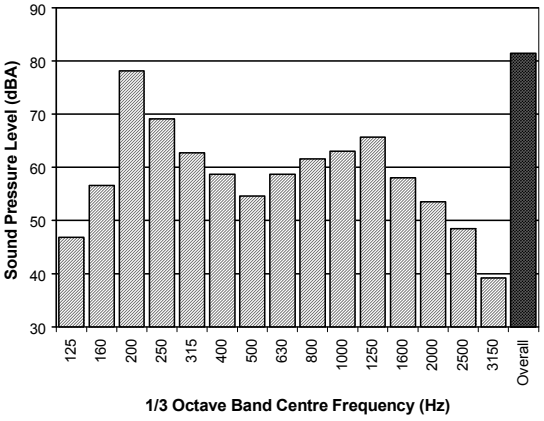
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal. This analysis was traditionally carried out using analogue electronic filters, but is now normally carried out using Fast Fourier Transform (FFT) analysers.

The units for frequency are Hertz (Hz), which represent the number of cycles per second.

Frequency analysis can be in:

- Octave bands (where the centre frequency and width of each band is double the previous band)
- 1/3 octave bands (3 bands in each octave band)
- Narrow band (where the spectrum is divided into 400 or more bands of equal width)

The following figure shows a 1/3 octave band frequency analysis where the noise is dominated by the 200 Hz band. Note that the indicated level of each individual band is less than the overall level, which is the logarithmic sum of the bands.



8 Vibration

Vibration may be defined as cyclic or transient motion. This motion can be measured in terms of its displacement, velocity or acceleration. Most assessments of human response to vibration or the risk of damage to buildings use measurements of vibration velocity. These may be expressed in terms of 'peak' velocity or 'rms' velocity.

The former is the maximum instantaneous velocity, without any averaging, and is sometimes referred to as 'peak particle velocity', or PPV. The latter incorporates 'root mean squared' averaging over some defined time period.

Vibration measurements may be carried out in a single axis or alternatively as triaxial measurements. Where triaxial measurements are used, the axes are commonly designated vertical, longitudinal (aligned toward the source) and transverse.

The common units for velocity are millimetres per second (mm/s). As with noise, decibel units can also be used, in which case the reference level should always be stated. A vibration level V, expressed in mm/s can be converted to decibels by the formula 20 log (V/V_o), where V_o is the reference level (10^{-9} m/s). Care is required in this regard, as other reference levels may be used by some organizations.

9 Human Perception of Vibration

People are able to 'feel' vibration at levels lower than those required to cause even superficial damage to the most susceptible classes of building (even though they may not be disturbed by the motion). An individual's perception of motion or response to vibration depends very strongly on previous experience and expectations, and on other connotations associated with the perceived source of the vibration. For example, the vibration that a person responds to as 'normal' in a car, bus or train is considerably higher than what is perceived as 'normal' in a shop, office or dwelling.

10 Over-Pressure

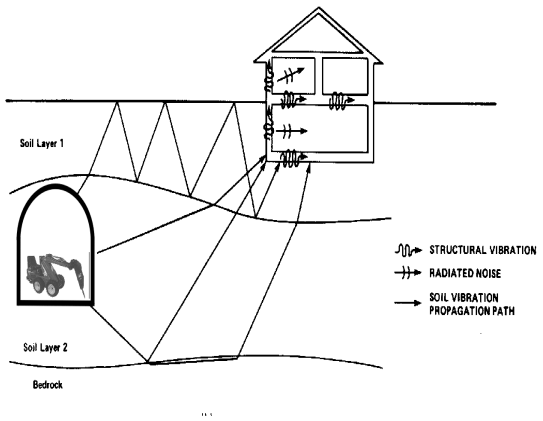
The term 'over-pressure' is used to describe the air pressure pulse emitted during blasting or similar events. The peak level of an event is normally measured using a microphone in the same manner as linear noise (ie unweighted), at frequencies both in and below the audible range.

11 Ground-borne Noise, Structure-borne Noise and Regenerated Noise

Noise that propagates through a structure as vibration and is radiated by vibrating wall and floor surfaces is termed 'structure-borne noise', 'ground-borne noise' or 'regenerated noise'. This noise originates as vibration and propagates between the source and receiver through the ground and/or building structural elements, rather than through the air.

Typical sources of ground-borne or structure-borne noise include tunnelling works, underground railways, excavation plant (eg rockbreakers), and building services plant (eg fans, compressors and generators).

