



DONALDSON COAL

Part of the Yancoal Australia Group
ABN: 87 073 088 945



Annual Environmental Management Report

Abel Underground Coal Mine
1 January 2015 – 31 December 2015



Prepared in conjunction with:


R.W. CORKERY & CO. PTY. LIMITED

DONALDSON COAL

PTY LTD

ABN: 87 073 088 945

Annual Environmental Management Report for the Abel Underground Coal Mine 1 January 2015 to 31 December 2015

| | | | |
|---|---|-----------------------------|----------|
| Name of mine | Abel Underground Coal Mine | | |
| Mining Titles/Leases | ML 1618 | | |
| MOP Commencement Date | 08/10/14 | MOP Completion date | 07/10/21 |
| AEMR Commencement Date | 01/01/15 | AEMR Completion date | 31/12/15 |
| Name of leaseholder | Donaldson Coal Company Pty Ltd | | |
| Name of mine operator (if different) | NA | | |
| Reporting Officer | Mr Phillip Brown | | |
| Title | Environment and Community Manager | | |
| Signature |  | | |
| Date | 31 March 2016 | | |

Prepared by:

Donaldson Coal Pty Ltd
ABN 87 073 088 945
1132 John Renshaw Drive
BLACKHILL NSW 2322

Telephone: (02) 4934 2798
Facsimile: (02) 4934 2736
Email: donaldson@doncoal.com.au

Prepared in conjunction with:

R.W. Corkery & Co. Pty. Limited
Geological & Environmental Consultants
ABN: 31 002 033 712
1st Floor, 12 Dangar Road
PO Box 239
BROOKLYN NSW 2083

Telephone: (02) 9985 8511
Facsimile: (02) 6361 3622
Email: brooklyn@rwcorkery.com

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March 2016



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CONTENTS

| | Page |
|--|------------|
| EXECUTIVE SUMMARY..... | VII |
| 1. INTRODUCTION..... | 1 |
| 1.1 SCOPE..... | 1 |
| 1.2 APPROVAL, LEASE AND LICENCES | 1 |
| 1.3 MINE CONTACTS | 3 |
| 1.4 ACTIONS REQUIRED FROM THE 2015 AEMR REVIEW | 4 |
| 2. OPERATIONS DURING THE REPORTING PERIOD..... | 5 |
| 2.1 EXPLORATION | 5 |
| 2.2 LAND PREPARATION..... | 5 |
| 2.3 CONSTRUCTION | 5 |
| 2.4 MINING | 5 |
| 2.5 MINERAL PROCESSING | 6 |
| 2.6 WASTE MANAGEMENT | 6 |
| 2.7 COAL STOCKPILES..... | 7 |
| 2.8 WATER MANAGEMENT | 8 |
| 2.9 HAZARDOUS MATERIAL MANAGEMENT | 9 |
| 2.10 OTHER INFRASTRUCTURE MANAGEMENT | 9 |
| 3. ENVIRONMENTAL MANAGEMENT AND PERFORMANCE | 10 |
| 3.1 METEOROLOGICAL MONITORING..... | 10 |
| 3.2 AIR POLLUTION..... | 10 |
| 3.3 EROSION AND SEDIMENT CONTROL | 16 |
| 3.4 SURFACE WATER POLLUTION | 17 |
| 3.5 GROUNDWATER POLLUTION..... | 20 |
| 3.6 THREATENED FLORA AND FAUNA..... | 22 |
| 3.7 WEEDS..... | 27 |
| 3.8 BLASTING | 28 |
| 3.9 OPERATIONAL NOISE | 28 |
| 3.10 VISUAL, STRAY LIGHT..... | 30 |
| 3.11 ABORIGINAL HERITAGE..... | 30 |
| 3.12 NATURAL HERITAGE | 31 |
| 3.13 SPONTANEOUS COMBUSTION | 31 |
| 3.14 BUSHFIRE | 31 |
| 3.15 MINE SUBSIDENCE..... | 31 |
| 3.16 HYDROCARBON CONTAMINATION | 33 |
| 3.17 METHANE DRAINAGE / VENTILATION..... | 34 |
| 3.18 PUBLIC SAFETY | 34 |
| 3.19 OTHER ISSUES AND RISKS..... | 34 |



CONTENTS

| | Page |
|---|-----------|
| 4. COMMUNITY RELATIONS | 35 |
| 4.1 ENVIRONMENTAL COMPLAINTS..... | 35 |
| 4.2 COMMUNITY LIAISON..... | 35 |
| 5. REHABILITATION | 37 |
| 5.1 BUILDINGS..... | 37 |
| 5.2 REHABILITATION OF DISTURBED LAND..... | 37 |
| 5.3 OTHER INFRASTRUCTURE..... | 38 |
| 5.4 REHABILITATION TRIALS AND RESEARCH..... | 38 |
| 5.5 FURTHER DEVELOPMENT OF THE FINAL REHABILITATION PLAN..... | 38 |
| 6. ACTIVITIES PROPOSED DURING THE NEXT AEMR PERIOD | 39 |
| 7. REFERENCES..... | 41 |

APPENDICES

| | |
|--|------|
| Appendix 1 Compliance Review | A1-1 |
| Appendix 2 2015 Abel Underground Coal Mine Dam Monitoring and Management Survey..... | A2-1 |
| Appendix 3 2015 Sub-tropical Rainforest Monitoring..... | A3-1 |
| Appendix 4 2015 Pambalong Nature Reserve Monitoring Report..... | A4-1 |
| Appendix 5 Aquatic Monitoring Report Autumn 2015 and Spring 2015 | A5-1 |
| Appendix 6 Noise Monitoring Reports..... | A6-1 |
| Appendix 7 Air and Water Monitoring Results | A7-1 |
| Appendix 8 2015 Annual Groundwater Review | A8-1 |
| Appendix 9 Abel Mine Subsidence Status Reports | A9-1 |

FIGURES

| | |
|--|----|
| Figure 1.1 Locality Plan..... | 2 |
| Figure 2.1 Abel Water Summary 1 January – 31 December 2015 | 8 |
| Figure 3.1 Environmental Monitoring Locations..... | 11 |
| Figure 3.2 Deposited Monitoring Results | 12 |
| Figure 3.3 PM ₁₀ Monitoring Results | 13 |
| Figure 3.4 TSP Monitoring Results | 14 |
| Figure 3.5 Surface Water Quality Monitoring Results – 2015..... | 18 |
| Figure 3.6 Groundwater Quality Monitoring Results – 2015..... | 22 |
| Figure 3.7 Selected Ecological Monitoring Results..... | 25 |

CONTENTS

| | Page |
|--|-------------|
| PLANS | |
| Plan 1 Site Activities..... | 45 |
| Plan 2A Mining Activities | 47 |
| Plan 2B Mining Activities | 49 |
| Plan 3 Rehabilitation Activities (1 January – 31 December 2015)..... | 51 |
| TABLES | |
| Table 1.1 Abel Underground Coal Mine – Approval, Lease and Licences | 1 |
| Table 1.2 Status of Actions from the 2015 AEMR | 4 |
| Table 2.1 Production and Waste Summary – 1 January 2015 to 31 December 2015 | 5 |
| Table 2.2 Principal Mining Equipment Used during the Reporting Period..... | 6 |
| Table 2.3 Approximate Waste Volumes during 2015 | 7 |
| Table 2.4 Stored Water | 8 |
| Table 3.1 Monthly Rainfall Records | 10 |
| Table 3.2 Deposited Dust Monitoring Results – 2015 [^] | 15 |
| Table 3.3 Summary of Water Quality Monitoring Results – 2015 ¹ | 17 |
| Table 3.4 Summary of Groundwater Quality Monitoring Results – 2015 | 21 |
| Table 3.5 Summary of Biological Characteristics (Macroinvertebrates) | 24 |
| Table 3.6 Summary of Attended Noise Monitoring Results – 2015..... | 29 |
| Table 3.7 Panel Approval and Extraction Summary | 32 |
| Table 3.8 Predicted versus Measured Subsidence Levels – 2015..... | 32 |
| Table 5.1 Rehabilitation Summary..... | 37 |
| Table 5.2 Maintenance Activities on Rehabilitated Land – Surface Infrastructure Area | 38 |

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EXECUTIVE SUMMARY

The Abel Underground Coal Mine is located approximately 23km northwest of Newcastle, New South Wales. This Annual Environmental Management Report details the operations undertaken, environmental management and performance, community relations and rehabilitation activities during the 2015 calendar year ('the reporting period'). A summary of planned activities during the 2016 calendar year are also outlined.

Operations During the Reporting Period

During the reporting period no exploration, construction or land preparation activities were undertaken. Mining activities were undertaken within Panels 25 to 31 recovering a total of 1,807,933t of run-of-mine (ROM) coal. ROM coal continued to be transported to Bloomfield Coal Handling and Preparation Plant for processing with a total of 1,741,998t of Abel ROM coal processed during the reporting period.

No significant changes to waste, water or hydrocarbon management occurred during the reporting period.

Environmental Management and Performance

Key environmental management and performance outcomes during the reporting period were as follows.

Air Quality – Monitoring of deposited dust, total suspended particulates and PM₁₀ continued during the reporting period. No non-compliances or exceedances of the relevant air quality criteria were recorded.

Erosion & Sedimentation and Surface Water – Surface water monitoring, both upstream and downstream of current mining activities, recorded exceedances of ANZECC criteria for pH, Electrical Conductivity and turbidity. However, baseline monitoring has previously recorded exceedances of the ANZECC criteria and mine activities are not considered to have contributed to these exceedances. Notably, no long-term trends are evident and no reportable incidents were recorded.

Groundwater – Groundwater level monitoring during the reporting period confirmed groundwater levels are responding predictably and as expected to mining activities. Drawdowns have continued within the Donaldson coal seams, however, monitoring confirms that there is no evidence of any drawdown response in the alluvium or regolith groundwater. Groundwater inflow volumes have also remained within the predicted range.

Groundwater quality monitoring recorded pH and Electrical Conductivity within previously recorded baseline conditions, with mining not considered to be having an effect on groundwater quality. No reportable incidents were recorded.

Flora and Fauna – Ecological survey was completed as part of the Dam Monitoring and Management Plan, Sub-tropical Rainforest Monitoring Plan and Pambalong Nature Reserve Monitoring Plan. Macroinvertebrate sampling also continued to be undertaken within Blue Gum Creek.

The results of dam monitoring suggest that activities at the Abel Mine have not had a negative impact upon the surveyed dams. Similarly, the macroinvertebrate monitoring concluded that, whilst Blue Gum Creek has been affected by pollution (from erosion, siltation, weeds and elevated salinity), this has not been the result of the Abel Mine.

Given no undermining has yet been undertaken in the vicinity of the Pambalong Nature Reserve or areas of sub-tropical rainforest, the ecological monitoring represents baseline monitoring for the purpose of understanding natural variations.

Weeds – Ongoing weed control was undertaken during 2015 targeting Pampas Grass.

Blasting – There were seven underground blasts carried out in 2015 to fragment hard rock, as opposed to ‘production’ blasts. No reportable incidents occurred.

Noise – Quarterly compliance monitoring was undertaken during March, June, September and December 2015. The Abel Mine operations were generally inaudible at the monitoring locations with noise attributable to non-mine related traffic, birds, cricket, insect and frog noise, wind and other extraneous sources. When operations were audible, the estimated contribution from the Abel operations was assessed as being below the criteria. No reportable incidents or non-compliances occurred.

Visual / Stray Light – No complaints were recorded and no further improvements were required.

Aboriginal Heritage – A number of Aboriginal heritage sites were undermined during the reporting period. Previous heritage assessments predict no impacts to any of these sites. As a result, only one of these sites, 38-4-0670, a previously identified scarred tree, is a specified sample monitoring site for sites which no subsidence-related impacts are expected to occur. Attempts were made to re-survey the site during a heritage survey in July 2015, however, it could not be located.

Spontaneous Combustion - No incidents of spontaneous combustion were recorded during the reporting period.

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

Mine Subsidence – All subsidence monitoring during the reporting period was within the predicted ranges. Subsidence impacts were managed in accordance with the approved subsidence monitoring and management plans. Rehabilitation of subsidence impacts included remedial works for surface cracking, repair of Blackhill and Meredith Roads and remediation of cracking to Dam 29 (above Panel 27).

Hydrocarbon Contamination – Excess oil drums were removed during the reporting period and a new purpose built storage container was provided. No reportable hydrocarbon incidents occurred.

Methane Drainage / Ventilation - No changes to ventilation were required during the current reporting period or are planned during the next reporting period

Public Safety - No public safety issues relating to the Abel Mine were reported during the reporting period.

Community Relations

A total of five complaints were received during the reporting period relating to noise (x2), odour (x1) and subsidence (x2). Follow up of the noise and odour complaints confirmed that the source was not the Abel Mine. Both subsidence complaints were resolved through the completion of repairs in accordance with the approved subsidence management plans.

During the reporting period the community consultative committee met four times. The meetings continued to provide an opportunity 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.

Rehabilitation

During the reporting period rehabilitation activities within the surface infrastructure area included regular inspection and maintenance of previously rehabilitated areas and retained vegetation. Rehabilitation works relating to subsidence impacts were also completed in accordance with the approved subsidence management plans.

No other rehabilitation activities were undertaken. As the Abel Mine is an underground operation, the only significant rehabilitation will be during mine decommissioning.

Activities Proposed During the Next Reporting Period

Operational activities will continue during the next reporting period until approximately June 2016. After this time, it is planned to place the mine into care and maintenance. The following provides a summary of the proposed activities.

Exploration - During the next reporting period a further 13 exploration holes are currently planned. The holes will be fully or partly cored diamond drill holes targeting the Lower Donaldson Seam.

Mining - During the next reporting period, mining will focus upon continued first and second workings within Panels 28, 30 and 31, and commencement of first workings in Panel 32. It is estimated that in the order of 435,000t of ROM coal will be extracted.

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 mine.

Monitoring – Monitoring will continue to be undertaken during the next reporting period in accordance with the current monitoring programs. However, all monitoring programs will be reviewed to ensure that the monitoring during the planned care and maintenance period remains appropriate.

Community Consultation and Liaison - The community consultative committee will continue to be convened quarterly during the next reporting period, however, the frequency of meetings may be reviewed during care and maintenance.

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1. INTRODUCTION

1.1 SCOPE

This Annual Environmental Management Report (AEMR) has been prepared in accordance with the requirement for an Annual Review under *Schedule 5 Condition 4* of Project Approval 05_0136 and for an annual Environmental Management Report under *Conditions 4* and *5* of Mining Lease 1618. This AEMR addresses the period 1 January to 31 December 2015 (“the reporting period”).

This AEMR generally follows the format and content requirements identified in the *Environmental Management Guidelines for Industry The Annual Environmental Management Report* (version 3 2006) prepared by Division of Resources and Energy. The Abel Underground Coal Mine (the “Abel Mine”) is located approximately 23km northwest of Newcastle, New South Wales (see **Figure 1.1**).

