

DONALDSON COAL

Part of the Yancoal Australia Group

DONALDSON COAL

PTY LTD

ABN: 87 073 088 945

**Annual Environmental
Management Report**

for the

**Abel Underground Coal Mine
1 June 2011 to 31 May 2012**

Compiled by:



R.W. CORKERY & CO. PTY. LIMITED

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Annual Environmental Management Report for the Abel Underground Coal Mine 1 June 2011 to 31 May 2012

Name of mine	Abel Underground Coal Mine		
Mining Titles/Leases	ML 1618		
MOP Commencement Date	31/12/09	MOP Completion date	31/12/16
AEMR Commencement Date	01/06/11	AEMR Completion date	31/05/12
Name of leaseholder	Donaldson Coal Company Pty Ltd		
Name of mine operator (if different)	NA		

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January 2013



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FOREWORD

This Annual Environmental Management Report (“AEMR”) for the Abel Underground Coal Mine has been compiled by R.W. Corkery & Co. Pty. Limited on behalf of Donaldson Coal Pty Ltd (the “Company”). Donaldson Coal Pty Ltd is part of Gloucester Coal Ltd which merged with Yancoal Australia Limited in July 2102. The Abel Underground Coal Mine (the “Abel mine”) is located approximately 23km northwest of Newcastle, New South Wales (see **Figure 1.1**).

This is the fifth AEMR submitted for the Abel mine and is applicable for the period 1 June 2011 to 31 May 2012 (“the reporting period”). The information presented within this AEMR has been compiled based on information and advice provided by the Company, together with observations during a site inspection undertaken on 05 September 2012.

This AEMR has been prepared in accordance with *Schedule 5 Condition 4* of Project Approval 05_0136 and generally follows the format and content requirements identified in the Guidelines to the Mining, Rehabilitation and Environmental Management Process (version 3) (2006) prepared by NSW Department of Trade and Investment, Regional Infrastructure and Services, Division of Resources and Energy (DTIRIS) (formerly, the Department of Primary Industries – Mineral Resources).



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1. INTRODUCTION

1.1 CONSENTS, LEASE AND LICENCES

The Company has operated the approved activities at the Abel Underground Coal Mine (the “Abel mine”) under the following consent, lease and licences (**Table 1.1**).

Table 1.1
Abel Underground Coal Mine – Approvals, Leases and Licences

Approval/Lease/Licence	Issue Date	Expiry Date	Details / Comments
Project Approval 05_0136	7 June 2007	31 December 2028	Granted by the Minister for Planning.
Mining Lease ML 1618*	15 May 2008	15 May 2029	Granted by the Department of Primary Industries - Mineral Resources. Incorporates 2755ha of surface area.
Environment Protection Licence No. 12856	9 July 2008 (licence version date 21 December 2011)	Not applicable	Issued by the (then) Department of Environment and Climate Change (EPA)
Water Licence 20BL171935	5 August 2008	4 August 2013	Bore licence to intercept groundwater
*See Figure 1.1			

The Company also holds Exploration Licence 5497 which was granted on 22 July 1998, last renewed on 21 January 2011 and has an expiry date of 21 July 2012. A renewal has been sought and is currently being processed by the Division of Resources and Energy (DRE).

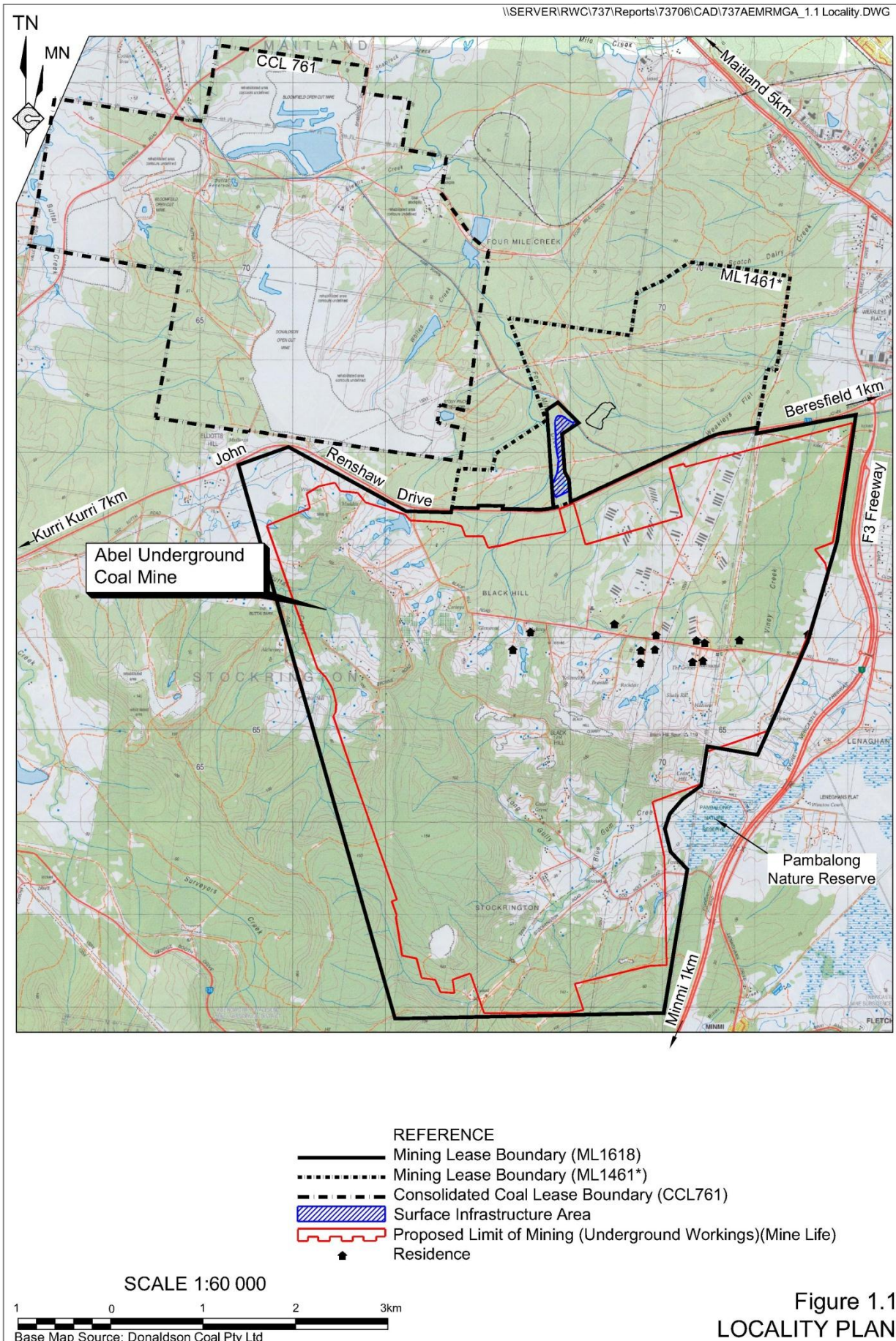
During the reporting period, an application for modification of Project Approval 05_0136 was lodged with Department of Planning and Infrastructure (DP&I) on 23 December 2011. The Director-General Requirements for this modification have been issued and environmental assessment works have commenced.

No other modifications or variations have been sought within the AEMR reporting period for any of the other leases, approvals or licences outlined within **Table 1.1**.

Conditions within the existing approval and mining lease which specify specific environmental criteria are as follows.

- Noise
 - *Schedule 4 Condition 23* of Project Approval 05_0136 - noise emissions (day, evening and night).
- Air Quality
 - *Schedule 4 Condition 25* of Project Approval 05_0136 - dust emissions (suspended particulates and deposited dust).

The approved management and monitoring plans and programs prepared for the Abel mine provide further detailed information relating to applicable environmental criteria.



The last independent environmental audit of the mine was undertaken between 14 and 16 November 2011, in accordance with *Schedule 5 Condition 5* of PA 05_0136. The audit reported a high degree of compliance with the project approval with no non-compliance reported for the period 2008 to 2011. The next independent audit is due in mid-2014.

As part of this AEMR a review of compliance against the conditions specified within PA 05_0136 is also provided in **Appendix 1**.

1.2 MINE CONTACTS

The Manager of Mining Engineering, Mr Charlie Spence is the primary mine contact (Tel: 0429 637 117). Mr Spence is responsible for the environmental management of the Abel mine and ensuring compliance with all relevant legislative obligations. Mr Phillip Brown (Tel: 0439 909 952) is the nominated Environmental Manager and is also responsible for the environmental management of the Abel mine. The contact details for the Abel mine are as follows.

Postal Address: Donaldson Coal Pty Ltd Tel: 02 4015 1100
PO Box 2275 Fax: 02 4015 1199
GREENHILLS NSW 2323 Email: donaldson@doncoal.com.au

Physical Address: Donaldson Open Cut Coal Mine
1132 John Renshaw Drive
BLACKHILL NSW 2322

24 hour Environmental Hotline: Tel: 1800 111 271

1.3 ACTIONS REQUIRED AT PREVIOUS AEMR REVIEW

The 2010/2011 AEMR was forwarded to NSW Department of Trade and Investment, Regional Infrastructure and Services, Division of Resources and Energy (DTIRIS-DRE) and the Department of Planning and Infrastructure (DP&I) in September 2012. No feedback or actions were raised by either DP&I or DTIRIS-DRE.

2. OPERATIONS DURING THE REPORTING PERIOD

2.1 EXPLORATION

During the reporting no exploration was undertaken within Mining Lease 1618 although analysis was undertaken of samples from previously drill holes.

Exploration reports for ML 1618 continued to be provided to the Coal Advice and Resource Assessment section of DTIRIS in accordance with Condition 11 of ML 1618.

2.2 LAND PREPARATION

During August 2011 land preparation activities included minor vegetation clearing and soil stripping for the installation of the upcast ventilation fan within the underground mine area south of John Renshaw Drive (see **Plan 1**). Vegetation was cleared with six hollow bearing



trees felled under supervision of an ecologist. Vegetation was placed within the area surrounding the upcast ventilation shaft. Soil material was stripped and stockpiled within bunding / the embankment surrounding the upcast ventilation shaft area.

No other land preparation activities were undertaken during the reporting period.

2.3 CONSTRUCTION

During the reporting period the principal construction activities for the Abel Underground Coal Mine related to extension of the bathhouses (completed in June 2012) and construction of the upcast ventilation shaft and relocation of the ventilation fan (see **Plan 1** and **Plate 1**). Work for the construction of the upcast ventilation fan commenced December 2011 and was completed during May 2012. A simple colorbond shelter was also erected above the downcast ventilation shaft during May 2012 to reduce the ingress of water during rainfall events (see **Plate 2**).

No other significant construction activities occurred during the reporting period.

2.4 MINING

Plan 2 presents the mining related activities undertaken during the reporting period. Mining activities concentrated on the completion of first workings within Panels 6, 7, 8 and 15, first workings within part Panels 20, 21, East Mains, South Mains and West Mains and second workings within Panels 4 to 8 and 15. A total of 1 110 641t (793 315m³) of run-of-mine coal (ROM) was recovered during the reporting period for transportation to and processing at the Bloomfield Coal Handling and Preparation Plant (CHPP).

Table 2.1 provides a production summary for this reporting period and estimated production at the end of the next reporting period.

Table 2.1
Production and Waste Summary – 1 June 2011 to 31 May 2012

	Cumulative Production (m ³)		
	Start of Reporting Period	End of Reporting Period	End of Next Reporting Period (Estimated)
Topsoils Stripped	820	1690	1690
Topsoil used / spread	0	0	0
Waste Rock	3 300	4 300	5 300
ROM Coal	1 885 763	2 679 078	3 979 001
Processing Waste	0	0	0
Product Coal ¹	1 885 763	2 679 078	3 979 001
Note 1: For the purposes of reporting, as no coal processing is undertaken on site, ROM coal equates to 'product coal' and therefore no processing waste is produced. Source: Donaldson Coal Pty Ltd			

A total of 25 blasts were undertaken as part of the Abel mine between 22 August 2011 and 20 September 2012. These blasts were undertaken to fragment hard rock encountered as opposed to 'production' blasts for coal recovery. Blasting is further discussed in Section 3.8.

Y:\Jobs 53176 1000\737\Reports\73707_AEMR_2012\CAD\Plates 1-4



Plate 1: New Upcast Ventilation Shaft and Fans
(Date of Photography 5 September 2012)
(Ref: E737E/051)

Plate 2: New Shelter Above Downcast Shaft
(Date of Photography 5 September 2012)
(Ref: E737E/047)



Plate 3: Portal and Coal Handling Area
(Date of Photography 5 September 2012)
(Ref: E737E/025)

Plate 4: Water Cart in Operation
(Date of Photography 5 September 2012)
(Ref: E737Q/045)



Mining equipment used at the mine throughout the reporting period along with its primary function is presented in **Table 2.2**.

Table 2.2
Principal Mining Equipment Used within the Reporting Period

Item	No.*	Primary Function
Continuous Miner (Joy 12CM12, Joy 12CM15 and 12CM30)	8	Forming underground roadways and secondary extraction.
Shuttle Cars	14	Transporting cut material away from Continuous Miner.
Driftrunners	12	Transporting people underground.
Coaltrams	7	Transporting materials and equipment, clean up roadways.
Feeder breaker	4	Discharge point for shuttle cars. Reduces size of coal and feeds it onto the conveyor system.
Ventilation Fans (Upcast / Auxiliary and Downcast)	1 / 8 / 1	Extracting used air from the mine and provision of fresh air.
Source: Donaldson Coal Pty Ltd *Includes hired equipment		

2.5 MINERAL PROCESSING

No processing activities were undertaken within ML 1618 other than the use of a feeder breaker to reduce spillage from the conveyor transporting coal to the surface. Processing activities are, however, applicable to Project Approval 05_0136 issued for the Abel underground mine which provides for haulage to and processing at Bloomfield CHPP. During the reporting period, approximately 1 111 034¹ of coal from the Abel mine was processed at Bloomfield CHPP. This resulted in the production of approximately 760 130t Product Coal sourced from the Abel mine during the reporting period. Details of this process and associated waste management are provided within the respective reporting for the Bloomfield CHPP.

2.6 WASTE MANAGEMENT

Wastes generated on site during the reporting period included the following.

- Waste rock / unprocessable weathered coaly material.
- Greases, oils, filters, tyres and batteries from maintenance of vehicles and equipment.
- Bulk scrap metal and plastics from discarded equipment.
- General office wastes, e.g. paper.
- General waste generated by employees, e.g. food scraps, paper, cardboard, aluminium and steel cans.
- Wastewater and sewage from bathhouses.