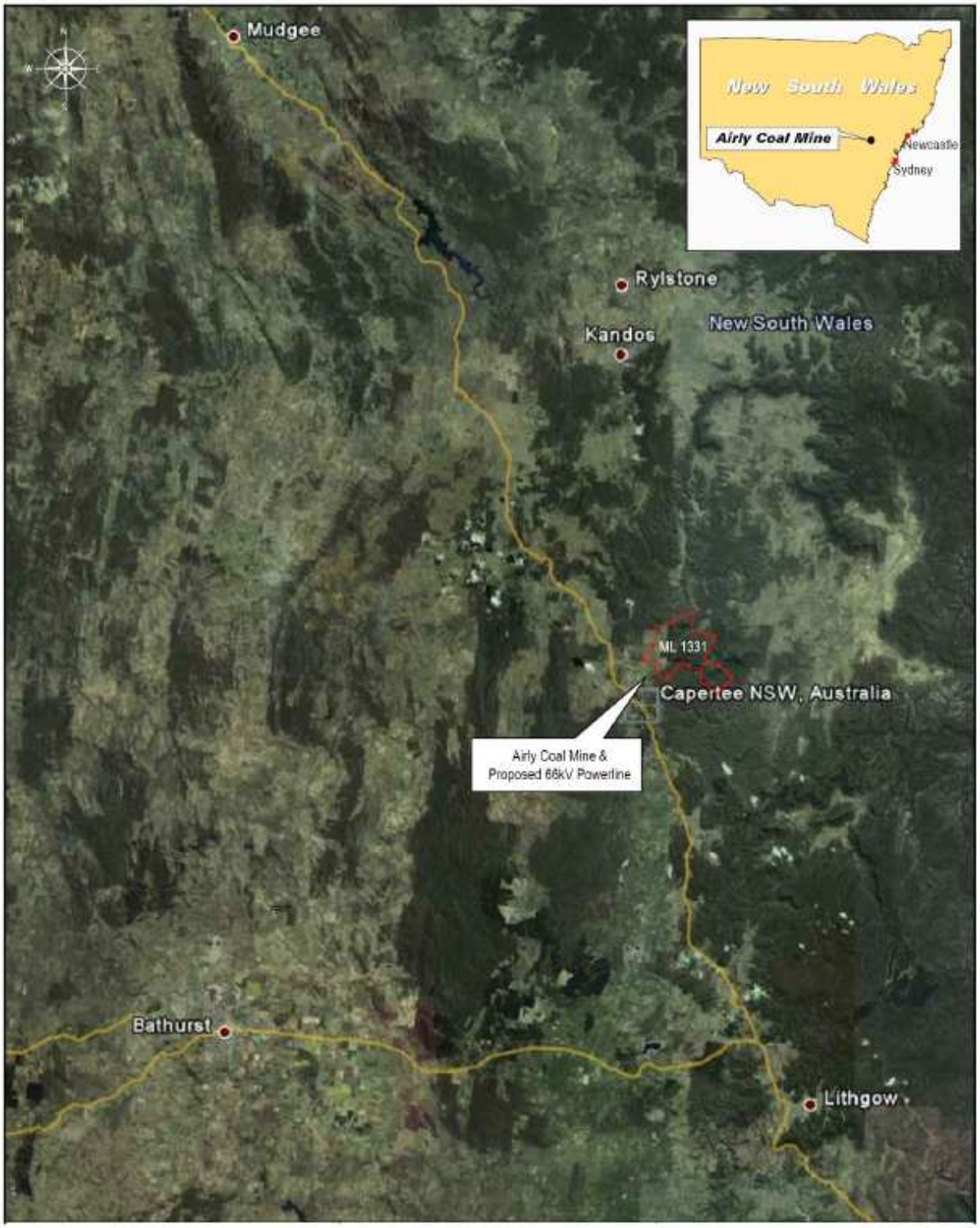
The following figure presents the various paths by which vibration and ground-borne noise may be transmitted between a source and receiver for construction activities occurring within a tunnel.



The term 'regenerated noise' is also used in other instances where energy is converted to noise away from the primary source. One example would be a fan blowing air through a discharge grill. The fan is the energy source and primary noise source. Additional noise may be created by the aerodynamic effect of the discharge grill in the airstream. This secondary noise is referred to as regenerated noise