1.2 APPROVAL, LEASE AND LICENCES

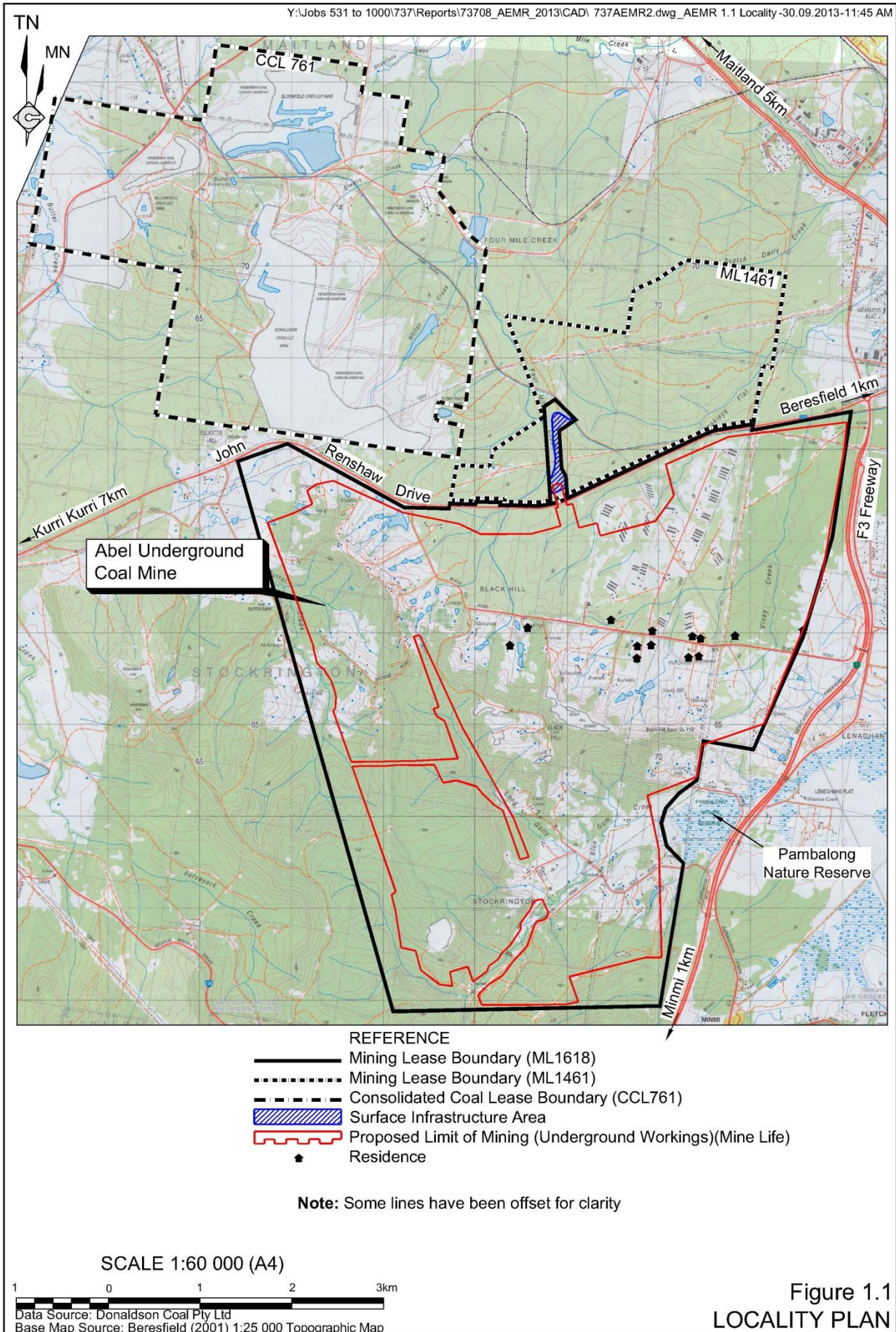
The Company has operated the approved activities at the Abel Mine under the approval, lease and licences listed in **Table 1.1**.

Table 1.1
Abel Underground Coal Mine – Approval, Lease and Licences

| Approval/Lease/Licence | Issue Date | Expiry Date | Details / Comments |
|--|--|------------------|---|
| Project Approval 05_0136 | 7 June 2007 | 31 December 2030 | Granted by the (then) Minister for Planning and last modified on 04 December 2013. |
| 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 2013 | 4 August 2018 | Bore licence to intercept groundwater issued by the (then) NSW Office of Water. |

*See **Figure 1.1**.

No changes or modifications to these approvals, leases and licences occurred during the reporting period.



Conditions within the Project Approval 05_0136 which specify specific environmental criteria are as follows.

1. Subsidence
 - *Schedule 3 Condition 1* – performance measures for natural and heritage features.
 - *Schedule 3 Condition 3* – performance measures for built features.
 - *Appendix 5 Schedule 1* – Subsidence Effects on All other Surface Structures.
2. Noise
 - *Schedule 4 Conditions 1 to 4* – noise emissions (day, evening and night).
3. Air Quality
 - *Schedule 4 Condition 9* – 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 in March 2015, in accordance with *Schedule 5 Condition 5* of PA 05_0136. The independent audit confirmed a high degree of compliance and did not identify any non-compliance with the Project Approval or Statement of Commitments for the activities undertaken during the 2012 to 2015 period.

The next independent environmental audit is due by the end of March 2018.

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

1.3 MINE CONTACTS

Operations Manager:

Mr. Aaron McGuigan

Tel: 02 4015 1100 Mobile: 0408 603 609

Environment and Community Manager:

Mr. Phillip Brown

Tel: 02 4015 1193 Mobile: 0439 909 952

The contact details for the Abel Mine are as follows.

Postal Address: Donaldson Coal Pty Ltd
PO Box 2275
GREENHILLS NSW 2323

Tel: 02 4015 1100
Fax: 02 4015 1199
Email: donaldson@doncoal.com.au

Physical Address: Abel Underground Coal Mine
1132 John Renshaw Drive
BLACKHILL NSW 2322

24 hour Environmental Hotline:

Tel: 1800 111 271



1.4 ACTIONS REQUIRED FROM THE 2015 AEMR REVIEW

The 2015 AEMR was forwarded to NSW Department of Investment, Division of Resources and Energy (DI-DRE) and the Department of Planning and Environment (DPE). Feedback was received from the DRE dated 25 May 2015 and DPE dated 26 October 2015. DRE raised no actions or follow up requirements. The actions raised by DPE in their feedback to the 2015 AEMR and how these have subsequently been addressed are outlined in **Table 1.2**.

Table 1.2
Status of Actions from the 2015 AEMR

| Action Required | Comment |
|---|---|
| 1. The Annual Review requires an executive summary to detail any exceedance, incident or non-compliance identified within the reporting period. | Executive Summary included on page vii of this AEMR. |
| 2. As required by Schedule 3, Condition 25 (d) please report on waste management and efforts in minimisation of waste, including volumes, in next year's Annual Report. | Additional information addressing these matters has been included in Section 2.6 of this AEMR. |
| 3. As required by Schedule 3, Condition 17 a comprehensive site water balance is required for the site and it is requested that this is reported within next year's annual review. As a minimum it is recommended that the Minerals Council of Australia's Water Accounting Framework Input / Output model is utilised. | Section 3.4 of the 2014 Water Management Plan provides a detailed water balance. An updated water balance for the reporting period is provided in Section 2.8. |
| 4. A plan detailing monitoring locations in relation to an air photo would assist in the understanding of the report. | The base map for Figure 3.1 has been adjusted to include aerial photography rather than the topographic map. |
| 5. As per Schedule 6, Condition 4 it is a requirement of the Annual Review to identify any trends in the monitoring data over the life of the project. Please include this in next year's Annual Review. | Further consideration of trends and presentation of data over the life of the project has been included in Section 3 and Appendix 7 . |
| 6. During the inspection, the Department observed that a large amount of equipment was stored at the Abel pit top area combined with generally poor housekeeping. It is recommended a review is undertaken to determine what is required for future projects and any waste is disposed of appropriately. | A review has been undertaken of the stored equipment and those items that are not required for Yancoal sites have been marked for scrap. A contract has been let for the removal of the scrapped items. |
| 7. During the inspection a number of Intermediate Bulk Containers (IBC's) were noted being stored onsite. As per Schedule 3, Condition 25 (b), waste generated is required to be appropriately stored, handled and disposed. | A review has been undertaken of the stored IBC's and those that are not required for ongoing reuse have been marked for disposal. A contract has been let for the removal of the scrapped items. |
| 8. During the inspection it was noted that a large number of waste oil drums were being inappropriately stored outside of bunded areas. | Waste oil drums have been removed and are now stored in a purpose built storage container. |
| 9. The use of fit for purpose tankage for the storage of waste oil is recommended to prevent hydrocarbon spills from tank degradation. | The integrity of the waste oil tank is inspected on a regular basis and will be replaced as required. |

2. OPERATIONS DURING THE REPORTING PERIOD

2.1 EXPLORATION

During the reporting period, no exploration holes were drilled.

2.2 LAND PREPARATION

No land preparation activities were undertaken during the reporting period.

2.3 CONSTRUCTION

No significant construction activities occurred during the reporting period.

2.4 MINING

Plans 2A and **2B** presents the mining-related activities undertaken during the reporting period. Mining activities concentrated on commencement of first workings within Panels 29 and 31, continuation of first workings within West Mains, continuation of first and second workings within Panels 28 and 30 and completion of second workings within Panels 25, 26 and 27. A total of 1,807,933t (1,291,380m³) 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 the reporting period and estimated production at the end of the next reporting period.

Table 2.1
Production and Waste Summary – 1 January 2015 to 31 December 2015

| | Cumulative Production (m ³) | | |
|---|---|-------------------------|--|
| | Start of Reporting Period | End of Reporting Period | End of Next Reporting Period (Estimated) |
| Topsoils Stripped | 1,690 | 1,690 | 1,690 |
| Topsoil used / spread | 0 | 0 | 0 |
| Waste Rock | 7,300 | 8,300 | 8,800 |
| ROM Coal | 6,604,842 | 7,896,222 | 8,206,936 |
| Processing Waste | 0 | 0 | 0 |
| Product Coal ¹ | 6,604,842 | 7,896,222 | 8,206,936 |
| 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. | | | |

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 during the Reporting Period

| Item | No.* | Primary Function |
|--|-----------|---|
| Continuous Miner (Joy 12CM12, Joy 12CM15 and 12CM30) | 4 | Forming underground roadways and secondary extraction. |
| Shuttle Cars | 6 | Transporting cut material away from Continuous Miner. |
| Driftrunners | 9 | Transporting people underground. |
| LHDS | 5 | 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 / 3 / 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 Mine which provides for haulage to and processing at Bloomfield CHPP. During the reporting period, 1,741,998t¹ of coal from the Abel Mine was processed at Bloomfield CHPP producing approximately 1,337,312t of product coal (based on 73% recovery). 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.

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

¹ The apparent difference in coal processed compared to ROM coal mined (per Section 2.4) is a result of differences in timing between mining of ROM coal, transportation to Bloomfield and storage at Bloomfield prior to processing through the 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. All waste rock and unprocessable coaly material was removed using haul trucks and placed within the West Pit in accordance with the approved final landform.

Waste oil was stored within 205L drums, 1,000L IBCs or the waste oil tank within the oil store before being removed from site, along with used oil filters and oily rags, by Australian Waste Oils. Excess waste oil drums that were stored external to bunded areas were removed and a purpose built bunded storage container is now also utilised to ensure adequate bunded storage is available. Used tyres are removed from site during servicing by Marathon Tyres Pty Ltd 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 J R Richards on a weekly basis whilst scrap metal was also collected by J R Richardson on an as-needs basis. The scrap steel/drum crusher continued to be used.

All general wastes were stored in skip bins and removed by J R Richards. All wastewater (greywater) and sewage generated within the on-site bathhouses was treated using the sewage treatment system with treated water being transferred to the Big Kahuna Dam. The treatment system was approved by Council on 24 August 2011.

The approximate volume of each waste stream generated during the reporting period is presented in **Table 2.3** together with the proportion of waste recycled.

Table 2.3
Approximate Waste Volumes during 2015

| Waste Stream | Total Volume (kg) | Volume (kg) per 1000t ROM Coal |
|-----------------------|-------------------|--------------------------------|
| Oily Water (Off Site) | 700 | 0.52 |
| Waste Oil | 2,700 | 2.01 |
| Paper & Cardboard | 460 | 0.34 |
| Scrap Steel | 4,380 | 3.25 |
| Mixed Solid Waste | 21,970 | 16.32 |
| Total Waste (kg) | 30,210 | 22.44 |
| Recycled Waste | 8,240 | 6.12 |
| Recycling % | 27.28% | 27.28% |

As part of the Company's Environmental Management Strategy, it is a requirement for contractors and employees to minimise waste generation wherever possible and to dispose of all waste in a satisfactory manner. Waste volumes will continue to be monitored into the future and opportunities to minimise waste or increase recycling implemented, where appropriate.

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 3,000t. During the reporting period, ROM coal continued to be transported to the Bloomfield CHPP by private road.

2.8 WATER MANAGEMENT

The former 1.5ML sump within the box cut area was decommissioned in September 2014 with all water runoff from within the box cut area (incorporating the surface facilities) together with excess underground water now diverted directly to a water storage sump within the ‘West Pit’ (located within ML 1461 for the Donaldson Mine).

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. The sump has sedimentation and oil separation systems and treated water is pumped out as required to the Big Kahuna Dam (400ML storage capacity, also located within ML 1461 for the Donaldson Mine).

Table 2.4 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. An updated water balance for the reported period is also provided in **Figure 2.1** for the integrated water management system.

Table 2.4
Stored Water

| | Volumes Held (m ³) [#] | | |
|----------------------------|---|----------------------------|------------------|
| | Start of Reporting Period | At end of Reporting Period | Storage Capacity |
| Clean Water | 400 | 400 | 450 |
| Dirty Water* | 0 | 0 | 0 |
| Controlled Discharge Water | 0 | 0 | 0 |
| Contaminated Water | 0 | 0 | 0 |

Source: Donaldson Coal Pty Ltd. [#] Within Abel Surface Infrastructure Area (ML 1618).
*As of September 2014, all dirty water is diverted directly to the sump within the ‘West Pit’ located within ML 1461.

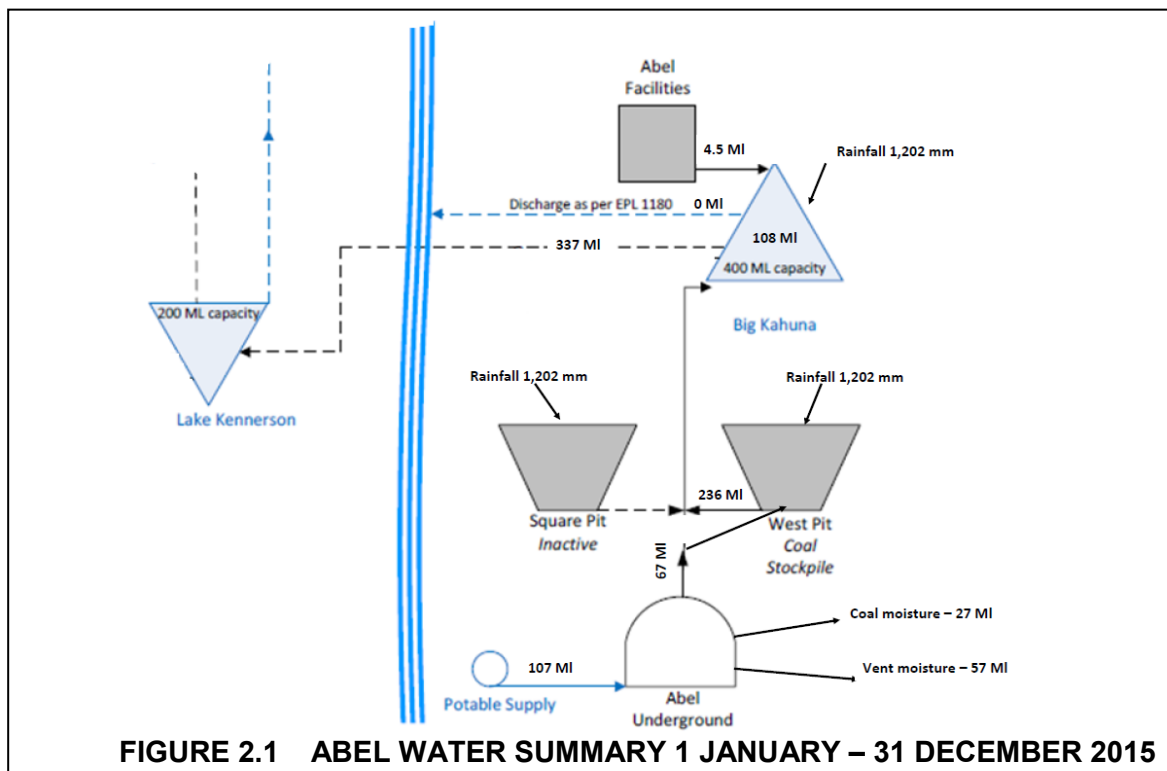


FIGURE 2.1 ABEL WATER SUMMARY 1 JANUARY – 31 DECEMBER 2015

The water management procedures are presented in further detail within the Water Management Plan prepared for the Abel Mine.