¹ The apparent additional coal processed compared to ROM coal mined is a result of differences in timing differences between mining of ROM coal, transportation to Bloomfield and processing through the CHPP.

Fine and coarse rejects were also generated at the Bloomfield CHPP.

As shown in **Table 2.1**, approximately 1 000m³ of waste rock and unprocessable coaly material was removed within the reporting period during formation of underground roadways and construction of the upcast ventilation shaft. All waste rock and unprocessable coaly material was removed using dump trucks and placed within the Donaldson mine waste rock emplacement and backfill areas in accordance with the approved final landform for the Donaldson mine (Development Consent 114-116).

All waste oil was stored within 205L drums or 1 000L IBC's within the oil store before being removed from site, along with used oil filters and oily rags, by Australian Waste Oils. Used tyres are removed from site during servicing by Marathon for repair or disposal.

Paper, cardboard, steel, aluminium and any other recyclable material was stored separately in 1.5m³ and 3.0m³ skip bins for recycling. Paper, cardboard and general waste material continued to be collected by Veolia on a weekly basis whilst scrap metal was collected by CMA recycling on an as-needs basis. The scrap steel / drum crusher continued to be in use.

All general wastes were stored in skip bins and removed by Veolia. All wastewater (greywater) and sewage generated on the site from bathhouses was treated using the new sewage treatment system with treated water being transferred to the Big Kahuna.

2.7 COAL STOCKPILES

All ROM coal was stockpiled within the mine's portal and coal handling area. The ROM stockpile, which is situated under the conveyor outfeed, has a capacity of approximately 3000t. During the reporting period, ROM coal continued to be transported to the Bloomfield CHPP by private road.

2.8 WATER MANAGEMENT

The water management procedures are presented in the approved Water Management Plan prepared for the Abel mine and are not presented here in detail. Essentially, all surface water was managed through the use of the existing water management structures for the Donaldson mine with clean water flows directed away from the surface facilities area. Water runoff from within the box cut area incorporating the surface facilities together with excess underground water was directed to an approximately 1.5ML water storage sump located in the southeast corner of the box cut. Road side drainage has also been directed using a section of piping to ensure all stormwater runoff from the northern part of the portal access road reports to the storage sump.

A temporary sump within the former open cut area east of the Abel box cut was also utilised during the reporting period. Water from the 1.5ML sump was piped to the temporary sump as required before being pumped to the Big Kahuna dam (400ML storage capacity, located within ML 1461 for the Donaldson mine). **Table 2.3** provides a summary of the volumes of water stored within the Abel mining lease ML 1618 at the start of the reporting period, at the end of the reporting period and the total storage capacity.

**Table 2.3
Stored Water**

	Volumes Held (m ³) [#]		
	Start of Reporting Period	At end of Reporting Period	Storage Capacity
Clean Water	400	400	450
Dirty Water	1500	1500	1500
Controlled Discharge Water	0	0	0
Contaminated Water	0	0	0
Source: Donaldson Coal Pty Ltd [#] Within Abel Surface Infrastructure Area (ML 1618).			

2.9 HAZARDOUS MATERIAL MANAGEMENT

At the time of reporting, fuel storages for the site include a 2 000L self bunded tank for the refuelling of mobile equipment and a 55 000L self bunded tank near the dedicated hydrocarbon store near the workshop. All tanks were filled as required using mini tankers. Smaller volumes of oils and grease are also stored within 1 000L IBC's or 20L/25L drums stored on bunded pallets and / or within the area draining to the wash bay and oil/water separator.

All handling, storage and transport of dangerous goods were undertaken in accordance with relevant Australian Standards including *AS1940*, *AS1596* and the *Dangerous Goods Code*. An on-line Material Safety Data Sheet (MSDS) database is available through subscription to ChemAlert. This provides immediate and current MSDS information in the Administration Office. When MSDSs are required underground hard copies are printed. Any new chemical substance is approved by the Mine Manager before introduction to the site.

Additionally, as part of the Environmental Management System for the Abel mine, a series of Emergency Response and Preparedness Plans have been prepared by the Company to address any significant environmental emergency, including those involving hazardous materials. Spill kits are located at appropriate points and are serviced by the supplier on a monthly basis. A new Pollution Incident Response Management Plan will also be implemented during the next reporting period.

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

2.10 OTHER INFRASTRUCTURE MANAGEMENT

No additional management measures were required for other infrastructure during the reporting period.

3. ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

3.1 METEOROLOGICAL MONITORING

An automated weather station, installed for the Donaldson mine, has been approved by the, then, Department of Planning as also meeting the requirements for the Abel mine. The weather station records wind speed and direction, temperature, rainfall and solar radiation. A summary of the rainfall data for the past 8 years is presented in **Table 3.1** and monthly and annual wind roses for June 2011 to April 2012 are presented in the Monthly Dust and Meteorological Reports provided in **Appendix 2**.

Table 3.1
Monthly Rainfall Records

Period	Average Monthly Rainfall (mm)												
	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
2004	86.0	176.6	80.0	33.6	17.4	9.4	15.4	43.1	61.2	136.0	77.4	69.8	805.9
2005	64.4	95.8	127.8	57.4	61.8	56.8	7.2	0.8	37.0	84.0	22.8	9.6	625.4
2006	29.8	47.4	63.6	4.6	7.8	43.8	42.6	49.2	162.4	25.4	34.4	34.5	545.5
2007	13.4	96.4	101.4	84.6	59.7	315.2	16.5	79.6	28.3	35.0	163.8	49.5	1043.4
2008	153.4	154.3	46.0	237.6	2.2	105.4	17.4	13.4	27.2	8.4	73.3	62.6	900.3
2009	125.7	97.7	102.8	189.0	125.7	75.7	32.1	1.8	29.2	59.8	44.3	62.0	945.8
2010	89.0	52.1	83.9	37.1	89.4	112.8	65.3	38.5	26.0	80.6	171.1	55.9	901.7
2011	25.6	34.5	65.6	138	98.8	152.2	128.8	48.9	103.0	100.0	171.9	75.9	1143.2
2012	96.1	207.0	137.6	114.7	11.8								

Note: Results relevant to this reporting period are in bold.

Total rainfall during the reporting period was 1347.9mm, approximately 435mm greater than the previous reporting period.

3.2 AIR POLLUTION

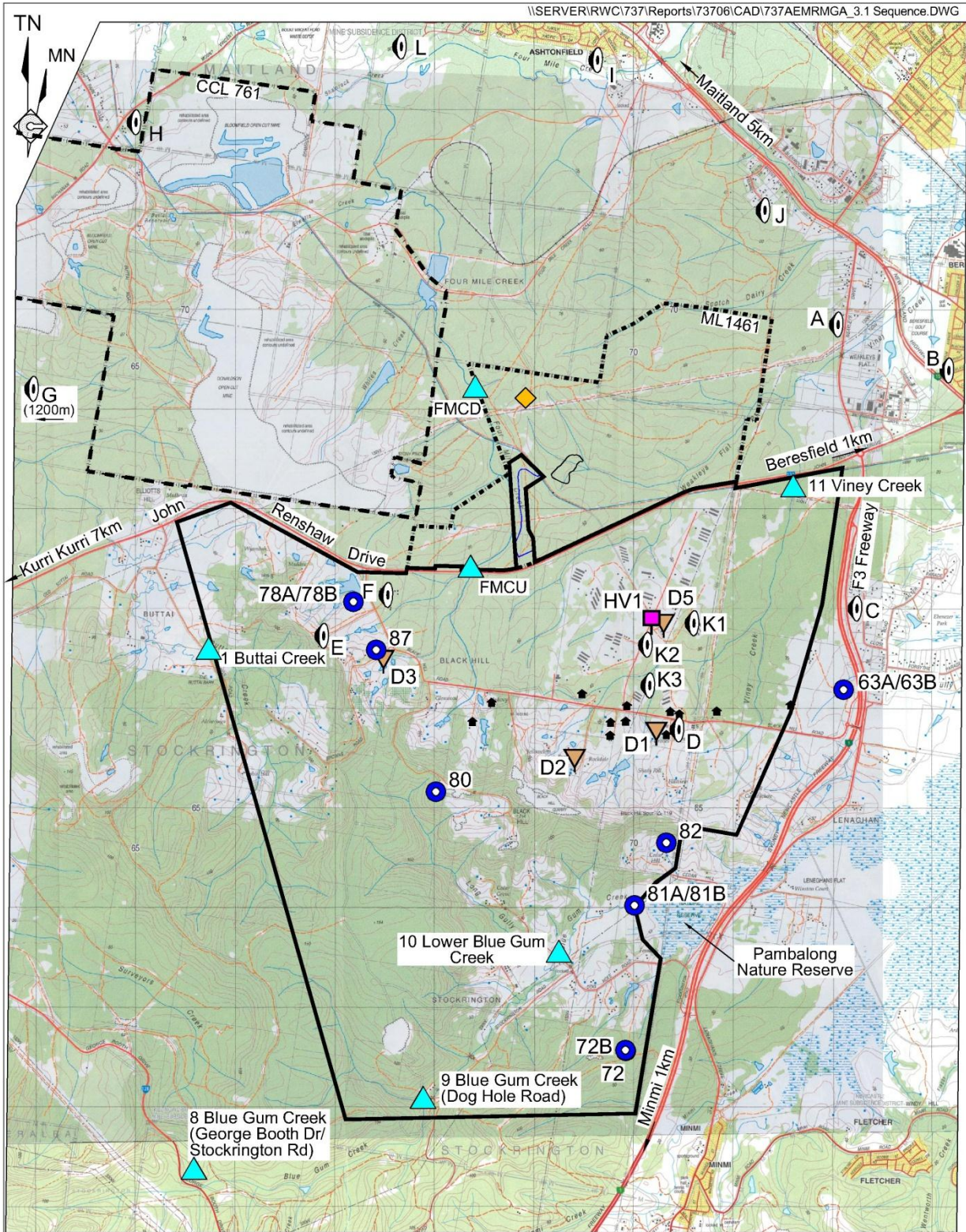
Environmental Management

Management of air quality during the reporting period was largely undertaken as part of the Donaldson mine activities which included watering of access roads (on an as needs basis – see **Plate 4**) and use of exhaust controls on mobile equipment.

Environmental Performance

Monthly deposited dust monitoring was undertaken by Donaldson at a total of four locations surrounding the Abel mine (consisting of four existing locations for the Donaldson mine). TSP and PM₁₀ monitoring was also undertaken at the existing High Volume Air Sampling station for the Donaldson mine located approximately 1500m southeast of the surface infrastructure area at Blackhill. Locations of deposited dust and suspended particulate (high volume air sampling) monitoring are shown on **Figure 3.1** and results summarised within **Table 3.2** and **Figure 3.2**. Monthly Dust and Meteorological Reports are provided in **Appendix 2**.

The highest dust deposition measurement (2.8g/m²/month at D3) occurred in May 2012. Monthly deposition rates were generally below this level. Annual average monthly deposition recorded were between 0.5g/m²/month and 1.1g/m²/month which is significantly below the goal of 4g/m²/month, indicating good air quality with respect to dust deposition.



REFERENCE

- | | |
|---|--|
| <ul style="list-style-type: none"> — Mining Lease Boundary (ML1618) - - - Mining Lease Boundary (ML1461) - - - Consolidated Coal Lease Boundary (CCL761) ⊙ Noise Monitoring Location ★ Residence | <ul style="list-style-type: none"> ◆ Meteorological Station ▲ Dust Monitoring Location ▲ Surface Water Monitoring Location ■ High Volume Air Sampler (HVAS) ● Groundwater Monitoring Location |
|---|--|

SCALE 1:60 000



Base Map Source: Donaldson Coal Pty Ltd

Figure 3.1
ENVIRONMENTAL
MONITORING LOCATIONS

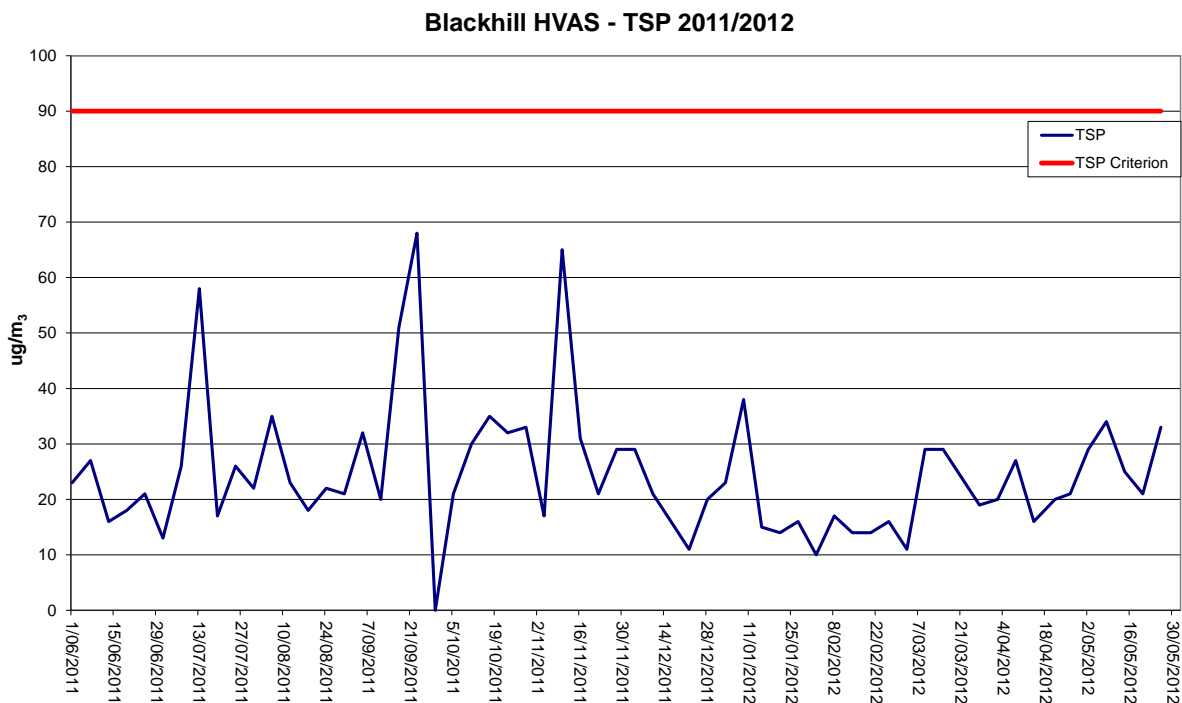
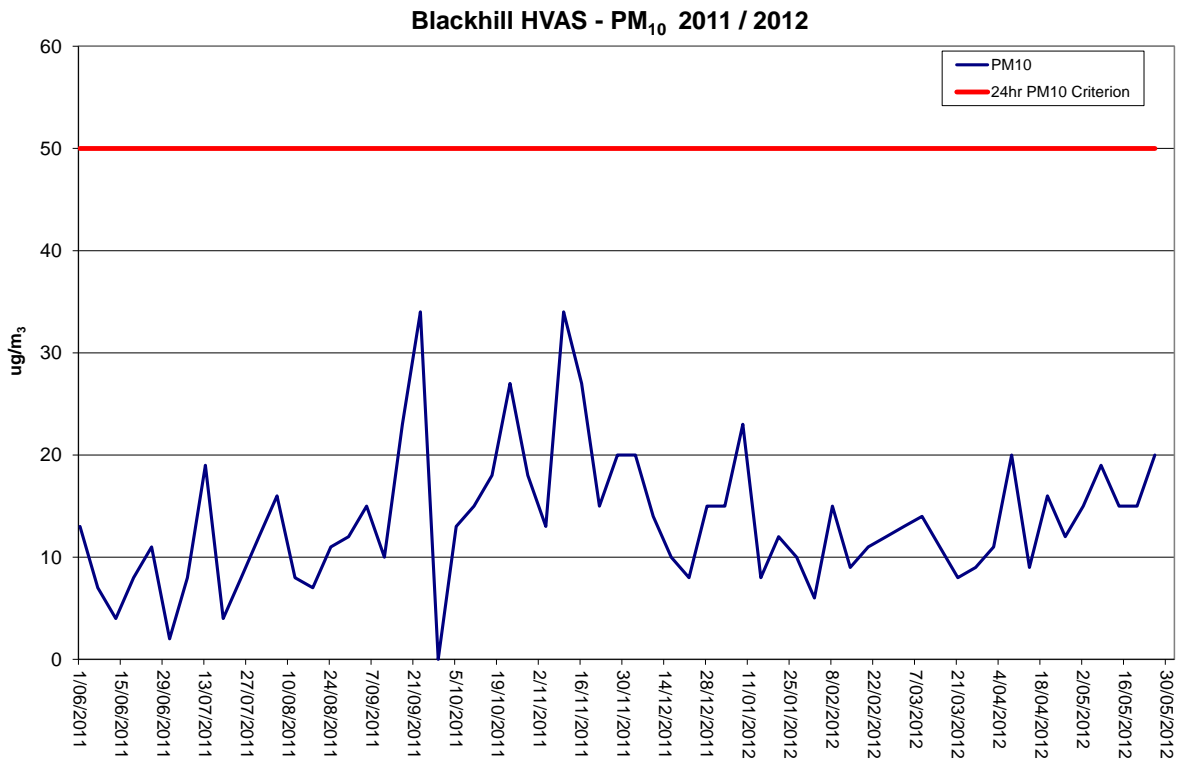


