



WHITEHAVEN COAL

Tarrawonga Coal Pty Ltd

ABN: 73 100 742 185

**Annual Environmental
Management Report (ML 1579,
ML 1685 & ML 1693) and
Annual Review (PA 11_0047)**

for the

Tarrawonga Coal Mine



1 May 2013 – 30 April 2014

Tarrawonga Coal Pty Ltd

Annual Environmental Management Report (ML 1579, ML 1685 & ML 1963) and Annual Review (PA 11_0047)
for the
Tarrawonga Coal Mine

MOP Commencement Date **1-11-2013** – Nominal MOP Completion Date **31-10-2015**
AEMR Commencement Date **1-05-2013** – AEMR Completion Date **30-04-2014**

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- NSW Office of Water
- Gunnedah Shire Council
- Narrabri Shire Council
- Tarrawonga Coal Mine Community Consultative Committee

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ACRONYMS USED THROUGHOUT THIS DOCUMENT

AEMR	- Annual Environmental Management Review
AQGHGA	- Air Quality and Greenhouse Gas Assessment
BCD	- Bollol Creek Downstream
BCU	- Bollol Creek Upstream
BOS	- Biodiversity Offset Strategy
CCC	- Community Consultative Committee
CHPP	- Coal Handling and Preparation Plant
DA	- Development Application
DECCW	- Department of Environment, Climate Change and Water (now EPA)
DoP	- Department of Planning (now DoPI)
DoPI	- Department of Planning and Infrastructure
DRE	- Division of Resources and Energy
EA	- Environmental Assessment
EC	- Electrical Conductivity
EEO	- Energy Efficiency Opportunity
EIS	- Environmental Impact Statement
EL	- Exploration Licence
EPA	- Environment Protection Authority
EPL	- Environment Protection Licence
LOM	- Life-of-Mine
ML	- Mining Lease or Megalitres
MOP	- Mining Operations Plan
MSDS	- Material Safety Data Sheet
NCD	- Nagero Creek Downstream
NCU	- Nagero Creek Upstream
OEH	- Office of Environment and Heritage
PEA	- Preliminary Environmental Assessment
PM ₁₀	- Particulate Matter 10 microns in diameter or smaller
PRP	- Pollution Reduction Program
ROM	- Run-of-Mine
SB	- Sediment Basin
SD	- Storage Dam
SWL	- Standing Water Level
TCM	- Tarrawonga Coal Mine
TCPL	- Tarrawonga Coal Pty Ltd
TSP	- Total Suspended Particles
TSS	- Total Suspended Solids
WCL	- Whitehaven Coal Limited
WC MPL	- Whitehaven Coal Mining Pty Ltd

1 INTRODUCTION AND OBJECTIVES

1.1 Scope

1.1.1 Introduction and Period of Reporting

This is the eighth Annual Environmental Management Report (AEMR) produced for the Tarrawonga Coal Mine, and it has been prepared in accordance with Condition 3 of Mining Lease ML 1579 and ML 1685 and Condition 4 of ML 1693 (Mining Act 1992), and Condition 4 (Schedule 5) of PA 11_0047. The current Mining Operations Plan for Tarrawonga was prepared under the new guidelines “*ESG3: Mining Operations Plan (MOP) Guidelines*”. There are currently no guidelines associated with the preparation of AEMRs in the new format and therefore this AEMR generally follows the format identified in the Department of Primary Industries Mineral Resources (DPI-MR) document, entitled “*Guidelines to the Mining, Rehabilitation and Environmental Management Process*”, Version 3 dated January 2006. It also addresses Condition 4 (Schedule 5) of PA 11_0047, which requires provision of an Annual Review and is herein referred to as an AEMR/Annual Review.

Though primarily covering the period from 1st May 2013 to 30th April 2014 (the reporting period), where relevant the AEMR/Annual Review provides information on historical aspects of the operations, longer term trends in environmental monitoring results and provides relevant information on activities to be undertaken during the ensuing period, i.e. from 1st May 2014 to 30th April 2015, or beyond.

1.1.2 The Company

The Tarrawonga Coal Mine (TCM) is located approximately 15km northeast of Boggabri, 10km north of the former Canyon Coal Mine (in closure) and south of, and adjacent to, the Boggabri Coal Mine (Figure 1). The mine site is contained within Mining Lease (ML) 1579, ML 1685 and ML 1693, as shown in Figure 1. The mine is being developed by Tarrawonga Coal Pty Ltd (TCPL), a joint venture between Whitehaven Coal Mining Pty Ltd (WCMPL) (70%) and Idemitsu Boggabri Coal Pty Ltd (IBC) (30%), and operates under Environment Protection Licence (EPL) 12365 and Project Approval (PA) 11_0047. WCMPL is a subsidiary company of Whitehaven Coal Limited (WCL), a publicly listed company which has several coal mining interests in the Gunnedah region of NSW. The mine is operated by WCMPL.

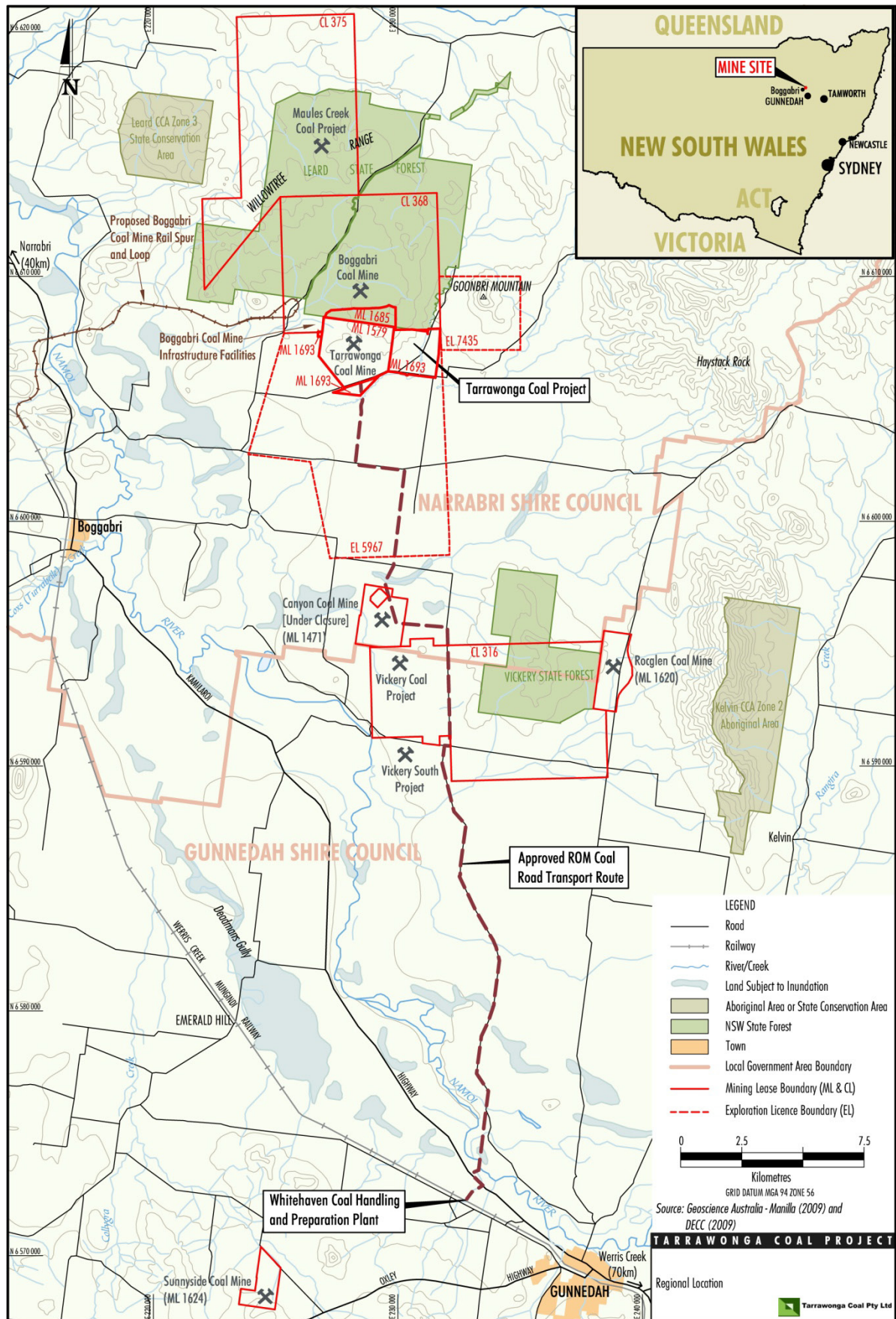


Figure 1 - Regional Location

WCL's coal mining assets are as follows:

- Canyon Coal Mine (formerly Whitehaven Coal Mine), 10km south of Tarrawonga, 100% owned by WCL, which ceased production in July 2009 and is currently under final rehabilitation;
- Whitehaven Rail Siding and Coal Handling and Preparation Plant (CHPP), 6km north-west of Gunnedah, 100% owned by WCL;
- Werris Creek Coal Mine, 4km south of Werris Creek, 100% owned by WCL;
- Narrabri Underground Coal Mine, 30km south-southeast of Narrabri, 70% owned by subsidiary company Narrabri Coal Pty Ltd. Production commenced mid 2010;
- Rocglen Coal Mine (formerly Belmont Coal Mine), 28km north of Gunnedah, 100% owned by WCL, which commenced operations in 2008;
- Sunnyside Coal Mine, 15km south west of Gunnedah, 100% owned by subsidiary company Namoi Mining Pty Ltd, which commenced production in 2008 and remained in care and maintenance during the reporting period;
- WCL also has 100% ownership of the Bonshaw project near Ashford;
- 100% ownership of the former Gunnedah Colliery through Namoi Mining Pty Ltd;
- 100% ownership of the former Vickery site and adjacent deposits, with the environmental assessment for the Vickery Project completed currently pending determination;
- 75% ownership of the Maules Creek Project, via the Aston Resources/Whitehaven merger, with joint venture partners ITOCHU (15%) and J-Power (10%). The Maules Creek Project has conditional approval with construction work commencing in the near future;
- 100% ownership of Dingo, Sienna and Monto projects (QLD) and Ferndale and Oaklands projects (NSW) via the Whitehaven/Coalworks merger; and
- WCL is also actively pursuing other prospective tenements with a view of maintaining a long-term presence in the Gunnedah Basin.

1.1.3 Background and History of the Tarrawonga Coal Mine

The Tarrawonga Coal Mine was developed after substantial investigations were undertaken under Exploration Licence 5967, granted in July 2002. Following completion of relevant assessments and studies, the Department of Planning

provided approval to the development via Development Consent (DA-88-4-2005) on the 9th November 2005. Environment Protection Licence (EPL) 12365 was also granted on 9th January 2006.

The Development Consent provided for the extraction of approximately 12.4 million tonnes of ROM coal, at a maximum rate of 2 million tonnes per year. The consent allowed for the crushing and screening of ROM coal at the mine site prior to transport to the Whitehaven CHPP near Gunnedah. It also allowed for the disposal of rejects from the Whitehaven CHPP at the mine.

Prior to commencement of operations in 2006, a Mining Operations Plan (MOP) was developed for a period of up to 6 years, until February 2012. In late 2009, following additional exploration works, an extension of the open cut pit limit and modifications to the northern and southern waste emplacements were identified to enable access to a further 4 million tonnes of coal. Consequently, a modification to the original consent DA-88-4-2005 was applied for under Section 75W of the *Environmental Planning and Assessment Act*. This modification was approved on 15th October 2010. As a consequence of this approval, an amendment to the existing MOP was developed, and subsequently approved, by the former I&I NSW in December 2010 (effective from the period 1st July 2010 – 30th June 2013).

In 2011, TCPL sought approval under the now repealed Part 3A, Section 75J of the EP&A Act for a continuation and extension of operations. The potential environmental impacts associated with the extension were assessed in the *Tarrawonga Coal Project Environmental Assessment* (Whitehaven Coal Pty Ltd, 2012). The extension project would allow continued development of the mining operations to facilitate a run-of-mine (ROM) coal production rate of up to 3 million tonnes per annum, and life of mine to 2030. PA 11_0047 was granted on 22nd January 2013 by the Planning Assessment Commission as the delegated approval authority, and received conditional federal approval on the 11th March 2013.

Subsequent to PA 11_0047 and conditional Federal approval, a new MOP was prepared in accordance with *“ESG3 Mining Operations Plan (MOP) Guidelines, September 2013”* and approved by DRE on 23rd October 2013. MOP Amendment A, which incorporated an additional road to the offsite explosives facility, was approved on 6th December 2013. The current MOP has been developed for a 2 year period expiring 31st October 2015.

1.1.4 Products and Markets

Coal within the Tarrawonga coal deposit can be described as a high volatility coal which will produce a very low sulphur, semi-soft coking/thermal coal, with typically <10% ash. It is expected that up to 65% of coal produced would be suitable for

marketing as a thermal or semi soft coking coal without the requirement for further washing. The coal also contains a low percentage of sulphur and phosphorous and exhibits a high energy.

The majority of coal produced is exported to Asia.

1.1.5 Operational and Environmental Management

1.1.5.1 Contacts

The management personnel responsible for operational and environmental performance at the Tarrawonga Coal Mine and their relevant contacts are as follows:

- Mr Anthony Margetts, Manager Mining Engineering - retains statutory responsibility for mining activities at the site. Contact: (02) 6743 4000.
- Mr Nigel Wood, General Manager, Open Cut Operations - oversees open cut operations for the Whitehaven Group. Contact: (02) 6741 9303.
- Mrs Jill Johnson, Group Environment Manager - oversees environmental and rehabilitation performance for all Whitehaven sites. Contact: (02) 6741 9321.
- Mr Lachlan Johnson, Environmental Officer – oversees day to day environmental compliance and performance at the Tarrawonga Mine. Contact: (02) 6743 4000.

1.1.5.2 Support Personnel

In addition to the personnel identified in Section 1.1.5.1, Tarrawonga Coal utilises specialist assistance as and when required. Specialist environmentally-based or related companies or consultants involved in activities at the mine during the reporting period included:

- ALS Acirl Pty Ltd;
- PAE Holmes;
- Eco Logical Australia Pty Ltd;
- Orica Blasting Limited;
- Spectrum Acoustics;
- G&B Ward Earthmoving;
- URS Australia;
- Dust Control Solutions;
- Geoterra Pty Ltd;

- RPS;
- Parsons Brinkerhoff;
- Tobiah Tree Mulching Services;
- Enright Land Management;
- Urban Tree Management Services;
- Fields Environmental Solutions;
- GSS Environmental; and
- Countrywide Ecological Services.

All mining and environmental management activities are undertaken generally in accordance with the MOP, management plans and procedures prepared in satisfaction of Tarrawonga Coal's Mining Leases, EPL 12365, Project Approval, and the relevant legislation.

1.1.6 Corporate Environmental Policy

WCL has a documented Health, Safety and Environmental Policy which states:

Whitehaven intends to conduct business in a way that maintains a safe and healthy workplace for its employees, contractors, visitors and the surrounding community and will protect the environment in all stages of exploration, mining, processing and train loading.

Whitehaven aims to:

- *Achieve zero injuries and occupational illnesses.*
- *Achieve zero equipment damage.*
- *Achieve zero environmental incidents.*

Whitehaven will strive to achieve these goals by:

- *Ensuring health, safety and environment is considered in all planning and work activities.*
- *Involve employees through regular communication, consultation and training.*
- *Identifying and controlling all potential hazards in the workplace through hazard identification and risk analysis.*
- *Ensuring all incidents are reported, controlled and learning's applied and shared.*
- *Providing effective injury management and rehabilitation for all employees.*
- *Seeking continuous improvement in performance by taking into account employee & community concerns and advances in health, safety and environment.*
- *Complying with legislative and other requirements and providing necessary training and resources.*

Whitehaven will ensure the availability of human, financial and physical resources to maintain and implement the Health and Safety Management System.

Responsibilities of people employed at Whitehaven Coal:

All persons employed by Whitehaven have a personal responsibility to comply with this policy and associated Health, Safety & Environment systems. No work is to be undertaken without a clear understanding of a safe method that minimizes the risk of injury, equipment damage and environmental harm.

Whitehaven employees shall:

- *Work in a healthy, safe and environmentally responsible manner.*
- *Encourage others to work in a healthy, safe and environmentally responsible manner.*
- *Promptly report incidents, unsafe practices or conditions and environmental concerns as they become apparent.*
- *Co-operate with Management in the support of promotion of health and safety responsible environmental management in the work place.*

This policy applies to all mines operated by Whitehaven Coal Limited and its subsidiaries.

1.2 Approval Status

1.2.1 Leases, Licences and Approvals

Table 1 identifies the leases, licences and approvals in place for the Tarrawonga Coal Mine at the end of the reporting period, the issuing/responsible Authority, dates of issue, duration (where limited) and relevant comments. The list is presented chronologically according to the date of issue.

Reviews of compliance/performance with the conditions identified in PA 11_0047 (Appendix 1), EPL 12365 (Appendix 2), and ML 1579, ML 1685 and ML 1693 are presented in Appendix 3, Tables A3-1, A3-2 and A3-3, respectively.

1.2.2 Amendments to Leases, Licences and Approvals

Amendments to leases, licences and approvals for the Tarrawonga Coal Mine during the reporting period (or planned for the next reporting period) are as follows:

- EPL 12365 – two licence variations were issued by the EPA (6th September 2013 and 5th February 2014) as detailed below:
 - The premises details on the license have been amended to reflect the land approved under Project Approval 11_0047.
 - Conditions U1 & U2 have been modified to include implementation dates for each PRP.

- ML 1685 was issued 18th July 2013.
- ML 1693 was issued 14th October 2013.
- As discussed in Section 1.1.3, the MOP for the LOM project was approved in October 2013. MOP Amendment A, which included an additional access road, was approved in December 2013.
- MOP Amendment B is planned to be submitted to DRE early during the next reporting period. This MOP amendment incorporates the latest Life of Mine Plan.
- The Offset Management Plan (OMP) for the Willeroi Offset Area has been developed in accordance with CoA associated with PA 11_0047 and EPBC 2011/5923 Willeroi Offset and was submitted to the Department Sustainability Environmental Water Populations & Communities (former, now Department of the Environment (DoE)) on 7th March 2014. Approval is pending.
- Management plans that are required to be developed and adopted under PA 11_0047 were prepared and submitted to the DP&E in accordance with CoA. The Heritage Management Plan has been approved and the Bushfire Management Plan and Waste Management Plan finalised. The remaining management plans have been reviewed by relevant agencies and will be resubmitted in the upcoming reporting period for approval.

Table 1 - Tenements, Licences and Approvals

Issuing / Responsible Authority	Type of Lease, Licence, Approval	Date of Issue	Expiry	Comments
Department of Primary Industries (DPI) ^{*1}	Exploration Licence (EL 5967)	24/07/2002	23/07/2015	Renewed 5 th August 2013
DA originally issued by Minister for Infrastructure and Planning ^{*2}	Development Application (DA) 88-4-2005	09/11/2005	09/11/2017	Original consent. It is anticipated that this consent will be surrendered during the next reporting period.
Department of Primary Industries - Mineral Resources ^{*1}	Mining Lease (ML) 1579	03/04/2006	02/04/2027	Expires 21 years from commencement
Department of Primary Industries - Mineral Resources ^{*1}	Mining Operations Plan (MOP)	09/05/2006	28/02/2012	Replaced by MOP Amendment approved in 2010
Department of Environment, Climate Change and Water (DECCW) ^{*3}	Environment Protection Licence (EPL) No. 12365 (Appendix 2)	09/01/2006	Anniversary date: 9 January	Variations to EPL made in Dec 07, Sep 08, May 09 Dec 11, Mar 13.
Department of Water and Energy (DWE) ^{*4}	90BL253276 90BL253278 90BL253279 90BL253280 90BL254253 90BL254254 90BL254255 90BL254221 90BL254214 90BL255766 90BL254692	18/05/2006 18/05/2006 18/05/2006 18/05/2006 18/05/2006 18/05/2006 24/04/2007 05/04/2007 04/04/2007 19/08/2012 12/05/2009	Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity 11/05/2014	Monitoring bores 50ML Mining
Director, Mining and Industry Projects for Department of Planning ^{*2}	Notice of Modification (DA) 88-4-2005 MOD 1 (Appendix 1)	15/10/2010	09/11/2017	Modification to original consent
Industry & Investment NSW ^{*1}	Mining Operations Plan (MOP) Amendment	01/07/2010	30/06/2013. Extension granted to 30/10/2013.	Superseded by 2013 MOP
Department of Planning and Infrastructure (DoPI) ^{*2}	Project Approval PA 11_0047	22/01/2013	31/12/2030	Project Approval for LOM Extension Project. Expires December 2030
Department of Sustainability, Environment, Water, Population	EPBC 2011/5923	11/03/2013	31/12/2053	Conditional Federal Project Approval for LOM Project

Issuing / Responsible Authority	Type of Lease, Licence, Approval	Date of Issue	Expiry	Comments
and Communities (SEWPaC) ^{*5}				
Department of Trade & Investment – Regional Infrastructure and Services	Mining Lease (ML) 1685	18/07/2013	14/11/2032	
Department of Trade & Investment – Regional Infrastructure and Services	Mining Lease (ML) 1693	14/10/2013	14/10/2034	Expires 21 years from commencement
Division of Resources and Energy (DRE)	Mining Operations Plan (MOP)	23/10/2013	31/10/2015	MOP prepared under the new ESG3 Guidelines for LOM Project
Division of Resources and Energy (DRE)	Mining Operations Plan Amendment A (MOP)	6/12/2013	31/10/2015	Amendment to MOP
^{*1} Now, Department of Trade and Investment, Regional Infrastructure and Services, Division of Resources and Energy (DTIRIS – DRE) ^{*2} Now, Department of Planning and Environment (DP&E) ^{*3} Now, Environment Protection Authority (EPA) ^{*4} Now, NSW Office of Water (NOW) ^{*5} Now, Department of the Environment				

1.3 Actions Requested at Previous AEMR Review

The annual environmental meeting for the 2012/2013 AEMR for the Tarrawonga Coal Mine was undertaken by DRE, EPA & DP&E on the 18th February 2014.

Formal advice was received from the DRE and EPA on the 6th March and 4th March 2014 respectively.

Two actions were identified by the DRE, as follows:

- The provision of a top soil balance to be included in the next AEMR, which also identifies any shortfalls in topsoil availability for future rehabilitation. This is addressed in Section 2.2; and
- A review of the Mining Operations Plan if a change to the Mine Plan occurs. If actions resulting from altered Mine Plan are not consistent with this approved MOP, seek to amend the MOP. As identified in Section 1.2.2, an amendment to the MOP will be sought in the next reporting period.

Advice received from the EPA is as follows:

- It was advised that the southern emplacement area is proposed to remain in its current form until the infrastructure area is relocated and the access road

is realigned. The timing of these activities is uncertain. The EPA has concerns about how potential dust generation from the southern emplacement area during this interim period will be managed. No additional management options appear to be proposed to mitigate dust potential.

As discussed in Section 3.1.2, the site plans to undertake a trial to stabilise the southern face of the emplacement during the next reporting period.

No formal advice was received from DP&E.

Matters discussed during the onsite meeting have been addressed throughout the document as required and where applicable.

2 SUMMARY OF OPERATIONS

2.1 Exploration, Resources / Reserves and Mine Life

2.1.1 Exploration

Exploration drilling was undertaken during the reporting period in ML 1579, ML 1685, ML 1693 with a total of 28 holes drilled (16 open core holes, 2 core holes and 10 blast holes). Exploration drilling carried out during the reporting period guided future mine planning and was carried out in accordance with EA.

2.1.2 Resources and Reserves

Eight coal seams are present within the Tarrawonga Open Cut and are listed below in increasing depth from the surface:

- Braymont (BR);
- Bollol Creek (BC);
- Jeralong (JE);
- Jeralong Lower (JEL);
- Merriown (ME);
- Merriown Lower (MEL);
- Velyama (VE); and
- Nagero (NA).

The coal seams range in thickness up to 4.0m, with an average thickness of 1.5m. Significant conglomerate interburden below the Nagero seam presents a practical divide between those seams mineable by open cut methods and those for which the potential may exist for future underground mining (the Northam, Therribri, Flixton and Tarrawonga seams).

2.1.3 Estimated Mine Life

The total thickness of the coal to be mined is approximately 20m, with the depth below the natural surface varying between 20m and 120m. With the approval of the Tarrawonga Mine Extension, it is estimated that the coal resource remaining within the Tarrawonga Deposit will be exhausted by 2030.

2.2 Land Preparation

Land preparation activities undertaken at the mine during the reporting period were conducted in accordance with commitments identified in the MOP and included:

- Vegetation removal in advance of the active pit over an area of approximately 1.5 ha comprising the White Cypress Pine – Narrow-leaved Ironbark Shrub/Grass Open Forest of the Western Nandewar Bioregion vegetation type.
- During the reporting period, no topsoil, subsoil and friable overburden was stripped into final stockpile locations. Soil stripping areas shown on Plan 3 indicate areas where material has been pushed to enable water management facilities to be established and drill access to the eastern hill. Actual volumes of material can be quantified upon transport to stockpile location, which will occur in the next reporting period. Existing stockpile locations are shown on Plan 3.

Table 2 shows that at the end of the reporting period, a total of 11,425 m³ of subsoil and topsoil had been replaced on reshaped areas of the final landform. A further 794,987 m³ of topsoil and subsoil remains stockpiled within the mining lease.

During the reporting period, the mine, which was developed as a series of approximately 60 m wide strips, advanced minimally east as most activity was restricted to the existing pit area. This advance comprises the actual working pit area and stripping in advance of the open cut.

At the end of the reporting period there was sufficient topsoil to cover all exposed areas to a depth of 200mm as specified in the EA and MOP. The disturbed areas include infrastructure area (29.7ha), active mining area (108.1ha), waste emplacements (206.2ha), tailings emplacement (5ha) and shaped waste emplacement (7.6ha), totalling 356.6ha of disturbed land. To cover this area to the depth specified in the EA and MOP a total of 713,200m³ would be required, which is slightly less than what is currently stockpiled. Where possible, the site strips soil to a greater depth than required in an effort to ensure sufficient quantities of topsoil are available for rehabilitation during the mine life and at closure.

Table 2 - Production and Waste Summary

	Cumulative Production			
	Start of Reporting Period (up to 30/4/13)	During Reporting Period (1/5/13 to 30/4/14)	Cumulative Total at End of Reporting Period	End of next Reporting Period (estimated)
Soil Stripped (m ³)	1,242,037	0	1,242,037	1,310,000
Soil Used/spread (m ³)	435,625	11,425	447,050	475,000
Waste Rock (m ³)	99,355,486	15,703,231	115,058,717	131,000,000
ROM Coal (t)	10,281,375	1,851,575	12,132,950	14,200,000
Product (t)	9,178,067	1,862,299	11,040,366	13,013,148
Domestic Product (t)	154,812	61,971	216,783	276783

ROM Coal is total production at the mine site. The difference between ROM Coal and final Product is related to changes in stockpile volumes both at the mine and the CHPP during the reporting period.

2.3 Construction

Construction activities over the last 12 months have included:

- Construction of Sediment Basin 25 (SB25) (Figure 2) and an associated dirty water diversion drain as part of the northern extension which will provide for improved sediment detention and dirty water capacity;
- Construction of an access road to the offsite Remote Mixing Site (RMS) facility and magazine; and
- A rock lined waterway (Figure 3) was installed on the southern emplacement within the existing rehabilitation zone.



Figure 2 - SB25 (adjacent to northern extension area)



Figure 3 - Rock lined waterway on the southern emplacement

2.4 Mining

2.4.1 Mining Method

All mining during the reporting period was undertaken by open cut methods using the techniques identified in the MOP, namely:

- Separate topsoil and subsoil removal by open bowl scraper and/or dozer push into windrows and load into articulated trucks with loader;
- Friable overburden removal by scraper;
- Drilling and blasting the underlying competent overburden;
- Overburden (and interburden) removal by bulldozers and/or excavator and dump trucks, with the overburden placed in and over the mined-out areas of the open cut; and
- Coal extraction by excavator loading into haul trucks for transport to the ROM stockpile.

All coal was assessed in pit and, depending on the seam, known quality, and the extent of dilution, was classified into:

- “clean”- (by-pass) top seam; and
- “dirty” - (to be washed).

The in-pit classification determines the form of subsequent processing undertaken on-site or off-site.

During the reporting period, a total of 15,703,231 bcm friable and competent overburden was removed to produce 1,851,575t ROM coal at an average overburden:coal stripping ratio of 8.5:1 (See Table 2). The lower strip ratio is a result of mining within the existing pit and south of the hill section avoiding for the present the greater overburden removal that would be required to access the coal under the hill. Plan 4 presents the status of mine and infrastructure development as of 30th April 2014. Plan 4 also identifies the limit of mining at the commencement of the reporting period.

2.4.2 Mining Constraints

Day-to-day mining activities are primarily constrained by economic considerations which, in turn, are determined to a large extent by factors beyond Tarrawonga Coal’s control (i.e. coal price and demand). Economic factors determine the viability of the determined overburden:coal stripping ratio, and hence the lateral extent of mining undertaken.

Other constraints to mining operations at the mine have included or continue to include:

- The depth of weathering of the coal seams which influences the volume of overburden requiring removal to access the coal;
- The potential presence of faulting within the seam structure which may influence the sequence and possibly the method of mining;
- The potential for an uneven coal seam floor which could potentially complicate vehicular access to the coal;
- Agricultural and ecological considerations;
- Inclement weather; and
- The existence of Aboriginal heritage sites within the ML area.

2.4.3 Mining Equipment

Table 3 presents a list of mining equipment in use at the mine at the end of the reporting period, together with its principal function(s) and frequency of use.

Table 3 - Mining Equipment

ITEM	NUMBER IN OPERATION	FUNCTION
O & K RH170 Excavator	3	Overburden excavation and loading
Hitachi EX1900 Excavator	1	Overburden / interburden / coal loading
CAT 785 Dump Trucks	16	
CAT 789 Dump Trucks	3	
Terex SKF Drill	1	Blast hole drilling
CAT SKSW Drill	1	Blast hole drilling
Cubex 1320 Drill	1	Blast hole drilling
CAT D11R Dozer	3	Interburden / coal ripping / pushing, dump maintenance
CAT D10T Dozer	5	Interburden / coal ripping / pushing, dump maintenance
Water Cart	3	Dust Suppression
CAT 16M Grader	2	Road maintenance
Service Truck	2	Machinery servicing
Cummins Genset	2	Power for site offices, workshop and coal loader
Mobile Crusher	1	Crushing
IT38G Loader	2	Loading
Lighting Plant	16	Lighting
CAT 988H Loader	2	Coal Pad

2.4.4 Hours of Operations

PA 11_0047 permits 24 hour operation of mining activities, and allows for changes to coal transportation following the commissioning of the Boggabri Rail Spur Line, and Boggabri CHPP. At this stage, mining operations have not been undertaken on a 24 hour basis, nor is the Boggabri rail spur or CHPP commissioned. TCPL has made some minor changes to operating times to accommodate changes in the working roster for improved production and economic stability.

Open cut mining activities, including processing of coal, generally occurred between the hours of 6:30am and midnight Monday to Friday, between midnight and 3.00am Tuesday to Saturday, and 6:30am to 5.00pm Saturdays. On occasion a Sunday day shift has been run to meet production deadlines.

Coal transportation from the mine site has continued between the hours of 7:00am to 9:15pm Monday to Friday, and 7:00am to 5:15pm on Saturdays. These times ensure that all coal trucks are off the public road network by 10.00pm Monday to Friday, and 6:00pm Saturdays.

General maintenance activities were permitted any time Monday to Sunday.

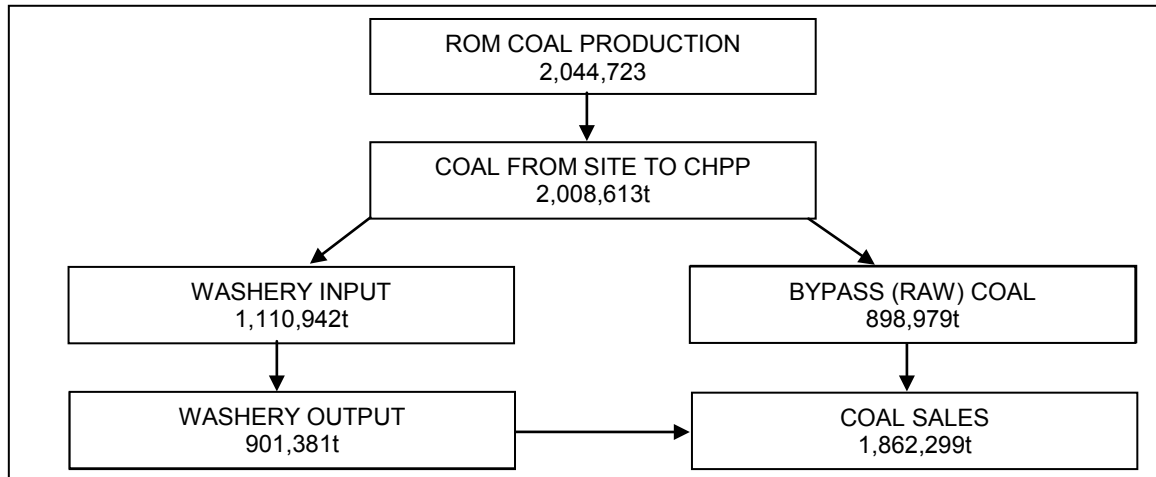
2.5 Processing

2.5.1 Outline of Processing Activities

With the exception of coal crushing to <200 mm, no coal processing was undertaken within the Project Area.

Figure 4 presents a schematic of coal movements and washery inputs, outputs and yields for the reporting period. The flowchart shows that over the last 12 months a total of 2,008,613 tonnes of coal was transported from the Tarrawonga site to the CHPP. 898,979 tonnes was direct bypass coal (i.e. crushed product coal not requiring washing) whilst 1,110,942 tonnes was directed through the washery, producing 901,381 tonnes of washed product (average yield of 81%). Coal from the CHPP was despatched via rail to domestic and export markets (Figure 4).

The slight variations in totals (i.e. washery input + bypass does not total coal from site and washery output + bypass coal does not total coal sales) are simply a result of variations in stockpiles.



**Figure 4 - Coal Movement and Production Summary
(2013/2014 Reporting Period)**

2.5.2 Changes or Additions to the Process or Facilities

No significant changes or additions to processes carried out at the mine have occurred.

2.6 Waste Management

2.6.1 Introduction

Wastes produced from the Tarrawonga Coal Mine (or at the Whitehaven CHPP) remain unchanged from those identified in the previous AEMR and Environmental Assessment and are comprised of:

- General domestic-type wastes from on-site buildings and routine maintenance consumables;
- Oils and grease;
- Sewage;
- Overburden and interburden;
- Mine equipment tyres; and
- Coarse and fine coal rejects from any coal preparation undertaken.

The following sub-sections identify the management procedures adopted for each of these wastes throughout the reporting period. Management procedures remain unchanged from those previously identified and will be continued for the ensuing reporting period.

2.6.2 Domestic Type Wastes

All general wastes were collected on-site and placed into large storage receptacles on a daily basis. An industrial waste collector collected this waste on a weekly basis. TCPL has established a recycling program for domestic type wastes which are collected in separate receptacles and delivered to the Gunnedah Waste Management Centre for recycling.

2.6.3 Oil Containment and Disposal

Waste oils from the maintenance building were pumped from machinery to bulk storage tanks banded in accordance with EPA requirements (also see Section 2.8.2). When breakdown maintenance was undertaken away from this location, oil was pumped from the equipment to a tank on the service truck from which it was subsequently transferred to the bulk storage tank.

Waste oil stored at the maintenance building was collected and disposed of by a licensed contractor approximately once every three months.

Oil filters at Tarrawonga are crushed prior to collection.

Runoff from the concrete vehicle and equipment wash pad was directed to an oil separator and containment system for subsequent pump out and disposal.

2.6.4 Sewage Treatment and Disposal

Effluent from the sewage and ablutions facilities at the mine was managed through the Council-approved septic system which is serviced by a licenced contractor. Pump outs are undertaken by a licensed waste disposal contractor on an as-needs-basis.

2.6.5 Mine Equipment Tyres

Mine equipment tyres are retained (stored) on site until disposal within the open cut void. Tyres were disposed of in-pit during the reporting period with the disposal location recorded by site personnel.

2.6.6 Overburden and Interburden

Overburden and interburden materials at the mine comprise conglomerates, sandstones, shales and mudstones which are prone to various degrees of breakdown on exposure to the atmosphere. The overburden is cast into the mined-out areas by blasting or removed from above the coal seam by a combination of dozer pushing and

excavator loading and hauling using dump trucks. Interburden removal to enable lower coal ply excavation is undertaken by excavator and dump truck.

During the reporting period, all overburden and interburden was blasted/pushed/dumped within areas nominated in the MOP for overburden emplacement.

2.6.7 Processing Plant Residues

2.6.7.1 Physical and Chemical Characteristics

The coarse and fine rejects produced from washing Tarrawonga coal comprise a mixture of coal and non-coal materials, e.g. sedimentary rocks such as shale, mudstone or claystone, and sand, silts and clays which either occur naturally within the coal seam or represent overburden or interburden materials which dilute the coal during its extraction.

2.6.7.2 Reject Handling and Disposal Procedures

Coarse Reject – As rehabilitation progresses at the mine, coarse reject produced from the Whitehaven CHPP will be backloaded to the mine for placement in the open cut prior to reshaping and rehabilitation. Coarse reject emplacement commenced in the current emplacement area in August 2010 following approval under Section 100 of the *Coal Mine Health and Safety Act 2002*. Approximately 458,177 tonnes of coarse reject has been disposed at the site during the reporting period.

Fine Reject – Pumped to a series of ten fine reject ponds within the Whitehaven CHPP balloon loop and adjacent to the Whitehaven CHPP for consolidation. The ponds are encircled by bunding and drains to contain fine reject in the event of a pond failure. Following consolidation, the fine rejects are excavated and transported to the former Gunnedah Colliery for use in final landform development and emplacement in the Melville and North Cut Void.

2.6.7.3 Monitoring and Management of Containment Facilities

Routine management and monitoring of reject material at the Whitehaven Siding is undertaken by Whitehaven Coal personnel under the direction of the Plant Manager. Inspections of the reject ponds at the Whitehaven CHPP are undertaken by officers of DRE, the statutorily responsible Authority.

2.7 Stockpile Capacity

All ROM coal produced is delivered to clean and dirty ROM stockpiles. ROM stockpile capacity at the Tarrawonga Coal Mine is approximately 150,000t. Average stockpile volume during the reporting period was 142,322 tonnes.

2.8 Water Management

2.8.1 Objectives

The mine lies within the catchment of the Namoi River. Locally, and within proximity of the project site, Goonbri Creek, Bollol Creek and Nagero Creek all provide flows to the Namoi River during runoff events. The design of sediment detention basins within the disturbed area of the mine aims to limit the opportunity of discharge of runoff from mine-disturbed area, i.e. after appropriate detention time to satisfy licensed discharge criteria.

There are seven wet weather discharge points nominated in the current EPL 12365. These are SD17, SD16, SD9, SB14, SB22, SB23 and SB24 (Plan 4). SB18 has been identified as an error as the relevant licence variation submitted by TCPL requested inclusion of SB24, not SB18. This error will need to be rectified when the next license variation is submitted to the EPA.

Management of water at the mine is undertaken with the following objectives:

- (i) The quantity of water exhibiting elevated suspended solids loadings is minimised;
- (ii) Erosion is minimised;
- (iii) Sediment-laden water is contained for a sufficient period that if it discharges, satisfies the discharge criteria identified in EPL 12365;
- (iv) Surface water is harvested off-site to the extent permissible, thereby minimising water extraction from bores or other sources;
- (v) Groundwater is not contaminated;
- (vi) Downstream water users are not adversely affected by the Mine's operations, either in terms of quantity or quality; and
- (vii) The water management system is consistent with planned rehabilitation objectives and long-term land use.

2.8.2 Surface Water Management

Water within the project approval area is nominally classified either as “clean”, “sediment-laden” or “dirty”, or “contaminated”, depending on the source of the flow and its potential for physical or chemical contamination.

“**Clean water**” comprises water which emanates from areas undisturbed by mining activities, flows from sediment basins following its clarification in those structures or is contained within, or discharges from, storage dams. Within the DA Area, clean surface water flows either pass to natural drainage lines and hence off-site or are collected by diversion banks and directed to the storage dams for use on-site. All water flowing from sediment basins ultimately flows to storage dams.

“**Dirty water**” comprises water which does or could potentially contain elevated levels of suspended solids originating from areas of mining-related disturbance.

Dirty water originating from surface runoff is collected by catch banks located down slope of the potential sources of pollution and directed to the sediment basins. Water collecting within the sediment basins is used for dust suppression in addition to waters in the storage dams to avoid potential for off-site water discharge.

The sediment basins are either cleaned out once their capacity is reduced by 20% or supplementary structures are installed to provide the required storage volume. In the event of structure replacement, the contents of the former structure will be allowed to dry prior to being capped and rehabilitated.

The principal components of the water management systems in place at the end of the reporting period are shown on Plan 4.

“**Contaminated Water Management**”. Two self bunded diesel fuel tanks with capacities of 68,000L and 105,000L (62,000L and 94,500L safe fill respectively) are maintained adjacent to the Tarrawonga workshop area. This ensures that in the event of a leak from the tanks, there is sufficient capacity to adequately store the full complement of diesel from those tanks. Tarrawonga Coal has also installed an additional concrete bund adjacent to the fuel tanks to house other oils and lubricants in a safe and efficient manner. Any associated spills within the bund then report to an oil separating unit for disposal by an appropriately licensed contractor. Waters potentially contaminated with hydrocarbons from the workshop area are also diverted to the oil separator, with clean water used for dust suppression purposes. Spill kits are also maintained on the mine site.

The likelihood of localised spills of fuel or oil external to bunded areas is kept to a minimum by the adoption of the above practice. In the event that localised spills do occur, immediate action would be undertaken to ensure appropriate clean-up and minimisation of harm.

Water originating from the open cut pit is pumped to Void Water Dams or retained in pit within managed sumps. Pit water is also used for dust suppression.

2.8.3 Discharges

Wet weather discharges that occurred during the reporting period are discussed in Section 3.3.2.

2.8.4 Water Sources, Demand and Use

Within the Project Approval area and immediate vicinity of the mine, surface water resources are limited to a number of ephemeral drainage lines which flow for a short period after substantial rainfall, farm dams, water storage dams and a series of interlinked sediment basins within the Project Approval area as shown on Plans 3 and 4.

Water is required on the mine site primarily for dust suppression purposes, with minor quantities required for potable, toilet and ablutions purposes. Where practicable, water collected on-site is retained or reused, with water for dust suppression sourced from a combination of on-site water harvesting, inflows from the exposed coal seam, overburden and interburden, and groundwater extraction. Water for potable, toilet and ablutions purposes is trucked to the site from Gunnedah or Boggabri.

During the reporting period, a total of approximately 424ML was used for mine site and processing facility dust suppression purposes, with all water sourced within the Project Approval area.

Water sources comprise the following:

- Groundwater/surface water inflows to the open cut (majority being surface water inflows); and
- Surface flows to sediment basins and storage dams within the Project Approval area.

The pipeline from Boggabri Coal, which was installed during the last reporting period, was not utilised during the reporting period. Ongoing logistical and commercial challenges have hampered any efforts to utilise this pipeline when prolonged dry periods have seen water resources below a satisfactory level. The utilisation of high security water from the Namoi River under a standing agreement with Whitehaven's Maules Creek Project was explored but ultimately discarded due to logistical challenges. This option remains available for future situations.

During the prolonged dry summer period preliminary desktop investigations were carried out to identify a reliable groundwater source on a nearby adjacent Tarrawonga owned property utilising existing groundwater entitlements. It is expected that this investigation will be completed in the next reporting period with that information to be used in the event that water resources fall below an acceptable level.

There was a significant reduction in water usage over the reporting period with approximately 424ML used. This reduction can be attributed a number of factors including the necessity in the previous reporting period to utilise large amounts of water to keep water storage levels at an acceptable level to reduce the risk of a discharge event.

During this reporting period a Dustex trial was also undertaken.

As required in PA 11_0047, an updated Water Management Plan was developed during the reporting period and submitted for review to the DoPI. URS Australia Pty Ltd was engaged to complete the Plan to a standard which addresses the requirements in the Project Approval. It is expected that the amended plan, incorporating Department comments, will be re-submitted for approval during the next reporting period.

2.8.5 Stored Water

Table 4 presents an estimate of the volume of stored water at the beginning and end of the reporting period.

Table 4 - Stored Water

	Volumes Held (m³)		Storage Capacity at the end of the Reporting Period (m³)
	Start of Reporting Period	At end of Reporting Period	
Clean Water (in Storage Dams)	38,432	41,143	110,053
Dirty Water (in Sediment Basins)	93,908	136,623	185,907
Controlled Discharge Water (salinity trading schemes)	N/A*	N/A*	N/A*
Pit Water	110,654	132,072	174,033
* N/A = Not applicable for the Tarrawonga Coal Mine			

2.8.6 Groundwater Management

Inflows into the open cut are irregular and result from a combination of:

- Direct rainfall runoff and infiltration through the emplaced overburden which flows down-dip to the open cut sumps;
- Where the open cut workings expose water stored within fractures in the rock mass or coal seams; and/or
- From areas where weakly cemented gravel overburden has been encountered.

Inflows not reporting to the sump(s) within the open cut either evaporate or are incorporated within the coal or replaced overburden.

Contamination of groundwater is controlled by the management of chemical, oil and grease spills and storage, with:

- Vehicle maintenance carried out in designated areas;
- Any spills being cleaned up; and
- Fuels, oils and greases being stored within a bunded area, constructed in accordance with AS 1940-2004 (also see Section 2.8.2) and/or EPA requirements.

Groundwater from surrounding bores is monitored on a regular basis to detect and assess any changes in groundwater quality or level that may be attributable to the mine (see Section 3.4.2).

2.9 Hazardous and Explosive Material Management

During the reporting period two contractors undertook the blasting services for Tarrawonga; Orica Mining Services up until December 2013 and LDE Corporation commenced blasting operations 6th January 2014.

No explosive materials are retained within the mine site. Orica Mining Services had a storage facility located between the Tarrawonga and Canyon sites to remove the requirement for on-site storage.

An offsite remote mixing station (RMS) and magazine was constructed to the west of Tarrawonga outside ML 1579 and LDE Corporation operates out of this facility.

Orica mixed nitropril with distillate to produce an explosive on the day of each blast using a purpose built explosives mixer and in a quantity adequate only for that particular blast.

LDE Corporation utilise a low density hybrid explosive product that has a very low potential to produce fume (NO_x gases). This product is mixed at the RMS prior to being transported onsite and loaded into the shot. A generic product is also utilised where necessary.

Safety Data Sheets (SDS's) are retained on-site for all hazardous materials, independent of the quantity. Additionally, all contractors are required to supply SDS sheets for any hazardous goods they may bring onto the site.

2.10 Infrastructure Management

Management of infrastructure (e.g. buildings, roads, generators and pumps) and other facilities not specified elsewhere within this AEMR/Annual Review, is undertaken on an as-needs basis or in accordance with Statutory requirements in order to maintain them in an operationally efficient, safe, neat and tidy condition, and one which does not result in the direct or indirect generation of unacceptable environmental impacts.

2.11 Product Transport

All sized (<200 mm) ROM coal delivered to the Whitehaven CHPP that is destined for the export market is transported via rail to the Port Waratah or Kooragang Island ship loaders at the Port of Newcastle. Approximately 2,008,613 tonnes of coal was transported from the mine over the reporting period in approximately 48,950 truckloads. This equated to an average of 179 truckloads of coal being transported per haulage day from the mine to the Whitehaven CHPP.

3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

The following sub-sections document the implementation and effectiveness of the various control strategies adopted at the Tarrawonga Coal Mine, together with monitoring data for the reporting period. Existing monitoring sites are shown in Figure 5, Figure 6 and Figure 7. Where relevant, life of mine monitoring data is also included as a basis for discussion on longer-term trends. A risk identification matrix and the relevant Environmental Management procedures are identified in the Tarrawonga Coal Mine MOP.

3.1 Air Pollution

3.1.1 Criteria

The air quality criteria applicable to the Tarrawonga Coal Mine are specified in PA 11_0047 Schedule 3 Condition 24, Tables 6, 7 & 8 (Appendix 1) which is summarised below:

- Acceptable mean annual increase in deposited dust – $2\text{g/m}^2/\text{month}$.
- Mean annual dust deposition (all sources) – $4\text{g/m}^2/\text{month}$.
- Mean annual TSP (all sources) concentration – $90\text{ }\mu\text{g/m}^3$.
- Mean annual PM_{10} particulate level – $30\text{ }\mu\text{g/m}^3$.
- 24 hour average PM_{10} particulate level – $50\text{ }\mu\text{g/m}^3$.

Additionally, exhaust gases on earthmoving/mining equipment should not be visible for more than 10 seconds continuously.

Routine air quality monitoring at the Tarrawonga Coal Mine is required for deposited dust and PM_{10} particulates. Monitoring of deposited dust is undertaken on a monthly basis whilst PM_{10} levels are monitored every 6 days.

Monitoring continues at all sites but exceedances on project-related properties are not reportable to the EPA and monitoring results are not reportable via the Annual Return.

Throughout the reporting period, real time PM_{10} TEOM (air quality) monitoring was conducted with a permanent monitoring station located at the nearby “Flixton” property (Figure 3). Data is generated every 15 minutes and correlated against current weather conditions, with alarms notifying site personnel of elevated PM_{10} results when wind conditions and direction is indicative of mining influence on the monitor. Real-time monitoring is used as a management tool to facilitate in the day to day mine plan and operations and is not a compliance monitor.

Schedule 3, Condition 29 of PA 11_0047 requires the updating of the existing Air Quality and Greenhouse Gas Management Plan. This Plan has been developed and was submitted to the Director General during the last reporting period. It is expected that the plan will be resubmitted, with changes to address comments, for approval in the next reporting period. A requirement of the approval, which is addressed in the Management Plan, is the development of a proactive and reactive air quality management system that includes PM_{2.5} monitoring. A real time PM_{2.5} TEOM is located at the “Will-gai” property south of Tarrawonga.

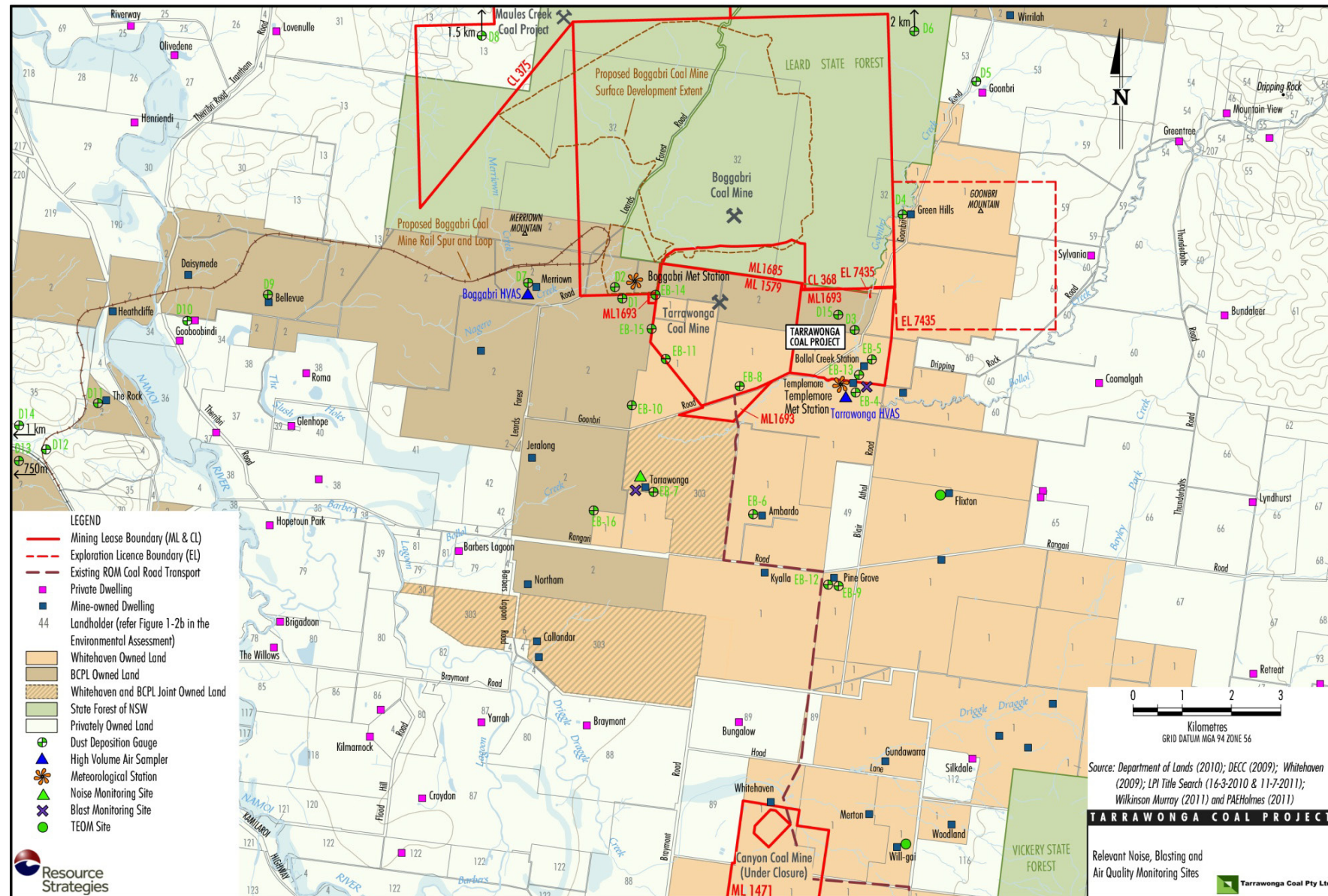


Figure 5 - Environmental Monitoring Locations

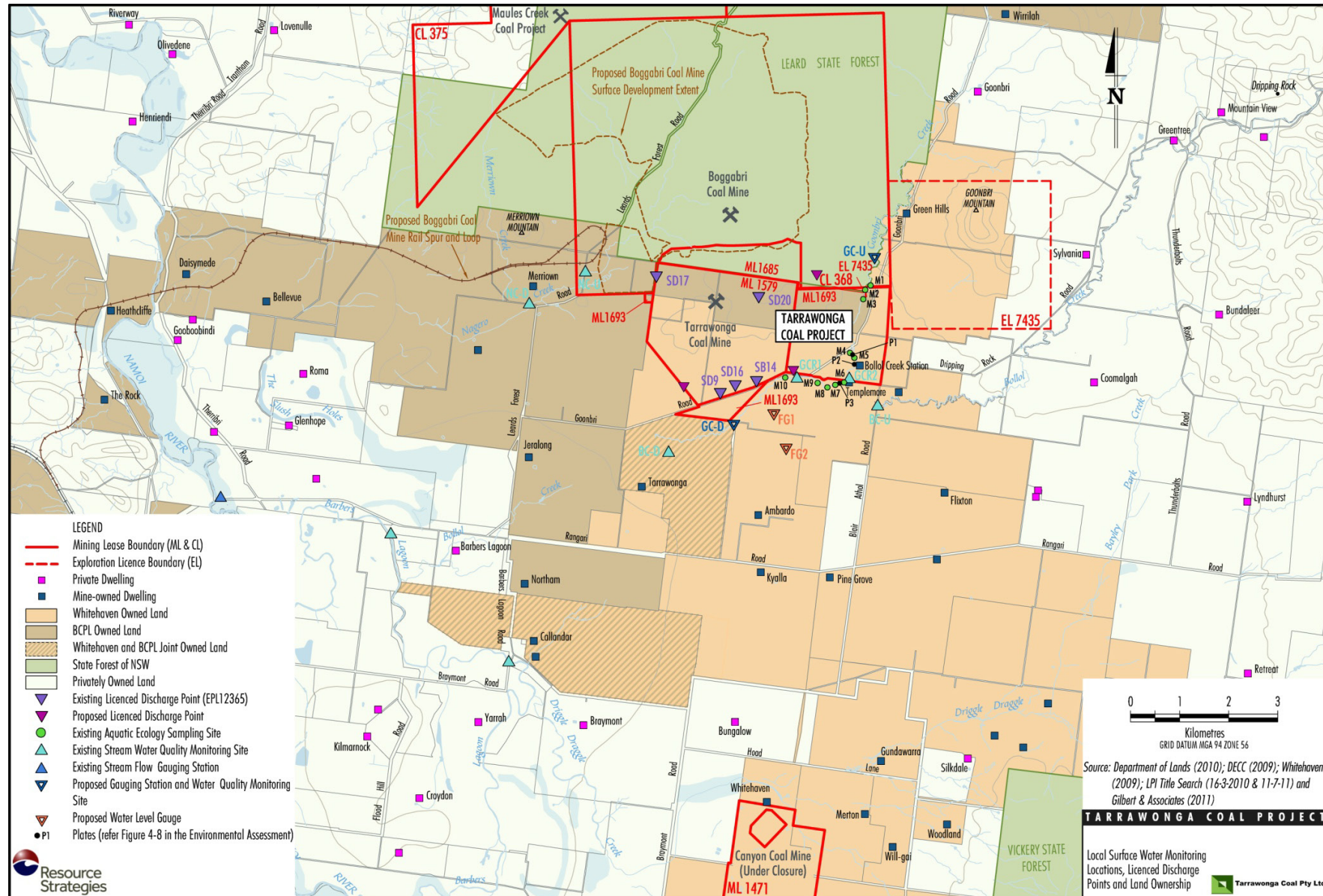


Figure 6 – Surface Water Monitoring Locations

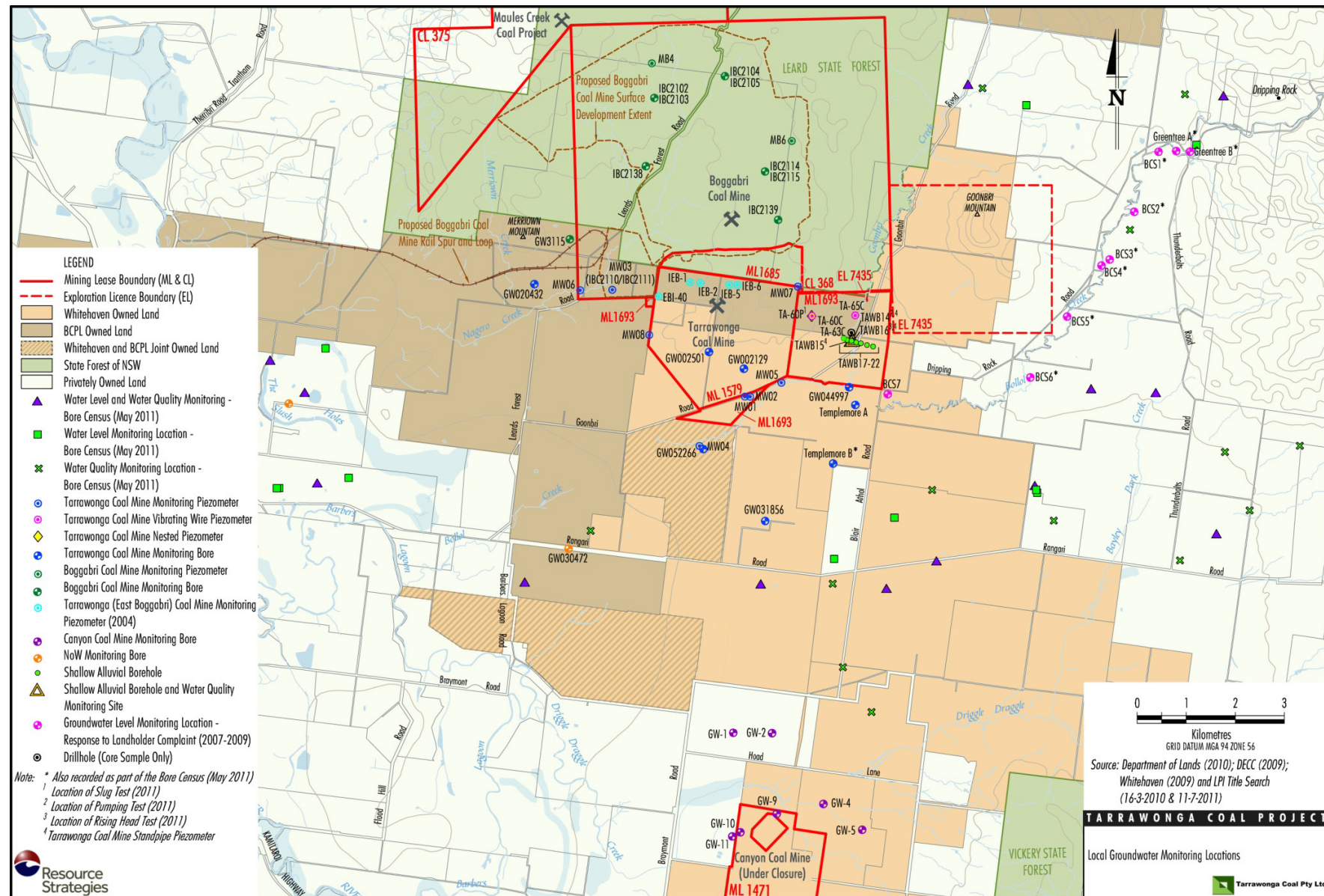


Figure 7 - Groundwater Monitoring Locations

3.1.2 Control Procedures

In order to satisfy the criteria identified above, Tarrawonga Coal employs a range of air pollution control measures including:

- Use of trunks, branches and litter from clearing for mine site rehabilitation. No materials are burnt;
- Limiting groundcover removal in advance of mining consistent with operational requirements. Under normal operational circumstances, a maximum of 100 m is prepared in advance of mining;
- Groundcover removal as part of the topsoil removal activities, rather than prior to topsoil removal;
- Where practicable, limiting soil stripping activities to periods when there is sufficient soil moisture to prevent significant dust lift-off and avoiding periods of high winds;
- Soil stripping using open bowl scrapers, thereby eliminating the dust generated from elevated scrapers;
- Application of water to exposed surfaces, with emphasis on those areas subject to frequent vehicle / equipment movements which may cause dust generation and dispersal;
- Use of water injection on the drilling rig;
- Use of imported aggregates for blast hole stemming;
- Water application at the crusher and on the conveyor discharge point to the coal bin;
- Cessation of coal processing activities during periods of concurrent high winds and temperatures which cause coal dust dispersal, independent of water applications. This situation did not arise during the reporting period;
- ROM coal pad watering;
- Progressive shaping and rehabilitation of areas once they are no longer required for mining purposes;
- Speed limit restrictions on all vehicles and equipment on the mine site;
- Equipment exhaust positioning to avoid exhausts impinging on the ground and causing dust lift-off; and
- Use of covers on all product coal trucks. Toll was the principal contractor engaged in the haulage of coal from the Tarrawonga Mine to the CHPP until January 2014 when BIS Industries took over the contract. All coal haulage

vehicles, including those operated by sub-contractors, are fitted with roll-over tarpaulins.

The site has continued to implement the requirements of the Pollution Studies and Reduction Programs listed in the EPL. The requirements relate to:

- Best practice management of wheel generated dust;
- Best practice management of disturbing and handling overburden in adverse weather conditions; and
- Trialling best practice measures for disturbing and handling overburden.

During the next reporting period it is proposed to undertake a trial with the objective to stabilise the exposed area of the southern waste emplacement to minimise the potential for dust generation during dry and/or high wind conditions. The trial will likely involve aerial seeding of species with a higher likelihood of germinating in waste rock.

3.1.3 Dust Monitoring

Table 5 presents a summary of the deposited dust monitoring data for the reporting period while Appendix 4 presents the results of all dust monitoring over the life of the mine to date. A graphical representation of the total insoluble solids and ash content data for each of the sites monitored during the reporting period is also included in Appendix 4.

It should be noted that the deposited dust result recorded for September 2009 (October 2009 for Idemitsu monitors) has been excluded from the long term average for each site. Dry conditions prevailed over the latter part of 2009 which contributed to severe dust storms around late September 2009. The results during the period do not represent normal deposited dust levels. The highly anomalous result of 254g/m²/month recorded in October 2009 at D-15 Forest View has also been excluded from the long term average.

Figure 5 identifies the locations of the various deposited dust gauges maintained during the reporting period.

Table 5 - Deposited Dust Monitoring Data

Site (see Figure 5)	Property Name	Mean Annual Total Insoluble Solids* ¹ (g/m ² /month)	Cumulative Total Insoluble Solids* ³ (g/m ² /month)	Mean Ash* ¹ (g/m ² /month)	Long Term Mean Total Insoluble Solids (g/m ² /month)
EB-4	TEMPLEMORE	3.0	4.2	1.1	2.4
EB-5	BOLLLOL CREEK STATION	4.3	5.5	3.8	2.8
EB-6	AMBARDO	0.8	2.0	0.5	1.1
EB-7	TARRAWONGA	0.9	2.1	0.6	1.0
EB-8	THUIN	2.7	3.9	2.3	2.5
EB-9	PINE GROVE	1.0	2.2	0.7	1.0
EB-10	TARRAWONGA MINE	8.3	9.5	2.7	4.0
EB-11	TARRAWONGA MINE	1.5	2.7	1.4	1.8
EB-14	WESTERN BOUNDARY OF ML	1.8	3.0	1.0	2.8
EB-15	WESTERN BOUNDARY OF ML	6.1	7.3	4.8	4.8
D-2* ²	NAGERO	4.1	5.3	1.4	3.7
D-4* ²	GREEN HILLS	1.7	2.9	0.8	3.7
D-7* ²	MERRIOWN	1.0	2.2	0.7	1.2
D-15* ²	FOREST VIEW	1.0	2.2	0.7	1.4
Grey = project related (TCPL or Boggabri Coal) * ¹ At end of reporting period * ² Site is monitored and maintained by Boggabri Coal * ³ Includes 1.2g/m ² /month background levels					

A review of Table 5 and Appendix 4 shows that:

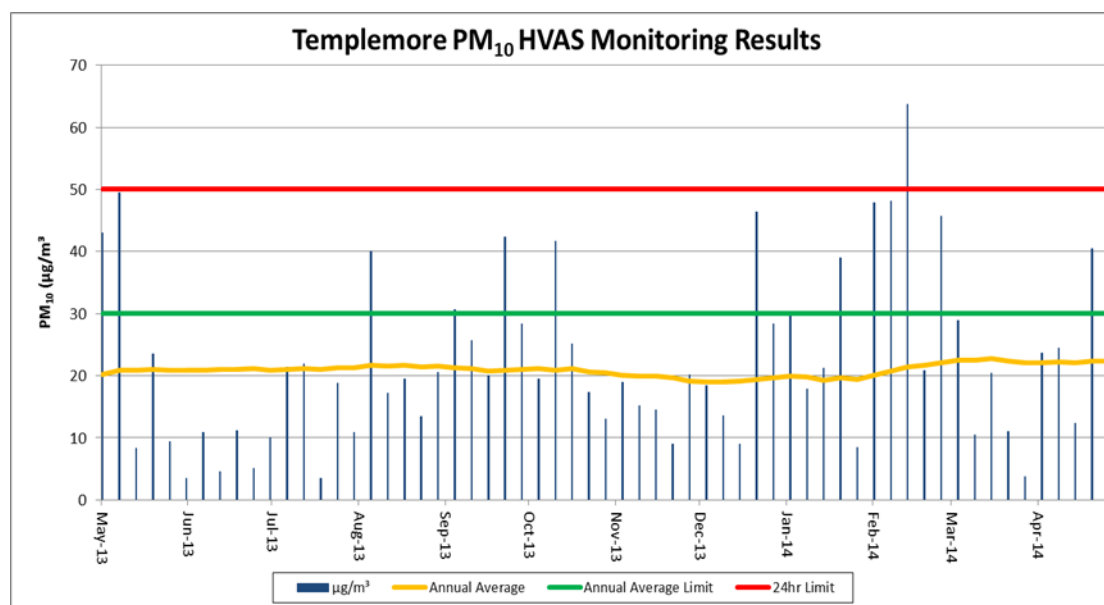
- The mean annual total insoluble solids (deposited dust) criterion was satisfied at all monitoring locations, except for EB-5 “Bollol Creek Station”, EB-10 “Mine”, EB-15 “Western Boundary” and D2 “Nagero”. All sites where the mean annual deposited dust criteria exceeded the 4g/m²/month criteria are on project related property. It should be noted that the Total Insoluble Matter value can be significantly impacted by other sources. When compared to the ash component (that proportion retained after combustion), the values are reduced and are generally reflective of a significant vegetative component in the sample.
- EB-5 is located at “Bollol Creek Station”, which is a project related property to the east of the mine. Increased dust deposition can be attributed to the

easterly progression of the pit and the close proximity of the gauge to local unsealed roads including Goonbri Rd and Blair Athol Lane.

- EB-10 is located south-west of the mine on project related land. It is in closer proximity to the unsealed Goonbri Road than the mine and, given the prevailing wind directions, it is assumed that the monitor is impacted by dust generation from the road.
- EB-15 is located on the western boundary of the mining lease, in close proximity to Boggabri Coal infrastructure and facilities most likely leading to anomalous results when Boggabri Coal construction works are being undertaken.
- D-2 is located west of Tarrawonga, in close proximity to the Boggabri Coal infrastructure area. Elevated results are most likely due to construction works being undertaken at the Boggabri Coal facility.
- Boggabri Coal ceased monitoring of D-2 “Nagero”, D-7 “Merriown” and D-15 “Forest View” during the reporting period. All deposition gauges located on Boggabri Mine owned land were removed from EPL 12407.

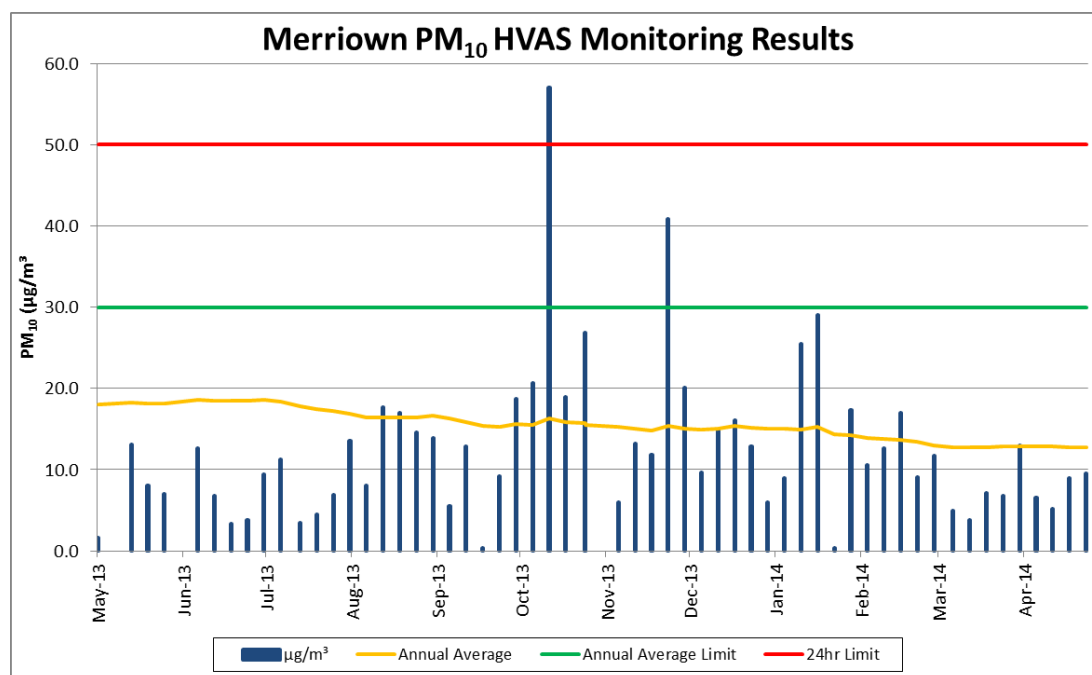
TCPL has a High Volume Air Sampler (PM₁₀) located at the property “Templemore”, to the south-east of the mine site. There is another PM₁₀ monitor located on the “Merriown” property, to the west of the mine site, which is operated by Boggabri Coal and is used as a cumulative impact monitor for the Boggabri and Tarrawonga mines. Each sampler runs for 24 hours every 6 days, with filter papers sent to an accredited laboratory for analysis.

During the reporting period, the PM₁₀ results at the “Templemore” monitor have exceeded compliance with the 24 hour criteria on one occasion in February 2014. This was primarily due to particularly dry weather conditions during this period and therefore increased dust generation from nearby unsealed. As the “Templemore” monitor is located on project owned property, and is unoccupied, the 24 hour PM₁₀ criteria do not apply at this property. Despite the exceedances in the 24 hour criteria, the “Templemore” monitor remains within the annual average compliance criteria of 30 µg/m³, with an annual average at the end of April 2014 of 22.22µg/m³ (Figure 8). The results for PM₁₀ at “Templemore” generally correlate well with the rainfall received, with higher PM₁₀ levels recorded during the drier periods.



**Figure 8 - Templemore HVAS PM₁₀ Data
May 2013 – April 2014**

During the reporting period, the PM₁₀ results at the “Merriown” monitor have exceeded compliance with the 24 hour criteria on one occasion on 15th October 2013. This was primarily due to particularly dry weather conditions during this period and therefore increased dust generation from nearby unsealed. The “Merriown” monitor remains within the annual average compliance criteria of 30 µg/m³, with the running annual average of 12.70 µg/m³ at the end of the reporting period (Figure 9).



**Figure 9 - Merriown HVAS PM₁₀ Data
May 2013 – April 2014**

The full data set for the PM₁₀ monitoring over the life of the mine, including graphs of long term data records, is contained within Appendix 4.

Tarrawonga has continued to receive complaints about dust despite continuing to improve dust management practices over the reporting period through both increased water application on haul roads, and Dustex trials on haul roads to improve dust mitigation. It should be noted that the number of complaints received has reduced significantly from the previous reporting period.

Dust impacts are further complicated by cumulative impacts from Tarrawonga and Boggabri Coal, with complainants not necessarily able to distinguish dust sources from Tarrawonga, Boggabri or the local gravel roads. As Tarrawonga mine is the operation most visible to complainants, it tends to be associated with the dust complaints. This is despite photographic evidence from the site camera located on the northern emplacement which has generally supported Tarrawonga claims that dust generation is minimised with no specific dust source associated with operating equipment being able to be identified.

A major contributing factor to visible dust in the wider valley is dust generation from gravel roads such as Rangari Road, Goonbri Road, Wean Road, Dripping Rock Road and Leard Forest Road. During the winter period, with temperature inversions prevalent, a layer of dust is visible during the early morning until the inversion layer dissipates. The impact of road dust on overall dust levels has been identified on preliminary dust charts produced by the real time PM₁₀ units located at the "Flixton" property, with spikes in PM₁₀ concentrations correlating with additional road use associated with shift change events at the mine sites. Tarrawonga employees and contractors are encouraged to utilise sealed roads where possible to minimise this impact.

3.1.4 Comparison with EA Predictions

The Air Quality and Greenhouse Gas Assessment (AQGHGA) was undertaken by PAEHolmes Pty Ltd as part of the Tarrawonga Coal Project mine extension (*Tarrawonga Coal Project Environmental Assessment, Appendix D, 2012*). The predicted levels and comparisons with actual monitoring data are included below for both dust deposition and PM₁₀.

Dust Deposition

The AQGHGA predicted that the annual average dust deposition levels at all receptors surrounding the Project Area would be below the relevant criteria of 4g/m²/month for cumulative dust deposition when using a background dust deposition level of 1.2g/m²/month.

The reporting period average for “Tarrawonga” (at the time, the only privately owned property surrounding the mine) was $0.9\text{g/m}^2/\text{month}$. During the reporting period the property was purchased by Whitehaven. Combined with the background dust deposition level, this monitor matches the Tarrawonga Coal Project EA prediction of not exceeding $4\text{g/m}^2/\text{month}$. All monitoring locations where exceedances have occurred are on project-related properties.

EB-10 is located between the south-west boundary of the ML and the unsealed Goonbri Road. Dust generated by mining activities would generally not travel in a south-westerly direction and as a result the exceedance of cumulative deposited dust levels is considered to be not directly associated with operations at Tarrawonga.

The exceedance at EB-15 is not unexpected as this monitor is located between Boggabri Coal’s ROM pad and Tarrawonga operations. This is also the case of D-2 “Nagero” to the west of the mine.

EB5 Bollol Creek is project owned land located to the east of the mine. The easterly progression of the mine and prevailing westerly winds along with non project related activities including the unsealed public road can be attributed to the elevated result and increase from the previous reporting period.

PM₁₀

The AQGHGA predicted that cumulative impacts from the extension of the Tarrawonga mine and background levels would not exceed the annual average PM₁₀ limit of $30\mu\text{g/m}^3$ at any receiver or the 24 hour PM₁₀ concentration limit of $50\mu\text{g/m}^3$ at any privately-owned receiver. The highest 24 hour concentration recorded during the reporting period was $63.7\mu\text{g/m}^3$ at “Templemore” and $57.1\mu\text{g/m}^3$ at “Merriown”. The highest annual average during the reporting period was $22.85\mu\text{g/m}^3$ at “Templemore” and $18.56\mu\text{g/m}^3$ at “Merriown”. Although the annual averages of both monitors were well below the annual average criteria, exceedances of the 24 hour concentration limit occurred at “Templemore” in February 2014 and Merriown in October 2013. As previously mentioned, this site is project related and therefore the criterion does not apply.

3.2 Erosion and Sedimentation

3.2.1 Management

Methods for the management of erosion and sediment control at the mine are presented in the MOP, the Erosion and Sediment Control Plan and Site Water Management Plan.

Control of erosion and sediment generation is achieved primarily through the implementation of water management controls identified in Section 2.8.2 and shown

on Plan 4. Water usage for dust suppression ensures adequate storage capacity is available within the various water containment structures to receive inflows. Additional measures which assist in the control of erosion and sedimentation include:

- Minimising the extent of disturbance consistent with operational requirements;
- Revegetation of long-term subsoil and topsoil stockpiles, areas shaped to their final landform and areas no longer required for mining-related purposes;
- Undertaking soil management activities generally in accordance with the soil stripping and stockpiling recommendations from Geoff Cunningham Natural Resource Consultants and McKenzie Soil Management; and
- Installation of contour banks and rock-lined waterways on the final landform following soil application.

Soil stockpiles have been placed in gently sloping or near flat areas surrounded by grassland which effectively reduces the runoff velocity, and hence erosive potential, from any run-on waters. However, TCPL is aware of the potential for stockpile erosion and will adopt stockpile protective procedures to minimise impacts as required over the remaining life of the mine. All soil stockpiles on the site have been sown to cover crops on completion to aid in stabilisation.

3.2.2 Performance

The effectiveness of the procedures for erosion and sedimentation management are assessed visually as part of routine mine operations and supervision undertaken by Tarrawonga Coal, with any ameliorative works initiated as and when required.

Proposed works to de-silt sediment basins and storage dams has been postponed until suitable climatic conditions persist to provide an opportunity to undertake the works. Predicted seasonal and climatic conditions indicate that the proposed works will be possible in the next reporting period.

A rock drain was constructed on the southern emplacement to convey runoff from contour banks and is directed into SB16A. The drain reduces erosion and reduces the risk of contour banks failing during large storm events.

3.2.3 Comparison with EA Measures

The Tarrawonga Coal Project EA stated that new and existing erosion and sediment control structures would be inspected by mine personnel on a regular basis and

following rainfall events greater than 25mm in a 24 hour period to assess integrity, identify instances of potential erosion and determine retained capacity. The Environmental Officer is responsible for undertaking monthly environmental inspections as well as inspections after heavy rainfall. Site mining supervisors also undertake daily inspections of the site which include visual assessment of water management structures.

During the 4th quarter of the reporting period it was proposed to de-silt a number of dams across the site in increase on site water capacity, however, due to high rainfall during March this project was not carried out. Subject to the seasonal conditions it is proposed that this will occur during the next reporting period.

Progressive construction of water management on rehabilitated areas has occurred as required. For example, extension of the rock lined waterway on the western face of the southern emplacement has been completed.

3.3 Surface Water Pollution

3.3.1 Management

The prevention of surface water pollution is achieved through the management of surface water as presented in Section 2.8.2.

3.3.2 Performance

3.3.2.1 Wet Weather Discharges

TCPL has, at all times, made every effort practically possible to avoid discharge and to minimise impacts when discharge is inevitable (ie. maintenance of sediment control fencing). One (1) instance of wet weather discharge occurred during the reporting period, as detailed below. The discharge was sampled in accordance with the requirements of EPL 12365 (Appendix 5). Rainfall records are shown in Appendix 10.

Wet weather discharge occurred from Storage Dam 9 on the 28th March 2014. The discharge occurred following 133.8 mm in the preceding 5 days. Water quality from this discharge complied with all parameters, including a TSS level of 12mg/L. This rainfall event exceeded the 5 day 90%ile design criteria and all efforts were made prior to this event to prevent a discharge. Both Nagero Creek (upstream and downstream) and Bollol Creek (upstream and downstream) were able to be sampled at the time with TSS results of 88 mg/L, 89mg/L, 160mg/l and 631mg/l respectively, indicating that non-project related discharge waters did have an influence upon water quality in Bollol Creek.

3.3.2.2 Conclusion

Significant improvements have been made in regards to managing wet weather discharge issues, with the successful trial and implementation of liquid flocculant into storage dams when required, as well as constructing additional dams for increased storage capacity and improved water management. Signage indicating dam names and purpose as well as level indicators has been installed to allow for easy identification of necessary storage capacities. In addition to this, the existing Water Management Plan prepared by URS under the previous mining approval DA 88-4-2005 MOD 1 was updated to comply with PA 11_0047 during the last reporting period, with correspondence received during this reporting period. It is expected that the revised plan, incorporating comments, will be resubmitted early in the next reporting period for approval.

3.3.2.3 Surface Water Storages

In addition to monitoring of wet weather discharge events, TCPL undertakes quarterly sampling of surface waters, with samples during the reporting period referred to ALS Acirl Pty Ltd for analysis. The results of analysis are presented in Appendix 5.

Whilst there are no criteria or concentration limits specified for the quarterly surface water samples, the results do provide an indication as to the quality of waters on-site.

EC levels in various storages have shown to be variable, and have been the subject of previous discussions during AEMR reviews. Results presented over the last 12 months continue to identify fluctuating EC levels.

The assessment of sediment load during these quarterly water monitoring events also provides an indication of the capacity for those storages to meet water quality criteria should a wet weather discharge occur, and if additional treatment methods would be warranted to minimise potential for a non-compliant discharge.

3.3.3 Comparison with EA predictions

The Tarrawonga Coal Project EA identified no consistent difference between water quality at sites upstream and downstream of the mine. It did however note potential impacts on creek water quality from elevated suspended solids contained in runoff and/or leakage or spillage of hydrocarbons from infrastructure area. No hydrocarbon related issues or impacts on creek water quality from elevated suspended solids in runoff have occurred during the reporting period.

SB25 was constructed during the reporting period. As per the Tarrawonga Coal Project EA, off-site creek monitoring locations have not changed. Assessment of Arsenic, Molybdenum and Selenium have continued in accordance with water management plan requirements, with no suggested trend of enrichment of these minerals in surface waters adjacent to the overburden emplacements.

3.4 Groundwater Pollution

3.4.1 Management

With the exception of fuels and oils, no materials occur, or are retained on the mine site which is likely to be a source of groundwater pollution.