2.9 HAZARDOUS MATERIAL MANAGEMENT

Fuel storages for the site include a 2,000L self bunded tank for the refuelling of mobile equipment and a 28,000L 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 IBCs 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 Pollution Incident Response Management Plan (August, 2012) has also been prepared and implemented in accordance with EPL 12856.

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 10 years is presented in **Table 3.1**.

Table 3.1
Monthly Rainfall Records

| Period | Average Monthly Rainfall (mm) | | | | | | | | | | | | |
|----------------|-------------------------------|--------------|-------------|--------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|--------------|---------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec | Total |
| 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 | 901.2 |
| 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 | 172.3 | 53.8 | 26.6 | 18.7 | 5.7 | 47.9 | 47.9 | 940.1 |
| 2013 | 166.7 | 226.6 | 97.9 | 89.4 | 60.9 | 96.5 | 11.2 | 9.7 | 21.2 | 49.5 | 261.8 | 2.6 | 1094.0 |
| 2014 | 15.6 | 108.3 | 112.8 | 99.3 | 44.3 | 31.4 | 24.6 | 104 | 42.4 | 55 | 38.4 | 133.4 | 809.5 |
| 2015 | 167 | 48 | 73.3 | 412 | 89.4 | 44.6 | 17.9 | 30.6 | 56.8 | 89 | 69.8 | 103.8 | 1202.2 |
| <i>Average</i> | <i>86.1</i> | <i>106.2</i> | <i>92.1</i> | <i>133.1</i> | <i>59.3</i> | <i>109.7</i> | <i>37.9</i> | <i>36.6</i> | <i>50.2</i> | <i>53.9</i> | <i>100.0</i> | <i>58.0</i> | <i>922.8</i> |

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

Total rainfall during the 2015 calendar year was 1172.2mm, 392.7mm more than 2014 and 279.4mm above the average rainfall.

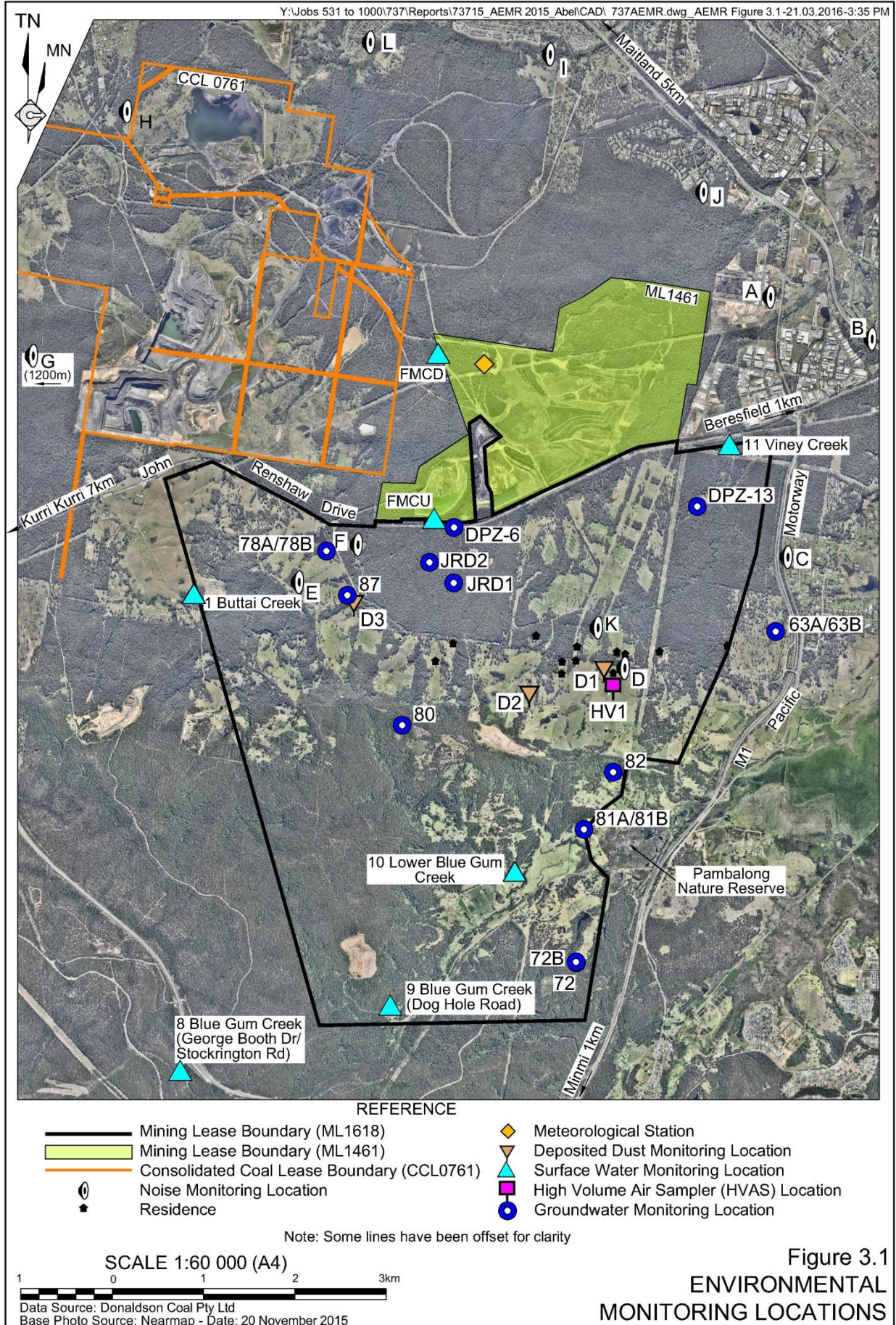
3.2 AIR POLLUTION

Environmental Management

Management of air quality during the reporting period included watering of access roads and use of exhaust controls on mobile equipment.

Environmental Performance

Monthly deposited dust monitoring was undertaken by the Company at a total of three locations surrounding and relevant to the Abel Mine. Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM₁₀) monitoring was also undertaken at the existing High Volume Air Sampling (HVAS) station located approximately 2,300m southeast of the surface infrastructure area at Blackhill (located at Site D1). Locations of deposited dust and suspended particulate (high volume air sampling) monitoring are shown on **Figure 3.1** and results are summarised in **Table 3.2** and **Figures 3.2, 3.3** and **3.4**.



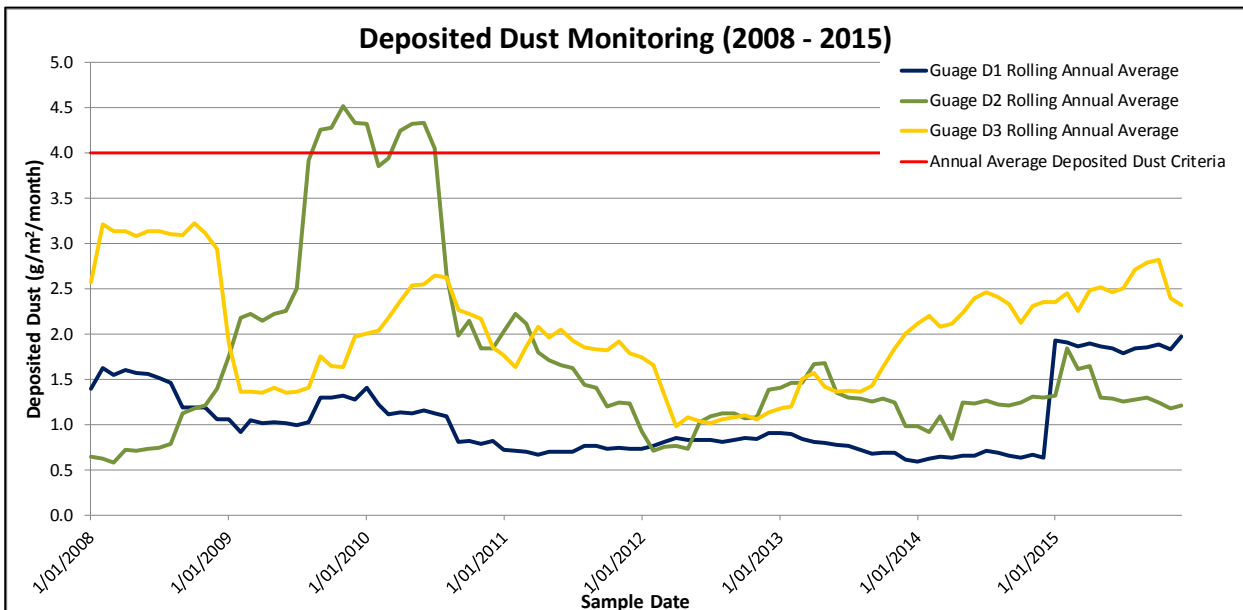
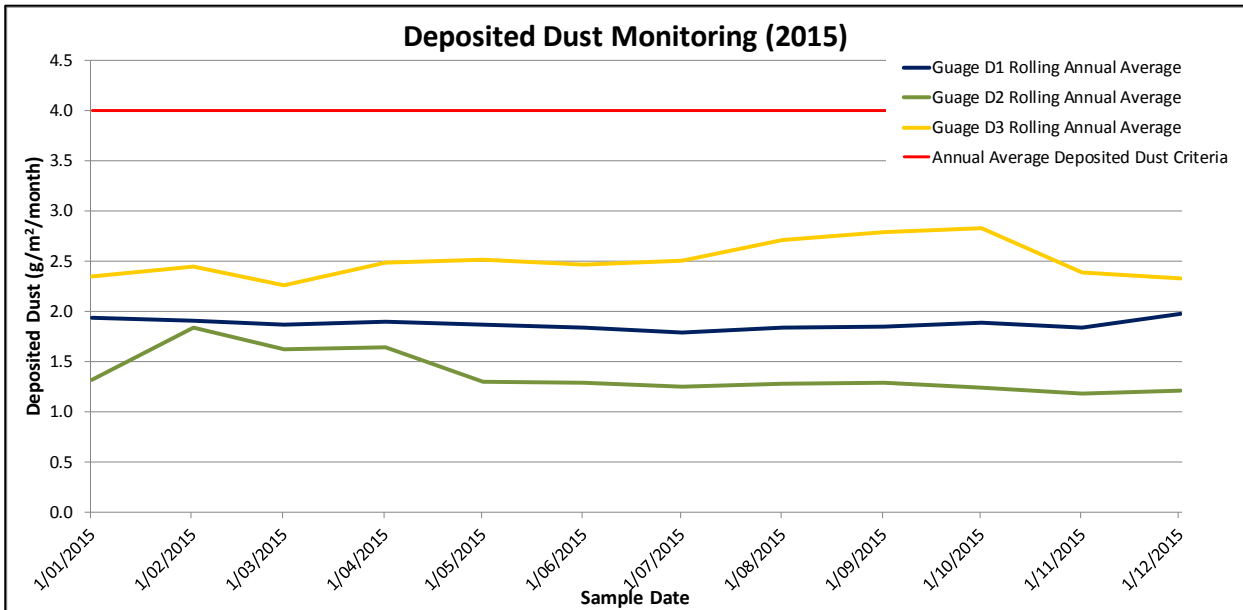


Figure 3.2 Deposited Monitoring Results

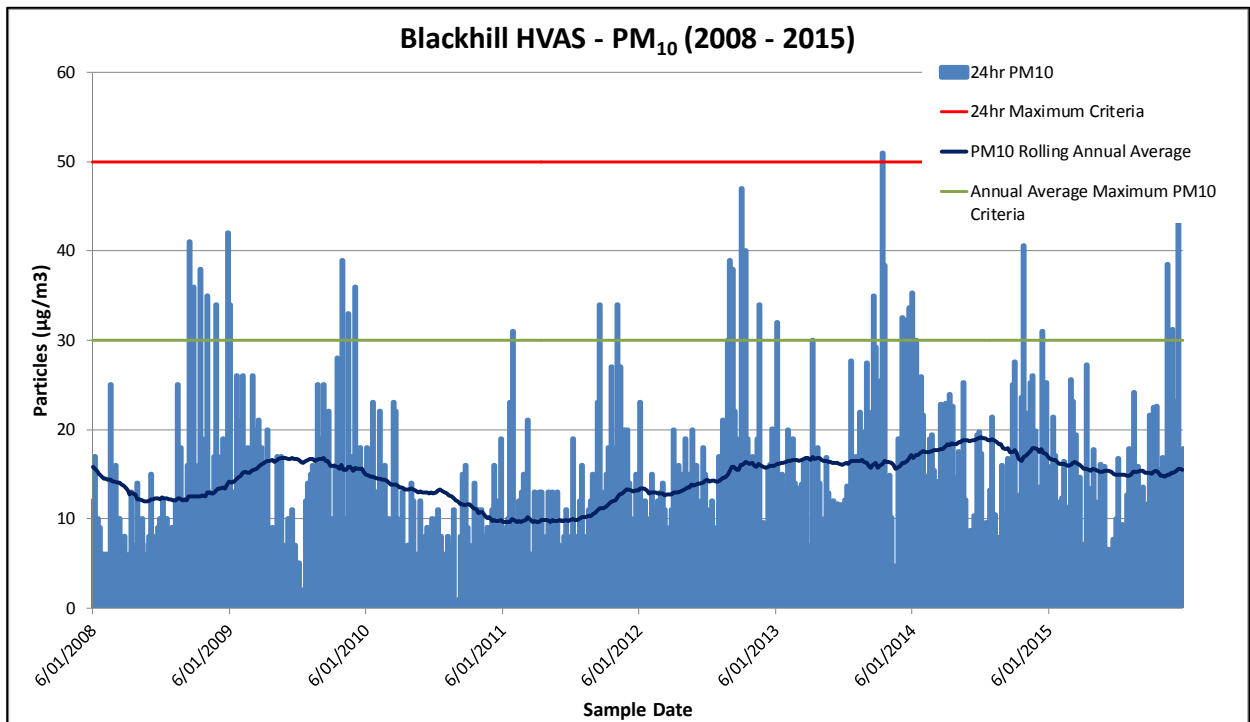
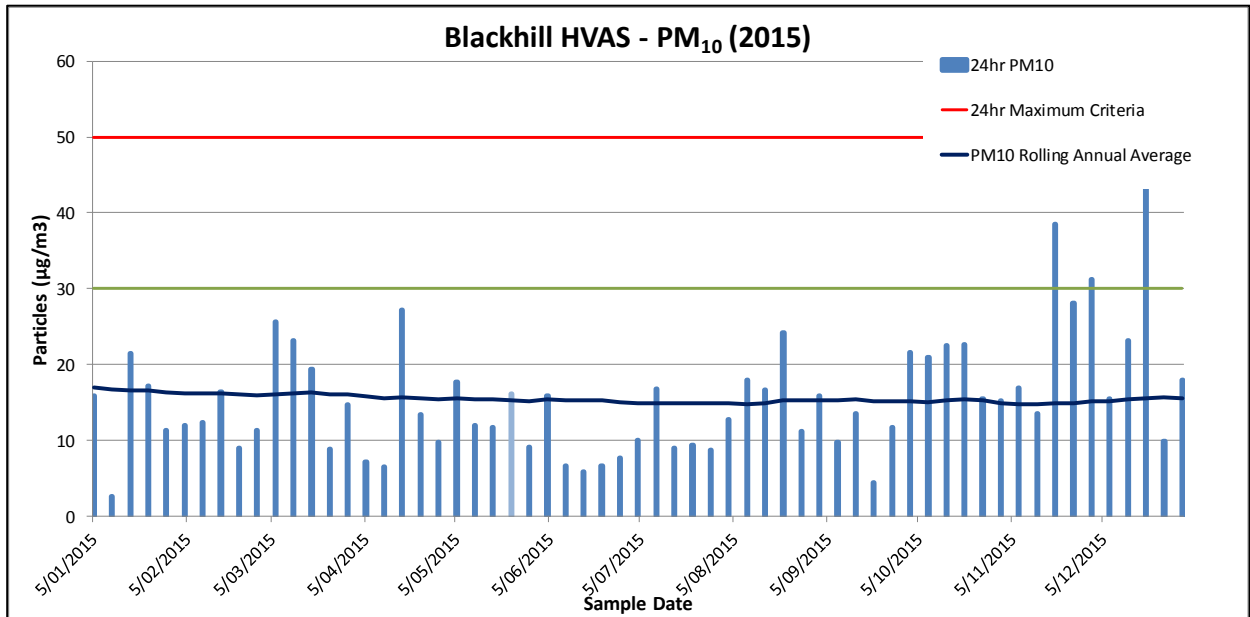