Appendix B1

MINE LOCATION



Appendix B2

SITE MAP AND MONITORING LOCATIONS

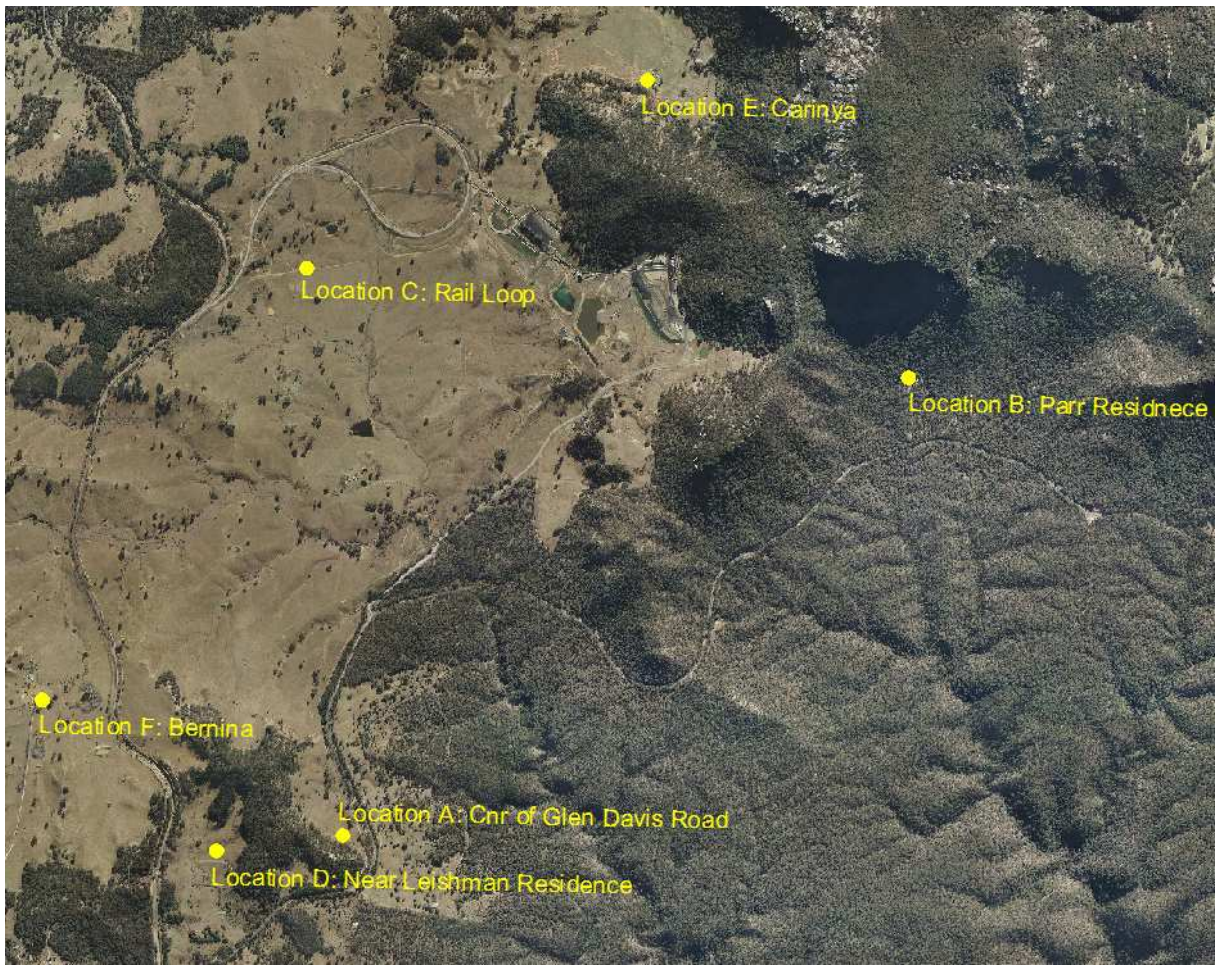


Table 1 Seasonal Frequency of occurrence Wind Speed Intervals - Daytime

Period	Calm (<0.5 m/s)	Wind Direction ±45°	Wind Speed		
			0.5 to 2 m/s	2 to 3 m/s	0.5 to 3 m/s
Summer	14.8%	E±45	14.3%	10.3%	24.6%
Autumn	26.7%	E±45	10.9%	6.1%	17.1%
Winter	15.5%	E±45	8.1%	4.4%	12.5%
Spring	11.5%	ENE±45	6.4%	5.5%	11.9%

Table 2 Seasonal Frequency of occurrence Wind Speed Intervals - Evening

Period	Calm (<0.5 m/s)	Wind Direction ±45°	Wind Speed		
			0.5 to 2 m/s	2 to 3 m/s	0.5 to 3 m/s
Summer	18.9%	E±45	15.3%	14.2%	29.5%
Autumn	48.1%	E±45	9.1%	5.5%	14.6%
Winter	33.1%	WSW±45	12.8%	5.5%	18.3%
Spring	30.4%	E±45	12.2%	7.7%	19.9%

Table 3 Seasonal Frequency of occurrence Wind Speed Intervals - Night-time

Period	Calm (<0.5 m/s)	Wind Direction ±45°	Wind Speed		
			0.5 to 2 m/s	2 to 3 m/s	0.5 to 3 m/s
Summer	47.4%	E±45	15.3%	7.1%	22.4%
Autumn	55.5%	WSW±45	15.0%	3.1%	18.1%
Winter	36.9%	WSW±45	13.9%	5.5%	19.4%
Spring	47.2%	E±45	13.0%	4.4%	17.5%

Table 4 Summary

Period	Winds ±45o ≤3m/s with Frequency of Occurrence ≥30%		
	Daytime	Evening	Night-time
Summer	Nil	Nil	Nil
Autumn	Nil	Nil	Nil
Winter	Nil	Nil	Nil
Spring	Nil	Nil	Nil

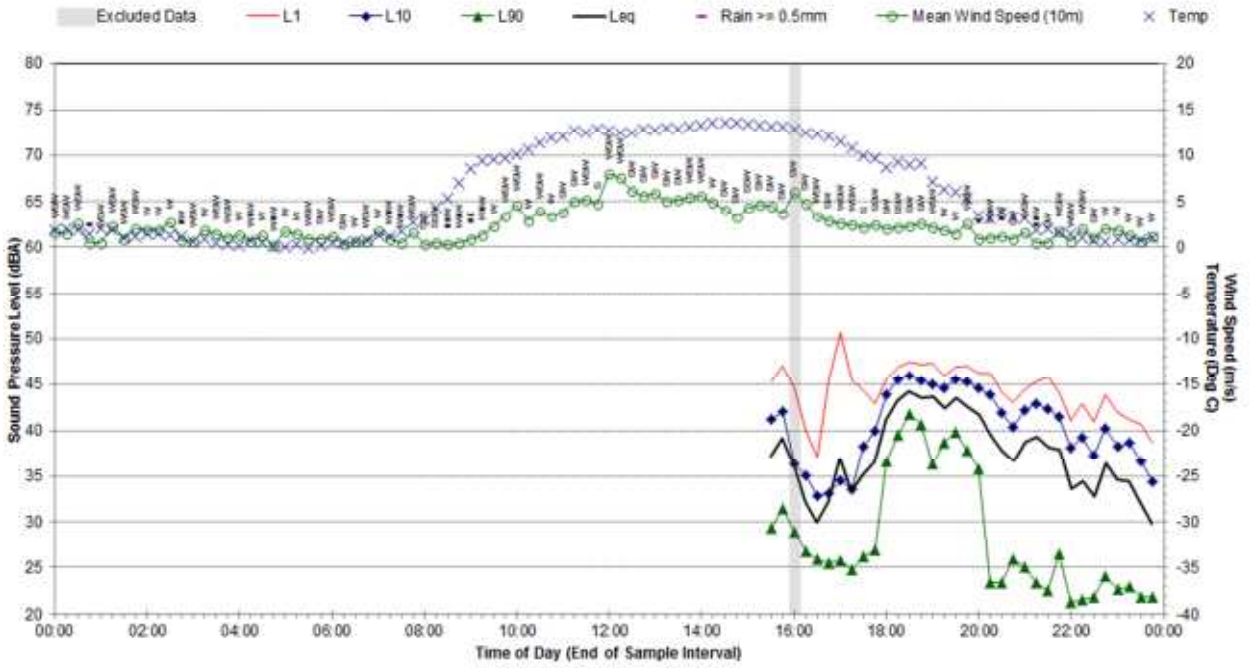
Table 5 Frequency of Occurrence of Atmospheric Stability Classes - Evening and Night-time