The methods for management of potential pollutants are summarised in Section 2.8. Ongoing monitoring to assess trends in groundwater chemistry will enable assessment of potential contaminants to groundwater, with particular emphasis on heavy metals and major cations and anions. Groundwater monitoring requirements are identified in the Water Management Plan.

3.4.2 Performance

Throughout the life of the mine to date, Tarrawonga Coal's performance with respect to groundwater management, the prevention of pollution and the assessment of impacts on groundwater availability to other surrounding users, has been assessed through groundwater level and chemistry monitoring undertaken at a series of operating and abandoned bores within ML 1579, 1685 and 1693 and extending to distances of up to 3km from the mining activities, where practicable, at the frequency and for the parameters identified in the Water Management Plan.

Appendix 6 presents the results of the groundwater monitoring undertaken since the commencement of mining at the Tarrawonga Coal Mine. Monitoring sites are shown on Figure 7.

Groundwater sampling and analysis was conducted by ALS Acirl Pty Ltd during the reporting period. A review of the groundwater monitoring results presented in Appendix 6 shows the following trends:

Groundwater levels

Groundwater levels within most bores remained relatively consistent (throughout the reporting period. This includes the trend of fluctuation shown in some bores over many years. The SWL in MW7 has been consistent through the reporting period, which is a different result to previous years where it showed a consistent drop in SWL.

Two vibrating wire piezometers were installed into exploration boreholes drilled in 2011 (TA60c and TA65c). Logger data continues to demonstrate a consistent trend of no perceptible drawdown as a consequence of mining operations, with water levels remaining relatively constant and generally within a range of 20cm over the reporting period.

Groundwater quality

- The water in most bores is generally neutral in pH to mildly alkaline.
- The water in all bores can be described as fresh to brackish.
- During the reporting period the water quality at all monitoring locations has been within the ANZECC guideline trigger values for livestock drinking water.

3.4.3 Comparison with EA predictions

The Tarrawonga Coal Project EA identified that there would be negligible drawdown effect on alluvial and porous rock systems and would only be in an area where no privately-owned bores are located. It also indicated that variations in standing water levels across the monitoring network are generally considered to be typical of natural effects and a response to rainfall trends and farming activity. This has been the case throughout the reporting period with all monitoring locations maintaining consistent levels (with fluctuations). Vibrating Wire Piezometer installed in TA60 and TA65 continue to demonstrate depressurisation as predicted in the Tarrawonga Coal Project EA as the mine moves toward the east.

3.5 Contaminated or Polluted Land

Prior to mining, the project area was a greenfields site. Discussion with landowners during the preparation of the EIS revealed that no environmentally harmful products had been used on their landholding nor had there been any disposal of potential environmental contaminants. This situation has remained unchanged throughout the life of the mine to date and consequently there is no reason to expect that contaminated lands would be present within the project area.

Areas identified of potential land contamination during the Life of Mine Extension Environmental Assessment have not been disturbed during this reporting period and are several years from disturbance based on current mine planning.

3.6 Threatened Flora

Investigations undertaken by Geoff Cunningham Natural Resource Consultants Pty Ltd as part of the original Mine EIS identified no significant impact on threatened flora species, endangered ecological communities, endangered flora populations or critical habitat as a consequence of the development.

Notwithstanding the findings of the initial flora investigations, procedures were identified in the Flora and Fauna Management Plan for the site for ongoing monitoring, specifically through the establishment of flora monitoring quadrats for use in future rehabilitation of the mine site.

Establishment of monitoring plots commenced in April 2007 and has continued as required. Over the life of the mine, a total of 28 quadrats are to be established across rehabilitation sites and control sites.

During the reporting period, vegetation monitoring was conducted during mid to late 2013 and early 2014 through Eco Logical Australia Pty Ltd. This monitoring comprised of:

- Remote sensing (multi-spectral imaging) on the 25th August 2013;
- Terrestrial fauna and habitat survey on the 2nd and 3rd September and 21st and 23rd October 2013; and
- Monitoring of native vegetation areas was conducted 2nd December 2013 and 9th and 10th January 2014.

As rehabilitation of pasture areas had only recently been undertaken, monitoring of the rehabilitated pasture will take place and be reported to during the next reporting period.

Changes in the Normalised Differential Vegetation Index (NDVI) of multi-spectral imagery captured on 30th September 2012 and 25th August 2013 were assessed. These identified an increase in groundcover across most of the site. One area of significant increase in photosynthetically active biomass (PAB) was identified in the southern portion of Pasture Rehabilitation Zone (Appendix 7). Field validation by WCM found the area to have an increase in weed cover, particularly Mayne's Pest. This is not an environmental or noxious weed, so no specific management action is required.

Scattered areas of increase and decrease in PAB across the image can be attributed to shadow position and slight image shift. This is particularly pronounced around dam perimeters. Key weeds identified for additional control included the African Boxthorn and Prickly Pear. A copy of the 2013 report is included in Appendix 7.

The Whitehaven Regional Biobank site was formally established on the 28th June 2012 under Biobank Agreement 43. This Biobank site now accounts for Tarrawonga

offset requirements associated with the original Tarrawonga development and the 2010 modification. The biobank credits required to be retired for these approvals occurred on the 17th April 2013, and the area is now subject to active management in accordance with the Management Plan for the Regional Biobank site.

The Offset Management Plan for the Willeroi Biodiversity Offset Area (EPBC approval requirement) has been submitted to the Department of Environment for approval. The Biodiversity Management Plan (required by the Project Approval) also incorporates management measures for Willeroi. It has been submitted to DP&E for approval and at the end of the reporting period, Tarrawonga had not received advice from DP&E.

3.6.1 Comparisons with EA Measures

The Biodiversity Assessment undertaken as part of the Tarrawonga Coal Project EA outlines the approved areas of disturbance. Approximately 1.5 ha was cleared in advance of the pit during the reporting period. Flora and fauna monitoring has occurred as identified in the Tarrawonga Coal Project EA (see Appendix 7 for reports), with pre-start clearance surveys completed by recognised ecologists prior to clearing activity.

3.7 Threatened Fauna

Investigations into the occurrence of threatened fauna within the Project Area were undertaken by Countrywide Ecological Service (CES) as part of the original EIS preparation phase. Those investigations identified that the proposed development was unlikely to significantly affect threatened species found or likely to occur in or around the mine site.

Notwithstanding these findings, the Flora and Fauna Management Plan was developed to monitor possible impacts on native fauna diversity. This is assessed using the control quadrats established for flora monitoring purposes, the re-establishing of native vegetation community quadrats, the re-establishing of pasture land monitoring quadrats, and will also involve additional sampling for amphibians, mammals and birds external to these quadrats to gain an appreciation of any significant changes to the native fauna assemblage in the presence of mining and absence of grazing.

During the reporting period, as part of PA 11_0047 requirements, a Biodiversity Management Plan was developed. Once approved, this Biodiversity Management Plan will replace the existing Flora and Fauna Management plan with updated procedures, policies and management strategies for the site itself and for the

Willeroi Offset area, in conjunction with the Offset Management Plan required by the EPBC approval.

The annual fauna monitoring program was undertaken in September 2013 by Eco Logical Australia Pty Ltd (ELA). Additionally, ELA undertook terrestrial fauna and habitat monitoring as part of their Rehabilitation Monitoring Report in December 2013. The report is provided in Appendix 7 and includes details on the suite of monitoring undertaken. As with flora monitoring, the results from the Eco Logical assessment will form a quantitative set of baseline data for ongoing monitoring via these methods.

A total of 66 bird species were recorded across all monitoring sites by ELA, with most species being recorded in the woodland control plots. However, there was a significant increase of species identified on rehabilitation survey plots with twice as many species recorded in September 2013 than September 2012. Five species listed as vulnerable under the TSC Act were recorded during the survey, most of which occurred in control plots. One occurred in Fauna Rehab 01.

- *Chthonicola sagittata* (Speckled Warbler)
- *Climacteris picumnus* (Brown Treecreeper)
- *Daphoenositta chrysoptera* (Varied Sittella)
- *Hieraaetus morphnoides* (Little Eagle)
- *Neophema pulchella* (Turquoise Parrot).

Of the non-bird fauna *Macropus giganteus* (Eastern Grey Kangaroo) and *Macropus robustus* (Common Wallaroo) were noted in all monitoring zones. *Wallabia bicolor* (Swamp Wallaby) was also recorded in the control zones. These species have been recorded in previous years. *Cryptoblepharus virgatus* (Wall Skink) was recorded in Fauna Rehab 01, whilst *Varanus varius* (Lace Monitor) was recorded in Fauna Control 3.

3.7.1 Comparison with EA Measures

The Tarrawonga Coal Project EA identified pre-clearance fauna surveys, rehabilitation and revegetation of disturbed areas and fauna monitoring as measures to avoid or mitigate impacts on fauna. Appendix 7 provides the Rehabilitation Monitoring Report undertaken by Eco Logical Australia. Rehabilitation is discussed in Section 5.

3.8 Weeds

3.8.1 Management

Weed management within the Project area involves general observations as well as six-monthly targeted inspections to determine levels of weed infestation. Weed control is undertaken by contractors or Whitehaven's Field Officer. All persons involved with weed control hold required chemical handling certificates.

3.8.2 Performance

Ongoing weed management during the reporting period comprised:

- Spot spraying of African Boxthorn within the ML (particularly in the waste emplacement rehabilitation and around SB5A);
- Removal of Silverleaf Nightshade and spraying of Mother-of-Millions along roadsides and within the ML;
- Spot spraying of general weeds and grasses around the administration office and workshops;
- Spot spraying of Prickly Pear, Bathurst Burr and Noogoora Burr within the ML;
- Introduction of Cactoblastis and Cochineal to eradicate Prickly Pear plants; and
- Spraying of grasses along rip lines and mounded areas to reduce competition with planted tubestock in rehabilitation areas.

Key recommendations from the ELA report relating to weed control include targeted control of African Boxthorn across the site which will be undertaken during the next reporting period.

3.9 Blasting

3.9.1 Blast Criteria and Control Procedures

3.9.1.1 Blast Criteria

Blasting criteria for the Tarrawonga Coal Mine are nominated in PA 11_0047 and specify that:

- Blasting must only be carried out between 9.00 am and 5.00 pm, Monday to Saturday inclusive. Blasting is not allowed on Sundays, public holidays or at any other time without the written approval of the Director-General.

- A maximum of one (1) blast per day; unless an additional blast is required following a blast misfire and a maximum of 4 blasts per week averaged over a calendar year for the project:
- The overpressure level from blasting operations must not:
 - exceed 115dB (Lin Peak) for more than 5% of the total number of blasts over a period of 12 months; and
 - exceed 120dB (Lin Peak) at any time.
- Ground vibration peak particle velocity from the blasting operations must not:
 - exceed 5mm/s for more than 5% of the total number of blasts during each reporting period; and
 - exceed 10mm/s at any time,at any residence on privately-owned land.

3.9.1.2 Control Procedures

Flyrock, air vibration, ground vibration and dust from blasting are controlled using a combination of design and operational methods which are detailed in the MOP and/or documented blasting procedures.

3.9.2 Performance

During the reporting period, a total of 50 blasts were initiated (all of which were monitored).

There was only one instance of monitoring results exceeding 115 dBL during the reporting period, occurring at the project-related “Templemore”. This exceedance falls within the allowable 5% of blasts in a 12 month period over 115 dBL but not greater than 120 dBL. There were no instances of blast results exceeding 120 dBL during this reporting period.

The maximum recorded ground vibration during the reporting period was 2.43mm/s recorded at Tarrawonga Station on 6th June 2013. This is well inside the consent criteria of 10 mm/s.

All blast monitoring results for the reporting period, including the time of initiation has been included in Appendix 8.

3.9.3 Comparison with EA predictions

Blasting impact predictions are presented in Appendix C of the Tarrawonga Coal Project EA and indicate that vibration and air blast emissions would comply with the relevant human comfort and structural damage criteria at nearby privately-owned receivers. PA 11_0047 allows for 5% of blasts to exceed 115 dB so the blast of the 23rd August 2013 which recorded an overpressure level of 116.5dBL is not considered non-compliance.

The Blast Management Plan was updated to comply with requirements in PA 11_0047 during the reporting period and is subject to approval by DP&E, with approval expected in the next reporting period. An additional requirement of the Blast Management Plan was the development of a Road Closure Management Plan in preparation for the mine moving further to the East, closer to on Goonbri Road. Approval of this plan is expected in the next reporting period.

3.10 Operational Noise

3.10.1 Criteria

For the purpose of monitoring noise performance throughout the reporting period following the granting of PA 11_0047, the criteria adopted for compliance is that of PA 11_0047 which is specified as follows:

Noise Criteria dB(A)

Location	Day, Evening & Night L_{Aeq} (15 min)	Night L_{A1} (1 min)
<i>All other privately-owned residences</i>	35	45

Road Traffic Noise Criteria dB(A) L_{Aeq} (1 hour)

Location	Day	Evening	Night
<i>Any residence on privately-owned land</i>	60	60	55

In August 2013, the property “Kyalla” was acquired and is now project owned land. This acquisition occurred following an agreement between both parties of terms for acquisition during the last reporting period. Subsequently the EPL has been amended to remove the noise criteria for the “Kyalla” property and is consistent with the project approval.

A number of other specific conditions (ie. acquisition, monitoring protocols and cumulative impacts) are listed in PA 11_0047 (Appendix 1) and EPL 12365 (Appendix 2).

3.10.2 Control Procedures

Control of noise generation and propagation on the mine site is by a combination of general source and propagation path methods including:

- Installation and maintenance of appropriate mufflers on plant and equipment;
- Where operationally feasible, scheduling activities to minimise operation of equipment in exposed locations when winds are blowing towards residences;
- Equipment removal or replacement;
- Changing operational procedures;
- Restricting hours of operations;
- Enclosure of fixed items of plant, eg generators;
- Bunding close to noise sources to create obstructions to the propagation path;
- On-going site road maintenance using the mine-based grader; and
- Regular equipment maintenance.

Tarrawonga Coal also regularly liaises with the majority of surrounding neighbours to seek feedback not only on noise, but on all mining activities. Any issues raised are investigated and appropriate measures are implemented to alleviate further impacts.

3.10.3 Operational Noise Monitoring

3.10.3.1 Introduction

In order to indicate to mine management the need, or otherwise further address noise related matters, routine attended noise monitoring programs were undertaken quarterly during the reporting period by Spectrum Acoustics. The noise monitoring sites are identified on Figure 5. A copy of all the attended noise monitoring reports is presented in Appendix 9.

In addition to the operational noise requirements, Tarrawonga Coal monitors road transport noise along public sections of the coal haulage route in accordance with the Tarrawonga and Rocglen Road Noise Management Plans. This monitoring occurs at the privately owned residences on the “Weroona” property and “Brooklyn” property located off Blue Vale Road. The results of this noise monitoring is also contained within Appendix 9.

In accordance with the requirements of PA 11_0047 and EPL 12365, TCPL undertook real time noise monitoring during the reporting period. Monitoring was undertaken at the following properties:

- “Blair Athol”: May 2013– 8th June 2013
- Laird property: 8th June – 11th November 2013
- “Matong”: 12th November 2013 to end of reporting period.

During this reporting period, Tarrawonga Coal continued to implement the procedures in relation to real time monitoring. The procedure has shown to provide crucial data in relation to the management of noise emissions from the operation.

The following sub-sections present a summary of the outcomes of attended noise monitoring over the reporting period.

3.10.3.2 June/July 2013 Noise Monitoring - Attended

Noise monitoring was undertaken from the 26th and 27th June and 1st and 2nd July 2013 at “Tarrawonga” (N1). TCM did not exceed the operational noise criterion at the Tarrawonga monitoring location. Atmospheric conditions at the times of the monitoring were calm and cold and there is high likelihood of a moderate to strong temperature inversion being in place.

Noise from TCM was inaudible during the sleep disturbance monitoring at “Tarrawonga” on the nights of 26th June and 1st and 2nd July 2013.

At the time of monitoring the “Tarrawonga” landholder retained acquisition rights under the Project Approval.

3.10.3.3 June 2013 Noise Monitoring – Road Noise

Road noise monitoring was conducted at the “Brooklyn” (2 residences) and “Weroona” properties on the 25th June 2013, with the following observations and results:

- 60 truck movements were recorded during the measurement period for Residence 1 and 2 at “Brooklyn” (4.26pm to 5.28pm). The calculated contribution at Residence 1 from mine-related vehicles was 57 dB(A),_{Leq (1 hour)}. The calculated contribution from mine-related vehicles at Residence 2 was 43 dB(A),_{Leq (1 hour)}. Both results are below the daytime criterion of 60 dB(A) _{Leq (1 hour)}.
- Over the course of the measurement period at “Weroona” (3:05pm to 4:07pm) there were 61 coal truck movements related to Tarrawonga and

Rocglen. The total measured contribution from mine-related vehicles at “Weroona” was 47dB(A), L_{eq} (1 hour). This is below the daytime criterion of 60 dB(A) L_{eq} (1 hour).

3.10.3.4 September 2013 Noise Monitoring – Attended

Noise monitoring was undertaken from the 25th to 28th September 2013. TCM were in excess of the operational noise criterion at the “Tarrawonga” monitoring location during the day on 28th September (37dB(A)). The measured level is consistent with modelled predictions and at the time of monitoring the landholder retained acquisition rights under the Project Approval.

3.10.3.5 December 2013 Noise Monitoring – Attended

Noise monitoring was undertaken from the 2nd to 4th December 2013. Noise emissions from TCM were higher than the operational noise criterion at the “Tarrawonga” monitoring location during the night of the 3rd (37dB(A)) and during the day and evening of 4th December (40dB(A) and 37dB(A) respectively). TCM also exceeded the sleep disturbance criterion during the monitoring on the 5th December (48 dB(A)).

At the time of monitoring, agreement had recently been reached in terms of acquisition of the “Tarrawonga” property, and as a consequence, it was considered project related.

3.10.3.6 March 2014 Noise Monitoring – Attended

Noise monitoring was undertaken from the 3rd to 6th March 2014. Noise emissions were within specified criteria. As the “Tarrawonga” property is project owned land the noise criterion does not apply.

3.10.3.7 March 2014 Noise Monitoring – Road Noise

Road noise monitoring was due to be undertaken in March 2013 but due to a lack of truck movements along the haul road from Tarrawonga and inclement weather at the time monitoring was to be undertaken, it was postponed until June 2013 and will be reported during the next reporting period.

3.10.4 Comparison with EA predictions

During the reporting period it was identified that noise levels measured at the “Tarrawonga” property were generally in accordance with predictions made in the

2011 Extension EA, with noise levels up to 5dB above the standard 35dB criteria. The “Tarrawonga” property was acquired during the reporting period and is now project related.

TCM will revise the noise monitoring locations during the next reporting period to include monitoring at private receivers.

3.11 Visual, Light

3.11.1 Management

Management/minimisation of local and more distant visual impacts is achieved by:

- Undertaking activities in accordance with the various management plans applicable to the mine, all of which incorporate safeguards which indirectly reduce visual impact;
- Minimising the extent of land disturbance / clearing in advance of mining;
- Progressive rehabilitation of disturbed areas; and
- Sympathetic positioning and direction of lights to avoid them impacting on local residences.

3.11.2 Performance

Tarrawonga Coal has minimised the visual impact of its activities to the extent practicable, however, the continued progression of the southern waste emplacement to the south and the increased height of the emplacement have resulted in increased visibility from non-mining related properties. TCM is aware of the visual impact this emplacement has created, and with the granting of PA 11_0047, will fast-track rehabilitation of the southern emplacement as much as possible.

Short term stabilisation of the southern waste emplacement has been considered and will be actioned in the next reporting period. Vegetating this area will improve the appearance of the site from the nearby public roads and private receivers.

Visual impacts from dust generation are discussed in Sections 3.1.3 and 4.1.

3.11.3 Comparison with EA Predictions

The Tarrawonga Coal Project EA provided simulations from neighbouring properties as well as predictions for general visual impacts created by the mine.

Mine management continually reiterates the importance of sympathetic positioning of lighting plant however it is difficult at times to locate lighting to avoid any offsite impact whilst maintaining safety requirements. In the event that complaints are received in relation to lighting, immediate action is taken on site to reduce the lighting impact wherever possible.

The Tarrawonga Coal Project EA also notes progressive rehabilitation as a visual impact mitigation measure. Section 5 discusses rehabilitation during the reporting period.

3.12 Aboriginal Heritage Management

3.12.1 Management and Consultation

A Cultural Heritage Assessment was completed in September 2011 as part of the Tarrawonga Coal Project EA by Kayandel Archaeological Services. A total of 57 sites (21 open artefacts, 11 scarred trees and 21 isolated artefacts) were located during the surveys of the Project Area. An updated Heritage Management Plan (HMP) was approved, as required in PA 11_0047, during the reporting period, to manage and reduce impacts by incorporating updated procedures for assessment and recovery of culturally significant objects as the mine progresses. An additional requirement of PA 11_0047 includes the development of an Aboriginal Conservation Strategy in conjunction with the Boggabri Coal Mine and Maules Creek Project. The Strategy is being developed and will be completed during the next reporting period.

Prior to the updated HMP being approved in February 2014, Tarrawonga Coal, through the soil stripping contractor, consulted with Red Chief Local Aboriginal Land Council (LALC). In accordance with the agreement with the Red Chief LALC, notification of planned topsoil stripping was provided by the soil stripping contractor directly to the Red Chief LALC site monitors approximately 2 to 3 days in advance of planned activities. During this time, no Aboriginal heritage material was identified during soil stripping activities.

Following the approval of the HMP in February 2014, cultural artefact salvage was undertaken in ML 1685 associated with the northern extension. There are 9 identified sites located within the northern extension comprising a mixture of isolated artefact, stone artefact scatter and culturally modified trees. During initial consultation it was identified that it was not practical to undertake the salvage of culturally modified trees and that this would be undertaken at a later date (in the next reporting period). The salvage of other artefacts was undertaken on the 25th February 2014 with eight of the nine Registered Aboriginal Parties (RAPs) participating. Gunida Gunyah elected not to participate in any salvage works or any

other site based work as a result of the ongoing political issues associated with mining in the Gunnedah basin. They will continue to be consulted with for any other cultural heritage matter as identified in the HMP.

During the salvage of the five isolated sites, only one artefact was recovered at BC18 (AHIMS # 20-4-0112). No other artefacts were observed or recovered from the other four designated sites; BC17 (AHIMS # 20-4-0111), BC19 (AHIMS # 20-4-0113), BC22 (AHIMS # 20-4-0116) and TCEP-IF-002 (AHIMS # 20-4-0303).

At the artefact scatter site, TCEP-OS-020 (AHIMS # 20-4-341), eight artefacts were recovered and recorded.

TCEP-ST-001 (AHIMS# 20-4-0299) was determined by all parties not to be of an Aboriginal cultural practice but rather a surveyor's mark. This site will be deregistered as an Aboriginal Cultural Heritage site.

To date, the measures in place to protect Aboriginal cultural heritage are considered satisfactory, with all measures identified in the EA, Project Approval and HMP in place. New procedures have been implemented to manage a significantly larger number of registered Aboriginal parties identified through the Tarrawonga Coal Project EA (refer to HMP).

3.12.2 Comparison with EA Measures

Management measures for Aboriginal Heritage items are detailed in the Tarrawonga Coal Project EA. During the reporting period the Heritage Management Plan was approved by DP&E. All measures, where applicable, have been implemented during the reporting period including, salvage works, monitoring of soil stripping and ground disturbance activities by Registered Aboriginal Parties.

3.13 Natural Heritage

There are no features of natural heritage within the Project Area and hence, no specific management procedures are required.

3.14 Spontaneous Combustion

3.14.1 Management

Tarrawonga Coal has a low percentage of inorganic sulphur and hence a low potential for exothermic oxidation reactions. The short residence time of ROM coal stockpiles at the mine also minimises the potential for spontaneous combustion incidents.

In the event of spontaneous combustion Tarrawonga Coal personnel are present within the area of the ROM coal stockpiles during work hours and are trained to watch for indications of spontaneous combustion. Any incident would be followed by excavation to identify the source and extinguishment through water saturation.

3.14.2 Performance

There were no incidents of spontaneous combustion during the reporting period.

3.15 Bushfire Management

3.15.1 Management

The existing Bushfire Management Plan was updated in April 2013, as required by Condition 59 of Schedule 3 of PA 11_0047. The plan identifies policies, procedures, responsibilities, equipment and equipment maintenance schedules, emergency response procedures and contact details in place for the Tarrawonga Coal Mine. The Plan was issued to both the Rural Fire Service and Narrabri Shire Council for reference and is available on the Whitehaven website.

Tarrawonga Coal maintains firebreaks around both its landholding and the mine area and maintains fire fighting equipment as well as earthmoving equipment, a water truck etc which would be used in the control of fires.

3.15.2 Performance

There were no bushfire incidents on or adjacent to the Project Area during the 2013/2014 reporting period.

3.16 Mine Subsidence

Mine subsidence is not an issue with open cut mines and hence it is not an issue with the Tarrawonga Coal Mine.

3.17 Hydrocarbon Contamination

3.17.1 Management

It is Tarrawonga Coal's objective that:

- All bulk hydrocarbons, i.e. fuel, oils, grease etc (both new and waste) retained at the Tarrawonga Coal Mine be contained within bunded areas within the contained water management system as described in Section 2.8.2;

- All fixed or portable equipment incorporate self-contained bunding;
- Hydrocarbon-contaminated materials be disposed of appropriately; and
- Minor spillages, if occurring, are cleaned up and the contaminated soil either bio-remediated or transferred off-site to an appropriately licensed waste disposal area.

Major spillages, if occurring, would be treated in accordance with the three-phase system identified in the relevant management plan required under the Project Approval.

3.17.2 Performance

Tarrawonga Coal's procedures for hydrocarbon management have been effective throughout the reporting period with:

- No surface or groundwater contamination evident or reported by landowners; and
- No requirement for off-site disposal of contaminated materials.

A concrete apron has been constructed at the refuelling area to contain any spillages and prevent soil contamination.

3.17.3 Greenhouse Gas Emissions

Diesel Consumption

During the reporting period, a total of 15,934,213 litres of diesel fuel was used on site for mining related activity, which is a decrease of approximately 3.07 million litres since the last reporting period. This is a result of improved mine plan efficiencies whilst maintaining increased production. Assuming an energy content of Automotive Diesel Oil of 38.6 GJ/kL and using Table 3 of the *National Greenhouse Accounts (NGA) Factors – July 2011*, the estimated direct – Scope 1 Greenhouse Gas emissions including all CO₂ and non CO₂ gases are shown in Table 6.

Table 6 - GHG Emissions - Diesel Fuel

	Diesel Fuel Usage kL	Emission Factor T CO ₂ -e/kL	Equivalent Tonnes
GHG 2012/13	15,934	2.7	43,022

The Tarrawonga site does not utilise electricity from the power grid, but via a number of diesel powered gensets. The emissions associated with diesel consumption by the gensets are included in the table above.

Explosives

During the reporting period, a total of 10,263 tonnes of explosives was used at Tarrawonga Coal Mine, which is a decrease of approximately 1,195 tonnes from last year. Assuming a conversion factor of 0.1778, it is estimated that blasting at the mine yielded 1,825 equivalent tonnes of CO₂.

Fugitive Emissions

Fugitive emissions from ROM coal production are reported via Whitehaven's National Greenhouse and Energy Report, as required by the *National Greenhouse and Energy Reporting Act 2007*. Emissions for Tarrawonga are determined from borehole samples taken at the mine and gas sampling analysed by external consultants. The actual gas content from each gas bearing strata is then applied to the mass of the gas bearing strata which is under the extraction area of the mine during the relevant financial year. The 2012/2013 National Greenhouse and Energy Report for the Whitehaven Group identified emissions from Tarrawonga of 1,956 total tonnes CO₂-e carbon dioxide equivalent.

Summary

A summary of calculated total CO₂ equivalent tonnes/year for the reporting period is provided in Table 7.

Table 7 - GHG Emissions Summary

Source	Calculated Total CO₂ Equivalent tonnes/year
Diesel	43,022
Explosives	1,825
Fugitive Emissions	1,956
TOTAL	46,803

The potential for reducing greenhouse gas emissions at Tarrawonga is related predominantly to consumption of diesel use by plant and equipment. Methods are in place at site to maximise efficiency from the mining fleet through regular maintenance scheduling and, where possible, minimising the gradient and length of loaded haul runs for the operating dump trucks.

Tarrawonga Coal remains committed to a reduction in emission levels as a result of operations at the mine site. Up until March 2013, Tarrawonga Coal had operated a fleet of Terex dump trucks (electric drive) which had proven to burn less diesel fuel as compared to a standard mechanical drive fleet. However, with the WHC cost reduction process undertaken in March 2013 as a means of addressing ongoing economic viability, these trucks were stood down due to modifications to the mining plan to improve economic efficiency. The change in the mining plan, installation of

larger CAT 785 and 789 trucks and maintenance of a production rate of 2Mtpa has, to some extent, offset any impacts associated with cessation of the electric drive fleet. Additionally, the biodiversity offset area at the Willeroi Property and the Regional Biobank site would assist with reducing the TCM carbon footprint, in particular the regeneration of areas previously cleared for agricultural purposes and the conservation commitment in place with the offsets to be maintained in perpetuity.

The fuel burn rate has increased over the last 12 months with an average rate of 7.8 litres/tonne of ROM coal. This compares to 9.8 litres/tonne ROM coal in 2012/2013 reporting period and 9.7 litres/tonne of ROM coal in the 2011/2012 AEMR period. The decrease since the last reporting period can be attributed to mine planning efficiencies, reduced overburden/coal strip ratio and shorter haul distances.

As part of Whitehaven's participation in the Commonwealth government's Energy Efficiency Opportunities (EEO) Program, the Tarrawonga site is subject to review and assessment of energy use performance and potential energy savings mechanisms.

The site has been undertaking energy efficiency works in accordance with the requirements of the program and in the last reporting year noted a decrease in fuel use by ancillary equipment (dozers, water carts and graders), whilst maintaining or increasing production, as a result of streamlined mine planning and scheduling.

3.17.4 Comparison with EA Predictions

Greenhouse gas emissions associated with the mine were assessed in Appendix D of the Tarrawonga Coal Project EA. The total direct (Scope 1) emissions were estimated to be approximately 0.2 million tonnes of carbon-dioxide equivalent (Mt CO₂-e) per annum. Scope 1 emissions are the release of greenhouse gases into the atmosphere as a direct result of an activity, or series of activities, that constitute the facility and include fugitive emissions from coal mines and diesel combustion.

Actual consumption (combining the major Scope 1 contributors of fugitive emissions, diesel consumption and explosives) totalled approximately 47,000 tonnes (or 0.047 Mt), which is significantly lower than the predicted emissions. This is expected as PAE Holmes identified in Appendix D of the Tarrawonga Coal Project EA that their estimation was expected to be a significant overestimate as it was based on the standard National Greenhouse Accounts factor which at the time was identified to be approximately 45 times greater than the factor measured for the same coal seams for a nearby mining project. This assumption was confirmed during 2012 drilling at Tarrawonga and subsequent NGERS reporting.

3.18 Methane Drainage / Ventilation

Methane drainage / ventilation are not of relevance to open cut mines and hence are not an issue at the mine.

3.19 Public Safety

3.19.1 Management

The mine is located wholly on WCL and Boggabri Coal owned land in a relatively remote area, in excess of 1 km from any public road and accessible only by a single access road which is locked when no mine-related personnel are at the mine. The site is fenced and appropriate signs installed.

Visitors to the mine are required to report to the mine office and unauthorised personnel are not permitted to move around the mine area unaccompanied. Procedures are in place with respect to blasting to ensure the area around each blast site is clear of personnel and that all surrounding residents are advised in advance of proposed blasts.

3.19.2 Performance

The procedures in place have been generally effective throughout the reporting period. However, anti-coal activists have on numerous occasions bypassed locked gates and ignored mine area safety signage to access areas of the mine site.

3.20 Feral Animal Control

Tarrawonga Coal continues to monitor feral animal occurrences both onsite and on other mine owned land and implements necessary control programmes if and when necessary.

In September 2013, Whitehaven participated in an aerial control campaign of feral animals (goats and pigs) on its offset properties.

3.21 Land Capability

All land currently disturbed by mining is classified as Land Capability Class III, IV, VI and VII with the remaining areas to be disturbed over the life of the approved mine primarily comprising Class III, IV & VI. All disturbance during the reporting period was undertaken on Class III, VI and VII land.

On completion of all mining activities, the successful rehabilitation of areas of disturbance and the relinquishment of the mining leases, the land affected by mining within the Project Area will, in the main, be returned to a classification similar to that prior to mining.

3.22 Meteorological Monitoring

3.22.1 Introduction

A weather station is located at the project owned “Templemore” property.

3.22.2 Rainfall

Rainfall data for the reporting period recorded from the “Templemore” meteorological station is presented in Table 8 and Figure 10. Full station data is presented in Appendix 10.

Table 8 - Rainfall Data
(1 May 2013 – 30 April 2014)

<i>Month</i>	<i>Monthly Rainfall (mm)</i>	<i>Long Term Average* (mm)</i>	<i>Cumulative Rainfall (mm)</i>	<i>Number of Rain Days (≥1mm)</i>
May 2013	21.6	42.5	21.6	5
June 2013	136.6	43.6	158.2	7
July 2013	21.4	42.7	179.6	4
August 2013	5.0	41.3	184.6	1
September 2013	21.8	40.3	206.4	2
October 2013	13.0	55.1	219.4	1
November 2013	120.0	62.2	339.4	7
December 2013	20.4	70	359.8	4
January 2014	8.4	71.7	368.2	2
February 2014	37.8	67.3	406.8	3
March 2014	168.0	47.8	574.0	9
April 2014	8.2	37.2	582.2	2
Total	582.2	621.7	582.2	47

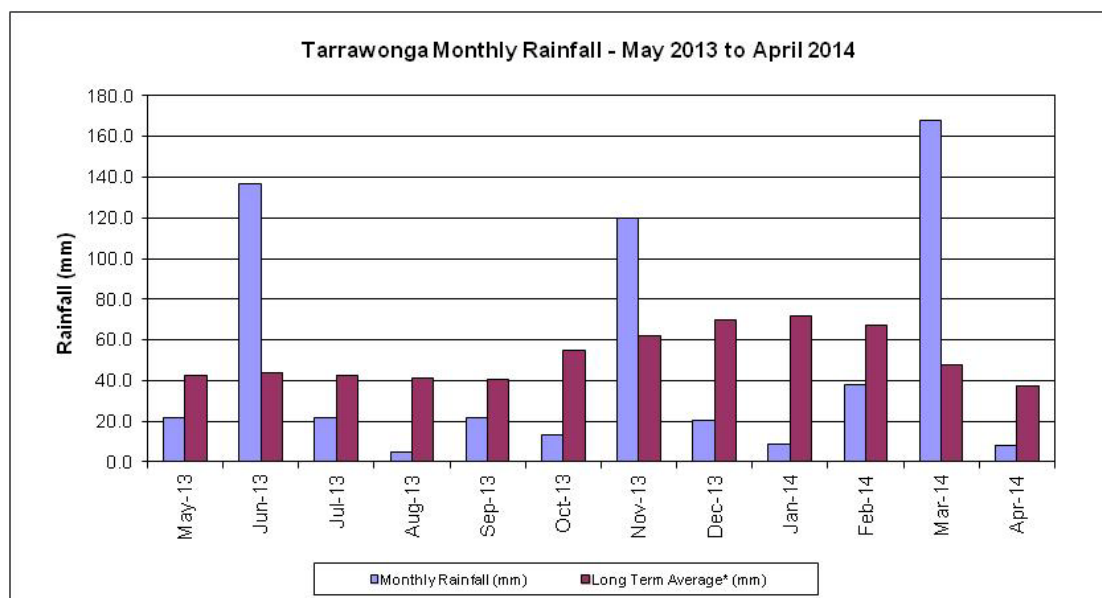


Figure 10 - Monthly Rainfall Data

A review of Table 8 and Figure 10 shows that the total rainfall at the mine during the reporting period was 581.2mm. The total rainfall at the site was 40.3mm less than the annual average rainfall for Gunnedah and 97.8mm less than the mine's total rainfall for the 2012/2013 AEMR/Annual Review reporting period. Below average rainfall was experienced for the majority of the reporting period. Nine of the twelve months received well below average rainfall. June and November 2013 and March 2014 received well above average rainfall which ultimately bolstered the annual figures.

3.22.3 Temperature

Average maximum and minimum temperatures for the reporting period are presented in Table 9 together with long-term monthly averages for Gunnedah Pool (Bureau of Meteorology Station 055023).

**Table 9 - Average Monthly Temperatures
(May 2013 – April 2014)**

Month	Average Daily Temperature			
	Reporting Period (°C)		Station 055023 (Gunnedah Pool)* (°C)	
	Min	Max	Min	Max
May 2013	5.2	21.7	7.1	21.3
June 2013	4.3	17.4	4.3	17.6
July 2013	2.6	18.6	3.0	16.9
August 2013	1.5	20.8	4.2	18.9
September 2013	5.3	27.1	7.0	22.8
October 2013	8.1	29.0	10.8	26.7
November 2013	11.6	30.5	14.2	30.3
December 2013	14.5	33.5	16.8	32.9
January 2014	18.2	36.1	18.4	34.0
February 2014	18.0	34.1	18.1	32.9
March 2014	16.4	29.4	15.8	30.7
April 2014	11.4	26.3	11.4	26.4
Annual Average	9.8	27.0	10.9	26.0

* Averages from 1876-2014

3.22.4 Wind Speed and Direction

Fifteen minute average wind speed and direction data is collected from the Tarrawonga meteorological station, as it, together with operational records and environmental monitoring results, can be used to assess the environmental effects or consequences of specific activities undertaken at the mine or in surrounding areas. Monthly wind roses show that the dominant wind directions during the reporting period were from the south east and north (Appendix 10).

3.22.5 Inversions

The meteorological station at “Templemore” is fitted with temperature sensors at 2m and 10m intervals to assist in the determination of inversion conditions. As the noise results obtained over the reporting period were generally in compliance or within modelled limits, no specific investigation into temperature inversion impacts on noise propagation was undertaken. Noise exceedances at the “Tarrawonga” property were modelled in the Tarrawonga Project Approval EA and the owner of this property retained compulsory acquisition rights under PA 11_0047 prior to Whitehaven acquiring the property. As of July 2013, TCM has access to data from a 60m tower with temperature sensors located at Boggabri Coal, as part of the

cumulative management of air quality and noise. This data will provide more detailed information on inversion layers throughout the winter and impacts will be reported during the next reporting period.

4 COMMUNITY RELATIONS

4.1 Environmental Complaints

Tarrawonga Coal maintains a designated complaints line, with messages checked on a daily basis (seven days/week) by the Environmental Officer. In the event of a complaint, details pertaining to the complainant, complaint and action taken are recorded on a "Complaints Form".

Eleven (11) complaints were received during the reporting period. The nature of the complaints, details and responses to each complaint are presented in Table 10. The number of complaints has reduced dramatically since previous reporting periods (55 recorded in the 2012/2013 AEMR period and 24 recorded during the 2011/2012 AEMR period) however there is some doubling up of complaints whereby a complaint was made directly to the mine and then additionally via the EPA.

Table 10 provides a comparison of complaints received over the past AEMR reporting periods.

The most common complaints were related to dust (including dust generation on the unsealed sections of nearby roads), blasting and noise. Anonymous complaints received via the EPA totalled 27% of the complaints whilst complaints from the most prominent complainant totalled 36%. The remaining 37% of complaints were from individuals who registered either one or two complaints during the reporting period.

Any complaints that are made are reported to the Community Consultative Committee and documented in the AEMR/Annual Review.

Table 10 - Complaints Summary (2013/2014 Reporting Period)

Method	Date/Time of Complaint	Nature of Complaint	Investigation	Action Taken/Follow-Up
EPA on behalf of anonymous complainant	31/05/2013 9:46am	Complaint relating to dust from the mines at 6am on Friday 31 st May.	<p>The Environmental Manager requested advice from the Tarrawonga site Environmental Officer as to conditions at the time of the complaint and relevant mitigation measures being undertaken to reduce dust lift off. The Environmental Officer confirmed that 1,632,000L of water was used on site over the preceding period (6am 30th May to 3am 31st May). On entry to site on the morning of 31st May the Environmental Officer noted slightly elevated dust levels in the general area, and put this down to general mining and road dust being trapped in an inversion layer. Subsequent site based inspections of dust levels was taken throughout the morning with no evidence of individual pieces of mining equipment generating significant dust loads. The Environmental Officer noted that by 10am, upon breakup of the inversion layer, the visible dust had generally dispersed.</p> <p>The Environmental Officer had also noted during the day on 30th May that farming activities on the "Ambardo" property was generating significant dust from farming equipment, with this dust travelling in a generally north-north east direction.</p>	Photographs of the site over the time of the complaint were provided to the EPA as part of the response.
Phone call to Tarrawonga site (spoke with Operations Manager)	12/07/2013 12:50pm	Complaint relating to what the complainant believed to be vibration from the blast earlier in the day. The complainant said he felt the vibration through the ground and it shook the whole house. He noted that he had been noticing blasts more and more lately.	<p>The Operations Manager advised the complainant that the blast wasn't out of the ordinary in terms of the size and type of blast however the overcast conditions on the day likely contributed to the effects of the blast being experienced at the complainant's property. The Operations Manager also explained that the complainant would have noticed airblast overpressure rather than ground vibration however the complainant was adamant it was ground vibration. The Operations Manager committed to investigating the blast with the view of improving blasting in the future.</p> <p>The monitor results showed no trigger on noise, however did trigger at Templemore and Tarrawonga Station on vibration, below exceedance levels. (Templemore: 1.42mm/s and 101.4dBL, Tarrawonga: 0.45mm/s and 80.5dBL).</p> <p>Following receipt of the complainant's concerns, Whitehaven sought specialist advice in relation to this blast from Orica's vibration specialist, who indicated that the blast effects may have been exacerbated by an initial presplit hole that was not fully contained. This could have caused airblast like effects (without necessarily triggering) a significant distance past the radius of the blast monitors. Environmental factors (low cloud, still day) would have amplified the effects of the blast. Orica also indicated vibration would not have propagated the distance to the complainant's property, and that the effects of rattling windows would have been as a consequence of blast overpressure.</p> <p>Alternative options for blasting, relating to presplit shots and possibly the direction of firing, will be considered in consultation with Whitehaven.</p>	Letter issued to the complainant detailing the blast investigation outcomes.
EPA on behalf of anonymous complainant	25/07/2013 12:10pm	Complaint relating to noise and vibration from unspecified mine blast. Caller was working inside 48 Laidlaw Street Boggabri and at 12:10 this afternoon the house shook, the cornice loudly cracked and the windows rattled. Caller said the	Tarrawonga did undertake a significant blast at 12:08pm on the 25/7/13. The Environmental Manager requested advice from the Tarrawonga site Environmental Officer as to conditions at the time of blast and if monitoring results were complaint. Monitoring results were compliant, (Tarrawonga monitor, SW of the mine and towards alleged impact area did not trigger) and weather condition were clear and were well under the criteria applied in the blast management plan for adverse weather conditions. Whitehaven sought specialist advice from qualified Orica personnel. An investigation stated that with data available from the blast monitoring, geological and weather conditions, no	Environmental report formulated and reported to the EPA. No further action required.

		effect was not mild. House is a 1960s vintage and has not suffered major damage in previous 50 years. Suspect either Whitehaven Coal or Boggabri Coal mines.	conclusion could be ascertained as to the cause or an explanation formulated in regards to the complaint.	
Phone call to Tarrawonga Environmental Officer	5/08/2013 10:00am	Complainant concerned about dust in area.	Message received by the Environmental Officer at 10am. On the returning call at 11:00am, a complaint was made in regards elevated dust levels during the morning. The complainant was not sure if it was emanating from Tarrawonga or IBC. The environmental officer stated that Tarrawonga had not been fully operation during morning due to equipment issues and toolbox talks regarding a recent incident. At 930am, it was noted that Tarrawonga dust levels were satisfactory but IBC did had slightly elevated dust levels. It is was also noted at by the site survey when checking water levels at 10am, that a cattle truck headed East along Goonbri Rd had caused significant dust lift off.	Continue to monitor dust levels and water cart usage.
EPA on behalf of identified complainant	14/08/2013 4:00pm	Complainant concerned about dust in area from mine personnel and mine related vehicles travelling on gravel roads, particularly from 4pm onwards. Complainant requested mines talk with their staff to again reiterate that they should use sealed roads wherever possible.	It is impossible for Tarrawonga Coal to stipulate that its employees cannot use public roads, and it would be most likely that the only employees for Tarrawonga that would utilise gravel roads in the area are those that have no alternate option. Notwithstanding this, site will be requested to toolbox this issue with personnel and encourage them, wherever possible, to limit travel on gravel roads.	Nil required.
Email to Health and Safety Advisor	3/10/2013 8:26am	Potential near miss on the Kamilaroi Highway near Blue Vale Road intersection with Whitehaven employees, approximately 5pm on the 2/10/13. The complainant was travelling east towards Gunnedah approaching the Blue Vale Road intersection when a blue Holden ute turned left onto the Highway in the turning lane and veered into the complainant's lane without looking. The complainant veered slightly onto the wrong side of the Highway and the ute pulled back into the turning lane and the proceeded to follow the complainant to town. The complainant turned right onto Quia Road and took a photo of the ute that was involved in the incident.	The driver of the ute, who works at Tarrawonga, was counselled by site personnel in regards to his driving, in particular merging onto the Kamilaroi Highway.	Nil required.
Phone call to Environmental	7/11/13	Complaint in relation to a blast that had just been initiated at the	Tarrawonga site was requested to provide details of the blast. Information obtained confirmed that a review of the weather forecast was undertaken prior to setting the blast date. The forecast indicated	Letter issued to complainant.

Manager	12:25pm	Tarrawonga site. Complainant indicated that it resulted in significant dust from site being sent onto his property which he should not have to accept.	mild conditions with light winds generally from the north-west. There was no indication in the forecast that conditions would be unsuitable for blasting. Confirmation of conditions at the blast time 11:59am indicated winds at 4m/s generally from the west. These conditions were generally lighter than earlier in the day. These conditions are suitable for blasting in accordance with the Blast Management Plan. No fume was present in the shot, with general dust travelling in an easterly direction. Both blast monitors confirmed the blast was within compliance parameters. Conditions are currently extremely dry and it is not possible to undertake blasting activities without the generation of dust. Site observations confirmed the dust plume travelled in an easterly direction but generally dispersed as it travelled across Whitehaven owned property. It is accepted that dust would have travelled to the complainant's property, however, it had substantially dissipated by the time it reached the property, as indicated by site photos taken by the Environmental Officer. Tarrawonga regrets any inconvenience caused by the blast, however was unable to undertake any additional mitigation measures in the current dry conditions.	
Phone call to Environmental Manager	6/01/2014 8:45pm	Complaint in relation to a mine vehicle travelling west along the Manilla-Boggabri Road near the Wean Race Course at excessive speed. The complainant's wife was heading east along the road when the mine vehicle passed, showering her in rocks and dust, and cracking her windscreen. The complaint is not in relation to the windscreen, but the general safety of other road users when these people travel at excessive speed along poor quality roads. The complainant is concerned someone will be seriously injured or killed as a result of mine personnel causing a road accident.	The complainant was asked if he had any identifying features of the vehicle involved such as a rego number or make of vehicle, however, the only identifier was that it was a utility with a beacon and high vis markings on the side. On this basis, the complainant was advised that we had no way of identifying the driver, or even if the vehicle was associated with the Tarrawonga Mine. Despite this, the complainant's concerns were noted and he was advised that the matter would be raised with the site Operations Manager to include in any toolbox sessions with operators, that it is expected that all personnel abide by relevant road rules, drive in a responsible manner and drive to road conditions. This was communicated with the Operations Manager the following morning 7 th January 2014.	No further advice required.
Email to Environmental Manager	9/04/2014 7:48am	The complaint related to increased dust and noise levels over the two weeks; a noticeable increase in mine related dust with a particular occurrence on Saturday 5/4. Second email noted that mine related noise was distinct morning of 11/4.	Monitored dust and noise levels in particular at the complainant's property boundary have been reviewed. These levels are within the specified levels. The matter will be continued to be monitored. Environmental Manager responded via email advising Environmental Officer would review noise and dust data for last two weeks. Environmental Officer to liaise with complainant and arrange a face to face meeting at a mutually convenient time.	Despite a number of efforts to organise a meeting with the complainant, the Environmental Officer is awaiting advice from complainant regarding a preferred time to meet.

Email to Environmental Manager	22/04/2014 6:10pm	Complaint about the dense dust in the valley and all around the mountains to the east of the Tarrawonga mine that morning. The complainant said the dust was very heavy and thick and there was a black layer above the mine site which all seemed to be floating in an easterly direction towards the complainant's homes and working environment. The complainant also noted mine noise that she is hearing during the night at her two properties. She said it is quite loud.	Environmental Superintendent responded via email (8/5/2014) advising that the site Environmental Officer would contact the complainant to arrange a meeting to discuss the issues.	Despite a number of efforts to organise a meeting with the complainant, the Environmental Officer is awaiting advice from complainant regarding a preferred time to meet.
Email to Environmental Manager	28/04/2014 4:15pm	Complaint regarding noise over the last week being louder than normal and that this is a continuation from the complainant's last email. The complainant said it concerns her as she hears this noise at night and it has been loud during the days as well.	Environmental Superintendent responded via email (8/5/2014) advising that the site Environmental Officer would contact the complainant to arrange a meeting to discuss the issues.	Despite a number of efforts to organise a meeting with the complainant, the Environmental Officer is awaiting advice from complainant regarding a preferred time to meet.

Table 11 - Yearly Complaints Comparison

AEMR/Annual Review Period	Issue										Other	Total
	Dust	Noise	Driver behaviour – coal trucks	Blasting	Multiple impacts (dust, noise, blasting)	Other traffic issues	Load coverage – coal trucks	Compliance with haulage hours	Lights	Surface Water or Ground-water		
2006-2007				1		1				1		3
2007-2008	4		2	2	2			2		2		14
2008-2009			5					4	1		1	10
2009-2010		1	2	1	1	1	2	1				9
2010-2011			1	3	2	2	1	1				10
2011-2012	12	1	1	6	1	1	2					24
2012-2013	23	6	3	12	1	4	1		1	1	3	55
2013-2014	2	1		3	2	3						11

4.2 Employment Status, Demography and Socio-Economic Contributions

4.2.1 Employment Status and Demography

During the reporting period, the mine had an average of 82 Tarrawonga personnel and 16 contractors. This is a decrease of approximately 5 people over the reporting period. Additional personnel were employed by contractors in the haulage of coal from the mine site back to the Whitehaven CHPP.

Approximately 50% of mine related employees reside in the Gunnedah / Boggabri area with the remainder residing in adjoining areas of Narrabri, Manilla and Curlewis.

4.2.2 Social and Economic Contributions

In addition to direct and indirect employment, and the purchase of goods and services from local suppliers, the Whitehaven Group continues to support the local community. Whitehaven also provides cadetships to local university students in a variety of fields.

As members of the Gunnedah / Boggabri area community, mine-related employees also contribute socially and economically through their involvement in community sporting, educational and social organisations and expenditure of a component of their disposable income.

4.3 Community Liaison

In accordance with Condition 7 of Schedule 5 of PA 11_0047, a Community Consultative Committee (CCC) continues to meet on regular basis, meeting 4 times per year. The committee comprises representatives of Narrabri and Gunnedah Shire Councils, Tarrawonga Coal and the community and is chaired by John Turner (Independent Chairman)

During the reporting period meetings were held on the 8th May 2013, 14th August 2013, 19th November 2013 and 12th February 2014.

Tarrawonga Coal representatives continue to maintain regular personal contact with the neighbours in the vicinity of the mine and CHPP. These contacts not only provide a means of information dissemination, but also enable Tarrawonga Coal to ascertain and address any potential issues which may arise from time to time.

Community organisations and other local business and institutions regularly identify an interest with activities occurring at the mine site. In this regard, and to maintain links with those business and community members, information is provided as required, and on occasion, guided tours of the facility have been undertaken.

Whitehaven also employs a Manager Community Relations who has a long term association with Gunnedah and was formerly employed with Gunnedah Shire Council.

5 REHABILITATION

5.1 Buildings

There was no removal of buildings or rehabilitation of building sites during the reporting period.

5.2 Rehabilitation of Disturbed Land

5.2.1 Objectives

Tarrawonga Coal's rehabilitation / land use objectives for the Project approval area, (ie. the area within the boundary of ML 1579, ML 1685 and ML 1693) are identified in the Mining Operations Plan Amendment A and in Table 12:

Table 12 - MOP Rehabilitation Commitments

Post Mining Land Use	Key Rehabilitation Goals
Final Landforms	<ul style="list-style-type: none"> • Create a physically and chemically stable and non-polluting post - mining landform. • Construct the Northern Emplacement to a maximum height of 370m AHD to integrate with the adjoining southern extent of the Boggabri Coal Mine waste rock emplacement and blend with the surrounding undisturbed environment including Leard State Forest (adjacent ridgeline has local high points between 370 and 382 m) and the Willow Tree Range. • Re-profile the Southern Emplacement to a final height of 340M AHD and partially infill the adjoining services corridor so that it integrates with the Northern Emplacement. • The Northern and Southern Emplacements will be shaped to be free draining with outer batters predominantly 10 degrees or shallower. • Construct the final top surface of the Northern Emplacement so that it drains in a stable manner to Goonbri Creek via a series of terraces with drop structures on the intervening batters.
Final Void	<ul style="list-style-type: none"> • Progressively backfill the open cut with overburden and interburden and reshape completed areas to their final landform shape so that they can be progressively rehabilitated. • Partially backfill the final void to the extent required to minimise long-term drawdown and water quality effects on local groundwater aquifers, so that their beneficial use is not compromised. • The total catchment for the final void will be defined by perimeter bunds and limited to achieve a target final void water equilibrium level of approximately 240 to 260 m AHD
Rehabilitation and	<ul style="list-style-type: none"> • Rehabilitation of land disturbed by the project will contribute to approximately 752 ha of native woodland vegetation communities

Revegetation Areas	<p>within the project area, focused on Box Gum Woodland EEC.</p> <ul style="list-style-type: none"> • Native vegetation areas in the Northern Emplacement will be vegetated with species to integrate with Boggabri's waste rock emplacement and the adjoining Leard State Forest. • The Southern Emplacement will be rehabilitated with native tree, shrub and grass species to achieve a native woodland / forest post mining land use. • The establishment of a minimum of 210 ha of Class 3 agricultural suitability land, including 160 ha with cropping capability. The final landform for agricultural areas will be developed to blend with the adjoining agricultural areas consistent with that area immediately adjacent to Goonbri Creek. • Minimise active disturbance areas by progressively rehabilitating, and by restricting clearing to the minimum required for operations. • Recover vegetation and habitat resources during clearing activities where practically possible and re-use in rehabilitated areas to provide habitat resources for fauna (e.g. trees, hollows). • Use soil resources stripped from disturbance areas directly for rehabilitation, but if this is not possible, minimise the time soil is stored in temporary stockpiles before being reused. • Install erosion and sediment control measures prior to the commencement of soil stripping and rehabilitation activities. • Plant cover crops on newly rehabilitated mine landform areas (and topsoil stockpiles) as soon as possible after completing earthworks, to minimise the potential for soil erosion. • Stabilise new infrastructure disturbance areas (e.g. road and dam embankments) as soon as possible by topsoiling and seeding. • Plant vegetation screens in key areas ahead of mine disturbance activities, to allow growth and screening to occur prior to the commencement of disturbance activities. • Revegetate the mine landforms to a combination of native woodland/forest and agricultural land uses that meet community and regulatory expectations in consideration of existing land uses and conservation values • Construct the low permeability barrier and permanent Goonbri Creek alignment such that they achieve their design objectives and the low flow channel is revegetated with riparian and floodplain vegetation, by using species characteristic of the Bracteate Honey myrtle (<i>Melaleuca bracteata</i>) community. (Note: Not to be undertaken within this MOP period). • Enhance the habitat values and biodiversity of the 3 km section of Goonbri Creek downstream of ML 1693, through revegetation, stock exclusion, and remedial earthworks if required. (Note: Not undertaken within this MOP period).
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Domain	Rehabilitation Objectives
Primary Domains	
Active Mining	<ul style="list-style-type: none"> • Rehabilitation resources including vegetation, topsoil and habitat resources will be identified for salvage ahead of mining. • Vegetation and topsoil will be progressively stripped ahead of mining to minimise the total area of disturbance and the potential period of soil storage. • Mined areas will be progressively backfilled and rehabilitated where possible.
Water Management Area	<ul style="list-style-type: none"> • Clean water will be diverted around operational areas prior to disturbance, where practical. • Mine water and sediment laden (dirty) water runoff from disturbance areas will be captured and diverted to mine water and dirty water dams. • Mine water and dirty water will be preferentially used for operational requirements such as dust suppression and earthworks. • Dirty water will be treated before discharge from site in accordance with regulatory requirements. • No mine water will be discharged from site. • Water management structures will be designed and constructed prior to disturbance, in accordance with Best Practice and “the Blue Book”. • Sediment dams and associated water management structures will remain in place until the catchment is rehabilitated and discharge water quality is similar to comparable undisturbed landforms.
Infrastructure Area	<ul style="list-style-type: none"> • Mining infrastructure will be removed progressively, and the area rehabilitated, when no longer required, • All land contamination will be identified and appropriately remediated.
Topsoil Stockpile Areas	<ul style="list-style-type: none"> • Topsoil stockpiles will be stabilised with sterile cover crops to minimise weed infestation and retain soil biological health. • Topsoil stockpiles will be constructed and managed to optimise physical, chemical and biological characteristics. • Topsoil stockpile areas will be rehabilitated progressively when no longer required.
Overburden Emplacements	<ul style="list-style-type: none"> • Final landform will be safe, stable and adequately drained. • Final landforms will be designed to integrate with the surrounding landscape. • The Northern Emplacement will be progressively constructed to a maximum height of 370 m AHD to integrate with the southern extent of the Boggabri waste rock emplacement. • The Southern Emplacement will be progressively constructed to a maximum height of 340 m AHD. • Outer batter slopes for the Northern and Southern Emplacements will be predominantly constructed at 10 degrees or shallower. • Any potentially acid forming (PAF) material will be covered with at

	<p>least 15 m of non-acid forming material (NAF).</p> <ul style="list-style-type: none"> • Final outer surfaces of overburden emplacements will be constructed with non-sodic or low sodicity and/or will be treated with gypsum. • Dump sequencing will be optimised to facilitate progressive shaping and rehabilitation.
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Domain	Rehabilitation Objective
Secondary Domains	
Final Void	<ul style="list-style-type: none"> • Final void will be safe, stable and non-polluting. • Final void northern and eastern highwalls will be profiled to be geotechnically stable with slopes approximately 60 degrees. • Material from the Southern Emplacement will be used to partially infill the southern and western low walls of the open cut to construct final grades generally between 10 and 15 degrees. • Surface water inflows to the final void will be managed through appropriate landform design (including final void perimeter bunding and the permanent flood bund) to minimise long term drawdown and potential water quality impacts on local aquifers. • Native vegetation will be established above the permanent water level (260 m AHD).
Water Management Area	<ul style="list-style-type: none"> • The final landform drainage will integrate with the surrounding catchments and will achieve long term geomorphic stability and minimise erosion. • Sediment dams identified for retention in the final landform will be decontaminated and preserved as clean water farm dams or water sources for native fauna.
Agricultural Rehabilitation Area	<ul style="list-style-type: none"> • At least 210 ha of Class 3 agricultural land (including 160 ha constructed on emplaced overburden) will be reinstated on areas disturbed by mining. • Soil profiles (soil characteristics and soil depths) will be reinstated to produce an Effective Rooting Depth at least 1.5 m, and capable of sustaining cereal and pasture production comparable to pre-mining agricultural areas near Goonbri Creek.
Woodland Rehabilitation Area	<ul style="list-style-type: none"> • Approximately 752 ha of open woodland/forest, with riparian corridors (including Goonbri Creek realignment) will be established on areas disturbed by mining. • Woodland Rehabilitation Areas will be comparable with adjacent undisturbed remnant native vegetation including areas commensurate with Box-Gum Woodland EEC.

5.2.2 Variations Against MOP

No rehabilitation was undertaken in association with the northern extension as the commencement of the operations was delayed by approximately 9 months.

Operations in this area will commence during the next AEMR period and the first stage of rehabilitation will follow as planned in the MOP.

A small area of rehabilitation works (as detailed in Section 5.2.14) was carried on the southern emplacement. There was, however, a postponement of the remaining works (tree planting only) until the next reporting period due to poor seasonal conditions.

5.2.3 Post Rehabilitation Land Use

The rehabilitation areas on the northern and southern emplacements are open woodlands at varying stages of maturity. Rehabilitation on the southern emplacement is only immature and still requires ongoing maintenance. Rehabilitation on the northern emplacement is further advanced and requires significantly less maintenance and is nearly to the point where it could be considered that open woodland land use has been achieved.

5.2.4 Landform Details

The rehabilitation areas on the northern emplacement and southern emplacement have been shaped with an average slope of 10° and utilise contours banks to divert runoff to rock lined waterways which minimise erosion.

5.2.5 Cover Material

Topsoil stripped as part of the mine operations and expansion was used on the northern and southern rehabilitation areas and replaced utilising scrapers to spread the soil to an average depth of 150-250mm.

5.2.6 Vegetation

Rehabilitation has been undertaken in accordance with the EA, MOP and management plans.

5.2.7 Progression to Maturity

The rehabilitation on the northern emplacement is progressing well towards maturity. As it nears maturity, the number of risks have become fewer and those that remain are predominately beyond the control of the Tarrawonga. Ongoing weed and pest control will continue as part of the maintenance of these areas, any necessary infill plating will be undertaken and water management structures will be

repaired as necessary. For the area of the northern rehabilitation that has yet to be planted with tubestock, the risks are far more significant, however they can be readily managed and monitored to ensure that a high survival rate is achieved and these trees reach maturity. Risks associated with weather are considered most likely to impact on the survival of trees. Many of these risks can be managed through timely planting, follow up watering and weed and pest control.

The rehabilitation on the southern emplacement is significantly younger and is susceptible to a risks including adverse weather, pests, soil condition, and planting techniques. It is therefore important to manage this area more intensely than areas that are considered mature or nearing maturity. A planting schedule and follow-up maintenance plan is a key component to the survival of tube stock. This includes timely planting, watering and pest control.

5.2.8 Present & Future Habitat

Winter and spring monitoring programmes are undertaken on site by Ecological Australia. Part of this monitoring provides an annual snapshot to ascertain the resident habitat in these areas. This compared to baseline data collected from adjacent unaffected land surrounding the mine to determine its success and progression in regards to habitat value for native and threatened species.

5.2.9 Weeds & Other Unwanted Vegetation

Monthly inspections of rehabilitation areas, as well as random visits, are undertaken to monitor weeds within the rehabilitation areas. A regular spraying regime is utilised to target identified weeds throughout both the northern and southern rehabilitation areas. Weeds listed as noxious under the Noxious Weeds Act 1993 are targeted and controlled in accordance with requirements of that legislation.

5.2.10 Erosion Control

Between both the northern and southern rehabilitation areas there are only minor signs of erosion including signs of some minor channelling, in particular on the southern rehabilitation area where the establishment of trees and understorey has not yet commenced or is in the early stages.

5.2.11 Erosion, Pollution and Contamination Strategies

Each of the rehabilitation areas on the northern and southern was emplacements has been shaped and constructed with a series of contour banks which feed into a rock lined waterway. Within each level, the topsoil is mounded for tree planting which also facilitates in reducing runoff and facilitates infiltration. The rock lined waterways, which run straight down the batter, are designed to convey water away from the contour banks and slow the water to minimise erosion within the rehabilitation areas.

5.2.12 Fencing

No exclusion fencing is in place. Fencing is restricted to property boundary and some internal fences outside of the disturbance limit.

5.2.13 Pollution Monitoring

Sediment basins and storage dams are sampled quarterly and in the event of a discharge from licensed discharge point/s. These results are utilised to monitor pollution levels and ensure discharge waters are within compliance criteria as set out in the EPL.

5.2.14 Achievements During the Reporting Period

The northern extension is approximately nine months behind schedule, which has significantly impacted upon the availability of areas for rehabilitation. Active rehabilitation has progressed on those areas no longer required for production purposes. A total of 5 ha on the southern emplacement was shaped and seeded during the reporting period. Within this 5 ha, revegetation activities comprising the planting of native tubestock across 2.6ha occurred as outlined in Table 13.

Works undertaken during the reporting period included:

- Topsoiling and seeding of SB25;
- Completion of the rock waterway on the western face of the southern emplacement, topsoiling, installation of contour banks and seeding.

Existing rehabilitation on the northern and western faces of the northern emplacement continues to progress well.

Ongoing drought conditions since the last reporting period have impacted upon the area of tubestock planted. It is anticipated that this shortfall will be addressed as

soon as seasonal conditions improve during the next reporting period. It is planned to plant tubestock over approximately 8ha on both the northern and southern emplacements in areas which have already been seeded. Cover crop and tubestock establishment will occur over a further 2ha on the northern emplacement.

Table 13 – Understorey Species

Date	Location	Species	Total
21 st August 2013	Western face of the Southern emplacement.	<i>Acacia decora</i>	80
		<i>Eucalyptus melliodora</i>	80
		<i>Eucalyptus albens</i>	80
		<i>Eucalyptus creba</i>	80
		<i>Dodonaea viscosa</i>	80
		<i>Eucalyptus populnea</i>	80
		<i>Eucalyptus pilligaensis</i>	80
		Total	560

Table 14 - Rehabilitation Summary

		Area Affected (hectares)		
		This Report Period (as of 30.04.14)	Last Report Period (as of 30.04.13)	Next Report Period (estimated)
A: MINE LEASE AREA				
A1	Mine Lease(s) Area	1,224.3		
B: DISTURBED AREAS				
B1	Infrastructure area (other disturbed areas to be rehabilitated at closure including facilities, roads)	29.7	29.7	29.7
B2:	Active Mining Area (excluding items B3 - B5 below)	108.1	98.4	100.0
B3	Waste emplacements, (active/unshaped/in or out-of-pit)	206.2	187.0	223.0
B4	Tailings emplacements, (active/unshaped/uncapped)	5.0	4.5	5.0
B5	Shaped waste emplacement (awaits final vegetation)	7.6	7.6	2.0
ALL DISTURBED AREAS		356.6	327.2	359.7
C REHABILITATION PROGRESS				
C1	Total Rehabilitated area* (except for maintenance)	51.0	46	53.0
D: REHABILITATION ON SLOPES				
D1	10 to 18 degrees	0	0	0
D2	Greater than 18 degrees	0	0	0
E: SURFACE OF REHABILITATED LAND				
E1	Pasture and grasses	23.5	18.5	25.5
E2	Native forest/ecosystems*	27.5	27.5	27.5
E3	Plantations and crops	0	0	0
E4	Other (include non vegetative outcomes)	0	0	0

* Areas with established tubestock are considered to be "native forest/ecosystem". "Pasture and Grasses" also includes areas with recently planted tube stock that are not yet established. C1 – Total Rehabilitated Area includes all rehabilitation regardless of progress.

Table 15 - Maintenance Activities on Rehabilitated Land

NATURE OF TREATMENT	Area Treated (ha)		Comment/control strategies/ treatment detail
	Report period	Next period	
Additional erosion control works (drains re-contouring, rock protection)	1	1	Repair of washouts and replacement of sediment control measures (hay bales) on western side of ML
Re-covering (detail - further topsoil, subsoil sealing etc)	Nil	Nil	
Soil treatment (detail - fertilizer, lime, gypsum etc)	Nil	4.9	Northern emplacement – chook manure and phosphorous
Treatment/Management (detail - grazing, cropping, slashing etc)	Nil	Nil	
Re-seeding/Replanting (detail - species density, season etc)	Nil	7.5ha	Northern Emplacement – pasture and tubestock Southern Emplacement - Tubestock
Adversely Affected by Weeds (detail - type and treatment)	5	5	General weed control (spot spraying within a 5ha area).
Feral animal control (detail - additional fencing, trapping, baiting etc)	*	Nil	* See Section 3.20

5.3 Rehabilitation Monitoring and Performance

Rehabilitation/revegetation monitoring by Whitehaven personnel has been confined to inspections of water management structures, soil stockpiles and seeded/planted areas for evidence of instability or poor germination. Results over the reporting period were good in terms of the minimal erosion experienced over prolonged periods of wet weather. Planted seedlings continue to develop well on the northern emplacement. Tubestock and grass cover establishment continues to be poor on the Southern Emplacement, with ongoing monitoring continuing by site personnel. Poor seasonal conditions throughout the reporting period (long dry periods and extreme summer temperatures) resulted in an extremely high mortality of planted tubestock. Sections 3.6 and 3.7 and Appendix 7 provide details on the rehabilitation monitoring undertaken by Eco Logical Australia in late 2013.

6 CONTINUOUS IMPROVEMENT AND TARGET INITIATIVES

6.1 Objectives

TCPL has an ongoing commitment to environmental management and aims to minimise any adverse impacts on the physical, biological, cultural and socio-economic environment in the area of the mine and in surrounding areas.

Improvements in environmental management will be achieved through the effective implementation of the operational and monitoring aspects of the MOP, which in turn, will incorporate relevant aspects of various management plans and monitoring programs prepared in accordance with the mine's Project Approval.

6.2 Achievements to Date

Achievements at the mine over its eighth year of operation have included:

- Approval of the Heritage Management Plan in February 2014;
- Ongoing development of the remaining management plans required by PA 11_0047;
- Continued effective management of site water, resulting in only one discharge during the reporting period which was within compliance limits;
- Continuation of cumulative impacts strategies preparation and submission to Planning & Environment with Boggabri Coal and Maules Creek Coal; and
- Ongoing relationship with local community, neighbours and community groups. Tarrawonga Coal recognises its role in the local community and that its activities have the potential to create benefits which extend beyond the life of the mine.

6.3 Targets and Goals






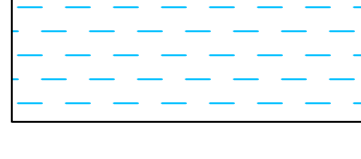


Targets and goals for the 2014 / 2015 reporting period include:

- Completion and implementation of additional Management Plans required for State and Federal approvals;
- Continual improvements in site rehabilitation;
- Continued community liaison, support and involvement / education in the mines activities;
- Compliance with all relevant conditions of the lease, licences and consents;
- Stabilisation of the southern face of the southern emplacement to minimise dust generation whilst it remains un-rehabilitated;

- Implementation of management actions within the Regional Biobank site, pertinent to Tarrawonga offset requirements;
- Implementation of management actions at the Willeroi Offset Area once the management plans are approved.



LEGEND

- | | |
|---|---|
|  | Proposed Soil Stripping Area (2014/2015 AEMR) |
|  | Soil Stripping Area (to 30/4/13) |
|  | Soil Stripping Area (2013/2014 AEMR) |
|  | Stockpile Areas |
|  | Infrastructure Areas |
|  | Sediment Basin (Dirty) |
|  | Storage Dam (Clean) |
|  | Soil Test Pit Site |

15cm Soil Stripping Depth

— — — Mining Lease Boundary

— — — Colliery Holding Boundary

— Limit of Open Cut

— Recommended Stripping Depths

TS¹⁰ Topsoil (depth stripped to)

SS¹⁰ Subsoil (depth stripped to)

③ Vegetation Monitoring Quadrat

Aboriginal Site

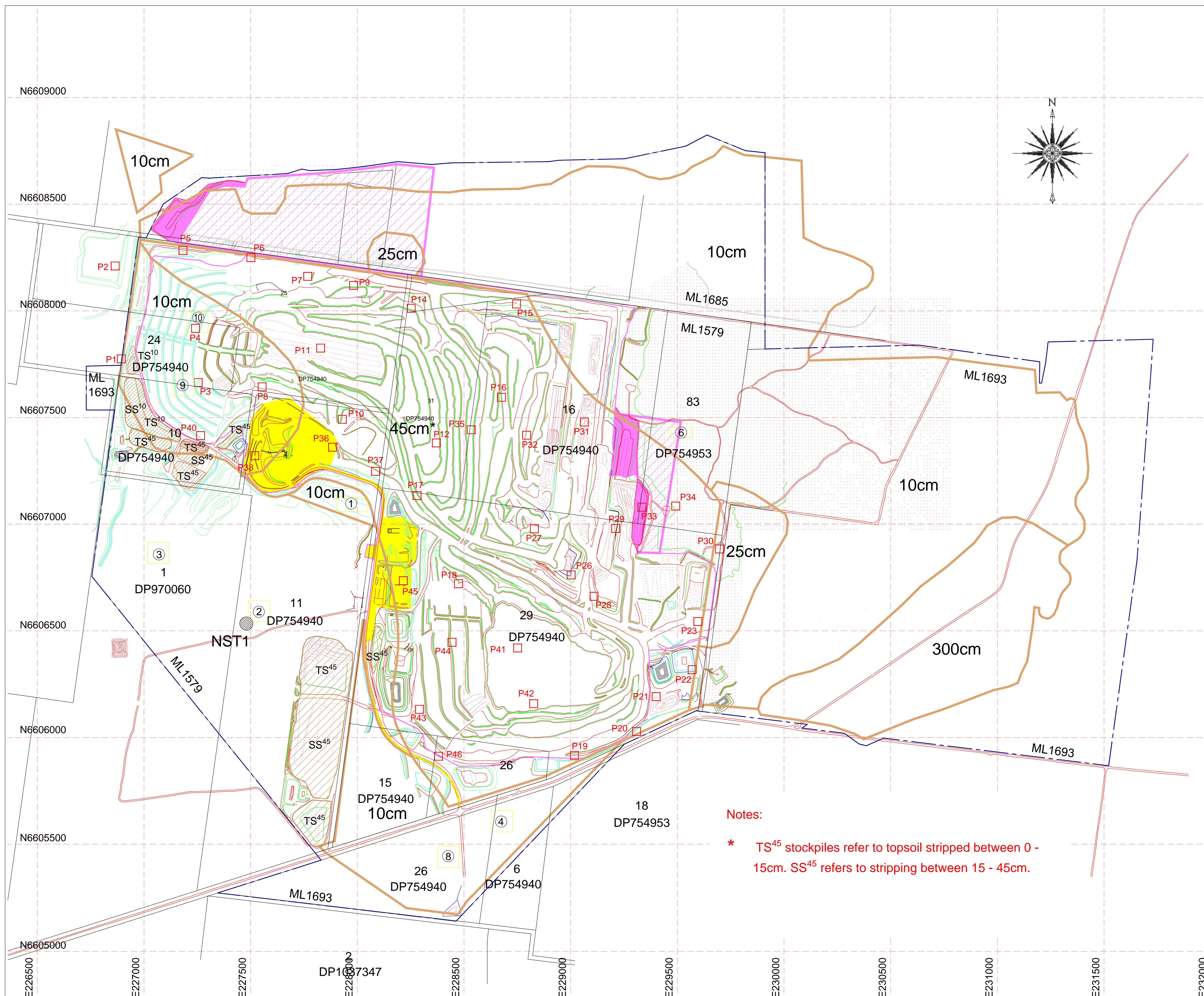
PLAN 3

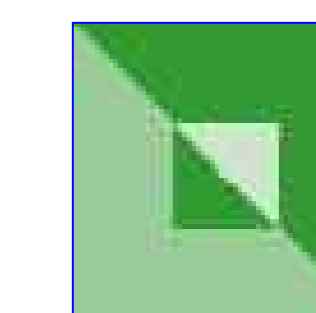
LAND PREPARATION

TARRAWONGA MINE

File Ref: TA140430

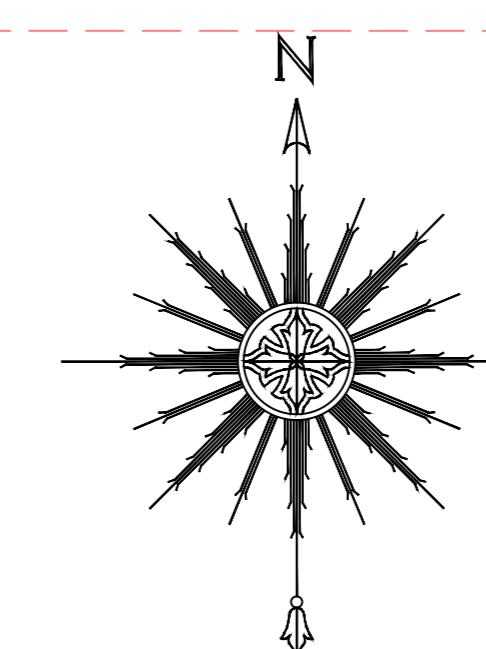
Surveyor:	
Date:	30/4/2014





TARRAWONGA
COAL PTY LTD

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REDUCTION RATIO
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LEGEND

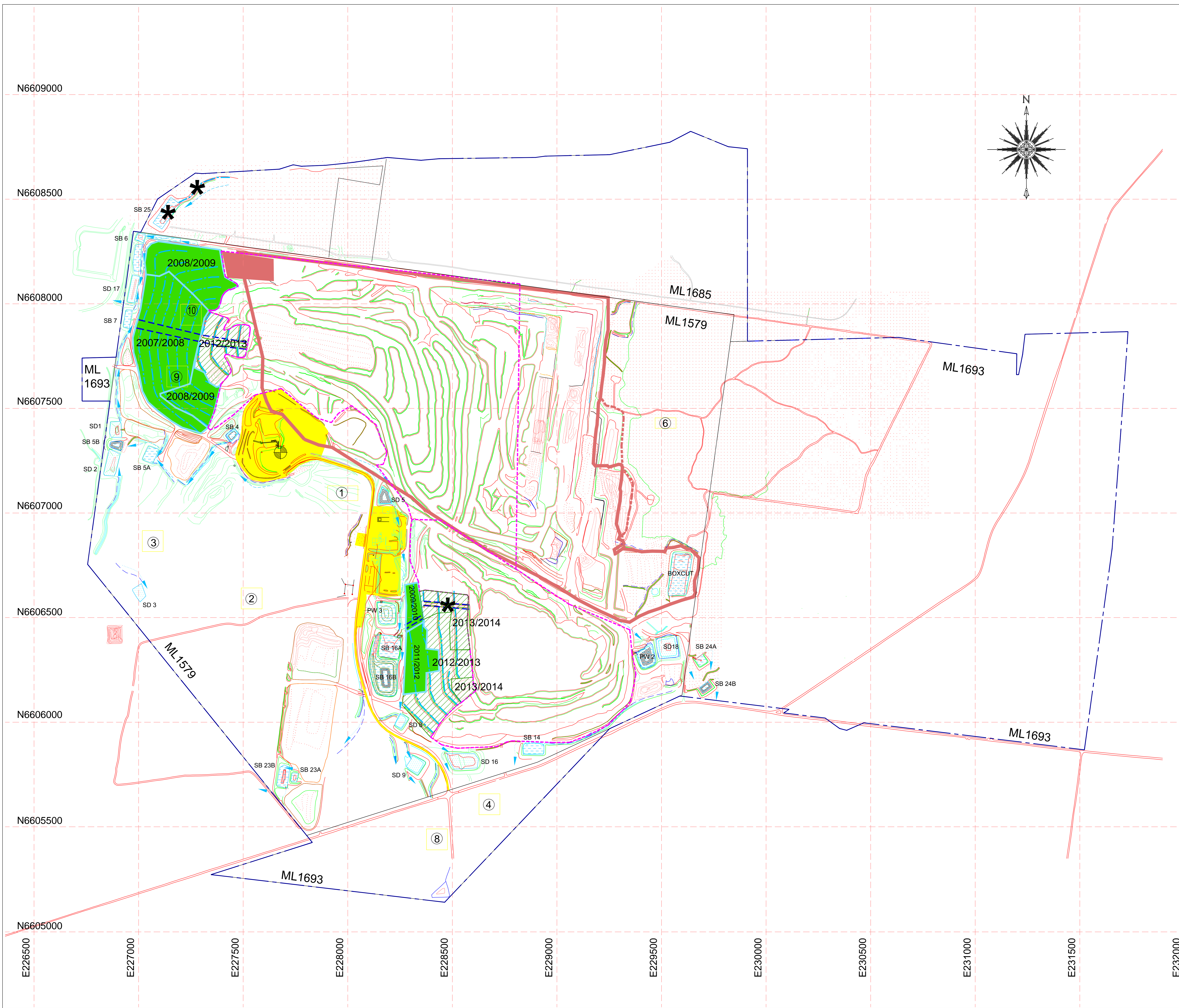
- Proposed Rehab Areas (2014/2015 AEMR)
- Soil Covered Slopes(10°-18°)
- Soil Covered Slopes (<10°)
- Infrastructure Areas
- Sediment Basin (Dirty)
- Storage Dam (Clean)
- Area shaped not soiled
- Flow (Dirty)
Flow (Clean)
- Mining Lease Boundary
Colliery Holding Boundary
- Diversion/Catch Bank
Extent of Mining to 30/4/13
Extent of Mining (This AEMR)
Waste Emplacement (This AEMR)
Vegetation to Native Water Management
Structure (installed this AEMR)
- Coal Stockpile
Contour banks
Rock Waterway
Vegetation Monitoring Quadrat

PLAN 4 MINING & REHABILITATION TARRAWONGA MINE

File Ref: TA140430

Surveyor:

Date: 30/4/2014



Project Approval

Section 75J of the *Environmental Planning & Assessment Act 1979*

As delegate of the Minister for Planning and Infrastructure, the Planning Assessment Commission of NSW approves the project application referred to in schedule 1, subject to the conditions in schedules 2 to 5.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.