Figure 3.3 PM₁₀ Monitoring Results

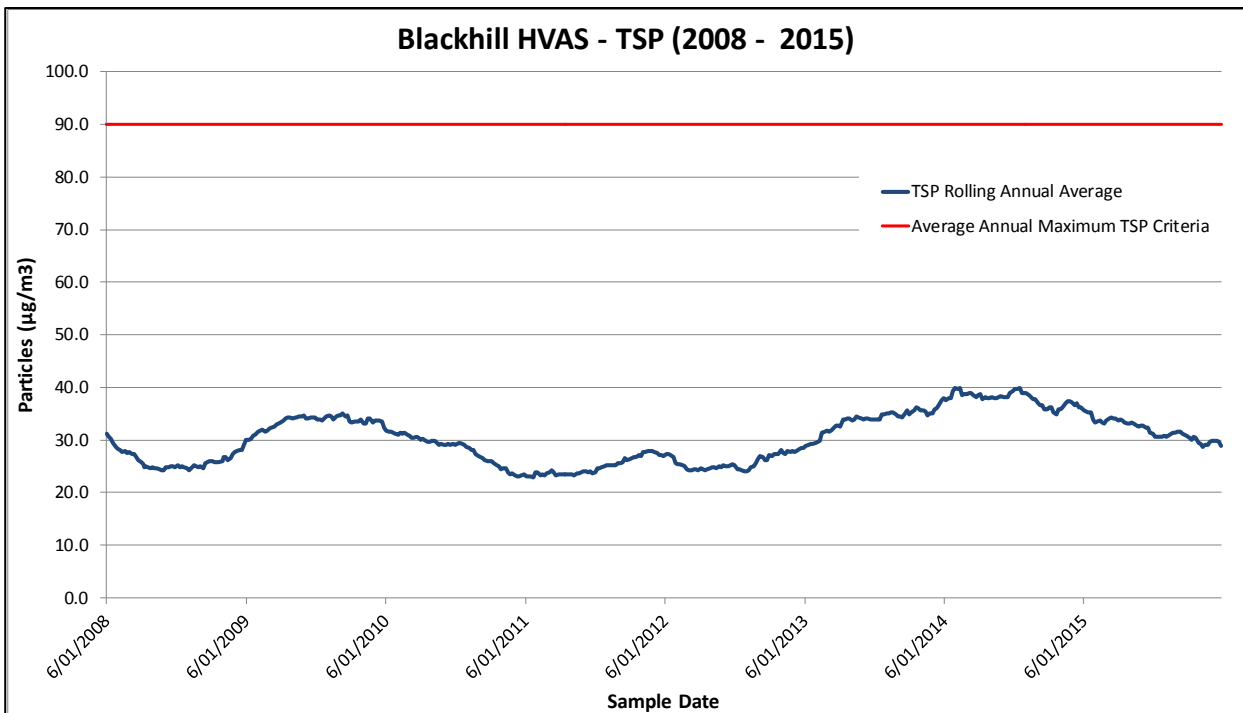
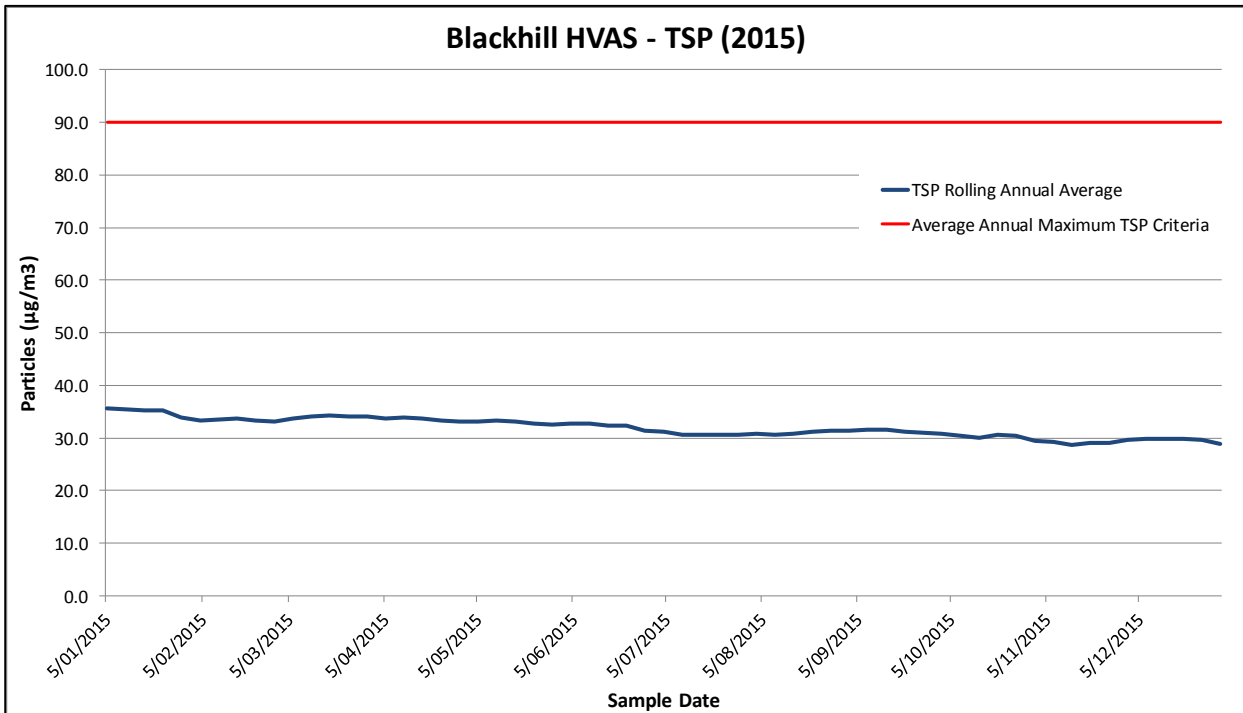


Figure 3.4 TSP Monitoring Results

Table 3.2
Deposited Dust Monitoring Results – 2015[^]

| Month | Monthly Dust Deposition Rate (g/m ² /month) | | | | | |
|-----------------|--|-------------|-------------|-------------|-------------|-------------|
| | D1 | | D2 | | D3 | |
| | Insoluble | Ash | Insoluble | Ash | Insoluble | Ash |
| January | 16.2* | 13.1 | 0.8 | 0.4 | 2.2 | 1.2 |
| February | 0.6 | 0.4 | 6.5* | 1.9 | 3.2* | 1.5 |
| March | 0.5 | 0.5 | 0.5 | 0.3 | 0.9 | 0.6 |
| April | 0.7 | 0.3 | 0.8 | 0.3 | 5* | 3.5 |
| May | 0.2 | 0.2 | 1.5 | 0.9 | 2.9 | 2.2 |
| June | 0.2 | 0.1 | 0.2 | 0.2 | 1.8 | 1.2 |
| July | 0.2 | 0.2 | 0.3 | 0.2 | 1.8 | 1.4 |
| August | 0.8 | 0.5 | 0.5 | 0.4 | 3.0 | 2.8 |
| September | 0.5 | 0.2 | 0.8 | 0.5 | 1.6 | 1.2 |
| October | 1.0 | 0.6 | 0.7 | 0.4 | 1.5 | 1.1 |
| November | 0.8 | 0.4 | 0.8 | 0.3 | 1.0 | 0.7 |
| December | 2.0 | 0.9 | 1.1 | 0.6 | 3.0 | 2.5 |
| Monthly Minimum | 0.2 | 0.1 | 0.2 | 0.2 | 0.9 | 0.6 |
| Monthly Maximum | 16.2 | 13.1 | 6.5 | 1.9 | 5.0 | 3.5 |
| Average | 1.98 | 1.45 | 1.21 | 0.53 | 2.33 | 1.66 |

Source: Donaldson Coal Pty Ltd.
[^] Historical data included in **Appendix 7** * Sample contaminated (e.g. bird droppings, insects, leaves etc.)

Deposited Dust

The highest uncontaminated monthly dust deposition measurement was 3.0g/m²/month at D3 and occurred in December 2015. A number of contaminated results were also recorded, however, the ash content (indicating the inorganic component) was generally significantly lower confirming the organic nature of contaminants (e.g. bird droppings, insects, leaves etc.) (See **Table 3.2**). One monthly ash measurement of 13.1g/m²/month was recorded at D1, given that monthly ash measurements at D2 and D3 were 0.4g/m²/month and 1.2g/m²/month respectively, this elevated result is likely to a localised event.

The annual average monthly deposition rates for the reporting period were between 1.21g/m²/month and 2.33g/m²/month which is significantly below the criteria of 4g/m²/month, indicating good air quality with respect to dust deposition.

Since commencement of the Abel operations, the rolling annual average deposited dust levels have remained low although spikes are evident due to local events, such as recorded at D1 in January 2015. When accounting for such events, no specific trends are evident at D1 and D2. However, whilst remaining well below applicable criteria, a gradual increase in deposited dust levels has been observed at D3 since 2012. This increase is thought to be as a result of increased activity in the area, principally relating to residential vehicle traffic on unsealed roads and parking areas.

Suspended Particulates – PM₁₀ & TSP

The suspended particulate monitoring results show that the highest 24-hour average PM₁₀ concentration was 46.4µg/m³, measured on 19 December 2015 which is below the 50µg/m³ 24-hour *National Environment Protection Measures* (NEPM) goal.

The annual average PM₁₀ concentration for Blackhill was 15.5µg/m³ for the 12 months to 31 December 2015 whilst the annual average TSP concentration was 28.9µg/m³. The annual monitoring results also indicate that suspended particulate concentrations are well below the annual average criteria of 30µg/m³ and 90µg/m³ respectively.

Excepting an annual trend of lower 24-hour average PM₁₀ during the winter months and higher 24-hour averages during the summer months, no long-term trends are currently apparent. Similarly, the rolling annual averages for PM₁₀ and TSP have fluctuated higher or lower by approximately 5µg/m³ and 10µg/m³ respectively (see **Figure 3.3** and **3.4**). However, the annual averages remain similar to the long-term averages (from 01 January 2008) of 15µg/m³ and 30µg/m³ respectively.

Reportable Incidents

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

Further Improvements

No other improvements relating to air pollution are planned or considered necessary. However, as part of planned placement of the Abel Mine into care and maintenance from June 2016, all management and monitoring plans will be reviewed to ensure that the management measures and monitoring intensities during the care and maintenance period remain appropriate. Air quality management measures prior to entering care and maintenance will remain consistent with those outlined within the current 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) Diversion of 'dirty' surface water flows within the box cut area to the water storage sump.
- ii) 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. However, as part of planned placement of the Abel Mine into care and maintenance from June 2016, all management and monitoring plans will be reviewed to ensure that the management measures and monitoring intensities during the care and maintenance period remain appropriate. Erosion and sediment control measures prior to entering care and maintenance will remain consistent with those outlined within the current 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 Water Management Plan, Abel Mine transfers water off site to the Big Kahuna Dam 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 Mine and serve to provide baseline data. Monitoring at Sites 1, 8, 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 3.5** with the full data set and graphical presentation since 2008 provided in **Appendix 7**. 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.

Table 3.3
Summary of Water Quality Monitoring Results – 2015¹

| Sampling Site [^] | pH [#] | EC (µS/cm) [#] | Turbidity (NTU) | TSS (mg/L) |
|--|-------------------|-------------------------|----------------------|-----------------------|
| <i>Upstream of Underground Workings (to date)</i> | | | | |
| 1 | 5.8-7.3 | 218- 2910 | 10.6- 142 | 6-64 |
| 8 | 5.55-7.62 | 116.3-642 | 10.6- 51 | 7-17 |
| 10 | 6.35-7.7 | 673-1364 | 3.8- 328 | 6-104 |
| <i>Downstream of Underground Workings (to date)</i> | | | | |
| 11 | 6.15-7.67 | 229-1945 | 11.8- 123 | 7-53 |
| FMCU | 6.33-7.88 | 202-307 | 33- 69 | 6-14 |
| FMCD | 6.0-8-8 | 134.9-372 | 5.2- 51.8 | 9-17 |
| <i>Trigger Level</i> | 6.5 – 8.5* | 125 to 2,200* | 6 – 50 (NTU)* | 50[®] |

[^] See **Figure 3.1** [®] Standard Industry Criterion * ANZECC Chapter 3 – Aquatic Ecosystems – Lowland Rivers in NSW
Bold Text – Exceedance of Trigger Level # Field Measurement NS – Not Sampled
1. Results cover period 01/1/2015 to 31/12/2015 Source: Donaldson Coal Pty Ltd

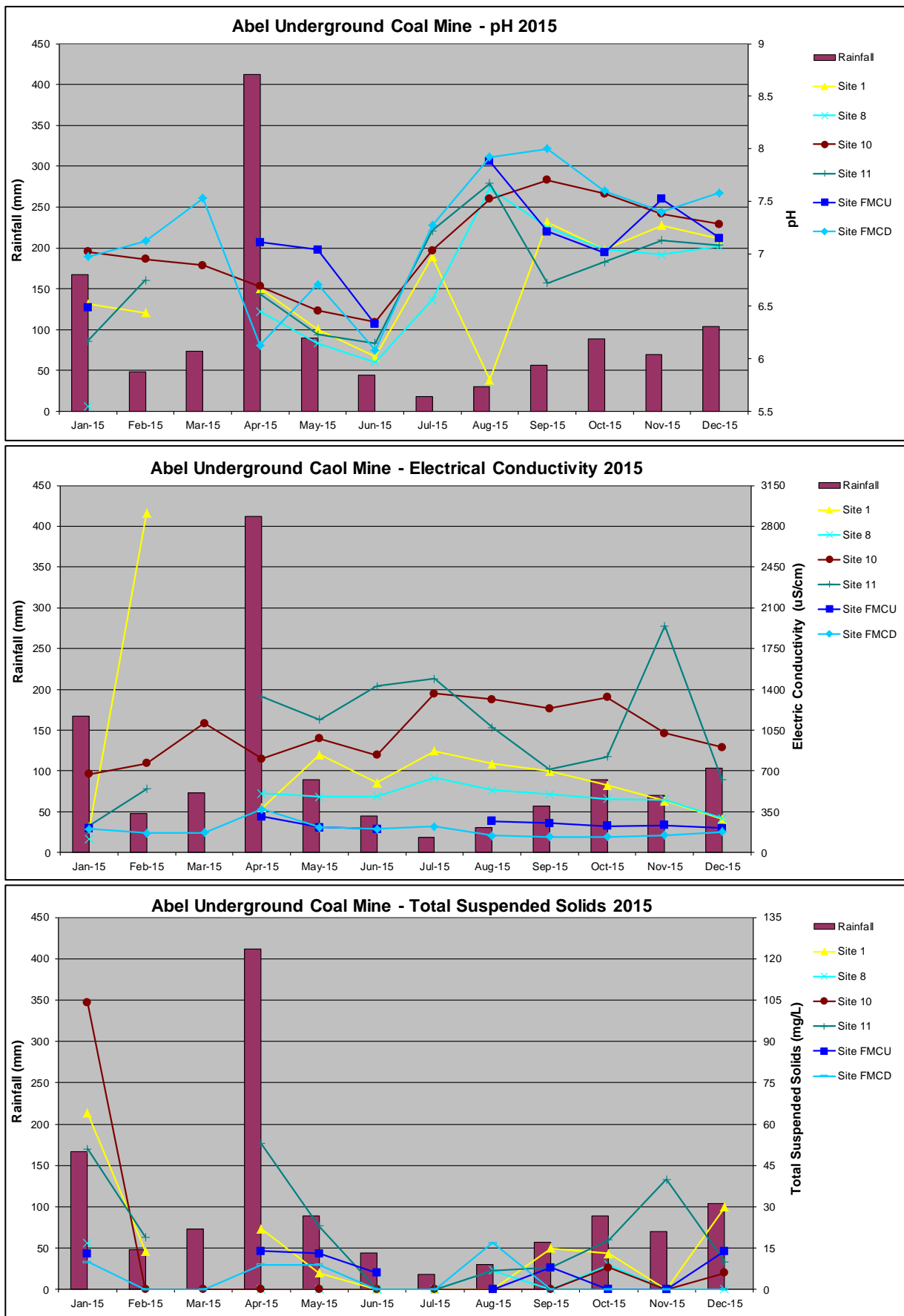


Figure 3.5 Surface Water Quality Monitoring Results – 2015

Analysis of the results obtained during the reporting period indicates the following.