Figure 3.2 Suspended Particulate Monitoring Results – 2011/2012

Table 3.2
Deposited Dust Monitoring Results

Reporting Period	Month	Monthly Dust Deposition Rate (g/m ² /month)			
		D1	D2	D3	D5
2007/2008	Monthly Minimum	0.4	0.1	0.6	0.1
	Monthly Maximum	4.5	0.9	3.7	2.9
	Annual Average	1.65	0.56	1.51	0.81
2008/2009	Monthly Minimum	0.2	0.4	0.1	0.5
	Monthly Maximum	2.8	5.8	2.7	2.5
	Annual Average	0.9	2.1	1.3	1.2
2009/2010	Monthly Minimum	0.2	0.1	0.1	0.1
	Monthly Maximum	4.3	11.3*	5.6	4.1
	Annual Average	1.1	2.8	2.4	1.6
2010/2011	Monthly Minimum	0.3	0.5	0.7	0.2
	Monthly Maximum	1.0	4.1	5.4	1.7
	Annual Average	0.7	1.7	2.1	0.7
2011/2012	Jun-11	0.6	0.5	1.6	0.4
	Jul-11	0.4	0.1	0.6	0.5
	Aug-11	1.3	0.4	0.8	^
	Sep-11	1.0	1.2	0.6	^
	Oct-11	0.5	1.0	0.8	^
	Nov-11	1.1	1.2	2.0	^
	Dec-11	0.9	0.6	0.4	^
	Jan-12	0.7	0.3	0.4	^
	Feb-12	0.8	0.3	0.5	^
	Mar-12	1.3	1.1	1.0	^
	Apr-12	0.9	1.3	1.2	^
	May-12	0.5	0.6	2.8	^
	Monthly Minimum	0.4	0.1	0.4	0.4
	Monthly Maximum	1.3	1.3	2.8	0.5
	Annual Average	0.8	0.7	1.1	0.5

Source: Donaldson Coal Pty Ltd
*Sample invalid due to excessive contamination (not included in average)
^Site unable to be accessed

The suspended particulate monitoring results show that the highest 24-hour average PM₁₀ concentration was 34µg/m³, measured on 10 November 2011. On no occasion did the measured PM₁₀ concentrations exceed the 50µg/m³ 24-hour *National Environment Protection Measures* (NEPM) goal. The highest 24-hour TSP was 68µg/m³ recorded on 23 September 2011 which is below the annual 90µg/m³ *National Health and Medical Research Council* (NHMRC) goal.

The annual average PM₁₀ concentration for Blackhill was 13.8µg/m³ for the 12 months to May 2012. The annual average TSP concentration for the 12 months to May 2012 was 25µg/m³. The monitoring results indicate that suspended particulate concentrations are well below the annual average criteria of 30µg/m³ and 90µg/m³ respectively.

A National Greenhouse Gas and Energy Report (NGER) was also submitted during the reporting period covering the 2010/2011 financial year. This was the second NGER report for the Abel mine.

Reportable Incidents

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

Further Improvements

No further improvements relating to air pollution are planned or considered necessary. Air quality management measures during future operations will be consistent with those outlined within the MOP prepared for the Abel mine and the Air Quality Management Plan.

3.3 EROSION AND SEDIMENT CONTROL

Environmental Management

Sediment and erosion management procedures implemented throughout the reporting period included the following.

- i) Continued diversion of 'dirty' surface water flows within the box cut area to the water storage sump.
- ii) Continued diversion of 'clean' water from areas surrounding the box cut to existing drainage lines.

No further erosion and sediment controls were deemed necessary.

Environmental Performance

No major erosion or sedimentation was observed during the reporting period. The erosion and sediment control measures implemented were largely considered successful without the need for further control measures. Silt fencing and sediment traps continued to be regularly inspected and maintained.

Reportable Incidents

No reportable incidents occurred during the reporting period.

Further Improvements

No further erosion and sediment control measures are planned or considered necessary. Erosion and sediment control measures during future operations will be consistent with those outlined within the Water Management Plan and MOP prepared for the Abel mine. Regular inspections will continue to be undertaken to ensure that these measures remain effective.

3.4 SURFACE WATER POLLUTION

Environmental Management

As part of the approved Water Management Plan, Abel mine transfers water off-site to the Big Kahuna and then to Bloomfield CHPP as required. Surface water monitoring sites specified for the Abel mine are aimed at detecting indirect impacts such as from underground mining activities and activities in the surface infrastructure area. Monitoring at Sites FMCU and FMCD commenced prior to the commencement of the Abel underground mine and serve to provide baseline data. Monitoring at Sites 1, 8, 9, 10 and 11 commenced in 2006 and provide baseline data and can also be used to assess impacts attributable to the Abel mine.

Environmental Performance

Surface water monitoring data for the reporting period is summarised in **Table 3.3** and presented graphically in **Figure 3.3**, with the full data set provided in **Appendix 8**. It is noted that monitoring at additional sites identified within the Integrated Environmental Monitoring Program incorporating the Abel mine, Donaldson Mine, Tasman Underground Coal Mine and Bloomfield Colliery were undertaken and will be reported within their respective AEMRs.

It is noted that, excepting for site FMCD, most samples were collected under low flow conditions.

Table 3.3
Summary of Water Quality Monitoring Results – 2011/2012

Sampling Site [^]	pH [#]	EC (µS/cm) [#]	Turbidity (NTU)	TSS (mg/L)
1	6.55 to 7.29	227 to 1190	9.4 to 280	5 to 173
8	6.60 to 7.64	217 to 932	8.6 to 66.4	5 to 68
9	NS	NS	NS	NS
10	6.65 to 7.54	248 to 1440	5.6 to 449	5 to 342
11	6.54 to 7.56	200 to 1180	11.8 to 1680	8 to 624
FMCU	6.78 to 7.74	199 to 639	16.1 to 33.3 [@]	5 to 51
FMCD	6.95 to 7.59	133 to 253	4 to 193 [@]	5 to 228
ANZECC Trigger Level *	6.5 – 8.5	125 - 2200	6 – 50 (NTU)	-
[^] See Figure 3.1		* ANZECC Chapter 3 – Aquatic Ecosystems – Lowland Rivers in NSW		
[#] Field Measurement		[@] Quarterly monitoring		NS – Not Sampled

Analysis of the results obtained during the reporting period, indicate the following.

- The pH at all sites was slightly acidic to slightly alkaline. All results were within the water quality trigger values for Lowland Rivers in NSW (6.5 to 8.5) outlined in the *Guidelines for Fresh and Marine Water Quality* (ANZECC 2000).
- The electrical conductivity (EC) results range between 133µS/cm and 253µS/cm at FMCD and 248µS/cm and 1 440µS/cm at Site 10 (Lower Blue Gum Creek). All EC results are within the water quality trigger values for Lowland Rivers in NSW (125 to 2 200µS/cm) (ANZECC 2000).
- Turbidity results for five sites (Sites 1, 8, 10, 11 and FMCD) and total suspended solids (TSS) levels at all sampled sites exceeded the water quality trigger values for Lowland Rivers in NSW (6 to 50 NTU) outlined in the *Guidelines for Fresh and Marine Water Quality* (ANZECC 2000) and commonly applied TSS criteria (50mg/L).

As Sites 1, 8, 9 and 10 are currently substantially upstream of underground mining activities these sites would not have been influenced by any Abel mine activities. Baseline monitoring results for Sites 11, FMCU and FMCD have also previously recorded significantly elevated TSS. Therefore it is considered that the Abel mine did not have a significant influence on the turbidity / TSS during the reporting period and that the elevated levels form part of the natural variation.

Reportable Incidents

No reportable incidents occurred during the reporting period.

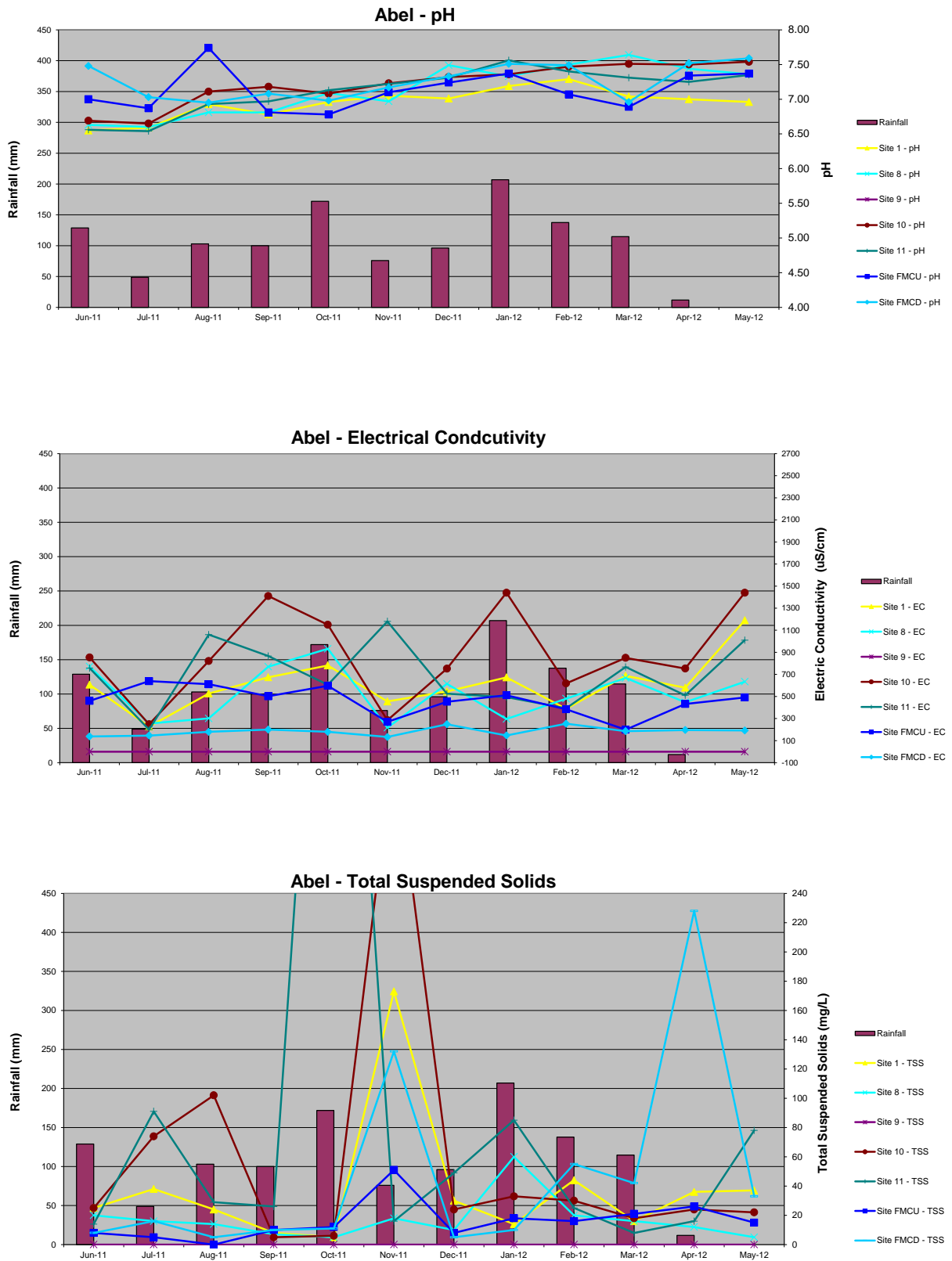


Figure 3.3 Surface Water Quality Monitoring Results 2011/2012

Further Improvements

No other surface water control measures are planned or considered necessary and surface water control measures during future operations will remain consistent with those outlined within the Water Management Plan and MOP prepared for the Abel mine.

3.5 GROUNDWATER POLLUTION

Environmental Management

Monthly monitoring of regional groundwater levels and groundwater quality was undertaken, where possible, throughout the reporting period in accordance with the Water Management Plan and Integrated Environmental Monitoring Plan.