Gabrielle Kibble AO
Member of the Commission



Brian Gilligan
Member of the Commission



Joe Woodward PSM
Member of the Commission

Sydney

22 January 2013

SCHEDULE 1

Application Number:	11_0047
Proponent:	Tarrawonga Coal Pty Limited
Approval Authority:	Minister for Planning and Infrastructure
Land:	See Appendix 1
Project:	Tarrawonga Coal Project

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DEFINITIONS

Annual review	The review required by condition 4 of schedule 5
BCA	Building Code of Australia
Biodiversity offset strategy	The biodiversity conservation and enhancement strategy described in the EA, required by condition 40 and 42 of schedule 3 of this approval and depicted conceptually in the figure in Appendix 7
Blast misfire	The failure of one or more holes in a blast pattern to initiate
Boggabri rail spur line	The railway line between the Narrabri-Werris Creek railway line and the Boggabri coal mine
CCC	Community Consultative Committee
CEEC	Critically endangered ecological community, as defined under the TSC Act or EPBC Act
CHPP	Coal Handling and Preparation Plant
Conditions of this approval	Conditions contained in schedules 1 to 5 inclusive
Council	Narrabri Shire Council
Day	The period from 7am to 6pm Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
Dedicated haulage route	The approved route used to transport coal from the site to the Whitehaven CHPP, which includes a combination of private and public roads, including Rangari Road, Hoad Lane, Blue Vale Road and the Kamilaroi Highway (see figure in Appendix 2)
Department	Department of Planning and Infrastructure
Director-General	Director-General of the Department, or delegate
DPI	Department of Primary Industries
DRE	Division of Resources and Energy (within the Department of Trade and Investment, Regional Infrastructure and Services)
EA	Environmental Assessment titled <i>Tarrawonga Coal Project Environmental Assessment</i> dated January 2012; associated response to submissions titled <i>Tarrawonga Coal Project Environmental Assessment - Response to Submissions (A and B)</i> dated May 2012; and the <i>Preferred Project Report</i> dated September 2012
EEC	Endangered ecological community, as defined under the TSC Act or EPBC Act
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environment Protection Licence issued under the POEO Act
Evening	The period from 6pm to 10pm
Executive Director Mineral Resources	The Executive Director of Mineral Resources within DRE, or equivalent position
Feasible	Feasible relates to engineering considerations and what is practical to build or carry out
Heritage item	An item as defined under the <i>Heritage Act 1977</i> and/or an Aboriginal Object or Aboriginal Place as defined under the <i>National Parks and Wildlife Act 1974</i>
Incident	A set of circumstances that: <ul style="list-style-type: none"> causes, or threatens to cause, material harm to the environment; and/or breaches or exceeds the limits or performance measures/criteria in this approval
Land	As defined in the EP&A Act, except where the term is used in the noise and air quality conditions in schedules 3 and 4 of this approval, where it is defined as the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
Leard Forest mining precinct	The area incorporating the existing and proposed coal mining operations centred around Leard Community Conservation Area (CCA) 4 including the Tarrawonga coal mine, Boggabri coal mine and Maules Creek coal mine
LPB	Low permeability barrier to be constructed between the mine and Goonbri Creek
Material harm to the environment	Actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial
Mine water	Water that accumulates within, or drains from, active mining areas, emplacements, stockpiles, tailings dams and infrastructure areas, synonymous with dirty water
Mining operations	Includes the removal of overburden and extraction, processing,

Minister	handling, storage and transportation of coal on site
Mitigation	Minister for Planning and Infrastructure, or delegate
Namoi CMA	Activities associated with reducing the impacts of the project
Negligible	Namoi Catchment Management Authority
Night	Small and unimportant, such as to be not worth considering
NOW	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
OEH	NSW Office of Water, within the Department of Primary Industries
PAC	Office of Environment and Heritage, within the Department of Premier and Cabinet
POEO Act	Planning Assessment Commission
Privately-owned land	<i>Protection of the Environment Operations Act 1997</i>
Project	Land that is not owned by a public agency or a mining company (or its subsidiary)
Proponent	The project as described in the EA
Public infrastructure	Tarrawonga Coal Pty Limited, or any person who seeks carry out the approved project under this approval
Reasonable	Linear and related infrastructure that provides services to the general public, such as roads, railways, water supply, drainage, sewerage, gas supply, electricity, telephone, telecommunications, etc.
Rehabilitation	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
RMS	The restoration of land disturbed by the project to a good condition and for the purpose of establishing a safe, stable and non-polluting environment
ROM coal	Roads and Maritime Services
SEWPaC	Run-of-mine coal
Site	Commonwealth Department of Sustainability, Environment, Water, Populations and Communities.
Statement of commitments	The land described in Appendix 1
TSC Act	The Proponent's commitments in Appendix 4
VPA	<i>Threatened Species Conservation Act 1995</i>
	Voluntary Planning Agreement

SCHEDULE 2 ADMINISTRATIVE CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. In addition to meeting the specific performance criteria established under this approval, the Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any material harm to the environment that may result from the construction, operation, or rehabilitation of the project.

TERMS OF APPROVAL

2. The Proponent shall carry out the project generally in accordance with the:
 - (a) EA;
 - (b) statement of commitments; and
 - (c) conditions of this approval.

Notes:

- The general layout of the project is shown in Appendix 2; and
- The statement of commitments is reproduced in Appendix 4.

3. If there is any inconsistency between the above documents, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.
4. The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
 - (a) any reports, strategies, plans, programs, reviews, audits or correspondence that are submitted in accordance with this approval; and
 - (b) the implementation of any actions or measures contained in these documents.

LIMITS ON APPROVAL

Mining Operations

5. The Proponent may carry out mining operations on the site until the end of December 2030.

Note: Under this approval, the Proponent is required to rehabilitate the site and carry out additional undertakings to the satisfaction of both the Director-General and the Executive Director Mineral Resources. Consequently, this approval will continue to apply in all other respects - other than the right to conduct mining operations - until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.

Coal Extraction

6. The Proponent shall not extract more than 3 million tonnes of ROM coal from the site in any calendar year.

Coal Transport – Before Commissioning of the Boggabri Rail Spur Line & Boggabri CHPP

7. For the period until up to 3 months after the commissioning of the Boggabri Rail Spur Line and Boggabri CHPP, the Proponent may transport up to:
 - (a) 2 million tonnes of ROM coal from the site to the Whitehaven CHPP along the dedicated haulage route in any calendar year; and
 - (b) 150,000 tonnes of this ROM coal from the site in any calendar year for direct distribution to domestic markets via the dedicated haulage route to the Kamilaroi Highway.

Note: For the avoidance of doubt, the total amount of coal permitted to be transported from the site by road in any calendar year is 2 million tonnes.

8. During this period, the Proponent shall only transport coal from the site or receive coal reject from the Whitehaven CHPP between the hours of:
 - (a) 7 am to 9.15 pm Monday to Friday;
 - (b) 7 am to 5.15 pm Saturday; and
 - (c) at no time on Sundays or public holidays.

Coal Transport – After Commissioning of the Boggabri Rail Spur Line & Boggabri CHPP

9. For the period commencing 3 months after the commissioning of the Boggabri Rail Spur Line & Boggabri CHPP, the Proponent:
 - (a) shall not transport more than 3 million tonnes of ROM coal from the site in any calendar year;
 - (b) may transport up to 150,000 tonnes of this ROM coal from the site in any calendar year for direct distribution to domestic markets via the dedicated haulage route to the Kamilaroi Highway; and
 - (c) shall transport all other coal from the site via the Boggabri rail spur line.

10. During this period, the Proponent shall only transport coal from the site by truck (excluding coal transport to the Boggabri coal mine for subsequent despatch via the Boggabri rail spur line) between 7 am and 6 pm Monday to Saturday.

Gravel Extraction and Transport

11. The Proponent shall not extract more than 90,000m³ of gravel from the site for distribution off-site in any calendar year.
12. The Proponent may transport up to 90,000m³ of gravel from the site by truck in any calendar year. This gravel is to be transported from the site to the Kamilaroi Highway via the dedicated haulage route.
13. The Proponent shall only transport gravel from the site by truck between 7 am and 6 pm Monday to Saturday.

SURRENDER OF EXISTING DEVELOPMENT CONSENT

14. By the end of December 2013, or as otherwise agreed by the Director-General, the Proponent shall surrender the existing development consent (DA-88-4-2005) for the Tarrawonga Coal Mine in accordance with Section 104A of the EP&A Act.

Prior to the surrender of this development consent, the conditions of this approval shall prevail to the extent of any inconsistency with the conditions of the development consent.

STRUCTURAL ADEQUACY

15. The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

Notes:

- Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works; and
- Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.

DEMOLITION

16. The Proponent shall ensure that all demolition work on site is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.

PROTECTION OF PUBLIC INFRASTRUCTURE

17. Unless the Proponent and the applicable authority agree otherwise, the Proponent shall:
- (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the project; and
 - (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project.

OPERATION OF PLANT AND EQUIPMENT

18. The Proponent shall ensure that all the plant and equipment used on site, or to transport coal from the site, is:
- (a) maintained in a proper and efficient condition; and
 - (b) operated in a proper and efficient manner.

STAGED SUBMISSION OF STRATEGIES, PLANS AND PROGRAMS

19. With the approval of the Director-General, the Proponent may submit any strategy, plan or program required by this approval on a progressive basis.

Notes:

- While any strategy, plan or program may be submitted on a progressive basis, the Proponent will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times.
- If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.

20. Until they are replaced by an equivalent strategy, plan or program approved under this approval, the Proponent shall implement the existing strategies, plans or programs for the site that have been approved under DA-88-4-2005.

COMMUNITY ENHANCEMENT

21. By the end of March 2013, unless otherwise agreed by the Director-General, the Proponent shall enter into a planning agreement with Council in accordance with:
- (a) Division 6 of Part 4 of the EP&A Act; and
 - (b) the terms of the Proponent's offer provided in Appendix 3.
-

SCHEDULE 3 ENVIRONMENTAL PERFORMANCE CONDITIONS

ACQUISITION ON REQUEST

1. Upon receiving a written request for acquisition from an owner of the privately-owned land listed in Table 1, the Proponent shall acquire the land in accordance with the procedures in conditions 8 and 9 of schedule 4.

Table 1: Land subject to acquisition upon request

Acquisition Basis	Property ID
Noise & Air	44, 45, 49
Noise	43, 47

Notes:

- To interpret the locations referred to in Table 1 see the applicable figure(s) in Appendix 5.
- Properties 43, 44 and 45 also have acquisition rights under the approval for the Boggabri coal mine, and/or the existing consent (DA 88-4-2005) for the Tarrawonga mine. The Proponent may acquire these properties on an equitable basis with the owner of the Boggabri mine.
- For the purposes of acquisition under this condition, parcels of land that are in close proximity and operated as a single agricultural enterprise should be included as part of the land to be acquired. Where the Proponent and the owner(s) cannot agree on whether non-contiguous parcels of land should be included, either party may refer the matter to the Director-General for resolution. The Director-General's decision as to the lands to be included for acquisition under the procedures in conditions 8 and 9 of Schedule 4 shall be final.

ADDITIONAL NOISE AND/OR AIR QUALITY MITIGATION ON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 1, the Proponent shall implement additional noise and/or air quality mitigation measures (such as double glazing, insulation, air filters, a first flush roof water drainage system and/or air conditioning) at the residence in consultation with the owner. These measures must be reasonable and feasible and directed towards reducing the noise and/or air quality impacts of the project on the residence.

If within 3 months of receiving this request from the owner, the Proponent and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.

NOISE AND VIBRATION

Noise Criteria

3. Except for the noise-affected land in Table 1, the Proponent shall ensure that operational noise generated by the project does not exceed the criteria in Table 2 at any residence on privately-owned land.

Table 2: Noise criteria dB(A)

Land	Day, Evening & Night <i>L_{Aeq}(15 min)</i>	Night <i>L_{A1} (1 min)</i>
All other privately-owned residences	35	45

Notes:

- Operational noise includes noise from the mining operations and the use of private roads and rail spurs.
- Noise is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions (also see condition 13)), of the NSW Industrial Noise Policy.

However, these noise criteria do not apply if the Proponent has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.

Noise Acquisition Requirements - Residences

4. If the owner(s) of a privately-owned residence, that is not listed in Table 1, have reason to believe that operational noise from the project is causing the criteria in Table 2 to be exceeded at the residence, the owner(s) can request an independent noise impact assessment for the residence. The request shall be made in writing to the Director-General. If the Director-General considers that a noise impact assessment is warranted, then the Proponent shall commission the assessment.

If the noise impact assessment determines that the noise generated by the project causes sustained exceedances, or is likely to cause sustained exceedances, of the criteria in Table 2, the owner(s) can make a written request to the Proponent for one of the following:

- (a) mitigation (such as double glazing, insulation and air conditioning) at the residence in consultation with the owner(s). These measures must be reasonable and feasible and directed towards reducing the noise impacts of the project on the residence. If within 3 months of receiving this request from the owner(s), the Proponent and owner(s) cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution; or
- (b) acquisition of the residence and land in accordance with the procedures in conditions 8 and 9 of Schedule 4.

Upon receiving a written request from the owner(s), the Proponent must undertake whichever option has been requested by the owner(s).

However, this condition does not apply if the Proponent has an agreement with the owner(s) of the relevant residence to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.

Notes:

1. *For the purposes of this condition a privately-owned residence is defined as a residence not owned by a mining company that: is regularly occupied; or is an existing residence that is not regularly occupied but for which a valid development consent exists; or is a proposed residence for which a development application has been lodged with the relevant authority prior to the date of this approval.*
2. *For the purposes of acquisition under this condition, parcels of land that are in close proximity and operated as a single agricultural enterprise should be included as part of the land to be acquired. Where the Proponent and the owner(s) cannot agree on whether non-contiguous parcels of land should be included, either party may refer the matter to the Director-General for resolution. The Director-General's decision as to the lands to be included for acquisition under the procedures in conditions 8 and 9 of Schedule 4 shall be final.*
3. *The noise assessment must be undertaken by a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General and include either:*
 - a. *sufficient monitoring at the affected residence to allow for assessment of the impacts under a range of meteorological conditions (including adverse conditions) likely to be experienced at the residence; or*
 - b. *sufficient monitoring to allow reliable prediction of the likely impacts under the range of meteorological conditions (including adverse conditions) likely to be experienced at the residence.*
4. *Monitoring should be conducted in accordance with the requirements of the NSW Industrial Noise Policy.*
5. *Where predictions of likely impacts is to be used, either in substitution for, or in conjunction with, direct measurement of noise impacts at the residence, it must be based on sufficient monitoring data to provide a reliable estimate of the impacts (including under adverse meteorological conditions) and be derived using standard noise modelling techniques accepted by the EPA.*
6. *The Proponent shall ensure that the requested noise impact assessment is submitted to the Director-General within 3 months of the Director-General's decision that the assessment was warranted. The Proponent shall also provide a copy of the assessment to the owner(s) of the residence at the same time it is submitted to the Director-General.*

Noise Acquisition Requirements - Land

5. If the owner(s) of land containing a privately owned residence, which is not listed in Table 1, have reason to believe that operational noise from the project is causing noise levels to exceed 40 dB(A) $L_{Aeq}(15 \text{ min})$ over more than 25% of that land, the owner(s) can request an independent noise impact assessment for the land. The request shall be made in writing to the Director-General. If the Director-General considers that a noise impact assessment is warranted, then the Proponent shall commission the assessment.

If the noise impact assessment determines that the noise generated by the project causes sustained exceedances, or is likely to cause sustained exceedances, of the 40 dBA criteria, the owner(s) can make a written request to the Proponent for acquisition of the residence and land in accordance with the procedures in conditions 8 and 9 of Schedule 4.

Upon receiving a written request from the owner(s), the Proponent must purchase the residence and land in accordance with the procedures in conditions 8 and 9 of Schedule 4.

However, this condition does not apply if the Proponent has an agreement with the owner(s) of the relevant residence to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.

Note: The notes to condition 4 of this Schedule also apply to this condition.

Cumulative Noise Criteria

6. Except for the land listed in Table 1, the Proponent shall ensure that the operational noise generated by the project combined with the noise generated by other mines does not exceed the criteria in Table 3 at any residence on privately-owned land.

Table 3: Cumulative noise criteria dB(A) L_{Aeq} (period)

Land	Day/Evening/Night L_{Aeq} (period)
All privately-owned land	40

Notes:

- Cumulative noise is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions (also see condition 13)), of the NSW Industrial Noise Policy.
- Operational noise includes noise from the mining operations and the use of private roads and rail spurs.

Cumulative Noise Acquisition Requirements

7. If the owner(s) of a privately-owned residence, which is not listed in Table 1, reasonably believes that the noise limits in Table 3 are being exceeded at the residence and that the exceedance is caused by operational noise from the project and one or more other mines (including use of private roads or rail spurs), the owner(s) can request an independent noise impact assessment for the residence. The request shall be made in writing to the Director-General. If the Director-General considers that a noise impact assessment is warranted, then the Proponent shall commission the assessment.

Where the noise impact assessment determines that the cumulative noise generated by the project combined with the noise from the other mine(s) causes, or is likely to cause, sustained exceedances of the criteria in Table 3, then the owner(s) can make a written request to the Proponent for one of the following:

- mitigation (such as double glazing, insulation and air conditioning) at the residence in consultation with the owner(s). These measures must be reasonable and feasible and directed towards reducing the noise impacts of the project on the residence. If within 3 months of receiving this request from the owner(s), the Proponent and owner(s) cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution; or
- acquisition of the residence and land in accordance with the procedures in conditions 8 and 9 of Schedule 4.

Upon receiving a written request from the owner(s), the Proponent must undertake whichever option has been requested by the owner(s).

However, this condition does not apply if the Proponent has an agreement with the owner(s) of the relevant residence to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.

The Proponent may seek to recover an equitable share of the costs incurred from the other mines contributing to the cumulative impact. Unless otherwise agreed between the mines, the proportional contributions should be based on expert analysis of the monitoring results to assess relative contribution to the impact. In the event of a dispute between the mines the Proponent, or one of the contributing mines, may submit the matter to the Director-General for resolution. The Director-General's decision shall be final.

Notes:

1. The notes to condition 4 of this Schedule also apply to this condition.
2. The noise impact assessment shall include assessment of the relative contribution of the mines to the impact at the residence.

Road Traffic Noise Criteria

8. The Proponent shall ensure that the noise generated by the project on public roads does not exceed the criteria in Table 4 at any existing residence on privately-owned land.

Table 4: Road traffic noise criteria dB(A)

Land	Day L_{Aeq} (period)	Evening L_{Aeq} (period)	Night L_{Aeq} (period)
All privately-owned residences	60	60	55

However, these criteria do not apply if the Proponent has a written agreement with the relevant landowner to exceed the criteria, and the Proponent has advised the Department in writing of the terms of this agreement.

Attenuation of Plant

9. The Proponent shall:
- ensure that:
 - all trucks, dozers, drills and excavators purchased for used on the site after the date of this approval are commissioned as noise suppressed (or attenuated) units;

- all equipment and noise control measures deliver sound power levels that are equal to, or less than, the sound power levels identified in the EA, and correspond to best practice, or the application of best available economically achievable technology;
 - improvements are made to existing noise suppression equipment as improved technology becomes available where reasonable and feasible; and
- (b) monitor and report on the implementation of these requirements annually on its website.
10. The Proponent shall:
- (a) conduct an annual testing program of the plant on site;
 - (b) restore the effectiveness of any attenuation if it is found to be defective; and
 - (c) report on the results of any testing and/or attenuation work within the Annual Review.

Operating Conditions

11. The Proponent shall:
- (a) implement best management practice to minimise all operational, low frequency, road and rail traffic noise levels associated with the project;
 - (b) operate a comprehensive on-site noise management system that uses a combination of predictive meteorological forecasting and real-time noise monitoring data to guide the day to day planning of mining operations and the implementation of both proactive and reactive noise mitigation measures to ensure compliance with the relevant conditions of this approval;
 - (c) maintain the effectiveness of noise suppression equipment on plant at all times and ensure defective plant is not operationally used until fully repaired;
 - (d) ensure that noise attenuated plant is deployed preferentially in locations near to sensitive receivers;
 - (e) minimise the noise impacts of the project during meteorological conditions under which the noise limits in this approval do not apply (see condition 13);
 - (f) ensure that project related trains on the Boggabri spur line only use locomotives that are approved to operate on the NSW rail network in accordance with the noise limits in ARTC's EPL (No. 3142);
 - (g) use its best endeavours to ensure that project-related rolling stock supplied by service providers on the Boggabri rail spur line is designed, constructed and maintained to minimise noise; and
 - (h) co-ordinate the noise management on site with the noise management at other mines within the Leard Forest Mining Precinct, to minimise the cumulative noise impacts of these mines, to the satisfaction of the Director-General.

Noise Management Plan

12. The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan must:
- (a) be prepared in consultation with the EPA, and be submitted to the Director-General for approval by the end of May 2013;
 - (b) describe the measures that would be implemented to ensure:
 - best management practice is being employed;
 - the noise impacts of the project are minimised during meteorological conditions under which the noise limits in this approval do not apply; and
 - compliance with the relevant conditions of this approval;
 - (c) describe the proposed noise management system in detail;
 - (d) include a risk/response matrix to codify operational responses to varying levels of risk resulting from weather conditions and specific mining activities;
 - (e) include commitments to provide summary reports and specific briefings at CCC meetings on issues arising from noise monitoring;
 - (f) include a monitoring program that:
 - uses attended monitoring to evaluate the performance of the project, including a minimum of four days attended monitoring per quarter at locations agreed to by the Director-General, or more regularly where required;
 - uses real-time monitoring to support the proactive and reactive noise management system on site;
 - includes monitoring of inversion strength at an appropriate sampling rate to determine compliance with noise limits;
 - evaluates and reports on the effectiveness of the noise management system on site;
 - provides for the annual validation of the noise model for the project (including the tenth percentile methodology); and
 - (g) includes a Leard Forest Mining Precinct Noise Management Strategy, that has been prepared in consultation with other coal mines in the Precinct, to minimise the cumulative noise impacts of all mines within the Precinct, and includes:
 - a description of the measures that would be implemented to ensure that the noise management of the mines is properly co-ordinated to ensure compliance with the relevant noise criteria;
 - a suitable monitoring network for the precinct;
 - protocols for data sharing; and

- procedures for identifying and apportioning the source/s and contribution/s to cumulative noise impacts for the operating mines and other sources, using the noise and meteorological monitoring network and appropriate investigative tools.

Note: The Leard Forest Mining Precinct Noise Management Strategy can be developed in stages and will need to be subject to ongoing review dependent upon the determination and commencement of other mining projects in the area.

Noise Measurement

- Where conditions in this approval refer to measurement of noise within the context of the NSW Industrial Noise Policy the inversion class to be applied to the project is Class G.

However, the Proponent may undertake an investigation to determine whether a proposal for change in this classification could be considered for approval by the Director-General. Any such investigation must be conducted in consultation with the EPA and be conducted by a suitably qualified person whose appointment has been endorsed by the EPA and approved by the Director-General. The report and recommendation must be submitted to the EPA for endorsement prior to submission to the Director-General. If the Director-General is satisfied that the recommendation is reasonable, then the Director-General may amend the inversion class applying to the project under this approval.

BLASTING

Blasting Criteria

- The Proponent shall ensure that blasting does not cause any exceedence of the criteria in Table 5.

Table 5: Blasting criteria

Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedence
Residence on privately-owned land	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months
All public infrastructure	-	50 (or a limit determined by the structural design methodology in AS 2187.2-2006, or its latest version, to the satisfaction of the Director-General)	0%

However, these criteria do not apply if the Proponent has a written agreement with the relevant owner or infrastructure provider/owner to exceed the limits in Table 5, and the Proponent has advised the Department in writing of the terms of this agreement.

Blasting Hours

- The Proponent shall only carry out blasting on the site between 9 am and 5 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of the Director-General.

Blasting Frequency

- The Proponent may carry out a maximum of:
 - 1 blast a day; unless an additional blast is required following a blast misfire; and
 - 4 blasts a week, averaged over a calendar year, for the project.

This condition does not apply to blasts that generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, or to blasts required to ensure the safety of the mine or its workers.

Note: For the purposes of this condition a blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the mine.

Property Inspections

17. If the Proponent receives a written request from the owner of any privately-owned land within 2 kilometres of the approved open-cut pit on site, for a property inspection to establish the baseline condition of any buildings and/or structures on his/her land, or to have a previous property inspection report updated, then within 2 months of receiving this request the Proponent shall:
- commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties, to:
 - establish the baseline condition of any buildings and/or structures on the land, or update the previous property inspection report; and
 - identify any measures that should be implemented to minimise the potential blasting impacts of the project on these buildings and/or structures; and
 - give the landowner a copy of the new or updated property inspection report.

If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Proponent or landowner disagrees with the findings of the independent property investigation, either party may refer the matter to the Director-General for resolution.

Property Investigations

18. If any owner of privately-owned land within 2 kilometres of blasting operations, or any other landowner nominated by the Director-General, claims that the buildings and/or structures on his/her land have been damaged as a result of blasting on site, then within 2 months of receiving this claim in writing from the landowner, the Proponent shall:
- commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties, to investigate the claim; and
 - give the landowner a copy of the property investigation report.

If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent shall repair the damages to the satisfaction of the Director-General.

If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Proponent or landowner disagrees with the findings of the independent property investigation, either party may refer the matter to the Director-General for resolution.

Operating Conditions

19. During mining operations on site, the Proponent shall:
- implement best practice blasting management to:
 - protect the safety of people and livestock in the surrounding area;
 - protect public or private infrastructure/property in the surrounding area from any damage;
 - minimise the dust and fume emissions of any blasting; and
 - minimise blasting impacts on heritage items in the vicinity of the site;
 - co-ordinate the timing of blasting on site with the timing of blasting at other mines within the Leard Forest Mining Precinct to minimise the cumulative blasting impacts of the mines; and
 - operate a suitable system to enable the public to get up-to-date information on the proposed blasting schedule on site,
- to the satisfaction of the Director-General.
20. The Proponent shall not undertake blasting on-site within 500 metres of:
- any public road without the approval of Council; or
 - any land outside of the site not owned by the Proponent, unless:
 - the Proponent has a written agreement with the relevant landowner to allow blasting to be carried out closer to the land, and the Proponent has advised the Department in writing of the terms of this agreement; or
 - the Proponent has:
 - demonstrated that the blasting can be carried out closer to the land without compromising the safety of the people or livestock on the land, or damaging the buildings and/or structures on the land; and
 - updated the Blast Management Plan to include the specific measures that would be implemented while blasting is being carried out within 500 metres of the land,
- to the satisfaction of the Director-General.

Blast Management Plan

21. The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Director-General. This plan must:
- be submitted to the Director-General for approval by the end of May 2013;

- (b) be prepared in consultation with the EPA and interested members of the local community who would potentially be affected by blasting;
- (c) propose and justify any alternative ground vibration limits for public infrastructure in the vicinity of the site;
- (d) describe the measures that would be implemented to ensure:
 - best management practice is being employed; and
 - compliance with the relevant conditions of this approval;
- (e) include a road closure protocol for blasting within 500 metres of a public road, that has been prepared in consultation with Council;
- (f) include a specific blast fume management protocol to demonstrate how emissions will be minimised, including risk management strategies if blast fumes are generated;
- (g) include a monitoring program for evaluating blasting performance, which includes:
 - compliance with the applicable criteria; and
 - minimising blast fume emissions; and
- (h) include a Leard Forest Mining Precinct Blast Management Strategy, that has been prepared in consultation with other mines within the Leard Forest Mining Precinct, to minimise cumulative blasting impacts.

Note: The Leard Forest Mining Precinct Blast Management Strategy can be developed in stages, and will need to be subject to ongoing review dependent upon the determination of and commencement of other mining projects in the area.

AIR QUALITY & GREENHOUSE GAS

Odour

22. Unless otherwise authorised by an EPL, the Proponent shall ensure that no offensive odours are emitted from the site, as defined under the POEO Act.

Greenhouse Gas Emissions

23. The Proponent shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site to the satisfaction of the Director-General.

Air Quality Criteria

24. The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are implemented so that particulate matter emissions generated by the project do not cause exceedances of the criteria in Table 6, Table 7 and Table 8 at any residence-on privately-owned land or on more than 25 percent of any privately-owned land.

The assessment acknowledges that it may not be reasonable and feasible to prevent exceedance of the PM₁₀ criteria in Table 6 at property 45 and exceedance of the criteria in Table 7 in year 16 at property 49. (To interpret the property locations referred to see the applicable figure(s) in Appendix 5.)

Table 6: Long-term criteria for particulate matter

Pollutant	Averaging Period	^d Criterion
Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³

Table 7: Short-term criteria for particulate matter

Pollutant	Averaging Period	^d Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³

Table 8: Long-term criteria for deposited dust

Pollutant	Averaging Period	Maximum increase in deposited dust level	Maximum total deposited dust level
^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month

Notes to Table 6, Table 7 and Table 8:

^a Total impact (ie incremental increase in concentrations due to the project plus background concentrations due to all other sources);

^b Incremental impact (ie incremental increase in concentrations due to the project on its own);

^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.

^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Director-General.

"Reasonable and feasible avoidance measures" includes, but is not limited to, the operational requirements in conditions 28 and 29 to develop and implement a real-time air quality management system that ensures operational responses to the risks of exceedance of the criteria.

Mine-Specific Air Quality Criteria

25. The Proponent shall ensure that particulate matter emissions generated by the project do not exceed the criteria listed in Table 9 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, except on property 49 in year 16.

Table 9: Short-term criteria for particulate matter

Pollutant	Averaging Period	Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³

Note:

As provided by the EP&A Act, the criterion in Table 9 may be amended to a more stringent criterion in an EPL, after the first review of the EPL under section 78 of the POEO Act.

Air Quality Acquisition Criteria

26. If particulate matter emissions generated by the project exceed the criteria, or contribute to an exceedance of the relevant cumulative criteria, in Table 10, Table 11 or Table 12, at any residence on privately-owned land or on more than 25 percent of any privately-owned land, then upon receiving a written request for acquisition from the landowner the Proponent shall acquire the land in accordance with the procedures in conditions 8 and 9 of schedule 4.

Table 10: Long term land acquisition criteria for particulate matter

Pollutant	Averaging period	^d Criterion
Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³

Table 11: Short term land acquisition criteria for particulate matter

Pollutant	Averaging period	^d Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 150 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	24 hour	^b 50 µg/m ³

Table 12: Long term land acquisition criteria for deposited dust

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month

Notes to Table 10, Table 11 and Table 12:

^a Total impact (ie incremental increase in concentrations due to the project plus background concentrations due to all other sources);

^b Incremental impact (ie incremental increase in concentrations due to the project on its own);

^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method;

^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, or any other activity agreed by the Director-General.

Mine-owned Land

27. The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are implemented so that particulate matter emissions generated by the project do not exceed the criteria in

Table 6, Table 7 and Table 8 at any occupied residence on any mine-owned land (including land owned by adjacent mines), unless:

- (a) the tenant and/or landowner has been notified of any health risks in accordance with the notification requirements under schedule 4 of this approval;
 - (b) the tenant on project-related land can terminate the tenancy agreement without penalty, subject to giving reasonable notice, and the Proponent uses its best endeavours to provide assistance with relocation and sourcing of alternative accommodation;
 - (c) air mitigation measures such as air filters, a first flush roof water drainage system and/or air conditioning) are installed at the residence, if requested by the tenant and landowner (where owned by another mine other than the Proponent);
 - (d) particulate matter air quality monitoring is undertaken to inform the tenant and landowner of potential health risks; and
 - (e) monitoring data is presented to the tenant in an appropriate format, for a medical practitioner to assist the tenant in making an informed decision on the health risks associated with occupying the property,
- to the satisfaction of the Director-General.

Operating Conditions

28. The Proponent shall:

- (a) implement best practice management to minimise the off-site odour, fume and dust emissions of the project;
 - (b) operate a comprehensive air quality management system on site that uses a combination of predictive meteorological forecasting, predictive and real time air dispersion modelling and real-time air quality monitoring data to guide the day-to-day planning of mining operations and implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this approval;
 - (c) manage PM_{2.5} levels in accordance with any requirements of an EPL;
 - (d) minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see note d under Table 8);
 - (e) minimise any visible off-site air pollution;
 - (f) minimise the surface disturbance of the site generated by the project; and
 - (g) co-ordinate the air quality management on site with the air quality management at other mines within the Leard Forest Mining Precinct to minimise the cumulative air quality impacts of the mines,
- to the satisfaction of the Director-General.

Air Quality and Greenhouse Gas Management Plan

29. The Proponent shall prepare and implement an Air Quality and Greenhouse Gas Management Plan for the project to the satisfaction of the Director-General. This plan must:

- (a) be prepared in consultation with the EPA and be submitted to the Director-General for approval by the end of May 2013;
- (b) describe the measures that would be implemented to ensure:
 - best practice management is being employed;
 - the air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events; and
 - compliance with the relevant conditions of this approval;
- (c) describe the proposed air quality management system;
- (d) include a risk/response matrix to codify mine operational responses to varying levels of risk resulting from weather conditions and specific mining activities;
- (e) include commitments to provide summary reports and specific briefings at CCC meetings on issues arising from air quality monitoring;
- (f) include an air quality monitoring program that:
 - uses a combination of real-time monitors and supplementary monitors to evaluate the performance of the project;
 - adequately supports the proactive and reactive air quality management system;
 - includes PM_{2.5} monitoring;
 - includes monitoring of occupied mine-owned residences and residences on the air quality affected land in Table 1, subject to the agreement of the tenant and/or landowner;
 - evaluates and reports on the effectiveness of the air quality management system;
 - includes sufficient random audits of operating responses to real time air quality management systems to determine the ongoing effectiveness of these responses in maintaining the project within the relevant criteria in this Schedule and the requirements of conditions 24 and 25, above;
 - includes a protocol for determining any exceedences of the relevant conditions in this approval; and
- (g) includes a Leard Forest Mining Precinct Air Quality Management Strategy that has been prepared in consultation with other coal mines in the Precinct to minimise the cumulative air quality impacts of all mines within the Precinct, that includes:
 - systems and processes to ensure that all mines are managed to achieve their air quality criteria;

- a shared environmental monitoring network and data sharing protocol;
- control monitoring site(s) to provide real time data on background air quality levels (ie not influenced by mining in the Leard Forest Mining Precinct and representative of regional air quality);
- a shared predictive and real time air dispersion model covering the Leard Forest Mining Precinct to be used for assessment of cumulative impacts, optimising location of the shared real time monitoring network, validation of air predictions and optimising mitigation measures; and
- procedures for identifying and apportioning the source/s and contribution/s to cumulative air impacts for both mines and other sources, using the air quality and meteorological monitoring network and appropriate investigative tools such as modelling of post incident plume dispersion, dual synchronised monitors and chemical methods of source apportionment (where possible).

Notes:

- *The requirement for regionally based control sites can be further reviewed if a regional air monitoring network is implemented and operated by the EPA as recommended in the draft Strategic Regional Land Use Plan for New England North West.*
- *The Leard Forest Mining Precinct Air Quality Management Strategy can be developed in stages and will need to be subject to ongoing review dependent upon the determination of and commencement of other mining projects in the area.*
- *The management plan should be consistent with the EPA's guidance on Best Management Practice reporting and Reactive Particulate Management Strategies.*

METEOROLOGICAL MONITORING

30. For the life of the project, the Proponent shall ensure that there is a meteorological station in the vicinity of the site that:
- (a) complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline; and
 - (b) is capable of continuous real-time measurement of temperature lapse rate in accordance with the *NSW Industrial Noise Policy*, unless a suitable alternative is approved by the Director-General following consultation with the EPA.

SOIL AND WATER

Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Proponent is required to obtain the necessary water licences for the project.

Water Supply

31. The Proponent shall ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of mining operations on site to match its available water supply, to the satisfaction of the Director-General.

Compensatory Water Supply

32. The Proponent shall provide a compensatory water supply to any owner of privately-owned land whose water supply is adversely and directly impacted (other than a negligible impact) as a result of the project, in consultation with NOW, and to the satisfaction of the Director-General.

The compensatory water supply measures must provide an alternative long-term supply of water that is equivalent to the loss attributed to the project. Equivalent water supply should be provided (at least on an interim basis) within 24 hours of the loss being identified.

If the Proponent and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.

If the Proponent is unable to provide an alternative long-term supply of water, then the Proponent shall provide alternative compensation to the satisfaction of the Director-General.

Surface Water Discharges

33. The Proponent shall ensure that all surface water discharges from the site comply with the discharge limits (both volume and quality) set for the project in any EPL.

Goonbri Creek Diversion and Low Permeability Barrier – Performance Objectives

34. The Proponent shall ensure that the project has no greater environmental consequences than predicted in the EA and complies with the performance objectives in Table 13, to the satisfaction of the Director-General.

Table 13: Goonbri Creek and alluvial aquifer performance objectives

Feature	Objective
Goonbri Creek and the Upper Namoi alluvial aquifer	<p>No more than negligible environmental consequences to the alluvial aquifer, including:</p> <ul style="list-style-type: none"> • negligible change in groundwater levels; • negligible leakage through low permeability barrier; • negligible change in groundwater quality; and • negligible impact to other groundwater users.
Goonbri Creek diversion	<p>Hydraulically and geomorphologically stable (including the low permeability barrier)</p> <p>Negligible change to off-site flooding characteristics (including flood levels, velocities and flood storage capacity)</p> <p>Riparian vegetation, habitat, energy management and dissipation, bedload transport, biophysical maintenance and pool holding capacity that is the same or better than existed prior to mining</p> <p>Revegetation of the riparian zone focused on establishment of self-sustaining vegetation characteristic of the Bracteate Honeymyrtle community (as proposed in the EA)</p>
Low permeability barrier, including associated flood bund	<p>Hydraulically and geomorphologically stable</p> <p>The effectiveness of the Low Permeability Barrier shall be at least 10^{-8} metres/second</p> <p>Negligible change to off-site flooding characteristics (including flood levels, velocities and flood storage capacity)</p> <p>Provides suitable protection for flood events up to and including the Probable Maximum Flood.</p>

Goonbri Creek Diversion and Flood Bund Concept Design Plan

35. The Proponent shall prepare and implement a Goonbri Creek Diversion and Flood Bund Concept Design Plan, to the satisfaction of the Director-General. The plan must:
- be prepared in consultation with NOW, OEH and the Namoi CMA;
 - be submitted to the Director-General for approval by December 2016;
 - set out the vision statement for the creek diversion;
 - assess the surface water and groundwater quality, ecology, hydrological (including flooding) and geomorphic baseline conditions within the creek;
 - set out the construction program for the creek diversion and LPB, describing how the work would be staged, and integrated with mining operations;
 - describe the revegetation program for the creek diversion and the use of a range of suitable native species;
 - establish the water quality, ecology, hydrological (including flooding) and geomorphic performance and completion criteria for the creek diversion and LPB based on the assessment of baseline conditions; and
 - be revised in consultation with NOW, OEH and the Namoi CMA, and resubmitted for approval by the Director-General in response to the findings of the detailed technical design required in condition 36 and the Monitoring and Management Plan in condition 38.

Goonbri Creek Diversion and Low Permeability Barrier – Design and Construction

36. The Proponent shall design the Goonbri Creek diversion and LPB to the satisfaction of NOW and the Director-General. The detailed designs must:
- be designed by a suitably qualified and experienced expert/s;
 - be endorsed by NOW and approved by the Director-General prior to the commencement of any works or construction on the Goonbri Creek diversion and LPB;
 - be generally in accordance with the conceptual designs in the EA (and depicted in Appendix 6), and applicable Australian Standards (including AS 3798-2007);
 - include detailed design, construction and engineering specifications, performance criteria and completion criteria;

- (e) demonstrate that the design would achieve the relevant performance objectives and criteria; and
- (f) demonstrate the LPB design would remain effective over an appropriate lifespan and would withstand mining operations, geological and weather events, decay and corrosive attack – including biological attack.

37. The Proponent shall:

- (a) construct the Goonbri Creek diversion and LPB prior to undertaking any mining operations within 200 metres of the Goonbri Creek alluvium, and at least 5 years prior to the planned mining in the alluvium; and
- (b) within 2 months of the construction of the Goonbri Creek diversion and LPB, submit an as-executed report to the Director-General and NOW, certified by a practising engineer, confirming that the diversion and barrier have been constructed:
 - in accordance with the concept design in the EA, applicable Australian Standards (including AS 3798-2007) and the approved design (see condition 36 above); and
 - in a manner that achieves the performance objectives in Table 13.

Notes:

- The Goonbri Creek alluvium, diversion, conceptual low permeability barrier and flood bunds are shown in Appendix 6.
- The diversion and low permeability barrier may be constructed on a staged basis. In this case, the reports required under conditions 36 and 37 shall be submitted for each stage.

Goonbri Creek Diversion and Low Permeability Barrier – Monitoring and Management Plan

38. The Proponent shall prepare and implement a Goonbri Creek Diversion and Low Permeability Barrier Monitoring and Management Plan to the satisfaction of the NOW and the Director-General. The plan must:

- (a) be prepared by a suitably qualified and experienced expert/s;
- (b) be endorsed by the NOW and approved to the Director-General prior to commencement of any works or construction on the Goonbri Creek diversion and LPB;
- (c) describe the monitoring and maintenance procedures to be implemented and the scheduling of these procedures;
- (d) demonstrate the monitoring system would be capable of timely detection of any failure or deficiency in the LPB and any impacts on Goonbri Creek and its associated alluvium;
- (e) describe the contingency measures that would be implemented in the event of a failure or deficiency in the LPB, or other impact on Goonbri Creek and its associated alluvium; and
- (f) identify the entity that would take responsibility for the future liabilities and costs associated with the long-term monitoring and maintenance of the LPB, flood bund, void and pit lake, and demonstrate that this entity's security and finances would be assured in the long term.

Water Management Plan

39. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director-General. This plan must:

- (a) be prepared in consultation with OEH, NOW and Namoi CMA, by suitably qualified and experienced person/s whose appointment has been approved by the Director-General;
- (b) be submitted to the Director-General for approval by the end of May 2013; and
- (c) in addition to the standard requirements for management plans (see condition 3 of schedule 5), include a:
 - (i) Site Water Balance, that includes:
 - details of:
 - sources and security of water supply, including contingency for future reporting periods;
 - water use and management on site;
 - any off-site water discharges;
 - reporting procedures, including the preparation of a site water balance for each calendar year;
 - a program to validate the surface water model, including monitoring discharge volumes from the site and comparison of monitoring results with modelled predictions; and
 - describes the measures that would be implemented to minimise clean water use on site;
 - (ii) Surface Water Management Plan, that includes:
 - detailed baseline data on surface water flows and quality in the water-bodies that could potentially be affected by the project;
 - detailed baseline data on soils within the irrigation area;
 - detailed baseline data on hydrology across the downstream drainage system of the Namoi River floodplain from the mine site to the Namoi River, including Barbers Lagoon and The Slush Holes;
 - a detailed description of the water management system on site, including the:
 - clean water diversion systems;

- erosion and sediment controls (mine water system);
 - mine water management systems including irrigation areas;
 - discharge limits in accordance with EPL requirements; and
 - water storages;
 - detailed plans, including design objectives and performance criteria for:
 - design and management of final voids;
 - design and management for the emplacement of reject materials, sodic and dispersible soils and acid or sulphate generating materials;
 - the Goonbri Creek diversion and low permeability barrier;
 - reinstatement of drainage lines on the rehabilitated areas of the site; and
 - control of any potential water pollution from the rehabilitated areas of the site;
 - performance criteria for the following, including trigger levels for investigating any potentially adverse impacts associated with the project:
 - the water management system;
 - soils within the irrigation area;
 - downstream surface water quality;
 - downstream flooding impacts, including flood impacts due to the flood bunds required for the project; and
 - stream and riparian vegetation health, including the Namoi River and its tributaries including Barbers Lagoon and The Slush Holes;
 - a program to monitor and assess:
 - the effectiveness of the water management system;
 - soils within the irrigation area;
 - the effectiveness of the Goonbri Creek diversion and flood bunds (see conditions 34-38);
 - surface water flows and quality in the watercourses that could be affected by the project; and
 - downstream flooding impacts;
 - reporting procedures for the results of the monitoring program; and
 - a plan to respond to any exceedences of the performance criteria, and mitigate and/or offset any adverse surface water impacts of the project;
- (iii) Groundwater Management Plan, that includes:
- detailed baseline data of groundwater levels, yield and quality in the region, and privately-owned groundwater bores including a detailed survey/schedule of groundwater dependent ecosystems (including stygo-fauna), that could be affected by the project;
 - detailed plans, including design objectives and performance criteria, for the design and management of:
 - the proposed final void; and
 - coal reject and potential acid forming material emplacement;
 - groundwater assessment criteria including trigger levels for investigating any potentially adverse groundwater impacts;
 - a program to monitor and assess:
 - groundwater inflows to the open cut mining operations;
 - the effectiveness of the LPB;
 - the seepage/leachate from the LPB, water storages, emplacements and the final void;
 - interconnectivity between the alluvial and bedrock aquifers;
 - background changes in groundwater yield/quality against mine-induced changes;
 - the impacts of the project on:
 - regional and local (including alluvial) aquifers;
 - groundwater supply of potentially affected landowners;
 - groundwater dependent ecosystems (including potential impacts on stygo-fauna) and riparian vegetation;
 - a program to validate the groundwater model for the project, including an independent review of the model every 3 years, and comparison of monitoring results with modelled predictions; and
 - a plan to respond to any exceedences of the performance criteria; and
- (iv) Leard Forest Mining Precinct Water Management Strategy, that has been prepared in consultation with other mines within the precinct to:
- minimise the cumulative water quality impacts of the mines;
 - review opportunities for water sharing/water transfers between mines;
 - co-ordinate water quality monitoring programs as far as practicable;
 - undertake joint investigations/studies in relation to complaints/exceedences of trigger levels where cumulative impacts are considered likely; and
 - co-ordinate modelling programs for validation, re-calibration and re-running of the groundwater and surface water models using approved mine operation plans.

Note: The Leard Forest Mining Precinct Water Management Strategy can be developed in stages and will need to be subject to ongoing review, dependent upon the determination of and commencement of other mining projects in the area.

BIODIVERSITY

Biodiversity Offset Strategy

40. The Proponent shall implement the biodiversity offset strategy described in the EA, summarised in Table 14 and shown conceptually in Appendix 7, to the satisfaction of the Director-General.

Table 14: Summary of the biodiversity offset strategy

Area	Offset Type	Minimum Size (hectares)
Willeroi Offset Area	Existing native vegetation to be enhanced, and additional native vegetation to be established with the restoration of at least 193 ha of Box Gum Woodland EEC, as listed under the TSC Act	1,660
Rehabilitation Area	Native woodland vegetation communities to be re-established, focused on Box Gum Woodland EEC	752

Note: For the purposes of this approval Box Gum Woodland refers to the EEC listed as White Box Yellow Box Blakely's Red Gum Woodland under the TSC Act, and the CEEC listed as White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grasslands under the EPBC Act, or similar EEC as may be updated from time to time.

Leard Forest Mining Precinct Regional Biodiversity Strategy

41. The Proponent shall contribute to the funding and preparation of the Leard Forest Mining Precinct Regional Biodiversity Strategy, as required under the approvals for the Boggabri coal mine and Maules Creek coal mine, to the satisfaction of the Director-General.

Notes:

- The approvals for the Boggabri coal mine and Maules Creek coal mine require the proponents of the mines in the Leard Forest mining precinct to prepare the regional biodiversity strategy in 3 stages, including:
 - Stage 1 Scoping Stage, by the end of January 2013;
 - Stage 2 Strategy Development Stage, by the end of January 2014; and
 - Stage 3 Strategy Review Stage, by the end of December 2018.
- The strategy is required to be prepared in collaboration with a working group comprising relevant government agencies and the Leard Forest mining precinct mines, and chaired by an independent person.
- Funding of the strategy should be based on predicted clearing of native vegetation for the three projects within the Leard Forest Mining Precinct. Based on the predicted clearing for the projects, the funding split would equate to total contributions of 36% from Boggabri (clearing of 1,385 ha), 54% from Maules Creek (clearing of 2,078ha) and 10% from Tarrawonga (clearing of 397 ha). This funding arrangement can be further refined in the Stage 1 Scoping Stage.

Revised Biodiversity Offset Strategy

42. Within 6 months of the approval of Stage 2 of the Leard Forest Mining Precinct Regional Biodiversity Strategy the Proponent shall review, and if necessary revise, the biodiversity offset strategy for the project to the satisfaction of the Director-General. The review/revision must:
- (a) be prepared in consultation with OEH, Namoi CMA, Forests NSW, the CCC, DPI Catchments and Lands and SEWPaC;
 - (b) not reduce the size or quality of the offset area; and
 - (c) be consistent (as far as is possible) with the recommendations and objectives of the Leard Forest Mining Precinct Regional Biodiversity Strategy.

Threatened Species

43. For the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland Endangered Ecological Community the Proponent shall:
- (a) ensure that the Biodiversity Offset Strategy and site Rehabilitation Strategy is focused on protection rehabilitation, re-establishment and long-term maintenance of viable stands of this community;
 - (b) investigate in consultation with OEH and the Namoi CMA, all factors likely to enhance or impede the effective long term restoration of degraded remnants of this EEC in offset areas or regeneration of this EEC on disturbed areas (both offset areas and the site);
 - (c) within 24 months of the date of this approval (and if possible in conjunction with Stage 2 of the Leard Forest Mining Precinct Regional Biodiversity Strategy), submit a report of this investigation and provide an implementation plan to maximise the prospects for rehabilitation and regeneration of this EEC on the offset areas and the site, for approval by the Director-General; and
 - (d) incorporate the approved implementation plan into the revised Biodiversity Management Plan, required under condition 48.

44. For all threatened species on site, the Proponent shall ensure that the Biodiversity Offset Strategy and Rehabilitation Strategy are focused on protection, rehabilitation and long-term maintenance of viable stands of suitable habitat for these species.
45. The Proponent shall:
- (a) investigate, in consultation with OEH and the Namoi CMA, all factors likely to enhance or impede the effective long term provision of suitable habitat(s) for the following species: Speckled Warbler, Brown Treecreeper, Grey-crowned Babbler, Hooded Robin, Varied Sittella, Turquoise Parrot, Masked Owl, Yellow-bellied Sheath Tail Bat and Squirrel Glider;
 - (b) within 12 months of the date of this approval (and if possible, in conjunction with Stage 2 of the Leard Forest Mining Precinct Regional Biodiversity Strategy), submit a report of this investigation and provide an implementation plan to ensure delivery of suitable areas of viable habitat for the species included in (a) above, for approval by the Director-General; and
 - (c) incorporate the approved implementation plan into the revised Biodiversity Management Plan, required under condition 48.

Long Term Security of Offset

46. The Proponent shall make suitable arrangements to provide appropriate long-term security for the offset areas:
- (a) for the Willeroi Offset Area the long-term security shall be provided by way of:
 - the Proponent entering into a conservation agreement or agreements pursuant to section 69B of the *National Parks and Wildlife Act 1974*, recording the obligations assumed by the Proponent under the conditions of this approval in relation to these offset areas, and registering the agreement(s) pursuant to section 69F of the *National Parks and Wildlife Act 1974*; or
 - a tenure of higher conservation status such as a National Park, or Nature Reserve, under the *National Parks and Wildlife Act 1974*,
The conservation agreement(s) must be registered by the end of December 2013 unless agreed otherwise by the Director-General after consultation with OEH. The conservation agreements must remain in force in perpetuity; and
 - (b) by the end of December 2030 unless otherwise agreed by the Director-General, for the woodland to be established in the Rehabilitation Area, as identified in Table 14, to the satisfaction of the Director-General.

Note: The Department acknowledges that the Proponent is investigating the potential to transfer part or all of the Willeroi Offset Area directly to the national park estate, and accepts that interim conservation measures may be implemented prior to this transfer.

Biodiversity Management Plan

47. The Proponent shall prepare and implement a Biodiversity Management Plan for the project to the satisfaction of the Director-General. This plan must:
- (a) be prepared in consultation with OEH, SEWPaC, Forests NSW, the CCC, DPI Catchments and Lands and the Namoi CMA, and be submitted to the Director-General for approval by the end of May 2013;
 - (b) describe the short, medium, and long term measures that would be implemented to:
 - manage the remnant vegetation and habitat on the site and in the offset area; and
 - implement the biodiversity offset strategy, including detailed performance and completion criteria;
 - (c) include detailed performance and completion criteria for evaluating the performance of the biodiversity offset strategy, and triggering remedial action (if necessary);
 - (d) include a detailed description of the measures that would be implemented for:
 - enhancing the quality of existing vegetation and fauna habitat;
 - restoring native vegetation and fauna habitat on the biodiversity offset area and rehabilitation area through focusing on assisted natural regeneration, targeted vegetation establishment and the introduction of naturally scarce fauna habitat features;
 - maximising the salvage of resources within the approved disturbance area – including vegetative, top and sub soils and cultural heritage resources – for beneficial reuse in the enhancement of the biodiversity offset area or rehabilitation area;
 - collecting and propagating seed;
 - minimising the impacts on fauna on site, including undertaking pre-clearance surveys;
 - managing any potential conflicts between the proposed restoration works in the biodiversity offset area and any Aboriginal heritage values (both cultural and archaeological);
 - managing salinity;
 - controlling weeds and feral pests;
 - controlling erosion;
 - controlling access; and
 - managing bushfire risk;
 - (e) include a seasonally-based program to monitor and report on the effectiveness of these measures,

- and progress against the detailed performance and completion criteria;
- (f) identify the potential risks to the successful implementation of the biodiversity offset strategy, and include a description of the contingency measures that would be implemented to mitigate against these risks; and
- (g) include details of who would be responsible for monitoring, reviewing, and implementing the plan.

Note: The Biodiversity Management Plan and Rehabilitation Management Plan need to be substantially integrated for achieving biodiversity objectives for the rehabilitated mine-site.

48. The Proponent shall review and if necessary revise the Biodiversity Management Plan within 6 months of the completion of Stage 2 of the Leard Forest Mining Precinct Regional Biodiversity Strategy, to the satisfaction of the Director-General. The review/revision must:
- (a) be prepared in consultation with OEH, SEWPaC, Forests NSW, the CCC, DPI Catchments and Lands and the Namoi CMA;
 - (b) be consistent with the findings of Leard Forest Mining Precinct Regional Biodiversity Strategy; and
 - (c) include any implementation plans arising from the studies required under conditions 434543 and 45 of this approval.

Conservation Bond

49. By the end of May 2013, the Proponent shall lodge a Conservation and Biodiversity Bond with the Department to ensure that the biodiversity offset strategy is implemented in accordance with the performance and completion criteria of the Biodiversity Management Plan. The sum of the bond shall be determined by:
- (a) calculating the full cost of implementing the biodiversity offset strategy (other than land acquisition costs); and
 - (b) employing a suitably qualified quantity surveyor to verify the calculated costs, to the satisfaction of the Director-General.

If the offset strategy is completed generally in accordance with the completion criteria in the Biodiversity Management Plan to the satisfaction of the Director-General, the Director-General will release the bond.

If the offset strategy is not completed generally in accordance with the completion criteria in the Biodiversity Management Plan, the Director-General will call in all, or part of, the conservation bond, and arrange for the satisfactory completion of the relevant works.

With the agreement of the Director-General, this bond may be combined with rehabilitation security deposit administered by DRE.

Notes:

- *Alternative funding arrangements for long term management of the Biodiversity Offset Strategy, such as provision of capital and management funding as agreed by OEH as part of a Biobanking Agreement or transfer to conservation reserve estate can be used to reduce the liability of the conservation and biodiversity bond.*
- *The sum of the bond may be reviewed in conjunction with any revision to the biodiversity offset strategy.*

Independent Biodiversity Audit

50. By the end of June 2014 and every 3 years thereafter, unless both the Director-General and OEH agree to a different timeframe, the Proponent shall commission suitably qualified, experienced and independent person/s, whose appointment has been approved by the Director-General, to undertake an audit of the revegetation of the rehabilitation area and management and restoration within the Biodiversity Offset Strategy areas to the satisfaction of the Director-General. This audit must:
- (a) include consultation with OEH, Namoi CMA, DPI Catchments and Lands, SEWPaC, CCC and DRE;
 - (b) assess the performance of the revegetation in the rehabilitation area completed to date (and the Goonbri Creek Diversion, once commenced) against the completion criteria in the Rehabilitation Management Plan;
 - (c) assess the performance of management and restoration in the off-site Biodiversity Offset Strategy areas completed to date against the completion criteria in the Biodiversity Management Plan;
 - (d) identify any measures that should be implemented to improve the performance of rehabilitation, management and restoration within the rehabilitation and biodiversity offset areas; and
 - (d) identify any additional measures that should be applied in the establishment of native vegetation, including riparian vegetation around the realigned Goonbri Creek, both before and after the realignment is undertaken;
 - (e) if the completion criteria have not been met, or are not adequately trending towards being met, determine the likely ecological value of the rehabilitation and restoration once completed, and recommend additional measures to augment the Biodiversity Offset Strategy to ensure that it adequately offsets the project's impacts on biodiversity.

If the audit recommends the implementation of additional measures to augment the Biodiversity Offset Strategy in accordance with (e) above, then within 6 months of the completion of the audit the Proponent

shall revise the Biodiversity Offset Strategy, in consultation with the Department, OEH and SEWPaC, and to the satisfaction of the Director-General.

HERITAGE

Aboriginal Heritage Conservation Strategy

51. The Proponent shall prepare and implement an Aboriginal Heritage Conservation Strategy for the project and the Biodiversity Offset Strategy areas to the satisfaction of the Director-General. This Strategy must enhance and conserve the Aboriginal cultural heritage values (both cultural and archaeological) and provide for their long-term protection and management. The Strategy must:
- (a) be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Director-General;
 - (b) be prepared in consultation with OEH, the local Aboriginal community and other mines within the Leard Forest Mining Precinct, and submitted to the Director-General for approval within 12 months from the date of project approval;
 - (c) identify the Aboriginal cultural heritage values of the Biodiversity Offset Strategy areas;
 - (d) identify areas of high Aboriginal cultural heritage significance within both the site and the Leard Forest Mining Precinct;
 - (e) identify a range of options for enhancing and conserving Aboriginal cultural heritage values, with specific consideration of the potential for the long-term protection and management of significant sites within either the site, the Biodiversity Offset Strategy areas or other lands within the Leard Forest Mining Precinct identified as having high cultural heritage significance to the Aboriginal community; and
 - (f) consider cumulative impacts and potential for developing joint initiatives with other mines within the Leard Forest Mining Precinct for enhancing and conserving Aboriginal cultural heritage values.

Heritage Management Plan

52. The Proponent shall prepare and implement a Heritage Management Plan for the project to the satisfaction of the Director-General. This plan must:
- (a) be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Director-General;
 - (b) be prepared in consultation with OEH and local Aboriginal stakeholders (in relation to the management of Aboriginal heritage values);
 - (c) be submitted to the Director-General for approval prior to undertaking any activities that may impact heritage items or sites, unless the Director-General agrees otherwise;
 - (d) include the following for the management of Aboriginal cultural heritage:
 - a detailed archaeological salvage program for Aboriginal sites/objects within the project disturbance area, including methodology and procedures/protocols for:
 - sub-surface testing;
 - staged salvage, based on anticipated mine planning;
 - pre-disturbance monitoring;
 - site assessment and reporting;
 - research objectives to inform knowledge of Aboriginal occupation;
 - protection, storage and management of salvaged Aboriginal objects;
 - addressing relevant statutory requirements under the *National Parks and Wildlife Act 1974*; and
 - long term protection of salvaged Aboriginal objects;
 - a description of the measures that would be implemented for:
 - protecting, monitoring and managing Aboriginal sites outside the project disturbance area;
 - maintaining and managing reasonable access for Aboriginal stakeholders to cultural heritage items on site and in the biodiversity offset area;
 - managing the discovery of any human remains or previously unidentified Aboriginal objects on site, including (in the case of human remains) stop work provisions and notification protocols;
 - ongoing consultation with the local Aboriginal stakeholders in the conservation and management of Aboriginal cultural heritage both on-site and in the biodiversity offset area;
 - ensuring any workers on site receive suitable heritage inductions prior to carrying out any activities which may disturb Aboriginal sites, and that suitable records are kept of these inductions;
 - (e) include the following for the management of historic heritage:
 - a description of the measures that would be implemented for:
 - managing the discovery of human remains or previously unidentified historic heritage items at the site, including (in the case of human remains) stop work provisions and notification protocols; and
 - ensuring workers on site receive suitable heritage inductions prior to carrying out any development on site, and ensure that suitable records of these inductions are kept.

Note: The Department acknowledges that the initial Heritage Management Plan may not include a detailed plan for the implementation of the Aboriginal Heritage Conservation Strategy. If this occurs, the Proponent will be required to update the plan as soon as practicable following the Director-General's approval of the Aboriginal Heritage Conservation Strategy.

TRANSPORT

Roadworks

53. The Proponent shall:
- construct the Goonbri Road realignments and associated mine access road intersection, Goonbri Road/private coal haulage road intersection and the Goonbri Road/Dripping Rock Road/Blair Athol Lane intersection as shown conceptually in the EA; and
 - install appropriate advance warning signs and lighting on Goonbri Road, the private coal haulage road at the intersection of the Northern Site Access Road, to the satisfaction of Council.

The road realignments and associated intersection upgrades shall be undertaken:

- to a bitumen sealed standard, unless otherwise agreed by Council; and
- prior to any project works occurring within 25 metres of the existing Goonbri Road alignment, or on the southern/eastern side of the existing road alignment.

Note: The road upgrade works may be undertaken in stages, with the agreement of Council.

Coal Transport

54. Whilst coal transport by road is permitted under this approval, the Proponent shall ensure that:
- trucks travelling to and from the site do not exceed 40 kilometres per hour in the vicinity of the school bus when it is operating on Hoad Lane, unless an alternative protocol is agreed by the Director-General; and
 - spillage from coal haulage vehicles is minimised and promptly managed.

Road Maintenance

55. During mining operations, the Proponent shall continue to implement road maintenance agreements with Narrabri Shire Council and Gunnedah Shire Council for the maintenance of the public roads affected by the project to the satisfaction of the respective Council. If there is any dispute in relation to these agreements, then any of the parties may refer the matter to the Director-General for resolution.

Monitoring of Coal and Gravel Transport

56. The Proponent shall:
- keep records of the:
 - amount of coal and gravel transported from the site (on a monthly basis); and
 - date and time of each train movement on the Boggabri rail spur line generated by the project; and
 - make these records available on its website at the end of each calendar year.

VISUAL

Operating Conditions

57. The Proponent shall:
- implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the project;
 - ensure no outdoor lights shine above the horizontal;
 - wherever possible, ensure that mobile equipment is appropriately designed and/or retrofitted to prevent light being directed above the horizontal;
 - ensure that all external lighting associated with the project complies with *Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting* or its latest version;
 - provide for the establishment of trees and shrubs and/or the construction of mounding or bunding:
 - along the realigned Goonbri Road and access road to the mine site;
 - along the services corridor to the Boggabri Coal Mine;
 - around the water storage dams; and
 - at other areas identified as necessary for the maintenance of satisfactory visual amenity;and
 - ensure that the visual appearance of all buildings, structures, facilities or works (including paint colours and specifications) is aimed at blending as far as possible with the surrounding landscape, to the satisfaction of the Director-General.

Additional Visual Impact Mitigation

58. Upon receiving a written request from the owner of any residence on privately-owned land which has, or would have, significant direct views of the mining operations and infrastructure on-site during the project, the Proponent shall implement additional visual impact mitigation measures (such as landscaping treatments or vegetation screens) to reduce the visibility of the mining operations and infrastructure from the residences on the privately-owned land.

These mitigation measures must be reasonable and feasible, and must be implemented within a reasonable timeframe.

If the Proponent and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.

Notes:

- *The additional visual impact mitigation measures must be aimed at reducing the visibility of the mining operations on site from affected residences, and do not require measures to reduce the visibility of the mining operations from other locations on the affected properties.*
- *The additional visual impact mitigation measures do not necessarily have to include the implementation of measures on the affected property itself (ie. the additional measures could involve the implementation of measures outside the affected property boundary that provide an effective reduction in visual impacts).*
- *Except in exceptional circumstances, the Director-General will not require additional visual impact mitigation to be undertaken for residences that are more than 5 kilometres from the mining operations.*

BUSHFIRE MANAGEMENT

59. The Proponent shall:
- (a) implement all reasonable and feasible measures to manage bushfire risks, including the suspension of activities that may have the potential to ignite a fire, during adverse conditions;
 - (b) ensure that the project is suitably equipped to respond to any fires on site; and
 - (c) assist the Rural Fire Service, Forests NSW, emergency services and National Parks and Wildlife Services as much as possible if there is a fire in the surrounding area.

WASTE

60. The Proponent shall:
- (a) implement all reasonable and feasible measures to minimise the waste (including coal reject) generated by the project;
 - (b) ensure that the waste generated by the project is appropriately stored, handled and disposed of; and
 - (c) monitor and report on the effectiveness of waste minimisation and management measures in the Annual Review.

REHABILITATION

Rehabilitation Objectives

61. The Proponent shall rehabilitate the site to the satisfaction of the Executive Director Mineral Resources. This rehabilitation must be generally consistent with the proposed Rehabilitation Strategy described in the EA (and depicted conceptually in Appendix 8) and comply with the objectives in Table 15.

Table 15: Rehabilitation objectives

Feature	Objective
Mine site (as a whole)	Safe, stable and non-polluting
	Constructed landforms drain to the natural environment
	Landforms fully integrated with the final landform for the Boggabri coal mine
Final void	Minimise the size and depth of the final void as far as is reasonable and feasible
	Minimise the drainage catchment of the final void as far as is reasonable and feasible
	Negligible high wall instability risk
	Minimise risk of flood interaction for all flood events up to and including the Probable Maximum Flood level
Surface infrastructure	To be decommissioned and removed, unless the Executive Director, Mineral Resources agrees otherwise
Agricultural land	Establish a minimum of 210 hectares of Class 3 agricultural suitability land, including 160 hectares with

Feature	Objective
All land – excluding the 210 ha of agricultural land and the final void	cropping capability Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of: <ul style="list-style-type: none"> • local native plant species (particularly Box Gum Woodland EEC); and • a landform consistent with the surrounding environment
Goonbri Creek diversion and LPB	See Table 13
Community	Ensure public safety Minimise the adverse socio-economic effects associated with mine closure

Operating Conditions

62. The Proponent shall, in consultation with the Namoi CMA:
- develop a detailed soil management protocol that identifies procedures for:
 - comprehensive soil surveys prior to soil stripping;
 - assessment of top-soil and sub-soil suitability for mine rehabilitation; and
 - annual soil balances to manage soil handling including direct respreading and stockpiling;
 - maximise the salvage of suitable top-soils and sub-soils and biodiversity habitat components such as bush rocks, tree hollows and fallen timber for rehabilitation of disturbed areas within the site and for enhancement of biodiversity offset areas; and
 - ensure that coal reject, or any potentially acid forming interburden materials, are not emplaced at elevations in the pit shell where they may promote acid or sulphate species generation and migration beyond the pit shell.

Progressive Rehabilitation

63. The Proponent shall rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim rehabilitation strategies shall be employed when areas prone to dust generation cannot yet be permanently rehabilitated.

Note: It is accepted that the parts of the site that are progressively rehabilitated may be subject to further disturbance in future.

Rehabilitation Management Plan

64. The Proponent shall prepare and implement a Rehabilitation Management Plan to the satisfaction of the Executive Director, Mineral Resources. This plan must:
- be prepared in consultation with the Department, Forests NSW, NOW, OEH, Namoi CMA and Council;
 - be submitted to the Executive Director, Mineral Resources for approval by the end of May 2013;
 - be prepared in accordance with any relevant DRE guideline;
 - describe how the rehabilitation of the site would be integrated with:
 - the implementation of the biodiversity offset strategy; and
 - the final landform for the Boggabri coal mine;
 - include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, and triggering remedial action (if necessary);
 - describe the measures that would be implemented to ensure compliance with the relevant conditions of this approval, and address all aspects of rehabilitation including mine closure, final landform and final land use;
 - include interim rehabilitation where necessary to minimise the area exposed for dust generation;
 - include a program to monitor, independently audit and report on the effectiveness of the rehabilitation measures, and progress against the detailed performance and completion criteria; and
 - build to the maximum extent practicable on the other management plans required under this approval.

Note: The Biodiversity Management Plan and Rehabilitation Management Plan require substantial integration to achieve biodiversity objectives for the rehabilitated mine site.

Final Void Design and Closure

65. The Proponent shall prepare and implement an updated Final Void and Mine Closure Plan (as a component of the overall Rehabilitation Management Plan required under condition 64 of schedule 3) to the satisfaction of the Executive Director Mineral Resources, following consultation with the Director-General. A draft plan must be prepared and submitted to the Executive Director Mineral Resources by the

end of December 2019, and a final plan must be prepared and submitted to the Executive Director Mineral Resources by the end of December 2024. Each version of the plan must:

- (a) be subject to independent review and verification by suitably qualified, experienced and independent person/s (including a groundwater expert) whose appointment has been approved by the Director-General;
- (b) identify and consider:
 - options for continued mining beyond current project life;
 - interactions with the final landform of adjoining mines (including any direct or indirect interaction between final voids);
 - opportunities for integrated mine planning with adjoining mines to minimise environmental impacts of the mines' final landforms;
 - all reasonable and feasible landform options for the final void (including filling);
 - predicted stability of the proposed landforms; and
 - predicted hydrochemistry and hydrogeology (including long-term groundwater recovery and void groundwater quality);
- (c) include a detailed proposed landform design; and
- (d) demonstrate that the proposed final landform:
 - satisfies the relevant objectives in Table 15;
 - minimises the extent of any resulting pit lake;
 - avoids salt scalding;
 - maximises the capacity of emplaced spoil to drain to the natural environment; and
 - ensures that drained waters do not adversely affect the downstream environment.

AGRICULTURE

66. The Proponent shall use its best endeavours to ensure that the agricultural productivity and production of non-operational project-related land is maintained or enhanced.

Note: This includes properties primarily used for agriculture that are acquired by the Proponent due to noise and/or air quality impacts. However, it does not include land where disturbance is permitted under the conditions of this approval or land that forms part of the biodiversity offset area.

SCHEDULE 4 ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS/TENANTS

1. Within 3 months of the date of this approval, the Proponent shall:
 - (a) notify in writing the owners of:
 - the land listed in Table 1 of schedule 3 that they have the right to require the Proponent to acquire their land in accordance with the procedures in conditions 8 and 9 below at any stage during the project;
 - any residence on the land listed in Table 1 of schedule 3 that they have the right to request the Proponent to ask for additional noise and/or air quality mitigation measures to be installed at their residence at any stage during the project; and
 - any privately-owned land within 2 kilometres of the approved open-cut mining pit/s that they are entitled to ask for a property inspection, to establish the baseline condition of any buildings or structures on their land, or to have a previous property inspection report updated;
 - (b) notify the tenants of any mine-owned land of their rights under this approval; and
 - (c) send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the owners and/or existing tenants of any land (including mine-owned land) where the predictions in the EA identify that dust emissions generated by the project are likely to be greater than the relevant air quality criteria in schedule 3 at any time during the life of the project.
2. Prior to entering into any tenancy agreement for any land owned by the Proponent that is predicted to experience exceedences of the recommended dust and/or noise criteria, or for any of the land listed in Table 1 that is subsequently purchased by the Proponent, the Proponent shall:
 - (a) advise the prospective tenants of the potential health and amenity impacts associated with living on the land, and give them a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time);
 - (b) advise the prospective tenants of the rights they would have under this approval; and
 - (c) request the prospective tenants consult their medical practitioner to discuss the air quality monitoring data and predictions and health impacts arising from this information, to the satisfaction of the Director-General.
3. As soon as practicable after obtaining monitoring results showing:
 - (a) an exceedence of the relevant criteria in schedule 3, the Proponent shall notify the affected landowner in writing of the exceedence, and provide regular monitoring results to the landowner until the project is complying with the relevant criteria again; and
 - (b) an exceedence of the relevant air quality criteria schedule 3, the Proponent shall send to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land) a copy of:
 - the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time); and
 - the monitoring data, in an appropriate format so that a medical practitioner can assist the resident in making an informed decision on the health risks associated with occupation of the property.

INDEPENDENT REVIEW

4. If an owner of privately-owned land considers the project to be exceeding the criteria in schedule 3 at his/her land, then he/she may ask the Director-General in writing for an independent review of the impacts of the project on his/her land.

If the Director-General is satisfied that an independent review is warranted, then within 2 months of the Director-General's decision, the Proponent shall:

 - (a) commission a suitably qualified, experienced and independent expert, whose appointment has been approved by the Director-General, to:
 - consult with the landowner to determine his/her concerns;
 - conduct monitoring to determine whether the project is complying with the relevant impact assessment criteria in schedule 3; and
 - if the project is not complying with the relevant criteria, then:
 - determine if the more than one mine is responsible for the exceedence, and if so the relative share of each mine towards the impact on the land;
 - identify the measures that could be implemented to ensure compliance with the relevant criteria; and
 - (b) give the Director-General and landowner a copy of the independent review.
5. If the independent review determines that the project is complying with the relevant criteria in schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.

If the independent review determines that the project is not complying with the relevant criteria, and that the project is primarily responsible for this non-compliance, then the Proponent shall:

- (a) implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent expert, and conduct further monitoring until the project complies with the relevant criteria; or
- (b) secure a written agreement with the landowner to allow exceedances of the relevant criteria, to the satisfaction of the Director-General.

If the independent review determines that the project is not complying with the relevant acquisition criteria, and that the project is primarily responsible for this non-compliance, then upon receiving a written request from the landowner, the Proponent shall acquire all or part of the landowner's land in accordance with the procedures in conditions 8 and 9 below.

6. If the independent review determines that the relevant criteria are being exceeded, but that more than one mine is responsible for this exceedance, then together with the relevant mine/s the Proponent shall:
 - (a) implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent expert, and conduct further monitoring until there is compliance with the relevant criteria; or
 - (b) secure a written agreement with the landowner and other relevant mine/s to allow exceedances of the relevant impact assessment criteria, to the satisfaction of the Director-General.

If the independent review determines that the project is not complying with the relevant acquisition criteria in schedule 3, but that more than one mine is responsible for this non-compliance, then upon receiving a written request from the landowner, the Proponent shall acquire all or part of the landowner's land on as equitable a basis as possible with the relevant mine/s, in accordance with the procedures in conditions 8 and 9 below.

Biodiversity & Heritage

7. If a person has good reason to believe the Proponent is not implementing the biodiversity and/or heritage conditions in schedule 3 satisfactorily, then he/she may ask the Director-General in writing for an independent review of the matter.

If the Director-General is satisfied that an independent review is warranted, then within 2 months of the Director-General's decision, the Proponent shall:

- (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to:
 - consult with the person and/or any relevant agencies;
 - investigate the person's complaints/claims;
 - review the environmental performance of the Proponent;
 - determine whether the Proponent's performance is satisfactory or not; and if necessary
 - recommend measures to improve the Proponent's performance; and
- (b) give the Director-General and complainant a copy of the independent review.

LAND ACQUISITION

8. Within 3 months of receiving a written request from a landowner with acquisition rights, the Proponent shall make a binding written offer to the landowner based on:
 - (a) the current market value of the landowner's interest in the land at the date of the written request, as if the land was unaffected by the project, having regard to the:
 - existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and
 - presence of improvements on the land and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of the additional mitigation measures required under condition 2 of schedule 3;
 - (b) the reasonable costs associated with:
 - relocating within the Tamworth, Narrabri, Gunnedah or Moree local government areas, or to any other local government area as agreed by the Director-General; and
 - obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is to be acquired; and
 - (c) reasonable compensation for any disturbance caused by the land acquisition process.

However, if the Proponent and landowner cannot agree on the acquisition price of the land and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Director-General for resolution.

Upon receiving such a request, the Director-General shall request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer to:

- consider submissions from both parties;
- determine a fair and reasonable acquisition price for the land and/or the terms upon which the land is to be acquired, having regard to the matters referred to in paragraphs (a)-(c) above;
- prepare a detailed report setting out the reasons for any determination; and
- provide a copy of the report to both parties.

Within 14 days of receiving the independent valuer's report, the Proponent shall make a binding written offer to the landowner to purchase the land at a price not less than the independent valuer's determination.

However, if either party disputes the independent valuer's determination, then within 14 days of receiving the independent valuer's report, they may refer the matter to the Director-General for review. Any request for a review must be accompanied by a detailed report setting out the reasons why the party disputes the independent valuer's determination. Following consultation with the independent valuer and both parties, the Director-General will determine a fair and reasonable acquisition price for the land, having regard to the matters referred to in paragraphs (a)-(c) above, the independent valuer's report, the detailed report of the party that disputes the independent valuer's determination and any other relevant submissions.

Within 14 days of this determination, the Proponent shall make a binding written offer to the landowner to purchase the land at a price not less than the Director-General's determination.

If the landowner refuses to accept the Proponent's binding written offer under this condition within 6 months of the offer being made, then the Proponent's obligations to acquire the land shall cease, unless the Director-General determines otherwise.

9. The Proponent shall pay all reasonable costs associated with the land acquisition process described in condition 5 above, including the costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of this plan at the Office of the Registrar-General.

SCHEDULE 5 ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. The strategy must:
 - (a) be submitted to the Director-General for approval by the end of May 2013;
 - (b) provide the strategic framework for environmental management of the project;
 - (c) identify the statutory approvals that apply to the project;
 - (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;
 - (e) describe the procedures that would be implemented to:
 - keep the local community and relevant agencies informed about the operation and environmental performance of the project;
 - receive, record, handle, and respond to complaints;
 - resolve any disputes that may arise during the course of the project;
 - respond to any non-compliance;
 - respond to emergencies; and
 - (f) include:
 - copies of any strategies, plans and programs approved under the conditions of this approval; and
 - a clear plan depicting all the monitoring to be carried out in relation to the project.

Adaptive Management

2. The Proponent must assess and manage project-related risks to ensure that there are no exceedences of the criteria and/or performance measures in schedule 3. Any exceedence of these criteria and/or performance measures constitutes a breach of this approval and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.

Where any exceedence of these criteria and/or performance measures has occurred, the Proponent must at the earliest opportunity:

- (a) take all reasonable and feasible steps to ensure that the exceedence ceases and does not reoccur;
- (b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other courses of action; and
- (c) implement remediation measures as directed by the Director-General, to the satisfaction of the Director-General.

Management Plan Requirements

3. The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:
 - (a) detailed baseline data;
 - (b) a description of:
 - the relevant statutory requirements (including any relevant approval, licence or lease conditions);
 - any relevant limits or performance measures/criteria;
 - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;
 - (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
 - (d) a program to monitor and report on the:
 - impacts and environmental performance of the project;
 - effectiveness of any management measures (see c above);
 - (e) a contingency plan to manage any unpredicted impacts and their consequences;
 - (f) a program to investigate and implement ways to improve the environmental performance of the project over time;
 - (g) a protocol for managing and reporting any:
 - incidents;
 - complaints;
 - non-compliances with statutory requirements; and
 - exceedences of the impact assessment criteria and/or performance criteria; and
 - (h) a protocol for periodic review of the plan.

Annual Review

4. By the end of June each year (or as otherwise agreed by the Director-General), the Proponent shall review the environmental performance of the project for the previous calendar year to the satisfaction of the Director-General. This review must:
- describe the development (including any rehabilitation) that was carried out in the past calendar year, and the development that is proposed to be carried out over the current calendar year;
 - include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the:
 - relevant statutory requirements, limits or performance measures/criteria;
 - monitoring results of previous years; and
 - relevant predictions in the EA;
 - identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
 - identify any trends in the monitoring data over the life of the project;
 - identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and
 - describe what measures will be implemented over the next year to improve the environmental performance of the project.

Revision of Strategies, Plans and Programs

5. Within 3 months of the submission of an:
- annual review under condition 4 above;
 - incident report under condition 8 below;
 - audit under condition 10 below; or
 - any modification to the conditions of this approval,
- the Proponent shall review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Director-General.

Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the project.

Management of Cumulative Impacts

6. In conjunction with the owners of the nearby mines in the Leard Forest Mining Precinct, the Proponent shall use its best endeavours to minimise the cumulative impacts of the project on the surrounding area, to the satisfaction of the Director-General.

Community Consultative Committee

7. The Proponent shall establish and operate a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General. This CCC must be operated in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* (Department of Planning, 2007, or its latest version), and be operating by the end of May 2013.

The CCC must seek to include joint membership with CCCs for other operating coal mines within the Leard Forest Mining Precinct, unless otherwise agreed by the Director-General.

Notes:

- The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Proponent complies with this approval.*
- In accordance with the Department's guideline, the CCC should be comprised on an independent chair and appropriate representation from the Proponent, Council and the local community.*

REPORTING

Incident Reporting

8. The Proponent shall notify, at the earliest opportunity, the Director-General and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the project, the Proponent shall notify the Director-General and any other relevant agencies as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent shall provide the Director-General and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

Regular Reporting

9. The Proponent shall provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval.

AUDITING

Independent Environmental Audit

10. By the end of June 2014 and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:
- (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;
 - (b) include consultation with the relevant agencies;
 - (c) assess the environmental performance of the project and assess whether it is complying with the requirements in this approval, and any other relevant approvals, relevant EPL/s and/or Mining Lease/s (including any assessment, plan or program required under these approvals);
 - (d) assess whether the Proponent is implementing best noise, blasting and air quality management practice;
 - (e) investigate and report on the measures taken to minimise the noise and air quality impacts of the project during meteorological conditions and/or extraordinary events when the relevant noise and air quality limits in this approval do not apply, including:
 - the effectiveness of these measures in maintaining impacts within the relevant criteria in this approval and/or the limits in the relevant EPL; and
 - any additional measures available to mitigate impacts under such conditions;
 - (f) review the adequacy of any approved strategy, plan or program required under the abovementioned approvals; and
 - (g) recommend measures or actions to improve the environmental performance of the project and/or any strategy, plan or program required under these approvals.

Note: This audit team must be led by a suitably qualified auditor, and include experts in noise, air quality, water, ecology, and any other fields specified by the Director-General.

11. Within 3 months of commissioning this audit, or as otherwise agreed by the Director-General, the Proponent shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.

ACCESS TO INFORMATION

12. The Proponent shall:
- (a) within 3 months of the date of this approval, make the following information publicly available on its website:
 - the EA;
 - all current statutory approvals for the project;
 - approved strategies, plans and programs required under the conditions of this approval;
 - a comprehensive summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval;
 - a complaints register, which is to be updated on a monthly basis;
 - minutes of CCC meetings;
 - the last five annual reviews;
 - any independent environmental audit, and the Proponent's response to the recommendations in any audit;
 - any other matter required by the Director-General; and
 - (b) keep this information up to date, to the satisfaction of the Director-General.

On-line Communication of Onsite Activities and Monitoring of Noise and Air Quality

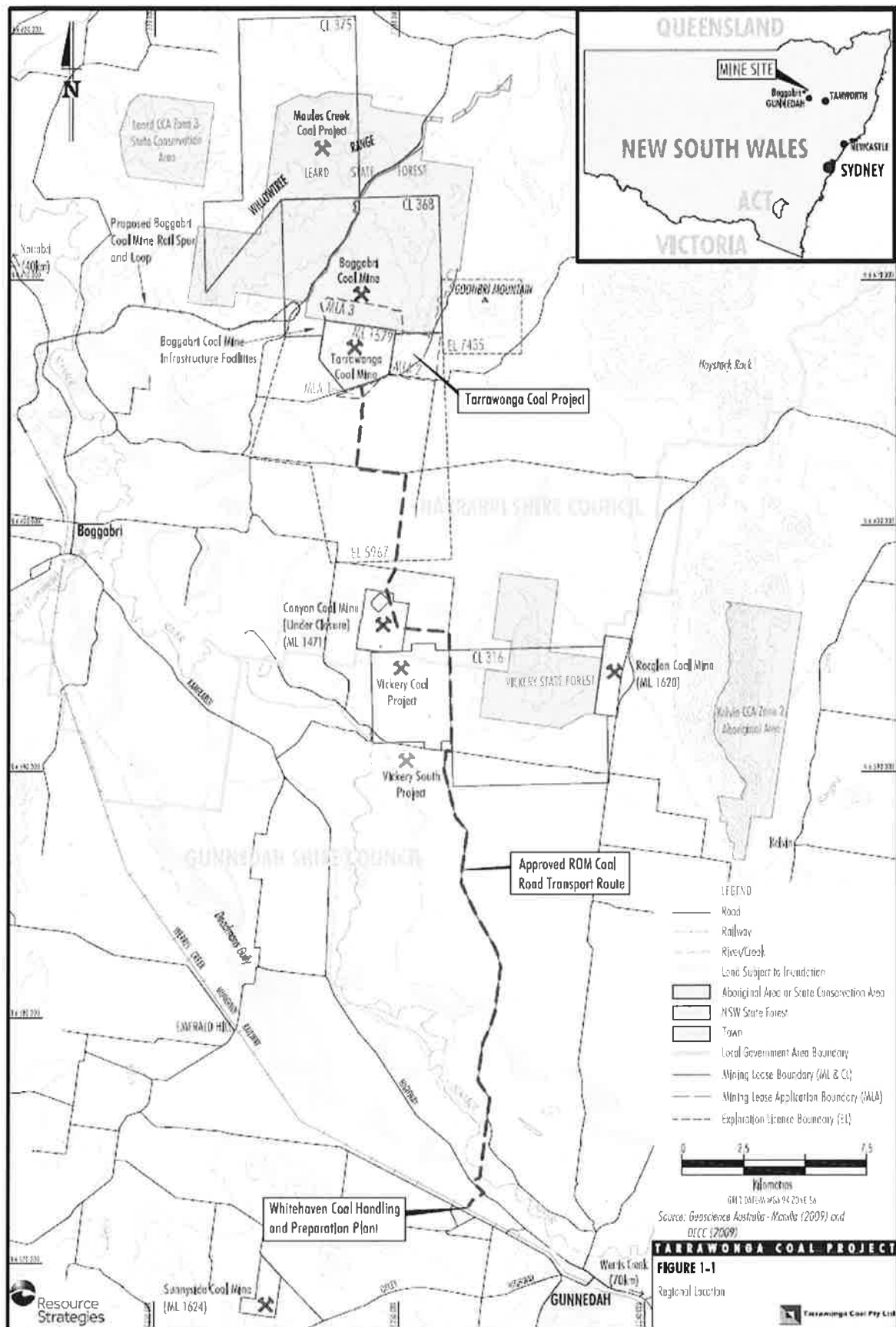
13. The Proponent shall, within 3 months of the date of this approval:
- (a) make the following information for the project publicly available on its website, on a daily basis and in a clearly understandable form:
 - daily weather forecasts for the coming week;
 - proposed operational responses to these weather forecasts;
 - real-time noise and air quality monitoring data (subject to any necessary caveats); and
 - any operational responses that were taken in response to the noise and air quality monitoring data, and
 - (b) make provision on its website for the provision of on-line and/or email comments by members of the community regarding this information, to the satisfaction of the Director-General.