1. The pH values at all sites were slightly acidic to slightly alkaline. All results were within the upper water quality trigger values for Lowland Rivers in NSW (8.5) outlined in the *Guidelines for Fresh and Marine Water Quality* (ANZECC 2000) but dropped below the lower water quality trigger value (6.5) during May and June 2015. Notably, the short-term decline in pH followed a highly significant rainfall event (412mm) in April 2015. Notably, the declines in pH were recorded at all sites, i.e. both upstream and downstream of areas which have been undermined to date. A similar, but not as pronounced, drop in pH also occurred following the significant rainfall event (261.8mm) in November 2013 (see **Appendix 7**).

No long-term trends in pH are apparent with the average pH across all sites since 2008 ranging between 6.8 and 7.2.

2. The electrical conductivity (EC) results range between 116 μ S/cm and 2,910 μ S/cm. One sample for Site 1 was above the water quality trigger value and one sample for Site 8 was slightly below the water quality trigger value. Both sites are upstream of current underground mining. All other EC results are within the water quality trigger values for Lowland Rivers in NSW (125 to 2,200 μ S/cm) (ANZECC 2000) at all sample sites.

Whilst it is expected that rainfall will influence EC results, EC does not appear to be strongly correlated with the monthly rainfall. The average EC values upstream are higher than the corresponding downstream values. No other long-term trends in EC are apparent.

3. Turbidity and total suspended solids (TSS) levels at upstream Sites 1 and 10 and downstream Site 11 during January 2015 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 industry standard TSS criteria (50mg/L). Minor exceedances of turbidity also occurred at Site 1 during February and April and Site FMCU during April. A minor exceedance of TSS also occurred at Site 11 during April.

These exceedances correlate with high rainfalls received during January and April 2015 and occurred at both upstream and downstream sites. It is not considered that the mine activities contributed to these levels.

No long-term trends are apparent within the monitoring data. Baseline monitoring results for both upstream and downstream sites have previously recorded significantly elevated TSS which are considered to form part of the natural variation.

The Environmental Assessment (Donaldson Coal, 2006) predicted no significant impacts upon surface water as a result of the mine activities. The monitoring results to date support that assessment.

Reportable Incidents

No reportable incidents occurred during the reporting period.

Further Improvements

No other surface water control measures are planned or considered necessary. However, as part of planned placement of the Abel Mine into care and maintenance from June 2016, all management and monitoring plans will be reviewed to ensure that the management measures and monitoring intensities during the care and maintenance period remain appropriate. Prior to entering care and maintenance surface water control measures 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

A full annual review of groundwater monitoring for 2015 has been completed by Dundon Consulting Pty Limited and is presented in **Appendix 8**. A summary of the principal outcomes and conclusions from this review is provided as follows.

Groundwater Levels

Piezometers located within and to the south of the Abel mine area are behaving predictably, with drawdown in the Donaldson Seams and by a lesser amount in most overburden piezometers responding as expected to mining activities.

However, monitoring confirms that there is no evidence of any drawdown response in the alluvium or regolith groundwater. In particular Piezometers 81A and 81B are located adjacent the Pambalong Nature Reserve (see **Figure 3.1**). Monitoring results from 81A (single vibrating wire transducer placed within the Lower Donaldson Seam) showed a drawdown response to mining the Donaldson Seam within the Abel Mine. However, Piezometer 81B is screened within overlying shallow Permian strata with water levels remaining stable. The lack of response in the shallow piezometer indicates there has been no mining impact on the Pambalong Nature Reserve.

Piezometer 63 is located to the east of the Abel Mine adjacent to the F3 Freeway and near the Hexham Swamp (see **Figure 3.1**). Piezometer 63 also has two vibrating wire transducers, one placed in the Lower Donaldson Seam (63A) and the other placed within sandstone interburden below the Buttai Seam (63B). Similarly, there is a lack of response in the shallow piezometer indicating no mining impacts on Hexham Swamp or the groundwater underlying the swamp.

A full summary of all bores and the groundwater response to mining is provided in **Appendix 8**.

Groundwater Inflows

Between August 2013 and October 2015 inflow volumes could not be accurately estimated as a significant portion of mine water was accumulating in isolated in-mine storages. From 01 October 2015 water began reporting from the overflow of the storage areas. Based on a total in-mine storage volume of 459ML it is calculated that average groundwater inflow ranged from 120ML/year to 240ML/year. Since 01 October 2015, the estimate inflows have been between 240ML/year and 360ML/year. Groundwater model predictions for this stage of mining were for between 800ML and 1,000ML/year. Therefore, the actual inflow rates remain well below the predicted maximum rate. Further detail is provided in the annual groundwater review (**Appendix 8**).

Groundwater Quality

Groundwater quality monitoring results are presented in **Appendix 8**. A summary of three representative bores located within the Abel underground mine area is presented in **Table 3.4** and **Figure 3.6**. They show that the pH values ranged between slightly acidic (6.45) and slightly alkaline (7.68) and EC values ranged between 446µS/cm and 5,890µS/cm.

A downward trend in EC has been observed at bores DPZ13 and DPZ6 (see **Appendix 8**) which may be due to enhanced recharge following drawdowns in the coal measures as a result of mining. Whilst salinity has been relatively consistent within JRD2, monitoring indicates occasional 'outliers' of significantly lower salinity. This is likely due to ingress of rainwater temporarily lowering the salinity.

Whilst some variations have occurred in pH, monitoring has generally recorded consistent pH values over time.

Table 3.4
Summary of Groundwater Quality Monitoring Results – 2015

| Sampling Site [#] | pH | EC (µS/cm) | TSS (mg/L) |
|--------------------------------|-----------|------------|-------------------------|
| DPZ – 6 | 6.45-7.4 | 2099-2450 | 31-626 |
| DPZ – 13 | 6.68-7.45 | 2540-5890 | 17-122 |
| JRD2 | 6.58-7.68 | 446-2580 | 9-196 |
| Source: Donaldson Coal Pty Ltd | | | # see Figure 3.1 |

In comparison to previously recorded levels, 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. All results were within previously recorded baseline ranges. Therefore, it is considered that, at this point in time, the activities of Abel Underground Coal Mine are not having an effect on groundwater quality.

Reportable Incidents

No reportable incidents occurred during the reporting period.

Further Improvements

Monitoring will continue in accordance with the current Water Management Plan, however, as part of planned placement of the Abel Mine into care and maintenance from June 2016, all management and monitoring plans will be reviewed to ensure that the management measures and monitoring intensities during the care and maintenance period remain appropriate.

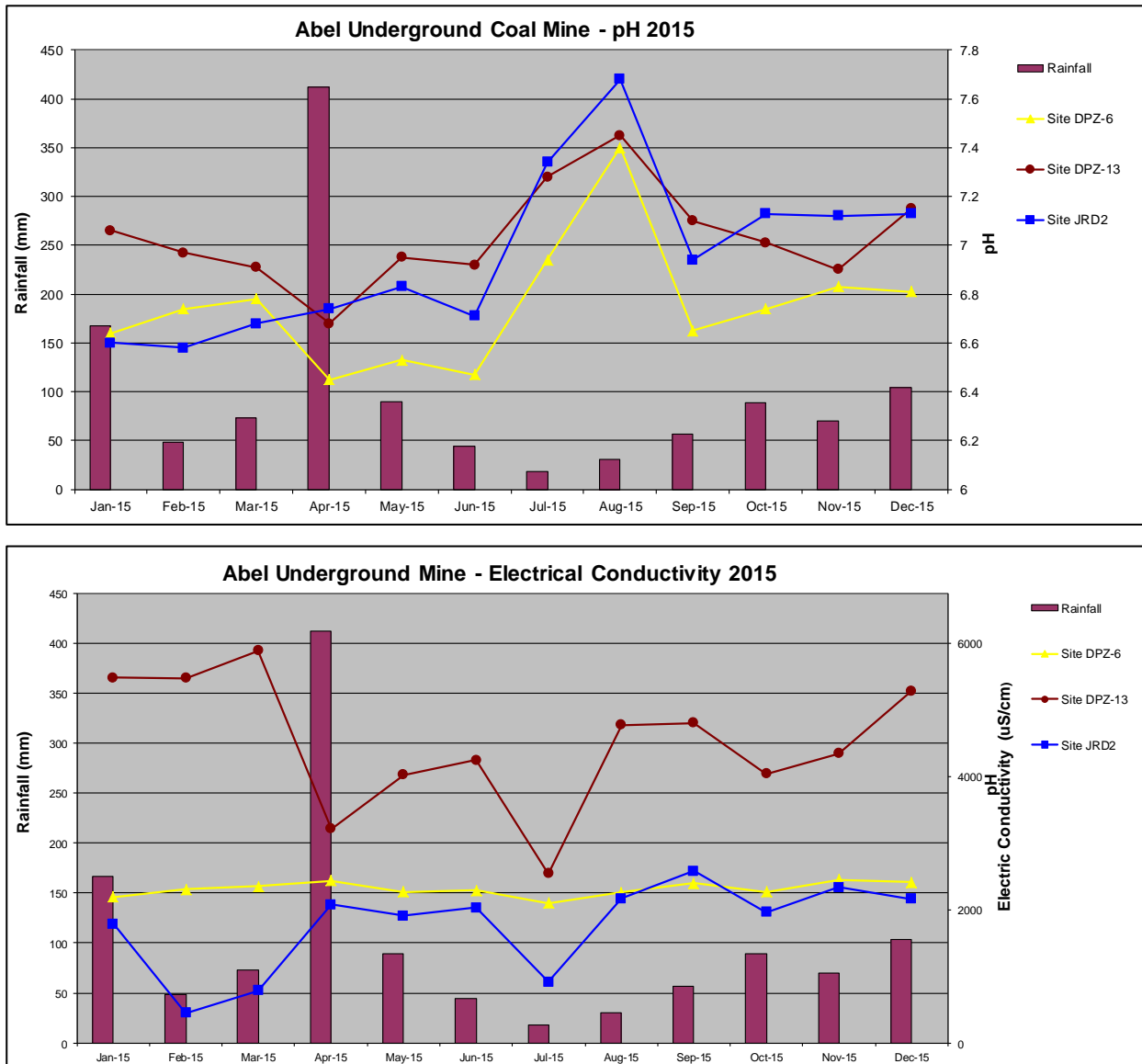


Figure 3.6 Groundwater Quality Monitoring Results – 2015

3.6 THREATENED FLORA AND FAUNA

Environmental Management

Underground workings occurred wholly or partly beneath 14 dams of habitat value during the reporting period, namely Dams 11, 12, 25, 27, 29, 30, 57, 58, 59, 60, 61, 62, 64 and 151. At the time of the 2015 survey, whilst two dams (Dams 27 and 29) were affected by subsidence. Kleinfelder considered that the data collected during 2015 continues to represent ‘baseline’ conditions.

No mining was undertaken during the reporting period within areas that would lead to subsidence under or near the Pambalong Nature Reserve or under sub-tropical rainforest. Hence, no specific flora or fauna management measures were required above these areas.

Environmental Performance

Ongoing survey work was completed by Kleinfelder Australia Pty Ltd 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 2, 3 and 4**).

Macroinvertebrate sampling also continued to be undertaken within Blue Gum Creek upstream of the Pambalong Nature Reserve by Niche Environment and Heritage during Spring and Autumn 2015 (see **Appendix 5**). A summary of the principal results is provided as follows.

Macroinvertebrate – Blue Gum Creek

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 and aquatic ecology diversity (utilising the SIGNAL index).

The RCE ranking ranged between 33 and 36 during the 2015 Autumn and Spring surveys. RCE scores between 20 and 40 reflect a stream in moderate condition and below 20 indicates a stream in poor condition. The 2015 RCE rankings are consistent with previous monitoring events.

Table 3.5 provides a summary of the biological characteristics recorded during monitoring undertaken to date. It is noted that the use of the SIGNAL2 index has been adopted in 2015 and results in a lower score than the original SIGNAL index utilised in previous monitoring.

The Autumn SIGNAL scores (between 4 and 5) indicate moderate pollution (from erosion, siltation, weeds and elevated salinity) which is consistent with previous SIGNAL scores. However, the Spring SIGNAL scores (<4) indicate severe pollution. The reduction in SIGNAL scores is unrelated to the Able or Tasman mining operations and is more likely related to disturbance factors such as roadways, weeds, agriculture, and past high flow events. Notwithstanding this, pollution sensitive taxa (Leptophlebiidae) were recorded at both sites in Autumn and upstream in Spring.

Dam Monitoring

Over time, the number of participants (land holders) with surveyed dams has declined due to a range of factors including lack of interest and changing ownership. In 2015, only 49 dams were surveyed for amphibians out of a possible 66 dams surveyed in 2008, only two out of the four dams were surveyed for Blue-billed Duck, and only 57 dams out of the original 87 were surveyed for *Maundia triglochinos*.

Species diversity and composition data for frogs, in addition to abundance for water-dependent bird species, were recorded at each of the targeted dams for the 2015 survey.

No frog species listed as threatened under State or Commonwealth legislation were recorded during field surveys. A total of eight species of frog were detected across all dams during the 2015 surveys. There remains a general pattern of decline in total frog species recorded since 2011

(see **Figure 3.7**) which appears to be correlated to average temperature in the 3 months preceding the survey. A more detailed statistical analysis is planned as part of the 2016 monitoring program to provide a more comprehensive understanding of this general pattern of decline.

Table 3.5
Summary of Biological Characteristics (Macroinvertebrates)

| Parameter | Date | Blue Gum Creek at Stockrington Road (upstream) | Blue Gum Creek at Dog Hole Road (downstream) |
|--------------------------|----------|--|--|
| Number of Taxa | 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 |
| | 01/11/12 | 28 | 20 |
| | 21/03/13 | 10 | 12 |
| | 29/09/13 | 22 | 16 |
| | 24/03/14 | 9 | 8 |
| | 15/09/14 | 20 | 13 |
| | 12/06/15 | 17 | 16 |
| | 07/10/15 | 15 | 2 |
| 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 |
| | 01/11/12 | 4.4 | 5.0 |
| | 21/03/13 | 4.9 | 5.6 |
| | 29/09/13 | 4.8 | 5.3 |
| | 24/03/14 | 4.8 | 3.2 |
| | 15/09/14 | 5.2 | 4.8 |
| SIGNAL2 (weighted) Index | 12/06/15 | 4.45 | 4.1 |
| | 07/10/15 | 3.29 | 3.17 |

Source: Niche Environment & Heritage and Robyn Tuft Associates.