Stability Class	Frequency of Occurrence				Estimated ELR °C/100 m	Qualitative Description
	Summer	Autumn	Winter	Spring		
A	0.0%	0.0%	0.0%	0.0%	<-1.9	Lapse
B	0.0%	0.0%	0.0%	0.0%	-1.9 to -1.7	Lapse
C	0.0%	0.0%	0.0%	0.0%	-1.7 to -1.5	Lapse
D	30.7%	18.8%	28.0%	19.6%	-1.5 to -0.5	Neutral
E	15.2%	10.5%	10.0%	10.8%	-0.5 to 1.5	Weak inversion
F	23.6%	22.2%	25.1%	15.7%	1.5 to 4	Moderate inversion
G	30.5%	48.6%	37.0%	54%	>4.0	Strong inversion
F+G	54.1%	70.8%	62.1%	69.6%	>1.5	Moderate to strong inversion

UNATTENDED AMBEIENT NOISE AND WEATHER DATA – LOCATION B – PARR RESIDENCE

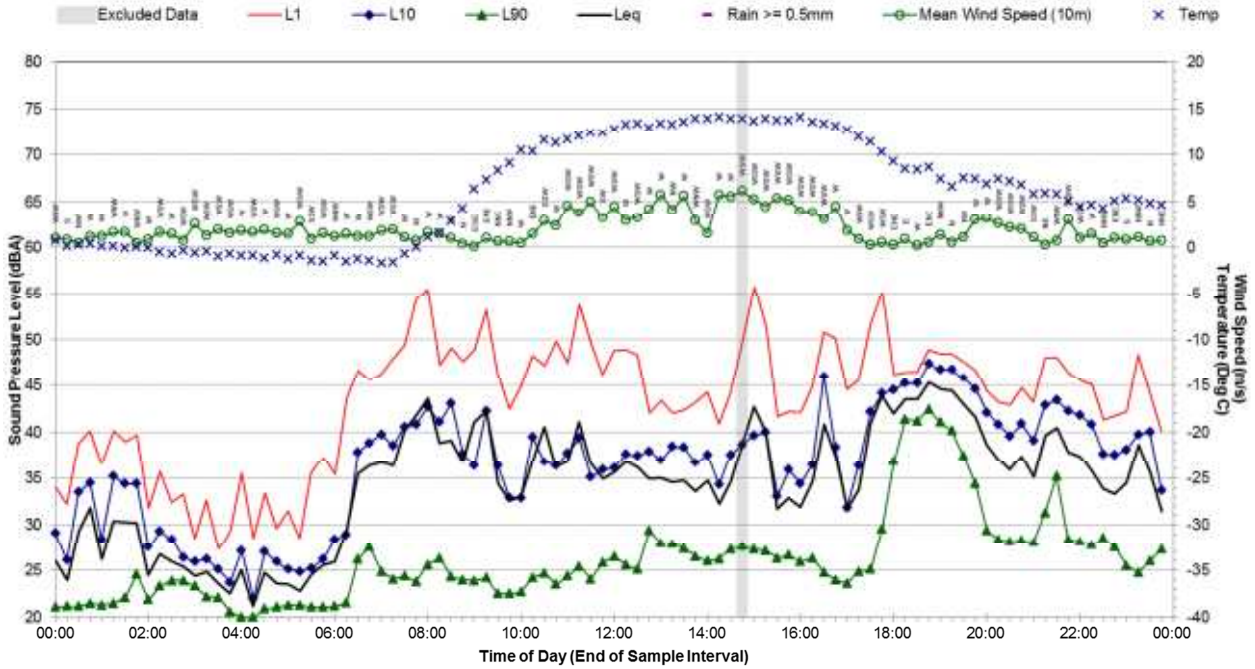
Statistical Ambient Noise Levels

Location B - Parr Residence - Tuesday, 5 August 2014



Statistical Ambient Noise Levels

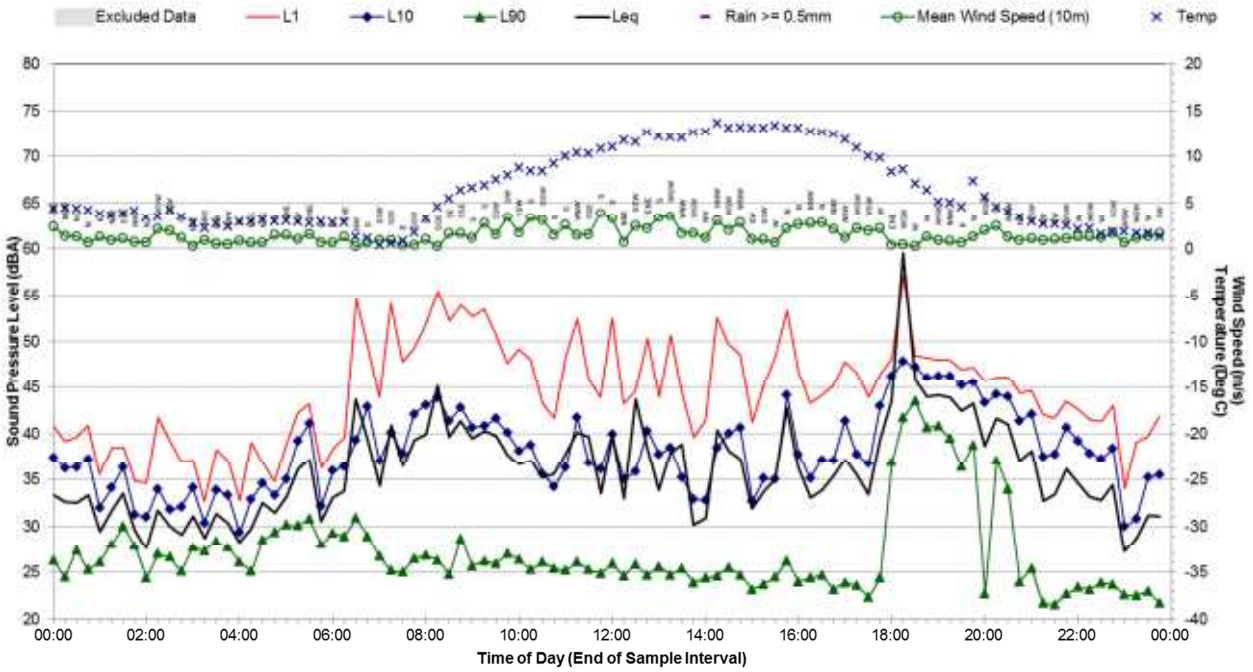
Location B - Parr Residence - Wednesday, 6 August 2014