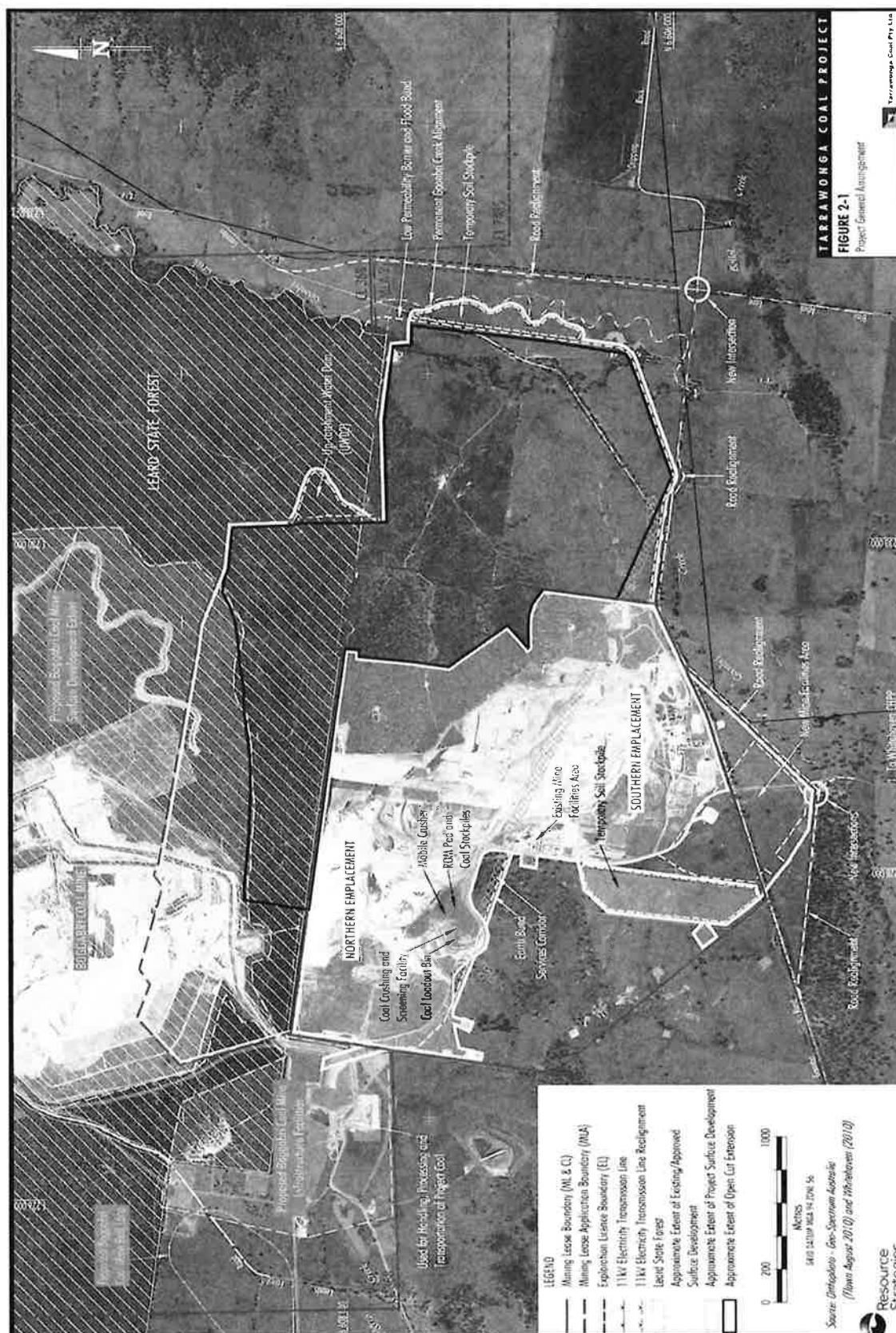
**APPENDIX 1
SCHEDULE OF LAND**

Tenure Type	Lot Number	Deposited Plan Number
Freehold	A	367991
Freehold	156	455004
Freehold	1	622375
Freehold	1	748046
Freehold	2	748046
Freehold	3	748046
Freehold	5	754940
Freehold	6	754940
Freehold	10	754940
Freehold	11	754940
Freehold	12	754940
Freehold	15	754940
Freehold	16	754940
Freehold	17	754940
Freehold	21	754940
Freehold	22	754940
Freehold	24	754940
Freehold	25	754940
Freehold	26	754940
Freehold	27	754940
Freehold	28	754940
Freehold	29	754940
State Forests of NSW	30	754940
Freehold	31	754940
Freehold	37	754940
State Forests of NSW	38	754940
Freehold	44	754940
Freehold	59	754948
Freehold	60	754948
Freehold	18	754953
Freehold	33	754953
Freehold	68	754953
Freehold	69	754953
Freehold	80	754953
Freehold	83	754953
Freehold	88	754953
Freehold	105	755470
Perpetual Lease	159	755475
Freehold	203	755475
Freehold	262	755475
State of NSW	263	755475
Freehold	1	970060
Freehold	1	1015797
Freehold	5	1018347
Freehold	2	1038308
Freehold	3	1038308

Tenure Type	Lot Number	Deposited Plan Number
Freehold	1	1131282
Freehold	3	1131282
Freehold	5	1131282
Freehold	3	1145592
Freehold	4	1145592
Narrabri Shire Council	Goonbri Road	N/A
Narrabri Shire Council	Dripping Rock Road	N/A
Narrabri Shire Council	Athol Lane	N/A
Narrabri Shire Council	Bollol Creek Corridor	N/A
Narrabri Shire Council or Department of Lands (Crown)	Other roads located within, between or adjacent to the above parcels of land	N/A
Part NSW State Forest (Leard State Forest)	N/A	N/A

APPENDIX 2 PROJECT LAYOUT PLANS





APPENDIX 3
GENERAL TERMS OF PLANNING AGREEMENT

Amount	Timeline for Payment	Description
\$1,400,000	<p>\$1,000,000 to be payable on approval of the Extension Project</p> <p>\$400,000 to be payable on the first anniversary of the Approval of the Extension Project</p>	<p>Funds to be utilised for the construction of sealed roads around the Tarrawonga mine site with an emphasis on sealing Manila Road for the benefit of local residents. Unallocated funds to be spent at the discretion of NSC.</p> <p>Tarrawonga Coal will make available to NSC the opportunity for these road works, to the value of the Amount, to be undertaken by Tarrawonga Mine to councils specification with preliminary works to commence at the time of grant of the Development Consent.</p>
\$100,000	Payable on the formation of an Environmental Trust associated with the Leard Forest Mining Industry Cluster but not before approval of the Extension Project.	<p>Funds to be held in trust for Environmental Projects to be administered by NSC with expenditure recommended by the Community Consultative Committee (CCC) in consultation with similar funds set up by mines within the Leard Forest Mining Industry Cluster</p> <p>The NSC will supplement this Fund by annually adding to it, 1.5% of the annual increased amount which NSC receives from Tarrawonga as a result of the CPI increase to the payment for saleable tonnes of coal.</p> <p>NSC will administer the fund with expenditure on projects agreed between NSC, Tarrawonga Coal and the other members of the CCC.</p>
\$0.075 per saleable tonne	<p>On Commencement of the movement of Tarrawonga Coal through the Boggabri Coal CHPP and only for tonnage moved through the Boggabri Coal CHPP</p> <p>Paid Monthly</p>	<p>The payment per tonne to be paid only on tonnes sold by Tarrawonga Coal and will mirror the calculation made in relation to Royalties to the NSW State Government</p> <p>CPI adjustment to be based on index published by the Australian Bureau of Statistics (ABS)</p> <p>CPI based on the weighted average of eight capital cities for the previous 12 months (based on closest applicable quarterly figure) with the start date for calculation being from the start of coal moving through the Boggabri Coal facility.</p> <p>The first review to be undertaken will be 12 months after the first coal has been moved through the Boggabri Coal facility</p>

APPENDIX 4 STATEMENT OF COMMITMENTS

Tarrawonga Coal Project – Environmental Assessment

SOC1 STATEMENT OF COMMITMENTS

In accordance with the Director-General's Environmental Assessment Requirements, this section provides a statement of Tarrawonga Coal Pty Ltd's (TCPL's) commitments in relation to the Tarrawonga Coal Project (the Project).

SOC1.1 PROPOSED PROJECT ENVIRONMENTAL MANAGEMENT, MONITORING AND REPORTING

Section 4 of this Environmental Assessment (EA) outlines proposed environmental management and offset measures for the Project.

These include measures relating to land resources, agricultural production, groundwater, surface water, noise, blasting, air quality, greenhouse gas emissions, ecology, road transport, visual character, Aboriginal heritage, non-Aboriginal heritage, socio-economics and hazard and risk. Where relevant, Project specific environmental monitoring programs are also proposed in Section 4.

Section 5 of this EA describes how the Project would be progressively rehabilitated and integrated into the adjoining landscapes.

TCPL will review and revise the existing Tarrawonga Coal Mine management and monitoring plans listed in Table SOC-1. Table SOC-1 also lists new management and monitoring plans that are proposed to be prepared for the Project.

The existing monitoring program at the Tarrawonga Coal Mine will be augmented to address additional Project disturbance areas and the open cut extensions. Figure SOC-1 shows the location of environmental monitoring sites proposed to be maintained or added for the Project.

It is recognised that changes to the Project environmental management, monitoring and reporting proposals contained in this EA may be considered necessary during government agency assessment of this EA.

Environmental management, monitoring and reporting will be conducted in accordance with finalised Project Approval conditions, with the final monitoring details (locations, parameters and frequencies) to be provided in the relevant management plans/monitoring programs.

SOC1.2 SPECIFIC ENVIRONMENTAL COMMITMENTS

Environmental management and offset measures to be implemented for the Project are described in Section 4. Key commitments include:

- design and construction of an engineered low permeability barrier to the east and south-east of the open cut;
- design, construction and implementation of a permanent Goonbri Creek alignment and associated flood bund;
- integration of key aspects of the Project with the adjoining Boggabri Coal Mine (i.e. Northern Emplacement, coal processing and loading of Project product coal onto trains);
- cessation of sized run-of-mine (ROM) coal road transport to the Whitehaven Coal Handling and Preparation Plant (once suitable approvals and upgrades are in place);
- management and mitigation of operational noise;
- rehabilitation of Project disturbance areas, including the reinstatement of key agricultural and ecological values;
- provision of biodiversity offset measures for the Project;
- management of the Project final void to minimise potential long-term impacts on water resources; and
- participation in joint air quality, operational noise and regional groundwater monitoring schemes with the adjoining Boggabri Coal Mine and the Maules Creek Coal Project.

These are described further below.

Low Permeability Barrier

A low permeability barrier will be constructed in the alluvium to the east and south-east of the open cut. Construction of the low permeability barrier will be completed before the Project open cut intersects the alluvium (approximately Year 12).

The design objectives of the low permeability barrier include minimising the potential for drainage of alluvial groundwater into the open cut during operations and post-mining, and maintaining the hydraulic character of Goonbri Creek.

Table SOC-1
Summary of Project Management, Monitoring and Reporting

Proposed Management, Monitoring and Reporting	Key EA Sections and Appendices
Management and Monitoring	
Environmental Management Strategy	Section 2.1.8
Water Management Plan	Sections 4.4, 4.5 and Appendices A and B
• Site Water Balance	Section 4.5 and Appendix B
• Erosion and Sediment Control Plan	Sections 4.3, 4.5 and 5 and Appendix B
• Surface Water Monitoring Program	Section 4.5 and Appendix B
• Groundwater Monitoring Program	Section 4.4 and Appendix A
• Surface and Groundwater Response Plan	Sections 4.4 and 4.5 and Appendices A and B
Goonbri Creek Management Plan [*]	Section 4.5
Noise Management Plan	Section 4.6 and Appendix C
Blast Management Plan	Section 4.6 and Appendix C
Air Quality and Greenhouse Gas Management Plan	Section 4.7 and Appendix D
Biodiversity Offset Strategy	Sections 4.9 and 4.10 and Appendices E and F
Biodiversity Management Plan [*]	Sections 4.9 and 4.10
Offset Area Management Plan [*]	Sections 4.9 and 4.10 and Appendix E
Farm Management Plan [*]	Sections 4.3, 4.10 and Appendices E and I
Aboriginal Heritage Management Plan	Section 4.13 and Appendix K
Waste Management Plan	Section 4.3
Rehabilitation Strategy	Appendix I
Rehabilitation Management Plan	Sections 4.9, 4.10, 5 and Appendix I
Bushfire Management Plan [*]	Sections 4.3, 4.9 and 4.10
Reporting Requirements	
Annual Environmental Management Report and Mining Operations Plan or Rehabilitation and Environmental Management Plan	Section 6.4.1
Licences and Approvals	Section 6.4.1
Greenhouse Gas Reporting	Sections 4.8.2 and 4.8.3

* New management plan to be prepared.

TCPL Commitment

TCPL commits to construction of the low permeability barrier to meet the following design objectives:

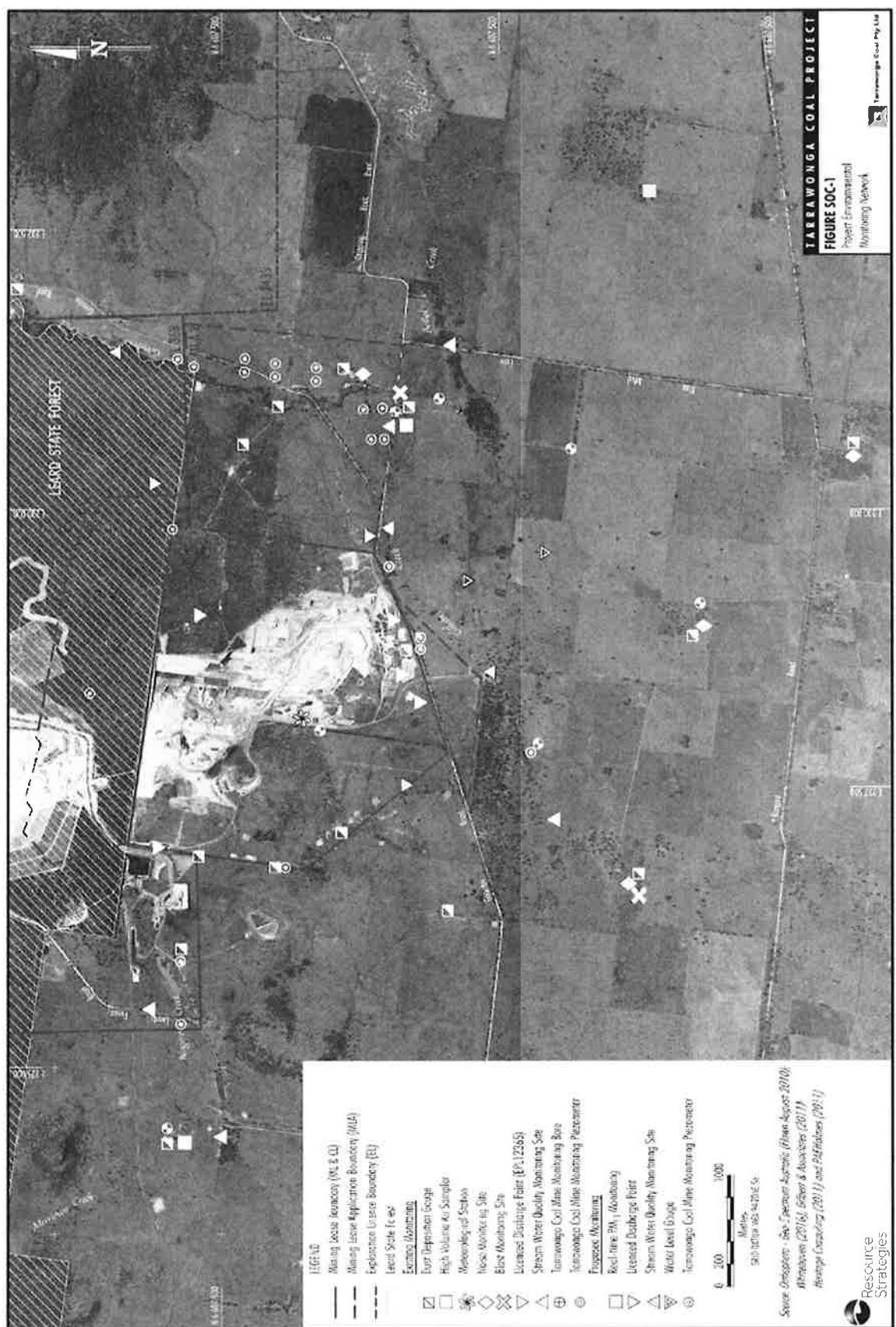
- minimise the potential for local drainage of alluvial groundwater into the open cut during operations and post-mining;
- minimise the potential for future instability of the open cut batters formed in the alluvium;
- maintain the hydraulic character of Goonbri Creek by minimising the potential loss of baseflow; and
- maintain the value of alluvial groundwater, by minimising potential interactions with the mine final void, post-mining.

In addition, TCPL will augment the existing piezometer network with additional sites to validate the performance of the low permeability barrier.

Permanent Goonbri Creek Alignment and Associated Flood Bund

In approximately Year 15, open cut mining would remove a 3 kilometre (km) section of Goonbri Creek. Prior to the open cut advancing into this section of the creek, the permanent Goonbri Creek alignment will be established.

A permanent flood bund will also be constructed to prevent inundation of the open cut during operations and post-mining. The permanent flood bund will generally coincide with the alignment of the low permeability barrier.



TCPL Commitment

TCPL commits to the design, construction and implementation of the permanent Goonbri Creek alignment to meet the following design objectives:

- construct a low flow channel that approximates the existing section of Goonbri Creek upstream of the Project in terms of stream geometry, hydrology and geomorphology;
- mimic the meandering path of the existing alignment of Goonbri Creek, such that the length of the permanent Goonbri Creek alignment is approximately the same length as the section of Goonbri Creek being removed;
- minimise the disturbance to the reaches of Goonbri Creek upstream of the permanent Goonbri Creek alignment; and
- provide a stable transition back to the existing Goonbri Creek alignment which results in no detectable change to the hydraulic conditions in the reaches of Goonbri Creek or the Bollol Creek floodplain area downstream.

In addition, TCPL commits to the design and construction of the permanent flood bund to a height that will provide protection against the peak flood height associated with a Probable Maximum Precipitation rainfall event.

TCPL will develop and implement a Goonbri Creek Management Plan prior to the commencement of construction activities associated with the low permeability barrier, permanent Goonbri Creek alignment and flood bund.

The Goonbri Creek Management Plan will describe:

- the design and construction details of the permanent Goonbri Creek alignment and flood bund;
- revegetation objectives and activities;
- water quality, ecological, hydrological and geomorphic performance and completion criteria for the permanent Goonbri Creek alignment based on baseline conditions; and
- a monitoring/maintenance program for water quality, ecological, hydrological and geomorphic integrity of the permanent Goonbri Creek alignment.

Integration with the Boggabri Coal Mine

Whitehaven Coal Mining Pty Ltd (Whitehaven) and Boggabri Coal Pty Limited have entered into an agreement that enables the handling, processing and transportation of Project coal at the upgraded Boggabri Coal Mine Infrastructure Facilities and private rail spur.

Under this agreement Boggabri Coal Pty Limited will handle and process Project ROM coal at the upgraded Boggabri Coal Mine Infrastructure Facilities on a campaign basis.

In addition, the Project Northern Emplacement will be integrated with the southern extent of the Boggabri Coal Mine waste rock emplacement to facilitate an integrated waste emplacement landform, avoiding the formation of a new valley between the two mine landforms and reducing the Project disturbance area.

Cessation of Sized ROM Coal Haulage to Whitehaven Coal Handling and Preparation Plant

Once approvals and upgrades are in place for the transfer of Project ROM coal to the Boggabri Coal Mine Infrastructure Facilities, Project sized ROM coal will no longer be trucked to the Whitehaven Coal Handling and Preparation Plant for train loading and associated processing.

Management of Operational Noise

Due to the extensions to the open cut, increased mobile fleet and alteration to operating hours (i.e. change from 20.5 to 24 hours per day) the Project has the potential to result in additional noise emissions at nearby privately-owned residences.

A number of iterative steps were undertaken to develop noise mitigation measures for the Project, including preliminary noise modelling, evaluation of potential noise management and mitigation measures and assessment of their effectiveness and feasibility by TCPL.

TCPL Commitment

TCPL will implement the following noise management and mitigation measures to appreciably reduce noise emissions associated with the Project:

- installation of an earth bund on the southern side of exposed sections of the services corridor (i.e. ROM coal haul road to the Boggabri Coal Mine);
- modified alignment of haul routes to reduce their exposure relative to nearby receivers; and
- a reduction in the number of mobile fleet items operating during the evening and night-time periods.

Rehabilitation Objectives and Final Landform

The Project would require the progressive removal of approximately 334 hectares (ha) of woodland and forest habitat and approximately 223 ha of grassland habitat.

This includes approximately 145 ha of native vegetation in the Leard State Forest, and approximately 13 ha of Box-Gum Woodland, which is an endangered ecological community.

The Project Northern Emplacement will be integrated with the southern extent of the Boggabri Coal Mine waste rock emplacement.

TCPL Commitment

The Project final landform and revegetation program will provide for a combination of approximately 752 ha of native woodland/forest and some 210 ha of Class 3 agricultural suitability land.

The agricultural land will be capable of being used for pasture production for grazing and occasional cropping. Revegetation of woodland/forest areas will include the planting of species characteristic of the local vegetation communities, including species from the Box-Gum Woodland endangered ecological community.

In addition, TCPL commits to a riparian vegetation enhancement program on a 3.2 km section of Goonbri Creek downstream of the Project open cut, through measures such as revegetation and stock exclusion.

A Rehabilitation Management Plan will be developed and implemented for the Project, including a rehabilitation monitoring program designed to track the progress of rehabilitation and revegetation.

Biodiversity Offset Measures*TCPL Commitment*

TCPL commits to the provision of an area to offset the residual impacts of the Project on flora and fauna and maintain or improve the biodiversity values of the region in the medium to long-term.

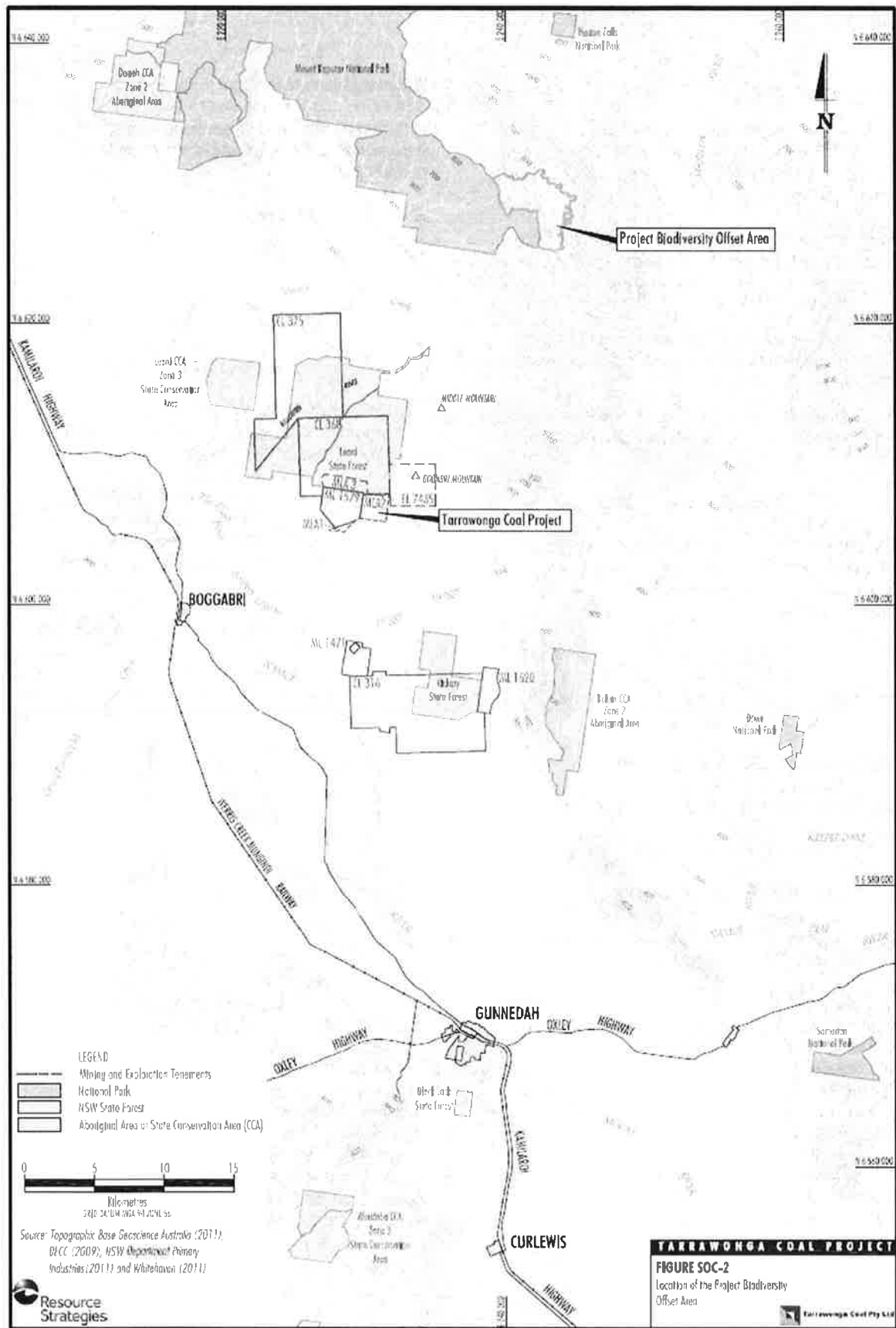
The biodiversity offset for the Project comprises approximately 1,600 ha of freehold land that has been purchased by Whitehaven.

The offset is situated approximately 20 km to the north-east of the Project and adjoins Mount Kaputar National Park (Figure SOC-2). Prior to its recent purchase by Whitehaven the offset area was part of a larger agricultural property.

Ecological gains from the biodiversity offset include:

- Similar vegetation communities/fauna habitats, compared to the Project area, will be conserved/enhanced in the biodiversity offset area.
- The biodiversity offset area is suitably located to benefit flora and fauna populations (biodiversity values) potentially impacted by the Project.
- The biodiversity offset area is located adjacent to Mount Kaputar National Park.
- Ephemeral creeks occur within the biodiversity offset area, providing a diversity of habitats.
- Substantial areas of Box-Gum Woodland (232 ha) occur in the biodiversity offset area.

Through active management, particularly of areas previously cleared for agriculture, the ecological values of the biodiversity offset area can be further improved. TCPL commits to a number of management measures to enhance the offset area's flora and fauna values. These measures will be detailed in the Offset Area Management Plan to be prepared for the Project.



The Offset Area Management Plan will also include a program to monitor and audit the effectiveness of the management measures and to evaluate performance against specified completion criteria.

TCPL intends to reach an agreement with the New South Wales (NSW) Government so that the biodiversity offset area can be permanently added to the adjoining Mount Kaputar National Park.

In the interim, TCPL will enter into a conservation arrangement with the NSW Government to ensure the protection and management of the offset area (e.g. a voluntary conservation agreement with the NSW Minister for the Environment).

Management of the Project Final Void

At the cessation of mining, a final void would remain at the eastern extent of the open cut.

One of the rehabilitation and mine closure goals for the Project is to minimise the long-term drawdown and potential water quality effects on local groundwater aquifers, so that their beneficial use is not adversely impacted.

TCPL Commitment

TCPL commits to installing permanent perimeter bunds and/or diversion channels to limit the catchment area of the final void.

In addition, TCPL will design and construct the final void to minimise the long-term drawdown and potential water quality effects on local groundwater aquifers. This will be achieved by adjusting the final void batter angles and/or placing additional waste rock backfill in the final void such that a permanent waterbody will form and reach an equilibrium level close to, but below, the local pre-mining groundwater level in the coal measures.

TCPL will adopt an adaptive management approach to the final void design and mine closure planning for the Project. Final void design and mine planning will be undertaken by TCPL in consultation with relevant government agencies as a component of the Rehabilitation Management Plan.

Participation in Joint Air Quality, Operational Noise and Regional Groundwater Monitoring

The Air Quality and Greenhouse Gas Management Plan will be revised and updated to address the construction and operation of the Project, including additional best-practice dust suppression measures on Project haul roads (i.e. additional haul road watering and/or the use of chemical dust suppressants).

The Noise Management Plan will be revised to include details of the mitigation and management measures for noise and methodology for measuring temperature inversions.

The Groundwater Monitoring Program (which is included in the Water Management Plan) will be updated to address the Project and associated extensions to the piezometer network.

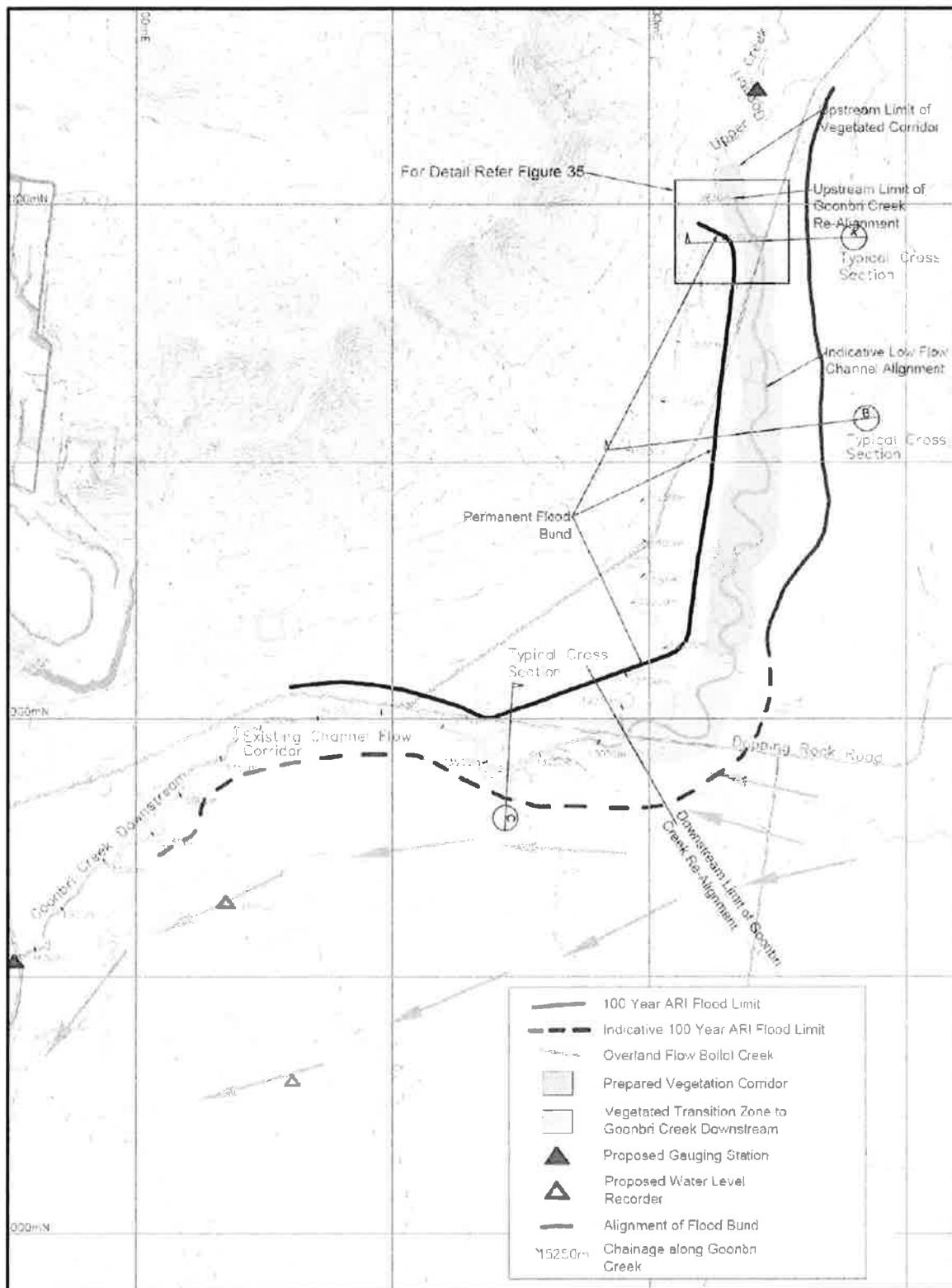
TCPL Commitment

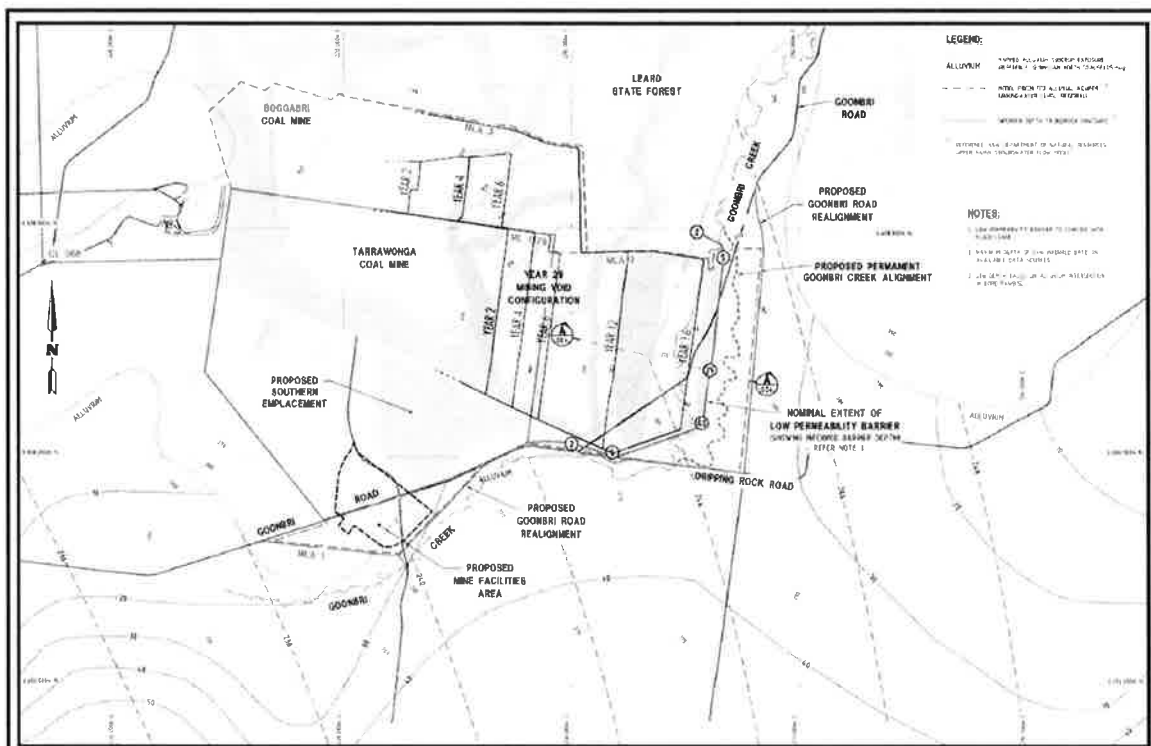
TCPL will work with the proponents of the Boggabri Coal Mine and Maules Creek Coal Project to develop and implement a joint network of real-time particulate matter monitors, operational noise monitors and regional groundwater monitoring in the vicinity of the Project. The details of the joint network will be provided in the revised Air Quality and Greenhouse Gas Management Plan, Noise Management Plan and Water Management Plan.

LAND OWNERSHIP PLAN



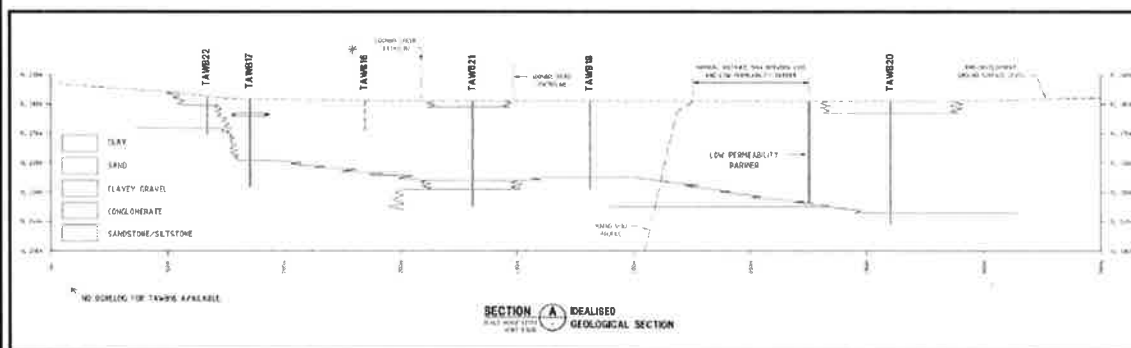
APPENDIX 6 GOONBRI CREEK REALIGNMENT CONCEPT





Source: Drawing 003 in Allen Watson Associates, 2011 (Appendix R of the EA)

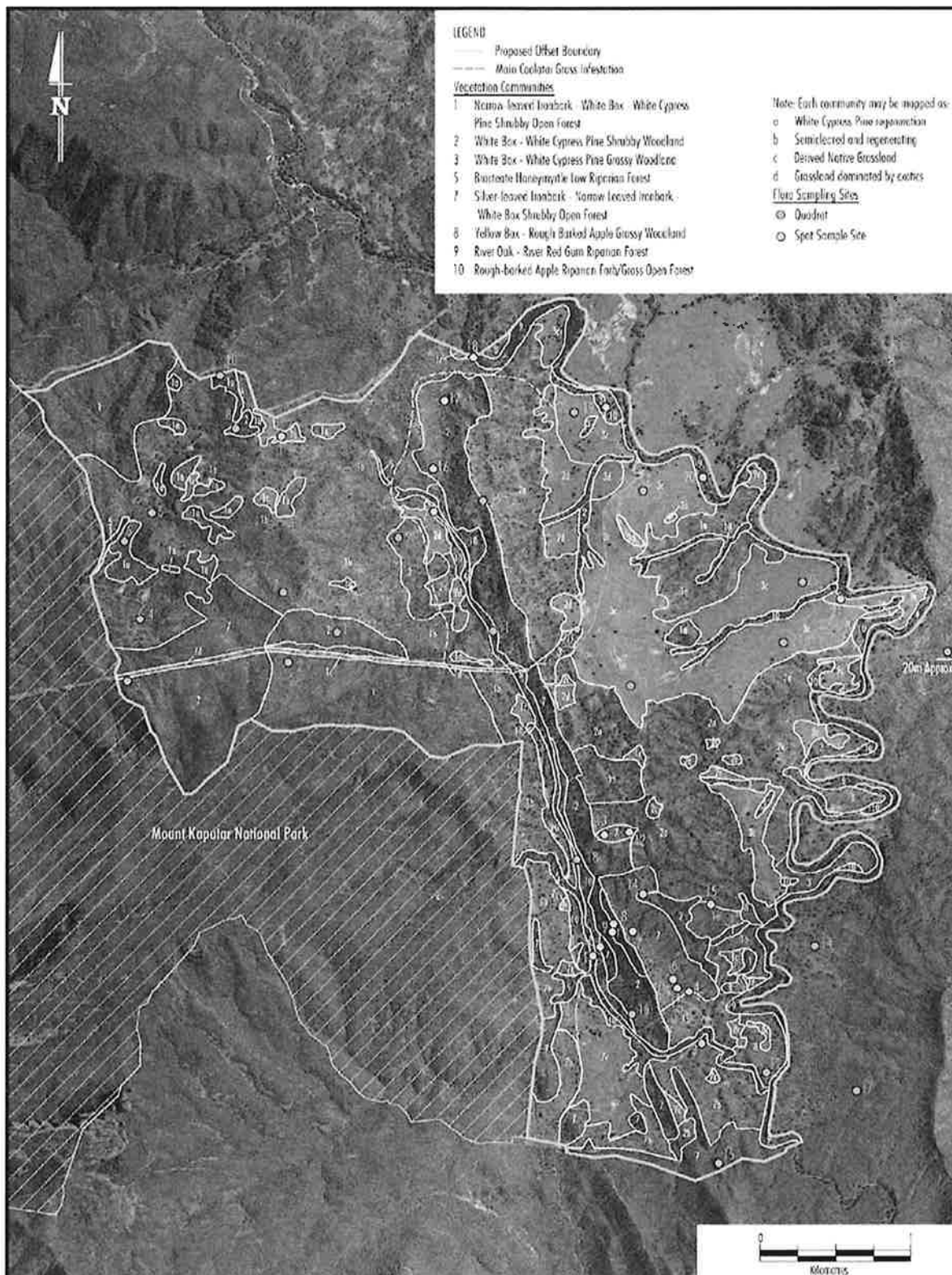
Upper Namoi Alluvium - Plan View



Source: Drawing A1 in Allen Watson Associates, 2011 (Appendix R of the EA)

Upper Namoi Alluvium - Section

APPENDIX 7 BIODIVERSITY OFFSET STRATEGY



APPENDIX 8 CONCEPTUAL FINAL LANDFORM





Approval

Tarrawonga Coal Mine Extension (EPBC 2011/5923)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Proposed action

person to whom the approval is granted Tarrawonga Coal Pty Ltd

proponent's ABN 73 100 742 185

proposed action To extend and operate an open cut coal mine 15 km north-east of the township of Boggabri in New South Wales, including associated infrastructure [See EPBC Act referral **2011/5923**].

Approval decision

Controlling Provision	Decision
Listed threatened species and communities (sections 18 & 18A)	Approved
Listed migratory species (sections 20 & 20A)	Approved

conditions of approval

This approval is subject to the conditions specified below.

expiry date of approval

This approval has effect until 31 December 2053

Decision-maker

name and position James Tregurtha
Assistant Secretary
Environment Assessment Branch

signature

date of decision 11 March 2013

Conditions attached to the approval

Disturbance areas

1. The person taking the action must not clear more than 13 hectares (ha) of the EPBC listed White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland critically endangered ecological community within the Tarrawonga Coal Extension **project area**, as identified in Attachment A of these conditions.
2. The person taking the action must not clear more than:
 - a. 279 ha of **habitat** for the regent honeyeater (*Anthochaera phrygia*: formerly *Xanthomyza phrygia*);
 - b. 54 ha of **habitat** for the swift parrot (*Lathamus discolor*); and
 - c. 334 ha of **habitat** for the greater long-eared bat (*Nyctophilus corbeni*), within the Tarrawonga Coal Extension **project area**.
3. The person taking the action must submit to the **Minister** for approval within three months of **commencement of construction**, an approach that:
 - a. limits the maximum disturbance (in hectares) specified for each of the years 5, 10, 15 and 17 from the date of this approval of the White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community and the habitat or potential habitat for the regent honeyeater, swift parrot and greater long-eared bat;
 - b. incorporates an analysis, undertaken by independent ecological experts approved by the **Department**, that demonstrates the maximum disturbance limits which will minimise any impacts on relevant matters of national environmental significance;
 - c. demonstrates collaboration with the person taking the action to develop and operate the Boggabri Coal Project (EPBC 2009/5256) and the person taking the action to develop and operate the Maules Creek Coal Project (EPBC 2010/5566), in order to minimise progressive **project area** disturbance limits across all three sites. The progressive disturbance limits are to be reflected in the development of the Leard Forest Mining Precinct Biodiversity Strategy.
4. The person taking the action must not clear more than the maximum **project area** disturbance limits specified for each of the years 5, 10, 15 and 17 as described in condition 3, unless otherwise approved by the **Minister**.
5. The person taking the action must publish the analysis under condition 3 on their website.

Direct Offsets

6. The person taking the action must register a legally binding conservation covenant over **offset areas** of no less than:
 - a. 1055 ha of an equivalent or better quality of habitat for the regent honeyeater;
 - b. 397 ha of an equivalent or better quality of habitat for the swift parrot;

- c. 1355 ha of an equivalent or better quality of habitat for the greater long-eared bat; and
- d. 232 ha of an equivalent or better quality of the White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community.

Note: Offset areas described in condition 6 do not necessarily need to be separate if the same areas can meet the listing criteria for the EPBC listed threatened species or communities as defined in the EPBC listing advice for that threatened species or community and meet the requirements of condition 6.

7. The person taking the action must verify through **independent review** the quantity and **condition class** of White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community and the quantity and quality of habitat for the regent honeyeater, swift parrot and greater long-eared bat within all proposed **offset areas** including those proposed in the **Environmental Assessment** and any additional offsets as required at condition 8. Details of all independently verified **offset areas** must be submitted to the **Minister** for approval by 31 January 2014. The findings of the independent review must be published on the proponent's website.
8. If the **independent review** finds that the **offset areas** do not meet the requirements of conditions 6, 7 and 9 then additional areas must be included in the offset areas until all relevant criteria under these conditions are met.
9. The **offset areas** must be of an overall equivalent or better quality than the areas being cleared. This means:
 - a. for White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community, **offset areas** must meet the definition of the ecological community described in the listing advice, and must be of an overall equivalent or better **condition class** than the areas being cleared, based on the proportion of each **condition class** represented and other relevant ecological attributes;
 - b. for the threatened species, the quality of the habitat for the species, taking account of its ecological requirements, must be equivalent to or better than the areas being cleared.
10. The mechanism/s for registering a legally binding covenant must provide protection for the offset areas in perpetuity and be registered within 5 years of the date of this approval.
11. If the person taking the action proposes to undertake any action within areas secured under condition 6, other than those management activities related to managing the offset areas or as set out in the conditions of approval, then approval to undertake that action must be obtained in writing from the **Minister**. In seeking the **Minister's** approval, the person undertaking the action must provide a detailed assessment of the area where the action is proposed to take place and an assessment of all associated adverse impacts on **matters of national environmental significance**. If the **Minister** agrees to the action within the offset areas, the area identified for the action must be excised from the **offset area** and alternative offsets secured by the person taking the action at a ratio of at least 20:1 in relation to the impact on **matters of national environmental significance**.

Offset management plan

12. The person taking the action must submit to the **Minister** for approval an *Offset management plan* for all of the **offset areas**, specified in condition 6, within 12 months of the date of this approval. The approved *Offset management plan* must be implemented.

Note: for consistency, the proponent may develop a Biodiversity Management plan that includes the requirements set for managing offsets and set out in these conditions, to align with the requirements of the NSW state government Project Approval dated 22 January 2013 (application number 11_0047) and this approval.

13. The *Offset management plan* must include, but not be limited to, the following:

- a) a text description and map which clearly defines the location and boundaries of the **offset areas**. This must be accompanied by the **offset attributes** and **shapefiles**;
- b) a description of the methodology and results of surveys measuring the baseline ecological conditions in the **offset areas**. This must be consistent with the **State and Transition Model** and include but not be limited to:
 - i. the extent and condition of all vegetation communities, including a description of the structure, floristics and tree age class representation of each community;
 - ii. the extent and **condition class** of all areas of the White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community;
 - iii. surveys targeting the regent honeyeater, swift parrot and greater long-eared bat;
 - iv. the extent and quality of all areas of habitat for the regent honeyeater, swift parrot and greater long-eared bat;
 - v. the location of all survey sites (including co-ordinates);
 - vi. photo reference points at survey sites.
- c) clearly defined ecological management objectives for the **offset areas**;
- d) detailed description of all ecological management activities proposed to be undertaken, including maps and/or diagrams showing areas to be managed and the timing of the proposed activities;
- e) details of ongoing ecological monitoring programs, performance criteria, targets and provisions for adaptive management, including but not limited to:
 - i. a set of measurable ecological indicators for detecting changes to the White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community, including those that may be ascribed to ongoing water stress;
 - ii. a monitoring plan to assess the success of the management activities measured against the baseline condition. The monitoring must be statistically robust and able to quantify change in the condition of the White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community and habitat for the regent honeyeater, swift parrot and greater long-eared bat.

This should include the use of control sites and periodic ecological surveys to be undertaken by a qualified ecologist;

- iii. a list of performance criteria based on the ecological management objectives for the White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community and habitat for the regent honeyeater, swift parrot and greater long-eared bat;
 - iv. measures to exclude weeds from all **offset areas** for the period covered by this approval;
 - v. a description of the potential risks to successful management against the performance criteria, and a description of the contingency measures that would be implemented to mitigate against these risks;
 - vi. a process by which to report to the department the progress of management activities undertaken in the offset areas and the outcome of those activities, including identifying any need for improved management and activities to undertake such improvement.
- f) details of all parties responsible for management, monitoring and implementing the management activities, including their position or status as a separate contractor.
 - g) details of the funding requirements for the ongoing management activities, including an estimate of the costs of the activities and details of the parties responsible for funding the activities.
14. Unless otherwise agreed to in writing by the **department**, the baseline surveys for threatened species must be conducted in accordance with the department's *Survey Guidelines for Australia's Threatened Birds* and the *Survey Guidelines for Australia's Threatened Bats*. Subsequent monitoring must be carried out annually at the same time of year as the baseline surveys, unless otherwise agreed to in writing by the **department**.

Surface and groundwater management plans

15. The person taking the action must provide by the 31 May 2013, to the **Minister** for approval, the *surface and groundwater management plans* as identified in condition 39 of the NSW state government Project Approval dated 22 January 2013 (application number 11_0047).
16. The *surface and groundwater management plans* must be consistent with the **National Water Quality Management Strategy**.
17. The person taking the action must, within six months of this approval, in collaboration with the proponent to develop and operate the Boggabri Extension (EPBC 2009/5256) and the proponent to develop and operate the Maules Creek Mine (EPBC 2010/5566), provide written advice to the Minister demonstrating how the NSW government approved *surface and groundwater management plans*, address the cumulative impact of groundwater drawdown as a result of mining and how this may impact on the consequent health of the remnant native vegetation in the Leard State Forest, the Leard State Conservation Area and surrounding areas. In particular the advice must address the following matters:

- a. maximum amount of allowable drawdown in the alluvial aquifer
 - b. drawdown in hard rock
 - c. trigger levels pertaining to drawdown in the alluvial aquifer when corrective actions will be required to be undertaken
 - d. identify the depth of root zone of the native vegetation
 - e. monitoring to assess the ongoing quality and quantity of both surface and groundwater to identify impacts on the native vegetation.
18. The person taking the action must within 6 months of the date of this approval, or such other timeframe specified by the **Minister**, provide to the **Minister** a report on:
- a. any updated modelling of surface and groundwater impacts that has been undertaken in preparing the *surface and groundwater management plans*
 - b. how the *surface and groundwater management plans* addressed groundwater and surface water impacts on matters of national environmental significance.

Goonbri Creek Diversion and Low Permeability Barrier

19. The person taking the action must provide to the **Minister** for approval, before **commencement of the construction of the permanent Goonbri Creek alignment, permanent flood bund and low permeability barrier**, a *Goonbri Creek Diversion and Flood Bund Concept Design Plan*. This approved *Goonbri Creek Diversion and Flood Bund Concept Design Plan* must be implemented.
20. The *Goonbri Creek Diversion and Flood Bund Concept Design Plan* must include:
- a. an assessment of the surface water and groundwater quality, ecology, hydrological and geomorphic baseline conditions within the creek;
 - b. a description of how restoration of the re-aligned riparian zone will be undertaken to best replicate the habitat of the existing creek, including plant species and fauna habitat features;
 - c. water quality, ecology, hydrological and geomorphic performance and completion criteria for the creek diversion and low permeability barrier based on the assessment of the baseline conditions identified in condition 20 (a); and
 - d. a risk assessment of the environmental consequences of the proposed low permeability barrier and the proposed Goonbri Creek realignment including the potential for impacts on groundwater and surface discharge. The risk assessment must be peer-reviewed.
 - e. details for ongoing monitoring and management of downstream impacts on the adjacent floodplains and Namoi River floodplain.

21. The person taking the action must ensure that dispersed waters downstream of the Goonbri Creek re-alignment do not adversely affect the downstream environment and avoid any impacts on matters of national environmental significance.

Leard Forest Mining Precinct Regional Biodiversity Strategy

22. The person taking the action must implement the regional biodiversity strategy as required under condition 41 of the NSW state government project approval dated 22 January 2013 (application number 11_0047). The required scoping report for the development of the strategy must be submitted to the **Minister** for approval on or before 31 July 2013. The approved strategy must be implemented.

Mine site rehabilitation

23. To mitigate the impacts to the White Box-Yellow Box –Blakely's Red Gum Grassy Woodland and Derived Native Grassland and the habitat of the regent honeyeater, swift parrot and greater long-eared bat, the person taking the action must, within 12 months of the commencement of construction, submit to the **Minister** for approval a *mine site rehabilitation plan* for the progressive rehabilitation and revegetation of no less than 752 ha of native forest and woodland in the **project area** including 13 ha using species consistent with a White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland Ecological Community. This approved *mine site rehabilitation plan* must be implemented.
24. The person taking the action must rehabilitate the site to be consistent with the proposed rehabilitation strategy as provided in the **Environmental Assessment** and, as required under the NSW State Government approval dated 22 January 2013 (Application 11_0047).
25. The *mine site rehabilitation plan* must include, at a minimum, the following information:
- targets and performance indicators to achieve effective restoration of potential habitat for the regent honeyeater, swift parrot and greater long-eared bat and White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community, including weed management;
 - details of the vegetation communities to be rehabilitated and the timing of progressive rehabilitation (commencing as soon as practicable following disturbance);
 - detailed soil depth surveys and analysis to inform the effective placement and restoration of soils underlying the proposed rehabilitation sites; including mapping of soils across the disturbance sites and soil sampling at no less than one sample point per 20 ha of each soil type identified. Sampling must identify; type, depth, water holding capacity, structure and physio-chemical properties of each of the soil and subsoil layers;
 - processes and methodologies for the removal, storage and re-layering of the top soil and sub soil layers underlying the disturbed sites being prepared for rehabilitation. These processes and methodologies must ensure the replacement of top soil and sub soil layers as provided in the Environment Assessment.

- e. a process to report annually to the department the rehabilitation management actions undertaken and the outcome of those actions, and the mechanisms to be used to identify the need for improved management;
- f. a description of the potential risks to successful management and rehabilitation on the project site, including weed invasion, and a description of the contingency measures that would be implemented to mitigate these risks;
- g. details of long-term management and protection of the mine site, including details of the commitment of funds to achieve this.

26. The *mine site rehabilitation plan* must be subject to an **independent review** by a qualified ecologist prior to being submitted to the **Minister** for approval. The findings of the **independent review** must be published on the proponent's website.

Conservation Bond

27. The person taking the action is required to submit a Conservation and Biodiversity Bond under condition 49 of the New South Wales state government project approval dated 22 January 2013 (application 11_0047). It is noted that this bond may be combined with the rehabilitation security deposit as required under the New South Wales *Mining Act 1992*. The person taking the action must submit details of this bond and the rehabilitation security deposit, to the **Minister**, within six months of this approval. If the **Minister** is not satisfied that the bond and rehabilitation security deposit lodged by the person taking the action is adequate to provide for the requirements referred to under conditions 19, 20, 22, 23 and 24, the **Minister** may require the person taking the action establish an additional bond or equivalent financial instrument in trust, under conditions approved in writing by the **Minister**.

Final Landform

Note: for consistency, the person taking the action may develop a single mine rehabilitation plan to align with the requirements, including timing of reporting, of the NSW State Government approval dated 22 January 2013 (Application 11_0047) and this approval. The Offset Management Plan and the Rehabilitation management Plan need to be substantially integrated for achieving biodiversity objectives for the rehabilitated mine-site.

28. The person taking the action must undertake rehabilitation to ensure the final landform provides the optimum opportunity for the successful restoration of native forest and woodland including the critically endangered White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community.

Note: for consistency, the proponent may develop a single mine rehabilitation plan to align with the requirements of the NSW Government and this approval. The Offset Management Plan and the Rehabilitation management Plan need to be substantially integrated for achieving biodiversity objectives for the rehabilitated mine-site.

29. The person taking the action must undertake rehabilitation to ensure the final void and landform minimises the extent of any resulting pit lake, avoids salt scalding and ensures that drained waters do not adversely affect the downstream environment and avoids any impacts on **matters of national environmental significance**.

Note: the State approval conditions for project 11_0047 require the preparation and implementation of a Final Void and Mine Closure Plan that considers interactions with the adjoining mines, including interaction between final voids, opportunities for integrated mine planning with adjoining mines to minimise environmental impacts, all reasonable

and feasible landform options for the final void (including filling) and predicted hydrochemistry and hydrogeology (including long-term groundwater recovery and void groundwater quality).

Survey data

30. All survey data collected for the project must be recorded so as to conform to data standards notified from time to time by the **department**. When requested by the **department**, the proponent must provide to the **department** all species and ecological survey data and related survey information from ecological surveys undertaken for matters of national environmental significance. This survey data must be provided within 30 business days of request, or in a timeframe agreed to by the **department** in writing. The **department** may use the survey data for other purposes.

In the event that any additional **matters of national environmental significance** are recorded within the **project area** and a significant impact on the matter/s is likely, the **department** must be notified in writing within 14 days of the matter/s being recorded. In accordance with condition 36, the Minister may request that the person taking the action revise any relevant plans to ensure better protection of the relevant matter/s.

Reporting and auditing

31. Within 14 days after the **commencement of construction**, the person taking the action must advise the **department** in writing of the actual date of **commencement of construction**.
32. By the end of March of each year after the commencement of the action, the person taking the action must publish a report on their website addressing compliance with the conditions of this approval over the previous 12 months, including implementation of any management plans as specified in the conditions. Non-compliance with any of the conditions of this approval must be reported to the **department** at the same time as the compliance report is published.
33. Upon the direction of the **Minister**, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.
34. If the person taking the action wishes to carry out any activity otherwise than in accordance with the plans, as specified in the conditions, the person taking the action must submit to the **department** for the **Minister's** written approval a revised version of that plan. The varied activity shall not commence until the Minister has approved the revised plan in writing. The **Minister** will not approve a revised plan, unless the revised plan would result in an equivalent or improved environmental outcome. If the **Minister** approves the revised plan that plan must be implemented in place of the plan originally approved.
35. If the **Minister** believes that it is necessary or convenient for the better protection of listed threatened species and communities or listed migratory species to do so, the **Minister** may request that the person taking the action make specified revisions to the management plan

specified in the conditions and submit the revised plan for the **Minister's** written approval. The person taking the action must comply with any such request. The revised approved plan must be implemented. Unless the **Minister** has approved the revised plan then the person taking the action must continue to implement the originally approved plan, as specified in the conditions.

36. If, at any time after 5 years from the date of this approval, the person taking the action has not **substantially commenced the action**, then the person taking the action must not substantially commence the action without the written agreement of the **Minister**.

Publication of plans

37. The person taking the action must maintain accurate records substantiating all activities and outcomes associated with or relevant to the above conditions of approval, including measures taken to implement the management plans required by this approval, and make them available upon request to the **department**. Such records may be subject to audit by the **department** or an independent auditor in accordance with section 458 of the *Environment Protection and Biodiversity Conservation Act 1999*, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **department's** website. The results of audits may also be publicised through the general media.
38. Unless otherwise agreed to in writing by the **Minister**, the person taking the action must publish all management plans referred to in these conditions of approval on their website. Each management plan must be published on the website within 1 month of being approved.

Definitions

Commencement of construction – the commencement of any activities within the project area which are included in this approval.

Commencement of the construction of the permanent Goonbri Creek alignment, permanent flood bund and low permeability barrier – the commencement of any activities in relation to the permanent Goonbri Creek alignment, permanent flood bund and/or low permeability barrier.

Condition class – One of three states in which the White Box—Yellow Box—Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community may exist, as defined within the Commonwealth listing advice for the listing of this ecological community as critically endangered under the EPBC Act.

Department - the Australian Government Department responsible for the *Environment Protection and Biodiversity Conservation Act 1999*.

Environmental Assessment – The Maules Creek Coal Project Environmental Assessment July 2011, prepared by Hansen Bailey for Aston Coal 2 Pty Ltd, and submitted as part of the approval documents for the Maules Creek Coal Project.

Habitat – areas in which a species or community is known to occur or is thought to have the potential to occur based on the biophysical conditions prevailing in the area and the ecological

requirements of the species or community.

Independent review – an investigation conducted by an independent expert ecologist who has been approved by the department.

Minister - the Minister administering the *Environment Protection and Biodiversity Conservation Act 1999* and includes a delegate of the Minister.

Matters of national environmental significance – all matters listed under Part 3 of the EPBC Act

Offset areas – areas that are proposed to meet the criteria set out in conditions 6, 7 and 8 of the approval, to offset the impacts of the action on matters of national environmental significance.

Offset attributes -means an '.xls' file capturing relevant attributes of the Offset Area, including the EPBC reference ID number, the physical address of the offset site, coordinates of the boundary points in decimal degrees, the EPBC protected matters that the offset compensates for, any additional EPBC protected matters that are benefiting from the offset, and the size of the offset in hectares.

Project area – the area defined by the Tarrawonga Coal Mine Extension Project EPBC Act referral (EPBC Act reference 2011/5923) as lying within the Project Application Boundary.

Shapefiles -means an ESRI Shapefile containing '.shp', '.shx' and '.dbf' files and other files capturing attributes of the Offset Area, including the shape, EPBC reference ID number and EPBC protected matters present at the relevant site. Attributes should also be captured in '.xls' format. A geographically referenced raster 'img' file/s must be provided to provide context for the shapefiles.

State and Transition Model – Section 3.2 of *A Guide to Managing Box Gum Grassy Woodlands* (Caring for our Country Environmental Stewardship, 2010), depicts the different condition states (as reflected by disturbance, inputs and altered land use) in which a given vegetation can exist. This publication can be found at:
<http://www.nrm.gov.au/resources/publications/stewardship/bggw-handbook.html>

Substantially commence the action – means the extraction of coal from the Tarrawonga Coal Mine Project for the purpose of commercial production. Substantial commencement does not include test extraction or extraction of coal samples for quality assurance.

Appendix 2

ENVIRONMENT PROTECTION LICENCE 12365

Environment Protection Licence

Licence - 12365

Licence Details

Number:	12365
Anniversary Date:	09-January

Licensee

TARRAWONGA COAL PTY LTD

PO BOX 600

GUNNEDAH NSW 2380

Premises

TARRAWONGA COAL MINE

469 GOONBRI ROAD

BOGGABRI NSW 2382

Scheduled Activity

Coal Works

Mining for Coal

Fee Based Activity

Scale

Coal works	0-2000000 T handled
Mining for coal	> 500000-2000000 T produced

Region

North - Armidale

Ground Floor, NSW Govt Offices, 85 Faulkner Street
ARMIDALE NSW 2350

Phone: (02) 6773 7000

Fax: (02) 6772 2336

PO Box 494 ARMIDALE

NSW 2350

Environment Protection Licence

Licence - 12365



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Environment Protection Licence

Licence - 12365



Information about this licence

Dictionary

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

Responsibilities of licensee

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

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

Variation of licence conditions

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

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

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

Duration of licence

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

Licence review

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

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

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

Environment Protection Licence

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

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

Transfer of licence

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

Public register and access to monitoring data

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

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

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

This licence is issued to:

TARRAWONGA COAL PTY LTD
PO BOX 600
GUNNEDAH NSW 2380

subject to the conditions which follow.

Environment Protection Licence

Licence - 12365



1 Administrative Conditions

A1 What the licence authorises and regulates

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

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

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

A2 Premises or plant to which this licence applies

- A2.1 The licence applies to the following premises:

Premises Details
TARRAWONGA COAL MINE
469 GOONBRI ROAD
BOGGABRI
NSW 2382
THE LAND APPROVED UNDER PROJECT APPROVAL 11_0047- INDICATED IN APPENDIX 1- SCHEDULE OF LAND OF PROJECT APPROVAL 11_0047, DATED 22 JANUARY 2013 (DOC13/87399).

A3 Information supplied to the EPA

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

In this condition the reference to "the licence application" includes a reference to:

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

Environment Protection Licence

Licence - 12365



2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

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

Air

EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
28	Ambient air monitoring		Real time air quality monitor located on 'Flixton' as referred to in map titled "Real Time Air Monitor Location- Tarrawonga Coal Mine" received by the EPA on 16 November 2011 (DOC11/56063).

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

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

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Wet weather discharge Discharge water quality monitoring	Wet weather discharge Discharge water quality monitoring	Discharge point located on the western boundary and labelled "SD17" on Figure 4: Proposed Water Discharge Points and Weather Station submitted with licence variation application form 13 October 2008.
2	Wet weather discharge Discharge water quality monitoring	Wet weather discharge Discharge water quality monitoring	Spillway on Storage Dam 9 located on southern boundary of premises labelled "SD9" on Figure 4: Proposed Water Discharge Points and Weather Station submitted with licence variation application form 13 October 2008.
3	Wet weather discharge Discharge water quality monitoring	Wet weather discharge Discharge water quality monitoring	Spillway on Sediment Basin 14 located east of Thuin house on southern boundary labelled "SB14" on Figure 4: Proposed Water Discharge Points and Weather Station submitted with licence variation application form 13 October 2008.

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5	Ambient water quality monitoring	Bollol Creek upstream of discharge from premises labelled "BC-U" on Figure 4: Proposed Water Discharge Points and Weather Station submitted with licence variation application form 13 October 2008.
6	Ambient water quality monitoring	Bollol Creek downstream of discharge from premises labelled "BC-D" on Figure 4: Proposed Water Discharge Points and Weather Station submitted with licence variation application form 13 October 2008.
7	Ambient water quality monitoring	Nagero Creek upstream of discharge from premises labelled "NC-U" on Figure 4: Proposed Water Discharge Points and Weather Station submitted with licence variation application form 13 October 2008.
8	Ambient water quality monitoring	Nagero Creek downstream of discharge from premises labelled "NC-D" on Figure 4: Proposed Water Discharge Points and Weather Station submitted with licence variation application form 13 October 2008.
9	Groundwater monitoring	Groundwater monitoring bore located on property "Thuin" labelled MW-1 on Figure 5 Water Monitoring Locations in the Site Water Management Plan submitted with licence application 17 November 2005
10	Groundwater monitoring	Groundwater monitoring bore located on property "Bollol Ck Station" labelled MW-2 on Figure 5 Water Monitoring Locations in the Site Water Management Plan submitted with licence application 17 November 2005
11	Groundwater monitoring	Groundwater monitoring bore located on property "Nagero" labelled MW-3 on Figure 5 Water Monitoring Locations in the Site Water Management Plan submitted with licence application 17 November 2005

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12	Groundwater monitoring		Groundwater monitoring bore located on property "Tarrawonga" labelled MW-4 on Figure 5 Water Monitoring Locations in the Site Water Management Plan submitted with licence application 17 November 2005
13	Surface water quality monitoring		Mining void (variable location) labelled MV1 on Figure 5 Water Monitoring Locations in the Site Water Management Plan submitted with licence application 17 November 2005
24	Wet weather discharge Discharge water quality monitoring	Wet weather discharge Discharge water quality monitoring	Spillway on Storage Dam 16 located on the southern side of the premises labelled "SD16" on "Figure 1: Existing and Proposed Water Discharge Monitoring Points" submitted with licence variation application form dated 14-5-09
25	Wet weather discharge Discharge water quality monitoring	Wet weather discharge Discharge water quality monitoring	Spillway on Sediment Basin 22 located on northern side of premises labelled "SB22" in Figure titled "Tarrawonga Mine Site. Licensed Discharge Points" submitted with licence variation application form dated 19 August 2011.
26	Wet weather discharge Discharge water quality monitoring	Wet weather discharge Discharge water quality monitoring	Spillway on Sediment Basin 23 located on northern side of premises labelled "SB23" in Figure titled "Tarrawonga Mine Site. Licensed Discharge Points" submitted with licence variation application form dated 19 August 2011.
27	Wet weather discharge Discharge water quality monitoring	Wet weather discharge Discharge water quality monitoring	Spillway on Sediment Basin 18 located on northern side of premises labelled "SB18" in Figure titled "Tarrawonga Mine Site. Licensed Discharge Points" submitted with licence variation application form dated 19 August 2011.

P1.4 The following point(s) in the table are identified in this licence for the purpose of the monitoring of weather parameters at the point.

EPA Identification number	Type of Monitoring Point	Description of Location
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W1	Weather analysis	Weather station located on "Templemore" labelled "Templemore- Project Related" on Figure submitted with licence variation application form received by EPA on 12 June 2012 (DOC12/23618).
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3 Limit Conditions

L1 Pollution of waters

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

L2 Concentration limits

- L2.1 For each monitoring/discharge point or utilisation area specified in the table\&s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.
- L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.
- L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\&s.
- L2.4 Water and/or Land Concentration Limits

POINT 1,2,3,24,25,26,27

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Oil and Grease	milligrams per litre				10
pH	pH				6.5 - 8.5
Total suspended solids	milligrams per litre				50

- L2.5 The Total Suspended Solids concentration limits specified for Points 1, 2, 3, 24, 25, 26 and 27 may be exceeded for water discharged provided that:

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- (a) the discharge occurs solely as a result of rainfall measured at the premises that exceeds 38.4 millimetres over any consecutive 5 day period immediately prior to the discharge occurring; and
 (b) all practical measures have been implemented to dewater all sediment dams within 5 days of rainfall such that they have sufficient capacity to store run off from a 38.4 millimetre, 5 day rainfall event.

Note: 38.4 mm equates to the 5 day 90%ile rainfall depth for Gunnedah sourced from Table 6.3a Managing Urban Stormwater: Soils and Construction Volume 1: 4th edition, March 2004.

L3 Waste

- L3.1 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.
- L3.2 This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require an environment protection licence.
- L3.3 Reject material from the Whitehaven CHPP can be disposed of at the premises in accordance with the disposal method outlined in the Environmental Impact Statement titled "East Boggabri Joint Venture, Environmental Impact Statement for the Proposed East Boggabri Coal Mine, May 2005" prepared by R.W. Corkery & Co. Pty. Limited dated May 2005, or as otherwise approved by the EPA.

L4 Noise limits

- L4.1 Noise generated at the premises must not exceed the noise limits in the table below.

Locality and Location	Day- LAeq (15 minute)	Evening- LAeq (15 minute)	Night- LAeq (15 minute)	Night- LA1 (1 minute)
All other surrounding residences	35	35	35	45

- L4.2 For the purpose of the table above:

- a) Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays;
 b) Evening is defined as the period from 6pm to 10pm;
 c) Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

L4.3 Determining Compliance

To determine compliance:

- a) with the Leq(15 minute) noise limits in the Noise Limits table, the noise measurement equipment must be located:
 i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or

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- ii) within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
- iii) within approximately 50 metres of the boundary of a National Park or a Nature Reserve.
- b) with the LA1(1 minute) noise limits in the Noise Limits table, the noise measurement equipment must be located within 1 metre of a dwelling façade.
- c) with the noise limits in the Noise Limits table, the noise measurement equipment must be located:
 - i) at the most affected point at a location where there is no dwelling at the location; or
 - ii) at the most affected point within an area at a location prescribed by part (a) or part (b) of this condition.

- L4.4** The noise limits set out in the Noise Limits table apply under all meteorological conditions except for the following:
- a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
 - b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
 - c) Stability category G temperature inversion conditions.

For the purposes of this condition:

- a) Data recorded by the meteorological station identified as EPA Identification Point(s) W1 must be used to determine meteorological conditions; and
- b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

- L4.5** For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

L5 Blasting

- L5.1** The overpressure level from blasting operations at the premises must not exceed 120dB (Lin Peak) at any time and at any point within 30 metres of any non project related residential building or other noise sensitive location. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.
- L5.2** The overpressure level from blasting operations at the premises must not exceed 115dB (Lin Peak) for more than five per cent of the total number of blasts over each reporting period at any time and at any point within 30 metres of any non-project related residential building or other noise sensitive location. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.
- L5.3** Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 10mm/sec at any time and at any point within 3.5 metres of any non project related residential building or other noise sensitive location. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.
- L5.4** Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 5mm/sec for more than five per cent of the total number of blasts over each reporting period at any point within 3.5 metres of any non project related residential building or other noise sensitive location. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

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- L5.5 Blasting operations on the premises must only be carried out between the hours 9am to 5pm, Monday to Saturday, inclusive.
- L5.6 The hours of operation for blasting operations specified in condition L7.3 may be varied if the EPA, having regard to the effect that the proposed variation would have on the amenity of the residents in the locality, gives written consent to the variation.
- L5.7 Blasting at the premises is limited to 1 blast on each day on which blasting is permitted.

Note: Additional blasts are permitted where it is demonstrated to be necessary for safety reasons and the EPA and neighbours have been notified of the intended blast prior to the additional blast being fired.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

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

O2 Maintenance of plant and equipment

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

O3 Dust

- O3.1 All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.
- O3.2 Trucks transporting coal from the premises must be covered immediately after loading to prevent wind blown emissions and spillage. The covering must be maintained until immediately before unloading the trucks.

5 Monitoring and Recording Conditions

M1 Monitoring records

- M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must

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be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:

- a) in a legible form, or in a form that can readily be reduced to a legible form;
- b) kept for at least 4 years after the monitoring or event to which they relate took place; and
- c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:

- a) the date(s) on which the sample was taken;
- b) the time(s) at which the sample was collected;
- c) the point at which the sample was taken; and
- d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

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

M2.2 Air Monitoring Requirements

POINT 28

Pollutant	Units of measure	Frequency	Sampling Method
PM10	micrograms per cubic metre	Continuous	AM-22

M2.3 Water and/ or Land Monitoring Requirements

POINT 1,2,3,24,25,26,27

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Special Frequency 1	Grab sample
Oil and Grease	milligrams per litre	Special Frequency 1	Grab sample
pH	pH	Special Frequency 1	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 1	Grab sample

POINT 5,6,7,8

Pollutant	Units of measure	Frequency	Sampling Method
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Conductivity	microsiemens per centimetre	Special Frequency 1	Grab sample
Oil and Grease	milligrams per litre	Special Frequency 1	Grab sample
pH	pH	Special Frequency 1	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 1	Grab sample

POINT 9,10,11,12

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Every 6 months	Grab sample
Lead	milligrams per litre	Every 6 months	Grab sample
pH	pH	Every 6 months	Grab sample
Standing Water Level	metres	Every 6 months	In situ

POINT 13

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

M2.4 For the purposes of the table(s) above Special Frequency 1 means the collection of samples as soon as practicable after a discharge from points 1, 2, 3, 24, 25, 26, and 27 commences and in any case not more than 12 hours after a discharge commences.

M2.5 For the purposes of condition M2.1, this licence acknowledges that points 15, 16, 20 and 21 are established, maintained and monitored by the licensee who holds Environment Protection Licence number 12407. The holder of environment protection licence 12365 obtains monitoring data from Licensee 12407 for these points to meet their obligations under this licence. The licensee is deemed to have not breached condition M2.1 of this licence where the licensee is unable to obtain the monitoring data to meet this condition.

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

- any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
- if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
- if no such requirement is imposed by or under the Act or by a condition of this licence, any

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methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

- M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M4 Weather monitoring

- M4.1 For each monitoring point specified in the table below the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns.

Point W1

Parameter	Units of Measure	Frequency	Averaging Period	Sampling Method
Temperature @ 2 metres	°C	Continuous	15 minute	AM-4
Wind direction @ 10 metres	°	Continuous	15 minute	AM-2 & AM-4
Wind speed @ 10 metres	m/s	Continuous	15 minute	AM-2 & AM-4
Sigma theta @ 10 metres	°	Continuous	15 minute	AM-2 & AM-4
Rainfall	mm/h	Continuous	1 hour	AM-4
Solar Radiation	W/m2	Continuous	15 minute	AM-4
Temperature @ 10 metres	°C	Continuous	15 minute	AM-4
Additional requirements - Siting - Measurement				AM-1 & AM-4 AM-2 & AM-4

- M4.2 The meteorological weather station must be maintained so as to be capable of continuously monitoring the parameters specified in this section.

M5 Recording of pollution complaints

- M5.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

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- M5.2** The record must include details of the following:
- a) the date and time of the complaint;
 - b) the method by which the complaint was made;
 - c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
 - d) the nature of the complaint;
 - e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
 - f) if no action was taken by the licensee, the reasons why no action was taken.

M5.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M5.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M6 Telephone complaints line

- M6.1** The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.
- M6.2** The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.
- M6.3** The preceding two conditions do not apply until 3 months after:
- a) the date of the issue of this licence or
 - b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.

M7 Other monitoring and recording conditions

- M7.1** For each monitoring point specified below, the Licensee must monitor the noise or vibration parameter specified in Column 1. The Licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns.

Points: N1

Parameter	Units of Measure	Frequency	Sampling Method
Ambient Noise	LAeq (15 minute) LAmax LA1 LA10 LA90 LAmin	Frequency of monitoring as detailed in the most recently approved "Noise Management Plan" and "Road Noise Management Plan" for the premises.	As detailed in the most recently approved "Noise Management Plan" and "Road Noise Management Plan" for the premises.

M7.2 Point: N3

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Parameter	Units of Measure	Frequency	Sampling Method
Ambient Noise	LAeq (15 minute) LAmax LA1 LA10 LA90 LAmin	Continuous real time noise monitoring as detailed in the most recently approved "Noise Management Plan" and "Road Noise Management Plan" for the premises.	As detailed in the most recently approved "Noise Management Plan" and "Road Noise Management Plan" for the premises.

M7.3 Points: N1

Parameter	Units of measure	Frequency	Sample Method
Blast Noise	DB(Lin Peak)	Every Blast	Type 1 Noise Blast Logger
Blast Vibration	mm/s	Every Blast	Geophone Logger or Similar

M7.4 For the purpose of conditions M7.1 and M7.2, the noise monitoring locations are described as:

EPA Identification No.	Description of Location
N1	Within 30m of the residence on property "Tarrawonga"
N3	Portable monitor

M7.5 Note: N3 is a portable monitor enabling the monitor to be relocated to areas of potential greatest impact. The licensee is responsible to ensure that it is located at the most suitable location.

M7.6 Note: The location, frequency of monitoring and the parameters to be monitored may be varied by the EPA once the variability of the noise impact is established.

M7.7 To assess compliance with the noise limits presented in the Noise Limits table, attended noise monitoring must be undertaken in accordance with the condition titled Determining Compliance, outlined above, and:

- at each one of the locations listed in the Noise Limits table;
- occur Quarterly in a reporting period;
- occur during each day, evening and night period as defined in the NSW Industrial Noise Policy for a minimum of:
 - 1.5 hours during the day;
 - 30 minutes during the evening; and
 - 1 hour during the night.
- occur for three consecutive operating days.

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

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- a) a Statement of Compliance; and
- b) a Monitoring and Complaints Summary.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

- R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.
- R1.3 Where this licence is transferred from the licensee to a new licensee:
- a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
 - b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.
- R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
- a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
 - b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.
- R1.5 The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').
- R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.
- R1.7 Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
- a) the licence holder; or
 - b) by a person approved in writing by the EPA to sign on behalf of the licence holder.
- R1.8 A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.

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

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

R2 Notification of environmental harm

- R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.
- R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

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

R3 Written report

- R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
- a) where this licence applies to premises, an event has occurred at the premises; or
 - b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.
- R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.
- R3.3 The request may require a report which includes any or all of the following information:
- a) the cause, time and duration of the event;
 - b) the type, volume and concentration of every pollutant discharged as a result of the event;
 - c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
 - d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
 - e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
 - f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
 - g) any other relevant matters.
- R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Other reporting conditions

- R4.1 A noise compliance assessment report must be submitted to the EPA within thirty (30) days of the completion of the quarterly noise monitoring. The assessment must be prepared by a suitably qualified and experienced acoustical consultant and include:
- a) an assessment of compliance with noise limits detailed in the limit conditions of this licence; and
 - b) an outline of any management actions taken within the monitoring period to address any exceedences of the limits detailed in the limit conditions of this licence.

7 General Conditions

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G1 Copy of licence kept at the premises or plant

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

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

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

8 Pollution Studies and Reduction Programs

U1 Particulate Matter Control Best Practice Implementation – Wheel Generated Dust

U1.1 The Licensee must achieve and maintain a dust control efficiency of 80% or more on all active haul roads by 17 May 2013.

Control efficiency is calculated as:

$$CE = \frac{E \text{ (uncontrolled)} - E \text{ (controlled)}}{E \text{ (uncontrolled)}} \times 100$$

Where E = the emission rate of the activity

U1.2 To assess compliance with Condition U1.1, the Licensee must:

- measure uncontrolled and controlled haul road emissions on at least 2 occasions using a mobile dust monitor;
- continuously measure and record 'additional site data' including:
 - vehicle kilometres travelled (VKT),
 - meteorological conditions,
 - water use for dust suppression.
- undertake silt content and soil moisture sampling during sampling events; and
- determine if a site specific relationship can be derived between the measured control efficiency, additional site data, water use, meteorological data; and silt content and soil moisture levels.

The measurement of uncontrolled and controlled haul road PM10 emissions must be undertaken under varying meteorological conditions, including at those times when analysis of meteorological data indicates that elevated levels of dust are most likely at the Premises.

Note: The EPA acknowledges that in order to determine uncontrolled PM10 emissions, the section of haul road to be sampled will need to be left untreated for a period of up to 12 hours prior to the sampling taking place.

U1.3 The Licensee must submit a report to the EPA which documents the results of the assessment undertaken in accordance with Condition U1.1. The report must include an assessment of:

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- the dust control effectiveness,
- the dust levels recorded, and
- any relationship established between control effectiveness and the additional site data.

The report must be submitted by the Licensee to the Environment Protection Authority Regional Manager Armidale, at PO Box 494, ARMIDALE by 15 August 2014.

U1.4 The report required by condition U1.3 must be made publicly available by the Licensee on the Licensee's website by (two weeks from submission date nominated in U1.3).

U2 Particulate Matter Control Best Practice Implementation – Disturbing and Handling Overburden under Adverse Weather Conditions

U2.1 The licensee must alter or cease the use of equipment on overburden and the loading and dumping of overburden during adverse weather conditions to minimise the generation of particulate matter from 22 March 2013.

U2.2 To assess compliance with Condition U2.1, the Licensee must:

- undertake daily visual dust level assessments, continuously record real-time PM10 levels and continuously measure and record real-time meteorological conditions; and
- record changes to mining activities due to adverse weather conditions.

U2.3 The Licensee must submit a report to the EPA which documents the results of the actions taken in accordance with Condition U2.1. The report must include an assessment of the effectiveness of changes made to mining activities due to adverse weather and document meteorological conditions and the resultant dust levels. The report must be submitted by the Licensee to the Environment Protection Authority Regional Manager Armidale, at PO Box 494, ARMIDALE by 15 August 2014.