A total of 61 bird species, including 23 waterbirds and 38 woodland/forest birds have been recorded between 2008 and 2015 across all of the dams surveyed. The 2015 surveys detected 37 species (9 waterbirds and 28 woodland/forest birds) across the two dams, the second highest since monitoring commenced (see **Figure 3.7**). Kleinfelder (2015b) concludes “*these results suggest that activity at the Abel underground mine has not had a negative impact on bird diversity at either of these dams*”.

One of the recorded bird species, the Grey-crowned Babbler, is listed as Vulnerable under the NSW *Threatened Species Conservation Act 1995* (TSC Act). A group of 6 individuals were observed foraging and tending to a nest in a Paperbark (*Melaleuca* spp.) overhanging Dam 7 (see **Plan 2B**) at the southwest end.

No individuals of the threatened plant, *Maundia triglochinos* were identified.

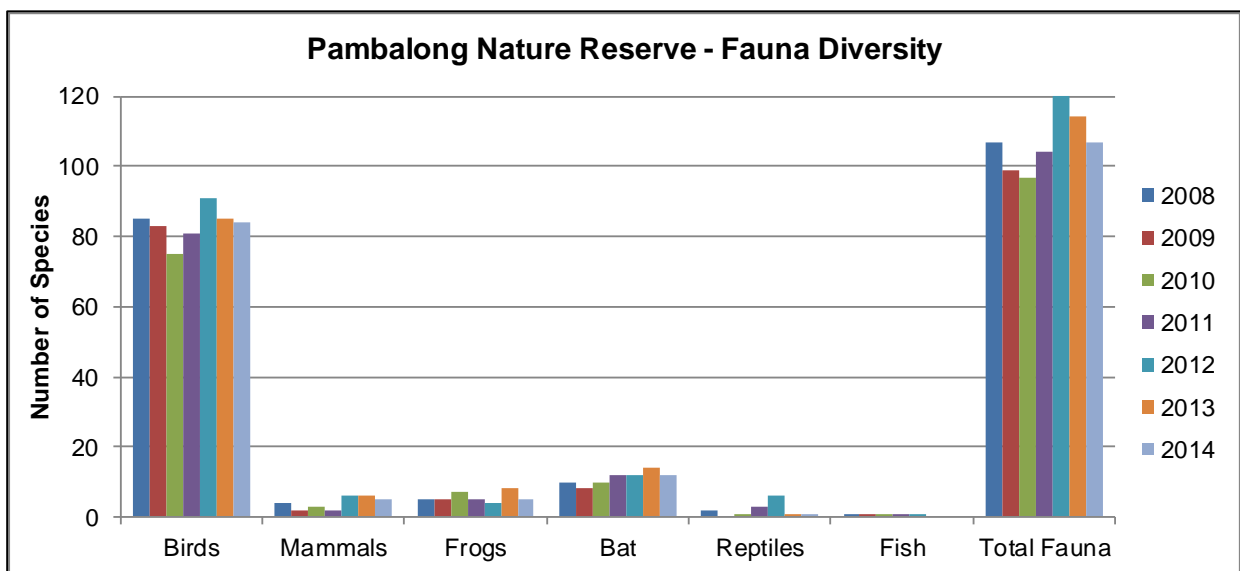
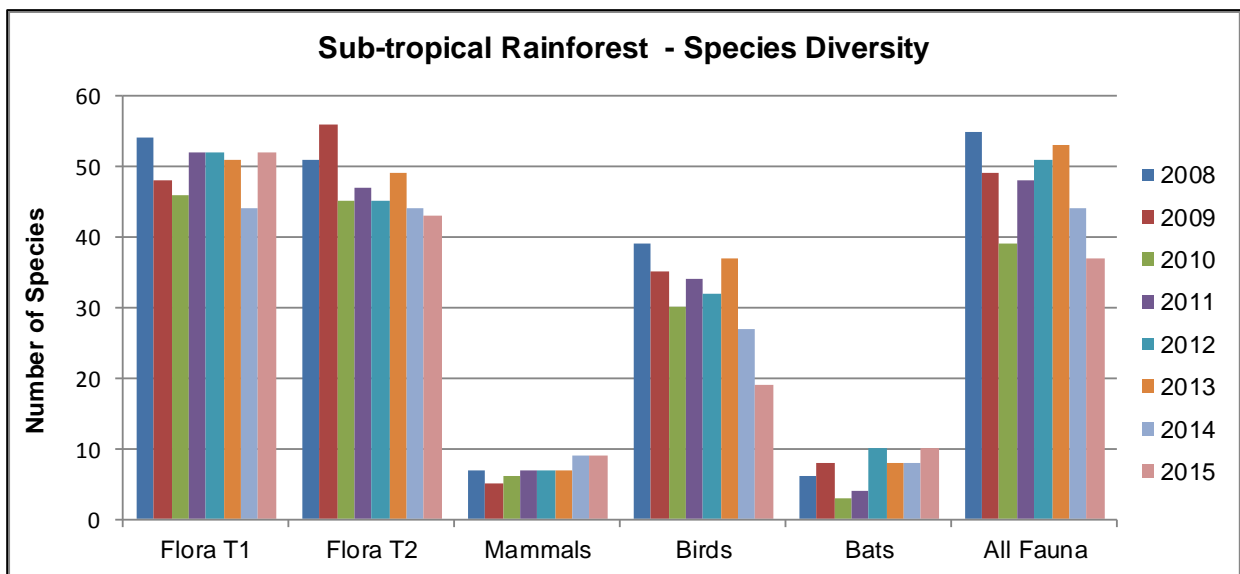
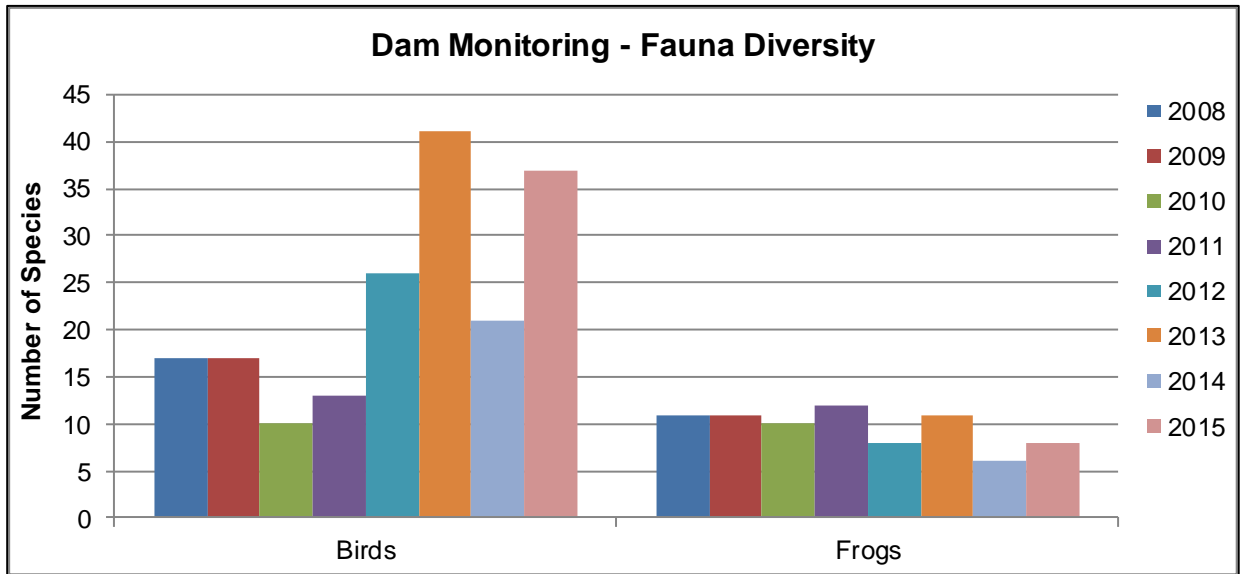


Figure 3.7 Selected Ecological Monitoring Results

Water level and quality monitoring (for pH and Electrical Conductivity) within dams that could potentially be affected by mining induced subsidence is undertaken pre and post mining in accordance with the individual property and dam management plans.

Sub-tropical Rainforest Monitoring

Annual monitoring has been conducted at Long Gully Creek for the past 8 years (2008 to 2015). The Subtropical Rainforest Monitoring Plan (SRMP) is designed to examine the stability of the rainforest/dry forest interface and floristic and faunal diversity. Whilst these areas have not yet been undermined, the information collected will allow best practice measures to be incorporated into the future Subsidence Management Plan(s) to be developed for this area.

The 2015 sub-tropical rainforest monitoring recorded a similar floral diversity compared to the 2008 baseline monitoring. Specifically 52 and 43 flora species were identified along each of the two monitoring transects in 2015 compared to 54 and 51 species in 2008 (see **Figure 3.7**). No threatened flora species were recorded during the survey.

The area of transition between dry and moist forest at Transect 1 has continued to expand since the 2008 baseline survey, with the width of the moist forest increasing. Specifically, along Transect 1, particularly at the end of the transect, there has been an increase in the number of moist species recorded and a decline in the number of dry species within each 5m segment. However, the forest transitional zones for Transect 2 recorded in 2015 occur in a similar location to that identified in the baseline study.

Along both Transect 1 and Transect 2 there has been a decline in Foliage Projection Cover (FPC) since the 2008 baseline survey. However, this is not an isolated occurrence in the current survey. When data from the 2015 survey are compared to that of the 2009 survey, the total FPC along both transects is relatively similar. The most distinct change observed within the forest in 2015 is an increase in groundcover and a decrease in canopy cover. It is important to note that severe storms occurred around Newcastle in 2015 which may have caused the loss of single trees. Light gaps are expected in rainforest systems and are important to drive regeneration.

In total, 38 fauna species were recorded, comprising six arboreal mammal species, three terrestrial mammal species, ten bat species and 19 bird species. Three of these species, the Little Bentwing-bat (*Miniopterus australis*), the Powerful Owl (*Ninox strenua*) and the Koala (*Pascolarctos cinerea*) are listed as vulnerable under the TSC Act and/or the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). No amphibians or reptiles were recorded. No feral species were recorded.

The 2015 survey recorded the highest number of bat and arboreal mammal species since monitoring began in 2008. Of note, the Little Forest Bat (*Vespadelus vulturnus*) and the Koala were recorded in 2015 for the first time since monitoring began in 2008. There was, however, a notable decline in bird numbers which is 13 species below the average of 32. Bird species diversity in 2014 was also below average.

An interesting observation was the recording of the Powerful Owl for the first time since 2012. Interestingly, Greater Gliders have been consistently recorded in the absence of the Powerful Owl. Comparing the presence/absence of gliders and owls shows a fluctuating pattern that might suggest that the Powerful Owls are regulating the Greater Glider population within the

study area and move throughout their territory as foraging efficiency becomes unprofitable. The return of Powerful Owls to the study area may coincide with an increase in glider numbers over the past few years. Further monitoring will show if this pattern continues over time.

No undermining of sub-tropical rainforest occurred during the reporting period or will occur for a number of years. The data collated continues to contribute to the baseline data set.

Pambalong Nature Reserve Monitoring

Whilst no mining occurred which could potentially impact upon the Pambalong Nature Reserve, monitoring was undertaken as part of the Pambalong Nature Reserve Monitoring Plan. The 2014/2015 survey represents the seventh year of baseline monitoring. The monitoring plan is aimed at building a picture of what constitutes normal variation so that any impacts from mining in the future can be identified, should they occur.

During the 2014/2015 survey a total of 107 fauna species consisting of 84 birds, five terrestrial mammals, 12 bats, one reptile and five frogs. Of these, five bat species, one bird species, and one mammal species are listed as threatened under the TSC Act and five species are introduced species.

No significant changes to the vegetation community extent and no additional flora species were recorded. A total of 190 flora species having been recorded since survey commenced in 2008, of which 68 are introduced species.

Reportable Incidents

No reportable incidents were recorded during the reporting period.

Further Improvements

Ongoing monitoring will continue to provide information to assist in assessing any potential impacts from subsidence and in formulating the subsidence management plans. During 2016, relevant dams will be reassessed for frog habitat to account for changes such as eutrophication from stock, fertiliser applications or other farming practices as opposed to changes resulting from mining. As recommended by Niche Environment and Heritage, consideration will also be given to the need for ongoing aquatic monitoring within Blue Gum Creek and/or whether the monitoring program is continued in its current form.

Furthermore, as it is planned to place the Abel Mine in care and maintenance from June 2016, all management and monitoring plans will be reviewed and the frequency and extent of all ecological monitoring will be reviewed.

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 Mine surface infrastructure area were controlled during the reporting period.

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.

3.8 BLASTING

Environmental Management and Performance

There were seven underground blasts carried out in 2015. These blasts were undertaken underground to fragment hard rock encountered as opposed to 'production' blasts for coal recovery.

As 'due diligence' monitoring of previous underground blasts recorded vibrations levels at the closest surrounding sensitive receivers no greater than 0.038mm/s, i.e. 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

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 used on the surface.

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 at four monitoring locations (see **Figure 3.1**) for quarters ending March, June, September and December 2015. Monitoring results are presented in **Table 3.6** and copies of the monitoring reports are presented within **Appendix 6**.

The findings of the monitoring surveys were that the Abel Mine operations were generally inaudible at the monitoring locations with noise attributable to non-mine related traffic, birds, cricket, insect and frog noise, wind and other extraneous sources. During some monitoring

events operations were audible at Locations I and L. The estimated contribution from the Abel operations was assessed as being below the criteria.

Table 3.6
Summary of Attended Noise Monitoring Results – 2015

| Location [#] | Time | Noise Criteria | Attended Monitoring | Noise generated by Abel Mine |
|--|--------------------------------------|----------------|---------------------|--|
| D Black Hill School, Black Hill | Day (L _A eq (15 min)) | 35 | <30-<34 | Abel not audible |
| | Evening (L _A eq (15 min)) | 35 | <30-<31 | Abel not audible |
| | Night (L _A eq (15 min)) | 35 | <30-<36 | Abel not audible |
| | Night (L _{A1} (1min)) | 45 | <30-<36 | Abel not audible |
| F Black Hill Rd, Black | Day (L _A eq (15 min)) | 35 | <35-<42 | Abel not audible |
| | Evening (L _A eq (15 min)) | 35 | <30-<44 | Abel not audible |
| | Night (L _A eq (15 min)) | 35 | <30-<39 | Abel not audible |
| | Night (L _{A1} (1min)) | 45 | <30-<39 | Abel not audible |
| G Buchanan Rd, Buchanan | Day (L _A eq (15 min)) | 35 | <30-<33 | Abel not audible |
| | Evening (L _A eq (15 min)) | 35 | <31-<39 | Abel not audible |
| | Night (L _A eq (15 min)) | 35 | <30-<35 | Abel not audible |
| | Night (L _{A1} (1min)) | 45 | <30-<35 | Abel not audible |
| I Lord Howe Drive, Ashtonfield | Day (L _A eq (15 min)) | 36 | <32-<37 | Abel not audible |
| | Evening (L _A eq (15 min)) | 36 | 31-<45 | Abel Mine audible – estimated LAeq(15min) contribution 31dBA |
| | Night (L _A eq (15 min)) | 36 | <30-<34 | Abel not audible |
| | Night (L _{A1} (1min)) | 45 | <30-<34 | Abel not audible |
| J Parish Drive, Thornton | Day (L _A eq (15 min)) | 35 | <30-<37 | Abel not audible |
| | Evening (L _A eq (15 min)) | 35 | <30-35 | Abel not audible |
| | Night (L _A eq (15 min)) | 35 | <30-<32 | Abel not audible |
| | Night (L _{A1} (1min)) | 45 | <30-<32 | Abel not audible |
| L 7 Kilshanny Av, Ashtonfield | Day (L _A eq (15 min)) | 40 | <30-30 | Abel not audible |
| | Evening (L _A eq (15 min)) | 40 | 30-34 | Abel Mine audible - estimated LAeq(15min) contribution <30dBA to 34dBA |
| | Night (L _A eq (15 min)) | 40 | <30-33 | Abel Mine audible - estimated LAeq(15min) contribution 33dBA |
| | Night (L _{A1} (1min)) | 47 | <30-<37 | Abel mine - estimated L _{A1} (1min) contribution 35dB(A) |

[#] See Figure 3.1.