Environmental Performance

Groundwater Levels

A review of the monitoring data has identified discrepancies in the data previously reported. In some cases this is an element of precision within the conversion factors when translating raw data. In other cases (e.g. C063A) a water level below ground level has been reported as relative levels. For all data previously provided, absolute trends remain as previously reported. Where appropriate, data from key monitoring bores has been amended for previous reporting periods.

A summary of groundwater level monitoring results relevant to the Abel Underground Coal Mine is provided in **Table 3.4**.

Table 3.4
Groundwater Levels

Piezometers [#]		Standing Water Level (m AHD)				
		2007/2008	2008/2009	2009/2010	2010/2011	2011/2012
C063A	Average	-0.46*	-0.4*	-0.003*	0.49*	-0.98
	Range	0.17*	0.18*	1.43*	2.55*	0.95
C063B	Average	-6.6*	-9.36*	-9.88	-10.65*	-17.13
	Range	3.49*	1.71*	2.13	6.74*	1.67
C072	Average	23.16*	25.24*	27.71*	29.84*	26.68
	Range	5.54	4.86	2.46	3.82	1.26
C072B	Average	50.51*	50.61*	50.52*	50.05*	50.06
	Range	0.29	0.37	1.08	0.44	0 [^]
C078A	Average	31.13*	32.26*	34.4*	31.5*	31.69
	Range	0.67	5.85	5.53	0.34	0 [^]
C078B	Average	68.3*	69.49*	68.1*	68.34*	68.23*
	Range	1.04*	0.52*	0.72*	0.35*	0 [^]
C080	Average	25.97*	25.34*	21.65*	17.94*	17.14
	Range	0.65	2.08	4.69	1.78	0.74
C081A	Average	17.59*	11.68*	7.06*	-2.68*	-5.12
	Range	1.19	9.49	10.28	4.52	0 [^]
C081B	Average	2.13*	1.97*	1.57*	0.79*	0.38
	Range	0.25	0.61	1.52	0.87	0 [^]
C082	Average	9.38	9.08	8.99	8.54	@
	Range	0.78	1.15	1.66	7.33	@
C087	Average	17.06	Dry	Dry	Dry	@
	Range	0.01	Dry	Dry	Dry	@

[^]Only a single record collected during this period due to access issues.

@ No samples collected due to access issues.

*Corrected data

See **Figure 3.1**

Source: Donaldson Coal Pty Ltd

The results indicate that groundwater levels and fluctuations have generally either remained consistent over the reporting period compared to previous reporting periods or, where pressures have declined, the changes are consistent with predicted trends.

Piezometer C063 is located to the east of the Abel underground mine area adjacent to the F3 Freeway (see **Figure 3.1**). Piezometer C063 has two vibrating wire transducers, placed in the Lower Donaldson Seam (C063A) and within sandstone interburden below the Buttai Seam (C063B) at respective depths of 198m and 129m. The water level decline observed in C063B suggests a very slow recession, following installation in 2005, considered to be an indication of extremely low permeability and not as a result of mining stresses.

Piezometers C081A and C081B are located south of current mining activities within the mine. Monitoring results from C081A (single vibrating wire transducer placed within the Lower Donaldson Seam) show a drawdown response to mining the Donaldson Seam within the Abel underground mine area. The rate of groundwater pressure decline reduced during the reporting period with this trend expected to continue. Piezometer C081B is screened within overlying shallow Permian strata with water levels remaining stable during the reporting period.

Piezometer C080 is located southwest of current mining with a single vibrating wire within the Lower Donaldson Seam. There is a marked lowering of the groundwater level starting in mid-2008, similar to that seen in C081A, corresponding to development within the Abel underground mine area. However, depressurisation at this location appears to have stabilised with a groundwater pressure reduction of less than 1m during the reporting period.

Piezometer C072 is a single vibrating wire piezometer located south of Pambalong Swamp on the southern margins of the mining lease boundary (see **Figure 3.1**). Its records show increasing pressures since installation from 2006 to 2008. Since 2008, pressures have generally remained stable apart from a peak in late 2010. No mining stresses on groundwater pressure are observed at this location. Piezometer C072B is a standpipe piezometer screened in shallow Permian strata (42m to 45m below ground level). Water levels within this monitoring bore have remained static.

Piezometers C078A and C078B are standpipe piezometers screened within the Lower Donaldson Seam and shallow Permian strata respectively and are located adjacent to John Renshaw Drive west of the current Abel underground mining activities (see **Figure 3.1**). Water levels within these monitoring bores remained stable during the reporting period.

The measured (and interpreted) steady drawdowns measured in C081A and C080 are coincident with the commencement of mining and dewatering within the Donaldson Seam and indicate that the pore pressure reduction has propagated north-south (i.e. down dip). This is as would be expected within a confined aquifer unit, especially at depth where the degree of hydraulic confinement (elastic compression of groundwater) increases with overburden pressure.

This north-south propagation of pore pressure reduction suggests less complete hydraulic connection to the east towards C063A (i.e. the lack of response is controlled by the geological structure).

The available data from the other piezometers also indicates that the pore pressure reduction as a result of mining is largely restricted to the Donaldson Seam. In particular, despite pore pressure reductions in the deep piezometer (C081A), there remains an upwards hydraulic gradient with negligible drawdown in the nested shallow piezometer (C081B).

Groundwater Inflows

Groundwater inflow rates increased during the reporting period to approximately 1 000m³ (1ML) per day. The increase in inflows is primarily due to the intersection of water bearing geological structures on the eastern margins of Subsidence Management Plan (SMP) Area 1 (including Panels 7 and 8). The consulting hydrogeologist anticipates that these increased rates will be transient and the overall inflow rate will subside when mining is completed in SMP Area 1.

Prior to this reporting period, inflows have been relatively stable with average inflows of approximately less than 500m³ per day. Groundwater modelling, which is currently being undertaken, suggests that rates in the order of 1ML per day will occur as the mine develops and, despite the minor increase in water inflows observed, the current flow rates are generally consistent with those predicted.

Groundwater Quality

Groundwater quality monitoring results are presented in **Appendix 8** and summarised in **Table 3.5** and **Figure 3.4**. They show that the pH ranges between slightly acidic (6.01) and alkaline (8.26), EC ranges between 312µS/cm and 11 600µS/cm and TSS ranges between 14mg/L and 542mg/L.

Table 3.5
Summary of Groundwater Quality Monitoring Results – 2011/2012

Sampling Site	pH	EC (µS/cm)	TSS (mg/L)
DPZ - 6	6.69 to 7.29	2 370 to 4 120	35 to 542
DPZ -7	6.31 to 7.55	1 540 to 2 740	15 to 258
DPZ - 12	6.01 to 7.33	517 to 9 120	18 to 210
DPZ - 13	6.88 to 7.37	3 710 to 11 600	14 to 108
JRD1	8.05 to 8.26	4 120 to 4 750	14 to 57
JRD2	6.21 to 8.06	313 to 2 280	18 to 94

Source: Donaldson Coal Pty Ltd

The Environmental Assessment baseline monitoring reported that the quality of groundwater sampled within the underground mining area of the Abel Mine was variable with total dissolved solids (TDS) ranging from less than 518mg/L to 13 000mg/L, which is approximately equivalent to EC readings of between 865µS/cm and 21 700µS/cm. The Environmental Assessment predicted that salinity and pH would initially remain similar, but that over time salinity may increase to levels around 3 000mg/L to 4 000mg/L. This is approximately equivalent to an EC reading of between 5 000µS/cm and 6 700µS/cm.

The results recorded during 2011/2012 reporting period are also largely within the same ranges recorded during the previous 2010/2011 reporting period. It is noted, however, that the lower pH range for DPZ-7 and JRD2 has increased by approximately 1.5 pH units to 6.31 and 8.05 respectively whilst the lower EC range for DPZ-12 has decreased to 517µS/cm.

Reportable Incidents

No reportable incidents occurred during the reporting period.

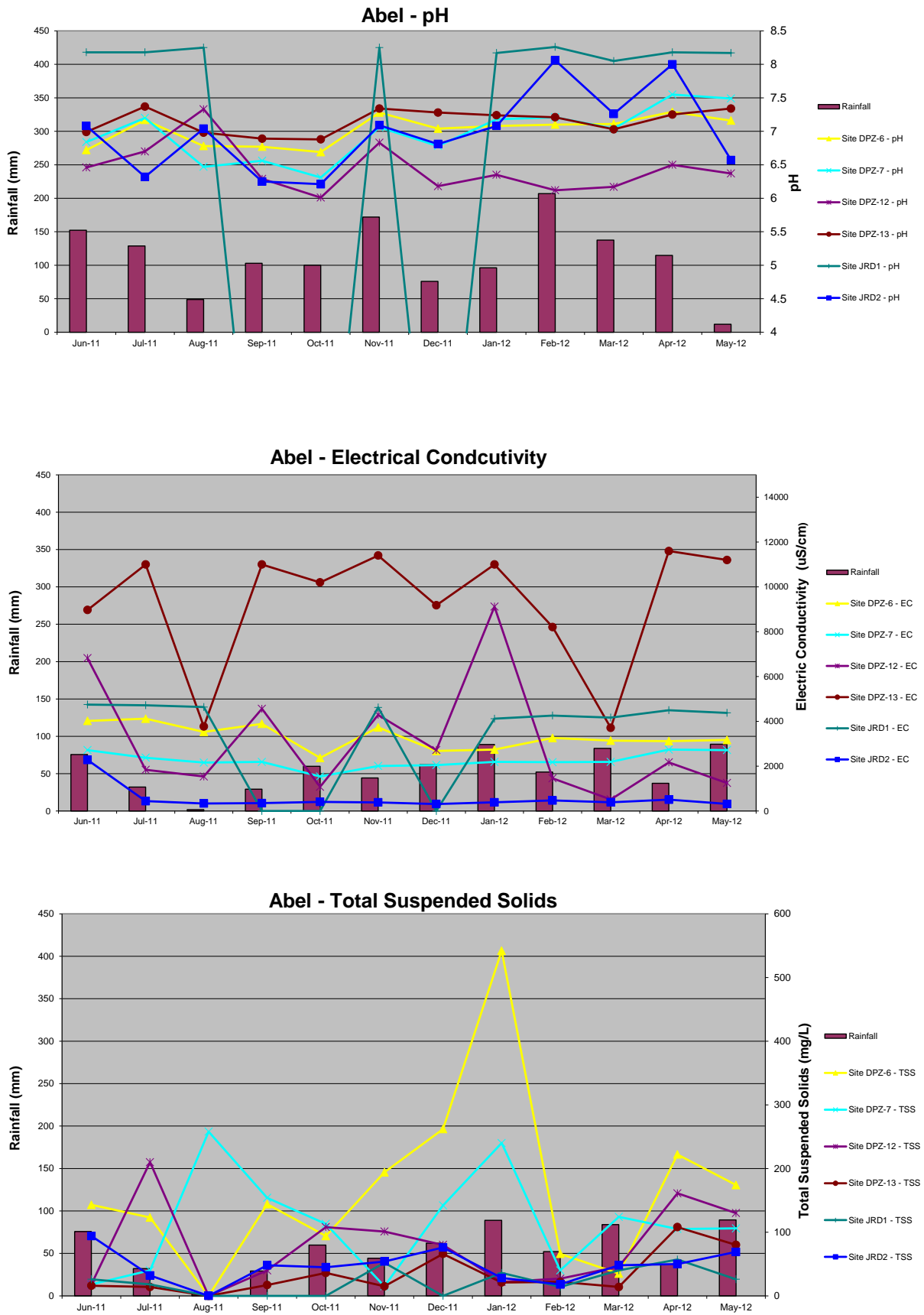


Figure 3.4 Groundwater Quality Monitoring Results 2011/2012



Further Improvements

Given that a maximum baseline measure of salinity was approximately 21 700 μ S/cm, it is considered that, at this point in time, the activities of Abel Underground Coal Mine are not having an effect on groundwater quality. Continued monitoring in subsequent reporting periods will detect any trends in groundwater levels and quality parameters.

3.6 THREATENED FLORA AND FAUNA

Environmental Management

The principal activity during the reporting period relating to flora and fauna involved the clearing of vegetation associated with the upcast ventilation shaft (see **Plan 1**). This activity was supervised by an ecologist with soft felling methodology utilised for six hollow bearing trees. The felled trees were subsequently inspected by the ecologist with no fauna species located within the hollows.

Additionally, as no mining was undertaken during the reporting period that would lead to subsidence under or near identified dams of habitat value, the Pambalong Nature Reserve or sub-tropical rainforest, no specific flora or fauna management measures were required above the underground mining area.

Environmental Performance

Ongoing survey work was completed by Ecobiological during the reporting period as part of the Dam Monitoring and Management Plan, Sub-tropical Rainforest Monitoring Plan and Pambalong Nature Reserve Monitoring Plan (see **Appendices 3, 4 and 5**). Macroinvertebrate sampling also continued to be undertaken within Blue Gum Creek upstream of the Pambalong Nature Reserve by Robyn Tuft and Associates during Spring 2011 and Autumn 2012 (see **Appendix 6**).

Macroinvertebrate surveys have been undertaken within Blue Gum Creek at Stockrington Road and Dog Hole Road since 2009 and 2008 respectively. Monitoring during the reporting period included an assessment of Riparian Channel Environmental (RCE) ranking, water quality and aquatic ecology. The RCE ranking remained relatively unchanged both sites during the Spring 2011 monitoring although a slight deterioration at the Dog Hole Road site from Good to Fair was recorded during the Autumn 2012 monitoring. Dissolved oxygen levels substantially increased from previous surveys and between surveys with levels meeting the ANZECC 2000 guidelines during the Autumn 2012 monitoring. Electrical conductivity was elevated, particularly at the Dog Hole Road site and pH was near neutral at both sites.

Biologically, Stockrington Road site showed some deterioration since previous monitoring reducing to an AUSRIVAS Band B – below reference. However, the Dog Hole Road site showed an overall improvement since previous monitoring. During the Spring 2011 monitoring there was an abundance of pollution tolerant invertebrate species whilst during the Autumn 2012 monitoring there was a mixture of pollutant tolerant and sensitive invertebrate species. Both sites were considered to be in the mildly impaired (level 5 to 6) category for SIGNAL indicating fair water quality. **Table 3.6** provides a summary of the biological characteristics recorded.