U2.4 The report required by Condition U2.3 must be made publicly available by the Licensee on the Licensee's website by (two weeks from submission date in 2.3 above).

U3 Particulate Matter Control Best Practice Implementation – Trial of Best Practice Measures for Disturbing and Handling Overburden

U3.1 The Licensee must submit a report documenting an investigation and trial of best practice measures for the control of particulate matter from the use of equipment on overburden and the loading and dumping of overburden. Best practice measures may include, but should not be limited to, the following:

- use of foggers;
- use of water sprays; and
- reduction of drop heights.

The report must document the investigation and trial of each best practice measure. It must quantify the particulate matter control effectiveness and discuss the practicability of each best practice measure.

The report must be submitted by the Licensee to the Environment Protection Authority Regional Manager

Environment Protection Licence

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Armidale, at PO Box 494, ARMIDALE by 14 April 2014.

Environment Protection Licence

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Dictionary

General Dictionary

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

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

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

Mr Robert O'Hern

Environment Protection Authority

(By Delegation)

Date of this edition: 09-January-2006

End Notes

- 1 Licence varied by notice 1082112, issued on 25-Feb-2008, which came into effect on 25-Feb-2008.
- 2 Licence varied by notice 1093269, issued on 10-Nov-2008, which came into effect on 10-Nov-2008.
- 3 Licence varied by notice 1103021, issued on 18-Aug-2009, which came into effect on 18-Aug-2009.
- 4 Licence varied by notice 1126949, issued on 13-Jul-2011, which came into effect on 13-Jul-2011.
- 5 Licence varied by notice 1501194 issued on 20-Dec-2011
- 6 Licence varied by notice 1506685 issued on 27-Nov-2012
- 7 Licence varied by notice 1510429 issued on 21-Mar-2013
- 8 Licence varied by notice 1516121 issued on 06-Sep-2013
- 9 Licence varied by notice 1518350 issued on 05-Feb-2014

Appendix 3

COMPLIANCE REVIEWS

- PA 11_0047 (Table A3-1)
- EPL 12365 (Table A3-2)
- ML 1579, 1685 & 1693 (Table A3-3)

TABLE A3.1
Compliance Review – PA 11_0047

Cond.	Conditional Requirement	Compliance	Comments
Schedule 2 – Administration Conditions			
1.	In addition to meeting the specific performance criteria established under this approval, the Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any material harm to the environment that may result from the construction, operation, or rehabilitation of the project.	Yes	As per condition.
2.	The Proponent shall carry out the project generally in accordance with the: (a) EA; (b) statement of commitments; and (c) conditions of this approval.	Yes	The activities on site were being undertaken generally in accordance with the nominated documents.
3.	If there is any inconsistency between the above documents, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.	Not applicable	
4.	The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of: (a) any reports, strategies, plans, programs, reviews, audits or correspondence that are submitted in accordance with this approval; and (b) the implementation of any actions or measures contained in these documents.	Yes	As per condition.
5.	The Proponent may carry out mining operations on the site until the end of December 2030.	Not yet applicable	
6.	The Proponent shall not extract more than 3 million tonnes of ROM coal from the site in any calendar year.	Yes	As per condition
7.	For the period until up to 3 months after the commissioning of the Boggabri Rail Spur Line and Boggabri CHPP, the Proponent may transport up to: (a) 2 million tonnes of ROM coal from the site to the Whitehaven CHPP along the dedicated haulage route in any calendar year; and (b) 150,000 tonnes of this ROM coal from the site in any calendar year for direct distribution to domestic markets via the dedicated haulage route to the Kamilaroi Highway.	No	Exceeded 2MT of ROM coal trucked to Whitehaven CHPP during calendar year.
8.	During this period, the Proponent shall only transport coal from the site or receive coal reject from the Whitehaven CHPP between the hours of: (a) 7 am to 9.15 pm Monday to Friday; (b) 7 am to 5.15 pm Saturday; and (c) at no time on Sundays or public holidays.	Yes	As per condition.
9.	For the period commencing 3 months after the commissioning of the Boggabri Rail Spur Line & Boggabri CHPP, the Proponent: (a) shall not transport more than 3 million tonnes of ROM coal from the site in any calendar year; (b) may transport up to 150,000 tonnes of this ROM coal from the site in any calendar year for direct distribution to domestic markets via the dedicated haulage route to the Kamilaroi Highway; and (c) shall transport all other coal from the site via the Boggabri rail spur line.	Not yet applicable	
10.	During this period, the Proponent shall only transport coal from the site by truck (excluding coal transport to the Boggabri coal mine for subsequent despatch via the Boggabri rail spur line) between 7 am	Not yet applicable	

Cond.	Conditional Requirement	Compliance	Comments
	and 6 pm Monday to Saturday.		
11.	The Proponent shall not extract more than 90,000m ³ of gravel from the site for distribution off-site in any calendar year.	Yes	Calendar year not yet complete. <90,000m ³ transported from site to date.
12.	The Proponent may transport up to 90,000m ³ of gravel from the site by truck in any calendar year. This gravel is to be transported from the site to the Kamilaroi Highway via the dedicated haulage route.	Yes	All gravel transport is via the dedicated haulage route.
13.	The Proponent shall only transport gravel from the site by truck between 7 am and 6 pm Monday to Saturday.	Yes	Gravel transport occurs only between 7am to 6pm Monday to Saturday.
14.	By the end of December 2013, or as otherwise agreed by the Director-General, the Proponent shall surrender the existing development consent (DA-88-4-2005) for the Tarrawonga Coal Mine in accordance with Section 104A of the EP&A Act. Prior to the surrender of this development consent, the conditions of this approval shall prevail to the extent of any inconsistency with the conditions of the development consent.	No	DA-88-4-2005 not yet surrendered.
15.	The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.	Yes	All buildings meet relevant requirements.
16.	The Proponent shall ensure that all demolition work on site is carried out in accordance with Australian Standard AS 2601-2001: The Demolition of Structures, or its latest version.	Not applicable	No demolition of buildings during reporting period.
17.	Unless the Proponent and the applicable authority agree otherwise, the Proponent shall: (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the project; and (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project.	Not applicable	No relocation or damage of public infrastructure during reporting period.
18.	The Proponent shall ensure that all the plant and equipment used on site, or to transport coal from the site, is: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.	Yes	All plant and equipment maintained and operated in proper and efficient manner.
19.	With the approval of the Director-General, the Proponent may submit any strategy, plan or program required by this approval on a progressive basis.	Not Yet Applicable	
20.	Until they are replaced by an equivalent strategy, plan or program approved under this approval, the Proponent shall implement the existing strategies, plans or programs for the site that have been approved under DA-88-4-2005.	Yes	As per condition.
21.	By the end of March 2013, unless otherwise agreed by the Director-General, the Proponent shall enter into a planning agreement with Council in accordance with: (a) Division 6 of Part 4 of the EP&A Act; and (b) the terms of the Proponent's offer provided in Appendix 3.	Yes	Planning agreement in place.
Schedule 3 – Environmental Performance Conditions			
1.	Upon receiving a written request for acquisition from an owner of the privately-owned land listed in Table 1, the Proponent shall acquire the land in accordance with the procedures in conditions 8 and 9 of schedule 4.	Not yet applicable	
2.	Upon receiving a written request from the owner of any residence on the land listed in Table 1, the Proponent shall implement additional noise and/or air quality mitigation measures (such as double glazing, insulation, air filters, a first flush roof water drainage system and/or air conditioning) at the residence in consultation with the owner. These measures must be reasonable	Not yet applicable	No written requests received to date.

Cond.	Conditional Requirement	Compliance	Comments
	and feasible and directed towards reducing the noise and/or air quality impacts of the project on the residence. If within 3 months of receiving this request from the owner, the Proponent and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.		
3.	Except for the noise-affected land in Table 1, the Proponent shall ensure that operational noise generated by the project does not exceed the criteria in Table 2 (35dB(A) $L_{Aeq(15min)}$ at all properties during day, evening and night and 45 $L_{Aeq(1 min)}$ at night) at any residence on privately-owned land. However, these noise criteria do not apply if the Proponent has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.	Yes	Exceedances at "Tarrawonga". Property retained acquisition rights and was acquired during reporting period.
4.	If the owner(s) of a privately-owned residence, that is not listed in Table 1, have reason to believe that operational noise from the project is causing the criteria in Table 2 to be exceeded at the residence, the owner(s) can request an independent noise impact assessment for the residence. The request shall be made in writing to the Director-General. If the Director-General considers that a noise impact assessment is warranted, then the Proponent shall commission the assessment. <i>(further details in condition)</i>	Not yet applicable	No written requests received to date.
5.	If the owner(s) of land containing a privately owned residence, which is not listed in Table 1, have reason to believe that operational noise from the project is causing noise levels to exceed 40 dB(A) $L_{Aeq(15 min)}$ over more than 25% of that land, the owner(s) can request an independent noise impact assessment for the land. The request shall be made in writing to the Director-General. If the Director-General considers that a noise impact assessment is warranted, then the Proponent shall commission the assessment. <i>(further details in condition)</i>	Not yet applicable	No written requests received to date.
6.	Except for the land listed in Table 1, the Proponent shall ensure that the operational noise generated by the project combined with the noise generated by other mines does not exceed the criteria in Table 3 (40dB(A) $L_{Aeq(Period)}$ at all properties during day, evening and night) at any residence on privately-owned land.	Yes	No exceedances recorded at privately owned residences that are not listed in Table 1.
7.	If the owner(s) of a privately-owned residence, which is not listed in Table 1, reasonably believes that the noise limits in Table 3 are being exceeded at the residence and that the exceedance is caused by operational noise from the project and one or more other mines (including use of private roads or rail spurs), the owner(s) can request an independent noise impact assessment for the residence. The request shall be made in writing to the Director-General. If the Director-General considers that a noise impact assessment is warranted, then the Proponent shall commission the assessment. <i>(further details in condition)</i>	Not yet applicable	No written requests received to date.
8.	The Proponent shall ensure that the noise generated by the project on public roads does not exceed the criteria in Table 4 (60dB(A) $L_{Aeq(1 hour)}$ during the day and evening and 55dB(A) $L_{Aeq(1 hour)}$ during the night) at any existing residence on privately-owned land.	Yes	No recorded exceedances in road noise criteria.
9.	The Proponent shall: (a) ensure that: <ul style="list-style-type: none"> all trucks, dozers, drills and excavators purchased for used on the site after the date of this approval are commissioned as noise suppressed (or attenuated) units; all equipment and noise control measures deliver sound power levels that are equal to, or less than, the sound power levels identified in the EA, and correspond to best 	Yes	No additional equipment purchases made. Site continues to operate at production levels in place pre-approval. Sound power testing on existing equipment to be re-assessed during next reporting period.

Cond.	Conditional Requirement	Compliance	Comments
	<p>practice, or the application of best available economically achievable technology;</p> <ul style="list-style-type: none"> improvements are made to existing noise suppression equipment as improved technology becomes available where reasonable and feasible; and <p>(b) monitor and report on the implementation of these requirements annually on its website.</p>		
10.	<p>The Proponent shall:</p> <p>(a) conduct an annual testing program of the plant on site;</p> <p>(b) restore the effectiveness of any attenuation if it is found to be defective; and</p> <p>(c) report on the results of any testing and/or attenuation work within the Annual Review.</p>	Yes	As per condition
11.	<p>The Proponent shall:</p> <p>(a) implement best management practice to minimise all operational, low frequency, road and rail traffic noise levels associated with the project;</p> <p>(b) operate a comprehensive on-site noise management system that uses a combination of predictive meteorological forecasting and real-time noise monitoring data to guide the day to day planning of mining operations and the implementation of both proactive and reactive noise mitigation measures to ensure compliance with the relevant conditions of this approval;</p> <p>(c) maintain the effectiveness of noise suppression equipment on plant at all times and ensure defective plant is not operationally used until fully repaired;</p> <p>(d) ensure that noise attenuated plant is deployed preferentially in locations near to sensitive receivers;</p> <p>(e) minimise the noise impacts of the project during meteorological conditions under which the noise limits in this approval do not apply (see condition 13);</p> <p>(f) ensure that project related trains on the Boggabri spur line only use locomotives that are approved to operate on the NSW rail network in accordance with the noise limits in ARTC's EPL (No. 3142);</p> <p>(g) use its best endeavours to ensure that project-related rolling stock supplied by service providers on the Boggabri rail spur line is designed, constructed and maintained to minimise noise; and</p> <p>(h) co-ordinate the noise management on site with the noise management at other mines within the Leard Forest Mining Precinct, to minimise the cumulative noise impacts of these mines,</p> <p>to the satisfaction of the Director-General.</p>	Yes	As per condition.
12.	<p>The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan must:</p> <p>(a) be prepared in consultation with the EPA, and be submitted to the Director-General for approval by the end of May 2013;</p> <p><i>(further details in condition)</i></p>	Yes	Noise Management Plan prepared in accordance with all requirements of this condition and submitted for approval prior to the end of May 2013. Approval expected during next reporting period.
13.	<p>Where conditions in this approval refer to measurement of noise within the context of the NSW Industrial Noise Policy the inversion class to be applied to the project is Class G.</p> <p>However, the Proponent may undertake an investigation to determine whether a proposal for change in this classification could be considered for approval by the Director-General. Any such investigation must be conducted in consultation with the EPA and</p>	Yes	Class G applied.

Cond.	Conditional Requirement	Compliance	Comments
	be conducted by a suitably qualified person whose appointment has been endorsed by the EPA and approved by the Director-General. The report and recommendation must be submitted to the EPA for endorsement prior to submission to the Director-General. If the Director-General is satisfied that the recommendation is reasonable, then the Director-General may amend the inversion class applying to the project under this approval.		
14.	<p>The Proponent shall ensure that blasting does not cause any exceedance of the criteria in Table 5.</p> <p>Residence on privately owned land</p> <ul style="list-style-type: none"> • 115dBL, Allowable exceedances: 5% of the total number of blasts in a 12 month period. • 120dBL at any time. • 5mm/s, Allowable exceedances: 5% of the total number of blasts in a 12 month period. • 10mm/s at any time. <p>All public infrastructure</p> <ul style="list-style-type: none"> • 50 mm/s at any time 	Yes	See Section 3.9.2 and Appendix 8 for details.
15.	The Proponent shall only carry out blasting on the site between 9 am and 5 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of the Director-General.	Yes	As per condition.
16.	<p>The Proponent may carry out a maximum of:</p> <p>(a) 1 blast a day; unless an additional blast is required following a blast misfire; and</p> <p>(b) 4 blasts a week, averaged over a calendar year, for the project.</p> <p>This condition does not apply to blasts that generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, or to blasts required to ensure the safety of the mine or its workers.</p>	Yes	See Section 3.9.2 and Appendix 8 for details.
17.	<p>If the Proponent receives a written request from the owner of any privately-owned land within 2 kilometres of the approved open-cut pit on site, for a property inspection to establish the baseline condition of any buildings and/or structures on his/her land, or to have a previous property inspection report updated, then within 2 months of receiving this request the Proponent shall:</p> <p>(a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties, to:</p> <p>(b) establish the baseline condition of any buildings and/or structures on the land, or update the previous property inspection report; and</p> <p>(c) identify any measures that should be implemented to minimise the potential blasting impacts of the project on these buildings and/or structures; and</p> <p>(d) give the landowner a copy of the new or updated property inspection report.</p> <p>If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Proponent or landowner disagrees with the findings of the independent property investigation, either party may refer the matter to the Director-General for resolution.</p>	Not yet applicable	No written requests received to date.
18.	If any owner of privately-owned land within 2 kilometres of blasting operations, or any other landowner nominated by the Director-General, claims that the buildings and/or structures on his/her land have been damaged as a result of blasting on site, then within 2 months of receiving this claim in writing from the landowner, the Proponent shall:	Not yet applicable	No claims made during reporting period.

Cond.	Conditional Requirement	Compliance	Comments
	<p>(a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties, to investigate the claim; and</p> <p>(b) give the landowner a copy of the property investigation report.</p> <p>If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent shall repair the damages to the satisfaction of the Director-General.</p> <p>If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Proponent or landowner disagrees with the findings of the independent property investigation, either party may refer the matter to the Director-General for resolution.</p>		
19.	<p>During mining operations on site, the Proponent shall:</p> <p>(a) implement best practice blasting management to:</p> <ul style="list-style-type: none"> protect the safety of people and livestock in the surrounding area; protect public or private infrastructure/property in the surrounding area from any damage; minimise the dust and fume emissions of any blasting; and minimise blasting impacts on heritage items in the vicinity of the site; <p>(b) co-ordinate the timing of blasting on site with the timing of blasting at other mines within the Leard Forest Mining Precinct to minimise the cumulative blasting impacts of the mines; and</p> <p>(c) operate a suitable system to enable the public to get up-to-date information on the proposed blasting schedule on site, to the satisfaction of the Director-General.</p>	Yes	As per condition.
20.	<p>The Proponent shall not undertake blasting on-site within 500 metres of:</p> <p>(a) any public road without the approval of Council; or</p> <p>(b) any land outside of the site not owned by the Proponent, unless:</p> <ul style="list-style-type: none"> the Proponent has a written agreement with the relevant landowner to allow blasting to be carried out closer to the land, and the Proponent has advised the Department in writing of the terms of this agreement; or the Proponent has: <ul style="list-style-type: none"> demonstrated that the blasting can be carried out closer to the land without compromising the safety of the people or livestock on the land, or damaging the buildings and/or structures on the land; and updated the Blast Management Plan to include the specific measures that would be implemented while blasting is being carried out within 500 metres of the land, <p>to the satisfaction of the Director-General.</p>	Not yet applicable	No blasting undertaking within 500m of any public road or land outside of the site not owned by Tarrawonga Joint Venture.
21.	<p>The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Director-General. This plan must:</p> <p>(a) be submitted to the Director-General for approval by the end of May 2013; <i>(further details in condition)</i></p>	Yes	Blast Management Plan prepared in accordance with all requirements of this condition and submitted for approval prior to the end of May 2013. Approval expected during next reporting period.

Cond.	Conditional Requirement	Compliance	Comments																							
22.	Unless otherwise authorised by an EPL, the Proponent shall ensure that no offensive odours are emitted from the site, as defined under the POEO Act.	Yes	As per condition.																							
23.	The Proponent shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site to the satisfaction of the Director-General.	Yes	As per condition.																							
24.	<p>The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are implemented so that particulate matter emissions generated by the project do not cause exceedances of the criteria in Table 6, Table 7 and Table 8 at any residence on privately-owned land or on more than 25 percent of any privately-owned land.</p> <p>The assessment acknowledges that it may not be reasonable and feasible to prevent exceedance of the PM10 criteria in Table 6 at property 45 and exceedance of the criteria in Table 7 in year 16 at property 49. (To interpret the property locations referred to see the applicable figure(s) in Appendix 5.)</p> <p><i>Table 6: Long-term criteria for particulate matter</i></p> <table><tr><th>Pollutant</th><th>Averaging Period</th><th>^d Criterion</th></tr><tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td>^a 90 µg/m³</td></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>Annual</td><td>^a 30 µg/m³</td></tr></table> <p><i>Table 7: Short-term criteria for particulate matter</i></p> <table><tr><th>Pollutant</th><th>Averaging Period</th><th>^d Criterion</th></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>24 hour</td><td>^a 50 µg/m³</td></tr></table> <p><i>Table 8: Long-term criteria for deposited dust</i></p> <table><tr><th>Pollutant</th><th>Averaging Period</th><th>Maximum increase in deposited dust level</th><th>Maximum total deposited dust level</th></tr><tr><td>^c Deposited dust</td><td>Annual</td><td>^b 2 g/m²/month</td><td>^a 4 g/m²/month</td></tr></table>	Pollutant	Averaging Period	^d Criterion	Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³	Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³	Pollutant	Averaging Period	^d Criterion	Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³	Pollutant	Averaging Period	Maximum increase in deposited dust level	Maximum total deposited dust level	^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month	Yes	No exceedances recorded on privately owned land.
Pollutant	Averaging Period	^d Criterion																								
Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³																								
Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³																								
Pollutant	Averaging Period	^d Criterion																								
Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³																								
Pollutant	Averaging Period	Maximum increase in deposited dust level	Maximum total deposited dust level																							
^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month																							
25.	The Proponent shall ensure that particulate matter emissions generated by the project do not exceed the criteria listed in Table 9 (24 hr PM ₁₀ : 50µg/m ³) at any residence on privately-owned land or on more than 25 percent of any privately-owned land, except on property 49 in year 16.	Yes	As per condition.																							
26.	<p>If particulate matter emissions generated by the project exceed the criteria, or contribute to an exceedance of the relevant cumulative criteria, in Table 10, Table 11 or Table 12, at any residence on privately-owned land or on more than 25 percent of any privately-owned land, then upon receiving a written request for acquisition from the landowner the Proponent shall acquire the land in accordance with the procedures in conditions 8 and 9 of schedule 4.</p> <p><i>Table 10: Long term land acquisition criteria for particulate matter</i></p> <table><tr><th>Pollutant</th><th>Averaging period</th><th>^d Criterion</th></tr><tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td>^a 90 µg/m³</td></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>Annual</td><td>^a 30 µg/m³</td></tr></table> <p><i>Table 11: Short term land acquisition criteria for particulate matter</i></p> <table><tr><th>Pollutant</th><th>Averaging period</th><th>^d Criterion</th></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>24 hour</td><td>^a 150 µg/m³</td></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>24 hour</td><td>^b 50 µg/m³</td></tr></table> <p><i>Table 12: Long term land acquisition criteria for deposited dust</i></p>	Pollutant	Averaging period	^d Criterion	Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³	Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³	Pollutant	Averaging period	^d Criterion	Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 150 µg/m ³	Particulate matter < 10 µm (PM ₁₀)	24 hour	^b 50 µg/m ³	Not yet applicable	No written requests received to date.					
Pollutant	Averaging period	^d Criterion																								
Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³																								
Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³																								
Pollutant	Averaging period	^d Criterion																								
Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 150 µg/m ³																								
Particulate matter < 10 µm (PM ₁₀)	24 hour	^b 50 µg/m ³																								

Cond.	Conditional Requirement				Compliance	Comments
	Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level		
	^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month		
27.	<p>The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are implemented so that particulate matter emissions generated by the project do not exceed the criteria in Table 6, Table 7 and Table 8 at any occupied residence on any mine-owned land (including land owned by adjacent mines), unless:</p> <ul style="list-style-type: none"> (a) the tenant and/or landowner has been notified of any health risks in accordance with the notification requirements under schedule 4 of this approval; (b) the tenant on project-related land can terminate the tenancy agreement without penalty, subject to giving reasonable notice, and the Proponent uses its best endeavours to provide assistance with relocation and sourcing of alternative accommodation; (c) air mitigation measures such as air filters, a first flush roof water drainage system and/or air conditioning) are installed at the residence, if requested by the tenant and landowner (where owned by another mine other than the Proponent); (d) particulate matter air quality monitoring is undertaken to inform the tenant and landowner of potential health risks; and (e) monitoring data is presented to the tenant in an appropriate format, for a medical practitioner to assist the tenant in making an informed decision on the health risks associated with occupying the property, <p>to the satisfaction of the Director-General.</p>				Yes	Notifications made as required.
28.	<p>The Proponent shall:</p> <ul style="list-style-type: none"> (a) implement best practice management to minimise the off-site odour, fume and dust emissions of the project; (b) operate a comprehensive air quality management system on site that uses a combination of predictive meteorological forecasting, predictive and real time air dispersion modelling and real-time air quality monitoring data to guide the day-to-day planning of mining operations and implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this approval; (c) manage PM2.5 levels in accordance with any requirements of an EPL; (d) minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see note d under Table 8); (e) minimise any visible off-site air pollution; (f) minimise the surface disturbance of the site generated by the project; and (g) co-ordinate the air quality management on site with the air quality management at other mines within the Leard Forest Mining Precinct to minimise the cumulative air quality impacts of the mines, <p>to the satisfaction of the Director-General.</p>				Yes	As per condition.
29.	<p>The Proponent shall prepare and implement an Air Quality and Greenhouse Gas Management Plan for the project to the satisfaction of the Director-General. This plan must:</p> <ul style="list-style-type: none"> (a) be prepared in consultation with the EPA and be submitted to the Director-General for approval by the end of May 2013; <p>(further details in condition)</p>					AQGGMP prepared in accordance with all requirements of this condition and submitted for approval prior to the end of May 2013. Approval expected in the next

Cond.	Conditional Requirement	Compliance	Comments									
			reporting period.									
30.	For the life of the project, the Proponent shall ensure that there is a meteorological station in the vicinity of the site that: (a) complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline; and (b) is capable of continuous real-time measurement of temperature lapse rate in accordance with the NSW Industrial Noise Policy, unless a suitable alternative is approved by the Director-General following consultation with the EPA.	Yes	As per condition.									
31.	The Proponent shall ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of mining operations on site to match its available water supply, to the satisfaction of the Director-General.	Yes	As per condition.									
32.	The Proponent shall provide a compensatory water supply to any owner of privately-owned land whose water supply is adversely and directly impacted (other than a negligible impact) as a result of the project, in consultation with NOW, and to the satisfaction of the Director-General. The compensatory water supply measures must provide an alternative long-term supply of water that is equivalent to the loss attributed to the project. Equivalent water supply should be provided (at least on an interim basis) within 24 hours of the loss being identified. If the Proponent and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution. If the Proponent is unable to provide an alternative long-term supply of water, then the Proponent shall provide alternative compensation to the satisfaction of the Director-General.	Not yet applicable	No compensatory water supply required to date.									
33.	The Proponent shall ensure that all surface water discharges from the site comply with the discharge limits (both volume and quality) set for the project in any EPL.	Yes	See Section 3.3.2 for details.									
34 - 38	Conditions relating to Goonbri Creek Diversion and Low Permeability Barrier.	Not yet applicable	Not proposed until later in the mine life.									
39.	The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director-General. This plan must: (a) be prepared in consultation with OEH, NOW and Namoi CMA, by suitably qualified and experienced person/s whose appointment has been approved by the Director-General, (b) be submitted to the Director-General for approval by the end of May 2013; <i>(further details in condition)</i>	Yes	WMP prepared in accordance with all requirements of this condition and submitted for approval in May 2013. Approval expected during next reporting period.									
40.	<p>The Proponent shall implement the biodiversity offset strategy described in the EA, summarised in Table 14 and shown conceptually in Appendix 7, to the satisfaction of the Director-General.</p> <p><i>Table 1: Summary of the biodiversity offset strategy</i></p> <table><tr><th>Area</th><th>Offset Type</th><th>Minimum Size (hectares)</th></tr><tr><td>Willeroi Offset Area</td><td>Existing native vegetation to be enhanced, and additional native vegetation to be established with the restoration of at least 193 ha of Box Gum Woodland EEC, as listed under the TSC Act</td><td>1,660</td></tr><tr><td>Rehabilitation Area</td><td>Native woodland vegetation communities to be re-established, focused on Box Gum Woodland EEC</td><td>752</td></tr></table>	Area	Offset Type	Minimum Size (hectares)	Willeroi Offset Area	Existing native vegetation to be enhanced, and additional native vegetation to be established with the restoration of at least 193 ha of Box Gum Woodland EEC, as listed under the TSC Act	1,660	Rehabilitation Area	Native woodland vegetation communities to be re-established, focused on Box Gum Woodland EEC	752	Not Yet Applicable	Currently awaiting approval to the Management Plan to enable active implementation of the strategy as defined in the EA.
Area	Offset Type	Minimum Size (hectares)										
Willeroi Offset Area	Existing native vegetation to be enhanced, and additional native vegetation to be established with the restoration of at least 193 ha of Box Gum Woodland EEC, as listed under the TSC Act	1,660										
Rehabilitation Area	Native woodland vegetation communities to be re-established, focused on Box Gum Woodland EEC	752										

Cond.	Conditional Requirement	Compliance	Comments
41.	The Proponent shall contribute to the funding and preparation of the Leard Forest Mining Precinct Regional Biodiversity Strategy, as required under the approvals for the Boggabri coal mine and Maules Creek coal mine, to the satisfaction of the Director-General. <i>(further details in condition)</i>	Not Yet Applicable	Preparation has commenced on development of the strategy, and Tarrawonga contributes as required. Completion expected during next reporting period.
42.	Within 6 months of the approval of Stage 2 of the Leard Forest Mining Precinct Regional Biodiversity Strategy the Proponent shall review, and if necessary revise, the biodiversity offset strategy for the project to the satisfaction of the Director-General. The review/revision must: (a) be prepared in consultation with OEH, Namoi CMA, Forests NSW, the CCC, DPI Catchments and Lands and SEWPaC; (b) not reduce the size or quality of the offset area; and (c) be consistent (as far as is possible) with the recommendations and objectives of the Leard Forest Mining Precinct Regional Biodiversity Strategy.	Not yet applicable	
43.	For the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland Endangered Ecological Community the Proponent shall: (a) ensure that the Biodiversity Offset Strategy and site Rehabilitation Strategy is focused on protection rehabilitation, re-establishment and long-term maintenance of viable stands of this community; (b) investigate in consultation with OEH and the Namoi CMA, all factors likely to enhance or impede the effective long term restoration of degraded remnants of this EEC in offset areas or regeneration of this EEC on disturbed areas (both offset areas and the site); (c) within 24 months of the date of this approval (and if possible in conjunction with Stage 2 of the Leard Forest Mining Precinct Regional Biodiversity Strategy), submit a report of this investigation and provide an implementation plan to maximise the prospects for rehabilitation and regeneration of this EEC on the offset areas and the site, for approval by the Director-General; and (d) incorporate the approved implementation plan into the revised Biodiversity Management Plan, required under condition 48.	Yes – 43 (a) and (b) Not yet applicable 43 (c) and (d)	As per condition.
44.	For all threatened species on site, the Proponent shall ensure that the Biodiversity Offset Strategy and Rehabilitation Strategy are focused on protection, rehabilitation and long-term maintenance of viable stands of suitable habitat for these species.	Not Yet Applicable	Awaiting approval of Strategies to enable implementation to commence.
45.	The Proponent shall: (a) investigate, in consultation with OEH and the Namoi CMA, all factors likely to enhance or impede the effective long term provision of suitable habitat(s) for the following species: Speckled Warbler, Brown Treecreeper, Grey-crowned Babbler, Hooded Robin, Varied Sittella, Turquoise Parrot, Masked Owl, Yellow-bellied Sheath Tail Bat and Squirrel Glider; (b) within 12 months of the date of this approval (and if possible, in conjunction with Stage 2 of the Leard Forest Mining Precinct Regional Biodiversity Strategy), submit a report of this investigation and provide an implementation plan to ensure delivery of suitable areas of viable habitat for the species included in (a) above, for approval by the Director-General; and (c) incorporate the approved implementation plan into the revised Biodiversity Management Plan, required under condition 48.	Yes – 45 (a) and (b) 45 (c) Not yet applicable	As per condition.
46.	The Proponent shall make suitable arrangements to provide appropriate long-term security for the offset areas:	Not Yet	

Cond.	Conditional Requirement	Compliance	Comments
	<p>(a) for the Willeroi Offset Area the long-term security shall be provided by way of:</p> <ul style="list-style-type: none"> the Proponent entering into a conservation agreement or agreements pursuant to section 69B of the National Parks and Wildlife Act 1974, recording the obligations assumed by the Proponent under the conditions of this approval in relation to these offset areas, and registering the agreement(s) pursuant to section 69F of the National Parks and Wildlife Act 1974 ; or a tenure of higher conservation status such as a National Park, or Nature Reserve, under the National Parks and Wildlife Act 1974, The conservation agreement(s) must be registered by the end of December 2013 unless agreed otherwise by the Director-General after consultation with OEH. The conservation agreements must remain in force in perpetuity; and <p>(b) by the end of December 2030 unless otherwise agreed by the Director-General, for the woodland to be established in the Rehabilitation Area, as identified in Table 14, to the satisfaction of the Director-General.</p>	Applicable	
47.	<p>The Proponent shall prepare and implement a Biodiversity Management Plan for the project to the satisfaction of the Director-General. This plan must:</p> <p>(a) be prepared in consultation with OEH, SEWPaC, Forests NSW, the CCC, DPI Catchments and Lands and the Namoi CMA, and be submitted to the Director-General for approval by the end of May 2013;</p> <p><i>(further details in condition)</i></p>	Yes	Biodiversity Management Plan prepared in accordance with all requirements of this condition and submitted for approval in May 2013. Approval expected during the next reporting period.
48.	<p>The Proponent shall review and if necessary revise the Biodiversity Management Plan within 6 months of the completion of Stage 2 of the Leard Forest Mining Precinct Regional Biodiversity Strategy, to the satisfaction of the Director-General. The review/revision must:</p> <p>(a) be prepared in consultation with OEH, SEWPaC, Forests NSW, the CCC, DPI Catchments and Lands and the Namoi CMA;</p> <p>(b) be consistent with the findings of Leard Forest Mining Precinct Regional Biodiversity Strategy; and</p> <p>(c) include any implementation plans arising from the studies required under conditions 43 and 45 of this approval.</p>	Not Yet Applicable	
49.	<p>By the end of May 2013, the Proponent shall lodge a Conservation and Biodiversity Bond with the Department to ensure that the biodiversity offset strategy is implemented in accordance with the performance and completion criteria of the Biodiversity Management Plan. The sum of the bond shall be determined by:</p> <p>(a) calculating the full cost of implementing the biodiversity offset strategy (other than land acquisition costs); and</p> <p>(b) employing a suitably qualified quantity surveyor to verify the calculated costs,</p> <p>to the satisfaction of the Director-General.</p> <p>If the offset strategy is completed generally in accordance with the completion criteria in the Biodiversity Management Plan to the satisfaction of the Director-General, the Director-General will release the bond.</p> <p>If the offset strategy is not completed generally in accordance with the completion criteria in the Biodiversity Management Plan, the Director-General will call in all, or part of, the conservation bond, and arrange for the satisfactory completion of the relevant works.</p> <p>With the agreement of the Director-General, this bond may be combined with rehabilitation security deposit administered by DRE.</p>	No	Bond not yet lodged on basis that the management plan has not been approved. Once the management plan is approved, it can be relevantly costed and arrangements made for lodgement of a bond.

Cond.	Conditional Requirement	Compliance	Comments
50.	By the end of June 2014 and every 3 years thereafter, unless both the Director-General and OEH agree to a different timeframe, the Proponent shall commission suitably qualified, experienced and independent person/s, whose appointment has been approved by the Director-General, to undertake an audit of the revegetation of the rehabilitation area and management and restoration within the Biodiversity Offset Strategy areas to the satisfaction of the Director-General. <i>(condition details what audit must involve)</i>	Not yet applicable	To be undertaken during next reporting period.
51.	The Proponent shall prepare and implement an Aboriginal Heritage Conservation Strategy for the project and the Biodiversity Offset Strategy areas to the satisfaction of the Director-General. This Strategy must enhance and conserve the Aboriginal cultural heritage values (both cultural and archaeological) and provide for their long-term protection and management. <i>(condition details what strategy must involve)</i>	Not Yet Applicable	Will be submitted for approval during next reporting period.
52.	The Proponent shall prepare and implement a Heritage Management Plan for the project to the satisfaction of the Director-General. <i>(further details in condition)</i>	Yes	Heritage Management Plan prepared in accordance with all requirements of this condition. Approval received 12 February 2014.
53.	The Proponent shall: (a) construct the Goonbri Road realignments and associated mine access road intersection, Goonbri Road/private coal haulage road intersection and the Goonbri Road/Dripping Rock Road/Blair Athol Lane intersection as shown conceptually in the EA; and (b) install appropriate advance warning signs and lighting on Goonbri Road, the private coal haulage road at the intersection of the Northern Site Access Road, to the satisfaction of Council.	Not yet applicable	Road realignments not yet required.
54.	Whilst coal transport by road is permitted under this approval, the Proponent shall ensure that: (a) trucks travelling to and from the site do not exceed 40 kilometres per hour in the vicinity of the school bus when it is operating on Hoad Lane, unless an alternative protocol is agreed by the Director-General; and (b) spillage from coal haulage vehicles is minimised and promptly managed.	Yes	As per condition.
55.	During mining operations, the Proponent shall continue to implement road maintenance agreements with Narrabri Shire Council and Gunnedah Shire Council for the maintenance of the public roads affected by the project to the satisfaction of the respective Council. If there is any dispute in relation to these agreements, then any of the parties may refer the matter to the Director-General for resolution.	Yes	Road maintenance agreements in place.
56.	The Proponent shall: (a) keep records of the: <ul style="list-style-type: none"> amount of coal and gravel transported from the site (on a monthly basis); and date and time of each train movement on the Boggabri rail spur line generated by the project; and (b) make these records available on its website at the end of each calendar year.	Yes	Records kept and made available on the website at the end of each calendar year.
57.	The Proponent shall: (a) implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the project; (b) ensure no outdoor lights shine above the horizontal; (c) wherever possible, ensure that mobile equipment is	Yes	As per condition.

Cond.	Conditional Requirement	Compliance	Comments
	<p>appropriately designed and/or retrofitted to prevent light being directed above the horizontal;</p> <p>(d) ensure that all external lighting associated with the project complies with Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting or its latest version;</p> <p>(e) provide for the establishment of trees and shrubs and/or the construction of mounding or bunding:</p> <ul style="list-style-type: none"> along the realigned Goonabri Road and access road to the mine site; along the services corridor to the Boggabri Coal Mine; around the water storage dams; and at other areas identified as necessary for the maintenance of satisfactory visual amenity; and <p>(f) ensure that the visual appearance of all buildings, structures, facilities or works (including paint colours and specifications) is aimed at blending as far as possible with the surrounding landscape,</p> <p>to the satisfaction of the Director-General.</p>		
58.	<p>Upon receiving a written request from the owner of any residence on privately-owned land which has, or would have, significant direct views of the mining operations and infrastructure on-site during the project, the Proponent shall implement additional visual impact mitigation measures (such as landscaping treatments or vegetation screens) to reduce the visibility of the mining operations and infrastructure from the residences on the privately-owned land.</p> <p>These mitigation measures must be reasonable and feasible, and must be implemented within a reasonable timeframe.</p> <p>If the Proponent and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.</p>	Not yet applicable	No written requests received to date.
59.	<p>The Proponent shall:</p> <p>(a) implement all reasonable and feasible measures to manage bushfire risks, including the suspension of activities that may have the potential to ignite a fire, during adverse conditions;</p> <p>(b) ensure that the project is suitably equipped to respond to any fires on site; and</p> <p>(c) assist the Rural Fire Service, Forests NSW, emergency services and National Parks and Wildlife Services as much as possible if there is a fire in the surrounding area.</p>	Yes	As per condition.
60.	<p>The Proponent shall:</p> <p>(a) implement all reasonable and feasible measures to minimise the waste (including coal reject) generated by the project;</p> <p>(b) ensure that the waste generated by the project is appropriately stored, handled and disposed of; and</p> <p>(c) monitor and report on the effectiveness of waste minimisation and management measures in the Annual Review.</p>	Yes	As per condition.
61.	<p>The Proponent shall rehabilitate the site to the satisfaction of the Executive Director Mineral Resources. This rehabilitation must be generally consistent with the proposed Rehabilitation Strategy described in the EA (and depicted conceptually in Appendix 8) and comply with the objectives in Table 15.</p> <p>(see condition for Table 15)</p>	Not yet applicable	
62.	<p>The Proponent shall, in consultation with the Namoi CMA:</p> <p>(a) develop a detailed soil management protocol that identifies procedures for:</p>	Not Yet Applicable	Tarrawonga will liaise with the Namoi CMA in relation to soil management requirements upon approval of the

Cond.	Conditional Requirement	Compliance	Comments
	<ul style="list-style-type: none"> comprehensive soil surveys prior to soil stripping; assessment of top-soil and sub-soil suitability for mine rehabilitation; and annual soil balances to manage soil handling including direct resspreading and stockpiling; <p>(b) maximise the salvage of suitable top-soils and sub-soils and biodiversity habitat components such as bush rocks, tree hollows and fallen timber for rehabilitation of disturbed areas within the site and for enhancement of biodiversity offset areas; and</p> <p>(c) ensure that coal reject, or any potentially acid forming interburden materials, are not emplaced at elevations in the pit shell where they may promote acid or sulphate species generation and migration beyond the pit shell.</p>		Rehabilitation Management Plan.
63.	The Proponent shall rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim rehabilitation strategies shall be employed when areas prone to dust generation cannot yet be permanently rehabilitated.	Yes	As per condition.
64.	The Proponent shall prepare and implement a Rehabilitation Management Plan to the satisfaction of the Executive Director, Mineral Resources. <i>(condition details what plan must include)</i>	Yes	Rehabilitation Management Plan prepared in accordance with all requirements of this condition and submitted by end of May 2013. Approval expected during next reporting period.
65.	The Proponent shall prepare and implement an updated Final Void and Mine Closure Plan (as a component of the overall Rehabilitation Management Plan required under condition 64 of schedule 3) to the satisfaction of the Executive Director Mineral Resources, following consultation with the Director-General. A draft plan must be prepared and submitted to the Executive Director Mineral Resources by the end of December 2019, and a final plan must be prepared and submitted to the Executive Director Mineral Resources by the end of December 2024. <i>(condition details what plan must include)</i>	Not yet applicable	
66.	The Proponent shall use its best endeavours to ensure that the agricultural productivity and production of non-operational project-related land is maintained or enhanced.	Not Yet Applicable	To be addressed in establishment of Farm Management Plan.
Schedule 4 – Additional procedures			
1.	<p>Within 3 months of the date of this approval, the Proponent shall:</p> <p>(a) notify in writing the owners of:</p> <ul style="list-style-type: none"> the land listed in Table 1 of schedule 3 that they have the right to require the Proponent to acquire their land in accordance with the procedures in conditions 8 and 9 below at any stage during the project; any residence on the land listed in Table 1 of schedule 3 that they have the right to request the Proponent to ask for additional noise and/or air quality mitigation measures to be installed at their residence at any stage during the project; and any privately-owned land within 2 kilometres of the approved open-cut mining pit/s that they are entitled to ask for a property inspection, to establish the baseline condition of any buildings or structures on their land, or to have a previous property inspection report updated; <p>(b) notify the tenants of any mine-owned land of their rights under this approval; and</p>	Yes	Notifications made as required.

Cond.	Conditional Requirement	Compliance	Comments
	(c) send a copy of the NSW Health fact sheet entitled “Mine Dust and You” (as may be updated from time to time) to the owners and/or existing tenants of any land (including mine-owned land) where the predictions in the EA identify that dust emissions generated by the project are likely to be greater than the relevant air quality criteria in schedule 3 at any time during the life of the project.		
2.	<p>Prior to entering into any tenancy agreement for any land owned by the Proponent that is predicted to experience exceedances of the recommended dust and/or noise criteria, or for any of the land listed in Table 1 that is subsequently purchased by the Proponent, the Proponent shall:</p> <p>(a) advise the prospective tenants of the potential health and amenity impacts associated with living on the land, and give them a copy of the NSW Health fact sheet entitled “Mine Dust and You” (as may be updated from time to time);</p> <p>(b) advise the prospective tenants of the rights they would have under this approval; and</p> <p>(c) request the prospective tenants consult their medical practitioner to discuss the air quality monitoring data and predictions and health impacts arising from this information, to the satisfaction of the Director-General.</p>	Yes	Notifications made as required.
3.	<p>As soon as practicable after obtaining monitoring results showing:</p> <p>(a) an exceedance of the relevant criteria in schedule 3, the Proponent shall notify the affected landowner in writing of the exceedance, and provide regular monitoring results to the landowner until the project is complying with the relevant criteria again; and</p> <p>(b) (b)an exceedance of the relevant air quality criteria schedule 3, the Proponent shall send to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land) a copy of:</p> <ul style="list-style-type: none"> the NSW Health fact sheet entitled “Mine Dust and You” (as may be updated from time to time); and the monitoring data, in an appropriate format so that a medical practitioner can assist the resident in making an informed decision on the health risks associated with occupation of the property. 	Not Yet Applicable	No exceedances identified during period.
4.	<p>If an owner of privately-owned land considers the project to be exceeding the criteria in schedule 3 at his/her land, then he/she may ask the Director-General in writing for an independent review of the impacts of the project on his/her land. (further details in condition)</p>	Not yet applicable	No requests received to date.
5.	<p>If the independent review determines that the project is complying with the relevant criteria in schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General. (further details in condition)</p>	Not yet applicable	No independent reviews to date.
6.	<p>If the independent review determines that the relevant criteria are being exceeded, but that more than one mine is responsible for this exceedance, then together with the relevant mine/s the Proponent shall:</p> <p>(a) implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent expert, and conduct further monitoring until there is compliance with the relevant criteria; or</p> <p>(b) secure a written agreement with the landowner and other relevant mine/s to allow exceedances of the relevant impact assessment criteria, to the satisfaction of the Director-General.</p>	Not yet applicable	No independent reviews to date.

Cond.	Conditional Requirement	Compliance	Comments
	<i>(further details in condition)</i>		
7.	<p>If a person has good reason to believe the Proponent is not implementing the biodiversity and/or heritage conditions in schedule 3 satisfactorily, then he/she may ask the Director-General in writing for an independent review of the matter.</p> <p>If the Director-General is satisfied that an independent review is warranted, then within 2 months of the Director-General's decision, the Proponent shall:</p> <p>(a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to:</p> <ul style="list-style-type: none"> consult with the person and/or any relevant agencies; investigate the person's complaints/claims; review the environmental performance of the Proponent; determine whether the Proponent's performance is satisfactory or not; and if necessary recommend measures to improve the Proponent's performance; and <p>(b) give the Director-General and complainant a copy of the independent review.</p>	Not yet applicable	No requests received to date.
8.	<p>Within 3 months of receiving a written request from a landowner with acquisition rights, the Proponent shall make a binding written offer to the landowner based on:</p> <p>(a) the current market value of the landowner's interest in the land at the date of the written request, as if the land was unaffected by the project, having regard to the:</p> <ul style="list-style-type: none"> existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and presence of improvements on the land and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of the additional mitigation measures required under condition 2 of schedule 3; <p>(b) the reasonable costs associated with:</p> <ul style="list-style-type: none"> relocating within the Tamworth, Narrabri, Gunnedah or Moree local government areas, or to any other local government area as agreed by the Director-General; and obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is to be acquired; and <p>(c) reasonable compensation for any disturbance caused by the land acquisition process.</p> <p><i>(further details in condition)</i></p>	Not yet applicable	No requests received to date.
9.	The Proponent shall pay all reasonable costs associated with the land acquisition process described in condition 5 above, including the costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of this plan at the Office of the Registrar-General.	Not yet applicable	No requests received to date.
Schedule 5 – Environmental Management, Reporting and Auditing			
1.	<p>The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General.</p> <p><i>(condition details what strategy must include)</i></p>	Yes	Environmental Management Strategy prepared in accordance with all requirements of this condition and submitted by end of May 2013. Approval expected

Cond.	Conditional Requirement	Compliance	Comments
			during next reporting period.
2.	<p>The Proponent must assess and manage project-related risks to ensure that there are no exceedences of the criteria and/or performance measures in schedule 3. Any exceedence of these criteria and/or performance measures constitutes a breach of this approval and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.</p> <p>Where any exceedence of these criteria and/or performance measures has occurred, the Proponent must at the earliest opportunity:</p> <ul style="list-style-type: none"> (a) take all reasonable and feasible steps to ensure that the exceedence ceases and does not reoccur; (b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other courses of action; and (c) implement remediation measures as directed by the Director-General, <p>to the satisfaction of the Director-General.</p>	Yes	As per condition.
3.	<p>The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:</p> <ul style="list-style-type: none"> (a) detailed baseline data; (b) a description of: <ul style="list-style-type: none"> • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria; (d) a program to monitor and report on the: <ul style="list-style-type: none"> • impacts and environmental performance of the project; • effectiveness of any management measures (see c above); (e) a contingency plan to manage any unpredicted impacts and their consequences; (f) a program to investigate and implement ways to improve the environmental performance of the project over time; (g) a protocol for managing and reporting any: <ul style="list-style-type: none"> • incidents; • complaints; • non-compliances with statutory requirements; and • exceedences of the impact assessment criteria and/or performance criteria; and (h) a protocol for periodic review of the plan. 	Yes	As per condition.
4.	<p>By the end of June each year (or as otherwise agreed by the Director-General), the Proponent shall review the environmental performance of the project for the previous calendar year to the satisfaction of the Director-General. This review must:</p> <ul style="list-style-type: none"> (a) describe the development (including any rehabilitation) that was carried out in the past calendar year, and the development that is proposed to be carried out over the current calendar year; 	Yes	As per condition.

Cond.	Conditional Requirement	Compliance	Comments
	<p>(b) include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the:</p> <ul style="list-style-type: none"> relevant statutory requirements, limits or performance measures/criteria; monitoring results of previous years; and relevant predictions in the EA; <p>(c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;</p> <p>(d) identify any trends in the monitoring data over the life of the project;</p> <p>(e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and</p> <p>(f) describe what measures will be implemented over the next year to improve the environmental performance of the project.</p>		
5.	<p>Within 3 months of the submission of an:</p> <p>(a) annual review under condition 4 above;</p> <p>(b) incident report under condition 8 below;</p> <p>(c) audit under condition 10 below; or</p> <p>(d) any modification to the conditions of this approval,</p> <p>the Proponent shall review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Director-General.</p>	Not yet applicable	
6.	In conjunction with the owners of the nearby mines in the Leard Forest Mining Precinct, the Proponent shall use its best endeavours to minimise the cumulative impacts of the project on the surrounding area, to the satisfaction of the Director-General.	Yes	Cumulative monitoring programs being developed to minimise impacts on surrounding area.
7.	<p>The Proponent shall establish and operate a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General. This CCC must be operated in general accordance with the Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects (Department of Planning, 2007, or its latest version), and be operating by the end of May 2013.</p> <p>The CCC must seek to include joint membership with CCCs for other operating coal mines within the Leard Forest Mining Precinct, unless otherwise agreed by the Director-General.</p>	Yes	CCC has been operating since 2006. Independent chair appointed for all three complex mines and some members are on more than one CCC.
8.	The Proponent shall notify, at the earliest opportunity, the Director-General and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the project, the Proponent shall notify the Director-General and any other relevant agencies as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent shall provide the Director-General and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.	Not applicable	No notifiable incidents during the reporting period.
9.	The Proponent shall provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval.	Yes	Website updated at least monthly.
10.	By the end of June 2014 and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. (condition details what audit must involve)	Not yet applicable	IEA to be undertaken during next reporting period.
11.	Within 3 months of commissioning this audit, or as otherwise	Not yet	

Cond.	Conditional Requirement	Compliance	Comments
	agreed by the Director-General, the Proponent shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.	applicable	
12.	<p>The Proponent shall:</p> <p>(a) within 3 months of the date of this approval, make the following information publicly available on its website:</p> <ul style="list-style-type: none"> the EA; all current statutory approvals for the project; approved strategies, plans and programs required under the conditions of this approval; a comprehensive summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval; a complaints register, which is to be updated on a monthly basis; minutes of CCC meetings; the last five annual reviews; any independent environmental audit, and the Proponent's response to the recommendations in any audit; any other matter required by the Director-General; and <p>(b) keep this information up to date, to the satisfaction of the Director-General.</p>	Yes	As per condition.
13.	<p>The Proponent shall, within 3 months of the date of this approval:</p> <p>(c) make the following information for the project publicly available on its website, on a daily basis and in a clearly understandable form:</p> <ul style="list-style-type: none"> daily weather forecasts for the coming week; proposed operational responses to these weather forecasts; real-time noise and air quality monitoring data (subject to any necessary caveats); and any operational responses that were taken in response to the noise and air quality monitoring data, and <p>(d) make provision on its website for the provision of on-line and/or email comments by members of the community regarding this information, to the satisfaction of the Director-General.</p>	Yes	As per condition.

TABLE A3.2

Compliance Review – Environment Protection Licence 12365

Condition	Conditional Requirement	Compliance	Comments
A1.1	Carry out coal mining at specified premises at a scale not exceeding >500 000 – 2 000 000t.	No	ROM coal production in 2013/2014 reporting period totalled 2,136,045t.
A3.1	Carry out works and activities in accordance with proposal contained in licence application.	Yes	Activities carried out in accordance with EA which accompanied licence application and subsequent licence variation applications.
L1.1	Comply with Section 120 of the POEO Act 1997 (re water quality).	Yes	As per condition.
L2	Comply with concentration limits: Oil & Grease 10 mg/L pH 6.5 – 8.5 TSS 50 mg/L TSS concentration limit may be exceeded for discharge provided rainfall measured exceeds 38.4mm over any consecutive 5 day immediately prior to discharge and all measures have been implemented to dewater all sediment dams within 5 days of rainfall such that they have sufficient capacity to store runoff from a 38.4mm, 5 day rainfall event.	Yes	See Section 3.3.2.
L3	Ensure no waste receipt or disposal at premises, except as permitted by licence.	Yes	No unauthorised waste received or disposed of at site.
L4.1	Ensure noise compliance: (a) $L_{Aeq(15min)}$ criterion of 40dB(A) during construction period; (b) $L_{Aeq(15min)}$ criterion of 35dB(A) during operational stage; and (c) $L_{A1(1min)}$ criterion of 45dB(A) at night.	Yes	Exceedances at “Tarrawonga”. See Section 3.10.3. As property had acquisition rights – noise criteria did not apply.
L4.3	Noise to be measured at any residence not on the premises to determine compliance	Yes	Noise levels monitored at residences as identified and approved in the Noise Management Plan. See Appendix 9 for details.

Condition	Conditional Requirement	Compliance	Comments
L5.1 and L5.2	<p>Airblast overpressure from blasting in or on the premises must not exceed:</p> <ul style="list-style-type: none"> • 115dB(Lin Peak) for more than 5% of total number of blasts over reporting period; and • 120dB(Lin Peak) at any time. <p>At any point within 30 metres of any non-project related residential building.</p>	Yes	As per condition. See Appendix 8.
L5.3 and L5.4	<p>Ground vibration peak particle velocity from blasting operations must not exceed:</p> <ul style="list-style-type: none"> • 5mm/s for more than 5% of the total number of blasts during the reporting period; and • 10mm/s at any time. 	Yes	As per condition. See Appendix 8.
L5.5	Blasting operations on the premises must only be carried out between the hours of 9am to 5pm, Monday to Saturday, inclusive.	Yes	As per condition. See Appendix 8.
L5.6	The hours of operation for blasting may be varied if the EPA, have regard to the effect that the proposed variation would have on the amenity of the residents in the locality, gives written consent to the variation.	Not Yet Applicable	
L5.7	Blasting at the premises is limited to 1 blast on each day on which blasting is permitted.	Yes	As per condition. See Appendix 8.
O1.1	<p>Carry out licensed activities in a competent manner, i.e.</p> <p>(a) processing, handling, movement and storage of materials and substances; and</p> <p>(b) treatment, storage, processing, reprocessing, transport and disposal of generated waste.</p>	Yes	As per condition.

Condition	Conditional Requirement	Compliance	Comments
O2.1	All plant and equipment installed at the premises or used in connection with the licensed activity must: (a) be maintained in a proper and efficient condition; and (b) be operated in a proper and efficient manner.	Yes	All plant and equipment is closely monitored and regularly serviced by Tarrawonga personnel.
O3.1	All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.	Yes	As per condition.
O3.2	Trucks transporting coal from the premises must be covered immediately after loading to prevent wind blown emissions and spillage. The covering must be maintained until immediately before unloading the trucks.	Yes	As per condition. All trucks are required to use tarpaulins in the transport of coal.
M1.1	Record and retain monitoring results required as per this licence.	Yes	Monitoring records documented in the AEMRs.
M1.2	Keep all monitoring records associated with this licence: (a) in a legible form; (b) for at least 4 years; for production to any EPA authorised officer.	Yes	Monitoring records documented in the AEMRs.
M1.3	Keep the following records in respect to samples required: (a) sampling date; (b) sampling time; (c) sampling location; and (d) sample collector's name.	Yes Yes Yes Yes	This information is held on chain-of-custody documentation compiled to accompany samples to the laboratory.
M2.1	Monitor the concentration of each pollutant specified using the sampling method, units and frequency specified.	Yes	Monitoring undertaken as required.
M3.1	Monitor air pollutants in accordance with the Approved Methods publication or as approved by EPA.	Yes	Test method used refer to the EPA approved publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW."
M3.2	Monitor pollutants discharged to waters in accordance with the Approved Methods publication or as approved by EPA.	Yes	Discharges are monitored in accordance with EPA requirements.

Condition	Conditional Requirement	Compliance	Comments
M4.1 and M4.2	Monitor weather parameters specified. The meteorological weather station must be maintained so as to be capable of continuously monitoring the parameters specified.	Yes	As per condition.
M5.1	Keep a legible record of all complaints re pollution arising from licenced activity.	Yes	Complaints register maintained by Environmental Officer.
M5.2	Keep the following records of complaints. (a) date and time of complaint; (b) method complaint made; (c) any personal details of complainant; (d) nature of complaint; (e) licensee's action in response, any follow-up contact; and (f) if no action – reason why.	Yes Yes Yes Yes Yes Yes	Complaints records are compiled in accordance with the condition.
M5.3	Keep records of complaints for 4 years.	Yes	All records have been kept to date.
M5.4	Present records to EPA upon request.	Yes	All records would be made available to the EPA upon request.
M6.1	Operate telephone complaints line for receipt of complaints from the public.	Yes	TCPL operates a complaints hotline on telephone No. 0429 497 730.
M6.2	Notify the public of the complaints telephone line number.	Yes	Complaints hotline advertised in local press and on Whitehaven website.
M7	Monitor noise and blasting parameters specified.	Yes	As per condition.
R1.1	Complete and supply Annual Return to EPA comprising: (a) Statement of Compliance; (b) Monitoring & Complaints Summary.	Yes	Annual return completed each year.
R1.5	Provide EPA with Annual Return no later than 60 days after end of each reporting period.	Yes	As per condition
R1.7	Retain copy of Annual Return for 4 years.	Yes	All annual returns kept on file.
R1.8	Certify the Statement of Compliance within the Annual Return and sign the Monitoring and Complaints Summary by: (a) licence holder; or (b) approved person.	Yes	Documents certified and signed by a Director and the Company Secretary.

Condition	Conditional Requirement	Compliance	Comments
R2.1	Notify EPA of threatening or harmful incidents as soon as practicable by phoning EPA's Pollution Line service.	Yes	No harmful incidents requiring notification during the reporting period.
R2.2	Provide written details of the incident to EPA within 7 days of incident.	Yes	No harmful incidents requiring notification during the reporting period.
R3.1	Upon an EPA officer suspecting that an event is causing or likely to cause environmental harm: (a) at the premises; or (b) in connection with vehicles or plant associated with the licenced activities; a request may be made for a written report of the event.	Not Applicable	No requests received by Tarrawonga Coal during reporting period.
R3.2	Tarrawonga Coal make inquiries in relation to the event and supply the report to the EPA within the time specified.	Not Applicable	No requests received by Tarrawonga Coal during reporting period.
R3.3	The report may be required to include: (a) event cause, time and duration; (b) type, volume and concentration of every pollutant discharged; (c) contact details of employees or agents of licensee who witnessed event; (d) contact details of any other persons witnessing the event; (e) the action taken and follow-up contact with complainants in relation to event; (f) mitigation measures proposed to prevent recurrence; (g) any other relevant matters.	Not Applicable	No requests received by Tarrawonga Coal during reporting period.
R3.4	EPA may request further details – must be supplied within specified time.	Not Applicable	No requests received by Tarrawonga Coal during reporting period.
R4.1	A noise compliance assessment must be submitted to the EPA within 30 days of the completion of quarterly noise monitoring.	Yes	Monitoring reports submitted within 30 days of being received by the noise consultants.

Condition	Conditional Requirement	Compliance	Comments
G1.1	Retain a copy of this licence at premises to which the licence applies.	Yes	Retained in the Tarrawonga Coal Site Office.
G1.2	Produce licence to EPA officer upon request.	Not Yet Applicable	Tarrawonga Coal personnel would produce the licence upon request.
G1.3	Make licence available for inspection by any employee or agent of licensee working at premises.	Yes	License is located in Tarrawonga Coal Site Office if required. Tarrawonga personnel would produce the licence upon request.
U1.1	The licensee must achieve and maintain a dust control efficiency of 80% or more on all active haul roads by 17 May 2013. Control efficiency calculation provided.	Yes	As per condition.
U1.2	The Licensee must prepare a Monitoring Program to assess its compliance with Condition U1.1 under varying meteorological conditions. Monitoring Program details specified in condition. Must be submitted by 31 May 2013.	Yes	Monitoring undertaken during reporting period.
U1.3	The Licensee must submit a written report to the EPA providing the results of the Monitoring Program. The report must include an assessment of the dust control effectiveness, dust levels and the Licensee's compliance with Condition U1.1. The report must be submitted by 15 August 2014.	Not Yet Applicable	PRP – Monitoring Results – Wheel Generated Dust during next reporting period as per condition.
U2.1	The Licensee must alter or cease the use of equipment on overburden and the loading and dumping of overburden during adverse weather conditions to minimise the generation of particulate matter from 22 March 2013.	Yes	As per condition.
U2.2	Licensee must undertake daily visual dust level assessments, continuously record PM ₁₀ levels and continuously measure and record real-time meteorological conditions; and Record any changes made to mining activities due to adverse weather conditions.	Yes	As per condition.

Condition	Conditional Requirement	Compliance	Comments
U2.3	The Licensee must submit a written report to the EPA providing the results of the Monitoring Program. The report must detail the following: weather conditions during which activities were ceased or altered; changes made to operational activities as a result of adverse weather; and resultant dust levels when activities were altered or ceased. Must be submitted by 15 August 2014.	Not Yet Applicable	
U3.1	The Licensee must submit a report documenting an investigation and trial of best practice measures for the control of particulate matter from the use of equipment on overburden and the loading and dumping of overburden. Best practice measures defined in condition. Report must be submitted by 14 April 2014.	Yes	Industry based response prepared for NSW Minerals Councils and submitted by Tarrawonga Coal in accordance with condition.

TABLE A3-3
Compliance Review – ML 1579

Relevant Condition	Conditional Requirement	Compliance	Comments
1	Service of notice on landholders of granting of mining lease.	Yes	All affected landholders were advised within the 3 months of the grant date.
2	Prepare and submit a MOP in accordance with DG's guidelines.	Yes	Initial MOP lodged with DMR and accepted on the 9 th May 2006. MOP amendment for Section 75W extension approved in October 2010. Revised MOP for Tarrawonga Extension area lodged May 2013; with MOP Amendment A approved in December 2013.
3	Submit AEMR to DG and prepare AEMR in accordance with DG's guidelines.	Yes	This document has been prepared in satisfaction with this condition. Content of AEMR follows guidelines.
5	Maintain at least 27 employees or expend not less than \$472,500 per year in mining operations	Yes	As per condition.
6	Comply with direction of Environmental Officer of Department.	Not Yet Applicable	No directions issued.
7	Provision of Exploration Report at each anniversary of grant of lease.	Yes	Exploration report supplied as required.
11(a)	Ground vibration from blasting must not exceed 10mm/s at any time, and must not exceed 5mm/s in more than 5% of the total number of blasts over a 12 month period.	Yes	See Appendix 8. No exceedances recorded.
11(b)	Peak Overpressure from blasting must not exceed 120dB at any time, and must not exceed 115dB in more than 5% of the total number of blasts over a 12 month period.	Yes	See Appendix 8. No exceedances recorded.
12	Operations must be carried out in such a way as to ensure the safety of persons or stock in the vicinity of operations	Yes	As per condition.
13(a)	Land disturbed is to be rehabilitated to a stable and permanent form in accordance with the MOP.	Yes	Current rehabilitation activities are in accordance with commitments identified in the MOP
13(b)	Topsoil is to be stored and maintained in a manner acceptable to the Director General.	Yes	Topsoil is stockpiled and seeded in accordance with commitments identified in the MOP.
14	Comply with directions issued by the Director-General regarding stabilisation and revegetation of mine residues, tailings or overburden dumps	Not Yet Applicable	No directions issued.
15(1)	Advise DNR Regional hydrogeologist of intention to drill exploration holes 28 days prior to commencement	Yes	As per condition.

Relevant Condition	Conditional Requirement	Compliance	Comments
15(2)	All exploration drill holes must be completed to the satisfaction of the Director General in relation to:- -adequate marking/survey -sealed to prevent collapse -sealed with cement plugs to prevent discharge of groundwaters -if meets gas, it is plugged to prevent escape -if meets artesian or sub-artesian flow is sealed to prevent contamination of aquifer -once no longer used, is sealed according to Department guidelines -once no longer used, the land is left in a clean, tidy and stable condition.	Yes	As per condition.
16	Operations must be carried out so as not to cause or aggravate air pollution, water pollution or soil contamination or erosion.	Yes	See Section 3.3.2 for details.
17	Operations must not interfere with transmission lines, pipelines or any other utility	Yes	As per condition.
18	Activities must not interfere with or damage fences, and gates must be closed or left open in accordance with landholder requirements.	Yes	As per condition.
19(a)	Operations must not affect any road unless in accordance with the MOP or written approval of Director General.	Yes	As per condition.
19(b)	Leaseholder must pay to the authority responsible for the road the cost incurred in fixing any damage to the roads caused by the operations.	Yes	Agreement in place with GSC and NSC.
20	Access tracks kept to a minimum and positioned so as not to cause unnecessary damage. Temporary tracks to be ripped, re-topsoiled and revegetated when no longer required.	Yes	As per condition.
21(a)	Trees must not be felled without the consent of the landholder who is entitled to the use of the timber.	Yes	As per condition.
21(b)	Trees must not be felled on the lease area except where it directly obstructs or prevents the carrying out of operations.	Yes	As per condition.
21(c)	Timber from Crown land within the lease area must not be used until all relevant approvals have been obtained.	Yes	As per condition.
23	Comply with direction of Director General if notice is issued with regard to resource recovery.	Not Yet Applicable	No notice issued.
25	Provision of Security of \$100,000 to the Minister to ensure fulfilment of lease conditions.	Yes	As per condition.

TABLE A3-3
Compliance Review – ML 1685

Relevant Condition	Conditional Requirement	Compliance	Comments
1	Service of notice on landholders of granting of mining lease.	Yes	All affected landholders were advised within the 3 months of the grant date.
2	Any disturbance relating to the activities under this lease must be rehabilitated to the satisfaction of the Minister	Yes	Current rehabilitation activities are in accordance with commitments identified in the MOP
3	Must comply with the approved MOP	Yes	As per condition
3(f)	Prepare to the satisfaction of the Minister and submit annually a Rehabilitation Report	Yes	As per condition
4	Must submit annually a Compliance Report to the satisfaction of the Minister. Must be submitted on the anniversary of the grant date of this lease each year.	Yes	As per condition
5(a)	Must notify the Department immediately of any and all breaches of this mining lease or breaches of the Act causing or threatening harm to the environment, and any breaches of environmental protection legislation.	Not applicable	No breaches of mining lease or act or environmental or environmental protection legislation
5(b)	Must submit an Environmental Incident Report to the Department within 7 days of any breach mentioned in 5(a)	No applicable	No environmental incidents during reporting period
5(c)	Must immediately advise the Department of any notification made under section 148 of the <i>Protection of the Environment Operations Act 1997</i>	No applicable	No notifications made
8	Provide and maintain a security deposit to the value of \$4,364,000	Yes	As per condition
9	Must make every reasonable attempt to enter into a cooperation agreement with the holders of any overlapping titles. Addressing, but not limited to: <ul style="list-style-type: none"> • Access arrangements • Operational interaction procedures • Dispute resolution • Information exchange • Well location • Timing of drilling • Potential resource extraction conflicts • Rehabilitation issues 	Yes	As per condition
10	Must submit a security review (in accordance with ESU guidelines and policy) within one month of the granting of the new mining lease.	Yes	As per condition

TABLE A3-3
Compliance Review – ML 1693

Relevant Condition	Conditional Requirement	Compliance	Comments
1	Service of notice on landholders of granting of mining lease.	Yes	All landholders were notified within 3 months
3	Prepare and submit a MOP in accordance with DG's guidelines.	Yes	As per condition. MOP Amendment B is proposed to be submitted to DRE during the next reporting period.
4	Submit AEMR annually or as directed to DG and prepare AEMR in accordance with DG's guidelines.	Yes	As per condition
5	An environmental incident report of any environmental incidents must be submitted within 24 hours.	Not Applicable	No environmental incidents during reporting period.
7	Any disturbance as a result of activities under this lease must be rehabilitated to the satisfaction of the DG.	Not Yet Applicable	
9(a)	Maintain at least 27 employees, or expend not less than \$297,500 per year in mining operations.	Yes	As per condition
10(a)	Ground vibration from blasting must not exceed 10mm/s at any time, and must not exceed 5mm/s in more than 5% of the total number of blasts over a 12 month period.	Yes	As per condition The maximum recorded ground vibration during the reporting period was 2.43mm/s.
10(b)	Peak Overpressure from blasting must not exceed 120dB at any time, and must not exceed 115dB in more than 5% of the total number of blasts over a 12 month period.	Yes	As per condition. There were no instances of blast results exceeding 120 dBL during this reporting period, and only one example of a blast exceeding 115dB.
11	Operations must be carried out in such a way as to ensure the safety of persons or stock in the vicinity of operations.	Yes	As per condition.
12	Prospecting operations must not cause or aggravate air or water pollution, soil contamination, or erosion, and must be carried out in accordance with the MOP.	Yes	See section 3 for details.
13	Operations must not interfere with transmission lines, pipelines or any other utility.	Yes	As per condition
14(a)	Leaseholder must pay to the authority responsible for the road the cost incurred in fixing any damage to the roads caused by the operations.	Yes	Agreement in place with GSC and NSC.
14(b)	Use of any road or track must be restricted in wet weather to minimise/prevent damage.	Yes	As per condition

Relevant Condition	Conditional Requirement	Compliance	Comments
14(c, d)	Access tracks kept to a minimum and positioned so as not to cause unnecessary damage. Temporary tracks to be ripped, re-topsoiled and revegetated when no longer required.	Yes	As per condition
15(a)	Trees must not be felled without the consent of the landholder who is entitled to the use of the timber.	Yes	As per condition. Compensation Agreement signed between Forestry NSW, Tarrawonga Coal Pty Ltd and Boggabri Coal Pty Ltd on 8 th March 2014.
15(b)	Timber from Crown land within the lease area must not be taken until all relevant approvals have been obtained.	Yes	As per condition
17	Comply with direction of Director General if notice is issued with regard to resource recovery.	Yes	As per condition
18	The lease holder must indemnify and keep indemnified the Crown from and against all actions, suits, claims and demands of whatsoever nature.	Yes	As per condition
23	The lease holder may not suspend mining operations other than in accordance with consent from the Minister.	Yes	As per condition
24	Must make every reasonable attempt to enter into a cooperation agreement with the holders of any overlapping titles. Addressing, but not limited to: <ul style="list-style-type: none"> • Access arrangements • Operational interaction procedures • Dispute resolution • Information exchange • Well location • Timing of drilling • Potential resource extraction conflicts • Rehabilitation issues 	Yes	As per condition

Appendix 4

DUST MONITORING RESULTS

TEMPLEMORE PM₁₀ HIGH VOLUME AIR SAMPLER

Site Templemore	Site Id EB4	Datum MGA	Zone 56	Easting 230706	Northing 6605640	
Date	mg/paper	µg/m ³	Annual Average	Annual Average Limit	24hr Limit	Comments
5/05/2007	78.1	49	49.00	30	50	
11/05/2007	23	14	31.50	30	50	
17/05/2007	16.9	11	24.67	30	50	
23/05/2007	14.3	9	20.75	30	50	
29/05/2007	26.5	17	20.00	30	50	
4/06/2007	7	4	17.33	30	50	
10/06/2007	3.4	2	15.14	30	50	
16/06/2007	1.9	1	13.38	30	50	
22/06/2007	0.1	0	11.89	30	50	
28/06/2007	0.3	0	10.70	30	50	
4/07/2007	5.6	4	10.09	30	50	
10/07/2007	4.9	3	9.50	30	50	
16/07/2007	11.7	7	9.31	30	50	
22/07/2007	9	5	9.00	30	50	
28/07/2007	10.4	6	8.80	30	50	
3/08/2007	8.5	5	8.56	30	50	
9/08/2007	13.7	14	8.88	30	50	
15/08/2007	30	18	9.39	30	50	
21/08/2007	2.6	2	9.00	30	50	
27/08/2007	5.2	3	8.70	30	50	
2/09/2007	18.8	12	8.86	30	50	
8/09/2007	4.1	3	8.59	30	50	
14/09/2007	41.2	27	9.39	30	50	
20/09/2007	48.9	32	10.33	30	50	
26/09/2007	46.2	30	11.12	30	50	
2/10/2007	51.8	33	11.96	30	50	
8/10/2007	39.4	25	12.44	30	50	
14/10/2007	32.4	20	12.71	30	50	
20/10/2007	46	29	13.28	30	50	
26/10/2007	44.9	29	13.80	30	50	
1/11/2007	13	13	13.77	30	50	
7/11/2007	3	3	13.44	30	50	
13/11/2007	11	11	13.36	30	50	
19/11/2007	12	12	13.32	30	50	
25/11/2007	8	8	13.17	30	50	
1/12/2007	5.5	4	12.92	30	50	
7/12/2007	14.9	10	12.84	30	50	
13/12/2007	14.1	9	12.74	30	50	
19/12/2007	14.7	10	12.67	30	50	
25/12/2007	19.2	12	12.65	30	50	
31/12/2007	22.3	15	12.71	30	50	
6/01/2008	25.7	17	12.81	30	50	
12/01/2008	37.2	25	13.09	30	50	
18/01/2008	25.3	17	13.18	30	50	
24/01/2008	32.4	21	13.36	30	50	
30/01/2008	47.9	32	13.76	30	50	
5/02/2008	13.3	9	13.66	30	50	
11/02/2008	18.7	12	13.63	30	50	
17/02/2008	9.6	6	13.47	30	50	
23/02/2008	62.5	42	14.04	30	50	
29/02/2008	7.1	5	13.86	30	50	
6/03/2008	41.1	27	14.12	30	50	
12/03/2008	48.4	32	14.45	30	50	
18/03/2008	33.9	22	14.59	30	50	
24/03/2008	35.6	24	14.76	30	50	
30/03/2008	27.8	18	14.82	30	50	
5/04/2008	27.9	18	14.88	30	50	
11/04/2008	17.2	11	14.81	30	50	
17/04/2008	17.2	11	14.75	30	50	
23/04/2008	1.9	1	14.52	30	50	
29/04/2008	4.9	3	14.33	30	50	
5/05/2008	41.3	26	13.95	30	50	
11/05/2008	12.8	8	13.85	30	50	

Date	mg/paper	µg/m ³	Annual Average	Annual Average Limit	24hr Limit	Comments
17/05/2008	22.5	15	13.92	30	50	
23/05/2008	5.9	4	13.84	30	50	
29/05/2008	20.6	13	13.77	30	50	
4/06/2008	2.5	2	13.74	30	50	
10/06/2008	6.8	4	13.77	30	50	
16/06/2008	1.6	1	13.77	30	50	
22/06/2008	1	1	13.79	30	50	
28/06/2008	15.4	9	13.93	30	50	
4/07/2008	6.5	4	13.93	30	50	
10/07/2008	1.2	1	13.90	30	50	
16/07/2008	4.7	3	13.84	30	50	
22/07/2008	14	9	13.90	30	50	
28/07/2008	1.8	1	13.82	30	50	
3/08/2008	3.3	1	13.75	30	50	
9/08/2008	4.2	3	13.57	30	50	
15/08/2008	7.5	5	13.36	30	50	
21/08/2008	15.5	10	13.49	30	50	
27/08/2008	28.1	18	13.74	30	50	
2/09/2008	7	4	13.61	30	50	
8/09/2008	6.6	4	13.62	30	50	
14/09/2008	16.7	11	13.36	30	50	
20/09/2008	48.1	32	13.36	30	50	
26/09/2008	9.5	6	12.97	30	50	
2/10/2008	47.2	31	12.93	30	50	
8/10/2008	14.3	9	12.67	30	50	
14/10/2008	14.1	9	12.49	30	50	
20/10/2008	38.5	25	12.43	30	50	
26/10/2008	21.7	14	12.18	30	50	
1/11/2008	39.9	25	12.38	30	50	
7/11/2008	27.6	18	12.62	30	50	
13/11/2008	34.5	22	12.80	30	50	
19/11/2008	3.6	2	12.64	30	50	
25/11/2008	14.5	9	12.66	30	50	
1/12/2008		11	12.77	30	50	
7/12/2008		16	12.87	30	50	
13/12/2008		14	12.95	30	50	
19/12/2008		9	12.93	30	50	
25/12/2008		16	13.00	30	50	
31/12/2008		32	13.28	30	50	
6/01/2009	21.7	15	13.25	30	50	
12/01/2009	19.6	13	13.05	30	50	
18/01/2009	22.1	14	13.00	30	50	
24/01/2009	19.7	14	12.89	30	50	
30/01/2009	20.8	14	12.59	30	50	
5/02/2009	25.9	18	12.74	30	50	
11/02/2009	34.1	22	12.90	30	50	
17/02/2009	3.2	2	12.84	30	50	
23/02/2009	29.5	20	12.48	30	50	
1/03/2009	35.3	24	12.79	30	50	
7/03/2009	40.1	26	12.77	30	50	
13/03/2009	33	22	12.61	30	50	
19/03/2009	59.8	40	12.90	30	50	
25/03/2009	68.5	45	13.25	30	50	
31/03/2009	8.7	6	13.05	30	50	
6/04/2009	9.8	6	12.85	30	50	
12/04/2009	5.3	3	12.72	30	50	
18/04/2009	35.3	23	12.92	30	50	
24/04/2009	20.6	13	13.11	30	50	
30/04/2009	26.8	17	13.34	30	50	
6/05/2009	57.6	37	13.52	30	50	
12/05/2009	56.1	36	13.98	30	50	
18/05/2009	36.8	24	14.13	30	50	
24/05/2009	18.3	12	14.26	30	50	
30/05/2009	10.1	6	14.15	30	50	
5/06/2009	3.2	2	14.15	30	50	
11/06/2009	14.6	9	14.23	30	50	
17/06/2009	2	1	14.23	30	50	
23/06/2009	2.6	1	14.23	30	50	
29/06/2009	3.2	4	14.15	30	50	