Night time sleep disturbance criteria (L_{A1}(1min)) were in compliance during all monitoring events with the Abel mine either not audible or the estimated contribution being well below the criteria.

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. As part of planned placement of the Abel Mine into care and maintenance from June 2016, all management and monitoring plans will be reviewed to ensure that the management measures and monitoring intensities during the care and maintenance period remain appropriate.

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

All mining during reporting period occurred within SMP Areas 3 and 4 with secondary workings undertaken within Panels 25, 26, 27, 28 and 30.

Within SMP Area 3 there are six sites (artefact scatters – AMA2/A, AMA2/B, AMA2/C, CA6, F1/B and FMC6) located above or in close proximity to Panels 24 and 25 (see **Plan 2B**). Two cultural places (Black Hill Locality and Black Hill Pathway) are also partly located within SMP Area 3 above the southern end of Panel 25. Previous heritage assessment predicted that no impacts would occur and none of the sites within SMP Area 3 are specified sample monitoring sites.

Within SMP Area 4 there are six sites (four open artefact sites, a scarred tree and cultural place) located above Panels 27, 29, 32 and the West Mains (see **Plan 2B**) of which five were previously identified and one was identified during further heritage survey completed in July 2015. Similarly, previous heritage assessment has predicted no impacts to these sites, however, one of these sites, 38-4-0670, a previously identified scarred tree, is a specified sample monitoring site for sites which no subsidence-related impacts are expected to occur. Attempts were made to re-survey the site during the July 2015 heritage survey, however, it could not be found.

In accordance with the August 2014 *Abel Underground Mine: Aboriginal Heritage Management Plan* (Donaldson Coal, 2014), annual reporting documenting the results of monitoring undertaken in accordance with the plan will be prepared and provided to either the Mindaribba or Awabakal Local Aboriginal Land Councils (LALCs) (as applicable to the area monitored), DPE and OEHL. As additional heritage surveys and reporting was completed in July 2015 in consultation with the Mindaribba LALC, separate annual reporting was not prepared. The first of the annual reports is therefore planned during the 2016 reporting period.

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 firefighting 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

To date four Subsidence Management Plan (SMP) areas have been prepared for the mine (see **Plan 2A** and **2B**). All mining during the reporting period occurred within SMP Areas 3 and 4. As part of each SMP, subsidence monitoring programs have been prepared together with required environmental and public safety management plans. Copies of all relevant SMP assessment reports and management plans are available on the Company's website.

Environmental Performance, Reportable Incidents and Further Improvements

During the reporting period secondary workings were undertaken within Panels 25, 26, 27, 28 and 30. **Table 3.7** provides a summary of the SMP approval, extraction commencement and extraction completion dates for all panels worked to during the reporting period.

Subsidence monitoring has been conducted over all 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 against predicted levels for panels within which extraction occurred during this reporting period. A comparison for all panels completed to date is provided within the Subsidence Management Reports (see **Appendix 9**).

Table 3.7
Panel Approval and Extraction Summary

| Panel | SMP Approval Date | Extraction Commenced | Extraction Completed |
|----------|-------------------|----------------------|----------------------|
| Panel 25 | 16 July 2013 | 11 May 2014 | 8 May 2015 |
| Panel 26 | 16 July 2013 | 11 August 2014 | 17 June 2015 |
| Panel 27 | 19 September 2014 | 30 September 2014 | 12 August 2015 |
| Panel 28 | 19 September 2014 | 11 May 2015 | Not Yet Complete |
| Panel 30 | 19 September 2014 | 22 June 2015 | Not Yet Complete |

Source: Donaldson (2016)

Table 3.8
Predicted versus Measured Subsidence Levels – 2015

| Panel | Monitoring Parameter | SMP Prediction | Final Measured |
|----------|--------------------------|--------------------|-------------------|
| Panel 25 | <130m Cover | | |
| | Subsidence | 1,300mm | 1,087mm |
| | Tensile Strain | 30mm/m | 21mm/m |
| | Compressive Strain | 30mm/m | 9mm/m |
| Panel 26 | <130m Cover | | |
| | Subsidence | 1,300mm | 803mm |
| | Tensile Strain | 30mm/m | 9mm/m |
| | Compressive Strain | 30mm/m | 9mm/m |
| Panel 27 | 70m to 170m Cover | | |
| | Subsidence | 1,450mm | 1,163mm |
| | Tensile Strain | >30mm/m | 7mm/m |
| Panel 28 | 95m to 190m Cover | | |
| | Subsidence | 1,450mm | Not Yet Completed |
| | Tensile Strain | >30mm/m | |
| Panel 30 | 98m to 233m Cover | | |
| | Subsidence | 1,450mm | Not Yet Completed |
| | Tensile Strain | >30mm/m | |
| | | Compressive Strain | >30mm/m |

Source: Donaldson Coal (2016). **Bold** values indicate exceedances.

All final measurements for subsidence, tilt and strain results for panels completed during the reporting period were within the predicted range.

During the reporting period a range of additional subsidence monitoring was undertaken in accordance with the approved monitoring programs. A summary of the outcomes of this monitoring is outlined as follows.

- Surface cracking occurred above the worked panels within vegetated areas, cleared areas and access tracks. Surface cracking remained within predictions and remedial works were completed in consultation with the relevant landowners.
- Impacts upon Blackhill Road due to mining included cracking and pipe separation of up to 30mm at a 1500mm culvert beneath Blackhill Road above Panel 26. The Principal Subsidence Engineer was notified on 19 January 2015 regarding the culvert and the culvert remediated. No additional remediation of the culvert has been required.
- Notification was also provided on 01 October 2015 in relation to humping on Blackhill Road. Remediation was completed in accordance with the road management plan.
- All other repairs to Blackhill Road and Meredith Road were completed in accordance with the 24hr monitoring program and road management plan. Both roads remained in a safe and serviceable condition.
- All subsidence impacts on the Hunter Water Corporation Waterline, Ausgrid Powerlines and TransGrid Transmission Towers were within predicted levels with no subsidence impacts or management actions required during the reporting period.
- Cracking and water loss occurred above Panel 27 from Dam C04d07 (Dam 29 – see **Plan 2B**) on Lot 611 DP 1035588. In accordance with the Dam Monitoring Management Strategy for the property, the landowner and the Mine Subsidence Board (MSB) were notified and pumping of the water to an adjacent dam to prevent any further loss of water commenced. Remediation was undertaken by the MSB in consultation with Donaldson and the Landowner.
- 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 approvals or plans.

Monitoring including subsidence surveys and photographic and visual monitoring will be continued in accordance with the approved Subsidence Management Plans.

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. Excess waste oil drums that were stored outside of bunded areas were removed from site and a purpose built storage container is provided for additional storage.

Environmental Performance, Reportable Incidents and Further Improvements

Whilst improper storage of hydrocarbons required rectification during the reporting period, no reportable hydrocarbon-related incidents occurred.

The existing hydrocarbon management practices will continue to be implemented with emphasis on continued inspections to ensure appropriate hydrocarbon storage. No further improvements are 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. Notwithstanding this, as mining has progressed ventilation has been improved through the construction of a downcast ventilation shaft in 2010 and an upcast ventilation shaft in 2011. The ventilation fan from the portal area was subsequently relocated to the upcast shaft in 2012 improving ventilation and reducing air flow velocities. No further changes to ventilation were required during the current reporting period or 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

During 2015, there were a total of five complaints received in relation to the Abel Mine. These related to the following.

- Noise x 2
- Odour x 1
- Subsidence x 2

Both noise complaints were made to the EPA and related to truck noise. No changes to trucking operations had been made and noise monitoring indicated compliance with applicable criteria. Further, one complaint specified a time for the noise of concern. No trucking operations were being undertaken by Donaldson at that time. Therefore, it is considered likely that the noise source was not the Abel mine operations. No further noise complaints have been received.

The odour complaint was made via the EPA and did not relate to the Abel mine. No further follow up was required.

Two complaints were also received regarding subsidence impacts. All measured subsidence impacts were within predicted ranges and were repaired in accordance with the subsidence management plans. No further follow up was required.

Since the commencement of operations at the Abel Mine there has been only one other complaint (received in 2009 relating to stray light).

4.2 COMMUNITY LIAISON

The principal formal community consultation undertaken is the Community Consultative Committee. In accordance with *Schedule 6 Condition 6* of the modified 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 at each meeting (included during the year, Messrs Phillip Brown, Tony Sutherland, David Gibson, Adam Heeney, Aaron McGuigan and Matthew Wright and Mrs Alarna Bristow and Mrs Linda Clough);
- a representative from Bloomfield Colliery (Mr Greg Lamb);
- five representatives of the local community (Messrs Alan Brown, Allan Jennings, Terry Lewin, Andrew Pace and Brad Ure); and
- One representative from Cessnock Council (Mr Ian Turnbull).

No representative from the Maitland City Council was present at the committee meetings during the reporting period.

The committee was chaired by the Hon Mr Milton Morris, an independent chairperson appointed by the NSW State government until his retirement at the meeting held 22 June 2015. Mr Morris had been the Chairman since the inception of the Abel Mine. Following Mr Morris' retirement, Ms Margaret McGraw Hill was appointed as the independent Chair by the Secretary, Department of Planning and Environment.



The committee held a total of four meetings during the reporting period (09 March, 22 June, 14 September and 07 December 2015). 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 meeting to provide updates on the mine development, environmental monitoring, subsidence management planning and other relevant matters.

5. REHABILITATION

5.1 BUILDINGS

No permanent buildings were renovated or removed during the reporting period.

5.2 REHABILITATION OF DISTURBED LAND

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 relevant to the surface infrastructure area.

Table 5.1
Rehabilitation Summary

| | Area Affected (ha) | | |
|---|---------------------------------------|-------------------------------------|---|
| | Total Area, start of Reporting Period | Total Area, end of Reporting Period | Area Estimated end of next Reporting Period |
| A: MINE LEASE AREA | | | |
| 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) | 11.02* | 11.02* | 11.02* |
| B2: Active Mining Area (excluding items B3 - B5 below) | 386 (underground) | 422 (underground) | 424 (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 | 397.02 | 433.02 | 435.02 |
| 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, 0.23ha for the downcast ventilation shaft and 0.58ha relating to the upcast ventilation shaft. | | | |
| [^] Excludes rehabilitation of surface cracks resulting from subsidence. | | | |

As the Abel Mine is an underground operation, the only significant rehabilitation will be during mine decommissioning. During the reporting period rehabilitation activities within the surface infrastructure area related to regular inspection and maintenance of previously rehabilitated areas and retained vegetation.

Above the underground mining area, minor rehabilitation works were 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. Road repair works were also completed for Blackhill Road in accordance with the Blackhill Road Management Plan. All road cracking was within predicted levels. Cracking to a 1,500mm culvert for Blackhill Road was also repaired.

Table 5.2
Maintenance Activities on Rehabilitated Land – Surface Infrastructure Area

| 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 (e.g. 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 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 | 0 | No re-seeding or re-planting was required during the reporting period. |
| Adversely Affected by Weeds | 20 | 20 | No areas were specifically identified within ML 1618 as being adversely affected by weeds although 'spot' treatment of Pampas Grass was undertaken (as opposed to treatment of an infested area) across the entire surface infrastructure area (i.e. ~20ha). Continued inspections and, where necessary, weed control will be undertaken. |
| Feral Animal Control | 0 | 0 | No feral animal control was deemed necessary within the surface infrastructure area during the reporting period. |
| * Indicative only | | | |

5.3 OTHER INFRASTRUCTURE

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

The Rehabilitation Management Plan was updated in August 2014 and submitted on 7 August 2014 in accordance with modified Project Approval 05_0136.

An updated Mining Operations Plan, prepared in accordance with the *Mining Operations Plan Guidelines September 2013*, was subsequently approved by DRE on 13 November 2014. The Mining Operations Plan incorporates performance and completion criteria for rehabilitation in accordance with guidelines and consistent with the Rehabilitation Management Plan. No further changes were made during the reporting period.

6. ACTIVITIES PROPOSED DURING THE NEXT AEMR PERIOD

The activities proposed for 2016 will include the continued expansion of mining areas, prior to the placement of the mine into care and maintenance in June 2016. The following provides a summary of the proposed activities.

Exploration

During the next reporting period a further 13 exploration holes are currently planned. The holes will be fully or partly cored diamond drill holes targeting the Lower Donaldson Seam.

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 and second workings within Panels 28, 30 and 31, and commencement of first workings in Panel 32. The planned mining activities are shown in **Plans 2a** and **2b**. It is estimated that in the order of 435,000t of ROM coal will be extracted during the next reporting period.

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. Any surface cracks that appear will be backfilled, compacted, topsoiled and seeded and ongoing repairs to any subsidence damage to public roads will be completed in accordance with the approved subsidence monitoring and management plans.

Monitoring

The following monitoring will be undertaken during the next reporting period. It is noted that all monitoring programs will be reviewed to ensure that the monitoring during the planned care and maintenance period remains appropriate.

- Air Quality – ongoing deposited dust, TSP and PM₁₀ monitoring will continue to be undertaken.
- 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 as part of the integrated monitoring with the Bloomfield, Donaldson and Tasman Mines.
- Groundwater – ongoing groundwater quality and level monitoring will be undertaken by 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.

- Noise – quarterly noise monitoring will continue and the frequency for ongoing monitoring reviewed.
- Flora & Fauna – flora and fauna surveys and reporting will continue to be undertaken in accordance with approved Flora and Fauna Management Plan.
- Meteorological – the on-site meteorological station at the Abel Mine will be maintained and data collated.
- Subsidence monitoring will continue to be undertaken in accordance with the approved subsidence monitoring programs.