Table 3.6
Summary of Biological Characteristics (Macroinvertebrates)

Parameter	Date	Blue Gum Creek at Stockrington Road	Blue Gum Creek at Dog Hole Road
Diversity	01/08/08	-	22
	20/05/09	29	25
	16/11/09	20	22
	27/04/10	-	11
	14/12/10	33	35
	01/04/11	24	20
	18/10/11	24	16
	12/04/12	-	23
SIGNAL Index	01/08/08	-	5.1
	20/05/09	5.7	5.8
	16/11/09	4.6	4.6
	27/04/10	-	3.4
	14/12/10	4.7	4.7
	01/04/11	4.7	4.4
	18/10/11	5.0	5.3
	12/04/12	-	5.6
AUSRIVAS Observed / Expected (band)	01/08/08	-	0.67 (Band B)
	20/05/09	-	-
	16/11/09	Outside the Model	Outside the Model
	27/04/10	-	-
	14/12/10	-	-
	01/04/11	0.92 (Band A)	0.69 (Band B)
	18/10/11	0.58 (Band B)	Outside the Model
	12/04/12	-	-
Predominant Species Types	18/10/11	Chironomidae (midge larvae) Corixidae (water boatmen) Leptophlebiidae (mayfly nymphs)	Chironomidae (midge larvae) Leptophlebiidae (mayfly nymphs) Notonectidae (back swimmers)
	12/04/12	-	Chironomidae (midge larvae) Dytiscidae (water boatmen) Leptophlebiidae (mayfly nymphs) Simuliidae (black fly larvae)
Source: Robyn Tuft & Associates (2011 & 2012)			

In 2009, dam monitoring recorded a much lower overall diversity of frogs across the 84 dams compared to the 2008 baseline survey. However, during the 2010 surveys there was an increase in frog diversity. The 2011 dam monitoring recorded a similar diversity of frog species compared to 2010 with a number of dams recording frog diversity comparable to or greater than the 2008 baseline survey. Bird diversity recorded an increase during the 2011 survey with 13 species recorded, however, this remains lower than the 2008 and 2009 surveys (see **Figure 3.5**). The fluctuations from abnormally dry conditions to above average rainfall between 2009 and 2010 are considered likely to be the main cause of the fluctuation. No threatened frogs or birds or individuals of the threatened plant *Maundia triglochinos* were identified.

The 2011 sub-tropical rainforest monitoring results indicated no substantial change in floral diversity compared to the 2008 baseline monitoring. Specifically, 52 and 47 flora species were identified on the two monitoring transects in 2011 compared to 54 and 51 species in 2008, 48 and 56 in 2009 and 46 and 45 in 2010 (see **Figure 3.5**). No threatened flora species were recorded. Monitoring also indicated no significant change in rainforest width with transitional zones remaining similar to those recorded in the baseline study.

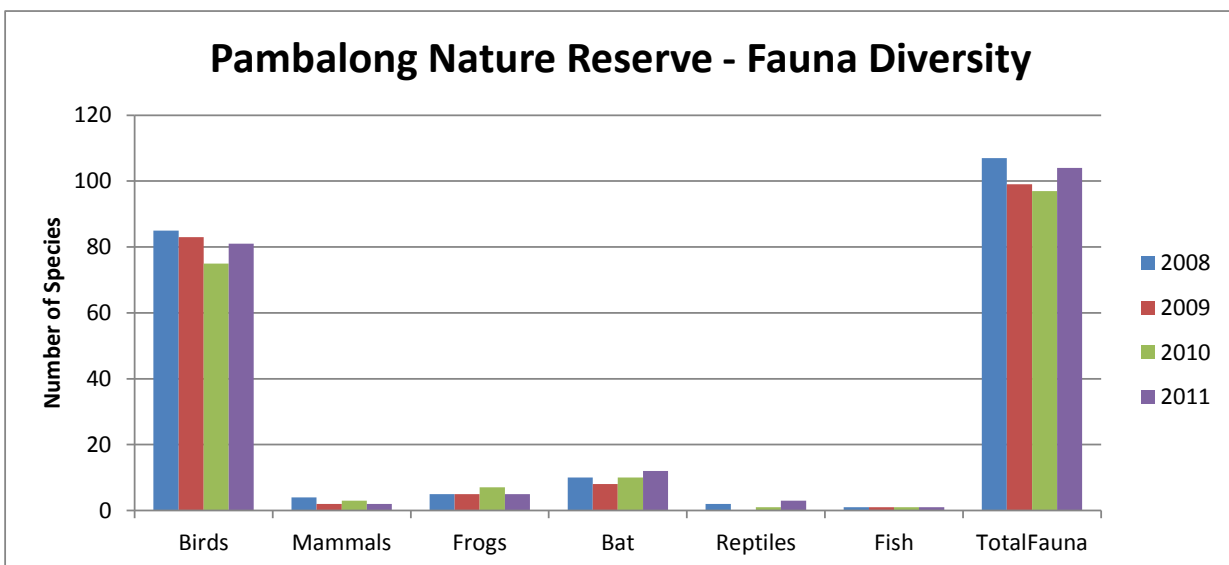
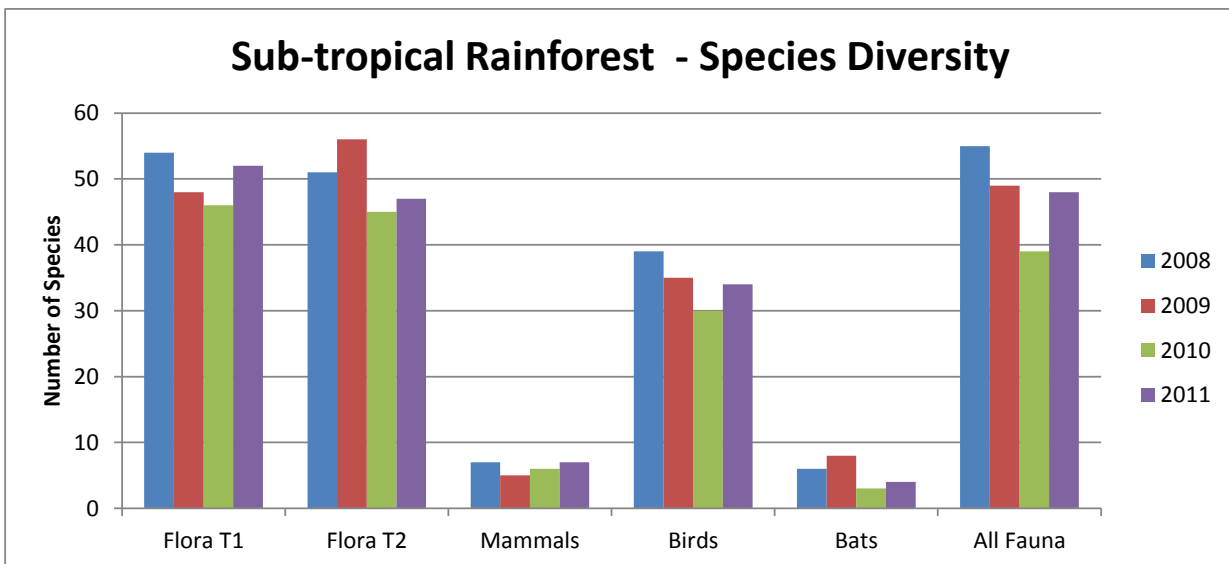
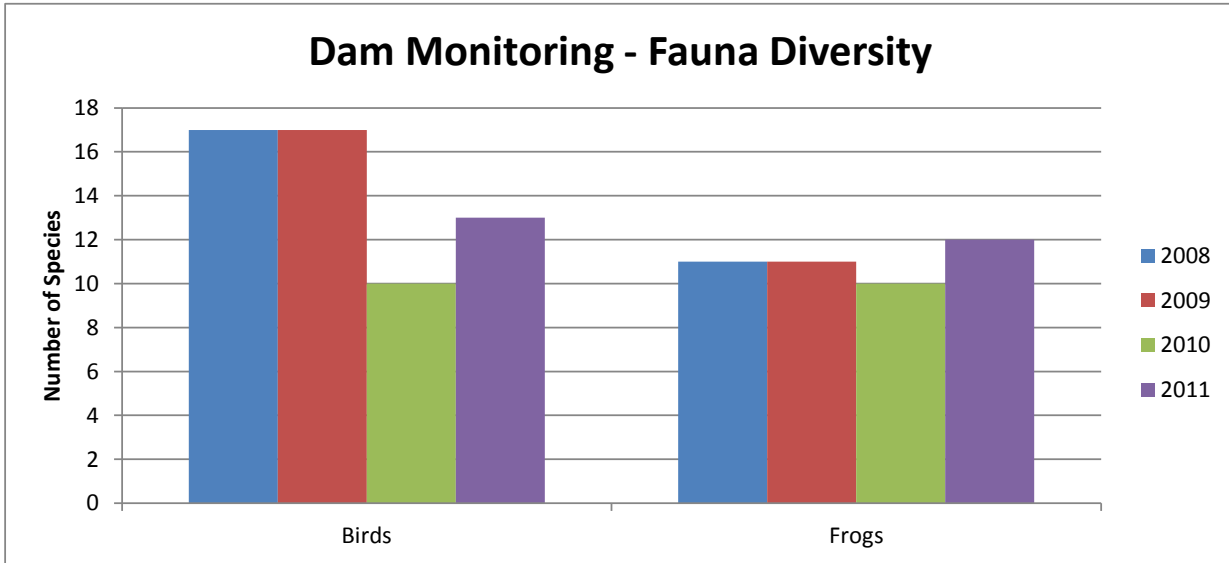


Figure 3.5 Ecological Monitoring Results

A total of 48 fauna species were recorded in 2011 compared to 55 species in 2008, 49 in 2009 and 39 in 2010. Almost all arboreal and terrestrial mammal species recorded during the 2008 baseline monitoring program were recorded again during 2011. Bird species diversity increased during 2011 compared to the 2010 survey but remains similar to that recorded during the 2008 baseline monitoring. Bat species diversity in 2011 remained relatively low (four species) compared to 2008 (six species) and 2009 (eight species). Two species listed as threatened under the NSW *Threatened Species Conservation Act 1995* were detected during the 2011 survey, namely the Little Bentwing-bat *Miniopterus australis* and Powerful Owl *Ninox strenua*. No undermining of sub-tropical rainforest occurred during the reporting period or will occur for a number of years.

Continued monitoring as part of the Pambalong Nature Reserve Monitoring Plan was undertaken during 2011/2012 representing the fourth year of monitoring. The monitoring plan is aimed at building a picture of what constitutes normal variation so that any impacts from subsidence in the future can be identified. During 2011/2012, a total of 104 fauna species were identified within Pambalong Nature Reserve including one fish, five frogs, two terrestrial mammals, three reptiles, 12 bats and 81 bird species. This includes three threatened species, namely Little Bentwing-bat *Miniopterus australis*, Eastern False Pipistrelle *Falsistrellus tasmaniensis* and Eastern Cave Bat *Vespadelus troughtoni*.

No significant changes to the vegetation community extent or species richness were recorded with 177 flora species having been recorded since survey commenced in 2008. Of the 177 species, 63 are weed species. Weed management continued to be conducted by the Office of Environment and Heritage, targeting Water Hyacinth and Alligator Weed. Hot and humid weather has resulted in a significant increase in Water Hyacinth with control measures appearing to have had little impact. However, chemical control of Alligator Weed appears to have been effective. Control works for Lantana and Moth Vine also appear to have been effective.

Reportable Incidents

No reportable incidents were recorded during the reporting period.

Further Improvements

Ongoing monitoring will provide information to assist in assessing any potential impacts from subsidence and in formulating the subsidence management plans. Future Dam monitoring will also include a water quality and condition assessment to assist in differentiating any potential effects from the mining operation compared to other influences. Additionally, Donaldson Coal will liaise with the OEH in relation to installation of permanent water depth markers.

3.7 WEEDS

Environmental Management

Regular inspections of the areas surrounding the surface infrastructure area were undertaken as part of weed management associated with the Donaldson mine and spot spraying of weeds (including the listed Pampas Grass) was undertaken. It is noted that any seed heads of Pampas Grass were cut and bagged prior to spraying.

Environmental Performance

Identified noxious weeds within the Abel surface infrastructure area were controlled during the reporting period.

An annual weed survey was also undertaken by Ecobiological for 2011 for the planned conveyor route from the Abel surface infrastructure area to the Bloomfield CHPP. In total 34 weed species were recorded compared to 32 species in 2010. It was concluded that weed control is required in the future conveyor easement, principally for Lantana, Crofton Weed and Pampas Grass. A single location of Blackberry was also identified and requires control. The management of these weed prior to construction of the conveyor would significantly reduce the potential for weed invasion and weed management requirements in the future.

Reportable Incidents

No reportable incidents were recorded within the reporting period.

Further Improvements

No further improvements are deemed necessary. Ongoing regular weed inspections within the area of responsibility for the Abel mine will continue. Weed control within the planned conveyor line easement will be undertaken via the respective operations (ie. Donaldson Open Cut Coal Mine and Bloomfield CHPP).

3.8 BLASTING

Environmental Management and Performance

A total of 25 blasts were undertaken as part of the Abel mine between 22 August 2011 and 20 September 2012. These blasts were undertaken underground to fragment hard rock encountered as opposed to 'production' blasts for coal recovery. As monitoring of previous underground blasts recorded vibrations levels at the closest surrounding sensitive receivers no greater than 0.038mm/s, ie orders of magnitude below the amenity criteria of 5mm/s, ongoing monitoring has not been deemed necessary.

Reportable Incidents

No reportable incidents were recorded during the reporting period.

Further Improvements

As the monitoring of the initial 'trial' blasts indicate compliance, where similar depths of cover and maximum instantaneous charges are similar to the initial 'trial' blasts additional monitoring will not be undertaken. No further improvements are deemed necessary.

3.9 OPERATIONAL NOISE

Environmental Management

The principal management control during the reporting period relating to noise was the continued use of low modulated frequency reversing alarms on mobile equipment.

Environmental Performance

Quarterly noise monitoring applicable to the Abel mine commenced in December 2008 as an extension of the monitoring survey previously undertaken for the Donaldson Open Cut Coal Mine. Quarterly attended and unattended noise monitoring continued to be undertaken throughout the reporting period for quarters ending June, September and December 2011 and March 2012. Monitoring results are presented in **Table 3.7** and copies of the monitoring reports are presented within **Appendix 7**.

The findings of the monitoring surveys were that the Abel mine operations were inaudible at all locations with noise attributable to non-mine related traffic, birds, cricket, insect and frog noise, wind and other extraneous sources. As the Abel mine operations were inaudible, it was concluded that noise contribution would not have exceeded the noise goals (including night time sleep disturbance criteria) and were in compliance with the Project Approval for the Abel mine.

Reportable Incidents

No reportable incidents were recorded within the reporting period.