UNATTENDED AMBEIENT NOISE AND WEATHER DATA – LOCATION B – PARR RESIDENCE

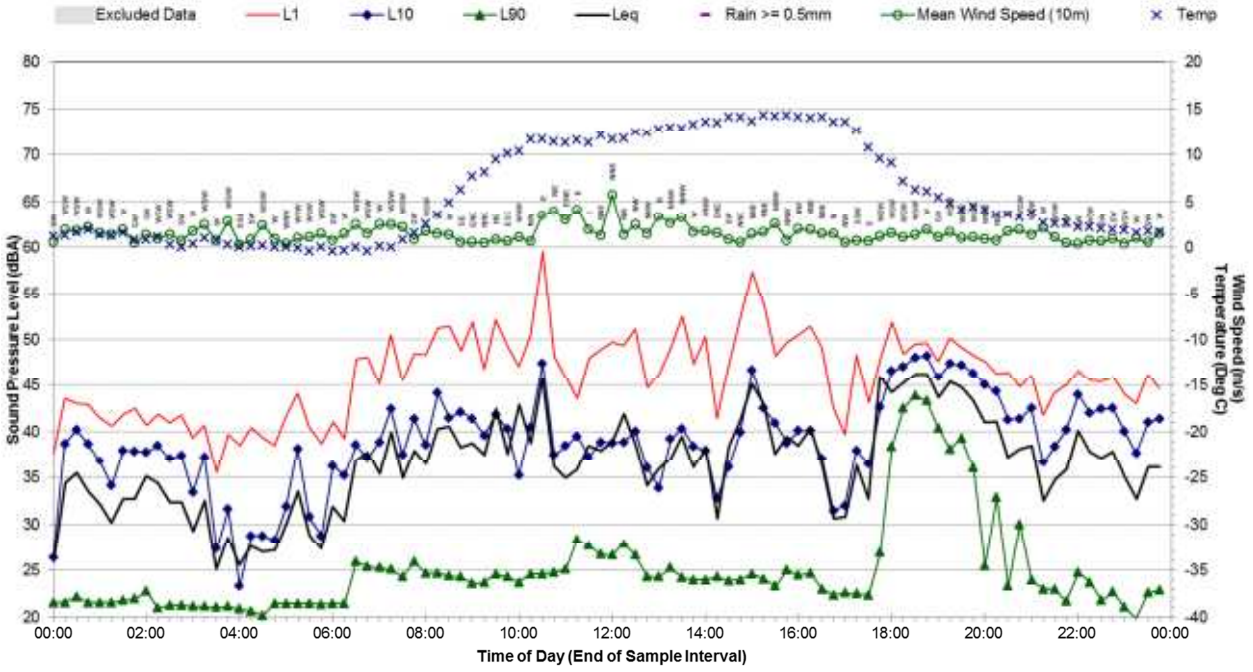
Statistical Ambient Noise Levels

Location B - Parr Residence - Thursday, 7 August 2014



Statistical Ambient Noise Levels

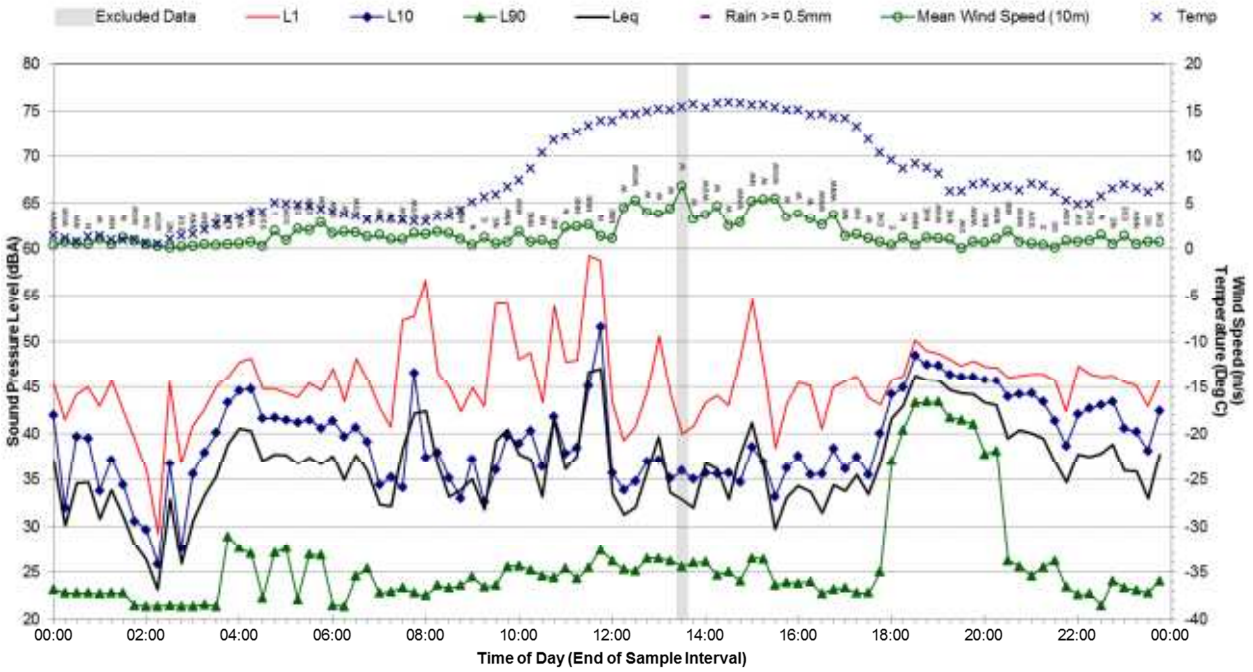
Location B - Parr Residence - Friday, 8 August 2014