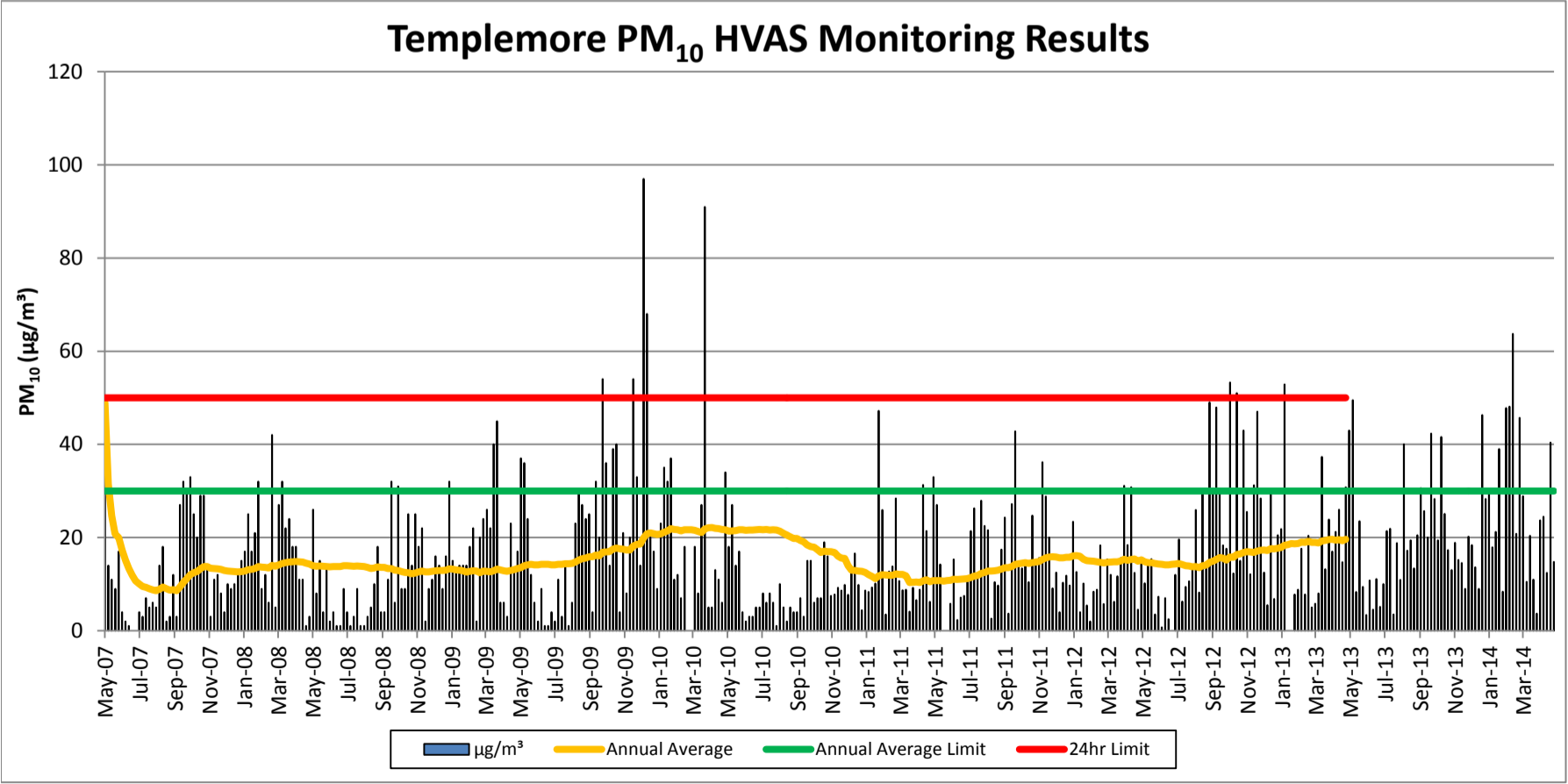
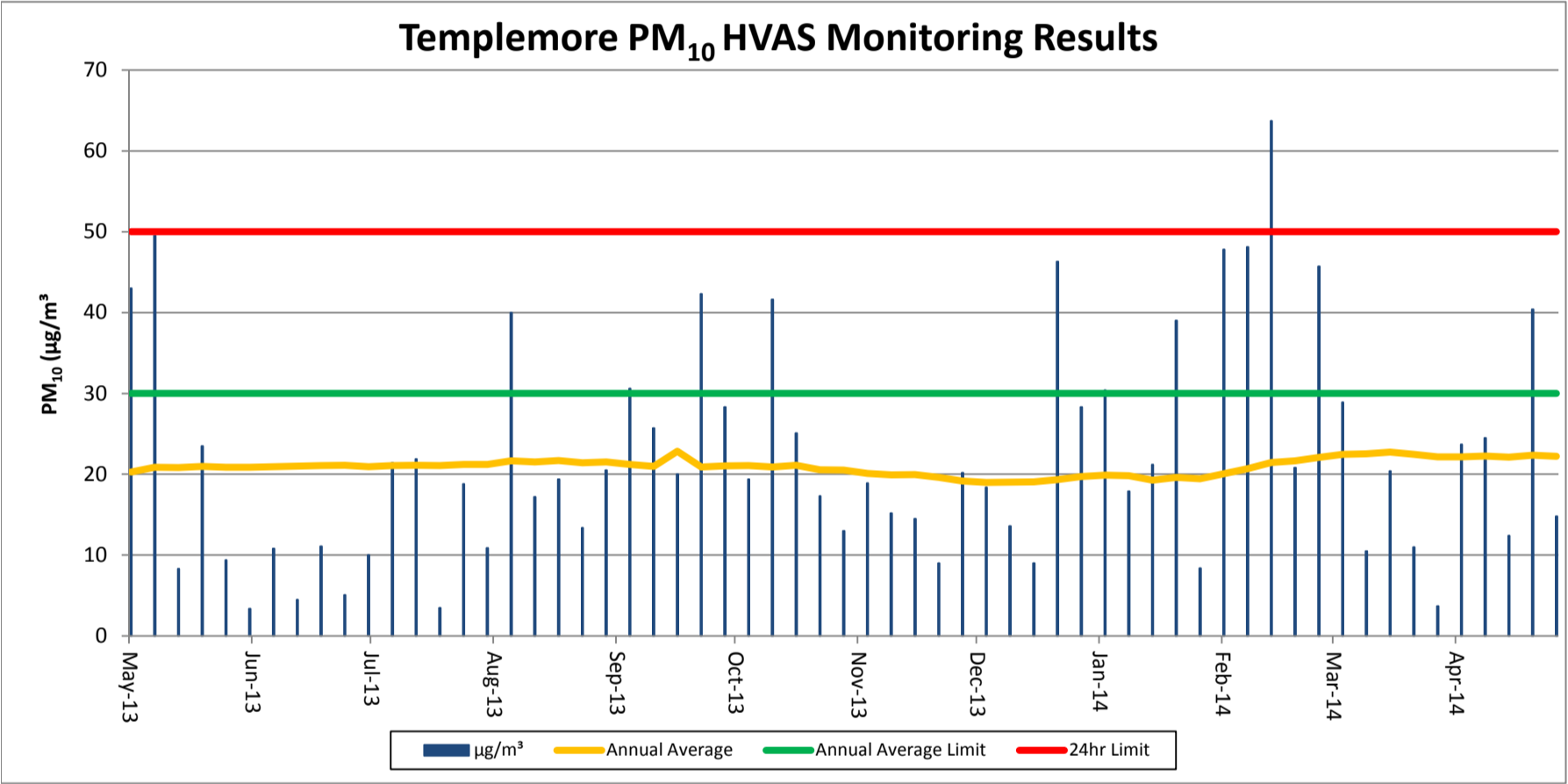
Date	mg/paper	µg/m ³	Annual Average	Annual Average Limit	24hr Limit	Comments
5/07/2009	2.9	2	14.11	30	50	
11/07/2009	17.1	11	14.28	30	50	
17/07/2009	4.4	3	14.28	30	50	
23/07/2009	21.8	14	14.36	30	50	
29/07/2009	4.1	1	14.36	30	50	
4/08/2009	9.2	6	14.44	30	50	
10/08/2009	35.4	23	14.77	30	50	
16/08/2009	46	30	15.18	30	50	
22/08/2009	41.3	27	15.46	30	50	
28/08/2009	36.7	24	15.56	30	50	
3/09/2009	39.5	25	15.90	30	50	
9/09/2009	6.8	4	15.90	30	50	
15/09/2009	49.2	32	16.25	30	50	
21/09/2009	30	20	16.05	30	50	
27/09/2009	83.2	54	16.84	30	50	
3/10/2009	55.1	36	16.92	30	50	
9/10/2009	22.7	14	17.00	30	50	
15/10/2009	59.3	39	17.49	30	50	
21/10/2009	60.8	40	17.74	30	50	
27/10/2009	6.3	4	17.57	30	50	
2/11/2009	31.4	21	17.51	30	50	
8/11/2009	11	8	17.34	30	50	
14/11/2009	30.5	20	17.31	30	50	
20/11/2009	78.5	54	18.16	30	50	
26/11/2009	49.3	33	18.56	30	50	
2/12/2009	21.4	14	18.61	30	50	
8/12/2009	140.2	97	19.93	30	50	
14/12/2009	101.9	68	20.82	30	50	
20/12/2009	30.4	20	21	30	50	
26/12/2009	25.4	17	20.83	30	50	
1/01/2010	13.7	9	20.64	30	50	
7/01/2010	33.8	23	20.77	30	50	
13/01/2010	51.7	35	21.13	30	50	
19/01/2010	48.7	32	21.43	30	50	
25/01/2010	55.3	37	21.93	30	50	
31/01/2010	16.8	11	21.75	30	50	
6/02/2010	18	12	21.66	30	50	
12/02/2010	11.1	7	21.41	30	50	
18/02/2010	27.2	18	21.67	30	50	
24/02/2010			21.70	30	50	No power
2/03/2010			21.66	30	50	No power
8/03/2010	23.1	18	21.53	30	50	
14/03/2010	12.8	8	21.29	30	50	
20/03/2010	40.6	27	21.07	30	50	
26/03/2010	136.5	91	21.85	30	50	
1/04/2010	7.5	5	22.10	30	50	
7/04/2010	7.7	5	22.14	30	50	
13/04/2010	20.4	13	21.97	30	50	
19/04/2010	16.6	11	21.93	30	50	
25/04/2010	9.2	6	21.74	30	50	
1/05/2010	52	34	21.69	30	50	
7/05/2010	28.6	18	21.38	30	50	
13/05/2010	42.5	27	21.43	30	50	
19/05/2010	22.4	14	21.47	30	50	
25/05/2010	26.5	17	21.66	30	50	
31/05/2010	6.6	4	21.69	30	50	
6/06/2010	2.7	2	21.57	30	50	
12/06/2010	5.3	3	21.60	30	50	
18/06/2010	4.2	3	21.64	30	50	
24/06/2010	7.7	5	21.66	30	50	
30/06/2010	7.6	5	21.71	30	50	
6/07/2010	12.6	8	21.66	30	50	
12/07/2010	9	6	21.71	30	50	
18/07/2010	12.3	8	21.60	30	50	
24/07/2010	10.2	6	21.69	30	50	
30/07/2010	0.9	1	21.60	30	50	
5/08/2010	15.1	10	21.38	30	50	
11/08/2010	8	5	20.95	30	50	
17/08/2010	3.6	2	20.52	30	50	

Date	mg/paper	µg/m³	Annual Average	Annual Average Limit	24hr Limit	Comments
23/08/2010	7.5	5	20.19	30	50	
29/08/2010	7.1	4	19.83	30	50	
4/09/2010	6.4	4	19.83	30	50	
10/09/2010	10.4	7	19.40	30	50	
16/09/2010	5.3	3	19.10	30	50	
22/09/2010	23.4	15	18.43	30	50	
28/09/2010	22.2	15	18.07	30	50	
4/10/2010	9	6	17.93	30	50	
10/10/2010	11.4	7	17.38	30	50	
16/10/2010	11.2	7	16.81	30	50	
22/10/2010	28.7	19	17.07	30	50	
28/10/2010	24.4	16	16.98	30	50	
3/11/2010	12.3	7.5	16.97	30	50	
9/11/2010	12.8	7.8	16.76	30	50	
15/11/2010	15.1	9.2	15.99	30	50	
21/11/2010	14	8.6	15.57	30	50	
27/11/2010	16	9.8	15.50	30	50	
3/12/2010	12.5	7.7	13.96	30	50	
9/12/2010	20.9	12.8	13.01	30	50	
15/12/2010	27	16.6	12.95	30	50	
21/12/2010	16	9.8	12.82	30	50	
27/12/2010	7.2	4.4	12.74	30	50	
2/01/2011	14.1	8.6	12.50	30	50	
8/01/2011	13.5	8.3	12.04	30	50	
14/01/2011	15.2	9.3	11.64	30	50	
20/01/2011	16.5	10.1	11.18	30	50	
26/01/2011	28.9	47.2	11.81	30	50	
1/02/2011	42.3	25.9	12.04	30	50	
7/02/2011	5.7	3.5	11.98	30	50	
13/02/2011	20.7	12.7	11.89	30	50	
19/02/2011	22.6	13.8	11.93	30	50	
25/02/2011	46.4	28.4	12.20	30	50	
3/03/2011	17.1	10.7	12.08	30	50	
9/03/2011	14.2	8.7	12.09	30	50	
15/03/2011	14.3	8.8	11.79	30	50	
21/03/2011	6.7	4.1	10.34	30	50	
27/03/2011	15	9.2	10.41	30	50	
2/04/2011	10.7	6.6	10.44	30	50	
8/04/2011	14.3	8.8	10.37	30	50	
14/04/2011	51	31.3	10.70	30	50	
20/04/2011	35	21.4	10.96	30	50	
26/04/2011	10.1	6.2	10.50	30	50	
2/05/2011	53.8	33	10.75	30	50	
8/05/2011	44.1	27	10.75	30	50	
14/05/2011	23.1	14.2	10.75	30	50	
20/05/2011			10.64	30	50	Power Outage
26/05/2011			10.76	30	50	Power Outage
1/06/2011	9.4	5.8	10.82	30	50	
7/06/2011	25	15.3	11.04	30	50	
13/06/2011	3.7	2.3	11.02	30	50	
19/06/2011	11.6	7.1	11.06	30	50	
25/06/2011	12.3	7.5	11.10	30	50	
1/07/2011	17.9	11	11.16	30	50	
7/07/2011	34.9	21.4	11.42	30	50	
13/07/2011	42.9	26.3	11.74	30	50	
19/07/2011	18.7	11.5	11.83	30	50	
25/07/2011	45.5	27.9	12.29	30	50	
31/07/2011	36.7	22.5	12.51	30	50	
6/08/2011	35.2	21.6	12.80	30	50	
12/08/2011	4.2	2.6	12.81	30	50	
18/08/2011	16.9	10.4	12.90	30	50	
24/08/2011	15.8	9.7	13.00	30	50	
30/08/2011	28.4	17.4	13.23	30	50	
5/09/2011	39.6	24.3	13.53	30	50	
11/09/2011	6.1	3.7	13.54	30	50	
17/09/2011	44.3	27.2	13.75	30	50	
23/09/2011	69.8	42.8	14.23	30	50	
29/09/2011	22.5	13.8	14.36	30	50	
5/10/2011	21.9	13.4	14.47	30	50	

Date	mg/paper	µg/m ³	Annual Average	Annual Average Limit	24hr Limit	Comments
11/10/2011	23.2	14.2	14.60	30	50	
17/10/2011	17	10.4	14.45	30	50	
23/10/2011	40.3	24.7	14.60	30	50	
29/10/2011	22.9	14	14.71	30	50	
4/11/2011	25.4	15.6	14.85	30	50	
10/11/2011	59.1	36.2	15.31	30	50	
16/11/2011	46.9	28.8	15.66	30	50	
22/11/2011	32.7	20	15.84	30	50	
28/11/2011	14.8	9.1	15.86	30	50	
4/12/2011	20.4	12.5	15.86	30	50	
10/12/2011	6.6	4	15.64	30	50	
16/12/2011	16.8	10.3	15.65	30	50	
22/12/2011	19.2	11.8	15.77	30	50	
28/12/2011	15.9	9.7	15.79	30	50	
3/01/2012	38.2	23.4	16.05	30	50	
9/01/2012	20.6	12.6	16.11	30	50	
15/01/2012	6.5	4	16.01	30	50	
21/01/2012	16.5	10.1	15.37	30	50	
27/01/2012	8.9	5.4	15.01	30	50	
2/02/2012	3.2	2	14.99	30	50	
8/02/2012	13.7	8.4	14.91	30	50	
14/02/2012	14.4	8.8	14.83	30	50	
20/02/2012	29.9	18.3	14.65	30	50	
26/02/2012	9.3	5.7	14.57	30	50	
3/03/2012	25	15.3	14.68	30	50	
9/03/2012	19.5	12	14.73	30	50	
15/03/2012	10.2	6.2	14.77	30	50	
21/03/2012	19.1	11.7	14.81	30	50	
27/03/2012	25.4	15.6	14.97	30	50	
2/04/2012	50.8	31.1	15.35	30	50	
8/04/2012	30	18.4	15.13	30	50	
14/04/2012	50.2	30.8	15.29	30	50	
20/04/2012	20.2	12.4	15.40	30	50	
26/04/2012	7.4	4.5	14.91	30	50	
2/05/2012	23.6	14.5	15.20	30	50	
8/05/2012	16.7	10.2	14.82	30	50	
14/05/2012	24.7	15.1	14.63	30	50	
20/05/2012	25.1	15.4	14.65	30	50	
26/05/2012	5.7	3.5	14.46	30	50	
1/06/2012	11.9	7.3	14.35	30	50	
7/06/2012	1.1	0.7	14.26	30	50	
13/06/2012	11.5	7	14.13	30	50	
19/06/2012	4.1	2.5	14.13	30	50	
25/06/2012			14.25	30	50	Runtime error
1/07/2012	19.7	12	14.32	30	50	
7/07/2012	32	19.6	14.46	30	50	
13/07/2012	10.3	6.3	14.22	30	50	
19/07/2012	15.4	9.4	13.94	30	50	
25/07/2012	17.3	10.6	13.92	30	50	
31/07/2012	23	14.1	13.70	30	50	
6/08/2012	42.3	25.9	13.75	30	50	
12/08/2012	13.4	8.2	13.53	30	50	
18/08/2012	49.2	30.2	13.99	30	50	
24/08/2012	23.4	14.3	14.05	30	50	
30/08/2012	30	49	14.70	30	50	
5/09/2012	36.6	29.7	14.90	30	50	
11/09/2012	77.9	47.9	15.28	30	50	
17/09/2012	49	30.1	15.72	30	50	
23/09/2012	29.7	18.3	15.57	30	50	
29/09/2012	28.6	17.6	15.16	30	50	
5/10/2012	86.9	53.3	15.80	30	50	
11/10/2012	15.2	12.3	15.79	30	50	
17/10/2012	83.3	51	16.39	30	50	
23/10/2012	24.5	15	16.47	30	50	
29/10/2012	70.2	43	16.77	30	50	
4/11/2012	41.6	25.5	16.95	30	50	
10/11/2012	19.8	12.1	16.90	30	50	
16/11/2012	50.8	31.2	16.81	30	50	
22/11/2012	76.6	47	17.11	30	50	

Date	mg/paper	µg/m³	Annual Average	Annual Average Limit	24hr Limit	Comments
28/11/2012	46.3	28.4	17.25	30	50	
4/12/2012	21	12.5	17.31	30	50	
10/12/2012	9.3	5.5	17.19	30	50	
16/12/2012	48.4	29.3	17.61	30	50	
22/12/2012	11.1	6.8	17.55	30	50	
28/12/2012	33.4	20.5	17.69	30	50	
3/01/2013	35.5	21.8	17.89	30	50	
9/01/2013	86.3	52.9	18.37	30	50	
15/01/2013			18.47	30	50	No power
21/01/2013			18.72	30	50	No power
27/01/2013	12.8	7.8	18.68	30	50	
2/02/2013	14.4	8.8	18.73	30	50	
8/02/2013	28.7	17.6	19.00	30	50	
14/02/2013	12.7	7.8	18.99	30	50	
20/02/2013	28.8	20.4	19.18	30	50	
26/02/2013	8.1	5	18.96	30	50	
4/03/2013	9.4	5.8	18.96	30	50	
10/03/2013	13	8	18.84	30	50	
16/03/2013	60.8	37.3	19.27	30	50	
22/03/2013	21.6	13.2	19.38	30	50	
28/03/2013	39	23.9	19.59	30	50	
3/04/2013	27.8	17	19.62	30	50	
9/04/2013	34.5	21.2	19.45	30	50	
15/04/2013	42.5	26	19.58	30	50	
21/04/2013	24	14.7	19.30	30	50	
27/04/2013	50.3	30.8	19.62	30	50	
3/05/2013	70.2	43	20.27	30	50	
9/05/2013	80.7	49.5	20.86	30	50	
15/05/2013	13.5	8.3	20.83	30	50	
21/05/2013	38.3	23.5	20.97	30	50	
27/05/2013	15.4	9.4	20.87	30	50	
2/06/2013	5.6	3.4	20.87	30	50	
8/06/2013	17.6	10.8	20.93	30	50	
14/06/2013	7.4	4.5	20.99	30	50	
20/06/2013	18.1	11.1	21.06	30	50	
26/06/2013	8.3	5.1	21.11	30	50	
2/07/2013	16.4	10	20.92	30	50	
8/07/2013	34.9	21.4	21.08	30	50	
14/07/2013	35.7	21.9	21.12	30	50	
20/07/2013	5.7	3.5	21.07	30	50	
26/07/2013	30.6	18.8	21.23	30	50	
1/08/2013	17.8	10.9	21.23	30	50	
7/08/2013	65.2	40	21.66	30	50	
13/08/2013	28	17.2	21.52	30	50	
19/08/2013	31.6	19.4	21.70	30	50	
25/08/2013	21.8	13.4	21.42	30	50	
31/08/2013	33.4	20.5	21.53	30	50	
6/09/2013	50	30.6	21.22	30	50	
12/09/2013	41.9	25.7	20.96	30	50	
18/09/2013	32.6	20	22.85	30	50	
24/09/2013	69	42.3	20.89	30	50	
30/09/2013	46.1	28.3	21.06	30	50	
6/10/2013	31.6	19.4	21.09	30	50	
12/10/2013	67.9	41.6	20.89	30	50	
18/10/2013	40.9	25.1	21.11	30	50	
24/10/2013	28.2	17.3	20.55	30	50	
30/10/2013	21.2	13	20.51	30	50	
5/11/2013	30.8	18.9	20.11	30	50	
11/11/2013	24.4	15.2	19.94	30	50	
17/11/2013	23.6	14.5	19.98	30	50	
23/11/2013	14.7	9	19.61	30	50	
29/11/2013	33	20.2	19.16	30	50	
5/12/2013	30	18.4	19.00	30	50	
11/12/2013	22.2	13.6	19.01	30	50	
17/12/2013	14.7	9	19.07	30	50	
23/12/2013	75.5	46.3	19.36	30	50	
29/12/2013	46.2	28.3	19.71	30	50	
4/01/2014	49.6	30.4	19.88	30	50	
10/01/2014	29.2	17.9	19.81	30	50	

Date	mg/paper	µg/m³	Annual Average	Annual Average Limit	24hr Limit	Comments
16/01/2014	34.6	21.2	19.29	30	50	
22/01/2014	63.5	39	19.61	30	50	
28/01/2014	13.7	8.4	19.43	30	50	
3/02/2014	78.1	47.8	20.07	30	50	
9/02/2014	78.5	48.1	20.71	30	50	
15/02/2014	104	63.7	21.45	30	50	
21/02/2014	34	20.8	21.66	30	50	
27/02/2014	74.6	45.7	22.07	30	50	
5/03/2014	47.2	28.9	22.45	30	50	
11/03/2014	17.1	10.5	22.53	30	50	
17/03/2014	33.3	20.4	22.73	30	50	
23/03/2014	17.9	11	22.45	30	50	
29/03/2014	6	3.7	22.15	30	50	
4/04/2014	38.7	23.7	22.15	30	50	
10/04/2014	39.9	24.5	22.27	30	50	
16/04/2014	20.3	12.4	22.13	30	50	
22/04/2014	65.8	40.4	22.36	30	50	
28/04/2014	24.2	14.8	22.22	30	50	



MERRIOWN PM₁₀ HIGH VOLUME AIR SAMPLER

Site	Site Id	Note: This site is monitored by Idemitsu Boggabri Coal			
Merriown	D7				
Date	µg/m ³	Annual Average	Annual Average Limit	24hr Limit	Comments
28/04/2007	8.0	8.00	30	50	
22/05/2007	8.0	8.00	30	50	
28/05/2007	5.0	7.00	30	50	
3/06/2007	5.0	6.50	30	50	
9/06/2007	4.0	6.00	30	50	
16/06/2007	5.0	5.83	30	50	
21/06/2007	5.0	5.71	30	50	
27/06/2007	11.0	6.38	30	50	
4/07/2007	6.0	6.33	30	50	
10/07/2007	7.0	6.40	30	50	
15/07/2007	10.0	6.73	30	50	
21/07/2007	9.0	6.92	30	50	
28/07/2007	4.0	6.69	30	50	
21/08/2007	15.0	7.29	30	50	
26/08/2007	16.0	7.87	30	50	
1/09/2007	12.0	8.13	30	50	
7/09/2007	11.0	8.29	30	50	
14/09/2007	28.0	9.39	30	50	
19/09/2007	38.0	10.89	30	50	
25/09/2007	31.0	11.90	30	50	
1/10/2007	22.0	12.38	30	50	
7/10/2007	26.0	13.00	30	50	
19/10/2007	28.0	13.65	30	50	
25/10/2007	14.0	13.67	30	50	
31/10/2007	18.0	13.84	30	50	
6/11/2007	5.0	13.50	30	50	
12/11/2007	26.0	13.96	30	50	
18/11/2007	11.0	13.86	30	50	
24/11/2007	16.0	13.93	30	50	
30/11/2007	9.0	13.77	30	50	
6/12/2007	15.0	13.81	30	50	
12/12/2007	11.0	13.72	30	50	
18/12/2007	21.0	13.94	30	50	
30/12/2007	7.0	13.74	30	50	
5/01/2008	12.0	13.69	30	50	
11/01/2008	2.0	13.36	30	50	
17/01/2008	15.0	13.41	30	50	
23/01/2008	9.0	13.29	30	50	
29/01/2008	8.0	13.15	30	50	
4/02/2008	7.0	13.00	30	50	
10/02/2008	2.0	12.73	30	50	
16/02/2008	20.0	12.90	30	50	
22/02/2008	6.0	12.74	30	50	
28/02/2008	1.8	12.50	30	50	
5/03/2008	10.6	12.45	30	50	
11/03/2008	5.4	12.30	30	50	
18/03/2008	15.2	12.36	30	50	
23/03/2008	0.4	12.11	30	50	
29/03/2008	18.7	12.25	30	50	
4/04/2008	7.6	12.15	30	50	
10/04/2008	0.1	11.92	30	50	

Date	µg/m ³	Annual Average	Annual Average Limit	24hr Limit	Comments
16/04/2008	0.1	11.69	30	50	
22/04/2008	4.8	11.56	30	50	
28/04/2008	6.0	11.52	30	50	
4/04/2008	1.0	11.39	30	50	
16/05/2008	6.7	11.42	30	50	
22/05/2008	3.3	11.39	30	50	
28/05/2008	1.3	11.34	30	50	
3/06/2008	2.7	11.30	30	50	
9/06/2008	5.6	11.31	30	50	
15/06/2008	1.8	11.13	30	50	
21/06/2008	2.5	11.07	30	50	
3/07/2008	8.5	11.10	30	50	
9/07/2008	3.4	10.97	30	50	
15/07/2008	4.9	10.89	30	50	
21/07/2008	7.4	10.96	30	50	
27/07/2008	7.8	10.82	30	50	
2/08/2008	5.2	10.62	30	50	
8/08/2008	8.5	10.55	30	50	
14/08/2008	10.6	10.55	30	50	
20/08/2008	8.4	10.18	30	50	
26/08/2008	10.6	9.66	30	50	
1/09/2008	34.4	9.72	30	50	
7/09/2008	17.7	9.64	30	50	
13/09/2008	26.0	9.64	30	50	
19/09/2008	19.7	9.48	30	50	
25/09/2008	30.3	9.79	30	50	
1/10/2008	9.8	9.64	30	50	
7/10/2008	9.9	9.73	30	50	
13/10/2008	12.2	9.47	30	50	
19/10/2008	6.8	9.39	30	50	
25/10/2008	14.2	9.36	30	50	
6/11/2008	16.6	9.50	30	50	
12/11/2008	20.8	9.61	30	50	
18/11/2008	25.3	9.88	30	50	
24/11/2008	11.0	9.69	30	50	
30/11/2008	13.5	9.81	30	50	
6/12/2008	19.4	9.95	30	50	
12/12/2008	27.8	10.44	30	50	
18/12/2008	18.2	10.50	30	50	
24/12/2008	28.1	10.86	30	50	
30/12/2008	19.7	11.08	30	50	
17/02/2009	8.8	11.12	30	50	
23/02/2009	21.2	11.48	30	50	
1/03/2009	15.2	11.39	30	50	
7/03/2009	17.9	11.61	30	50	
13/03/2009	18.9	11.93	30	50	
19/03/2009	25.1	12.21	30	50	
25/03/2009	13.5	12.36	30	50	
31/03/2009	7.5	12.22	30	50	
6/04/2009	14.1	12.47	30	50	
12/04/2009	8.3	12.28	30	50	
18/04/2009	30.0	12.70	30	50	
24/04/2009	17.0	13.02	30	50	
30/04/2009	25.3	13.49	30	50	
6/05/2009	13.8	13.66	30	50	

Date	µg/m ³	Annual Average	Annual Average Limit	24hr Limit	Comments
12/05/2009	26.8	14.06	30	50	
19/05/2009	8.1	14.19	30	50	
25/05/2009	8.6	14.23	30	50	
31/05/2009	11.4	14.38	30	50	
6/06/2009	8.6	14.52	30	50	
12/06/2009	10.3	14.66	30	50	
18/06/2009	9.9	14.74	30	50	
24/06/2009	10.0	14.90	30	50	
30/06/2009	61.4	16.01	30	50	
6/07/2009	15.4	16.14	30	50	
12/07/2009	7.6	16.22	30	50	
18/07/2009	14.5	16.40	30	50	
24/07/2009	8.9	16.43	30	50	
30/07/2009	18.4	16.63	30	50	
5/08/2009	13.8	16.79	30	50	
17/08/2009	15.8	16.93	30	50	
23/08/2009	17.3	17.05	30	50	
29/08/2009	9.3	17.07	30	50	
4/09/2009	26.2	17.36	30	50	
10/09/2009	32.5	17.33	30	50	
16/09/2009	17.6	17.33	30	50	
24/09/2009	22.2	17.25	30	50	
30/09/2009	17.4	17.21	30	50	
6/10/2009	18.6	16.99	30	50	
13/10/2009	34.9	17.46	30	50	
19/10/2009	27.4	17.79	30	50	
25/10/2009	16.4	17.87	30	50	
31/10/2009	11.4	17.96	30	50	
6/11/2009	0.0	17.69	30	50	
12/11/2009	27.2	17.89	30	50	
19/11/2009	86.6	19.13	30	50	
25/11/2009	36.6	19.35	30	50	
1/12/2009	0.1	19.14	30	50	
7/12/2009	50.3	19.84	30	50	
13/12/2009	43.8	20.30	30	50	
20/12/2009	26.4	20.27	30	50	
26/12/2009	28.0	20.45	30	50	
9/01/2010	28.9	20.47	30	50	
9/01/2010	28.9	20.64	30	50	
15/01/2010	18.2	20.82	30	50	
21/01/2010	7.7	20.57	30	50	
27/01/2010	11.0	20.49	30	50	
2/02/2010	28.1	20.68	30	50	
8/02/2010	16.6	20.64	30	50	
14/02/2010	16.6	20.48	30	50	
20/02/2010	24.4	20.68	30	50	
2/03/2010	13.2	20.79	30	50	
8/03/2010	7.9	20.67	30	50	
14/03/2010	10.0	20.70	30	50	
20/03/2010	7.0	20.27	30	50	
26/03/2010	16.4	20.26	30	50	
1/04/2010	16.0	20.08	30	50	
7/04/2010	21.3	20.22	30	50	
13/04/2010	19.2	20.08	30	50	
19/04/2010	16.6	20.24	30	50	
25/04/2010	16.4	20.39	30	50	

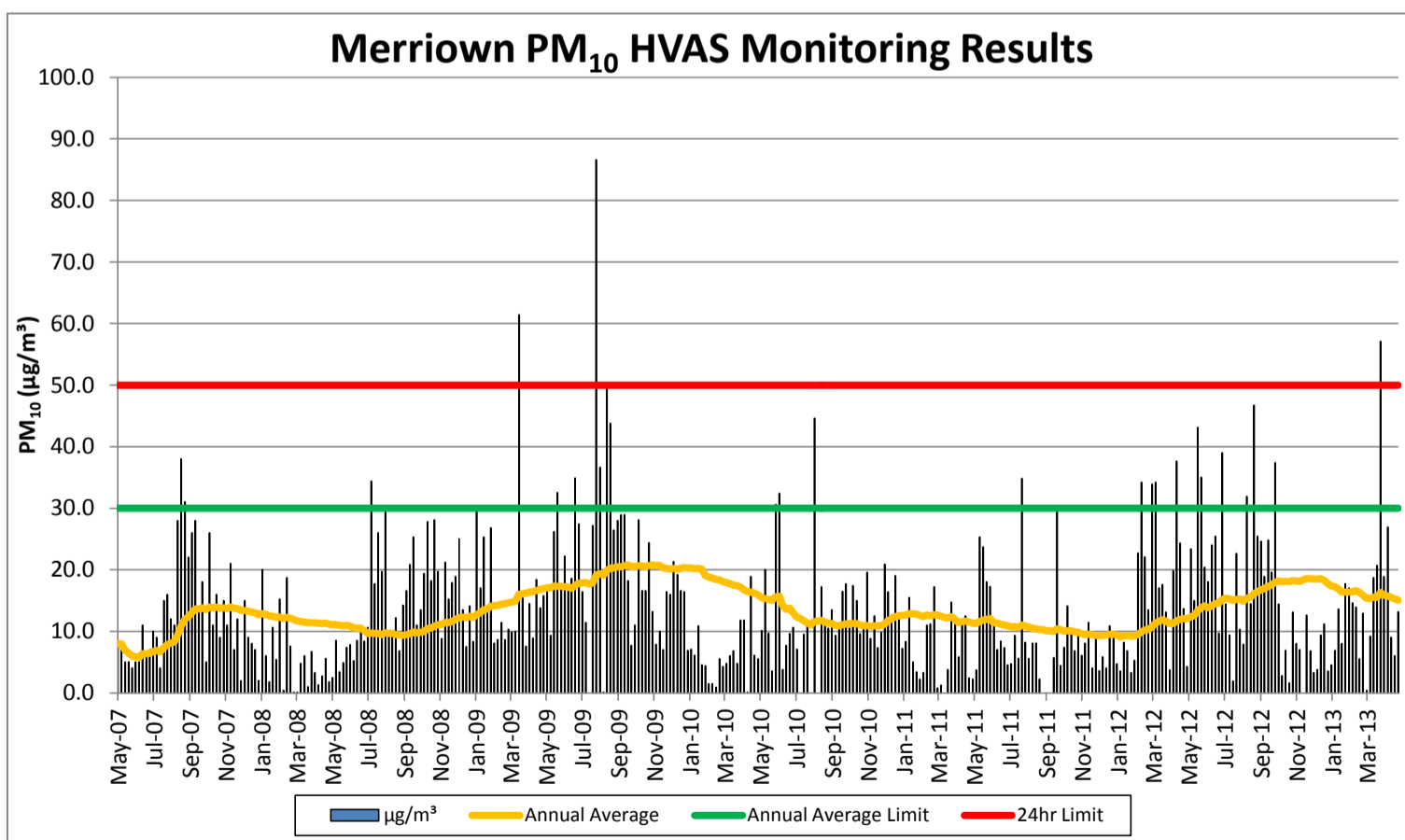
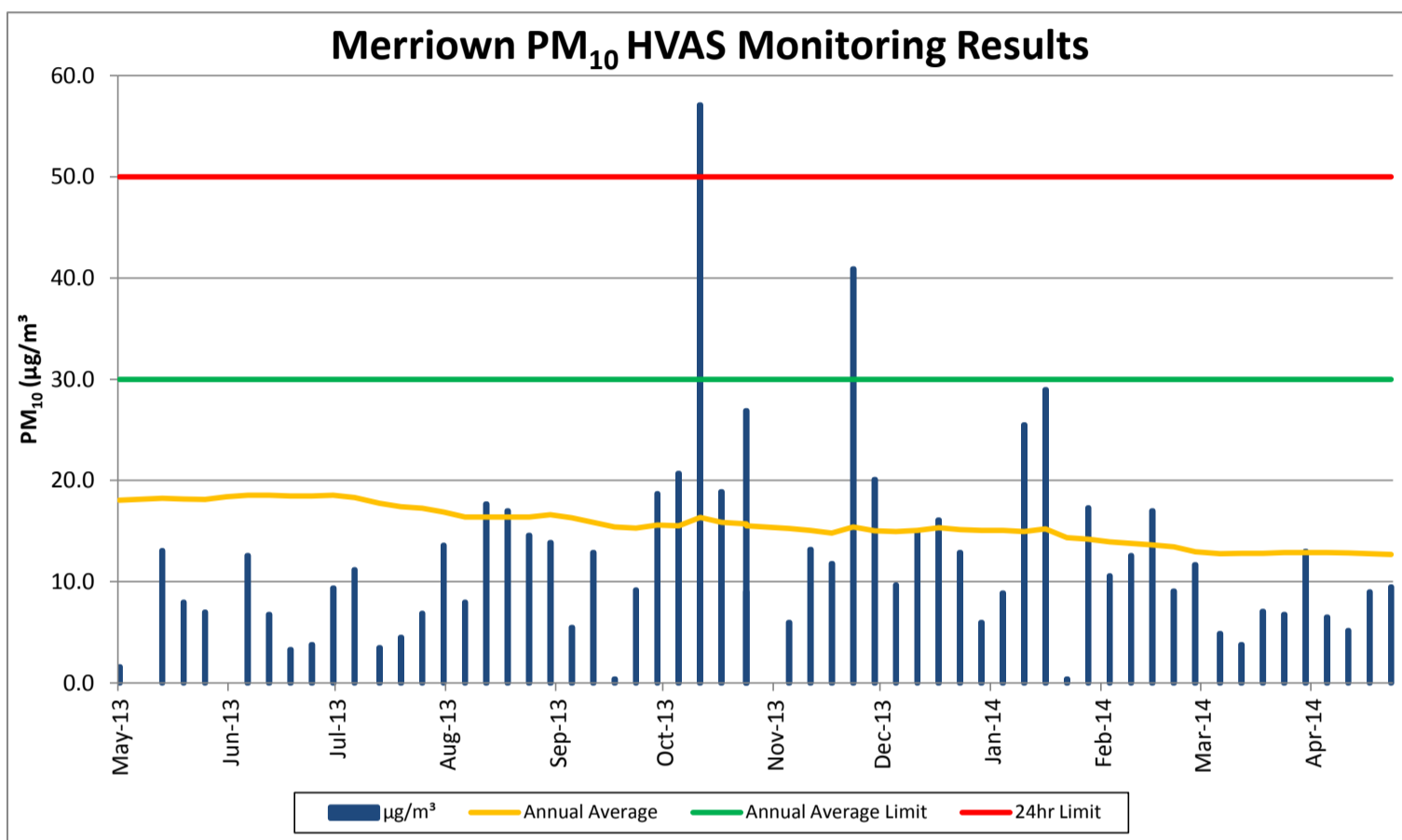
Date	µg/m ³	Annual Average	Annual Average Limit	24hr Limit	Comments
1/05/2010	6.9	20.30	30	50	
8/05/2010	7.1	20.28	30	50	
16/05/2010	6.1	20.20	30	50	
22/05/2010	10.9	20.22	30	50	
28/05/2010	4.5	20.11	30	50	
3/06/2010	4.4	19.04	30	50	
9/06/2010	1.5	18.77	30	50	
15/06/2010	1.5	18.66	30	50	
21/06/2010	0.9	18.40	30	50	
27/06/2010	5.5	18.34	30	50	
3/07/2010	4.3	18.07	30	50	
9/07/2010	4.8	17.90	30	50	
16/07/2010	6.0	17.72	30	50	
22/07/2010	6.8	17.52	30	50	
28/07/2010	4.8	17.43	30	50	
3/08/2010	11.8	17.16	30	50	
9/08/2010	11.8	16.77	30	50	
15/08/2010	0.1	16.44	30	50	
21/08/2010	18.9	16.38	30	50	
27/08/2010	6.1	16.17	30	50	
2/09/2010	5.5	15.92	30	50	
8/09/2010	10.1	15.45	30	50	
14/09/2010	20.0	15.31	30	50	
20/09/2010	9.7	15.18	30	50	
6/10/2010	3.5	15.04	30	50	
12/10/2010	30.6	15.61	30	50	
18/10/2010	32.4	15.71	30	50	
27/10/2010	3.8	14.15	30	50	
2/11/2010	7.7	13.60	30	50	
8/11/2010	9.6	13.78	30	50	
14/11/2010	10.6	13.03	30	50	
20/11/2010	7.1	12.34	30	50	
26/11/2010	<0.1	12.07	30	50	
2/12/2010	9.5	11.72	30	50	
8/12/2010	11.7	11.38	30	50	
14/12/2010	<0.1	11.04	30	50	
20/12/2010	44.6	11.56	30	50	
2/01/2011	<0.1	11.64	30	50	
9/01/2011	17.2	11.76	30	50	
15/01/2011	11.8	11.43	30	50	
21/01/2011	10.5	11.31	30	50	
27/01/2011	13.5	11.25	30	50	
2/02/2011	9.3	10.95	30	50	
8/02/2011	10.3	10.89	30	50	
14/02/2011	16.5	11.06	30	50	
20/02/2011	17.7	11.22	30	50	
26/02/2011	10.5	11.29	30	50	
4/03/2011	17.4	11.31	30	50	
10/03/2011	15.0	11.29	30	50	
16/03/2011	9.6	11.05	30	50	
22/03/2011	10.7	10.88	30	50	
28/03/2011	19.6	10.94	30	50	
3/04/2011	8.8	10.79	30	50	
9/04/2011	12.5	10.90	30	50	
15/04/2011	7.3	10.91	30	50	

Date	µg/m ³	Annual Average	Annual Average Limit	24hr Limit	Comments
21/04/2011	9.8	10.98	30	50	
27/04/2011	20.9	11.18	30	50	
3/05/2011	16.4	11.77	30	50	
9/05/2011	12.6	12.00	30	50	
15/05/2011	19.0	12.38	30	50	
21/05/2011	13.0	12.54	30	50	
27/05/2011	7.2	12.60	30	50	
2/06/2011	8.3	12.67	30	50	
8/06/2011	15.5	12.87	30	50	
14/06/2011	5.0	12.83	30	50	
20/06/2011	3.4	12.80	30	50	
28/06/2011	2.2	12.60	30	50	
2/07/2011	3.3	12.42	30	50	
8/07/2011	11.0	12.65	30	50	
14/07/2011	11.2	12.49	30	50	
20/07/2011	17.2	12.72	30	50	
26/07/2011	0.8	12.62	30	50	
1/08/2011	1.2	12.44	30	50	
7/08/2011	<0.1	12.28	30	50	
13/08/2011	3.8	12.15	30	50	
19/08/2011	14.7	12.39	30	50	
25/08/2011	11.1	11.97	30	50	
6/09/2011	5.8	11.41	30	50	
12/09/2011	11.4	11.57	30	50	
18/09/2011	12.5	11.67	30	50	
24/09/2011	2.4	11.52	30	50	
30/09/2011	2.2	11.34	30	50	
31/08/2011	3.7	11.27	30	50	
3/10/2011	25.3	11.56	30	50	
9/10/2011	23.7	11.86	30	50	
15/10/2011	18.0	11.99	30	50	
21/10/2011	17.3	12.10	30	50	
27/10/2011	10.8	11.41	30	50	
2/11/2011	7.0	11.32	30	50	
8/11/2011	8.4	11.14	30	50	
14/11/2011	7.3	11.05	30	50	
20/11/2011	4.5	10.93	30	50	
26/11/2011	4.7	10.76	30	50	
2/12/2011	9.3	10.76	30	50	
8/12/2011	5.6	10.66	30	50	
16/12/2011	34.8	11.03	30	50	
22/12/2011	8.2	10.84	30	50	
28/12/2011	5.6	10.74	30	50	
3/01/2012	8.1	10.55	30	50	
9/01/2012	8.1	10.41	30	50	
15/01/2012	2.2	10.27	30	50	
21/01/2012	<0.1	10.26	30	50	
27/01/2012	<0.1	10.06	30	50	
2/02/2012		10.09	30	50	No sample as unit
15/03/2012	5.7	9.94	30	50	Unit dismantled for
21/03/2012	29.4	10.41	30	50	
27/03/2012	4.4	10.30	30	50	
2/04/2012	7.4	10.01	30	50	
8/04/2012	14.1	10.10	30	50	
14/04/2012	10.1	10.10	30	50	
20/04/2012	6.8	9.90	30	50	

Date	µg/m ³	Annual Average	Annual Average Limit	24hr Limit	Comments
26/04/2012	9.4	9.84	30	50	
2/05/2012	6.1	9.57	30	50	
8/05/2012	8.1	9.47	30	50	
14/05/2012	11.4	9.56	30	50	
20/05/2012	4.0	9.47	30	50	
26/05/2012	8.9	9.34	30	50	
1/06/2012	3.6	9.31	30	50	
7/06/2012	5.8	9.36	30	50	
13/06/2012	4.0	9.39	30	50	
19/06/2012	10.9	9.55	30	50	
25/06/2012	9.5	9.52	30	50	
1/07/2012	4.7	9.39	30	50	
7/07/2012	3.5	9.11	30	50	
13/07/2012	8.2	9.26	30	50	
19/07/2012	6.8	9.37	30	50	
25/07/2012	3.3	9.25	30	50	
31/07/2012	5.3	9.28	30	50	
6/08/2012	22.7	9.44	30	50	
12/08/2012	34.2	9.90	30	50	
18/08/2012	22.1	10.23	30	50	
24/08/2012	13.5	10.27	30	50	
30/08/2012	33.9	10.70	30	50	
5/09/2012	34.2	11.33	30	50	
11/09/2012	17.0	11.63	30	50	
17/09/2012	17.6	11.91	30	50	
23/09/2012	13.1	11.66	30	50	
29/09/2012	3.7	11.26	30	50	
5/10/2012	19.8	11.30	30	50	
11/10/2012	37.6	11.71	30	50	
17/10/2012	24.3	11.98	30	50	
23/10/2012	13.7	12.11	30	50	
29/10/2012	4.3	12.03	30	50	
4/11/2012	23.4	12.35	30	50	
10/11/2012	15.0	12.56	30	50	
16/11/2012	43.1	13.33	30	50	
22/11/2012	35.0	13.84	30	50	
28/11/2012	20.4	14.14	30	50	
4/12/2012	18.0	13.80	30	50	
10/12/2012	24.0	14.12	30	50	
16/12/2012	25.4	14.51	30	50	
22/12/2012	9.7	14.55	30	50	
29/12/2012	39.0	15.17	30	50	
6/01/2013	14.4	15.41	30	50	
12/01/2013	9.4	15.29	30	50	
29/01/2013	1.9	15.03	30	50	
4/02/2013	22.6	15.18	30	50	
10/02/2013	10.3	15.26	30	50	
16/02/2013	7.9	14.86	30	50	
22/02/2013	31.9	15.38	30	50	
28/02/2013	14.5	15.51	30	50	
6/03/2013	46.7	16.13	30	50	
12/03/2013	25.4	16.42	30	50	
18/03/2013	24.6	16.75	30	50	
24/03/2013	18.9	16.93	30	50	
30/03/2013	24.8	17.28	30	50	

Date	µg/m ³	Annual Average	Annual Average Limit	24hr Limit	Comments
5/04/2013	19.6	17.50	30	50	
11/04/2013	37.4	17.99	30	50	
17/04/2013	14.4	18.19	30	50	
23/04/2013	2.8	18.07	30	50	
29/04/2013	6.9	18.13	30	50	
5/05/2013	1.6	18.05	30	50	
17/05/2013	13.1	18.23	30	50	
23/05/2013	8.0	18.17	30	50	
29/05/2013	7.0	18.12	30	50	
4/06/2013	<0.1	18.38	30	50	
10/06/2013	12.6	18.56	30	50	
16/06/2013	6.8	18.53	30	50	
22/06/2013	3.3	18.46	30	50	
28/06/2013	3.8	18.47	30	50	
4/07/2013	9.4	18.55	30	50	
10/07/2013	11.2	18.33	30	50	
17/07/2013	3.5	17.74	30	50	
23/07/2013	4.5	17.40	30	50	
29/07/2013	6.9	17.28	30	50	
4/08/2013	13.6	16.88	30	50	
10/08/2013	8.0	16.38	30	50	
16/08/2013	17.7	16.39	30	50	
22/08/2013	17.0	16.38	30	50	
28/08/2013	14.6	16.41	30	50	
3/09/2013	13.9	16.61	30	50	
9/09/2013	5.5	16.33	30	50	
15/09/2013	12.9	15.86	30	50	
21/09/2013	0.4	15.40	30	50	
27/09/2013	9.2	15.31	30	50	
3/10/2013	18.7	15.59	30	50	
9/10/2013	20.7	15.54	30	50	
15/10/2013	57.1	16.35	30	50	
21/10/2013	18.9	15.88	30	50	
28/10/2013	26.9	15.73	30	50	
28/10/2013	9.0	15.51	30	50	
9/11/2013	6.0	15.28	30	50	
15/11/2013	13.2	15.07	30	50	
21/11/2013	11.8	14.81	30	50	
27/11/2013	40.9	15.41	30	50	
3/12/2013	20.1	15.04	30	50	
9/12/2013	9.7	14.95	30	50	
15/12/2013	14.9	15.06	30	50	
21/12/2013	16.1	15.33	30	50	
27/12/2013	12.9	15.14	30	50	
2/01/2014	6.0	15.06	30	50	
8/01/2014	8.9	15.08	30	50	
14/01/2014	25.5	14.96	30	50	
20/01/2014	29.0	15.24	30	50	
26/01/2014	0.4	14.35	30	50	
1/02/2014	17.3	14.19	30	50	
7/02/2014	10.6	13.92	30	50	
13/02/2014	12.6	13.80	30	50	
19/02/2014	17.0	13.65	30	50	
25/02/2014	9.1	13.45	30	50	
3/03/2014	11.7	12.95	30	50	
10/03/2014	4.9	12.77	30	50	

Date	µg/m ³	Annual Average	Annual Average Limit	24hr Limit	Comments
16/03/2014	3.8	12.79	30	50	
22/03/2014	7.1	12.79	30	50	
28/03/2014	6.8	12.89	30	50	
3/04/2014	13.0	12.89	30	50	
9/04/2014	6.5	12.86	30	50	
15/04/2014	5.2	12.83	30	50	
21/04/2014	9.0	12.76	30	50	
27/04/2014	9.5	12.70	30	50	



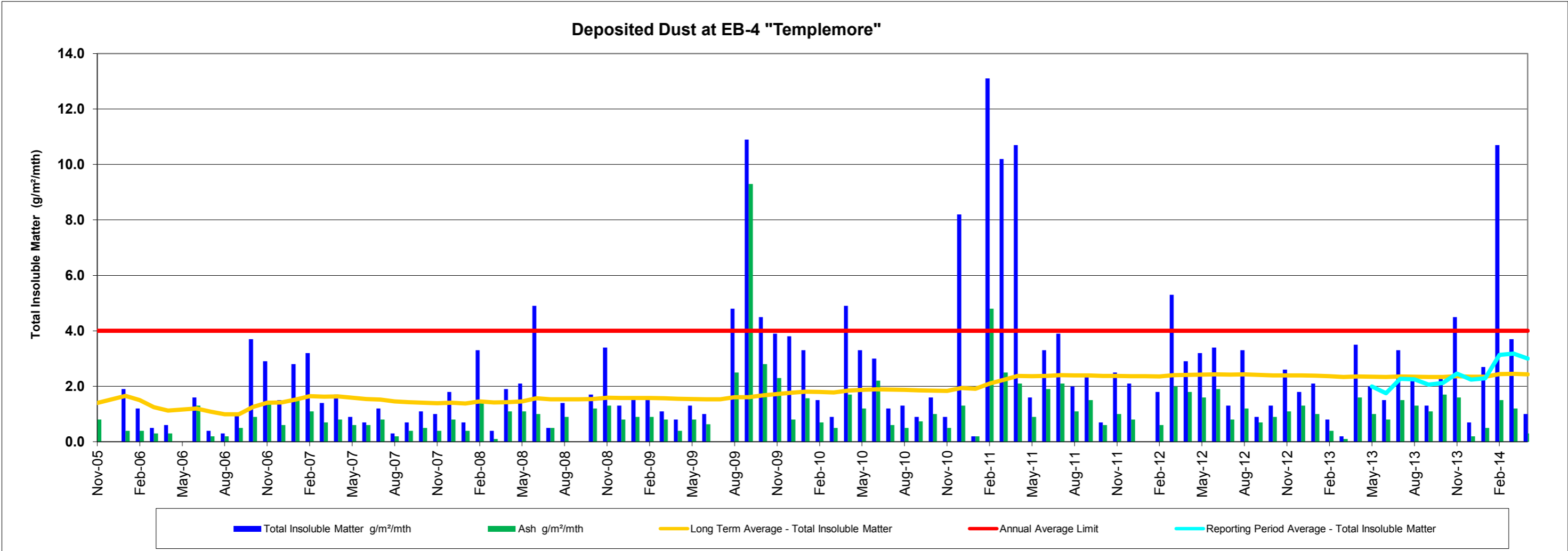
Deposited Dust EB-4 "Templemore"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
21992.03	EB-3	02-Dec-05	Nov-05	Client		2800	1.4		1.4	4.0	0.8	
22570.03	EB-3	02-Feb-06	Jan-06	Client		1825	1.9		1.7	4.0	0.4	
22746.03	EB-3	02-Mar-06	Feb-06	Client		1450	1.2		1.5	4.0	0.4	
23208.03	EB-3	03-Apr-06	Mar-06	Client	1430	175	0.5		1.3	4.0	0.3	
23334.03	EB-3	02-May-06	Apr-06	S Burns EEL	0825	525	0.6		1.1	4.0	0.3	
23880.02	EB-4	04-Jul-06	Jun-06	Client	1020	800	1.6		1.2	4.0	1.3	Site Name changed from EB-3 to EB-4
24082.02	EB-4	01-Aug-06	Jul-06	Client	1315	980	0.4		1.1	4.0	0.2	
24416.02	EB-4	03-Sep-06	Aug-06	Client	1620	220	0.3		1.0	4.0	0.2	
24693.02	EB-4	03-Oct-06	Sep-06	Client	1800	200	1.0		1.0	4.0	0.5	
24977.02	EB-4	06-Nov-06	Oct-06	Client	1735	1300	3.7		1.3	4.0	0.9	
25438.02	EB-4	03-Dec-06	Nov-06	Client	0800	295	2.9		1.4	4.0	1.4	
25540.02	EB-4	02-Jan-07	Dec-06	Client		230	1.5		1.4	4.0	0.6	
25843.02	EB-4	02-Feb-07	Jan-07	Client	0855	40	2.8		1.5	4.0	1.6	
26120.02	EB-4	05-Mar-07	Feb-07	Client	1235	1050	3.2		1.6	4.0	1.1	
26427.02	EB-4	03-Apr-07	Mar-07	Client	1330	220	1.4		1.6	4.0	0.7	
26631.02	EB-4	02-May-07	Apr-07	Client	1000	360	1.7		1.6	4.0	0.8	
26960.02	EB-4	03-Jun-07	May-07	Client	0730	945	0.9		1.6	4.0	0.6	
27234.02	EB-4	02-Jul-07	Jun-07	Client	0930	1170	0.7		1.5	4.0	0.6	
27531.02	EB-4	04-Aug-07	Jul-07	Client	1200	265	1.2		1.5	4.0	0.8	
27820.02	EB-4	02-Sep-07	Aug-07	Client	0950	930	0.3		1.5	4.0	0.2	
28119.02	EB-4	01-Oct-07	Sep-07	Client	1000	265	0.7		1.4	4.0	0.4	
28398.02	EB-4	03-Nov-07	Oct-07	Client	0735	335	1.1		1.4	4.0	0.5	
28663.02	EB-4	02-Dec-07	Nov-07	Client	1645	410	1.0		1.4	4.0	0.4	
28924.02	EB-4	03-Jan-08	Dec-07	Client	1105	2025	1.8		1.4	4.0	0.8	
29225.02	EB-4	04-Feb-08	Jan-08	Client	1045	>2060	0.7		1.4	4.0	0.4	
29526.02	EB-4	04-Mar-08	Feb-08	Client	1730	1105	3.3		1.5	4.0	1.5	
29774.02	EB-4	05-Apr-08	Mar-08	Client	1000	310	0.4		1.4	4.0	0.1	
30056.02	EB-4	5-May-08	Apr-08	Client	1430	260	1.9		1.4	4.0	1.1	
30387.02	EB-4	3-Jun-08	May-08	Client	1410	665	2.1		1.5	4.0	1.1	
30661.02	EB-4	05-Jul-08	Jun-08	Client	1020	400	4.9		1.6	4.0	1.0	
30903.01	EB-4	05-Aug-08	Jul-08	Client	1550	500	0.5		1.5	4.0	0.5	
31211.02	EB-4	09-Sep-08	Aug-08	Client	1405	905	1.4		1.5	4.0	0.9	
31528.01	EB-4	02-Oct-08	Sep-08	Client	NS	NS	NS		1.5	4.0	NS	Too wet to sample
31776.01	EB-4	02-Nov-08	Oct-08	Client	1330	1525	1.7		1.5	4.0	1.2	
32024.01	EB-4	6-Dec-08	Nov-08	Client	1045	1535	3.4		1.6	4.0	1.3	
32519.01	EB-4	3-Jan-09	Dec-08	Client	1750	1205	1.3		1.6	4.0	0.8	
32247.01	EB-4	4-Feb-09	Jan-09	Client	0925	40	1.6		1.6	4.0	0.9	
32864.01	EB-4	3-Mar-09	Feb-09	Client	1640	1030	1.5		1.6	4.0	0.9	
2600 1008 - 0	EB-4	29-Mar-09	Mar-09	Client		50	1.1		1.6	4.0	0.8	
2600 1018 - 00	EB-4	04-May-09	Apr-09	Client		600	0.8		1.5	4.0	0.4	Bird Droppings, Grazing
2600 1033 - 01	EB-4	31-May-09	May-09	Client		600	1.3		1.5	4.0	0.8	
2600 1039 - 01	EB-4	30-Jun-09	Jun-09	Client		600	1.0		1.5	4.0	0.6	
2600 1051 - 01	EB-4	04-Aug-09	Jul-09	Client			NS		1.5	4.0		Missing from batch. Listed on field sheet as "bottle not supplied"
2600 1062 - 00	EB-4	03-Sep-09	Aug-09	Client	1630	20	4.8		1.6	4.0	2.5	
2600 1096 - 01	EB-4	04-Oct-09	Sep-09	Client	1235	750	10.9		1.6	4.0	9.3	
2600 1126 - 00	EB-4	03-Nov-09	Oct-09	Client	0940	750	4.5		1.7	4.0	2.8	Insects, Grazing

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
2600 1204 - 00	EB-4	01-Dec-09	Nov-09	Client	1325	75	3.9		1.7	4.0	2.3	
2600 1222 - 00	EB-4	05-Jan-10	Dec-09	Client	1045	2500	3.8		1.8	4.0	0.8	
2600 1234	EB-4	03-Feb-10	Jan-10	Client	1445	250	3.3		1.8	4.0	1.6	
2600 1247	EB-4	04-Mar-10	Feb-10	Client	1245	2500	1.5		1.8	4.0	0.7	
2600 1260	EB-4	05-Apr-10	Mar-10	Client	1035	2500	0.9		1.8	4.0	0.5	
2600 1268	EB-4	03-May-10	Apr-10	Client	0945	300	4.9		1.8	4.0	1.7	
2600 1277	EB-4	02-Jun-10	May-10	TCPL	1355		3.3		1.9	4.0	1.2	Grazing and Mining Activity
2600 1288-805-1	EB-4	04-Jul-10	Jun-10	TCPL	1005		3		1.9	4.0	2.2	Grazing and Mining Activity
2600 1298 - 887	EB-4	03-Aug-10	Jul-10	TCPL	1110	1300	1.2		1.9	4.0	0.6	Grazing & Mining Activity
26001309-914	EB-4	04-Sep-10	Aug-10	TCPL	1030	1000	1.3		1.9	4.0	0.5	Plant Material,Bird Droppings,Mining Activity
2600431904.00	EB-4	05-Oct-10	Sep-10	TCPL	1650	-	0.9		1.9	4.0	0.7	Mining Activity
6800-4368-10	EB-4	21-Oct-10	Oct-10	TCPL	1655	600	1.6		1.8	4.0	1.0	
1002977-001	EB-4	02-Dec-10	Nov-10	TCPL			0.9		1.8	4.0	0.5	
1100063-001	EB-4	04-Jan-11	Dec-10	TCPL	1110		8.2		1.9	4.0	1.3	Funnel blocked by bird droppings
1100335-001	EB-4	04-Feb-11	Jan-11	TCPL	1415		0.2		1.9	4.0	0.2	
1100549-001	EB-4	03-Mar-11	Feb-11	TCPL	1000		13.1		2.1	4.0	4.8	Cow manure in funnel
1100793-001	EB-4	03-Apr-11	Mar-11	TCPL	0940		10.2		2.2	4.0	2.5	Fully blocked by bird droppings
EN1101030.001	EB-4	02-May-11	Apr-11	TCPL	1050		10.7		2.4	4.0	2.1	
EN1101344-001	EB-4	05-Jun-11	May-11	Merton Past. Co.	1230		1.6		2.4	4.0	0.9	
EN1101700-001	EB-4	04-Jul-11	Jun-11	Merton Past. Co.	0850		3.3		2.4	4.0	1.9	Grazing activity, mining activity
EN1102064-001	EB-4	03-Aug-11	Jul-11	Merton Past. Co.	950		3.9		2.4	4.0	2.1	Mining Activity
EN1102639-001	EB-4	05-Sep-11	Aug-11	Merton Past. Co.	1130		2.0		2.4	4.0	1.1	Bird droppings, Grazing activity,Mining Activity-Funnel part blocked
EN1103081-001	EB-4	03-Oct-11	Sep-11	Merton Past. Co.	1510		2.4		2.4	4.0	1.5	
EN1103410-001	EB-4	05-Nov-11	Oct-11	Merton Past. Co.	1050	1050	0.7		2.4	4.0	0.6	
EN1104053-001	EB-4	05-Dec-11	Nov-11	Merton Past. Co.	0945		2.5		2.4	4.0	1.0	
EN1200212-002	EB-4	06-Jan-11	Dec-11	Merton Past. Co.	1730		2.1		2.4	4.0	0.8	Funnel fully blocked
EN1200212-002	EB-4	06-Jan-11	Jan-12	Merton Past. Co.					2.4	4.0		Unable to sample-road closed due to flooding
EN1201033-001	EB-4	04-Mar-12	Feb-12	Merton Past. Co.	1230		1.8		2.4	4.0	0.6	
EN1201376-001	EB-4	02-Apr-12	Mar-12	Merton Past. Co.	1500		5.3		2.4	4.0	2.0	
EN1201718-001	EB-4	04-May-12	Apr-12	Merton Past. Co.	1020		2.9		2.4	4.0	1.8	
EN1202179-001	EB-4	09-Jun-12	May-12	Merton Past. Co.	1210		3.2		2.4	4.0	1.6	
EN1202527-001	EB-4	03-Jul-12	Jun-12	Merton Past. Co.	1145		3.4		2.4	4.0	1.9	
EN1202939-001	EB-4	04-Aug-12	Jul-12	Merton Past. Co.	1540		1.3		2.4	4.0	0.8	
EN1203413-001	EB-4	02-Sep-12	Aug-12	Merton Past. Co.	1555		3.3		2.4	4.0	1.2	
EN1203939-001	EB-4	06-Oct-12	Sep-12	Merton Past. Co.	0930		0.9		2.4	4.0	0.7	
EN1204272-001	EB-4	06-Nov-12	Oct-12	Merton Past. Co.	1830		1.3		2.4	4.0	0.9	
EN1204642-001	EB-4	03-Dec-12	Nov-12	Merton Past. Co.	1145		2.6		2.4	4.0	1.1	
EN1300140-001	EB-4	05-Jan-13	Dec-12	Merton Past. Co.	0920		1.8		2.4	4.0	1.3	
EN1300548-001	EB-4	07-Feb-13	Jan-13	Merton Past. Co.	0915		2.1		2.4	4.0	1	
EN1301077-009	EB-4	18-Mar-13	Feb-13	ALS Acirl	1130	300	0.8		2.4	4.0	0.4	
EN1301077-009	EB-4	17-Apr-13	Mar-13	ALS Acirl	1000	200	0.2		2.3	4.0	0.1	
EN1301832-009	EB-4	16-May-13	Apr-13	ALS Acirl	1115	200	3.5		2.4	4.0	1.6	Insects, plant material
EN1302216-009	EB-4	17-Jun-13	May-13	ALS Acirl	1200	900	2	2.0	2.4	4.0	1	Insects, plant material
EN1302635-009	EB-4	16-Jul-13	Jun-13	ALS Acirl	1110	400	1.5	1.8	2.3	4.0	0.8	Bird droppings, plant material-replaced funnel
EN1303027-001	EB-4	15-Aug-13	Jul-13	ALS Acirl	1255	300	3.3	2.3	2.4	4.0	1.5	Insects, plant material
EN1303430-001	EB-4	16-Sep-13	Aug-13	ALS Acirl	1125	100	2.2	2.3	2.4	4.0	1.3	Insects, plant material
EN1303809-001	EB-4	15-Oct-13	Sep-13	ALS Acirl	1130	300	1.3	2.1	2.3	4.0	1.1	Insects, plant material
EN1304188-001	EB-4	14-Nov-13	Oct-13	ALS Acirl	1145	250	2.4	2.1	2.3	4.0	1.7	Insects, plant material
EN1304650-001	EB-4	16-Dec-13	Nov-13	ALS Acirl	0950	650	4.5	2.5	2.4	4.0	1.6	Insects, plant material, bugs

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
2066185402-001	EB-4	14-Jan-14	Dec-13	ALS Acirl	1140	100	0.7	2.2	2.3	4.0	0.2	Insects, plant material
2600186702-001	EB-4	13-Feb-14	Jan-14	ALS Acirl	1215	200	2.7	2.3	2.3	4.0	0.5	Insects
2600188202-001	EB-4	14-Mar-14	Feb-14	ALS Acirl	1050	1000	10.7	3.1	2.4	4.0	1.5	Insects, plant material
2600189702-001	EB-4	15-Apr-14	Mar-14	ALS Acirl	1035	2700	3.7	3.2	2.5	4.0	1.2	Insects, plant material
2600191002-001	EB-4	15-May-14	Apr-14	ALS Acirl	1145	500	1	3.0	2.4	4.0	0.3	Plant material

* September 2009 result excluded from long term average (regional dust storms).



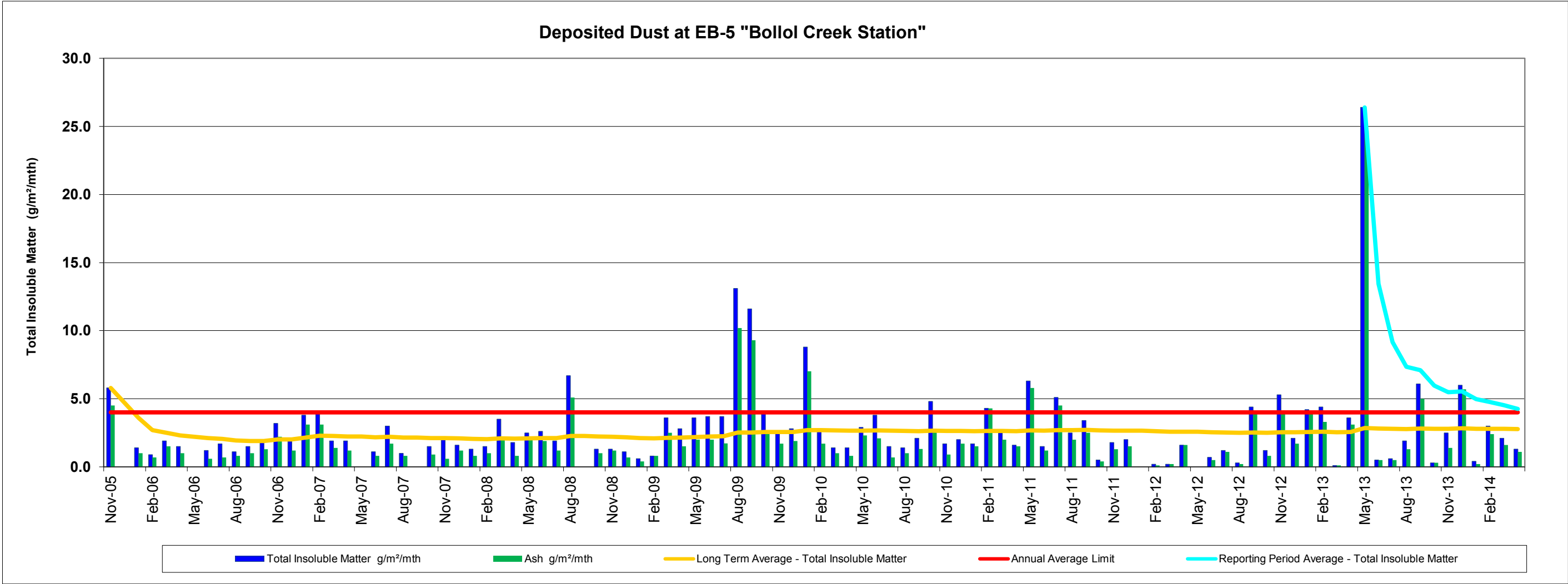
Deposited Dust EB-5 "Bollol Creek Station"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
21992.04	EB-5	02-Dec-05	Nov-05	Client		2775	5.8		5.8	4.0	4.5	
22570.04	EB-5	02-Feb-06	Jan-06	Client		2210	1.4		3.6	4.0	1.0	
22746.04	EB-5	02-Mar-06	Feb-06	Client		1500	0.9		2.7	4.0	0.7	
23208.04	EB-5	03-Apr-06	Mar-06	Client	1437	250	1.9		2.5	4.0	1.5	
23334.04	EB-5	02-May-06	Apr-06	S Burns EEL	0835	700	1.5		2.3	4.0	1.0	
23880.03	EB-5	04-Jul-06	Jun-06	Client	1040	700	1.2		2.1	4.0	0.6	Site Name changed from EB-4 to EB-5
24082.03	EB-5	01-Aug-06	Jul-06	Client	1320	970	1.7		2.1	4.0	0.7	
24416.03	EB-5	03-Sep-06	Aug-06	Client	1645	430	1.1		1.9	4.0	0.8	
24693.03	EB-5	03-Oct-06	Sep-06	Client	1830	200	1.5		1.9	4.0	1.0	
24977.03	EB-5	06-Nov-06	Oct-06	Client	1745	1320	2.0		1.9	4.0	1.3	
25438.03	EB-5	03-Dec-06	Nov-06	Client	0810	380	3.2		2.0	4.0	2.2	
25540.03	EB-5	02-Jan-07	Dec-06	Client		150	1.9		2.0	4.0	1.2	
25843.03	EB-5	02-Feb-07	Jan-07	Client	0900	40	3.8		2.1	4.0	3.1	
26120.03	EB-5	05-Mar-07	Feb-07	Client	1225	655	4.1		2.3	4.0	3.1	
26427.03	EB-5	03-Apr-07	Mar-07	Client	1340	165	1.9		2.3	4.0	1.4	
26631.03	EB-5	02-May-07	Apr-07	Client	1010	270	1.9		2.2	4.0	1.2	
26960.03	EB-5	03-Jun-07	May-07	Client					2.2	4.0		No Access
27234.03	EB-5	02-Jul-07	Jun-07	Client	0945	1900	1.1		2.2	4.0	0.8	
27531.03	EB-5	04-Aug-07	Jul-07	Client	1215	150	3.0		2.2	4.0	1.7	
27820.03	EB-5	02-Sep-07	Aug-07	Client	0955	1045	1.0		2.2	4.0	0.8	
28119.03	EB-5	01-Oct-07	Sep-07	Client					2.2	4.0		No Entry due to Equine Influenza
28398.03	EB-5	03-Nov-07	Oct-07	Client	0745	345	1.5		2.1	4.0	0.9	
28663.03	EB-5	02-Dec-07	Nov-07	Client	1630	720	2.0		2.1	4.0	0.6	
28924.03	EB-5	03-Jan-08	Dec-07	Client	1045	>2500	1.6		2.1	4.0	1.2	
29225.03	EB-5	04-Feb-08	Jan-08	Client	1035	>2060	1.3		2.1	4.0	0.8	
29526.03	EB-5	04-Mar-08	Feb-08	Client	1715	1500	1.5		2.0	4.0	1.0	
29774.03	EB-5	05-Apr-08	Mar-08	Client	0950	265	3.5		2.1	4.0	2.1	
30056.03	EB-5	5-May-08	Apr-08	Client	1450	50	1.8		2.1	4.0	0.8	
30387.03	EB-5	3-Jun-08	May-08	Client	1425	695	2.5		2.1	4.0	2.0	
30661.03	EB-5	05-Jul-08	Jun-08	Client	1010	495	2.6		2.1	4.0	1.9	
30903.01	EB-5	05-Aug-08	Jul-08	Client	1605	525	1.9		2.1	4.0	1.2	
31211.03	EB-5	09-Sep-08	Aug-08	Client	1355	850	6.7		2.3	4.0	5.1	
31528.02	EB-5	02-Oct-08	Sep-08	Client	NS	NS	NS		2.3	4.0	NS	Too wet to sample
31776.02	EB-5	02-Nov-08	Oct-08	Client	1350	1460	1.3		2.2	4.0	1.0	
32024.02	EB-5	6-Dec-08	Nov-08	Client	1100	1570	1.3		2.2	4.0	1.2	
32519.02	EB-5	3-Jan-09	Dec-08	Client	1810	1200	1.1		2.2	4.0	0.7	
32247.02	EB-5	4-Feb-09	Jan-09	Client	0915	<10	0.6		2.1	4.0	0.4	
32864.02	EB-5	3-Mar-09	Feb-09	Client	1650	1550	0.8		2.1	4.0	0.8	
2600 1008 - 0	EB-5	29-Mar-09	Mar-09	Client		50	3.6		2.1	4.0	2.5	
2601 1018 - 00	EB-5	04-May-09	Apr-09	Client		500	2.8		2.1	4.0	1.5	Bird Droppings
2600 1033 - 01	EB-5	31-May-09	May-09	Client		550	3.6		2.2	4.0	2.0	
2601 1039 - 01	EB-5	30-Jun-09	Jun-09	Client		550	3.7		2.2	4.0	2.0	
2601 1051 - 01	EB-5	04-Aug-09	Jul-09	Client	1645	200	3.7		2.3	4.0	1.7	
2600 1062 - 00	EB-5	03-Sep-09	Aug-09	Client	1640	20	13.1		2.5	4.0	10.2	Bird Droppings
2600 1096 - 01	EB-5	04-Oct-09	Sep-09	Client	1245	840	11.6		2.5	4.0	9.3	
2600 1126 - 00	EB-5	03-Nov-09	Oct-09	Client	0950	900	4		2.6	4.0	2.4	

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
2600 1204 - 00	EB-5	01-Dec-09	Nov-09	Client	1335	50	2.5		2.6	4.0	1.7	
2600 1222 - 00	EB-5	05-Jan-10	Dec-09	Client	1055	2500	2.8		2.6	4.0	1.9	
2600 1234	EB-5	03-Feb-10	Jan-10	Client	1455	400	8.8		2.7	4.0	7.0	
2600 1247	EB-5	04-Mar-10	Feb-10	Client	1255	2500	2.8		2.7	4.0	1.7	
2600 1260	EB-5	05-Apr-10	Mar-10	Client	1045	2500	1.4		2.7	4.0	1.0	
2600 1268	EB-5	03-May-10	Apr-10	Client	0955	350	1.4		2.6	4.0	0.8	
2600 1277	EB-5	02-Jun-10	May-10	TCPL	1345		2.9		2.7	4.0	2.3	Farming and Mining Activity
2600 1288-805-1	EB-5	04-Jul-10	Jun-10	TCPL	1015		3.8		2.7	4.0	2.1	Farming, Grazing and Mining Activity
2601 1298 - 887	EB-5	03-Aug-10	Jul-10	TCPL	1120	1800	1.5		2.7	4.0	0.7	Mining Activity
26001309-914	EB-5	04-Sep-10	Aug-10	TCPL	1040	1450	1.4		2.6	4.0	1.0	Plant Material,Bird Droppings, Farming activity
2600431904	EB-5	05-Oct-10	Sep-10	TCPL	1640	-	2.1		2.6	4.0	1.3	Grazing Activity, Mining Activity
6800-4368-10	EB-5	21-Oct-10	Oct-10	TCPL	1700	500	4.8		2.7	4.0	2.8	
1002977-002	EB-5	02-Dec-10	Nov-10	TCPL			1.7		2.6	4.0	0.9	Fence with bottle attached knocked over by cattle
1100063-002	EB-5	04-Jan-11	Dec-10	TCPL	1120		2		2.6	4.0	1.7	
1100335-002	EB-5	04-Feb-11	Jan-11	TCPL	1425		1.7		2.6	4.0	1.5	
1100549-002	EB-5	03-Mar-11	Feb-11	TCPL	1015		4.3		2.6	4.0	4.3	
1100793-002	EB-5	03-Apr-11	Mar-11	TCPL	0950		2.5		2.6	4.0	2.0	Top of bottle broken
EN1101030-002	EB-5	02-May-11	Apr-11	TCPL	1055		1.6		2.6	4.0	1.5	Spider webs
EN1101344-002	EB-5	05-Jun-11	May-11	TCPL	1240		6.3		2.7	4.0	5.8	Funnel Smashed
EN1101700-002	EB-5	04-Jul-11	Jun-11	TCPL	0840		1.5		2.7	4.0	1.2	Grazing activity, mining activity
EN1102064-002	EB-5	03-Aug-11	Jul-11	TCPL	1000		5.1		2.7	4.0	4.5	Mining Activity-Funnel broken-new funnel
EN1102639-002	EB-5	05-Sep-11	Aug-11	TCPL	1140		2.5		2.7	4.0	2.0	Grazing activity, mining activity
EN1103081-002	EB-5	03-Oct-11	Sep-11	TCPL	1520		3.4		2.7	4.0	2.5	Broken funnel
EN1103410-002	EB-5	05-Nov-11	Oct-11	TCPL	1100	1100	0.5		2.7	4.0	0.4	
EN1104053-002	EB-5	05-Dec-11	Nov-11	TCPL	0955		1.8		2.7	4.0	1.3	Funnel broken
EN1200212-003	EB-5	06-Jan-11	Dec-11	TCPL	1740		2		2.7	4.0	1.5	
EN1200212-003	EB-5	06-Jan-11	Jan-12	TCPL					2.7	4.0		Unable to sample-road closed due to flooding
EN1201033-002	EB-5	04-Mar-12	Feb-12	TCPL	1240		0.2		2.6	4.0	0.1	
EN1201376-002	EB-5	02-Apr-12	Mar-12	TCPL	1500		0.2		2.6	4.0	0.2	Site damaged by cattle
EN1201718-002	EB-5	04-May-12	Apr-12	TCPL	1030		1.6		2.6	4.0	1.6	Broken funnel again
	EB-5	09-Jun-12	May-12	Merton Past. Co.					2.6	4.0		
EN1202527-002	EB-5	03-Jul-12	Jun-12	Merton Past. Co.	1155		0.7		2.5	4.0	0.5	
EN1202939-002	EB-5	04-Aug-12	Jul-12	Merton Past. Co.	1550		1.2		2.5	4.0	1.1	
EN1203413-002	EB-5	02-Sep-12	Aug-12	Merton Past. Co.	1605		0.3		2.5	4.0	0.2	
EN1203939-002	EB-5	06-Oct-12	Sep-12	Merton Past. Co.	0940		4.4		2.5	4.0	4	
EN1204272-002	EB-5	06-Nov-12	Oct-12	Merton Past. Co.	1850		1.2		2.5	4.0	0.8	
EN1204642-002	EB-5	03-Dec-12	Nov-12	Merton Past. Co.	1155		5.3		2.5	4.0	4.1	
EN1300140-002	EB-5	05-Jan-13	Dec-12	Merton Past. Co.	0930		2.1		2.5	4.0	1.7	
EN1300548-002	EB-5	07-Feb-13	Jan-13	Merton Past. Co.	0930		4.2		2.6	4.0	4.1	
EN1301077-010	EB-5	18-Mar-13	Feb-13	ALS Acirl	1105	300	4.4		2.6	4.0	3.3	
EN1301077-010	EB-5	17-Apr-13	Mar-13	ALS Acirl	1015	200	0.1		2.5	4.0	0.1	
EN1301832-010	EB-5	16-May-13	Apr-13	ALS Acirl	1050	200	3.6		2.6	4.0	3.1	Insects, plant material
EN1302216-010	EB-5	17-Jun-13	May-13	ALS Acirl	1125	1000	26.4	26.4	2.8	4.0	24.7	Insects, plant material. Result excluded from average.
EN1302635-010	EB-5	16-Jul-13	Jun-13	ALS Acirl	1130	400	0.5	13.5	2.8	4.0	0.5	Insects
EN1303027-009	EB-5	15-Aug-13	Jul-13	ALS Acirl	1230	300	0.6	9.2	2.8	4.0	0.5	Insects, plant material
EN1303430-009	EB-5	16-Sep-13	Aug-13	ALS Acirl	1110	100	1.9	7.4	2.8	4.0	1.3	Insects, plant material
EN1303809-009	EB-5	15-Oct-13	Sep-13	ALS Acirl	1120	350	6.1	7.1	2.8	4.0	5	Insects, plant material
EN1304188-002	EB-5	14-Nov-13	Oct-13	ALS Acirl	1130	250	0.3	6.0	2.8	4.0	0.3	Insects, plant material

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EN1304650-002	EB-5	16-Dec-13	Nov-13	ALS Acirl	0925	900	2.5	5.5	2.8	4.0	1.4	Insects, plant material
2066185402-002	EB-5	14-Jan-14	Dec-13	ALS Acirl	1120	100	6	5.5	2.8	4.0	5.7	Insects, plant material, broken funnel
2600186702-002	EB-5	13-Feb-14	Jan-14	ALS Acirl	1200	250	0.4	5.0	2.8	4.0	0.2	Plant material
2600188202-002	EB-5	14-Mar-14	Feb-14	ALS Acirl	1100	750	3	4.8	2.8	4.0	2.4	Insects, plant material
2600189702-002	EB-5	15-Apr-14	Mar-14	ALS Acirl	1010	2600	2.1	4.5	2.8	4.0	1.6	Plant material
2600191002-002	EB-5	15-May-14	Apr-14	ALS Acirl	1130	350	1.3	4.3	2.8	4.0	1.1	Insects

* September 2009 result excluded from long term average (regional dust storms).