Further Improvements

Other than ongoing plant maintenance and noise monitoring (both attended and unattended), no other improvements are planned during the next reporting period.

Table 3.7
Summary of Attended Noise Monitoring Results – 2011/2012

Location	Time	Project Noise Goal	Attended Monitoring	Noise generated by Abel Mine
A 98Weakley's Drive, Beresfield	Day ($L_{A\text{ eq}}(15\text{ min})$)	50	54 to 57	Abel inaudible
	Evening ($L_{A\text{ eq}}(15\text{ min})$)	48	63 to 65	Abel inaudible
	Night ($L_{A\text{ eq}}(15\text{ min})$)	41	60 to 61	Abel inaudible
	Night ($L_{A1}(1\text{ min})$)	51	70 to 74	Abel inaudible
F Black Hill Rd, Black Hill	Day ($L_{A\text{ eq}}(15\text{ min})$)	41	57 to 70	Abel inaudible
	Evening ($L_{A\text{ eq}}(15\text{ min})$)	40	55 to 61	Abel inaudible
	Night ($L_{A\text{ eq}}(15\text{ min})$)	36	50 to 56	Abel inaudible
	Night ($L_{A1}(1\text{ min})$)	46	58 to 65	Abel inaudible
G Buchanan Rd, Buchanan	Day ($L_{A\text{ eq}}(15\text{ min})$)	43	41 to 52	Abel inaudible
	Evening ($L_{A\text{ eq}}(15\text{ min})$)	41	40 to 51	Abel inaudible
	Night ($L_{A\text{ eq}}(15\text{ min})$)	36	39 to 53	Abel inaudible
	Night ($L_{A1}(1\text{ min})$)	46	51 to 58	Abel inaudible
K Catholic Diocese (formerly Bartter Enterprises)	Day ($L_{A\text{ eq}}(15\text{ min})$)	41	55 to 75	Abel inaudible
	Evening ($L_{A\text{ eq}}(15\text{ min})$)	40	57 to 73	Abel inaudible
	Night ($L_{A\text{ eq}}(15\text{ min})$)	37	47 to 71	Abel inaudible
	Night ($L_{A1}(1\text{ min})$)	46	53 to 82	Abel inaudible
L 7 Kilshanny Av, Ashtonfield	Day ($L_{A\text{ eq}}(15\text{ min})$)	46	43 to 53	Abel inaudible
	Evening ($L_{A\text{ eq}}(15\text{ min})$)	46	44 to 56	Abel inaudible
	Night ($L_{A\text{ eq}}(15\text{ min})$)	40	38 to 52	Abel inaudible
	Night ($L_{A1}(1\text{ min})$)	53	47 to 60	Abel inaudible

3.10 VISUAL, STRAY LIGHT

Environmental Management

During the reporting period all lighting was positioned and directed so as to minimise disturbing light emissions. As all activities occurred within the box cut created for the surface infrastructure area, no further controls were deemed necessary. Structures are painted a muted dark green to blend with the background bush.

Environmental Performance

The visual controls implemented have been considered effective and will be maintained throughout the next reporting period.

Reportable Incidents

No complaints regarding visual amenity or stray light were recorded during the reporting period.

Further Improvements

No further improvements are planned or are deemed necessary.

3.11 ABORIGINAL HERITAGE

No known items of Aboriginal heritage were disturbed as part of the operations undertaken during the reporting period.

No Aboriginal artefacts are expected to be affected by subsidence within SMP Area 2 although a further survey for Aboriginal artefacts will be completed prior to secondary extraction in accordance with the Company's commitments. Results of this survey will be summarised within the relevant AEMR.

It is noted that the some landholders have organised Aboriginal heritage surveys of their properties in preference to survey being organised through the Company. In these instances the Company will rely upon the results of these surveys.

3.12 NATURAL HERITAGE

No items or areas of natural heritage significance are considered to occur within the surface infrastructure area.

3.13 SPONTANEOUS COMBUSTION

No incidents of spontaneous combustion were recorded during the reporting period. Considering that the Upper and Lower Donaldson seams are considered to have a very low propensity for spontaneous combustion and with no history of spontaneous combustion, the management measures implemented have been considered adequate.

3.14 BUSHFIRE

Environmental Management

Integrated emergency response procedures have been prepared for Donaldson mine and Abel mine.

Environmental Performance

No bushfire incidents occurred during the reporting period nor were any requests received to assist in containing bushfires in the local area.

Reportable Incidents

No bushfires or other related reportable incidents occurred during the reporting period.

Further Improvements

Other than maintenance of fire fighting equipment at all site buildings and provision of clear access and signposting, no further improvements are planned or deemed necessary.

3.15 MINE SUBSIDENCE

Environmental Management

A Subsidence Management Plan (SMP) was prepared in December 2009 for pillar extraction within Area 1 incorporating Panels 1 to 13 and was approved on 27 May 2010 by, the then, I&I NSW. A second SMP was also prepared in May 2011 for pillar extraction within Area 2 incorporating Panels 14 to 26 and approved by DTIRIS on 07 December 2011.

Environmental Performance, Reportable Incidents and Further Improvements

Secondary workings during the reporting period were undertaken within Panels 4, 5, 6, 7, 8 and 15. Subsidence monitoring has been conducted over these panels in accordance with the monitoring program included within the approved SMP. Monitoring has included survey assessment, photographic monitoring and visual inspections. **Table 3.8** provides a comparison of the surveyed subsidence levels to those predicted.

As can be seen from **Table 3.8**, within panels mined during the reporting period, all subsidence, tilt and strain results are generally within the predicted range. However, minor exceedances of the predicted tilt or compressive strain was recorded over a one bay (10m) section of Panel 6 and over two one bay (10m) sections of Panels 5, 6 and 15.

The SMP End of Year Report 2011, dated 31 March 2012 and Subsidence Management Status Report, dated 31 May 2012 (**Appendix 9**) also provide results of visual monitoring. A summary is provided as follows.

- Surface cracking occurred generally as predicted above Panels 4 to 8 and 15 within vegetated areas, grazing areas and sealed access roads and tracks. Remedial works were carried out in consultation and agreement with the landowner.
- No exceedances of predicted cracking occurred and therefore no notification was required during the reporting period.

Table 3.8
Predicted versus Measured Subsidence Levels

Page 1 of 2

Panel No. Commencement & Completion	Monitoring Parameter	SMP Prediction	Final Measured
Panel 1 Commenced 12/07/10 Completed 22/12/10	>75m Cover		
	Subsidence	0.95 to 1.25m	0.72m to 1.228m
	Tensile Strain	10 to 18mm/m	4 to 12mm/m (18mm/m)
	Compressive Strain	13 to 23mm/m	5 to 14mm/m
	Tilt	22 to 40mm/m	22 to 46mm/m
Panel 2 Commenced 17/09/10 Completed 12/11/10	<75m Cover		
	Subsidence	1.30 to 1.38m	0.977 to 1.041m
	Tensile Strain	18 to 31mm/m	4 to 6mm/m (5mm/m)
	Compressive Strain	23 to 40mm/m	4 to 7mm/m
	Tilt	40 to 67mm/m	22 to 32mm/m
	>75m Cover		
	Subsidence	1.20 to 1.32m	0.94 to 0.966m
	Tensile Strain	13 to 20mm/m	9mm/m (15mm/m)
	Compressive Strain	17 to 25mm/m	6mm/m
	Tilt	30 to 45mm/m	27mm/m
Panel 3 Commenced 07/01/11 Completed 19/04/11	<75m Cover		
	Subsidence	1.33 to 1.34m	1.003m
	Tensile Strain	19 to 31mm/m	8 to 9mm/m (26mm/m)
	Compressive Strain	24 to 40mm/m	5 to 7mm/m
	Tilt	42m to 67mm/m	28 to 39mm/m
	>75m Cover		
	Subsidence	1.26m to 1.27m	0.884 to 0.982m
	Tensile Strain	14 to 21mm/m	8mm/m (10mm/m)
	Compressive Strain	18 to 27mm/m	4mm/m
	Tilt	33 to 49mm/m	30mm/m
Panel 4* Commenced 14/03/11 Completed 20/07/11	<75m Cover		
	Subsidence	1.27 to 1.29m	1.065m
	Tensile Strain	19 to 31mm/m	6 to 10mm/m (37.5mm/m)
	Compressive Strain	24 to 40mm/m	6 to 18mm/m
	Tilt	42 to 67mm/m	36 to 60mm/m
	>75m Cover		
	Subsidence	1.29 to 1.32m	1.054m
	Tensile Strain	14 to 21mm/m	5mm/m
	Compressive Strain	18 to 27mm/m	5mm/m
	Tilt	42 to 67mm/m	25 to 36mm/m
Panel 5* Commenced 30/05/11 Completed 24/09/11	<75m Cover		
	Subsidence	1.27 to 1.43m	1.154m
	Tensile Strain	14 to 15mm/m	10mm/m
	Compressive Strain	15 to 19mm/m	4mm/m
	Tilt	41 to 46mm/m	68mm/m¹
	>75m Cover		
	Subsidence	1.52 to 1.43m	1.002m
	Tensile Strain	11 to 15mm/m	2mm/m
	Compressive Strain	15 to 18mm/m	2mm/m
	Tilt	38 to 46mm/s	29.8mm/m
1. Measured tilts less than predictions except 1 minor exceedance. * Panel worked this reporting period.			
			Bold values indicate exceedances

Table 3.8 (Cont'd)
Predicted versus Measured Subsidence Levels

Page 2 of 2

Panel No. Commencement & Completion	Monitoring Parameter	SMP Prediction	Final Measured
Panel 6 * Commenced 22/09/11 Completed 02/02/12	<75m Cover		
	Subsidence	1.21 to 1.32m	1.215m
	Tensile Strain	14mm/m	8mm/m
	Compressive Strain	17 to 18mm/m	21mm/m²
	Tilt	39 to 41mm/m	89.6mm/m³
	>75m Cover		
	Subsidence	1.32 to 1.42m	1.066m
	Tensile Strain	11 to 14mm/m	9mm/m
	Compressive Strain	14 to 17mm/m	7mm/m
	Tilt	38 to 41mm/m	30mm/m
Panel 7* Commenced 19/11/11 Completed 31/05/12	>75m Cover		
	Subsidence	1.32 to 1.43m	Final measurements to be completed.
	Tensile Strain	17 to 22mm/m	
	Compressive Strain	21 to 27mm/m	
	Tilt	57 to 58mm/m	
>75m Cover			
Panel 8* Commenced 31/03/12 In Progress	>75m Cover		
	Subsidence	1.24 to 1.32m	Final measurements to be completed.
	Tensile Strain	15 to 23mm/m	
	Compressive Strain	19 to 29mm/m	
	Tilt	45 to 61mm/m	
>75m Cover			
Panel 15* Commenced 20/02/12 Completed 26/03/12	>75m Cover		
	Subsidence	1.17 to 1.23m	1.125m
	Tensile Strain	7 to 12mm/m	14mm/m
	Compressive Strain	9 to 15mm/m	12mm/m
	Tilt	19 to 32mm/m	47mm/m⁴
2. Measured compressive strains less than predictions except 1 minor exceedance. 3. Measured tilts less than predictions except 1 minor exceedance. 4. Measured tilts less than predictions except 2 minor exceedance. * Panel worked this reporting period. Source: Donaldson Coal (2012a and 2012b)			

Bold values indicate exceedances

- No subsidence impacts on the Hunter Water Corporation Waterline or Ausgrid Power Poles or TransGrid Transmission Towers have been recorded during the reporting period.
- There have been no other observed and/or reported subsidence impacts, incidents, service difficulties, community complaints during the reporting period that would require notification under the SMP approval.
- Monitoring results display no discernible trends.

Within SMP Area 1, due to operational difficulties encountered with geological structures, Panels 9 to 13 will no longer be extracted. A variation to SMP Area 1 was submitted 08 August 2011 and approved by DTIRIS on 29 September 2011. Similarly, within SMP Area 2, Panel 14 will no longer be extracted and Panels 16 to 19 have been reconfigured into Panel 19 and 19A.



Monitoring including subsidence survey and photographic and visual monitoring will be continued throughout the ensuing reporting period and the end of year report outlined within the Subsidence Management Plan Approval will continue to be submitted as required.

3.16 HYDROCARBON CONTAMINATION

Environmental Management

All hydrocarbons were stored either within a self-bunded tank or a bunded area with a capacity to contain a minimum 110% of the largest storage tank.

Environmental Performance, Reportable Incidents and Further Improvements

No hydrocarbon related incidents occurred during the reporting period.

The existing hydrocarbon management practices will continue to be implemented with no further improvements planned during the next reporting period.

3.17 METHANE DRAINAGE / VENTILATION

Methane testing previously undertaken during exploration programs indicate that the generation of methane will be low. During the reporting an upcast ventilation shaft was installed and the existing ventilation fan from the portal area was relocated to the upcast shaft to improve ventilation and reduce air flow velocities. No further changes to ventilation are planned during the next reporting period.

3.18 PUBLIC SAFETY

The perimeter of the Donaldson mine, incorporating the surface infrastructure area for the Abel Underground Coal Mine, has been secured by standard rural fencing, boom gates and lockable gates to prevent unauthorised entry and various warning and information signs positioned to alert both employees and visitors.

No public safety issues relating to the Abel mine were reported during the reporting period.

3.19 OTHER ISSUES AND RISKS

No other issues arose during the reporting period nor were there unaccounted risks which needed to be addressed.

4. COMMUNITY RELATIONS

4.1 ENVIRONMENTAL COMPLAINTS

Between 1 June 2011 and 31 May 2012 no complaints relating to the Abel mine were received. Since the commencement of operations at the Abel mine there has been only one complaint (relating to stray light).

4.2 COMMUNITY LIAISON

The principal formal community consultation undertaken is the community consultative committee. In accordance with *Schedule 5 Condition 8* of Project Approval 05_0136, the Company has established a community consultative committee for the Abel mine. During the reporting period the committee consisted of:

- four representatives from the Company (Messer's Phillip Brown, Tony Sutherland, Charlie Spence and Adam Heeney);
- a representative from Bloomfield Colliery; and
- five representatives of the local community (Messer's Alan Brown, Allan Jennings, Terry Lewin, Andrew Pace and Brad Ure).

The committee is chaired by the Hon Mr Milton Morris, an independent chairperson appointed by the NSW State government. No representatives from Maitland City Council attended the committee meetings during the reporting period.