UNATTENDED AMBEIENT NOISE AND WEATHER DATA – LOCATION B – PARR RESIDENCE

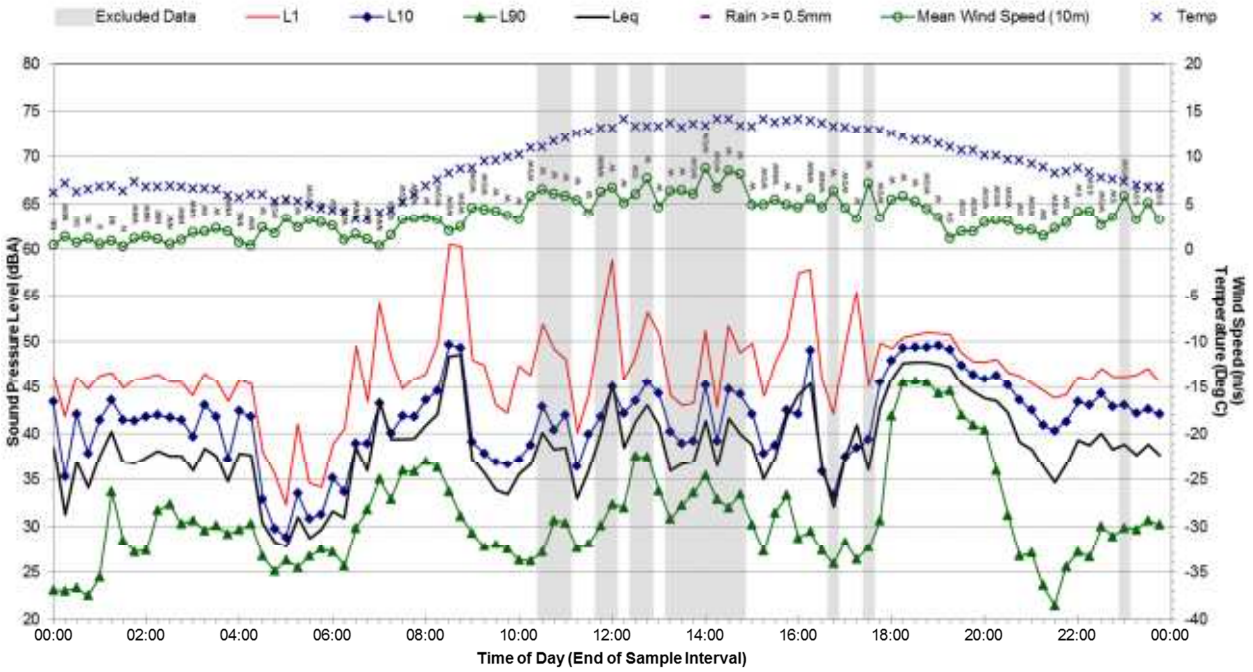
Statistical Ambient Noise Levels

Location B - Parr Residence - Saturday, 9 August 2014



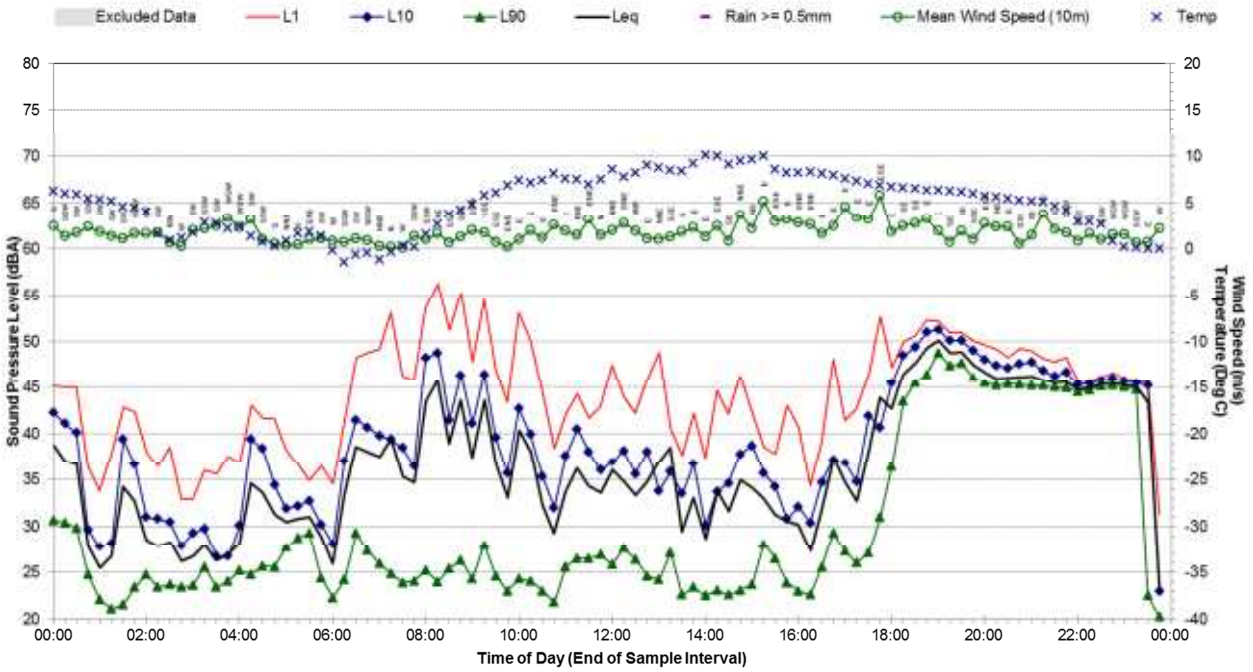
Statistical Ambient Noise Levels