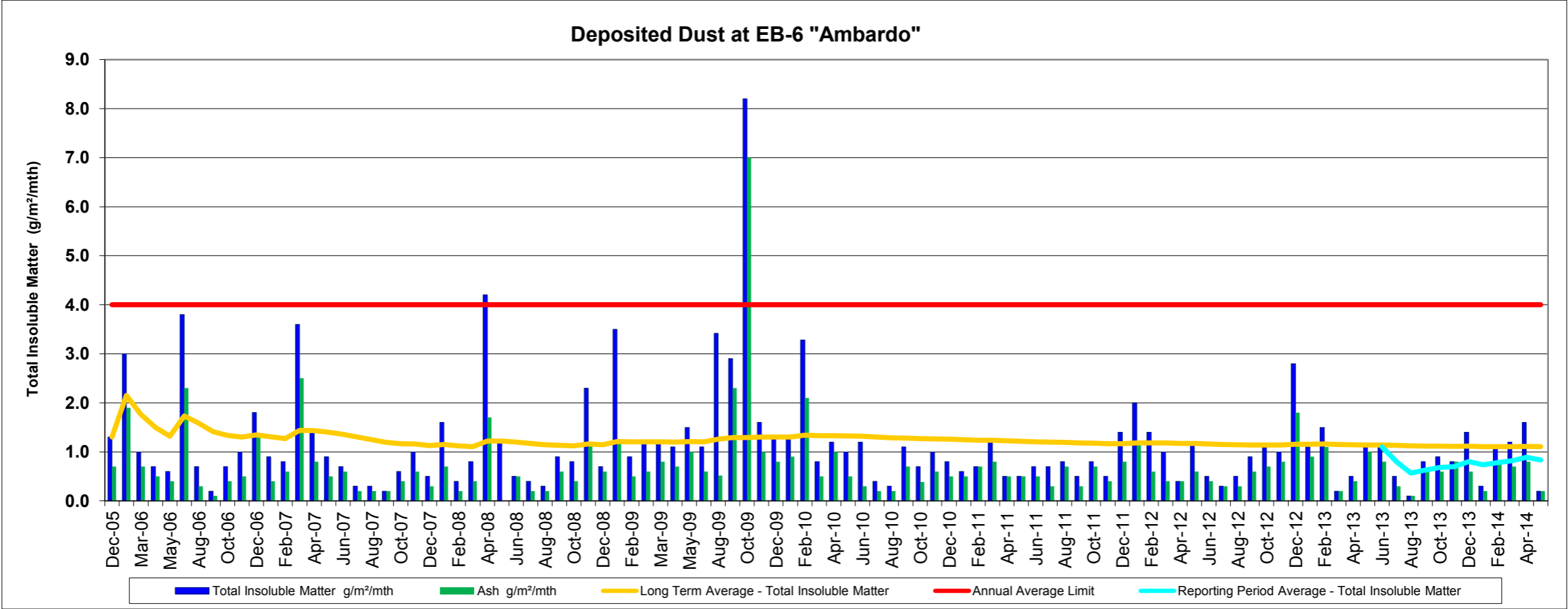
Deposited Dust EB-6 "Ambardo"

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21992.06	EB-6	02-Dec-05	Nov-05	Client		2625	1.3		1.3	4.0	0.7	
22570.06	EB-6	02-Feb-06	Jan-06	Client		1835	3.0		2.2	4.0	1.9	
22746.06	EB-6	02-Mar-06	Feb-06	Client		900	1.0		1.8	4.0	0.7	
23208.06	EB-6	03-Apr-06	Mar-06	Client	1449	100	0.7		1.5	4.0	0.5	
23334.06	EB-6	02-May-06	Apr-06	S Burns EEL	0910	800	0.6		1.3	4.0	0.4	
23880.04	EB-6	04-Jul-06	Jun-06	Client	1115	850	3.8		1.7	4.0	2.3	
24082.04	EB-6	01-Aug-06	Jul-06	Client	1348	1050	0.7		1.6	4.0	0.3	
24416.04	EB-6	03-Sep-06	Aug-06	Client	1700	240	0.2		1.4	4.0	0.1	
24693.04	EB-6	03-Oct-06	Sep-06	Client	1600	350	0.7		1.3	4.0	0.4	
24977.04	EB-6	06-Nov-06	Oct-06	Client	1815	1410	1.0		1.3	4.0	0.5	
25438.04	EB-6	03-Dec-06	Nov-06	Client	0850	330	1.8		1.3	4.0	1.3	
25540.04	EB-6	02-Jan-07	Dec-06	Client		240	0.9		1.3	4.0	0.4	
25853.04	EB-6	02-Feb-07	Jan-07	Client	0930	170	0.8		1.3	4.0	0.6	
26120.04	EB-6	05-Mar-07	Feb-07	Client	1320	1275	3.6		1.4	4.0	2.5	
26427.04	EB-6	03-Apr-07	Mar-07	Client	1450	290	1.4		1.4	4.0	0.8	
26631.04	EB-6	02-May-07	Apr-07	Client	1040	490	0.9		1.4	4.0	0.5	
26960.04	EB-6	03-Jun-07	May-07	Client	0820	880	0.7		1.4	4.0	0.6	
27234.04	EB-6	02-Jul-07	Jun-07	Client	1020	1235	0.3		1.3	4.0	0.2	
27531.04	EB-6	04-Aug-07	Jul-07	Client	1100	230	0.3		1.2	4.0	0.2	
27820.04	EB-6	02-Sep-07	Aug-07	Client	0900	1165	0.2		1.2	4.0	0.2	
28119.04	EB-6	01-Oct-07	Sep-07	Client	0900	125	0.6		1.2	4.0	0.4	
28398.04	EB-6	03-Nov-07	Oct-07	Client	0810	565	1.0		1.2	4.0	0.6	
28663.04	EB-6	02-Dec-07	Nov-07	Client	1300	715	0.5		1.1	4.0	0.3	
28924.04	EB-6	03-Jan-08	Dec-07	Client	1000	2050	1.6		1.2	4.0	0.7	
29225.04	EB-6	04-Feb-08	Jan-08	Client	1000	>2065	0.4		1.1	4.0	0.2	
29526.04	EB-6	04-Mar-08	Feb-08	Client	1645	1545	0.8		1.1	4.0	0.4	
29774.04	EB-6	05-Apr-08	Mar-08	Client	0900	120	4.2		1.2	4.0	1.7	
30056.04	EB-6	5-May-08	Apr-08	Client	1420	300	1.2		1.2	4.0		
30387.04	EB-6	3-Jun-08	May-08	Client	1320	760	0.5		1.2	4.0	0.5	
30661.04	EB-6	05-Jul-08	Jun-08	Client	1040	705	0.4		1.2	4.0	0.2	
30903.01	EB-6	05-Aug-08	Jul-08	Client	1500	475	0.3		1.1	4.0	0.2	
31211.04	EB-6	09-Sep-08	Aug-08	Client	1330	945	0.9		1.1	4.0	0.6	
31528.03	EB-6	05-Oct-08	Sep-08	Client	0830	1645	0.8		1.1	4.0	0.4	
31776.03	EB-6	02-Nov-08	Oct-08	Client	1240	310	2.3		1.2	4.0	1.2	
32024.03	EB-6	6-Dec-08	Nov-08	Client	1010	1655	0.7		1.1	4.0	0.6	
32519.03	EB-6	3-Jan-09	Dec-08	Client	1710	1020	3.5		1.2	4.0	1.2	
32247.03	EB-6	4-Feb-09	Jan-09	Client	1000	325	0.9		1.2	4.0	0.5	
32864.03	EB-6	3-Mar-09	Feb-09	Client	1600	1335	1.2		1.2	4.0	0.6	
2600 1008 - 0	EB-6	29-Mar-09	Mar-09	Client		50	1.2		1.2	4.0	0.8	
2610 1018 - 00	EB-6	04-May-09	Apr-09	Client		500	1.1		1.2	4.0	0.7	
2600 1033 - 01	EB-6	31-May-09	May-09	Client		600	1.5		1.2	4.0	1.0	
2602 1039 - 01	EB-6	30-Jun-09	Jun-09	Client		600	1.1		1.2	4.0	0.6	
2602 1051 - 01	EB-6	04-Aug-09	Jul-09	Client	1600	350	3.4		1.3	4.0	0.5	

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2600 1062 - 00	EB-6	03-Sep-09	Aug-09	Client	1600	50	2.9		1.3	4.0	2.3	
2600 1096 - 01	EB-6	04-Oct-09	Sep-09	Client	1200	850	8.2		1.3	4.0	7.0	
2600 1126 - 00	EB-6	03-Nov-09	Oct-09	Client	0900	950	1.6		1.3	4.0	1.0	
2600 1204 - 00	EB-6	01-Dec-09	Nov-09	Client	1250	50	1.3		1.3	4.0	0.8	
2600 1222 - 00	EB-6	05-Jan-10	Dec-09	Client	1015	2500	1.3		1.3	4.0	0.9	
2600 1234	EB-6	03-Feb-10	Jan-10	Client	1400	250	3.3		1.3	4.0	2.1	
2600 1247	EB-6	04-Mar-10	Feb-10	Client	1210	2500	0.8		1.3	4.0	0.5	
2600 1260	EB-6	05-Apr-10	Mar-10	Client	1010	2500	1.2		1.3	4.0	1.0	Insects
2600 1268	EB-6	03-May-10	Apr-10	Client	0900	2500	1.0		1.3	4.0	0.5	Vegetation
2600 1277	EB-6	02-Jun-10	May-10	TCPL	1310		1.2		1.3	4.0	0.3	Grazing and Mining Activity
2600 1288-805-1	EB-6	04-Jul-10	Jun-10	TCPL	0930		0.4		1.3	4.0	0.2	Grazing and Mining Activity
2602 1298 - 887	EB-6	03-Aug-10	Jul-10	TCPL	1030	1500	0.3		1.3	4.0	0.2	Grazing & Mining Activity
26001309-914	EB-6	04-Sep-10	Aug-10	TCPL	1100	1450	1.1		1.3	4.0	0.7	Plant Material, Grazing Activity, Mining Activity
2600431904.00	EB-6	05-Oct-10	Sep-10	TCPL	1640	-	0.7		1.3	4.0	0.4	Grazing Activity, Mining Activity
6800-4368-10	EB-6	21-Oct-10	Oct-10	TCPL	1625	450	1.0		1.3	4.0	0.6	
1002977-003	EB-6	02-Dec-10	Nov-10	TCPL			0.8		1.3	4.0	0.5	
1100063-003	EB-6	04-Jan-11	Dec-10	TCPL	1035		0.6		1.2	4.0	0.5	Spider webs, tree nuts and leaves present
1100335-003	EB-6	04-Feb-11	Jan-11	TCPL	1510		0.7		1.2	4.0	0.7	
1100549-003	EB-6	03-Mar-11	Feb-11	TCPL	0900		1.2		1.2	4.0	0.8	
1100793-003	EB-6	03-Apr-11	Mar-11	TCPL	0915		0.5		1.2	4.0	0.5	Funnel blocked with spider web
EN1101030.003	EB-6	02-May-11	Apr-11	TCPL	1010		0.5		1.2	4.0	0.5	
EN1101344-003	EB-6	05-Jun-11	May-11	TCPL	1205		0.7		1.2	4.0	0.5	
EN1101700-003	EB-6	04-Jul-11	Jun-11	TCPL	0935		0.7		1.2	4.0	0.3	Grazing activity, mining activity
EN1102064-003	EB-6	03-Aug-11	Jul-11	TCPL	915		0.8		1.2	4.0	0.7	Farming activity, Mining Activity-next to workshop
EN1102639-003	EB-6	05-Sep-11	Aug-11	TCPL	1100		0.5		1.2	4.0	0.3	Grazing activity, mining activity
EN1103081-003	EB-6	03-Oct-11	Sep-11	TCPL	1435		0.8		1.2	4.0	0.7	
EN1103410-003	EB-6	05-Nov-11	Oct-11	TCPL	1015	1015	0.5		1.2	4.0	0.4	
EN1104053-003	EB-6	05-Dec-11	Nov-11	TCPL	0915		1.4		1.2	4.0	0.8	Full
EN1200212-004	EB-6	06-Jan-11	Dec-11	TCPL	1700		2.0		1.2	4.0	1.2	
EN1200627-001	EB-6	08-Feb-12	Jan-12	TCPL	1555		1.4		1.2	4.0	0.6	Grazing activity, mining activity-near workshop
EN1201033-003	EB-6	04-Mar-12	Feb-12	TCPL	115		1		1.2	4.0	0.4	
EN1201376-003	EB-6	02-Apr-12	Mar-12	TCPL	1500		0.4		1.2	4.0	0.4	
EN1201718-003	EB-6	04-May-12	Apr-12	TCPL	0945		1.2		1.2	4.0	0.6	Spider web
EN1202179-002	EB-6	09-Jun-12	May-12	TCPL	1130		0.5		1.2	4.0	0.4	
EN1202527-003	EB-6	03-Jul-12	Jun-12	TCPL	1110		0.3		1.2	4.0	0.3	
EN1202939-003	EB-6	04-Aug-12	Jul-12	TCPL	1500		0.5		1.1	4.0	0.3	
EN1203413-003	EB-6	02-Sep-12	Aug-12	TCPL	1530		0.9		1.1	4.0	0.6	
EN1203939-003	EB-6	06-Oct-12	Sep-12	TCPL	0900		1.1		1.1	4.0	0.7	
EN1204272-003	EB-6	06-Nov-12	Oct-12	TCPL	1740		1.0		1.1	4.0	0.8	
EN1204642-003	EB-6	03-Dec-12	Nov-12	TCPL	1115		2.8		1.2	4.0	1.8	
EN1300140-003	EB-6	05-Jan-13	Dec-12	TCPL	0845		1.1		1.2	4.0	0.9	
EN1300548-003	EB-6	07-Feb-13	Jan-13	TCPL	0830		1.5		1.2	4.0	1.1	
EN1301077-011	EB-6	18-Mar-13	Feb-13	ALS Acirl	0850	400	0.2		1.1	4.0	0.2	Insects, plant material-broken funnel
EN1301077-011	EB-6	17-Apr-13	Mar-13	ALS Acirl	0905	200	0.5		1.1	4.0	0.4	Insects, plant material

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EN1301832-011	EB-6	16-May-13	Apr-13	ALS Acirl	0850	200	1.1		1.1	4.0	1.0	Insects, plant material
EN1302216-011	EB-6	17-Jun-13	May-13	ALS Acirl	1015	900	1.1	1.1	1.1	4.0	0.8	Insects, plant material
EN1302635-011	EB-6	16-Jul-13	Jun-13	ALS Acirl	0845	400	0.5	0.8	1.1	4.0	0.3	Insects, plant material
EN1303027-012	EB-6	15-Aug-13	Jul-13	ALS Acirl	1135	300	0.1	0.6	1.1	4.0	0.1	Insects, plant material
EN1303430-012	EB-6	16-Sep-13	Aug-13	ALS Acirl	1150	100	0.8	0.6	1.1	4.0	0.6	Insects, plant material
EN1303809-012	EB-6	15-Oct-13	Sep-13	ALS Acirl	0900	300	0.9	0.7	1.1	4.0	0.6	Insects, plant material
EN1304188-003	EB-6	14-Nov-13	Oct-13	ALS Acirl	0905	250	0.8	0.7	1.1	4.0	0.8	Insects, plant material
EN1304650-003	EB-6	16-Dec-13	Nov-13	ALS Acirl	0910	900	1.4	0.8	1.1	4.0	0.6	Insects, plant material
2066185402-003	EB-6	14-Jan-14	Dec-13	ALS Acirl	0925	100	0.3	0.7	1.1	4.0	0.2	Insects, plant material
2600186702-003	EB-6	13-Feb-14	Jan-14	ALS Acirl	0950	250	1.1	0.8	1.1	4.0	0.8	Insects, plant material
2600188202-003	EB-6	14-Mar-14	Feb-14	ALS Acirl	0920	1250	1.2	0.8	1.1	4.0	0.7	Insects, plant material
2600189702-003	EB-6	15-Apr-14	Mar-14	ALS Acirl	1120	2300	1.6	0.9	1.1	4.0	0.8	Insects
2600191002-003	EB-6	15-May-14	Apr-14	ALS Acirl	0920	250	0.2	0.8	1.1	4.0	0.2	Plant material

* September 2009 result excluded from long term average (regional dust storms).



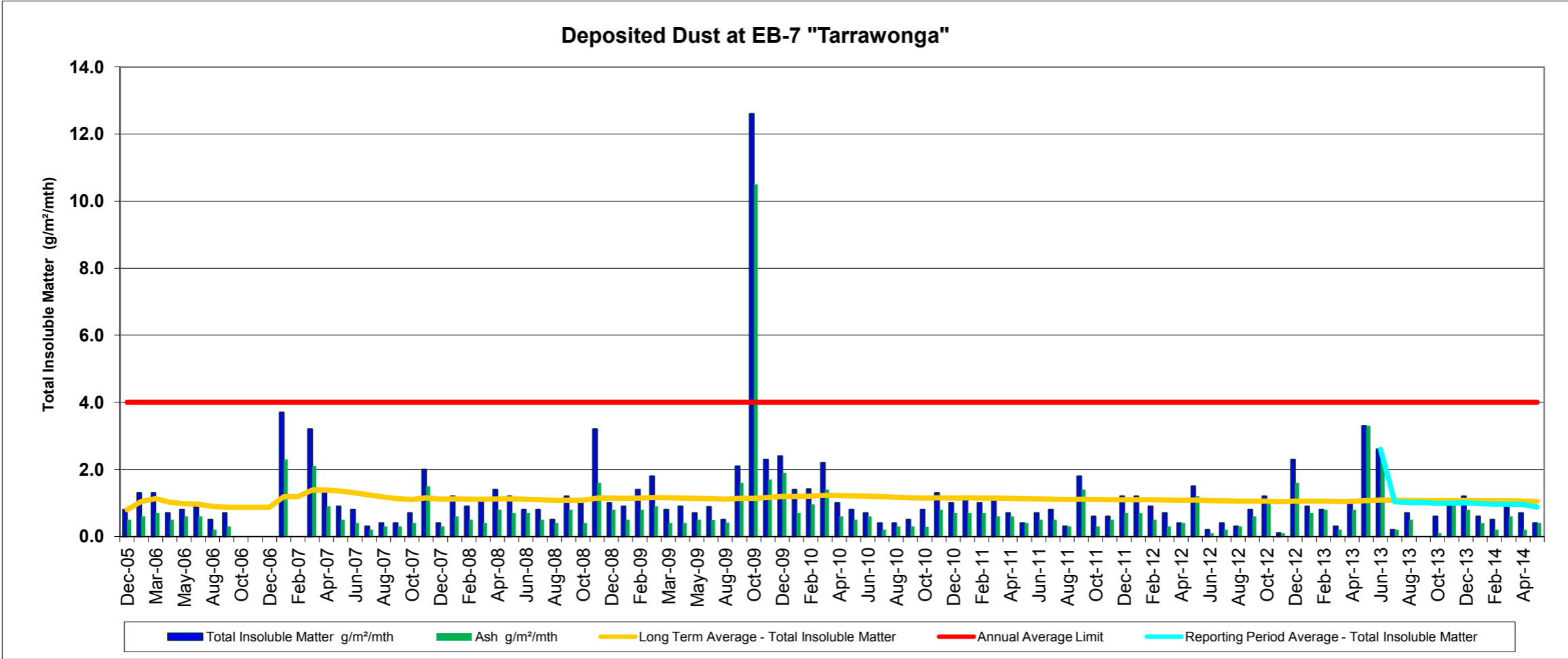
Deposited Dust EB-7 "Tarrawonga"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
21992.07	EB-7	02-Dec-05	Nov-05	Client		2750	0.8		0.8	4.0	0.5	
22570.07	EB-7	02-Feb-06	Jan-06	Client		1800	1.3		1.1	4.0	0.6	
22746.07	EB-7	02-Mar-06	Feb-06	Client		925	1.3		1.1	4.0	0.7	
23208.07	EB-7	03-Apr-06	Mar-06	Client	1503	100	0.7		1.0	4.0	0.5	
23334.07	EB-7	02-May-06	Apr-06	S Burns EEL	0930	250	0.8		1.0	4.0	0.6	
23880.05	EB-7	04-Jul-06	Jun-06	Client	1130	925	0.9		1.0	4.0	0.6	
24082.05	EB-7	01-Aug-06	Jul-06	Client	1400	980	0.5		0.9	4.0	0.2	
24416.05	EB-7	03-Sep-06	Aug-06	Client	1715	280	0.7		0.9	4.0	0.3	
24693.05	EB-7	03-Oct-06	Sep-06	Client					0.9	4.0		No sample
24977.05	EB-7	06-Nov-06	Oct-06	Client					0.9	4.0		No sample
25438.05	EB-7	03-Dec-06	Nov-06	Client					0.9	4.0		No sample
25540.05	EB-7	02-Jan-07	Dec-06	Client		900	3.7		1.2	4.0	2.3	
25843.05	EB-7	02-Feb-07	Jan-07	Client					1.2	4.0		No sample
26120.05	EB-7	05-Mar-07	Feb-07	Client	1255	1230	3.2		1.4	4.0	2.1	
26427.05	EB-7	03-Apr-07	Mar-07	Client	1440	50	1.4		1.4	4.0	0.9	
26631.05	EB-7	02-May-07	Apr-07	Client	0930	330	0.9		1.4	4.0	0.5	
26960.05	EB-7	03-Jun-07	May-07	Client	0810	845	0.8		1.3	4.0	0.4	
27234.05	EB-7	02-Jul-07	Jun-07	Client	1000	1030	0.3		1.2	4.0	0.2	
27531.05	EB-7	04-Aug-07	Jul-07	Client	1115	225	0.4		1.2	4.0	0.3	
27820.05	EB-7	02-Sep-07	Aug-07	Client	0915	1035	0.4		1.1	4.0	0.3	
28119.05	EB-7	01-Oct-07	Sep-07	Client	0920	100	0.7		1.1	4.0	0.4	
28398.05	EB-7	03-Nov-07	Oct-07	Client	0755	<10	2.0		1.2	4.0	1.5	Funnel and Bottle Broken
28663.05	EB-7	02-Dec-07	Nov-07	Client	1315	800	0.4		1.1	4.0	0.3	
28924.05	EB-7	03-Jan-08	Dec-07	Client	1130	1360	1.2		1.1	4.0	0.6	
29225.05	EB-7	04-Feb-08	Jan-08	Client	1120	>2500	0.9		1.1	4.0	0.5	
29526.05	EB-7	04-Mar-08	Feb-08	Client	1625	1335	1.1		1.1	4.0	0.4	
29774.05	EB-7	05-Apr-08	Mar-08	Client	1040	250	1.4		1.1	4.0	0.8	
30056.05	EB-7	5-May-08	Apr-08	Client	1400	130	1.2		1.1	4.0	0.7	
30387.05	EB-7	3-Jun-08	May-08	Client	1340	665	0.8		1.1	4.0	0.7	
30661.05	EB-7	05-Jul-08	Jun-08	Client	1055	640	0.8		1.1	4.0	0.5	
30903.01	EB-7	05-Aug-08	Jul-08	Client	1520	415	0.5		1.1	4.0	0.4	
31211.05	EB-7	09-Sep-08	Aug-08	Client	1435	1025	1.2		1.1	4.0	0.8	
31528.04	EB-7	05-Oct-08	Sep-08	Client	0845	1730	1.0		1.1	4.0	0.4	
31776.04	EB-7	02-Nov-08	Oct-08	Client	1300	160	3.2		1.2	4.0	1.6	
32024.04	EB-7	6-Dec-08	Nov-08	Client	1025	1770	1.0		1.1	4.0	0.8	
32519.04	EB-7	3-Jan-09	Dec-08	Client	1730	1250	0.9		1.1	4.0	0.5	
32247.04	EB-7	4-Feb-09	Jan-09	Client	0940	420	1.4		1.1	4.0	0.8	
32864.04	EB-7	3-Mar-09	Feb-09	Client	1620	1800	1.8		1.2	4.0	0.9	
2600 1008 - 0	EB-7	29-Mar-09	Mar-09	Client		50	0.8		1.2	4.0	0.4	
2600 1018 -00	EB-7	04-May-09	Apr-09	Client		450	0.9		1.1	4.0	0.4	
2600 1033 - 01	EB-7	31-May-09	May-09	Client		650	0.7		1.1	4.0	0.5	
2603 1039 - 01	EB-7	30-Jun-09	Jun-09	Client		650	0.9		1.1	4.0	0.5	
2603 1051 - 01	EB-7	04-Aug-09	Jul-09	Client	1615	400	0.5		1.1	4.0	0.4	
2600 1062 - 00	EB-7	03-Sep-09	Aug-09	Client	1615	20	2.1		1.1	4.0	1.6	
2600 1096 - 01	EB-7	04-Oct-09	Sep-09	Client	1215	780	12.6		1.1	4.0	10.5	
2600 1126 - 00	EB-7	03-Nov-09	Oct-09	Client	0920	950	2.3		1.2	4.0	1.7	

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
2600 1204 - 00	EB-7	01-Dec-09	Nov-09	Client	1310	75	2.4		1.2	4.0	1.9	
2600 1222 - 00	EB-7	05-Jan-10	Dec-09	Client	1030	2500	1.4		1.2	4.0	0.7	
2600 1234	EB-7	03-Feb-10	Jan-10	Client	1430	200	1.4		1.2	4.0	1.0	
2600 1247	EB-7	04-Mar-10	Feb-10	Client	1230	2500	2.2		1.2	4.0	1.4	
2600 1260	EB-7	05-Apr-10	Mar-10	Client	1020	2500	1		1.2	4.0	0.6	
2600 1268	EB-7	03-May-10	Apr-10	Client	0920	300	0.8		1.2	4.0	0.5	Insects, Vegetation
2600 1277	EB-7	02-Jun-10	May-10	TCPL	1415		0.7		1.2	4.0	0.6	Farming and Mining Activity
2600 1288-805-1	EB-7	04-Jul-10	Jun-10	TCPL	0950		0.4		1.2	4.0	0.2	Farming and Mining Activity
2603 1298 - 887	EB-7	03-Aug-10	Jul-10	TCPL	1050	1500	0.4		1.2	4.0	0.3	Vegetation, Farming & Mining activity
26001309-914	EB-7	04-Sep-10	Aug-10	TCPL	1020	1050	0.5		1.2	4.0	0.3	Plant Material, Farming Activity, Mining Activity
2600431904	EB-7	05-Oct-10	Sep-10	TCPL	1620	-	0.8		1.2	4.0	0.3	Farming activity, Grazing Activity, Mining Activity
6800-4368-10	EB-7	21-Oct-10	Oct-10	TCPL	1635	600	1.3		1.2	4.0	0.8	
1002977-004	EB-7	02-Dec-10	Nov-10	TCPL			1.0		1.2	4.0	0.7	
1100063-004	EB-7	04-Jan-11	Dec-10	TCPL	1055		1.2		1.2	4.0	0.7	Partly blocked with webs and leaves
1100335-004	EB-7	04-Feb-11	Jan-11	TCPL	1400		1		1.1	4.0	0.7	
1100549-004	EB-7	03-Mar-11	Feb-11	TCPL	0915		1.1		1.1	4.0	0.6	
1100793-004	EB-7	03-Apr-11	Mar-11	TCPL	0925		0.7		1.1	4.0	0.6	Close to workshop
EN1101030.004	EB-7	02-May-11	Apr-11	TCPL	1030		0.4		1.1	4.0	0.4	
EN1101344-004	EB-7	05-Jun-11	May-11	TCPL	1215		0.7		1.1	4.0	0.5	Spider Webs. Next to Workshop.
EN1101700-004	EB-7	04-Jul-11	Jun-11	TCPL	0915		0.8		1.1	4.0	0.5	Farming, grazing & mining activity- next to workshop
EN1102064-004	EB-7	03-Aug-11	Jul-11	TCPL	930		0.3		1.1	4.0	0.3	Grazing Activity, Mining activity
EN1102639-004	EB-7	05-Sep-11	Aug-11	TCPL	1115		1.8		1.1	4.0	1.4	Farming, mining activity, funnel & top of bottle smashed
EN1103081-004	EB-7	03-Oct-11	Sep-11	TCPL	1450		0.6		1.1	4.0	0.3	
EN1103410-004	EB-7	05-Nov-11	Oct-11	TCPL	1030	1030	0.6		1.1	4.0	0.5	
EN1104053-004	EB-7	05-Dec-11	Nov-11	TCPL	0930		1.2		1.1	4.0	0.7	Bird droppings
EN1200212-005	EB-7	06-Jan-11	Dec-11	TCPL	1715		1.2		1.1	4.0	0.7	
EN1200627-002	EB-7	08-Feb-12	Jan-12	TCPL	1620		0.9		1.1	4.0	0.5	Grazing activity, mining activity
EN1201033-004	EB-7	04-Mar-12	Feb-12	TCPL	1210		0.7		1.1	4.0	0.3	
EN1201376-004	EB-7	02-Apr-12	Mar-12	TCPL	1500		0.4		1.1	4.0	0.4	Next to workshop
EN1201718-004	EB-7	04-May-12	Apr-12	TCPL	1005		1.5		1.1	4.0	1.2	Broken funnel again
EN1202179-003	EB-7	09-Jun-12	May-12	TCPL	1145		0.2		1.1	4.0	0.1	No funnel since last check
EN1202527-004	EB-7	03-Jul-12	Jun-12	TCPL	1125		0.4		1.1	4.0	0.2	Next to workshop
EN1202939-004	EB-7	04-Aug-12	Jul-12	TCPL	1515		0.3		1.1	4.0	0.3	
EN1203413-004	EB-7	02-Sep-12	Aug-12	TCPL	1545		0.8		1.1	4.0	0.6	
EN1203939-004	EB-7	06-Oct-12	Sep-12	TCPL	0915		1.2		1.1	4.0	1.0	Broken funnel
EN1204272-004	EB-7	06-Nov-12	Oct-12	TCPL	1750		0.1		1.0	4.0	0.1	
EN1204642-004	EB-7	03-Dec-12	Nov-12	TCPL	1135		2.3		1.1	4.0	1.6	Funnel blocked spider webs
EN1300140-004	EB-7	05-Jan-13	Dec-12	TCPL	0900		0.9		1.1	4.0	0.7	Next to workshop
EN1300548-004	EB-7	07-Feb-13	Jan-13	TCPL	0900		0.8		1.1	4.0	0.8	
EN1301077-012	EB-7	18-Mar-13	Feb-13	ALS Acirl	0910	400	0.3		1.0	4.0	0.2	Insects, plant material-spider in bottle
EN1301077-012	EB-7	17-Apr-13	Mar-13	ALS Acirl	0930	200	1.1		1.0	4.0	0.8	Insects, plant material
EN1301832-012	EB-7	16-May-13	Apr-13	ALS Acirl	0920	150	3.3		1.1	4.0	3.3	Insects, plant material-broken funnel in bottle
EN1302216-012	EB-7	17-Jun-13	May-13	ALS Acirl	1000	500	2.6	2.6	1.1	4.0	2.3	Insects, plant material-broken funnel again
EN1302635-012	EB-7	16-Jul-13	Jun-13	ALS Acirl	0910	400	0.2	1.0	1.1	4.0	0.2	Plant material-replaced funnel
EN1303027-006	EB-7	15-Aug-13	Jul-13	ALS Acirl	1150	300	0.7	1.0	1.1	4.0	0.5	Insects, plant material
EN1303430-006	EB-7	16-Sep-13	Aug-13	ALS Acirl				1.0	1.1	4.0		Bottle broken inside dust gauge
EN1303809-006	EB-7	15-Oct-13	Sep-13	ALS Acirl	930	300	0.6	1.0	1.1	4.0	0.1	Insects, plant material

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
EN1304188-004	EB-7	14-Nov-13	Oct-13	ALS Acirl	0940	250	1.1	1.0	1.1	4.0	1.0	Insects, plant material
EN1304650-004	EB-7	16-Dec-13	Nov-13	ALS Acirl	1020	650	1.2	1.0	1.1	4.0	0.8	Insects, plant material, broken funnel
2066185402-004	EB-7	14-Jan-14	Dec-13	ALS Acirl	0950	100	0.6	1.0	1.1	4.0	0.4	Insects, plant material
2600186702-004	EB-7	13-Feb-14	Jan-14	ALS Acirl	1015	150	0.5	1.0	1.1	4.0	0.2	Insects
2600188202-004	EB-7	14-Mar-14	Feb-14	ALS Acirl	0840	1000	1.1	1.0	1.1	4.0	0.6	Insects, plant material
2600189702-004	EB-7	15-Apr-14	Mar-14	ALS Acirl	1105	2250	0.7	1.0	1.1	4.0	0.2	Insects
2600191002-004	EB-7	15-May-14	Apr-14	ALS Acirl	0950	250	0.4	0.9	1.0	4.0	0.4	

* September 2009 result excluded from long term average (regional dust storms).



Deposited Dust EB-8 "Thuin"

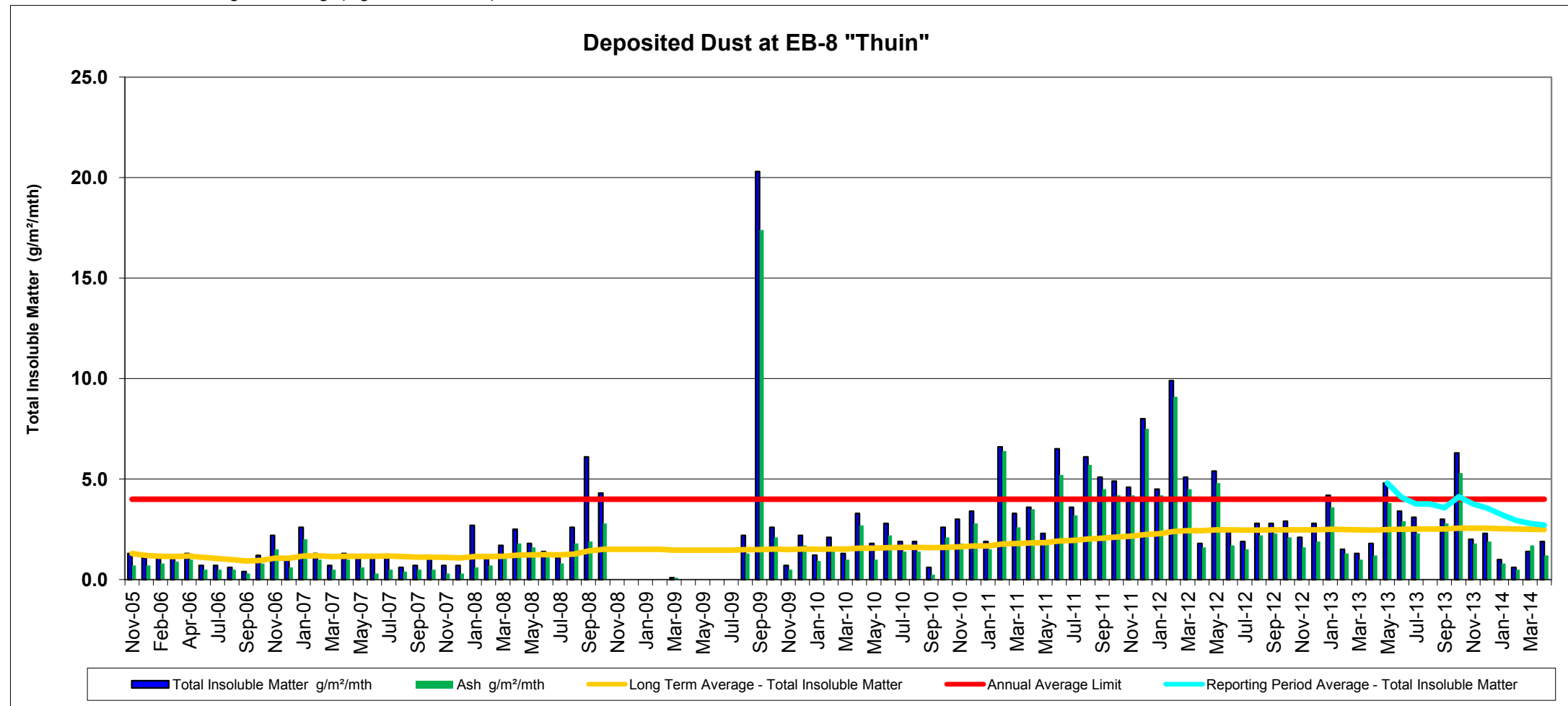
Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
21992.02	EB-2	02-Dec-05	Nov-05	Client		2700	1.3		1.3	4.0	0.7	
22570.02	EB-2	02-Feb-06	Jan-06	Client		1425	1.1		1.2	4.0	0.7	
22746.02	EB-2	02-Mar-06	Feb-06	Client		1000	1.1		1.2	4.0	0.8	
23208.02	EB-2	03-Apr-06	Mar-06	Client	1415	200	1.1		1.2	4.0	0.9	
23334.02	EB-2	02-May-06	Apr-06	S Burns EEL	0815	600	1.3		1.2	4.0	1.0	
23880.06	EB-8	04-Jul-06	Jun-06	Client	1010	800	0.7		1.1	4.0	0.5	Site name changed from EB-2 to EB-8
24082.06	EB-8	01-Aug-06	Jul-06	Client	1400	1040	0.7		1.0	4.0	0.5	
24416.06	EB-8	03-Sep-06	Aug-06	Client	1605	400	0.6		1.0	4.0	0.5	
24693.06	EB-8	03-Oct-06	Sep-06	Client	1720	250	0.4		0.9	4.0	0.3	
24977.06	EB-8	06-Nov-06	Oct-06	Client	1720	1175	1.2		1.0	4.0	0.8	
25438.06	EB-8	03-Dec-06	Nov-06	Client	0755	365	2.2		1.1	4.0	1.5	
25540.06	EB-8	02-Jan-07	Dec-06	Client		275	1.0		1.1	4.0	0.6	
25843.06	EB-8	02-Feb-07	Jan-07	Client	0845	50	2.6		1.2	4.0	2.0	
26120.06	EB-8	05-Mar-07	Feb-07	Client	1245	340	1.3		1.2	4.0	1.0	
26427.06	EB-8	03-Apr-07	Mar-07	Client	1350	195	0.7		1.2	4.0	0.5	
26631.06	EB-8	02-May-07	Apr-07	Client	0945	375	1.3		1.2	4.0	1.0	
26960.06	EB-8	03-Jun-07	May-07	Client	0745	855	1.2		1.2	4.0	0.6	
27234.06	EB-8	02-Jul-07	Jun-07	Client	0920	890	1.2		1.2	4.0	0.3	
27531.06	EB-8	04-Aug-07	Jul-07	Client	1150	250	1.2		1.2	4.0	0.5	
27820.06	EB-8	02-Sep-07	Aug-07	Client	0945	1010	0.6		1.1	4.0	0.4	
28119.06	EB-8	01-Oct-07	Sep-07	Client	0950	140	0.7		1.1	4.0	0.5	
28398.06	EB-8	03-Nov-07	Oct-07	Client	0725	400	1.1		1.1	4.0	0.5	
28663.06	EB-8	02-Dec-07	Nov-07	Client	1655	485	0.7		1.1	4.0	0.3	
28924.06	EB-8	03-Jan-08	Dec-07	Client	1115	1910	0.7		1.1	4.0	0.3	
29225.06	EB-8	04-Feb-08	Jan-08	Client	1100	>2055	2.7		1.1	4.0	0.6	
29526.06	EB-8	04-Mar-08	Feb-08	Client	1800	1320	1.1		1.1	4.0	0.7	
29774.06	EB-8	05-Apr-08	Mar-08	Client	1020	250	1.7		1.2	4.0	1.1	
30056.06	EB-8	5-May-08	Apr-08	Client	1445	160	2.5		1.2	4.0	1.8	
30387.06	EB-8	3-Jun-08	May-08	Client	1400	750	1.8		1.2	4.0	1.6	
30661.06	EB-8	05-Jul-08	Jun-08	Client	1100	430	1.4		1.2	4.0	1.1	

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
30903.01	EB-8	05-Aug-08	Jul-08	Client	1540	465	1.1		1.2	4.0	0.8	
31211.06	EB-8	09-Sep-08	Aug-08	Client	1415	870	2.6		1.3	4.0	1.8	
31528.05	EB-8	05-Oct-08	Sep-08	Client	0915	1535	6.1		1.4	4.0	1.9	
31776.05	EB-8	02-Nov-08	Oct-08	Client	1315	120	4.3		1.5	4.0	2.8	
32024.05	EB-8	6-Dec-08	Nov-08	Client					1.5	4.0		No access
32519.05	EB-8	3-Jan-09	Dec-08	Client					1.5	4.0		No access
	EB-8	4-Feb-09	Jan-09	Client					1.5	4.0		No access
32864.05	EB-8	3-Mar-09	Feb-09	Client					1.5	4.0		No access
2600 1008 - 0	EB-8	29-Mar-09	Mar-09	Client		<50	0.1		1.5	4.0	0.1	
2600 1018 - 00	EB-8	04-May-09	Apr-09	Client					1.5	4.0		No sample
	EB-8	31-May-09	May-09	Client					1.5	4.0		No sample due to mining activity
	EB-8	30-Jun-09	Jun-09	Client					1.5	4.0		No sample due to mining activity
	EB-8	03-Aug-09	Jul-09	Client					1.5	4.0		No sample due to mining activity
2600 1062 - 00	EB-8	31-Aug-09	Aug-09	Client	1340	20	2.2		1.5	4.0	1.3	
2600 1096 - 01	EB-8	29-Sep-09	Sep-09	Client	1156	700	20.3		1.5	4.0	17.4	
2600 1126 - 00	EB-8	03-Nov-09	Oct-09	Client	1232	850	2.6		1.5	4.0	2.1	
2600 1204 - 00	EB-8	02-Dec-09	Nov-09	Client	1020	DRY	0.7		1.5	4.0	0.5	
2600 1222 - 00	EB-8	04-Jan-10	Dec-09	Client	1505	2500	2.2		1.5	4.0	1.7	
2600 1234	EB-8	01-Feb-10	Jan-10	Client	1340	200	1.2		1.5	4.0	0.9	
2600 1247	EB-8	02-Mar-10	Feb-10	Client	1155	2500	2.1		1.5	4.0	1.5	
2600 1260	EB-8	05-Apr-10	Mar-10	Client	1155	2500	1.3		1.5	4.0	1	
2600 1268	EB-8	03-May-10	Apr-10	Client	1150	350	3.3		1.6	4.0	2.7	
2600 1277	EB-8	25-May-10	May-10	ALS Acirl	1305	10	1.8		1.6	4.0	1	Plant Material
2600 1288-805-1	EB-8	24-Jun-10	Jun-10	ALS Acirl	1110	800	2.8		1.6	4.0	2.2	Insects
2605 1298 - 887	EB-8	03-Aug-10	Jul-10	ALS Acirl	1150	500	1.9		1.6	4.0	1.4	Insects, Plant Material
26001309-914	EB-8	04-Sep-10	Aug-10	ALS Acirl	0955	1100	1.9		1.6	4.0	1.4	Insects, Plant Material
2600431904	EB-8	05-Oct-10	Sep-10	ALS Acirl	1350	800	0.6		1.6	4.0	0.2	Farming activity, Grazing Activity
6800-4368-14	EB-8	21-Oct-10	Oct-10	ALS Acirl	1005	400	2.6		1.6	4.0	2.1	
1002886-001	EB-8	22-Nov-10	Nov-10	ALS Acirl	1050	2100	3		1.6	4.0	1.8	
1003101-001	EB-8	22-Dec-10	Dec-10	ALS Acirl	1145		3.4		1.7	4.0	2.8	
1100199-001	EB-8	21-Jan-11	Jan-11	ALS Acirl	1200	300	1.9		1.7	4.0	1.5	
1100446-001	EB-8	22-Feb-11	Feb-11	ALS Acirl	1050	600	6.6		1.8	4.0	6.4	

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1100695-001	EB-8	24-Mar-11	Mar-11	ALS Acirl	1010	600	3.3		1.8	4.0	2.6	
EN1100922-001	EB-8	20-Apr-11	Apr-11	ALS Acirl	1000	400	3.6		1.8	4.0	3.5	
EN1101205-001	EB-8	20-May-11	May-11	ALS Acirl	1050	Dry	2.3		1.8	4.0	1.9	Insects
EN1101448-001	EB-8	20-Jun-11	Jun-11	ALS Acirl	1000	1500	6.5		1.9	4.0	5.2	Insects/Plant Material
EN1101812-001	EB-8	19-Jul-11	Jul-11	ALS Acirl	1110	100	3.6		1.9	4.0	3.2	Insects, plant material
EN1102301-001	EB-8	17-Aug-11	Aug-11	ALS Acirl	1010	80	6.1		2.0	4.0	5.7	Bird Droppings, Plant material
EN1102773-001	EB-8	16-Sep-11	Sep-11	ALS Acirl	1100	800	5.1		2.1	4.0	4.5	Plant material
EN1103124-001	EB-8	17-Oct-11	Oct-11	ALS Acirl	1050	1400	4.9		2.1	4.0	4.2	Insects, Scrapers operating near gauge
EN1103467-001	EB-8	15-Nov-11	Nov-11	ALS Acirl	1045	600	4.6		2.2	4.0	4.2	Insects, Plant material
EN1104232-001	EB-8	15-Dec-11	Dec-11	ALS Acirl	1100	2500	8		2.2	4.0	7.5	Insects, Plant material
EN1200242-001	EB-8	13-Jan-12	Jan-12	ALS Acirl	1100	300	4.5		2.3	4.0	4.2	Insects, Plant material
EN1200606-001	EB-8	13-Feb-12	Feb-12	ALS Acirl	1100	2500	9.9		2.4	4.0	9.1	Insects, Plant material
EN1201026-001	EB-8	15-Mar-12	Mar-12	ALS Acirl	1030	500	5.1		2.4	4.0	4.5	Insects, Plant material
EN1201453-001	EB-8	16-Apr-12	Apr-12	ALS Acirl	1010	<100	1.8		2.4	4.0	1.6	Insects, Plant material
EN1201862-001	EB-8	17-May-12	May-12	ALS Acirl	1015	300	5.4		2.5	4.0	4.80	Insects-sediment in bottom of bottle
EN1202258-001	EB-8	18-Jun-12	Jun-12	ALS Acirl	1130	300	2.4		2.5	4.0	1.70	Insects, Bird droppings
EN1202679-001	EB-8	18-Jul-12	Jul-12	ALS Acirl	1135	1400	1.9		2.5	4.0	1.50	Insects
EN1203136-001	EB-8	17-Aug-12	Aug-12	ALS Acirl	1100	100	2.8		2.5	4.0	2.20	Insects, Bird droppings, Plant material
EN1203585-001	EB-8	18-Sep-12	Sep-12	ALS Acirl	1040	100	2.8		2.5	4.0	2.30	Insects
EN1203993-001	EB-8	18-Oct-12	Oct-12	ALS Acirl	1120	200	2.9		2.5	4.0	2.10	Insects, Bird Droppings
EN1204413-001	EB-8	19-Nov-12	Nov-12	ALS Acirl	1030	50	2.1		2.5	4.0	1.60	Insects
EN1204841-001	EB-8	19-Dec-12	Dec-12	ALS Acirl	1000	50	2.8		2.5	4.0	1.90	Plant material
EN1300226-001	EB-8	17-Jan-13	Jan-13	ALS Acirl	1010		4.2		2.5	4.0	3.60	
EN1300226-001	EB-8	18-Feb-13	Feb-13	ALS Acirl	1040	1700	1.5		2.5	4.0	1.30	Insects, plant material-close to scraper run
EN1301077-001	EB-8	18-Mar-13	Mar-13	ALS Acirl	1040	700	1.3		2.5	4.0	1.00	Insects, plant material
EN1301077-001	EB-8	17-Apr-13	Apr-13	ALS Acirl	1035	200	1.8		2.5	4.0	1.20	Insects, bird droppings, plant material
EN1301832-001	EB-8	16-May-13	May-13	ALS Acirl	0940	200	4.8	4.8	2.5	4.0	3.80	Insects, plant material
EN1302216-001	EB-8	17-Jun-13	Jun-13	ALS Acirl	1110	900	3.4	4.1	2.5	4.0	2.90	Insects, plant material
EN1302635-001	EB-8	16-Jul-13	Jul-13	ALS Acirl	1050	400	3.1	3.8	2.5	4.0	2.30	Insects, bird droppings, plant material
	EB-8	15-Aug-13	Aug-13	ALS Acirl	1310	200		3.8	2.5	4.0		Bottle Broken in transit
EN1303430-010	EB-8	16-Sep-13	Sep-13	ALS Acirl	1040	100	3.0	3.6	2.5	4.0	2.80	Insects, plant material
EN1303809-010	EB-8	15-Oct-13	Oct-13	ALS Acirl	0950	350	6.3	4.1	2.6	4.0	5.30	Insects, bird droppings, plant material

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EN1304188-005	EB-8	14-Nov-13	Nov-13	ALS Acirl	1000	250	2.0	3.8	2.6	4.0	1.80	Insects, plant material
EN1304650-005	EB-8	16-Dec-13	Dec-13	ALS Acirl	1355	450	2.3	3.6	2.6	4.0	1.90	Insects, plant material, scrapers nearby
2066185402-005	EB-8	14-Jan-14	Jan-14	ALS Acirl	1015	100	1.0	3.2	2.5	4.0	0.80	Insects, plant material
2600186702-005	EB-8	13-Feb-14	Feb-14	ALS Acirl	1040	200	0.6	2.9	2.5	4.0	0.50	Plant material
2600188202-005	EB-8	14-Mar-14	Mar-14	ALS Acirl	1035	1000	1.4	2.8	2.5	4.0	1.70	Insects, plant material
2600189702-005	EB-8	15-Apr-14	Apr-14	ALS Acirl	0955	2500	1.9	2.7	2.5	4.0	1.20	Insects

* September 2009 result excluded from long term average (regional dust storms).



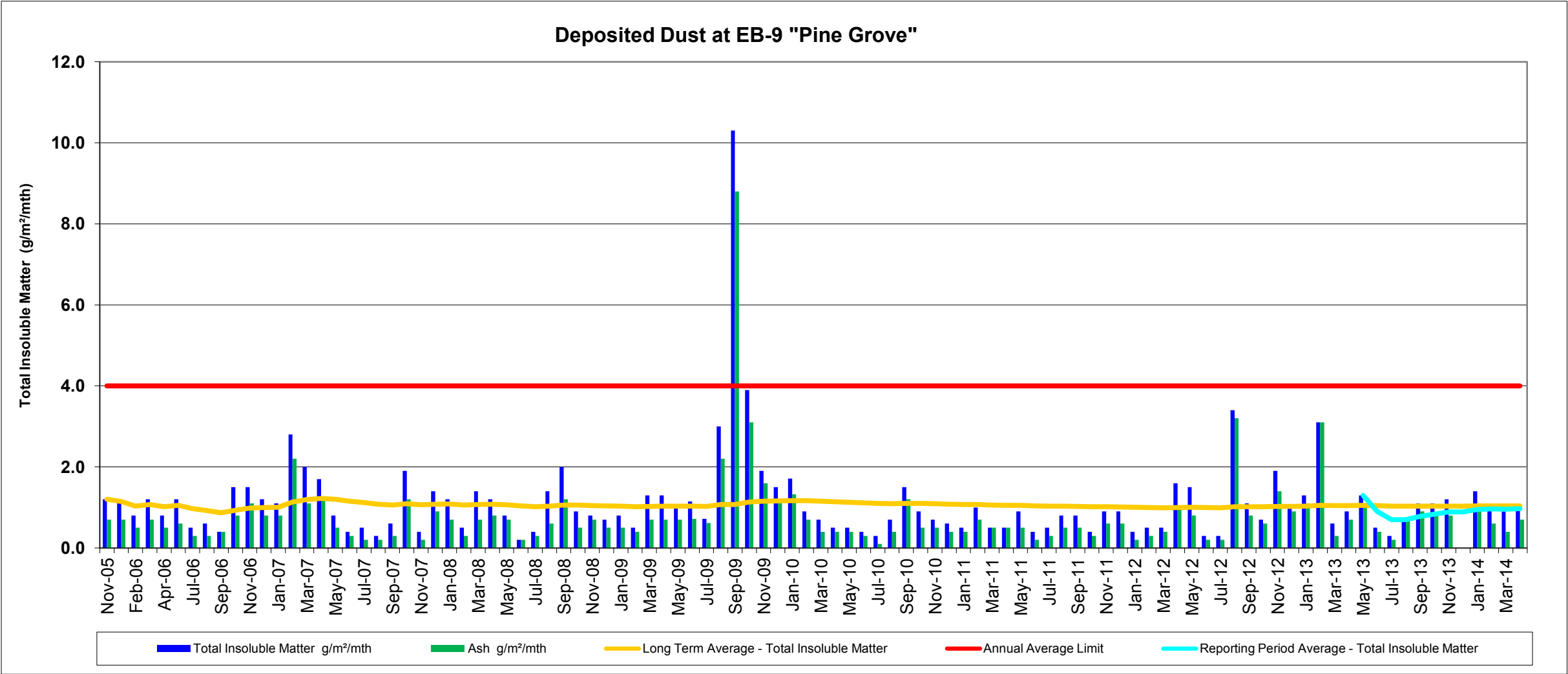
Deposited Dust EB-9 "Pine Grove"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
21992.05	EB - 5	02-Dec-05	Nov-05	Client		2750	1.2		1.2	4.0	0.7	
22570.05	EB - 5	02-Feb-06	Jan-06	Client		2095	1.1		1.2	4.0	0.7	
22746.05	EB - 5	02-Mar-06	Feb-06	Client		450	0.8		1.0	4.0	0.5	
23208.05	EB - 5	03-Apr-06	Mar-06	Client	1445	180	1.2		1.1	4.0	0.7	
23334.05	EB - 5	02-May-06	Apr-06	S Burns EEL	0855	700	0.8		1.0	4.0	0.5	
23880.03	EB - 5	04-Jul-06	Jun-06	Client	1040	700	1.2		1.1	4.0	0.6	
24082.07	EB - 9	01-Aug-06	Jul-06	Client	1338	1150	0.5		1.0	4.0	0.3	Site name changed from EB-5 to EB-9
24416.07	EB - 9	03-Sep-06	Aug-06	Client	1635	270	0.6		0.9	4.0	0.3	
24693.07	EB - 9	03-Oct-06	Sep-06	Client	1630	350	0.4		0.9	4.0	0.4	
24977.07	EB - 9	06-Nov-06	Oct-06	Client	1800	1100	1.5		0.9	4.0	0.8	
25438.07	EB - 9	03-Dec-06	Nov-06	Client	0825	280	1.5		1.0	4.0	1.1	
25540.07	EB - 9	02-Jan-07	Dec-06	Client		375	1.2		1.0	4.0	0.8	
25843.07	EB - 9	02-Feb-07	Jan-07	Client	0915	640	1.1		1.0	4.0	0.8	
26120.07	EB - 9	05-Mar-07	Feb-07	Client	1215	1160	2.8		1.1	4.0	2.2	
26427.07	EB - 9	03-Apr-07	Mar-07	Client	1315	315	2.0		1.2	4.0	1.1	
26631.07	EB - 9	02-May-07	Apr-07	Client	1020	295	1.7		1.2	4.0	1.2	
26960.07	EB - 9	03-Jun-07	May-07	Client	0715	1055	0.8		1.2	4.0	0.5	
	EB-9	02-Jul-07	Jun-07	Client	1030	1230	0.4		1.2	4.0	0.3	
27531.07	EB-9	04-Aug-07	Jul-07	Client	1235	340	0.5		1.1	4.0	0.2	
27820.07	EB-9	02-Sep-07	Aug-07	Client	1020	1280	0.3		1.1	4.0	0.2	
28119.07	EB-9	01-Oct-07	Sep-07	Client	1020	230	0.6		1.1	4.0	0.3	
28398.07	EB-9	03-Nov-07	Oct-07	Client	0825	1075	1.9		1.1	4.0	1.2	
28663.07	EB-9	02-Dec-07	Nov-07	Client	1615	690	0.4		1.1	4.0	0.2	
28924.07	EB-9	03-Jan-08	Dec-07	Client	1020	2245	1.4		1.1	4.0	0.9	
29225.07	EB-9	04-Feb-08	Jan-08	Client	1015	>2500	1.2		1.1	4.0	0.7	
29526.07	EB-9	04-Mar-08	Feb-08	Client	1700	1720	0.5		1.1	4.0	0.3	
29774.07	EB-9	05-Apr-08	Mar-08	Client	0930	275	1.4		1.1	4.0	0.7	
30056.07	EB-9	5-May-08	Apr-08	Client	1530	345	1.2		1.1	4.0	0.8	
30387.07	EB-9	3-Jun-08	May-08	Client	1445	805	0.8		1.1	4.0	0.7	
30661.07	EB-9	05-Jul-08	Jun-08	Client	1000	575	0.2		1.0	4.0	0.2	
30903.01	EB-9	05-Aug-08	Jul-08	Client	1625	600	0.4		1.0	4.0	0.3	
31211.07	EB-9	09-Sep-08	Aug-08	Client	1345	120	1.4		1.0	4.0	0.6	
31528.06	EB-9	05-Oct-08	Sep-08	Client	0945	1760	2.0		1.1	4.0	1.2	
31776.06	EB-9	02-Nov-08	Oct-08	Client		465	0.9		1.1	4.0	0.5	
32024.06	EB-9	6-Dec-08	Nov-08	Client	1130	2175	0.8		1.0	4.0	0.7	
32519.06	EB-9	3-Jan-09	Dec-08	Client	1830	1550	0.7		1.0	4.0	0.5	
32247.06	EB-9	4-Feb-09	Jan-09	Client	0900	195	0.8		1.0	4.0	0.5	
32864.06	EB-9	3-Mar-09	Feb-09	Client	1710	1640	0.5		1.0	4.0	0.4	
2600 1008 - 0	EB-9	29-Mar-09	Mar-09	Client		50	1.3		1.0	4.0	0.7	
2600 1018 - 00	EB-9	04-May-09	Apr-09	Client		400	1.3		1.0	4.0	0.7	
2600 1033 - 01	EB-9	31-May-09	May-09	Client		550	1.0		1.0	4.0	0.7	
2605 1039 - 01	EB-9	30-Jun-09	Jun-09	Client		550	1.1		1.0	4.0	0.7	
2604 1051 - 01	EB-9	04-Aug-09	Jul-09	Client	1700	400	0.7		1.0	4.0	0.6	
2600 1062 - 00	EB-9	03-Sep-09	Aug-09	Client	1710	20	3.0		1.1	4.0	2.2	
2600 1096 - 01	EB-9	04-Oct-09	Sep-09	Client	1310	800	10.3		1.1	4.0	8.8	
2600 1126 - 00	EB-9	03-Nov-09	Oct-09	Client	1020	900	3.9		1.1	4.0	3.1	

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2600 1204 - 00	EB-9	01-Dec-09	Nov-09	Client	1350	75	1.9		1.2	4.0	1.6	
2600 1222 - 00	EB-9	05-Jan-10	Dec-09	Client	1110	2500	1.5		1.2	4.0	1.2	
2600 1234	EB-9	03-Feb-10	Jan-10	Client		200	1.7		1.2	4.0	1.3	
2600 1247	EB-9	04-Mar-10	Feb-10	Client	1315	2500	0.9		1.2	4.0	0.7	
2600 1260	EB-9	05-Apr-10	Mar-10	Client	1105	2500	0.7		1.2	4.0	0.4	
2600 1268	EB-9	03-May-10	Apr-10	Client	1105	300	0.5		1.1	4.0	0.4	
2600 1277	EB-9	02-Jun-10	May-10	TCPL	1330		0.5		1.1	4.0	0.4	Grazing, Mining and Farming Activity
2600 1288-805-1	EB-9	04-Jul-10	Jun-10	TCPL	1035		0.4		1.1	4.0	0.3	Grazing, Mining and Farming Activity
2604 1298 - 887	EB-9	22-Jul-10	Jul-10	TCPL	1135	1400	0.3		1.1	4.0	0.1	Mining Activity
26001309-914	EB-9	20-Aug-10	Aug-10	TCPL	1100	2000	0.7		1.1	4.0	0.4	Insects, Plant Material, Mining Activity
2600431904.00	EB-9	21-Sep-10	Sep-10	TCPL	1600		1.5		1.1	4.0	1.2	insects
6800-4368-10	EB-9	21-Oct-10	Oct-10	TCPL	1725	600	0.9		1.1	4.0	0.5	
1002977-005	EB-9	02-Dec-10	Nov-10	TCPL			0.7		1.1	4.0	0.5	
1100063-005	EB-9	04-Jan-11	Dec-10	TCPL	1135		0.6		1.1	4.0	0.4	Spider webs and grass from mowing
1100335-005	EB-9	04-Feb-11	Jan-11	TCPL	1445		0.5		1.1	4.0	0.4	Spider webs in funnel
1100549-005	EB-9	03-Mar-11	Feb-11	TCPL	1020		1.0		1.1	4.0	0.7	Spider webs
1100793-005	EB-9	03-Apr-11	Mar-11	TCPL	1005		0.5		1.1	4.0	0.5	
EN1101030.005	EB-9	02-May-11	Apr-11	TCPL	1115		0.5		1.1	4.0	0.5	
EN1101344-005	EB-9	05-Jun-11	May-11	TCPL	1315		0.9		1.1	4.0	0.5	
EN1101700-005	EB-9	04-Jul-11	Jun-11	TCPL	0830		0.4		1.0	4.0	0.2	Grazing activity, mining activity
EN1102064-005	EB-9	03-Aug-11	Jul-11	TCPL	1030		0.5		1.0	4.0	0.3	Insects, grazing, mining acticity, light spider webs in funnel
EN1102639-005	EB-9	05-Sep-11	Aug-11	TCPL	1155		0.8		1.0	4.0	0.5	Grazing activity, mining activity
EN1103081-005	EB-9	03-Oct-11	Sep-11	TCPL	1545		0.8		1.0	4.0	0.5	
EN1103410-005	EB-9	05-Nov-11	Oct-11	TCPL	1120	1120	0.4		1.0	4.0	0.3	
EN1104053-005	EB-9	05-Dec-11	Nov-11	TCPL	1020		0.9		1.0	4.0	0.6	
EN1200212-006	EB-9	06-Jan-11	Dec-11	TCPL	1825		0.9		1.0	4.0	0.6	
EN1200627-003	EB-9	08-Feb-12	Jan-12	TCPL	1540		0.4		1.0	4.0	0.2	Mining activity
EN1201033-005	EB-9	04-Mar-12	Feb-12	TCPL	1115		0.5		1.0	4.0	0.3	
EN1201376-005	EB-9	02-Apr-12	Mar-12	TCPL	1500		0.5		1.0	4.0	0.4	
EN1201718-005	EB-9	04-May-12	Apr-12	TCPL	1050		1.6		1.0	4.0	1.0	
EN1202179-004	EB-9	09-Jun-12	May-12	TCPL	1300		1.5		1.0	4.0	0.8	Half blocked with webs and droppings
EN1202527-005	EB-9	03-Jul-12	Jun-12	TCPL	1215		0.3		1.0	4.0	0.2	
EN1202939-005	EB-9	04-Aug-12	Jul-12	TCPL	1620		0.3		1.0	4.0	0.2	
EN1203413-005	EB-9	02-Sep-12	Aug-12	TCPL	1630		3.4		1.0	4.0	3.2	
EN1203939-005	EB-9	06-Oct-12	Sep-12	TCPL	1000		1.1		1.0	4.0	0.8	
EN1204272-005	EB-9	06-Nov-12	Oct-12	TCPL	1730		0.7		1.0	4.0	0.6	
EN1204642-005	EB-9	03-Dec-12	Nov-12	TCPL	1220		1.9		1.0	4.0	1.4	
EN1300140-005	EB-9	05-Jan-13	Dec-12	TCPL	0950		1.0		1.0	4.0	0.9	
EN1300548-005	EB-9	07-Feb-13	Jan-13	TCPL	0955		1.3		1.0	4.0	1.1	
EN1301077-013	EB-9	18-Mar-13	Feb-13	ALS Acirl	0840	500	3.1		1.1	4.0	3.1	Insects, plant material-broken funnel
EN1301077-013	EB-9	17-Apr-13	Mar-13	ALS Acirl	0835	200	0.6		1.0	4.0	0.3	Insects, plant material
EN1301832-013	EB-9	16-May-13	Apr-13	ALS Acirl	0840	150	0.9		1.0	4.0	0.7	Insects, plant material-broken funnel in bottle
EN1302216-013	EB-9	17-Jun-13	May-13	ALS Acirl	0930	600.00	1.3	1.3	1.0	4.0	1.0	Insects, plant material
EN1302635-013	EB-9	16-Jul-13	Jun-13	ALS Acirl	1140	400.00	0.5	0.9	1.0	4.0	0.4	Insects-replaced funnel
EN1303027-011	EB-9	15-Aug-13	Jul-13	ALS Acirl	1120	300.00	0.3	0.7	1.0	4.0	0.2	Insects, plant material
EN1303430-011	EB-9	16-Sep-13	Aug-13	ALS Acirl	1215	100.00	0.7	0.7	1.0	4.0	0.7	Insects, plant material
EN1303809-011	EB-9	15-Oct-13	Sep-13	ALS Acirl	0845	350.00	1.1	0.8	1.0	4.0	0.9	Insects, plant material

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EN1304188-006	EB-9	14-Nov-13	Oct-13	ALS Acirl	850.00	250.00	1.1	0.8	1.0	4.0	0.8	Insects, plant material
EN1304650-006	EB-9	16-Dec-13	Nov-13	ALS Acirl	0900	450.00	1.2	0.9	1.0	4.0	0.8	Insects, plant material
2066185402-006	EB-9	14-Jan-14	Dec-13	ALS Acirl	0910	100.00		0.9	1.0	4.0		Insects, plant material, broken in transit
2600186702-006	EB-9	13-Feb-14	Jan-14	ALS Acirl	0940	100.00	1.4	1.0	1.0	4.0	1.0	Insects
2600188202-006	EB-9	14-Mar-14	Feb-14	ALS Acirl	1140	850.00	1.1	1.0	1.0	4.0	0.6	Insects, plant material
2600189702-006	EB-9	15-Apr-14	Mar-14	ALS Acirl	1145	2500.00	0.9	1.0	1.0	4.0	0.4	Insects
2600191002-006	EB-9	15-May-14	Apr-14	ALS Acirl	0910	300.00	1.1	1.0	1.0	4.0	0.7	

* September 2009 result excluded from long term average (regional dust storms).



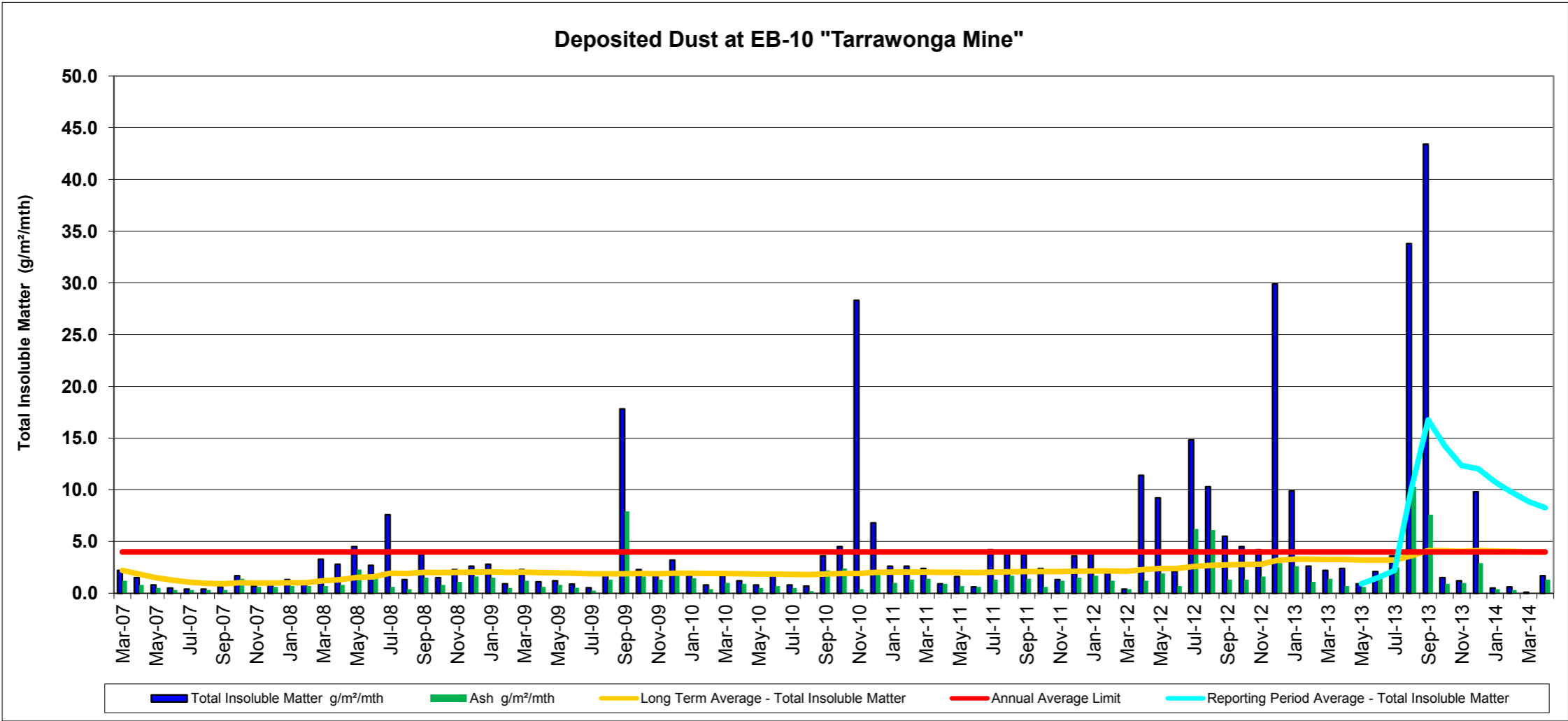
Deposited Dust EB-10 "Tarrawonga Mine"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
26427.08	EB - 10	03-Apr-07	Mar-07	Client	1400	135	2.2		2.2	4.0	1.2	
26631.08	EB - 10	02-May-07	Apr-07	Client	0920	310	1.5		1.9	4.0	0.8	
26960.08	EB - 10	03-Jun-07	May-07	Client	0950	1015	0.8		1.5	4.0	0.5	
27234.08	EB-10	02-Jul-07	Jun-07	Client	1115	1035	0.5		1.3	4.0	0.3	
27531.08	EB-10	04-Aug-07	Jul-07	Client	1650	180	0.4		1.1	4.0	0.3	
27820.08	EB-10	04-Sep-07	Aug-07	Client	0940	1095	0.4		1.0	4.0	0.3	
28119.08	EB-10	01-Oct-06	Sep-07	Client	1055	45	0.6		0.9	4.0	0.3	
28398.08	EB-10	02-Nov-07	Oct-07	Client	1230	420	1.7		1.0	4.0	1.4	
28663.08	EB-10	05-Dec-07	Nov-07	Client	1155	1020	0.7		1.0	4.0	0.6	
28924.08	EB-10	02-Jan-08	Dec-07	Client	1515	1640	1.0		1.0	4.0	0.6	
29225.08	EB-10	04-Feb-08	Jan-08	Client	1140	>2500	1.3		1.0	4.0	0.7	
29526.08	EB-10	03-Mar-08	Feb-08	Client	1000	1405	1.1		1.0	4.0	0.7	
29774.08	EB-10	01-Apr-08	Mar-08	Client	1635	70	3.3		1.2	4.0	0.7	
30056.08	EB-10	05-May-08	Apr-08	Client	1005	245	2.8		1.3	4.0	0.8	
30387.08	EB-10	02-Jun-08	May-08	Client	1015	210	4.5		1.5	4.0	2.3	
30661.08	EB-10	08-Jul-08	Jun-08	Client	1345	1200	2.7		1.6	4.0	1.5	
30903.01	EB-10	05-Aug-08	Jul-08	Client	1250	285	7.6		1.9	4.0	0.6	
31211.08	EB-10	01-Sep-08	Aug-08	Client	1417	530	1.3		1.9	4.0	0.4	
31528.07	EB-10	05-Oct-08	Sep-08	Client	1210	1520	4.1		2.0	4.0	1.5	
31776.07	EB-10	03-Nov-08	Oct-08	Client	1525	1390	1.5		2.0	4.0	0.8	
32024.07	EB-10	03-Dec-08	Nov-08	Client	1020	1100	2.3		2.0	4.0	1.1	
32519.07	EB-10	03-Jan-09	Dec-08	Client	1350	1220	2.6		2.0	4.0	1.6	
32247.07	EB-10	04-Feb-09	Jan-09	Client	1330	250	2.8		2.1	4.0	1.5	
32864.07	EB-10	03-Mar-09	Feb-09	Client	1250	1725	0.9		2.0	4.0	0.5	
2600 1008 - 0	EB-10	29-Mar-09	Mar-09	ALS		50	2.3		2.0	4.0	1.2	
2600 1018 - 00	EB-10	01-May-09	Apr-09	ALS		500	1.1		2.0	4.0	0.6	Insects
2600 1033 - 01	EB-10	04-Jun-09	May-09	ALS		600	1.2		2.0	4.0	0.8	
2606 1039 - 01	EB-10	6-Jul-09	Jun-09	ALS		600	0.9		1.9	4.0	0.5	Insects, Plant Material
2605 1051 - 01	EB-10	3-Aug-09	Jul-09	ALS	1245	300	0.5		1.9	4.0	0.2	
2600 1062 - 00	EB-10	31-Aug-09	Aug-09	ALS	1300	20	1.9		1.9	4.0	1.3	
2600 1096 - 01	EB-10	29-Sep-09	Sep-09	ALS	1132	800	17.8		1.9	4.0	7.9	Insects, Plant Material
2600 1126 - 00	EB-10	03-Nov-09	Oct-09	ALS	1215	900	2.3		1.9	4.0	1.6	Insects, Plant Material
2600 1204 - 00	EB-10	02-Dec-09	Nov-09	ALS	1000	15	1.8		1.9	4.0	1.3	Insects
2600 1222 - 00	EB-10	04-Jan-10	Dec-09	ALS	1440	2500	3.2		1.9	4.0	1.8	Insects, Plant Material, Bird Droppings
2600 1234	EB-10	1-Feb-10	Jan-10	ALS	1320	200	2.0		1.9	4.0	1.4	Insect, Plant Material
2600 1247	EB-10	2-Mar-10	Feb-10	ALS	1110	2300	0.8		1.9	4.0	0.4	Insects
2600 1260	EB-10	03-Apr-10	Mar-10	ALS	1110	2300	1.7		1.9	4.0	1.0	Insects, Plant Material
2600 1268	EB-10	03-May-10	Apr-10	ALS	1130	350	1.2		1.9	4.0	0.9	Insects, Plant Material

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
2600 1277	EB-10	25-May-10	May-10	ALS Acirl	1240	20	0.8		1.9	4.0	0.5	
2600 1288-805-1	EB-10	24-Jun-10	Jun-10	ALS Acirl	1050	700	2.0		1.9	4.0	0.7	Insects, Plant Material
2606 1298 - 887	EB-10	22-Jul-10	Jul-10	ALS Acirl	1130	500	0.8		1.8	4.0	0.5	Insects, Plant Material
26001309-914	EB-10	20-Aug-10	Aug-10	ALS Acirl	1010	2000	0.7		1.8	4.0	0.2	Insects
2600431904.00	EB-10	21-Sep-10	Sep-10	ALS Acirl	1325	700	3.6		1.8	4.0	2.2	Insects, plant material
6800-4368-14	EB-10	21-Oct-10	Oct-10	ALS Acirl	0930	500	4.5		1.9	4.0	2.4	
1002886-002	EB-10	22-Nov-10	Nov-10	ALS Acirl	1030	2200	28.3		1.9	4.0	0.4	
1003101-002	EB-10	22-Dec-10	Dec-10	ALS Acirl	1115		6.8		2.0	4.0	2.0	
1100199-002	EB-10	21-Jan-11	Jan-11	ALS Acirl	1215	300	2.6		2.0	4.0	1.0	
1100446-002	EB-10	22-Feb-11	Feb-11	ALS Acirl	1020	600	2.6		2.0	4.0	1.3	
1100695-002	EB-10	24-Mar-11	Mar-11	ALS Acirl	0940	500	2.4		2.0	4.0	1.4	
EN1100922-002	EB-10	20-Apr-11	Apr-11	ALS Acirl	0930	300	0.9		2.0	4.0	0.9	
EN1101205-002	EB-10	20-May-11	May-11	ALS Acirl	1030	Dry	1.6		2.0	4.0	0.7	Bird droppings
EN1101448-002	EB-10	20-Jun-11	Jun-11	ALS Acirl	0940	1100	0.6		2.0	4.0	0.6	Insects/Plant Material
EN1101812-002	EB-10	19-Jul-11	Jul-11	ALS Acirl	1025	50	4.2		2.0	4.0	1.3	Insects, bird droppings, plant material
EN1102301-002	EB-10	17-Aug-11	Aug-11	ALS Acirl	0940	80	4.0		2.1	4.0	1.7	Bird Droppings, Plant material
EN1102773-002	EB-10	16-Sep-11	Sep-11	ALS Acirl	1030	700	3.8		2.1	4.0	1.4	Insects, Bird Droppings, Plant material
EN1103124-002	EB-10	17-Oct-11	Oct-11	ALS Acirl	1015	1300	2.4		2.1	4.0	0.6	Insects, Plant material
EN1103467-002	EB-10	15-Nov-11	Nov-11	ALS Acirl	1020	600	1.3		2.1	4.0	1.2	Insects
EN1104232-002	EB-10	15-Dec-11	Dec-11	ALS Acirl	1030	2500	3.6		2.1	4.0	1.5	Insects, Plant material
EN1200242-002	EB-10	13-Jan-12	Jan-12	ALS Acirl	0940	600	3.9		2.2	4.0	1.7	Insects, Plant material
EN1200606-002	EB-10	13-Feb-12	Feb-12	ALS Acirl	1115	2500	2.0		2.1	4.0	1.2	Insects, Plant material
EN1201026-002	EB-10	15-Mar-12	Mar-12	ALS Acirl	1000	500	0.4		2.1	4.0	0.4	Insects, Plant material
EN1201453-002	EB-10	16-Apr-12	Apr-12	ALS Acirl	0925	200	11.4		2.3	4.0	1.2	Insects, Bird droppings, Plant material
EN1201862-002	EB-10	17-May-12	May-12	ALS Acirl	1000	250	9.2		2.4	4.0	1.9	Insects, Bird droppings, Plant material
EN1202258-002	EB-10	18-Jun-12	Jun-12	ALS Acirl	1110	250	2.1		2.4	4.0	0.7	Bird Droppings
EN1202679-002	EB-10	18-Jul-12	Jul-12	ALS Acirl	1115	1400	14.8		2.6	4.0	6.2	Insects, Bird droppings, Plant material
EN1203136-002	EB-10	17-Aug-12	Aug-12	ALS Acirl	1030	100	10.3		2.7	4.0	6.1	Insects, Bird droppings, Plant material
EN1203585-002	EB-10	18-Sep-12	Sep-12	ALS Acirl	1030	10	5.5		2.7	4.0	1.3	Insects, Bird Droppings
EN1203993-002	EB-10	18-Oct-12	Oct-12	ALS Acirl	1100	200	4.5		2.8	4.0	1.3	Insects, Bird Droppings
EN1204413-002	EB-10	19-Nov-12	Nov-12	ALS Acirl	1010	50	4.2		2.8	4.0	1.6	Insects, Bird Droppings
EN1204841-002	EB-10	19-Dec-12	Dec-12	ALS Acirl	0945	50	29.9		3.2	4.0	2.9	Insects, bird droppings
EN1300226-002	EB-10	17-Jan-13	Jan-13	ALS Acirl	0950		9.9		3.3	4.0	2.6	
EN1300226-002	EB-10	18-Feb-13	Feb-13	ALS Acirl	1010	1800	2.6		3.3	4.0	1.1	Insects, bird droppings, plant material
EN1301077-002	EB-10	18-Mar-13	Mar-13	ALS Acirl	950	700	2.2		3.3	4.0	1.4	Insects, bird droppings, plant material
EN1301077-002	EB-10	17-Apr-13	Apr-13	ALS Acirl		200	2.4		3.3	4.0	0.7	Insects, plant material
EN1301832-002	EB-10	16-May-13	May-13	ALS Acirl	1035	200	0.9	0.9	3.2	4.0	0.6	Insects, plant material
EN1302216-002	EB-10	17-Jun-13	Jun-13	ALS Acirl	1040	1000	2.1	1.5	3.2	4.0	1.4	Insects, bird droppings, plant material
EN1302635-002	EB-10	16-Jul-13	Jul-13	ALS Acirl	1010	400	3.6	2.2	3.2	4.0	2.5	Insects, bird droppings

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
EN1303027-005	EB-10	15-Aug-13	Aug-13	ALS Acirl	1350	200	33.8	10.1	3.6	4.0	10.3	Insects, bird droppings, plant material
EN1303430-005	EB-10	16-Sep-13	Sep-13	ALS Acirl	1025	100	43.4	16.8	4.1	4.0	7.6	Insects, plant material
EN1303809-005	EB-10	15-Oct-13	Oct-13	ALS Acirl	1045	300	1.5	14.2	4.1	4.0	0.9	Insects, bird droppings, plant material
EN1304188-007	EB-10	14-Nov-13	Nov-13	ALS Acirl	1055	250	1.2	12.4	4.1	4.0	1.0	Insects, plant material
EN1304650-007	EB-10	16-Dec-13	Dec-13	ALS Acirl	1345	700	9.8	12.0	4.1	4.0	2.9	Insects, plant material
2066185402-007	EB-10	14-Jan-14	Jan-14	ALS Acirl	1100	100	0.5	10.8	4.1	4.0	0.4	Insects, plant material
2600186702-007	EB-10	13-Feb-14	Feb-14	ALS Acirl	1120	100	0.6	9.7	4.0	4.0	0.3	Insects, plant material
2600188202-007	EB-10	14-Mar-14	Mar-14	ALS Acirl	1000	800	0.1	8.9	4.0	4.0	<0.1	Insects, plant material-broken funnel
2600189702-007	EB-10	15-Apr-14	Apr-14	ALS Acirl	0945	2500	1.7	8.3	4.0	4.0	1.3	Insects

* September 2009 result excluded from long term average (regional dust storms). Anomolous result in November 2010 excluded from averages.