The committee held a total of four meetings during the reporting period (08 August and 07 November 2011 and 27 February and 28 May 2012). The meetings have continued to provide an opportunity for the Company to keep the community up-to-date with activities undertaken and programmed at the Abel mine and for community members to table issues relating to the Abel mine for the Company's consideration. It is noted that the Company provided presentations during each meetings to provide updates on the mine development, environmental monitoring, subsidence management planning and a proposed modification to allow shortwall and longwall mining in designated areas.

During the meetings the principal issue raised by one of the committee members was the accuracy and availability of the meeting minutes. The Company committed to following up this issue and ensuring the website was kept up to date and minutes were committed to be emailed to committee members. It is noted that the Company has undergone two mergers during the last and current reporting period and that some delays in information transfer to new websites were experienced. All previous meeting minutes are currently available on the Company's website.

Other issues raised included the need for consultation regarding the proposed modification for longwall mining and concerns regarding the perception of seeking longwall mining instead of pillar extraction to get more coal / money. Information regarding the proposed modification were provided through presentations to the committee. Additionally a community information newsletter relating to the proposed modification was circulated during November 2011 and community information sessions were held on 06 and 07 December 2011. Consultation relating

to the modification is being managed and documented through the assessment processes for the proposed modification.

Questions were also raised regarding rumours the Catholic Diocese land would be rezoned as industrial and when the Abel mine will be available for development. It was advised that the Abel mine has greater than 20 years of operations remaining.

5. REHABILITATION

5.1 BUILDINGS

The temporary bathhouse was removed during the reporting period, however, no permanent buildings were renovated or removed during the reporting period.

5.2 REHABILITATION OF DISTURBED LAND

As the Abel mine is an underground operation, the only significant rehabilitation will be during mine decommissioning. During the reporting period, the principal rehabilitation works undertaken related to the planting of shrubs on the visual bund for the substation. Other 'rehabilitation' activities related to regular inspection and maintenance of previously rehabilitated areas and retained vegetation.

Minor rehabilitation works were also completed for surface cracks associated with subsidence. These cracks were within the predicted range and were excavated to the limit of the crack, backfilled, compacted, topsoiled and seeded.

Table 5.1 provides a summary of the areas disturbed and rehabilitated at the start and end of the reporting period and estimated areas during the next reporting period whilst **Table 5.2** provides a further breakdown of the rehabilitation activities.

Table 5.1
Rehabilitation Summary

A: MINE LEASE AREA	Area Affected (ha)		
	Total Area, start of Reporting Period	Total Area, end of Reporting Period	Area Estimated end of next Reporting Period
A1 Mine lease(s) Area	2755	2755	2755
B: DISTURBED AREAS			
B1 Infrastructure area (other disturbed areas to be rehabilitated at closure including facilities, roads)	10.44*	11.02 [#]	11.02
B2: Active Mining Area (excluding items B3 - B5 below)	123.3 (underground)	147 (underground)	241 (underground)
B3 Waste emplacements, (active/unshaped/in or out-of-pit)	0	0	0
B4 Tailings emplacements, (active/unshaped/uncapped)	0	0	0
B5 Shaped waste emplacement (awaits final vegetation)	0	0	0
Previous Mining Activities	0	0	0
TOTAL ALL DISTURBED AREAS	133.74	158.02	252.02
C REHABILITATION			
C1 Total Rehabilitated area[^] (except for maintenance)	0.75	0.75	0.75
D: REHABILITATION ON SLOPES			
D1 10 to 18 degrees	0.7	0.7	0.7
D2 Greater than 18 degrees	0.05	0.05	0.05
D3 Less than 10 degrees	0	0	0
E: SURFACE OF REHABILITATED LAND			
E1 Pasture and grasses	0.7	0.7	0.7
E2 Native forest/ecosystems	0.05	0.05	0.05
E3 Plantations and crops	0	0	0
E4 Other (include non-vegetative outcomes)	0	0	0
*Includes 0.41ha associated with the extended light vehicle car park and 0.23ha for the downcast ventilation shaft			
[#] Includes 0.58ha relating to the upcast ventilation shaft.			
[^] Excludes rehabilitation of surface cracks resulting from subsidence.			

Table 5.2
Maintenance Activities on Rehabilitated Land

Nature of Treatment	Area Treated (ha)		Comments/control strategies/treatment detail [#]
	During Reporting Period [#]	During Next Reporting Period [*]	
Additional Erosion Control Works	0	0	No additional erosion control works were undertaken during the reporting period.
Re-covering	0	0	Nil
Soil Treatment	0	0	No soil treatment (eg. lime, gypsum or fertilisers) was required during the reporting period or is likely to be required in subsequent reporting periods.
Treatment / Management	0	0	No other specific treatments or management measures were required during the reporting period or are expected to be required in ensuing reporting periods.
Re-seeding / Replanting	0.01	0.01	The batters of the visual bund for the substation was planted with shrubs to further reduce its visibility from John Renshaw Drive
Adversely Affected by Weeds	0	0	No areas were identified as being adversely affected by weeds although 'spot' treatment of Pampas Grass was undertaken (as opposed to treatment of an infested area). Continued inspections and, where necessary, weed control will be undertaken.
Feral Animal Control	0	0	No feral animal control was deemed necessary during the reporting period. Feral animal control will be undertaken in ensuing reporting periods if required.
[#] See Plan 3 [*] Indicative only			

5.3 OTHER INFRASTRUCTURE

As discussed in Section 2.1, no exploration holes were drilled during the reporting period or required rehabilitation. No issues relating to the rehabilitation of previous exploration holes / drill sites were raised during the reporting period.

No other specific rehabilitation or maintenance activities were undertaken during the reporting period.

5.4 REHABILITATION TRIALS AND RESEARCH

No rehabilitation trials or research was undertaken during the reporting period.

5.5 FURTHER DEVELOPMENT OF THE FINAL REHABILITATION PLAN

No further development of the final rehabilitation plan was undertaken during the reporting period. The Landscape Management Plan which incorporates a Rehabilitation Management Plan was approved by the, then, Department of Planning on 11 February 2008 and remains the most up-to-date rehabilitation plan. No concerns have been raised by any stakeholders relating to final rehabilitation.

6. ACTIVITIES PROPOSED IN THE NEXT AEMR PERIOD

The activities proposed for 2012/2013 will include the continued expansion of mining areas together with a range of exploration and monitoring activities. The following provides a summary of the proposed activities.

Exploration

Over the next 12 months it is proposed to drill approximately a further 18 holes to obtain quality data ahead of mine development in the Upper and Lower Donaldson seams. Some drilling of the underlying Ashtonfield seam is also planned to prove up reserves.

Exploration reports will continue to be submitted to the Coal Advice and Resource Assessment section of DTIRIS in accordance with *Condition 11* of ML 1618.

Mining

During the next reporting period, mining will focus upon continued first workings within Panels 19, 19A, 20 to 24 and the West Mains with second workings within Panels 8, 19A, 20, 21, East Mains, Tailgate Headings and East Install Headings (see **Plan 2**).

Rehabilitation

No specific rehabilitation works are planned during the next reporting period and no major rehabilitation work will be able to be undertaken until the decommissioning of the site.

Monitoring

The following monitoring will be undertaken during the next reporting period.

- Air Quality – ongoing deposited dust, TSP and PM₁₀ monitoring will be undertaken by RCA Laboratories.
- Surface water – ongoing surface water quality and flow monitoring at a range of routine monitoring sites located within Blue Gum Creek, Viney Creek, Buttai Creek, Four Mile Creek and a number of local water storages. This monitoring will be undertaken by Carbon Based Environmental Pty Ltd as part of the integrated monitoring with the Bloomfield, Donaldson and Tasman mines.
- Groundwater – ongoing groundwater quality and level monitoring will be undertaken by Carbon Based Environmental Pty Ltd as part of the integrated network of monitoring bores for the Bloomfield, Donaldson and Tasman mines. Measurement of the quality and volume of inflow water to the underground workings will also continue to be undertaken by Company personnel.
- Noise – SLR Consulting Australia Pty Ltd will undertake quarterly noise monitoring and review the frequency for ongoing monitoring.
- Flora & Fauna – Ecobiological will undertake flora and fauna surveys and reporting in accordance with approved Flora and Fauna Management Plan.
- Meteorological – the on-site meteorological station at Donaldson mine will be maintained and data collated.
- Subsidence monitoring will continue.

Community Consultation and Liaison

The community consultative committee will continue to be convened during the next reporting period. It is expected that meetings will continue to be held quarterly. The 24hr environmental hotline will be maintained and a register retained of any complaints received.

7. REFERENCES

Australia and New Zealand Environment and Conservation Council (ANZECC), 2000, *Australia and New Zealand Guidelines for Fresh and Marine Water Quality*.

Australian Standards (2004), *AS 1940-2004 The Storage and Handling of Flammable and Combustible Liquids*.

Australian Standards (2008), *AS 1596-2008 The Storage and Handling of LP Gas*.

Donaldson Coal Company (2012a), *Abel Mine Subsidence Management Plan End of Year Report 2011*.

Donaldson Coal Company (2012b), *Abel Mine Subsidence Management Status Report Four Monthly Update, 31 May 2012*.

National Transport Commission (2007), *Dangerous Goods Code*.