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*.
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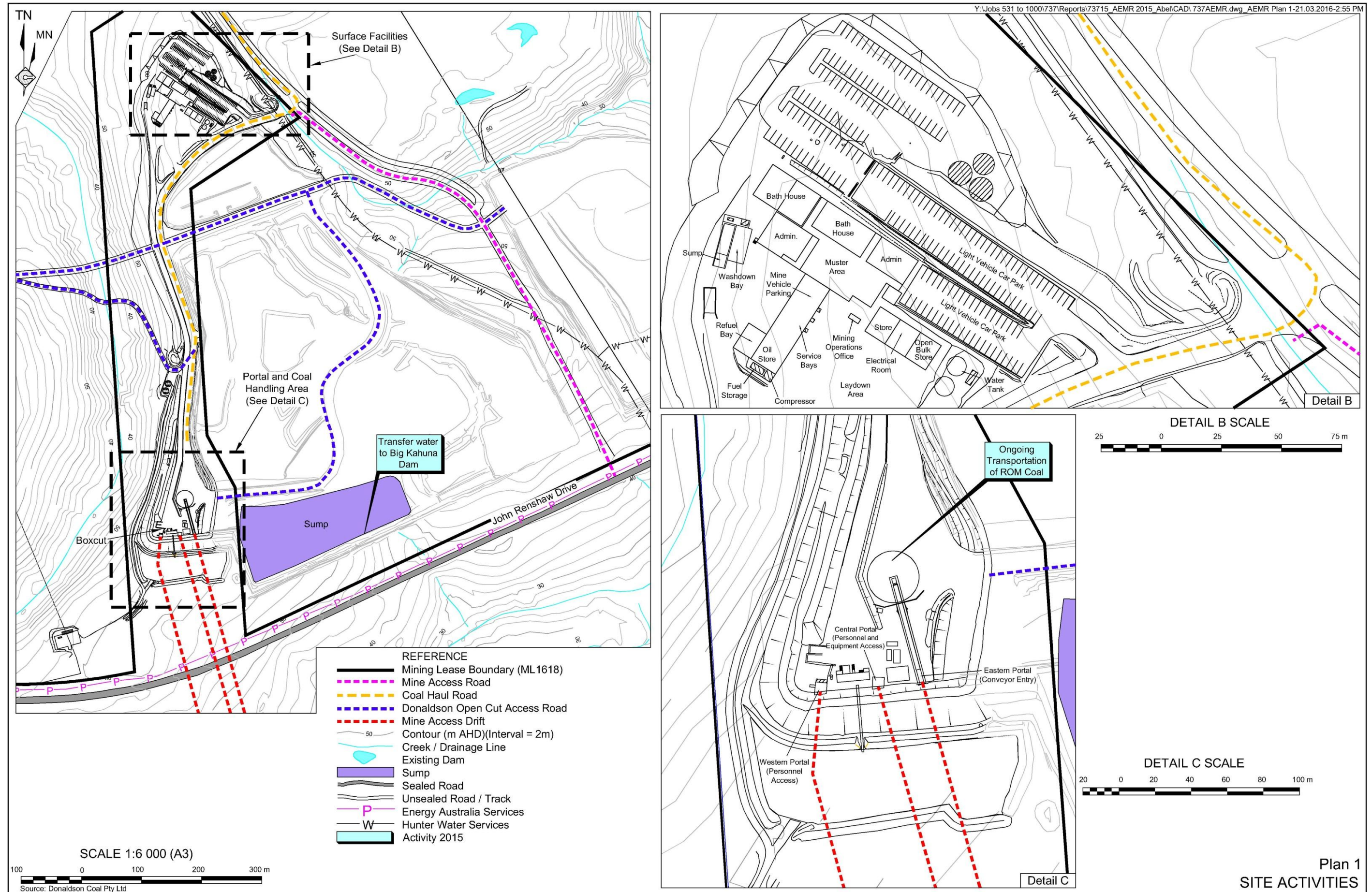


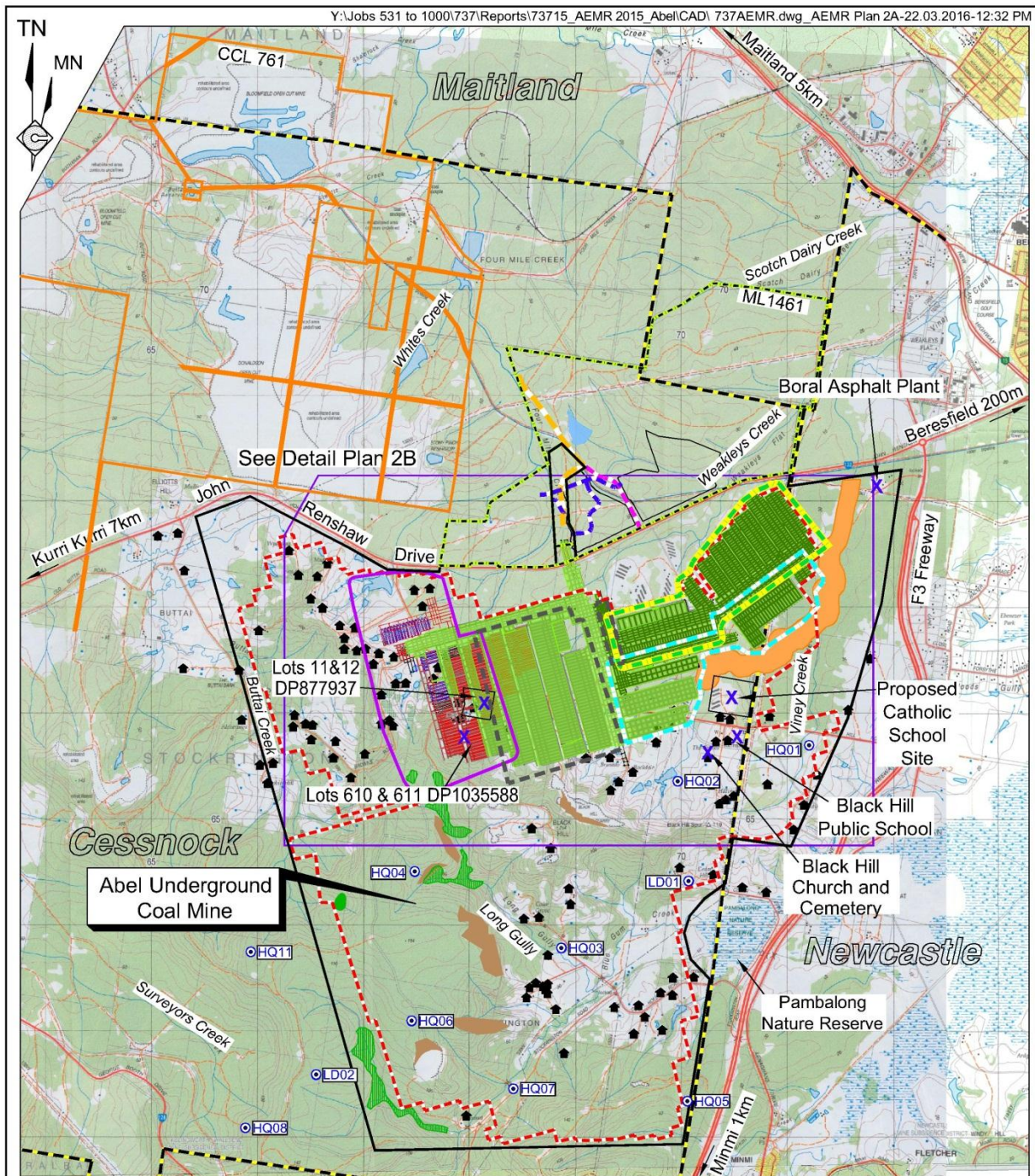
Plans

| | |
|----------------|--|
| Plan 1: | Site Activities |
| Plans 2A & 2B: | Mining Activities |
| Plan 3: | Rehabilitation Activities (1 January to 31 December 2015) |

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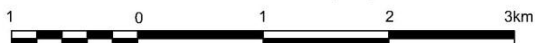




REFERENCE

- | | |
|--|---|
| <ul style="list-style-type: none"> LGA Boundary (offset for clarity) CCL 761 Boundary ML 1461 Boundary Mining Lease Boundary (ML1618) Underground Workings (Prior to this AEMR) Underground Workings 2015 1st Workings / 2nd Workings Underground Workings (2016 - Indicative) Underground Workings (Mine Life - Indicative) Planned Exploration Hole (2016) | <ul style="list-style-type: none"> Viney Creek Subsidence Control Zone Coal Haul Road to Internal Mine Road Donaldson Open Cut Access Road Mine Access Road Rainforest Cliffs Place of Interest SMP Area 1 Boundary SMP Area 2 Boundary SMP Area 3 Boundary SMP Area 4 Boundary Residence |
|--|---|

SCALE 1:60 000 (A4)



Data Source: Donaldson Coal Pty Ltd
Base Map Source: Beresfield (2001) 1:25 000 Topographic Map

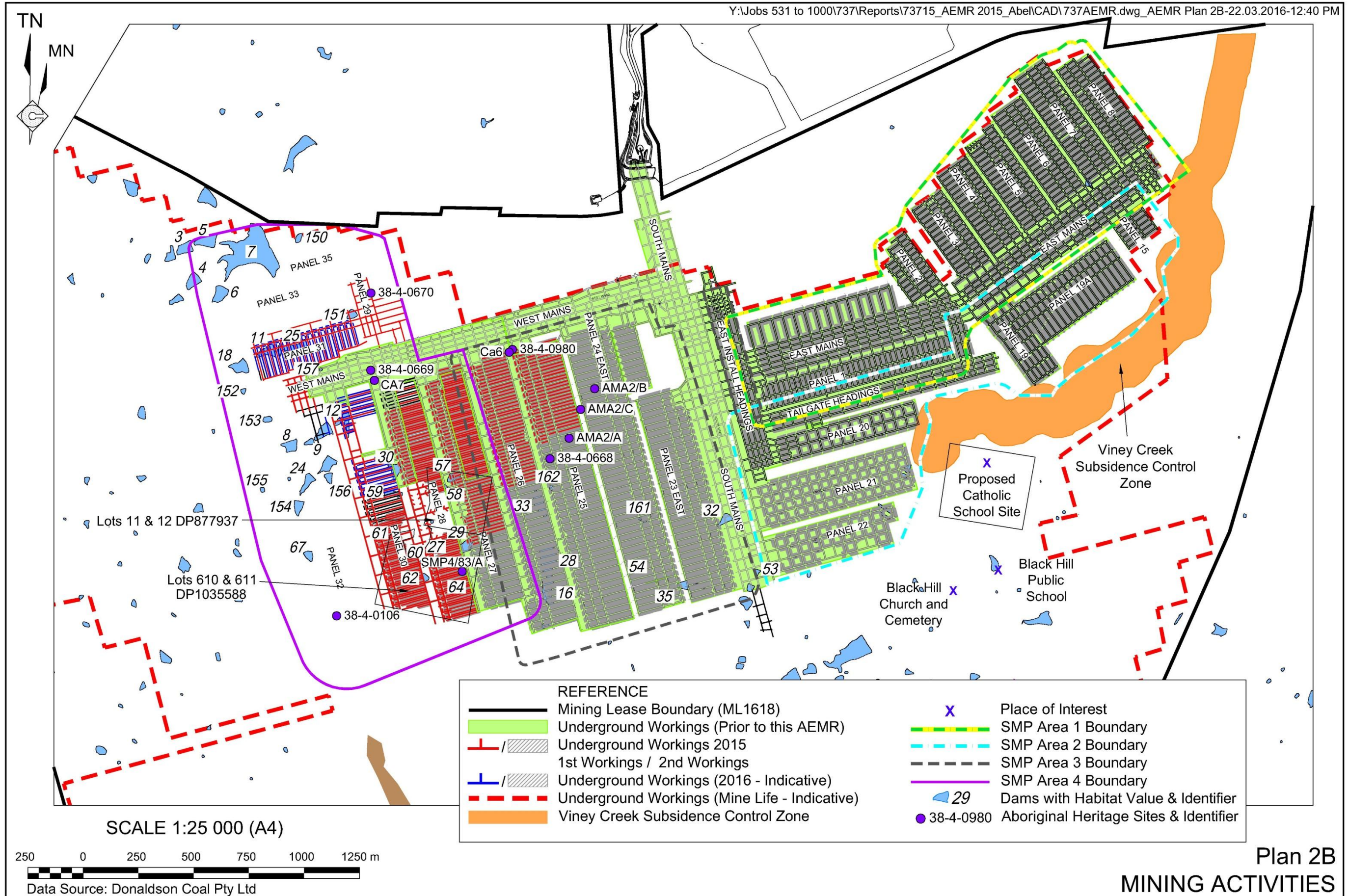
Plan 2A
MINING ACTIVITIES



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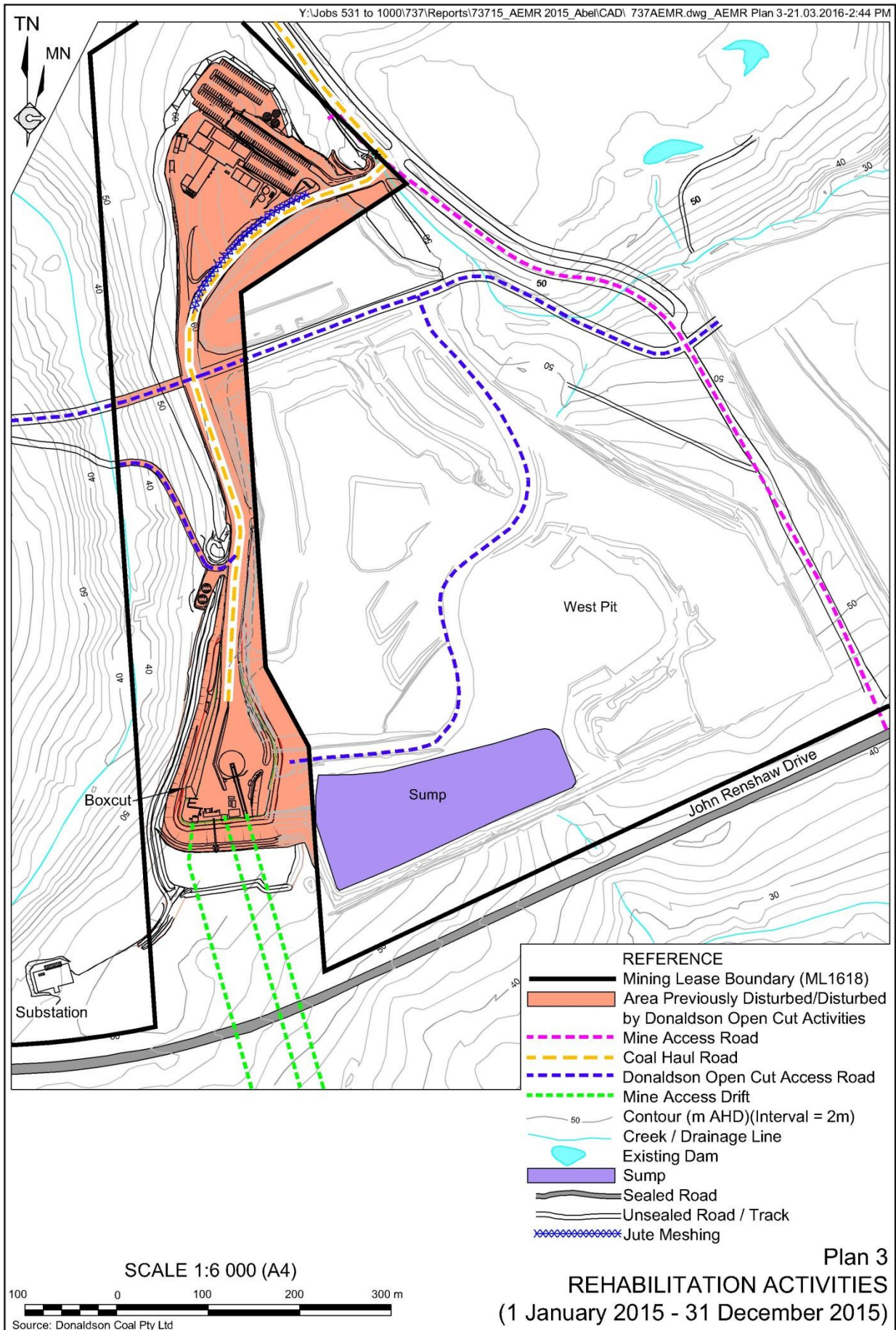
| REFERENCE | |
|-----------|--|
| | Mining Lease Boundary (ML1618) |
| | Underground Workings (Prior to this AEMR) |
| | Underground Workings 2015 1st Workings / 2nd Workings |
| | Underground Workings (2016 - Indicative) |
| | Underground Workings (Mine Life - Indicative) |
| | Viney Creek Subsidence Control Zone |
| | Place of Interest |
| | SMP Area 1 Boundary |
| | SMP Area 2 Boundary |
| | SMP Area 3 Boundary |
| | SMP Area 4 Boundary |
| | 29 Dams with Habitat Value & Identifier |
| | 38-4-0980 Aboriginal Heritage Sites & Identifier |

SCALE 1:25 000 (A4)

250 0 250 500 750 1000 1250 m

Data Source: Donaldson Coal Pty Ltd

Plan 2B
MINING ACTIVITIES



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