Location B - Parr Residence - Sunday, 10 August 2014



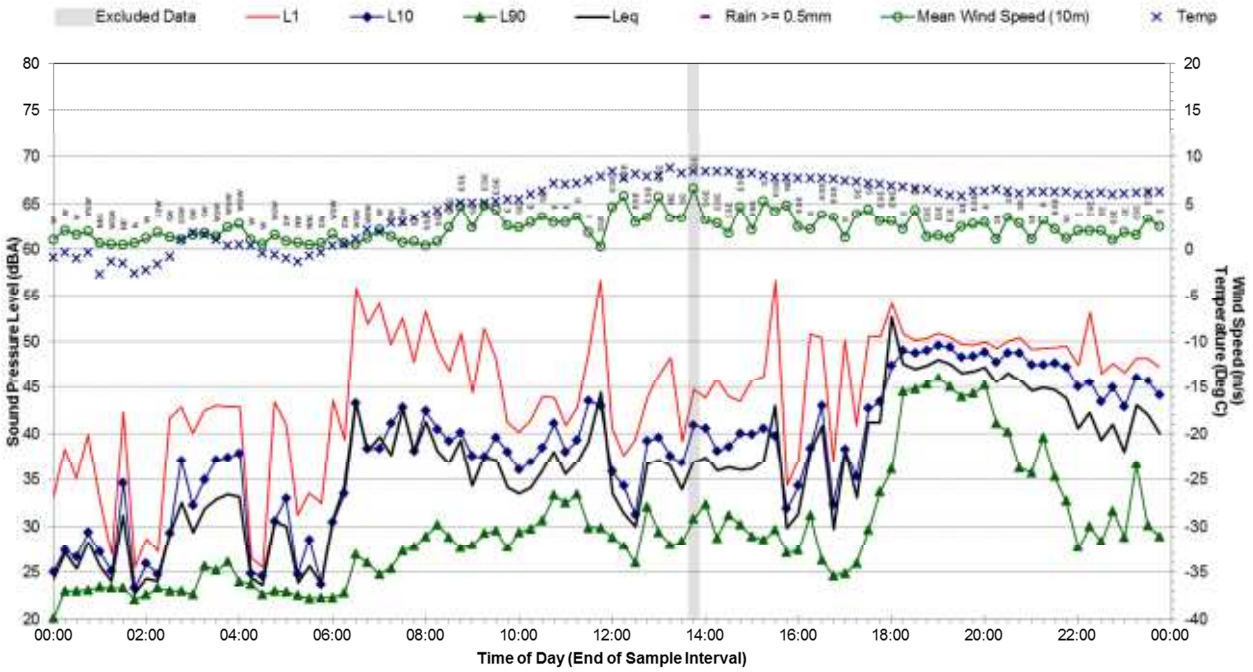
Statistical Ambient Noise Levels

Location B - Parr Residence - Monday, 11 August 2014



Statistical Ambient Noise Levels

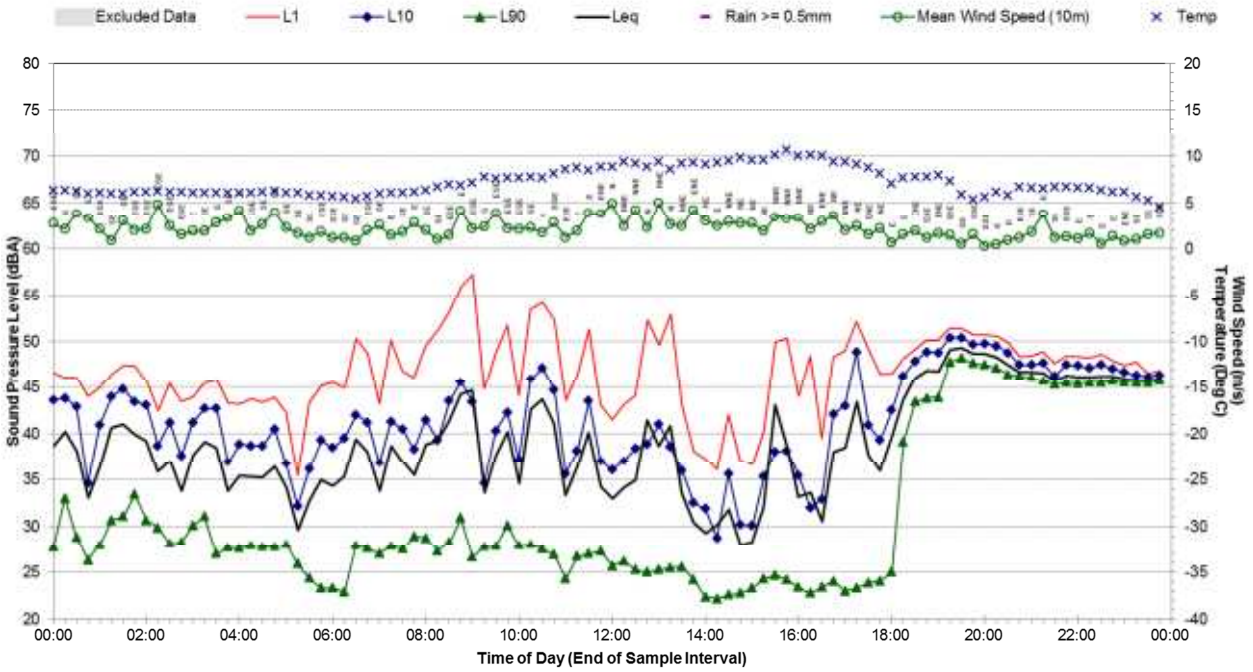
Location B - Parr Residence - Tuesday, 12 August 2014