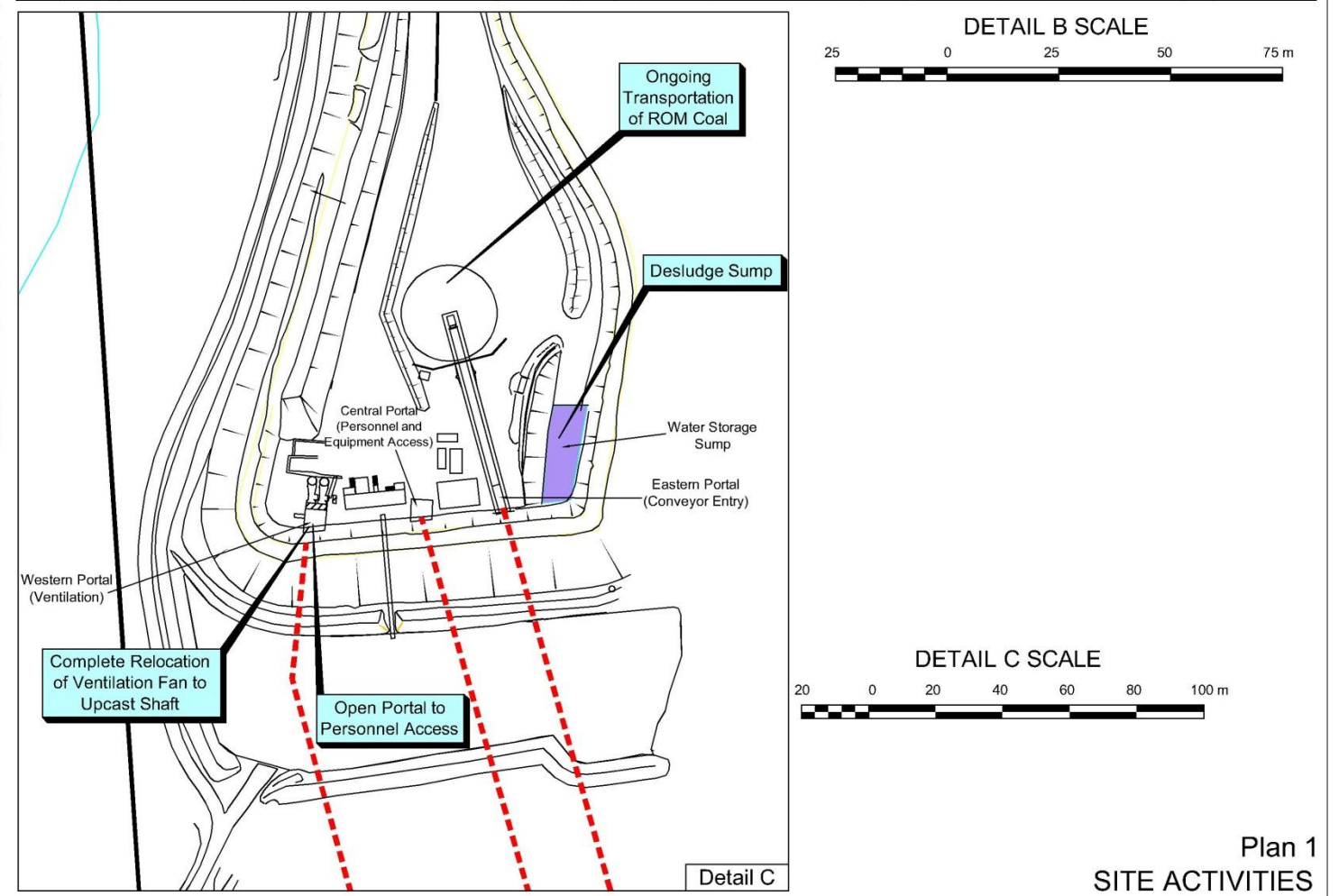
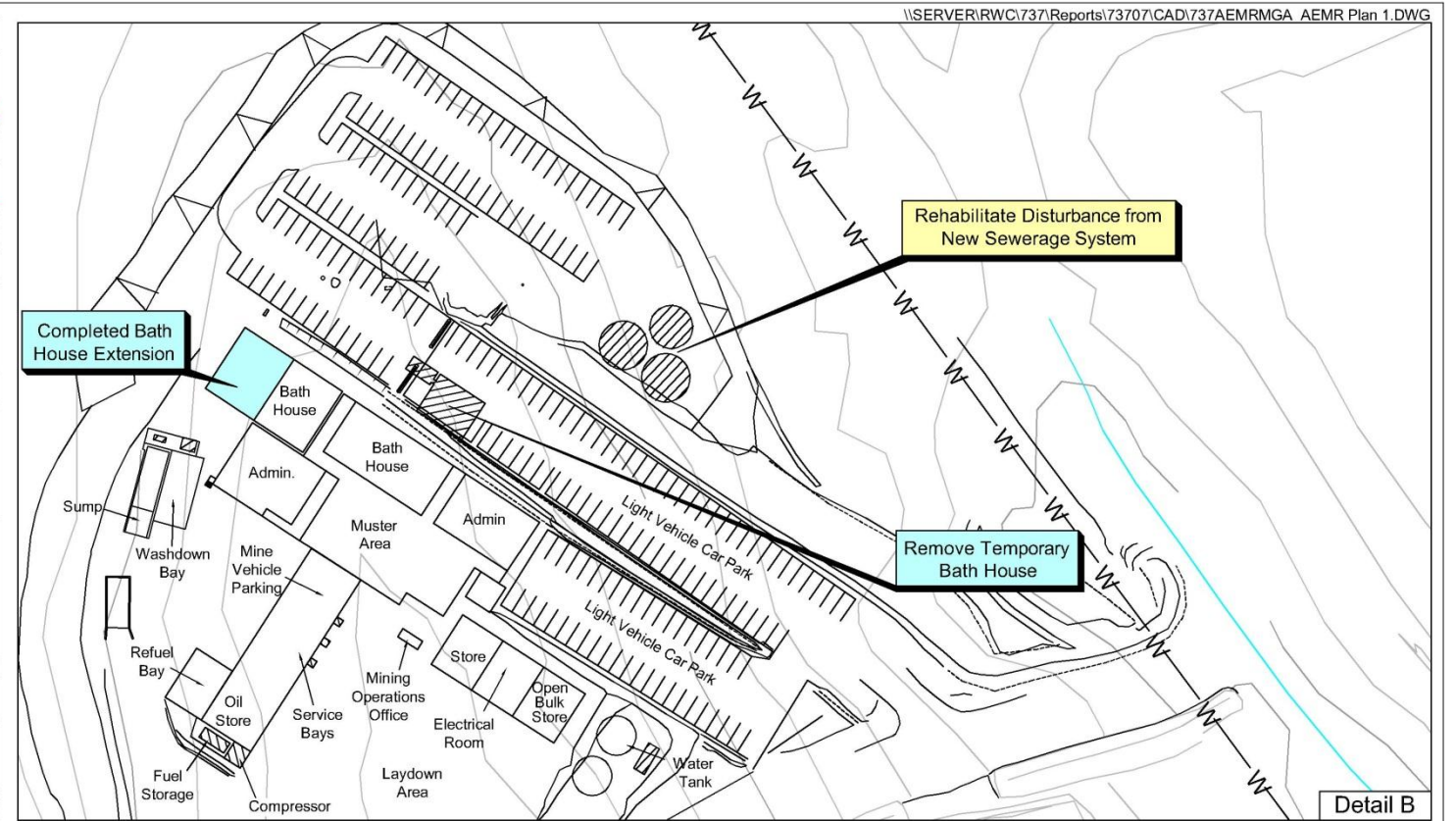
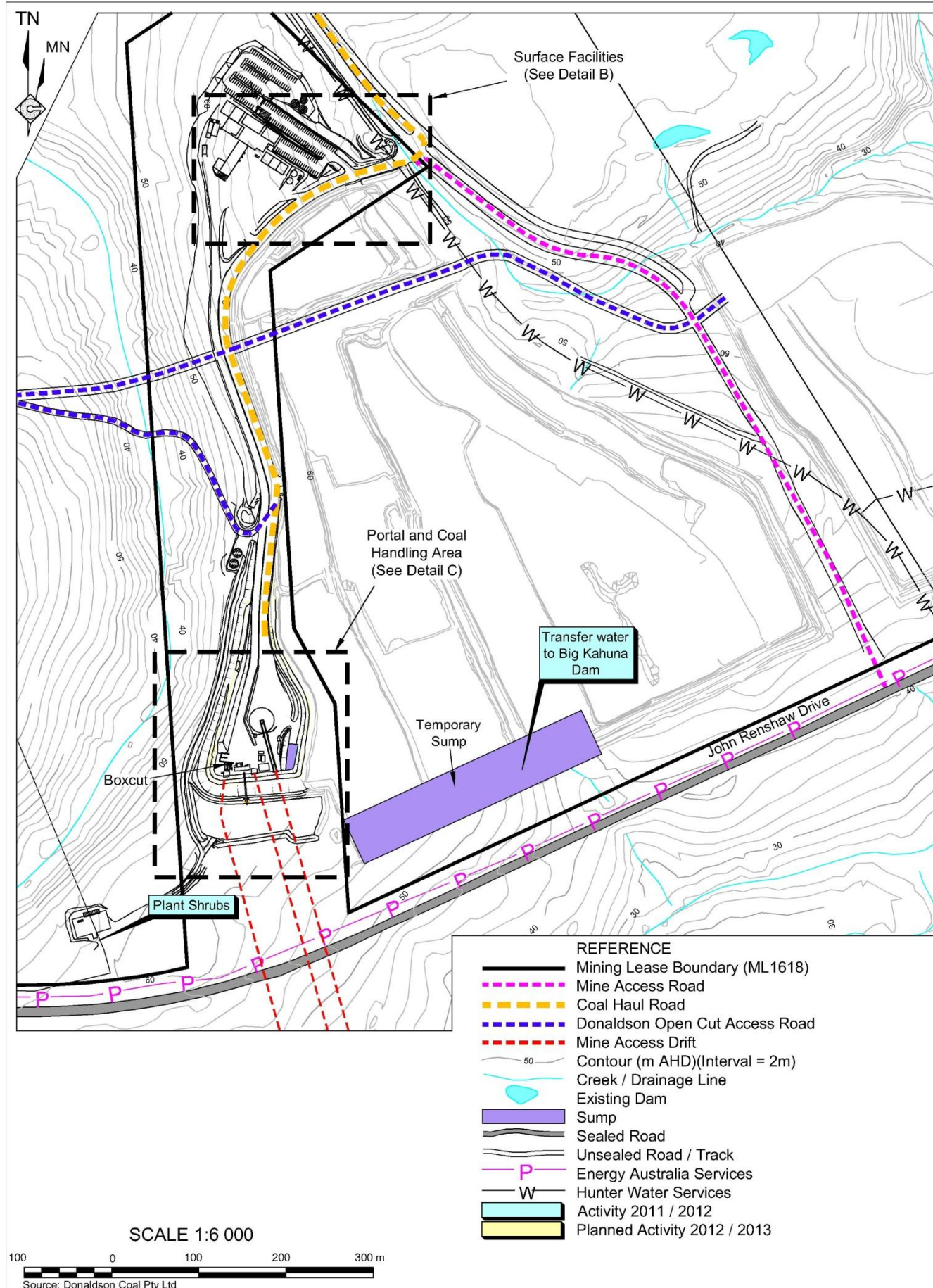
Mineral Resources NSW (1997), *Borehole Sealing Requirements on Land – Coal Exploration*.

National Health and Medical Research Council (NHMRC) (2003), *National Environmental Protection Measures (NEPM)*.

NSW Department of Primary Industries (2006), *Guidelines to the Mining, Rehabilitation and Environmental Management Process*.

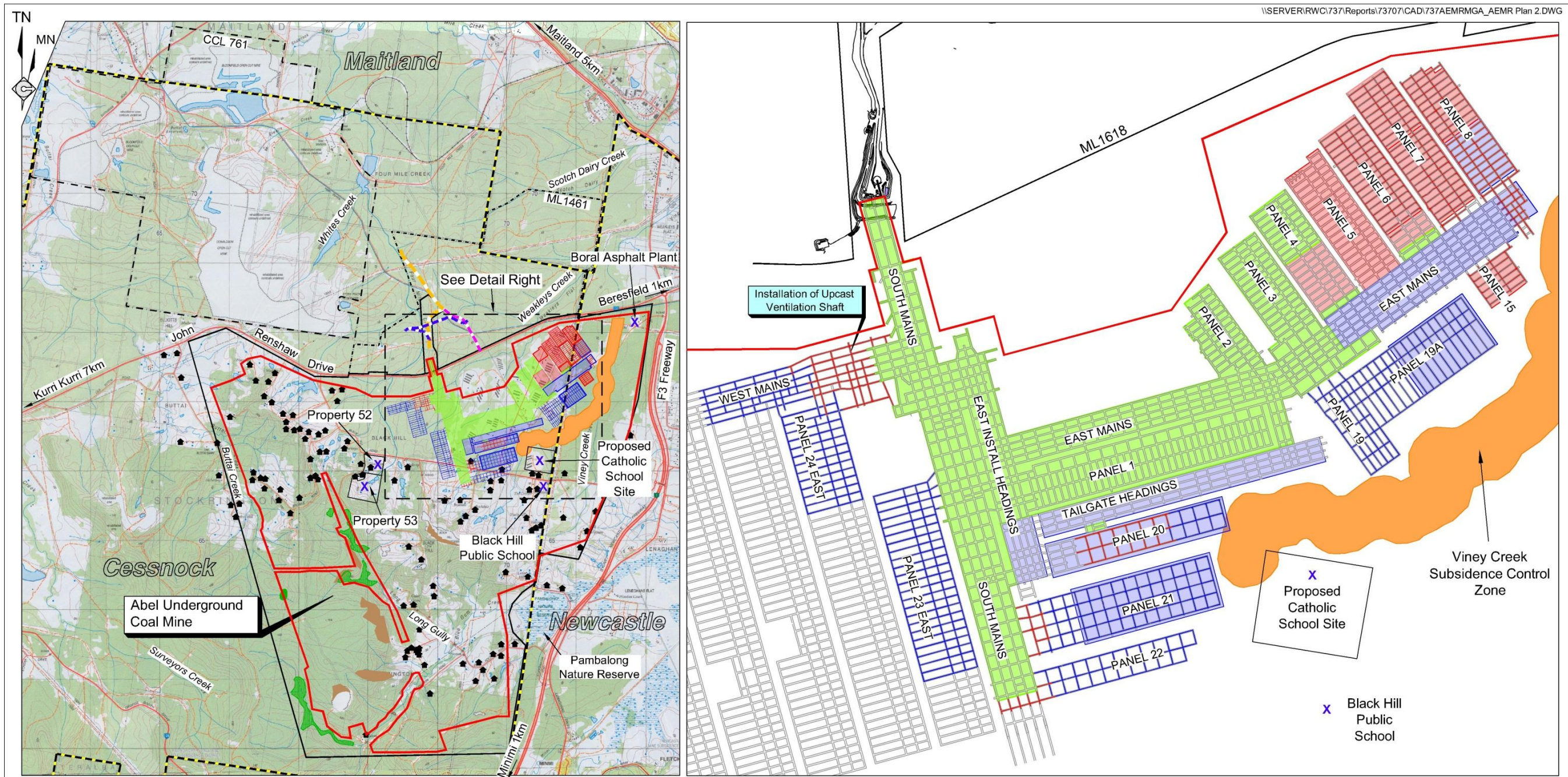
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Plan 1
SITE ACTIVITIES

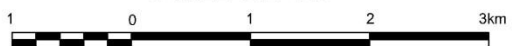
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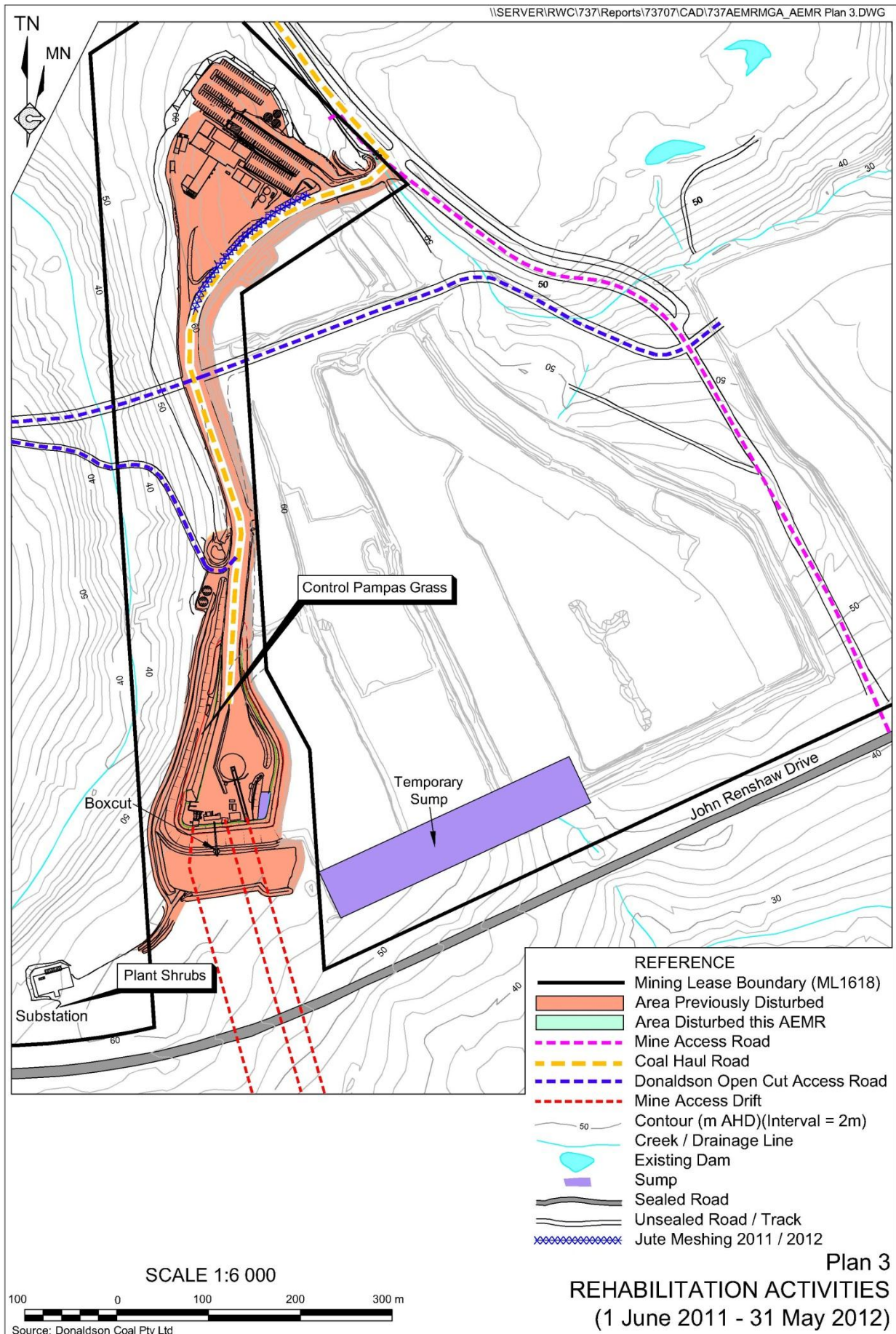
REFERENCE

- LGA Boundary (offset for clarity)
- - - CCL 761 Boundary
- - - ML 1461 Boundary
- Mining Lease Boundary (ML1618)
- Underground Workings (Prior to this AEMR)
- / — Underground Workings 2011 / 2012
- / — 1st Workings / 2nd Workings
- / — Underground Workings (2012 / 2013 - Indicative)
- / — Underground Workings (Mine Life - Indicative)
- Viney Creek Subsidence Control Zone
- Coal Haul Road to Internal Mine Road
- Donaldson Open Cut Access Road
- Mine Access Road
- Completed Activity 2011 / 2012
- Planned Activity 2012 / 2013
- Rainforest
- Cliffs
- X Place of Interest

Base Map Source: Donaldson Coal Pty Ltd

Plan 2
MINING ACTIVITIES

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