UNATTENDED AMBEIENT NOISE AND WEATHER DATA – LOCATION B – PARR RESIDENCE

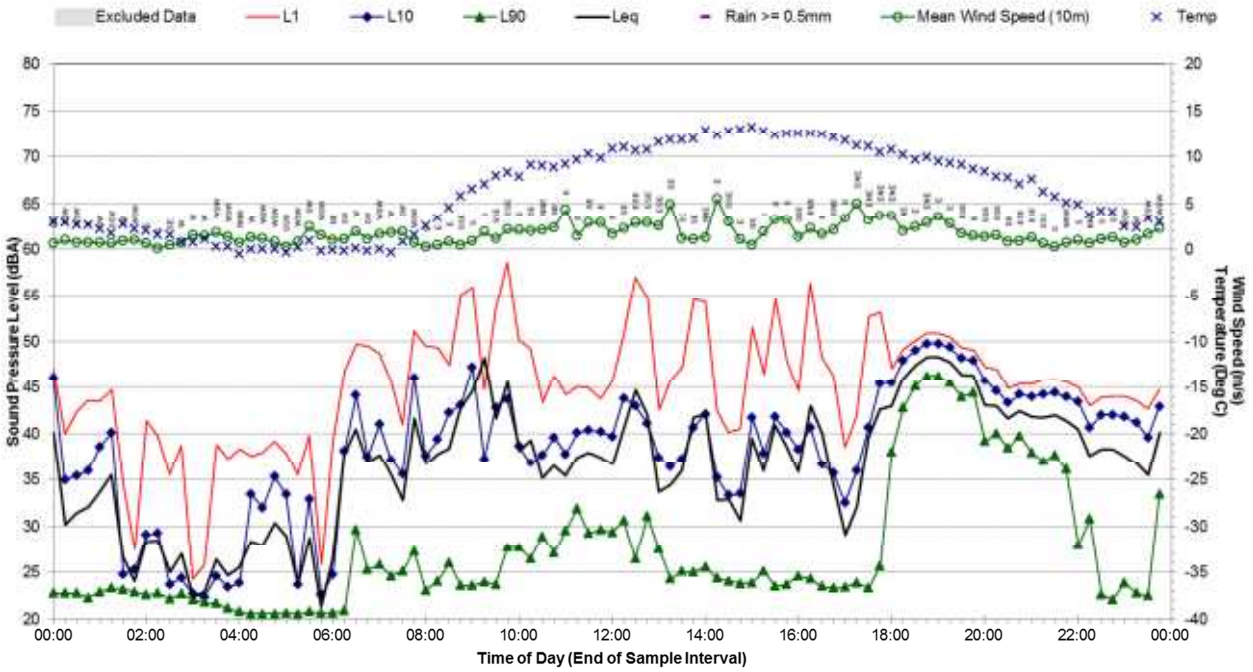
Statistical Ambient Noise Levels

Location B - Parr Residence - Wednesday, 13 August 2014



Statistical Ambient Noise Levels

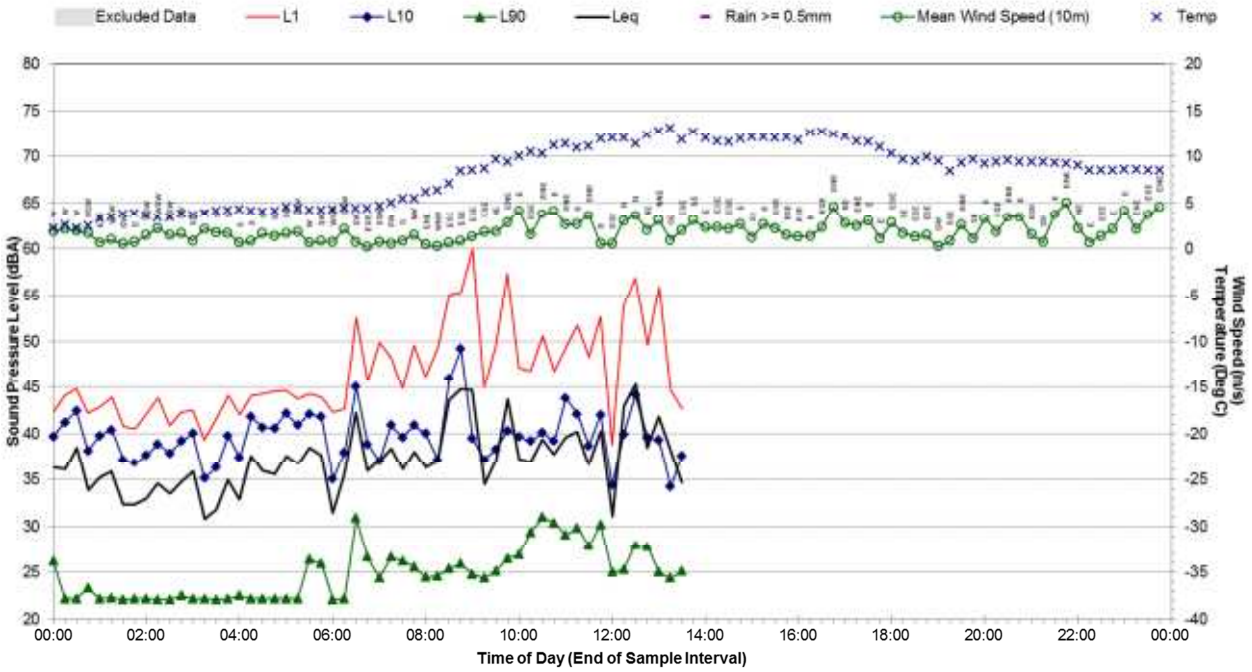
Location B - Parr Residence - Thursday, 14 August 2014



UNATTENDED AMBEIENT NOISE AND WEATHER DATA – LOCATION B – PARR RESIDENCE

Statistical Ambient Noise Levels

Location B - Parr Residence - Friday, 15 August 2014



Appendix D2

UNATTENDED AMBEIENT NOISE AND WEATHER DATA – LOCATION F – BERNINA

Centennial Airly Pty Limited
319 Glen Davis Road
Capertee NSW 2846
www.centennialcoal.com.au