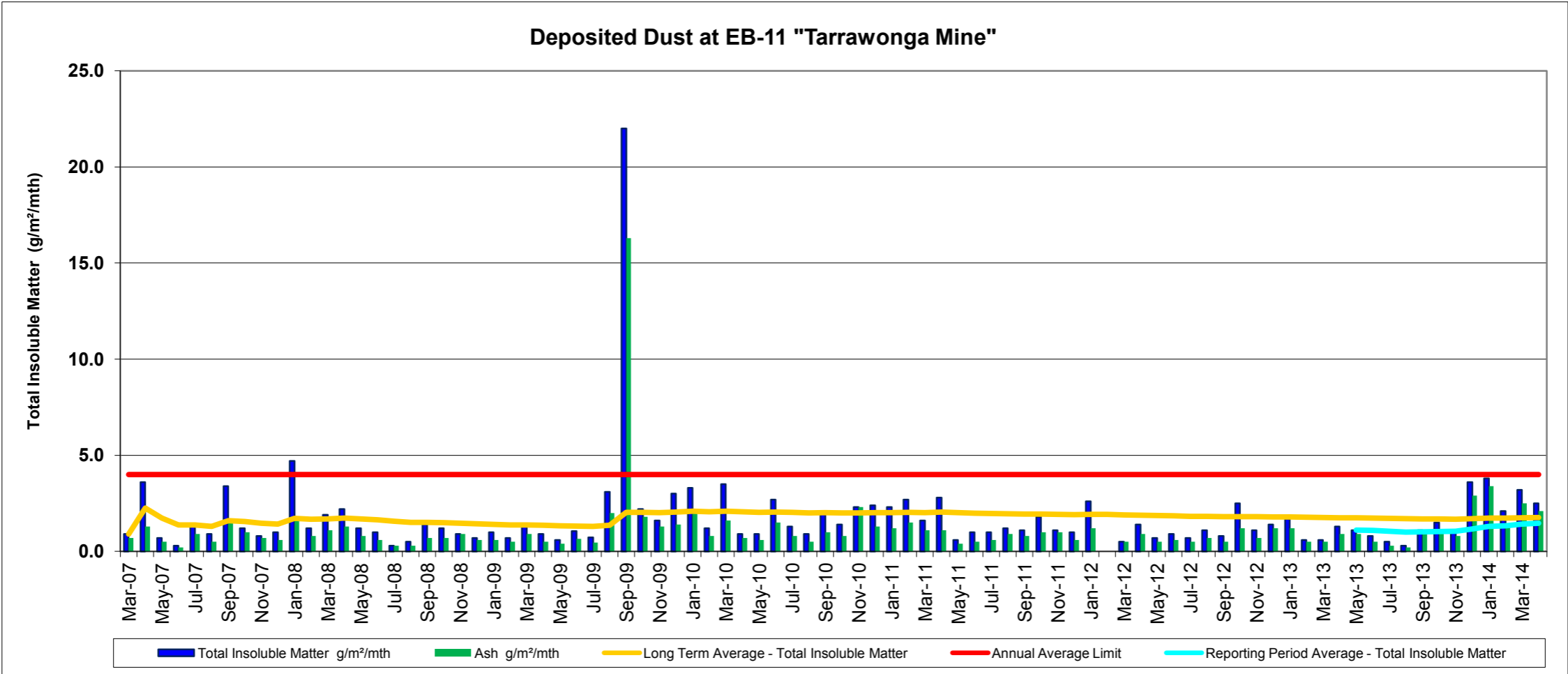
Deposited Dust EB-11 "Tarrawonga Mine"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
26427.09	EB-11	03-Apr-07	Mar-07	Client	1410	160	0.9		0.9	4.0	0.7	
26631.09	EB-11	02-May-07	Apr-07	Client	0935	340	3.6		2.3	4.0	1.3	
26960.09	EB-11	03-Jun-07	May-07	Client	1005	1015	0.7		1.7	4.0	0.5	
27234.09	EB-11	02-Jul-07	Jun-07	Client	1025	950	0.3		1.4	4.0	0.2	
27531.09	EB-11	04-Aug-07	Jul-07	Client	1640	190	1.4		1.4	4.0	0.9	
27820.09	EB-11	04-Sep-07	Aug-07	Client	0930	1240	0.9		1.3	4.0	0.5	
28119.09	EB-11	01-Oct-06	Sep-07	Client	1045	100	3.4		1.6	4.0	1.5	
28398.09	EB-11	02-Nov-07	Oct-07	Client	1220	405	1.2		1.6	4.0	1.0	
28663.09	EB-11	05-Dec-07	Nov-07	Client	1145	920	0.8		1.5	4.0	0.7	
28924.09	EB-11	02-Jan-08	Dec-07	Client	1525	1950	1.0		1.4	4.0	0.6	
29225.09	EB-11	04-Feb-08	Jan-08	Client	1130	2620	4.7		1.7	4.0	1.7	
29526.09	EB-11	03-Mar-08	Feb-08	Client	0945	1700	1.2		1.7	4.0	0.8	
29774.09	EB-11	01-Apr-08	Mar-08	Client	1625	100	1.9		1.7	4.0	1.1	
30056.09	EB-11	05-May-08	Apr-08	Client	0955	270	2.2		1.7	4.0	1.3	
30387.09	EB-11	02-Jun-08	May-08	Client	1025	240	1.2		1.7	4.0	0.8	
30661.09	EB-11	08-Jul-08	Jun-08	Client	1320	1145	1.0		1.7	4.0	0.6	
30903.01	EB-11	05-Aug-08	Jul-08	Client	1240	375	0.3		1.6	4.0	0.3	
31211.09	EB-11	01-Sep-08	Aug-08	Client	1405	640	0.5		1.5	4.0	0.3	
31528.08	EB-11	05-Oct-08	Sep-08	Client	1135	1635	1.4		1.5	4.0	0.7	
31776.08	EB-11	03-Nov-08	Oct-08	Client	1510	1390	1.2		1.5	4.0	0.7	
32024.08	EB-11	03-Dec-08	Nov-08	Client	1015	1280	0.9		1.5	4.0	0.9	
32519.08	EB-11	03-Jan-09	Dec-08	Client	1358	1565	0.7		1.4	4.0	0.6	
32247.08	EB-11	04-Feb-09	Jan-09	Client	1318	375	1.0		1.4	4.0	0.6	
32864.08	EB-11	03-Mar-09	Feb-09	Client	1235	1690	0.7		1.4	4.0	0.5	
2600 1008 - 0	EB-11	29-Mar-09	Mar-09	ALS		50	1.3		1.4	4.0	0.9	
2600 1018 - 00	EB-11	01-May-09	Apr-09	ALS		500	0.9		1.4	4.0	0.5	Insects
2600 1033 - 01	EB-11	04-Jun-09	May-09	ALS		600	0.6		1.3	4.0	0.4	
2607 1039 - 01	EB-11	6-Jul-09	Jun-09	ALS		600	1.1		1.3	4.0	0.6	Plant Material
2606 1051 - 01	EB-11	3-Aug-09	Jul-09	ALS	1250	400	0.7		1.3	4.0	0.5	Plant Material, Insects
2600 1062 - 00	EB-11	31-Aug-09	Aug-09	ALS	1310	20	3.1		1.4	4.0	2.0	Insects, Bird Droppings
2600 1096 - 01	EB-11	29-Sep-09	Sep-09	ALS	1140	900	22.0		2.0	4.0	16.3	Insects, Bird Droppings, Plant Material
2600 1126 - 00	EB-11	03-Nov-09	Oct-09	ALS	1221	900	2.2		2.0	4.0	1.8	Insects, Plant Material
2600 1204 - 00	EB-11	02-Dec-09	Nov-09	ALS	1010	50	1.6		2.0	4.0	1.3	Insects, Bird Droppings
2600 1222 - 00	EB-11	04-Jan-10	Dec-09	ALS	1450	2500	3.0		2.0	4.0	1.4	Bird Droppings
2600 1234	EB-11	1-Feb-10	Jan-10	ALS	1325	400	3.3		2.1	4.0	2.0	Bird Droppings, Plant Material
2600 1247	EB-11	2-Mar-10	Feb-10	ALS	1140	2500	1.2		2.1	4.0	0.8	Insects
2600 1260	EB-11	5-Apr-10	Mar-10	ALS	1140	2500	3.5		2.1	4.0	1.6	Insects, Bird Droppings, Plant Material

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
2600 1268	EB-11	3-May-10	Apr-10	ALS	1140	350	0.9		2.1	4.0	0.7	Insects
2600 1277	EB-11	25-May-10	May-10	ALS Acirl	1245	20	0.9		2.0	4.0	0.6	Insects
2600 1288-805-1	EB-11	24-Jun-10	Jun-10	ALS Acirl	1100	800	2.7		2.1	4.0	1.5	Insects, Bird Droppings
2607 1298 - 887	EB-11	22-Jul-10	Jul-10	ALS Acirl	1135	600	1.3		2.0	4.0	0.8	Insects, Plant Material
26001309-914	EB-11	20-Aug-10	Aug-10	ALS Acirl	0940	2200	0.9		2.0	4.0	0.5	Insects, Plant Material
2600431904.00	EB-11	21-Sep-10	Sep-10	ALS Acirl	1335	1200	2.1		2.0	4.0	1.0	Insects
6800-4368-14	EB-11	21-Oct-10	Oct-10	ALS Acirl	0935	600	1.4		2.0	4.0	0.8	
1002886-003	EB-11	22-Nov-10	Nov-10	ALS Acirl	1040	2200	2.3		2.0	4.0	2.3	
1003101-003	EB-11	22-Dec-10	Dec-10	ALS Acirl	1130		2.4		2.0	4.0	1.3	
1100199-003	EB-11	21-Jan-11	Jan-11	ALS Acirl	1135	400	2.3		2.0	4.0	1.2	
1100446-003	EB-11	22-Feb-11	Feb-11	ALS Acirl	1030	700	2.7		2.0	4.0	1.5	
1100695-003	EB-11	24-Mar-11	Mar-11	ALS Acirl	0945	600	1.6		2.0	4.0	1.1	
EN1100922-003	EB-11	20-Apr-11	Apr-11	ALS Acirl	0940	400	2.8		2.0	4.0	1.1	
EN1101205-003	EB-11	20-May-11	May-11	ALS Acirl	1020	Dry	0.6		2.0	4.0	0.4	Bird droppings
EN1101448-003	EB-11	20-Jun-11	Jun-11	ALS Acirl	0930	50	1.0		2.0	4.0	0.5	Insects/Plant Material/Funnel broken in bottle
EN1101812-003	EB-11	19-Jul-11	Jul-11	ALS Acirl	1015	100	1.0		2.0	4.0	0.6	Insects, plant material
EN1102301-003	EB-11	17-Aug-11	Aug-11	ALS Acirl	0950	80	1.2		2.0	4.0	0.9	Insects
EN1102773-003	EB-11	16-Sep-11	Sep-11	ALS Acirl	1040	800	1.1		1.9	4.0	0.8	
EN1103124-003	EB-11	17-Oct-11	Oct-11	ALS Acirl	1030	1500	1.8		1.9	4.0	1.0	Insects, Clearing vegetation near gauge
EN1103467-003	EB-11	15-Nov-11	Nov-11	ALS Acirl	1030	900	1.1		1.9	4.0	1.0	Insects, Plant material
EN1104232-003	EB-11	15-Dec-11	Dec-11	ALS Acirl	1040	2500	1.0		1.9	4.0	0.6	Insects, Plant material
EN1200242-003	EB-11	13-Jan-12	Jan-12	ALS Acirl	0955	600	2.6		1.9	4.0	1.2	Insects, Plant material
EN1200606-003	EB-11	13-Feb-12	Feb-12	ALS Acirl					1.9	4.0		Broken upon arrival
EN1201026-003	EB-11	15-Mar-12	Mar-12	ALS Acirl	0950	500	0.5		1.9	4.0	0.5	Insects, Plant material
EN1201453-003	EB-11	16-Apr-12	Apr-12	ALS Acirl	0910	200	1.4		1.9	4.0	0.9	Insects, Plant material
EN1201862-003	EB-11	17-May-12	May-12	ALS Acirl	0945	300	0.7		1.9	4.0	0.5	Insects
EN1202258-003	EB-11	18-Jun-12	Jun-12	ALS Acirl	1120	300	0.9		1.8	4.0	0.6	Insects
EN1202679-003	EB-11	18-Jul-12	Jul-12	ALS Acirl	1040	1400	0.7		1.8	4.0	0.5	
EN1203136-003	EB-11	17-Aug-12	Aug-12	ALS Acirl	1045	100	1.1		1.8	4.0	0.7	Insects
EN1203585-003	EB-11	18-Sep-12	Sep-12	ALS Acirl	1000	100	0.8		1.8	4.0	0.5	Insects
EN1203993-003	EB-11	18-Oct-12	Oct-12	ALS Acirl	1110	250	2.5		1.8	4.0	1.2	Insects, Bird Droppings
EN1204413-003	EB-11	19-Nov-12	Nov-12	ALS Acirl	1020	50	1.1		1.8	4.0	0.7	Insects
EN1204841-003	EB-11	19-Dec-12	Dec-12	ALS Acirl	0930	50	1.4		1.8	4.0	1.2	Insects
EN1300226-003	EB-11	17-Jan-13	Jan-13	ALS Acirl	1000		1.7		1.8	4.0	1.2	
EN1300226-003	EB-11	18-Feb-13	Feb-13	ALS Acirl	1000	1900	0.6		1.8	4.0	0.5	Insects, plant material
EN1301077-003	EB-11	18-Mar-13	Mar-13	ALS Acirl	930	800	0.6		1.8	4.0	0.5	Insects, plant material
EN1301077-003	EB-11	17-Apr-13	Apr-13	ALS Acirl	1045	200	1.3		1.8	4.0	0.9	Insects, plant material
EN1301832-003	EB-11	16-May-13	May-13	ALS Acirl	1020	150	1.1	1.1	1.7	4.0	0.9	Insects, bird droppings, plant material
EN1302216-003	EB-11	17-Jun-13	Jun-13	ALS Acirl	1030	900	0.8	1.1	1.7	4.0	0.5	Insects, plant material

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
EN1302635-003	EB-11	16-Jul-13	Jul-13	ALS Acirl	1030	400	0.5	1.1	1.7	4.0	0.3	Insects, plant material
EN1303027-003	EB-11	15-Aug-13	Aug-13	ALS Acirl	1340	200	0.3	1.0	1.7	4.0	0.2	Insects, plant material
EN1303430-003	EB-11	16-Sep-13	Sep-13	ALS Acirl	1010	100	1.1	1.0	1.7	4.0	0.9	Insects, plant material
EN1303809-003	EB-11	15-Oct-13	Oct-13	ALS Acirl	1030	350	1.5	1.0	1.7	4.0	1.1	Insects, plant material
EN1304188-008	EB-11	14-Nov-13	Nov-13	ALS Acirl	1040	300	1.1	1.0	1.7	4.0	0.8	Insects, plant material
EN1304650-008	EB-11	16-Dec-13	Dec-13	ALS Acirl	1335	650	3.6	1.2	1.7	4.0	2.9	Insects, plant material
2066185402-008	EB-11	14-Jan-14	Jan-14	ALS Acirl	1050	100	3.8	1.3	1.7	4.0	3.4	Insects, plant material, construction nearby
2600186702-008	EB-11	13-Feb-14	Feb-14	ALS Acirl	1110	100	2.1	1.3	1.7	4.0	1.4	Insects, plant material
2600188202-008	EB-11	14-Mar-14	Mar-14	ALS Acirl	1020	1000	3.2	1.4	1.8	4.0	2.5	Insects, plant material
2600189702-008	EB-11	15-Apr-14	Apr-14	ALS Acirl	0935	2800	2.5	1.5	1.8	4.0	2.1	Insects

* September 2009 result excluded from long term average (regional dust storms).



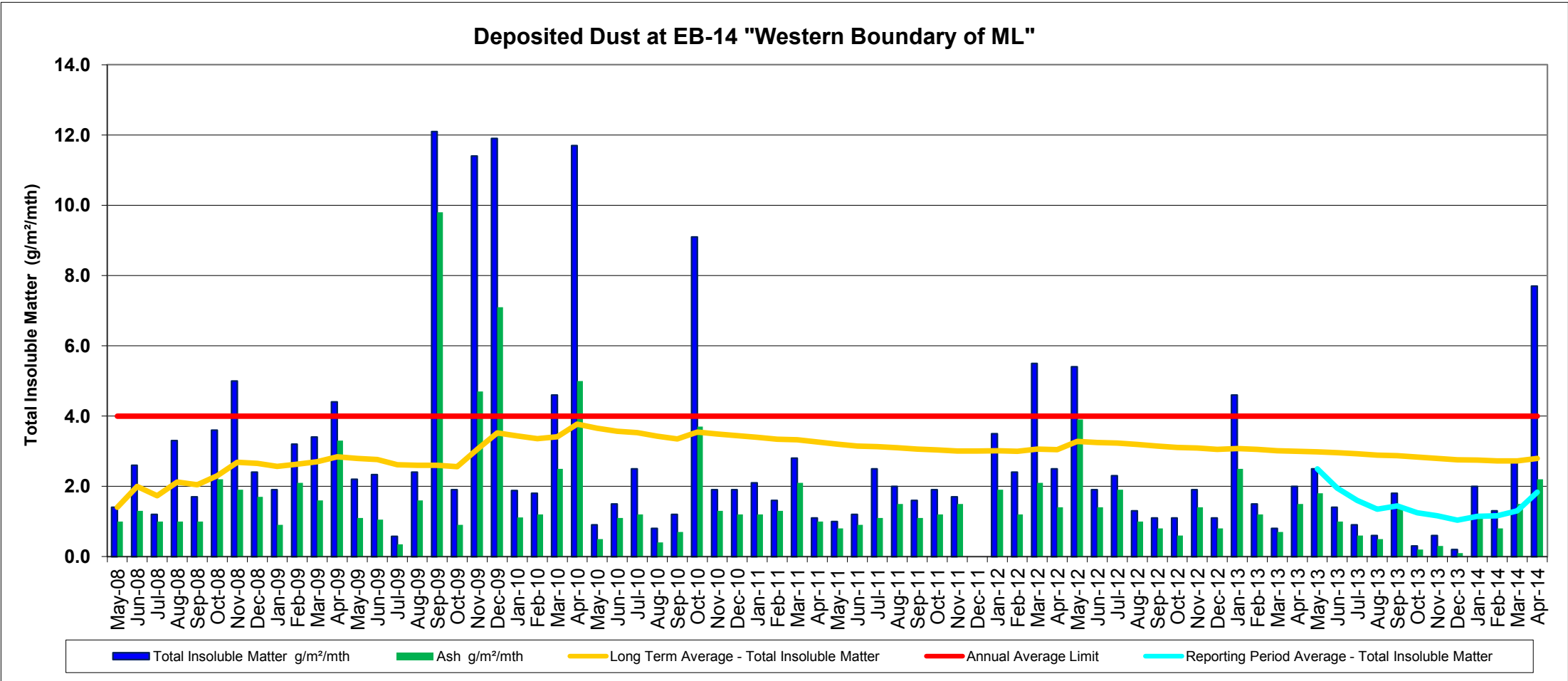
Deposited Dust EB-14 "Western Boundary of ML"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
30387.1	EB-14	02-Jun-08	May-08	Client	1045	220	1.4		1.4	4.0	1.0	
30661.1	EB-14	08-Jul-08	Jun-08	Client	1335	1195	2.6		2.0	4.0	1.3	
30903.0	EB-14	05-Aug-08	Jul-08	Client	1235	460	1.2		1.7	4.0	1.0	
31211.1	EB-14	01-Sep-08	Aug-08	Client	1350	720	3.3		2.1	4.0	1.0	
31528.1	EB-14	05-Oct-08	Sep-08	Client	1130	1400	1.7		2.0	4.0	1.0	
31776.1	EB-14	03-Nov-08	Oct-08	Client	1454	1295	3.6		2.3	4.0	2.2	
32024.1	EB-14	03-Dec-08	Nov-08	Client	1005	1165	5.0		2.7	4.0	1.9	
32519.1	EB-14	03-Jan-09	Dec-08	Client	1338	1110	2.4		2.7	4.0	1.7	
32247.1	EB-14	04-Feb-09	Jan-09	Client	1310	95	1.9		2.6	4.0	0.9	
32864.1	EB-14	03-Mar-09	Feb-09	Client	1225	1655	3.2		2.6	4.0	2.1	
2600 1008 - 0	EB-14	29-Mar-09	Mar-09	Client		50	3.4		2.7	4.0	1.6	
2600 1018 - 00	EB-14	01-May-09	Apr-09	ALS		600	4.4		2.8	4.0	3.3	Insects, Plant Material, Bird Droppings
2600 1033 - 01	EB-14	04-Jun-09	May-09	ALS		550	2.2		2.8	4.0	1.1	
2610 1039 - 01	EB-14	6-Jul-09	Jun-09	ALS		550	2.3		2.8	4.0	1.1	Insects, Plant Material
2609 1051 - 01	EB-14	3-Aug-09	Jul-09	ALS	1237	300	0.6		2.6	4.0	0.3	Insects
2600 1062 - 00	EB-14	31-Aug-09	Aug-09	ALS	1255	25	2.4		2.6	4.0	1.6	Insects, Bird Droppings, Plant Material
2600 1096 - 01	EB-14	29-Sep-09	Sep-09	ALS	1125	800	12.1		2.6	4.0	9.8	Insects, Plant Material
2600 1126 - 00	EB-14	03-Nov-09	Oct-09	ALS	1208	1000	1.9		2.6	4.0	0.9	Insects, Plant Material
2600 1204 - 00	EB-14	02-Dec-09	Nov-09	ALS	0950	10	11.4		3.1	4.0	4.7	Insects, Bird Droppings, Plant Material
2600 1222 - 00	EB-14	04-Jan-10	Dec-09	ALS	1435	2500	11.9		3.5	4.0	7.1	Insects, Plant Material
2600 1234	EB-14	1-Feb-10	Jan-10	ALS	1315	200	1.9		3.4	4.0	1.1	Insects, Plant Material
2600 1247	EB-14	2-Mar-10	Feb-10	ALS	1220	2500	1.8		3.4	4.0	1.2	Insects
2600 1260	EB-14	5-Apr-10	Mar-10	ALS	1220	2500	4.6		3.4	4.0	2.5	Insects, Bird Droppings, Plant Material
2600 1268	EB-14	3-May-10	Apr-10	ALS	1125	350	11.7		3.8	4.0	5.0	Insects, Bird Droppings, Plant Material
2600 1277	EB-14	25-May-10	May-10	ALS Acirl	1235	20	0.9		3.7	4.0	0.5	
2600 1288-805-1	EB-14	24-Jun-10	Jun-10	ALS Acirl	1045	850	1.5		3.6	4.0	1.1	Insects, Plant Material
2610 1298 - 887	EB-14	22-Jul-10	Jul-10	ALS Acirl	1120	500	2.5		3.5	4.0	1.2	Bird Droppings
26001309-914	EB-14	20-Aug-10	Aug-10	ALS Acirl	0930	2000	0.8		3.4	4.0	0.4	Insects, Plant Material
2600431904.00	EB-14	21-Sep-10	Sep-10	ALS Acirl	1320	1000	1.2		3.3	4.0	0.7	insects
6800-4368-14	EB-14	21-Oct-10	Oct-10	ALS Acirl	0920	400	9.1		3.5	4.0	3.7	
1002886-006	EB-14	22-Nov-10	Nov-10	ALS Acirl	1020	2200	1.9		3.5	4.0	1.3	
1003101-006	EB-14	22-Dec-10	Dec-10	ALS Acirl	1100		1.9		3.4	4.0	1.2	

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
1100199-006	EB-14	21-Jan-11	Jan-11	ALS Acirl	1100	300	2.1		3.4	4.0	1.2	
1100446-006	EB-14	22-Feb-11	Feb-11	ALS Acirl	1010	600	1.6		3.3	4.0	1.3	
1100695-006	EB-14	24-Mar-11	Mar-11	ALS Acirl	0930	500	2.8		3.3	4.0	2.1	
EN1100922-006	EB-14	20-Apr-11	Apr-11	ALS Acirl	0920	300	1.1		3.3	4.0	1.0	
EN1101205-006	EB-14	20-May-11	May-11	ALS Acirl	1000	Dry	1.0		3.2	4.0	0.8	No field observations
EN1101448-006	EB-14	20-Jun-11	Jun-11	ALS Acirl	0915	1200	1.2		3.1	4.0	0.9	Plant Material
EN1101812-006	EB-14	19-Jul-11	Jul-11	ALS Acirl	1030	100	2.5		3.1	4.0	1.1	Insects, plant material
EN1102301-006	EB-14	17-Aug-11	Aug-11	ALS Acirl	0925	100	2.0		3.1	4.0	1.5	Insects, Plant material
EN1102773-006	EB-14	16-Sep-11	Sep-11	ALS Acirl	1010	700	1.6		3.1	4.0	1.1	Insects
EN1103124-006	EB-14	17-Oct-11	Oct-11	ALS Acirl	0955	1400	1.9		3.0	4.0	1.2	Insects, plant material
EN1103467-006	EB-14	15-Nov-11	Nov-11	ALS Acirl	1010	600	1.7		3.0	4.0	1.5	Insects, Plant material
EN1200212-001	EB-14	6-Jan-11	Dec-11	ALS Acirl					3.0	4.0		Bottle Broken
EN1200242-006	EB-14	13-Jan-12	Jan-12	ALS Acirl	1010	600	3.5		3.0	4.0	1.9	Insects, Plant material
EN1200606-006	EB-14	13-Feb-12	Feb-12	ALS Acirl	1230	2500	2.4		3.0	4.0	1.2	Insects, Plant material
EN1201026-006	EB-14	15-Mar-12	Mar-12	ALS Acirl	1010	500	5.5		3.1	4.0	2.1	Insects, Plant material
EN1201453-006	EB-14	16-Apr-12	Apr-12	ALS Acirl	0940	100	2.5		3.0	4.0	1.4	Insects, Bird droppings, Plant material
EN1201862-006	EB-14	17-May-12	May-12	ALS Acirl	0930	300	5.4		3.3	4.0	3.9	Insects
EN1202258-006	EB-14	18-Jun-12	Jun-12	ALS Acirl	1100	300	1.9		3.2	4.0	1.4	Plant material
EN1202679-006	EB-14	18-Jul-12	Jul-12	ALS Acirl	1020	1400	2.3		3.2	4.0	1.9	Insects, Plant material
EN1203136-006	EB-14	17-Aug-12	Aug-12	ALS Acirl	1010	100	1.3		3.2	4.0	1.0	Insects, Plant material
EN1203585-006	EB-14	18-Sep-12	Sep-12	ALS Acirl	1020	100	1.1		3.1	4.0	0.8	Insects
EN1203993-006	EB-14	18-Oct-12	Oct-12	ALS Acirl	1045	200	1.1		3.1	4.0	0.6	Insects, Bird Droppings-lots of insects
EN1204413-006	EB-14	19-Nov-12	Nov-12	ALS Acirl	1000	100	1.9		3.1	4.0	1.4	Insects, Bird Droppings
EN1204841-006	EB-14	19-Dec-12	Dec-12	ALS Acirl	0920	50	1.1		3.0	4.0	0.8	Insects
EN1300226-006	EB-14	17-Jan-13	Jan-13	ALS Acirl	0940		4.6		3.1	4.0	2.5	
EN1300226-006	EB-14	18-Feb-13	Feb-13	ALS Acirl	1015	1800	1.5		3.0	4.0	1.2	Insects, plant material
EN1301077-006	EB-14	18-Mar-13	Mar-13	ALS Acirl	1010	600	0.8		3.0	4.0	0.7	Insects, plant material
EN1301077-006	EB-14	17-Apr-13	Apr-13	ALS Acirl	1115	200	2.0		3.0	4.0	1.5	Insects, plant material
EN1301832-006	EB-14	16-May-13	May-13	ALS Acirl	1000	200	2.5	2.5	3.0	4.0	1.8	Insects, plant material
EN1302216-006	EB-14	17-Jun-13	Jun-13	ALS Acirl	1050	900	1.4	2.0	3.0	4.0	1.0	Insects, plant material
EN1302635-006	EB-14	16-Jul-13	Jul-13	ALS Acirl	1000	400	0.9	1.6	2.9	4.0	0.6	Insects, plant material
EN1303027-002	EB-14	15-Aug-13	Aug-13	ALS Acirl	1320	200	0.6	1.4	2.9	4.0	0.5	
EN1303430-002	EB-14	16-Sep-13	Sep-13	ALS Acirl	0940	100	1.8	1.4	2.9	4.0	1.4	Insects, bird droppings, plant material

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
EN1303809-002	EB-14	15-Oct-13	Oct-13	ALS Acirl	1005	300	0.3	1.3	2.8	4.0	0.2	Insects, plant material
EN1304188-011	EB-14	14-Nov-13	Nov-13	ALS Acirl	1015	250	0.6	1.2	2.8	4.0	0.3	Insects, plant material
EN1304650-011	EB-14	16-Dec-13	Dec-13	ALS Acirl	1310	650	0.2	1.0	2.8	4.0	0.1	Insects, plant material, broken funnel
2066185402-011	EB-14	14-Jan-14	Jan-14	ALS Acirl	1030	100	2.0	1.1	2.7	4.0	1.1	Insects, plant material
2600186702-011	EB-14	13-Feb-14	Feb-14	ALS Acirl	1130	100	1.3	1.2	2.7	4.0	0.8	Bird droppings, insects, plant material
2600188202-011	EB-14	14-Mar-14	Mar-14	ALS Acirl	0930	1000	2.7	1.3	2.7	4.0	1.5	Insects, plant material
2600189702-011	EB-14	15-Apr-14	Apr-14	ALS Acirl	0910	2800	7.7	1.8	2.8	4.0	2.2	Insects, bird droppings

* September 2009 result excluded from long term average (regional dust storms).



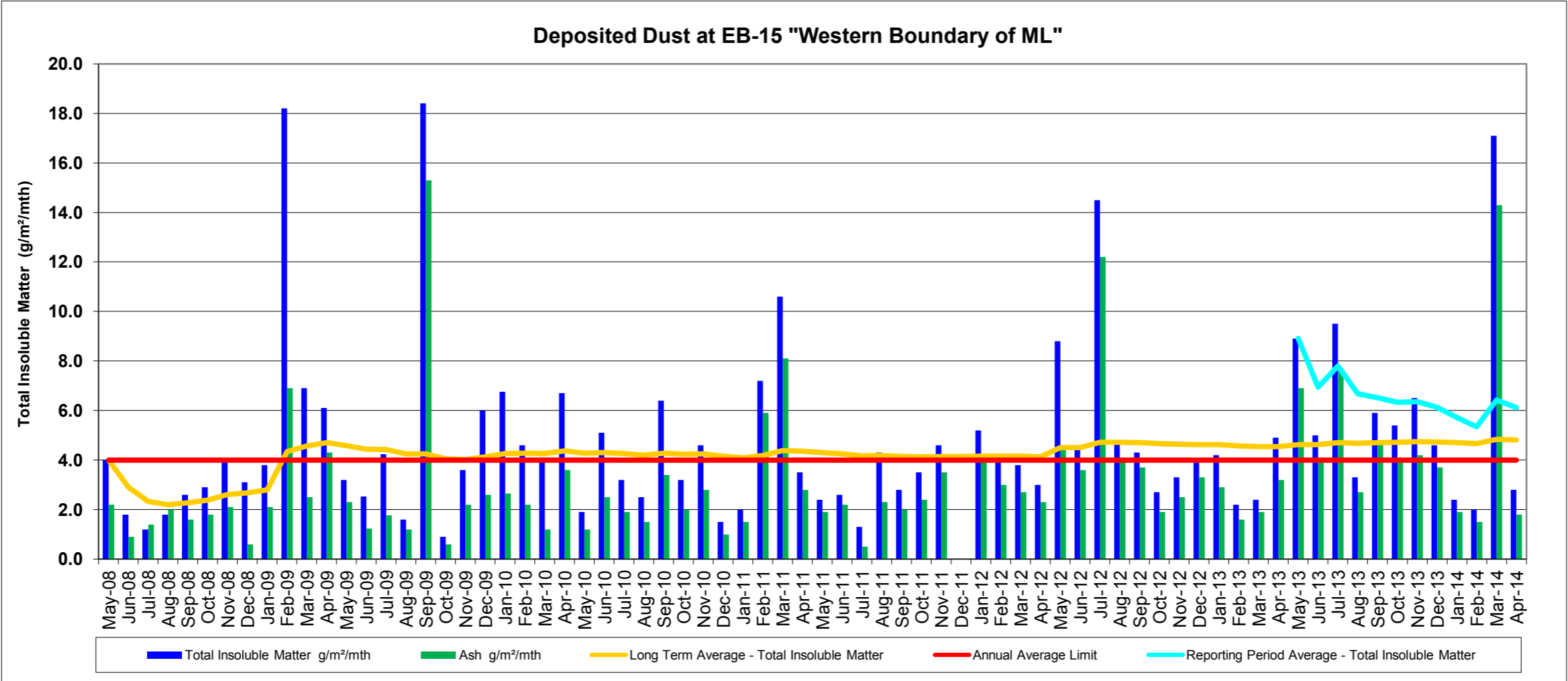
Deposited Dust EB-15 "Western Boundary of ML"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
30387.1	EB-15	02-Jun-08	May-08	Client	1035	165	4.0		4.0	4.0	2.2	
30661.1	EB-15	08-Jul-08	Jun-08	Client	1330	1145	1.8		2.9	4.0	0.9	
30903.0	EB-15	05-Aug-08	Jul-08	Client	1225	345	1.2		2.3	4.0	1.4	
31211.1	EB-15	01-Sep-08	Aug-08	Client	1345	635	1.8		2.2	4.0	2.0	
31528.1	EB-15	05-Oct-08	Sep-08	Client	1120	1605	2.6		2.3	4.0	1.6	
31776.1	EB-15	03-Nov-08	Oct-08	Client	1446	1375	2.9		2.4	4.0	1.8	
32024.0	EB-15	03-Dec-08	Nov-08	Client	1000	1340	4.0		2.6	4.0	2.1	
32519.1	EB-15	03-Jan-09	Dec-08	Client	1330	1600	3.1		2.7	4.0	0.6	
32247.1	EB-15	04-Feb-09	Jan-09	Client	1300	165	3.8		2.8	4.0	2.1	
32864.1	EB-15	03-Mar-09	Feb-09	Client	1216	2055	18.2		4.3	4.0	6.9	
2600 1008 - 0	EB-15	29-Mar-09	Mar-09	ALS		50	6.9		4.6	4.0	2.5	
2600 1018 - 00	EB-15	01-May-09	Apr-09	ALS		600	6.1		4.7	4.0	4.3	
2600 1033 - 01	EB-15	04-Jun-09	May-09	ALS		650	3.2		4.6	4.0	2.3	
2611 1039 - 01	EB-15	6-Jul-09	Jun-09	ALS		650	2.5		4.4	4.0	1.2	
2610 1051 - 01	EB-15	3-Aug-09	Jul-09	ALS	1230	450	4.2		4.4	4.0	1.8	Insects, Plant Material
2600 1062 - 00	EB-15	31-Aug-09	Aug-09	ALS	1245	50	1.6		4.2	4.0	1.2	Plant Material
2600 1096 - 01	EB-15	29-Sep-09	Sep-09	ALS	1115	900	18.4		4.2	4.0	15.3	Insects, Bird Droppings, Plant Material
2600 1126 - 00	EB-15	03-Nov-09	Oct-09	ALS	1202	1000	0.9		4.1	4.0	0.6	Insects, Bird Droppings, Plant Material
2600 1204 - 00	EB-15	02-Dec-09	Nov-09	ALS	0945	20	3.6		4.0	4.0	2.2	
2600 1222 - 00	EB-15	04-Jan-10	Dec-09	ALS	1430	2500	6.0		4.1	4.0	2.6	
2600 1234	EB-15	1-Feb-10	Jan-10	ALS	1310	600	6.8		4.3	4.0	2.7	
2600 1247	EB-15	2-Mar-10	Feb-10	ALS	1035	2500	4.6		4.3	4.0	2.2	
2600 1260	EB-15	5-Apr-10	Mar-10	ALS	1035	2500	4.1		4.3	4.0	1.2	
2600 1268	EB-15	03-May-10	Apr-10	ALS	1115	350	6.7		4.4	4.0	3.6	
2600 1277	EB-15	25-May-10	May-10	ALS Acirl	1230	50	1.9		4.3	4.0	1.2	Insects, Plant Material
2600 1288-805-1	EB-15	24-Jun-10	Jun-10	ALS Acirl	1040	900	5.1		4.3	4.0	2.5	Insects, Plant Material
2611 1298 - 887	EB-15	22-Jul-10	Jul-10	ALS Acirl	1110	500	3.2		4.3	4.0	1.9	Insects, Plant Material, Bird Droppings
26001309-914	EB-15	20-Aug-10	Aug-10	ALS Acirl	0915	2000	2.5		4.2	4.0	1.5	Insects, Plant Material
2600431904.00	EB-15	21-Sep-10	Sep-10	ALS Acirl	1310	1100	6.4		4.3	4.0	3.4	Insects
6800-4368-14	EB-15	21-Oct-10	Oct-10	ALS Acirl	0915	600	3.2		4.2	4.0	2.0	
1002886-007	EB-15	22-Nov-10	Nov-10	ALS Acirl	1000	2400	4.6		4.3	4.0	2.8	
1003101-007	EB-15	22-Dec-10	Dec-10	ALS Acirl	1045		1.5		4.2	4.0	1.0	

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
1100199-007	EB-15	21-Jan-11	Jan-11	ALS Acirl	1040	400	2.0		4.1	4.0	1.5	
1100446-007	EB-15	22-Feb-11	Feb-11	ALS Acirl	1000	600	7.2		4.2	4.0	5.9	
1100695-007	EB-15	24-Mar-11	Mar-11	ALS Acirl	0920	600	10.6		4.4	4.0	8.1	
EN1100922-007	EB-15	20-Apr-11	Apr-11	ALS Acirl	0910	400	3.5		4.4	4.0	2.8	
EN1101205-007	EB-15	20-May-11	May-11	ALS Acirl	945	Dry	2.4		4.3	4.0	1.9	
EN1101448-007	EB-15	20-Jun-11	Jun-11	ALS Acirl	0910	1200	2.6		4.3	4.0	2.2	Insects/Plant Material/Bird Droppings
EN1101812-007	EB-15	19-Jul-11	Jul-11	ALS Acirl	1040	100	1.3		4.2	4.0	0.5	Insects, bird droppings, plant material
EN1102301-007	EB-15	17-Aug-11	Aug-11	ALS Acirl	0915	150	4.3		4.2	4.0	2.3	Bird droppings
EN1102773-007	EB-15	16-Sep-11	Sep-11	ALS Acirl	0950	800	2.8		4.1	4.0	2.0	Insects, Plant material
EN1103124-007	EB-15	17-Oct-11	Oct-11	ALS Acirl	0940	1500	3.5		4.1	4.0	2.4	Insects, plant material
EN1103467-007	EB-15	15-Nov-11	Nov-11	ALS Acirl	1000	600	4.6		4.1	4.0	3.5	Insects, Plant material
EN1200212-002	EB-15	6-Jan-11	Dec-11	ALS Acirl					4.1	4.0		Bottle Broken in transit
EN1200242-007	EB-15	13-Jan-12	Jan-12	ALS Acirl	1030	600	5.2		4.2	4.0	3.9	Insects, Plant material
EN1200606-007	EB-15	13-Feb-12	Feb-12	ALS Acirl	1245	2500	4.0		4.2	4.0	3.0	Insects, Plant material
EN1201026-007	EB-15	15-Mar-12	Mar-12	ALS Acirl	0930	500	3.8		4.2	4.0	2.7	Insects, Bird droppings, Plant material
EN1201453-007	EB-15	16-Apr-12	Apr-12	ALS Acirl	0955	100	3.0		4.1	4.0	2.3	Insects, Bird droppings, Plant material
EN1201862-007	EB-15	17-May-12	May-12	ALS Acirl	0915	450	8.80		4.5	4.0	4.6	Insects, Bird droppings
EN1202258-007	EB-15	18-Jun-12	Jun-12	ALS Acirl	1045	450	4.50		4.5	4.0	3.6	Insects, Plant material
EN1202679-007	EB-15	18-Jul-12	Jul-12	ALS Acirl	0950	1400	14.50		4.7	4.0	12.2	Insects, Bird droppings
EN1203136-007	EB-15	17-Aug-12	Aug-12	ALS Acirl	0950	100	4.80		4.7	4.0	4.1	Plant material-IBC construction & digging near gauge
EN1203585-007	EB-15	18-Sep-12	Sep-12	ALS Acirl	0950	100	4.30		4.7	4.0	3.7	Insects
EN1203993-007	EB-15	18-Oct-12	Oct-12	ALS Acirl	1035	250	2.70		4.7	4.0	1.9	Insects-construction adjacent to gauge
EN1204413-007	EB-15	19-Nov-12	Nov-12	ALS Acirl	0940	100	3.30		4.6	4.0	2.5	Insects, Bird Droppings
EN1204841-007	EB-15	19-Dec-12	Dec-12	ALS Acirl	0915	50	3.90		4.6	4.0	3.3	Insects, plant material
EN1300226-007	EB-15	17-Jan-13	Jan-13	ALS Acirl	0920		4.20		4.6	4.0	2.9	
EN1300226-007	EB-15	18-Feb-13	Feb-13	ALS Acirl	1030	2000	2.20		4.6	4.0	1.6	Insects, plant material
EN1301077-007	EB-15	18-Mar-13	Mar-13	ALS Acirl	1020	800	2.40		4.5	4.0	1.9	Insects, plant material
EN1301077-007	EB-15	17-Apr-13	Apr-13	ALS Acirl	1130	200	4.90		4.5	4.0	3.2	Insects, bird droppings, plant material
EN1301832-007	EB-15	16-May-13	May-13	ALS Acirl	1010	200	8.90	8.9	4.6	4.0	6.9	Insects, plant material-construction work happening nearby at Downer
EN1302216-007	EB-15	17-Jun-13	Jun-13	ALS Acirl	1100	900	5.00	7.0	4.6	4.0	3.9	Insects, bird droppings, plant material-heavy construction near dust gauge
EN1302635-007	EB-15	16-Jul-13	Jul-13	ALS Acirl	0950	400	9.50	7.8	4.7	4.0	7.7	Insects, bird droppings, broken funnel replaced, heavy construction near dust gauge
EN1303027-004	EB-15	15-Aug-13	Aug-13	ALS Acirl	1330	200	3.30	6.7	4.7	4.0	2.7	Insects, plant material-construction nearby at Downer
EN1303430-004	EB-15	16-Sep-13	Sep-13	ALS Acirl	0955	100	5.90	6.5	4.7	4.0	4.8	Insects, plant material-Idemitsu construction site nearby

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
EN1303809-004	EB-15	15-Oct-13	Oct-13	ALS Acirl	1015	350	5.40	6.3	4.7	4.0	3.9	Insects, plant material
EN1304188-012	EB-15	14-Nov-13	Nov-13	ALS Acirl	1025	300	6.50	6.4	4.7	4.0	4.2	Insects, plant material
EN1304650-012	EB-15	16-Dec-13	Dec-13	ALS Acirl	1320	450	4.60	6.1	4.7	4.0	3.7	Insects, plant material, Idemitsu construction nearby
2066185402-012	EB-15	14-Jan-14	Jan-14	ALS Acirl	1040	100	2.40	5.7	4.7	4.0	1.9	Insects, plant material, construction nearby
2600186702-012	EB-15	13-Feb-14	Feb-14	ALS Acirl	1055	100	2.00	5.4	4.7	4.0	1.5	Bird droppings
2600188202-012	EB-15	14-Mar-14	Mar-14	ALS Acirl	0945	1100	17.10	6.4	4.8	4.0	14.3	Insects, plant material-gravel crushing plant opposite
2600189702-012	EB-15	15-Apr-14	Apr-14	ALS Acirl	0925	2800	2.80	6.1	4.8	4.0	1.8	Insects-Idemitsu earthmoving nearby

* September 2009 result excluded from long term average (regional dust storms).



Deposited Dust D-2 "Nagero"

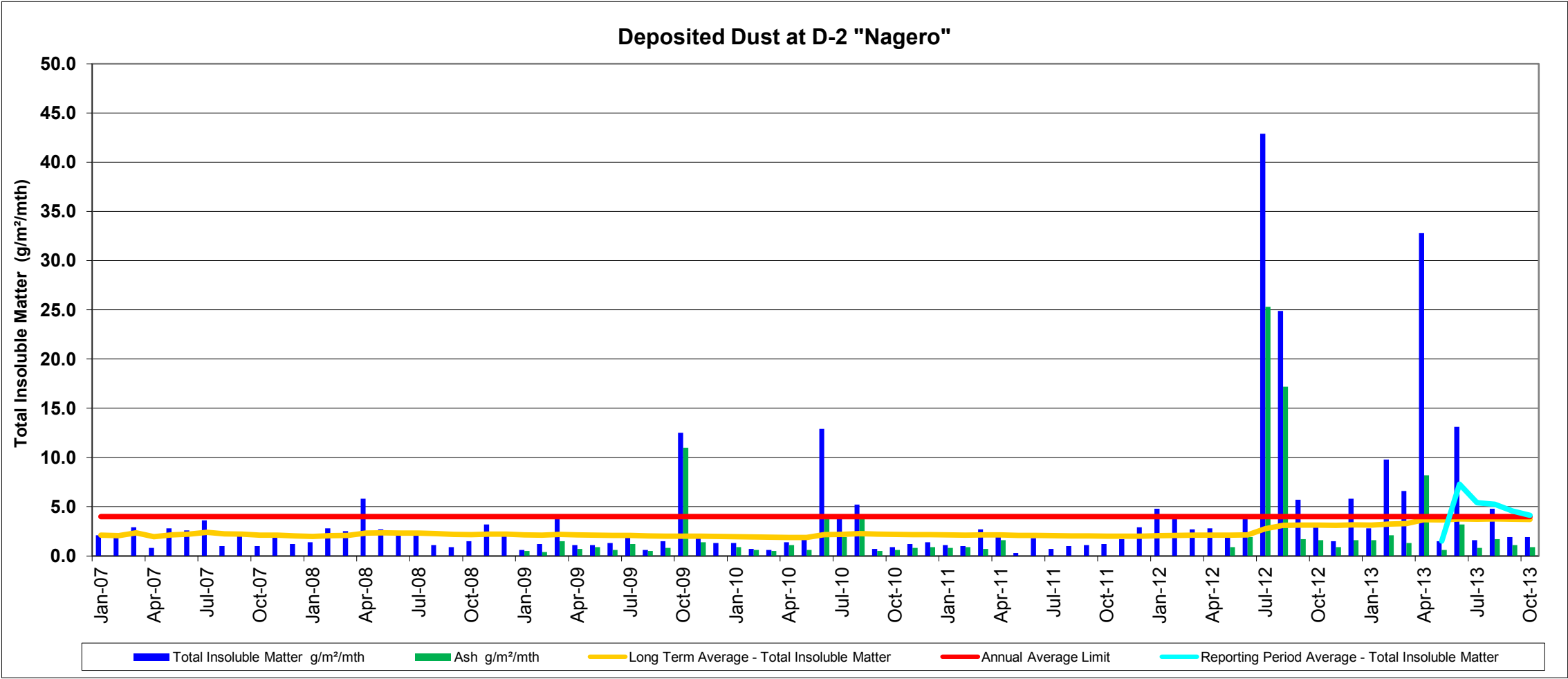
Note: This site is monitored by Idemitsu Boggabri Coal. The sample month generally reflects the period between the 15th of the previous month and the 15th of the sample month.

Sample Location	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
D-2	Jan-07	IBC			2.1		2.1	4.0		
D-2	Feb-07	IBC			2.0		2.1	4.0		
D-2	Mar-07	IBC			2.9		2.3	4.0		
D-2	Apr-07	IBC			0.8		2.0	4.0		
D-2	May-07	IBC			2.8		2.1	4.0		
D-2	Jun-07	IBC			2.6		2.2	4.0		
D-2	Jul-07	IBC			3.6		2.4	4.0		
D-2	Aug-07	IBC			1.0		2.2	4.0		
D-2	Sep-07	IBC			2.2		2.2	4.0		
D-2	Oct-07	IBC			1.0		2.1	4.0		
D-2	Nov-07	IBC			2.2		2.1	4.0		
D-2	Dec-07	IBC			1.2		2.0	4.0		
D-2	Jan-08	IBC			1.4		2.0	4.0		
D-2	Feb-08	IBC			2.8		2.0	4.0		
D-2	Mar-08	IBC			2.5		2.1	4.0		
D-2	Apr-08	IBC			5.8		2.3	4.0		
D-2	May-08	IBC			2.7		2.3	4.0		
D-2	Jun-08	IBC			2.2		2.3	4.0		
D-2	Jul-08	IBC			2.2		2.3	4.0		
D-2	Aug-08	IBC			1.1		2.3	4.0		
D-2	Sep-08	IBC			0.9		2.2	4.0		
D-2	Oct-08	IBC			1.5		2.2	4.0		
D-2	Nov-08	IBC			3.2		2.2	4.0		
D-2	Dec-08	IBC			2.2		2.2	4.0		
D-2	Jan-09	IBC			0.6		2.1	4.0	0.5	
D-2	Feb-09	IBC			1.2		2.1	4.0	0.4	
D-2	Mar-09	IBC			4.0		2.2	4.0	1.5	
D-2	Apr-09	IBC			1.1		2.1	4.0	0.7	
D-2	May-09	IBC			1.1		2.1	4.0	0.9	
D-2	Jun-09	IBC			1.3		2.1	4.0	0.6	
D-2	Jul-09	IBC			1.9		2.1	4.0	1.2	
D-2	Aug-09	IBC			0.6		2.0	4.0	0.5	
D-2	Sep-09	IBC			1.5		2.0	4.0	0.8	
D-2	Oct-09	IBC			12.5		2.0	4.0	11	
D-2	Nov-09	IBC			1.8		2.0	4.0	1.4	

Sample Location	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
D-2	Dec-09	IBC			1.3		2.0	4.0		
D-2	Jan-10	IBC			1.3		2.0	4.0	0.9	
D-2	Feb-10	IBC			0.7		1.9	4.0	0.6	
D-2	Mar-10	IBC			0.6		1.9	4.0	0.5	
D-2	Apr-10	IBC			1.4		1.9	4.0	1.1	
D-2	May-10	IBC			1.8		1.9	4.0	0.6	
D-2	Jun-10	IBC			12.9		2.1	4.0	3.8	
D-2	Jul-10	IBC			3.9		2.2	4.0	1.9	
D-2	Aug-10	IBC			5.2		2.3	4.0	4	
D-2	Sep-10	IBC			0.7		2.2	4.0	0.5	
D-2	Oct-10	IBC			0.9		2.2	4.0	0.6	
D-2	Nov-10	IBC			1.2		2.2	4.0	0.8	
D-2	Dec-10	IBC			1.4		2.2	4.0	0.9	
D-2	Jan-11	IBC			1.1		2.1	4.0	0.8	
D-2	Feb-11	IBC			1		2.1	4.0	0.9	
D-2	Mar-11	IBC			2.7		2.1	4.0	0.7	
D-2	Apr-11	IBC			2.1		2.1	4.0	1.6	
D-2	May-11	IBC			0.3		2.1	4.0		
D-2	Jun-11	IBC			1.8		2.1	4.0		
D-2	Jul-11	IBC			0.7		2.1	4.0		
D-2	Aug-11	IBC			1		2.0	4.0		
D-2	Sep-11	IBC			1.1		2.0	4.0		
D-2	Oct-11	IBC			1.2		2.0	4.0		
D-2	Nov-11	IBC			1.7		2.0	4.0		
D-2	Dec-11	IBC			2.9		2.0	4.0		
D-2	Jan-12	IBC			4.8		2.1	4.0		
D-2	Feb-12	IBC			3.9		2.1	4.0		
D-2	Mar-12	IBC			2.7		2.1	4.0		
D-2	Apr-12	IBC			2.8		2.1	4.0		
D-2	May-12	IBC			2.2		2.1	4.0	0.9	
D-2	Jun-12	IBC			3.9		2.1	4.0	1.9	
D-2	Jul-12	IBC			42.9		2.8	4.0	25.3	
D-2	Aug-12	IBC			24.9		3.1	4.0	17.2	
D-2	Sep-12	IBC			5.7		3.1	4.0	1.7	
D-2	Oct-12	IBC			3.1		3.1	4.0	1.6	
D-2	Nov-12	IBC			1.5		3.1	4.0	0.9	
D-2	Dec-12	IBC			5.8		3.1	4.0	1.6	
D-2	Jan-13	IBC			2.8		3.1	4.0	1.6	
D-2	Feb-13	IBC			9.8		3.2	4.0	2.1	

Sample Location	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
D-2	Mar-13	IBC			6.6		3.3	4.0	1.3	
D-2	Apr-13	IBC			32.8		3.7	4.0	8.2	
D-2	May-13	IBC			1.5	1.5	3.6	4.0	0.6	
D-2	Jun-13	IBC			13.1	7.3	3.8	4.0	3.2	
D-2	Jul-13	IBC			1.6	5.4	3.7	4.0	0.8	
D-2	Aug-13	IBC			4.8	5.3	3.7	4.0	1.7	
D-2	Sep-13	IBC			1.9	4.6	3.7	4.0	1.1	
D-2	Oct-13	IBC			1.9	4.1	3.7	4.0	0.9	

* October 2009 result excluded from long term average (regional dust storms).



Deposited Dust D-4 "Green Hills"

Note: This site is monitored by Idemitsu Boggabri Coal. The sample month generally reflects the period between the 15th of the previous month and the 15th of the sample month.

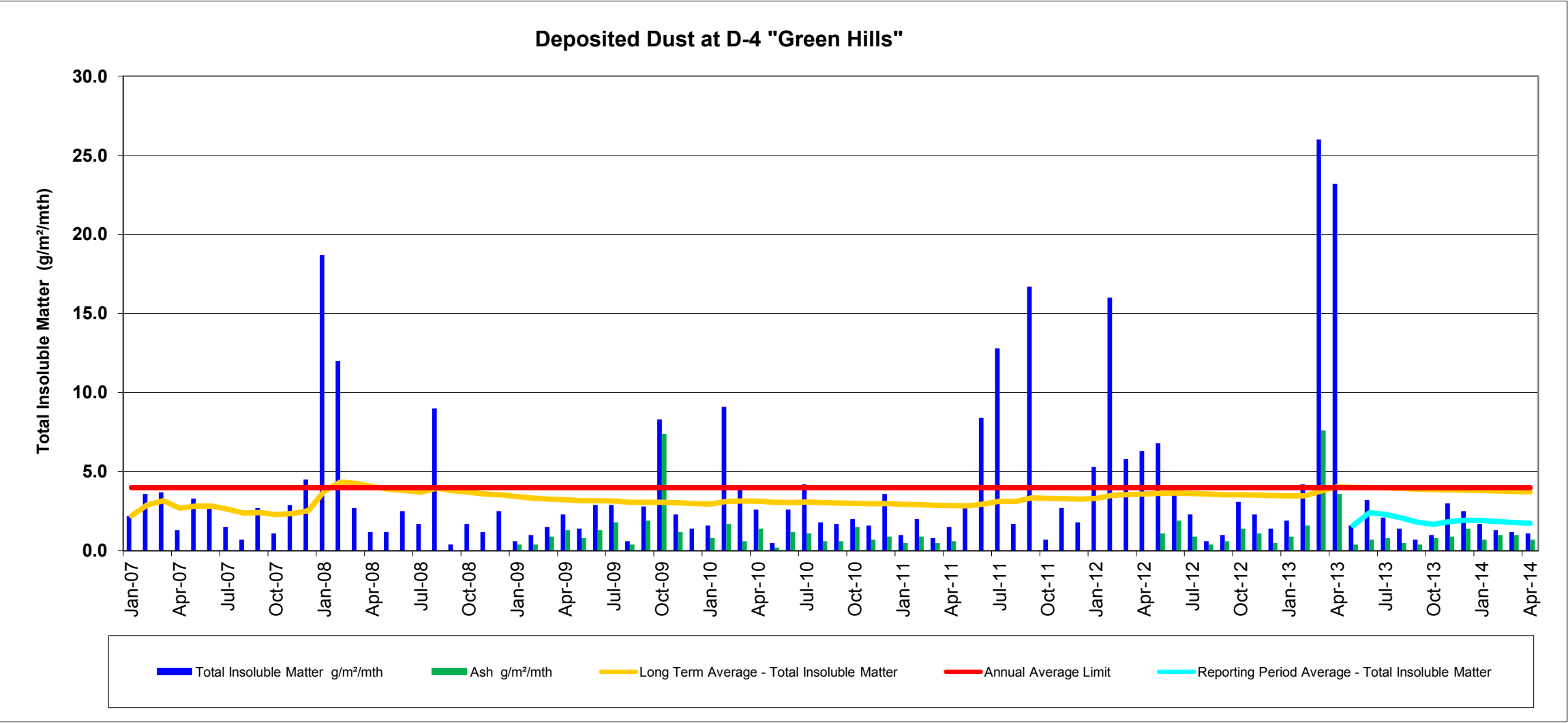
Sample Location	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
D-4	Jan-07	IBC			2.2		2.2	4.0		
D-4	Feb-07	IBC			3.6		2.9	4.0		
D-4	Mar-07	IBC			3.7		3.2	4.0		
D-4	Apr-07	IBC			1.3		2.7	4.0		
D-4	May-07	IBC			3.3		2.8	4.0		
D-4	Jun-07	IBC			2.8		2.8	4.0		
D-4	Jul-07	IBC			1.5		2.6	4.0		
D-4	Aug-07	IBC			0.7		2.4	4.0		
D-4	Sep-07	IBC			2.7		2.4	4.0		
D-4	Oct-07	IBC			1.1		2.3	4.0		
D-4	Nov-07	IBC			2.9		2.3	4.0		
D-4	Dec-07	IBC			4.5		2.5	4.0		
D-4	Jan-08	IBC			18.7		3.8	4.0		
D-4	Feb-08	IBC			12.0		4.4	4.0		
D-4	Mar-08	IBC			2.7		4.2	4.0		
D-4	Apr-08	IBC			1.2		4.1	4.0		
D-4	May-08	IBC			1.2		3.9	4.0		
D-4	Jun-08	IBC			2.5		3.8	4.0		
D-4	Jul-08	IBC			1.7		3.7	4.0		
D-4	Aug-08	IBC			9.0		4.0	4.0		
D-4	Sep-08	IBC			0.4		3.8	4.0		
D-4	Oct-08	IBC			1.7		3.7	4.0		
D-4	Nov-08	IBC			1.2		3.6	4.0		
D-4	Dec-08	IBC			2.5		3.5	4.0		
D-4	Jan-09	IBC			0.6		3.4	4.0	0.4	
D-4	Feb-09	IBC			1.0		3.3	4.0	0.4	
D-4	Mar-09	IBC			1.5		3.3	4.0	0.9	
D-4	Apr-09	IBC			2.3		3.2	4.0	1.3	
D-4	May-09	IBC			1.4		3.2	4.0	0.8	
D-4	Jun-09	IBC			2.9		3.2	4.0	1.3	
D-4	Jul-09	IBC			2.9		3.2	4.0	1.8	
D-4	Aug-09	IBC			0.6		3.1	4.0	0.4	
D-4	Sep-09	IBC			2.8		3.1	4.0	1.9	
D-4	Oct-09	IBC			8.3		3.1	4.0	7.4	
D-4	Nov-09	IBC			2.3		3.0	4.0	1.2	
D-4	Dec-09	IBC			1.4		3.0	4.0		
D-4	Jan-10	IBC			1.6		3.0	4.0	0.8	
D-4	Feb-10	IBC			9.1		3.1	4.0	1.7	
D-4	Mar-10	IBC			3.9		3.1	4.0	0.6	

AEMR
2013/2014

TARRAWONGA COAL PTY LTD
Deposited Dust Data - D-4

Sample Location	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
D-4	Apr-10	IBC			2.6		3.1	4.0	1.4	
D-4	May-10	IBC			0.5		3.1	4.0	0.2	
D-4	Jun-10	IBC			2.6		3.1	4.0	1.2	
D-4	Jul-10	IBC			4.2		3.1	4.0	1.1	
D-4	Aug-10	IBC			1.8		3.0	4.0	0.6	
D-4	Sep-10	IBC			1.7		3.0	4.0	0.6	
D-4	Oct-10	IBC			2		3.0	4.0	1.5	
D-4	Nov-10	IBC			1.6		3.0	4.0	0.7	
D-4	Dec-10	IBC			3.6		3.0	4.0	0.9	
D-4	Jan-11	IBC			1		2.9	4.0	0.5	
D-4	Feb-11	IBC			2		2.9	4.0	0.9	
D-4	Mar-11	IBC			0.8		2.9	4.0	0.5	
D-4	Apr-11	IBC			1.5		2.8	4.0	0.6	
D-4	May-11	IBC			2.8		2.8	4.0		
D-4	Jun-11	IBC			8.4		3.0	4.0		
D-4	Jul-11	IBC			12.8		3.1	4.0		
D-4	Aug-11	IBC			1.7		3.1	4.0		
D-4	Sep-11	IBC			16.7		3.4	4.0		
D-4	Oct-11	IBC			0.7		3.3	4.0		
D-4	Nov-11	IBC			2.7		3.3	4.0		
D-4	Dec-11	IBC			1.8		3.3	4.0		
D-4	Jan-12	IBC			5.3		3.3	4.0		
D-4	Feb-12	IBC			16		3.5	4.0		
D-4	Mar-12	IBC			5.8		3.5	4.0		
D-4	Apr-12	IBC			6.3		3.6	4.0		
D-4	May-12	IBC			6.8		3.6	4.0	1.1	
D-4	Jun-12	IBC			3.9		3.6	4.0	1.9	
D-4	Jul-12	IBC			2.3		3.6	4.0	0.9	
D-4	Aug-12	IBC			0.6		3.6	4.0	0.4	
D-4	Sep-12	IBC			1		3.5	4.0	0.6	
D-4	Oct-12	IBC			3.1		3.5	4.0	1.4	
D-4	Nov-12	IBC			2.3		3.5	4.0	1.1	
D-4	Dec-12	IBC			1.4		3.5	4.0	0.5	
D-4	Jan-13	IBC			1.9		3.5	4.0	0.9	
D-4	Feb-13	IBC			4.2		3.5	4.0	1.6	
D-4	Mar-13	IBC			26		3.8	4.0	7.6	
D-4	Apr-13	IBC			23.2		4.0	4.0	3.6	
D-4	May-13	D4			1.6	1.6	4.0	4.0	0.4	
D-4	Jun-13	D4			3.2	2.4	4.0	4.0	0.7	
D-4	Jul-13	D4			2.1	2.3	4.0	4.0	0.8	
D-4	Aug-13	D4			1.4	2.1	3.9	4.0	0.5	
D-4	Sep-13	D4			0.7	1.8	3.9	4.0	0.4	

Sample Location	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
D-4	Oct-13	D4			1	1.7	3.9	4.0	0.8	
D-4	Nov-13	D4			3	1.9	3.9	4.0	0.9	
D-4	Dec-13	D4			2.5	1.9	3.8	4.0	1.4	
D-4	Jan-14	D4			1.7	1.9	3.8	4.0	0.7	
D-4	Feb-14	D4			1.3	1.9	3.8	4.0	1.0	
D-4	Mar-14	D4			1.2	1.8	3.8	4.0	1.0	
D-4	Apr-14	D4			1.1	1.7	3.7	4.0	0.7	



Deposited Dust D-7 "Merriown"

Note: This site is monitored by Idemitsu Boggabri Coal. The sample month generally reflects the period between the 15th of the previous month and the 15th of the sample month.

Sample Location	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
D-7	Jan-07	IBC			1.9		1.9	4.0		
D-7	Feb-07	IBC			2.0		2.0	4.0		
D-7	Mar-07	IBC			2.3		2.1	4.0		
D-7	Apr-07	IBC			0.6		1.7	4.0		
D-7	May-07	IBC			1.8		1.7	4.0		
D-7	Jun-07	IBC			2.5		1.9	4.0		
D-7	Jul-07	IBC			0.9		1.7	4.0		
D-7	Aug-07	IBC			1.2		1.7	4.0		
D-7	Sep-07	IBC			1.0		1.6	4.0		
D-7	Oct-07	IBC			1.0		1.5	4.0		
D-7	Nov-07	IBC			1.4		1.5	4.0		
D-7	Dec-07	IBC			1.7		1.5	4.0		
D-7	Jan-08	IBC			0.4		1.4	4.0		
D-7	Feb-08	IBC			1.4		1.4	4.0		
D-7	Mar-08	IBC			2.0		1.5	4.0		
D-7	Apr-08	IBC			1.6		1.5	4.0		
D-7	May-08	IBC			1.3		1.5	4.0		
D-7	Jun-08	IBC			0.7		1.4	4.0		
D-7	Jul-08	IBC			1.7		1.4	4.0		
D-7	Aug-08	IBC			6.4		1.7	4.0		
D-7	Sep-08	IBC			0.3		1.6	4.0		
D-7	Oct-08	IBC			1.5		1.6	4.0		
D-7	Nov-08	IBC			0.7		1.6	4.0		
D-7	Dec-08	IBC			1.4		1.6	4.0		
D-7	Jan-09	IBC			1.1		1.6	4.0	0.6	
D-7	Feb-09	IBC			1.5		1.6	4.0	0.9	
D-7	Mar-09	IBC			0.7		1.5	4.0	0.3	
D-7	Apr-09	IBC			0.6		1.5	4.0	0.4	
D-7	May-09	IBC			0.7		1.5	4.0	0.5	
D-7	Jun-09	IBC			0.7		1.4	4.0	0.3	
D-7	Jul-09	IBC			0.9		1.4	4.0	0.4	
D-7	Aug-09	IBC			0.7		1.4	4.0	0.4	
D-7	Sep-09	IBC			0.9		1.4	4.0	0.7	
D-7	Oct-09	IBC			18.3		1.4	4.0	16.2	
D-7	Nov-09	IBC			1.6		1.4	4.0	1	
D-7	Dec-09	IBC			2		1.4	4.0		

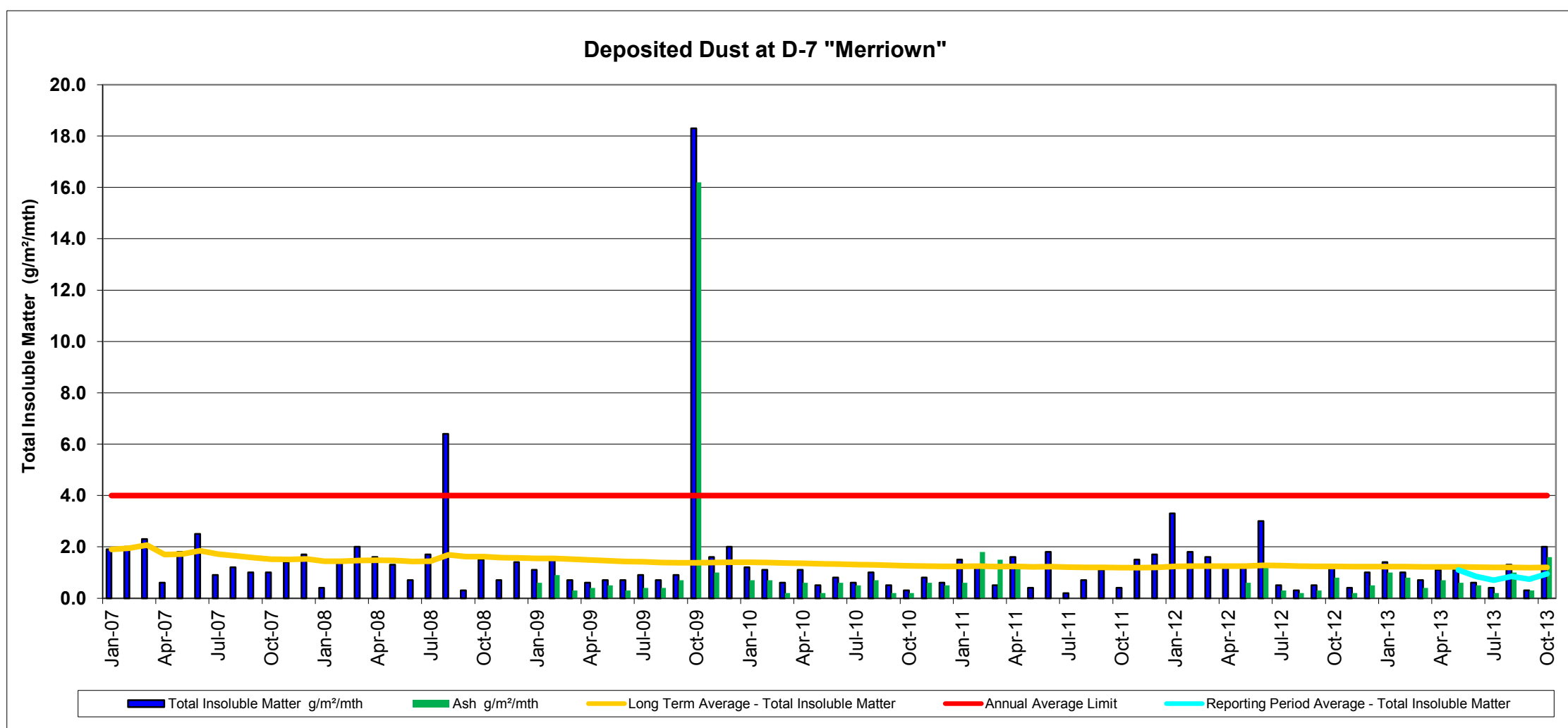
AEMR
2013/2014

TARRAWONGA COAL PTY LTD
Deposited Dust Data - D-7

Sample Location	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
D-7	Jan-10	IBC			1.2		1.4	4.0	0.7	
D-7	Feb-10	IBC			1.1		1.4	4.0	0.7	
D-7	Mar-10	IBC			0.6		1.4	4.0	0.2	
D-7	Apr-10	IBC			1.1		1.4	4.0	0.6	
D-7	May-10	IBC			0.5		1.3	4.0	0.2	
D-7	Jun-10	IBC			0.8		1.3	4.0	0.6	
D-7	Jul-10	IBC			0.6		1.3	4.0	0.5	
D-7	Aug-10	IBC			1		1.3	4.0	0.7	
D-7	Sep-10	IBC			0.5		1.3	4.0	0.2	
D-7	Oct-10	IBC			0.3		1.3	4.0	0.2	
D-7	Nov-10	IBC			0.8		1.3	4.0	0.6	
D-7	Dec-10	IBC			0.6		1.2	4.0	0.5	
D-7	Jan-11	IBC			1.5		1.2	4.0	0.6	
D-7	Feb-11	IBC			1.3		1.2	4.0	1.8	
D-7	Mar-11	IBC			0.5		1.2	4.0	1.5	
D-7	Apr-11	IBC			1.6		1.2	4.0	1.2	
D-7	May-11	IBC			0.4		1.2	4.0		
D-7	Jun-11	IBC			1.8		1.2	4.0		
D-7	Jul-11	IBC			0.2		1.2	4.0		
D-7	Aug-11	IBC			0.7		1.2	4.0		
D-7	Sep-11	IBC			1.1		1.2	4.0		
D-7	Oct-11	IBC			0.4		1.2	4.0		
D-7	Nov-11	IBC			1.5		1.2	4.0		
D-7	Dec-11	IBC			1.7		1.2	4.0		
D-7	Jan-12	IBC			3.3		1.2	4.0		
D-7	Feb-12	IBC			1.8		1.2	4.0		
D-7	Mar-12	IBC			1.6		1.3	4.0		
D-7	Apr-12	IBC			1.2		1.3	4.0		
D-7	May-12	IBC			1.2		1.3	4.0	0.6	
D-7	Jun-12	IBC			3		1.3	4.0	1.3	
D-7	Jul-12	IBC			0.5		1.3	4.0	0.3	
D-7	Aug-12	IBC			0.3		1.3	4.0	0.2	
D-7	Sep-12	IBC			0.5		1.2	4.0	0.3	
D-7	Oct-12	IBC			1.3		1.2	4.0	0.8	
D-7	Nov-12	IBC			0.4		1.2	4.0	0.2	
D-7	Dec-12	IBC			1		1.2	4.0	0.5	
D-7	Jan-13	IBC			1.4		1.2	4.0	1.0	
D-7	Feb-13	IBC			1		1.2	4.0	0.8	
D-7	Mar-13	IBC			0.7		1.2	4.0	0.4	
D-7	Apr-13	IBC			1.1		1.2	4.0	0.7	

Sample Location	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
D-7	May-13	IBC			1.1	1.1	1.2	4.0	0.6	
D-7	Jun-13	IBC			0.6	0.9	1.2	4.0	0.5	
D-7	Jul-13	IBC			0.4	0.7	1.2	4.0	0.2	
D-7	Aug-13	IBC			1.3	0.9	1.2	4.0	1.0	
D-7	Sep-13	IBC			0.3	0.7	1.2	4.0	0.3	
D-7	Oct-13	IBC			2	1.0	1.2	4.0	1.6	

* October 2009 result excluded from long term average (regional dust storms).



Deposited Dust D-15 "Forest View"

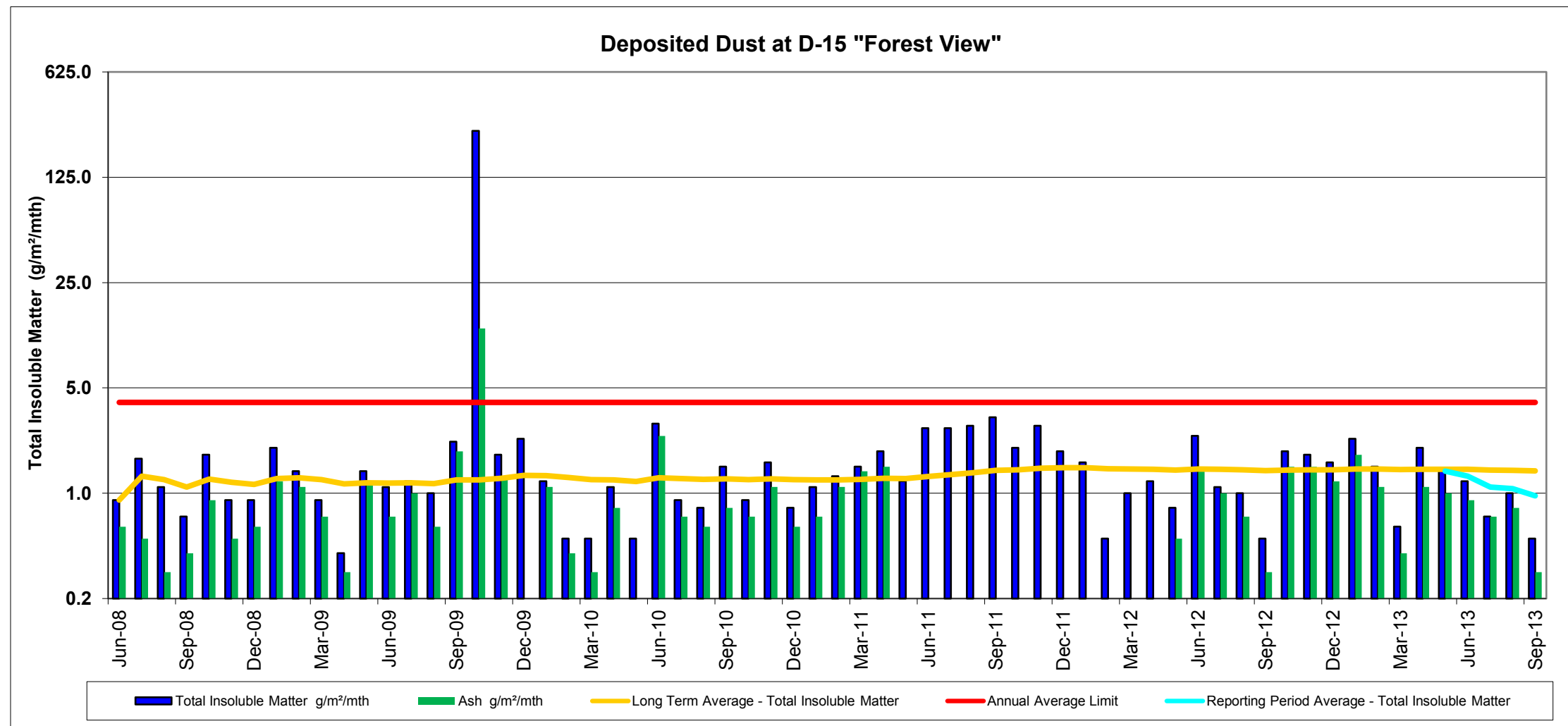
Note: This site is monitored by Idemitsu Boggabri Coal. The sample month generally reflects the period between the 15th of the previous month and the 15th of the sample month.

Sample Location	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
D-15	Jun-08	IBC			0.9		0.9	4.0	0.6	
D-15	Jul-08	IBC			1.7		1.3	4.0	0.5	
D-15	Aug-08	IBC			1.1		1.2	4.0	0.3	
D-15	Sep-08	IBC			0.7		1.1	4.0	0.4	
D-15	Oct-08	IBC			1.8		1.2	4.0	0.9	
D-15	Nov-08	IBC			0.9		1.2	4.0	0.5	
D-15	Dec-08	IBC			0.9		1.1	4.0	0.6	
D-15	Jan-09	IBC			2.0		1.3	4.0	1.2	
D-15	Feb-09	IBC			1.4		1.3	4.0	1.1	
D-15	Mar-09	IBC			0.9		1.2	4.0	0.7	
D-15	Apr-09	IBC			0.4		1.2	4.0	0.3	
D-15	May-09	IBC			1.4		1.2	4.0	1.2	
D-15	Jun-09	IBC			1.1		1.2	4.0	0.7	
D-15	Jul-09	IBC			1.2		1.2	4.0	1	
D-15	Aug-09	IBC			1.0		1.2	4.0	0.6	
D-15	Sep-09	IBC			2.2		1.2	4.0	1.9	
D-15	Oct-09	IBC			254		1.2	4.0	12.4	
D-15	Nov-09	IBC			1.8		1.3	4.0	1.3	
D-15	Dec-09	IBC			2.3		1.3	4.0		
D-15	Jan-10	IBC			1.2		1.3	4.0	1.1	
D-15	Feb-10	IBC			0.5		1.3	4.0	0.4	
D-15	Mar-10	IBC			0.5		1.2	4.0	0.3	
D-15	Apr-10	IBC			1.1		1.2	4.0	0.8	
D-15	May-10	IBC			0.5		1.2	4.0		
D-15	Jun-10	IBC			2.9		1.3	4.0	2.4	
D-15	Jul-10	IBC			0.9		1.3	4.0	0.7	
D-15	Aug-10	IBC			0.8		1.2	4.0	0.6	
D-15	Sep-10	IBC			1.5		1.2	4.0	0.8	

Sample Location	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
D-15	Oct-10	IBC			0.9		1.2	4.0	0.7	
D-15	Nov-10	IBC			1.6		1.2	4.0	1.1	
D-15	Dec-10	IBC			0.8		1.2	4.0	0.6	
D-15	Jan-11	IBC			1.1		1.2	4.0	0.7	
D-15	Feb-11	IBC			1.3		1.2	4.0	1.1	
D-15	Mar-11	IBC			1.5		1.2	4.0	1.4	
D-15	Apr-11	IBC			1.9		1.3	4.0	1.5	
D-15	May-11	IBC			1.2		1.3	4.0		
D-15	Jun-11	IBC			2.7		1.3	4.0		
D-15	Jul-11	IBC			2.7		1.3	4.0		
D-15	Aug-11	IBC			2.8		1.4	4.0		
D-15	Sep-11	IBC			3.2		1.4	4.0		
D-15	Oct-11	IBC			2		1.4	4.0		
D-15	Nov-11	IBC			2.8		1.5	4.0		
D-15	Dec-11	IBC			1.9		1.5	4.0		
D-15	Jan-12	IBC			1.6		1.5	4.0		
D-15	Feb-12	IBC			0.5		1.5	4.0		
D-15	Mar-12	IBC			1		1.4	4.0		
D-15	Apr-12	IBC			1.2		1.4	4.0		
D-15	May-12	IBC			0.8		1.4	4.0	0.5	
D-15	Jun-12	IBC			2.4		1.4	4.0	1.5	
D-15	Jul-12	IBC			1.1		1.4	4.0	1.0	
D-15	Aug-12	IBC			1		1.4	4.0	0.7	
D-15	Sep-12	IBC			0.5		1.4	4.0	0.3	
D-15	Oct-12	IBC			1.9		1.4	4.0	1.5	
D-15	Nov-12	IBC			1.8		1.4	4.0	1.5	
D-15	Dec-12	IBC			1.6		1.4	4.0	1.2	
D-15	Jan-13	IBC			2.3		1.4	4.0	1.8	
D-15	Feb-13	IBC			1.5		1.5	4.0	1.1	
D-15	Mar-13	IBC			0.6		1.4	4.0	0.4	
D-15	Apr-13	IBC			2		1.4	4.0	1.1	

Sample Location	Sample Month	Sampler	Time: (d)	Volume Collected ml	Total Insoluble Matter g/m ² /mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m ² /mth	Comment
D-15	May-13	IBC			1.4	1.4	1.4	4.0	1.0	
D-15	Jun-13	IBC			1.2	1.3	1.4	4.0	0.9	
D-15	Jul-13	IBC			0.7	1.1	1.4	4.0	0.7	
D-15	Aug-13	IBC			1	1.1	1.4	4.0	0.8	
D-15	Sep-13	IBC			0.5	1.0	1.4	4.0	0.3	

* October 2009 result excluded from long term average (regional dust storms).



Appendix 5

SURFACE WATER AND WET WEATHER DISCHARGE MONITORING DATA

Quarterly Surface Water Monitoring Results

Sample No.	Date	Time	Sample Location	pH	EC (µS/cm)	Total Suspended Solids (mg/L)	Total Organic Carbon (TOC)	Grease & Oil (mg/L)	Antimony	Arsenic	Molybdenum	Selenium
	8 September 2006		SD5	6.5	930	144		<2				
	8 September 2006		SD6	7.5	310	104		<2				
	8 September 2006		SD8	8.9	190	25		<6				
	8 September 2006		SD9	9	285	1940		<2				
	11 January 2007		SD5	8.4	3750	20		<2				
	11 January 2007		SD8	8.2	420	84						
	11 January 2007		SD9	8.6	440	15		<2				
	11 January 2007		MV1	7.7	3970	293		<2				
	18 April 2007		SD1	8.6	605	86		<2				
	18 April 2007		SD2	8.5	395	102		<2				
	18 April 2007		SD8	8.6	270	36		<2				
	18 April 2007		SD9	8.4	310	133		<2				
	18 April 2007		SD20	9.1	520	80		<2				
	18 April 2007		MV	7.8	4260	<2		<2				
27514.01	25 July 2007	1510	SD1	7.5	990	23		<2				
27514.02	25 July 2007	1525	S85	8	1150	17		<2				
27514.03	25 July 2007	1540	MV1	7.6	3130	15		30				
27514.04	25 July 2007	1550	SD8	8.1	260	25		<2				
27514.05	25 July 2007	1600	SD9	7.7	290	22		<2				
27514.06	25 July 2007	1605	SD5	8.4	3370	8		<2				
28415.01	31 October 2007	1545	SD9	7.8	310	16		<2				
28415.02	31 October 2007	1555	SD8	8.8	780	32		<2				
28415.03	31 October 2007	1610	S85	8.9	1200	60		<2				
28415.04	31 October 2007	1620	S88*	9	2000	110		<2				
28415.05	31 October 2007	1630	S87	8.4	560	27		<2				
28415.06	31 October 2007	1640	MV	8.1	2780	45		<2				
28415.07	31 October 2007	1650	SD5	8.3	2620	44		<2				
29740.01	18 March 2008	1035	SD9	6.9	245	27		<2				
29740.02	18 March 2008	1050	SD8	8.4	1340	19		<2				
29740.03	18 March 2008	1110	SD5									
29740.04	18 March 2008	1120	SD20	7.4	385	44		<2				
29740.05	18 March 2008	1130	Pit Water Dam	8.4	1620	14		<2				
29740.06	18 March 2008	1145	MV	7.8	3110	10		<2				
29740.07	18 March 2008	1155	S85	7.8	870	54		<2				
29740.08	18 March 2008	1200	S87	7.5	365	387		<2				
29740.09	18 March 2008	1205	SD17	7.4	460	58		<2				
31188.01	22 August 2008	1350	SD9	7.9	275	35		<2				
31188.02	22 August 2008	1355	SD8	8.9	1450	20		<2				
31188.03	22 August 2008	1405	S816	8.8	1440	16		<2				
31188.04	22 August 2008	1425	SD5	8.7	1310	35		<2				
31188.05	22 August 2008	1430	S84	8.7	1980	31		<2				
31188.06	22 August 2008	1440	S85	8.5	955	13		<2				
31188.07	22 August 2008	1455	Pit Water Dam	8.7	2420	17		<2				
31333.01	5 September 2008	1600	BCD	7.2	75	150		<2				
31333.02	5 September 2008	1025	DAM1	7.4	185	4930		<2				
31490.01	23 September 2008	1400	BCU	6.8	95	92		<2				
31490.02	23 September 2008	1545	BCD	6.7	115	107		<2				
31490.03	23 September 2008	1516	SD8	8.9	995	24		<2				
31490.04	23 September 2008	1450	SD17	8.3	720	456		<2				
31597.01	7 October 2008	930	SD17	8.2	735	75		<2				
31597.02	7 October 2008	950	SD8	8.9	775	22		<2				
31597.03	7 October 2008	1015	S814	8.5	255	43		<2				
32277.01	15 December 2008	1114	SD17	7.4	435	152		<2				
32277.02	15 December 2008	1140	SD9	7.3	245	24		3				
32277.03	15 December 2008	1130	SD8	8.2	635	22		<2				
32277.04	15 December 2008	1207	BCD	6.9	135	30		<2				
32738.01	10 February 2009	0620	MV	8.2	3370	13		<2				
32738.02	10 February 2009	0638	SD8	8.9	790	11		<2				
32738.03	10 February 2009	0655	SD9	8.5	330	16		<2				
32738.04	10 February 2009	0646	S814	8	380	32		<2				
32738.05	10 February 2009	0604	S85	8.8	1070	7		<2				
32738.06	10 February 2009	0631	S816	9	1200	6		<2				
ES0909243-001	24 June 2009	0910	S87	8.21	401	90	6	<5				
ES0909243-002	24 June 2009	0925	S85	8.62	1180	12	8	<5				
ES0909243-003	24 June 2009	0935	Pit water	8.87	2330	148	5	<5				
ES0909243-004	24 June 2009	0950	SD9	8.33	335	5	8	<5				
ES0909243-005	24 June 2009	1010	SD16	8.16	550	20	5	<5				
ES0909243-006	24 June 2009	1040	S814	7.71	351	29	9	<5				
ES0912983-001	27 August 2009	1035	S87	8.1	418	62	5	<10				
ES0912983-002	27 August 2009	1050	S85	8.64	1210	29	8	<10				
ES0912983-003	27 August 2009	1145	Pit water	8.2	2580	264	6	<10				
ES0912983-004	27 August 2009	1105	SD9	8.36	389	12	8	<10				
ES0913144-001	31 August 2009	0905	S814	8.73	342	56	10	<10				
ES0913144-002	31 August 2009	0915	SD16	8.3	547	158	5	<10				
ES0919560-001	22 December 2009	1030	NCD	7.8	137	164	16	19				
ES0919560-002	22 December 2009	1100	BCU	7.32	150	220	25	-				
ES0919560-003	22 December 2009	1125	BCD	7.04	146	32	43	-				
ES0919731-001	29 December 2009	1300	BCD	6.88	75	47	15					
ES0919731-002	29 December 2009	1310	NCD	6.73	143	32	10					
ES0919731-003	29 December 2009	1320	NCU	6.79	95	34	18					
ES0919731-004	29 December 2009	1350	SD14	8.12	1080	65	4					
ES0919731-005	29 December 2009	1405	S814	7.41	374	128	19					
ES0919731-006	29 December 2009	1410	Goonbri Creek	7.02	60	38	12					

Sample No.	Date	Time	Sample Location	pH	EC (µS/cm)	Total Suspended Solids (mg/L)	Total Organic Carbon (TOC)	Grease & Oil (mg/L)	Antimony	Arsenic	Molybdenum	Selenium
ES1003581-001	25 February 2010	1400	S87	8.14	197	194	3	5				
ES1003581-002	25 February 2010	1415	S85	8.06	681	77	4	<5				
ES1003581-003	25 February 2010	1505	SD9	7.95	123	18	8	5				
ES1003581-004	25 February 2010	1445	SD16	8.49	734	257	3	<5				
ES1003581-005	25 February 2010	1455	S814	8.03	232	40	6	<5				
ES1003581-006	25 February 2010	1530	SD2	8.37	276	15	<5	<5				
ES1009879-001	24 May 2010	1030	S87	8.41	291	17	4	13				
ES1009879-001	24 May 2010	1045	S85	8.59	531	48	5	13				
ES1009879-001	24 May 2010	1110	SD9	8.62	148	10	8	6				
ES1009879-001	24 May 2010	1125	SD16	8.93	810	9	4	8				
ES1009879-001	24 May 2010	1205	S814	7.76	251	538	8	6				
ES1013265-001	6 July 2010	1130	S814	8.09	245	95	5	<5				
ES1015929-001	9 August 2010	1245	S816	8.39	1170	10	3	<5				
ES1015929-002	9 August 2010	1320	Pit water	7.07	1940	37	2	<5				
ES1015929-003	9 August 2010	1150	SD9	7.72	147	24	9	<5				
ES1015929-004	9 August 2010	1210	SD16	8.29	793	40	5	<5				
ES1015929-005	9 August 2010	1220	S814	7.69	260	1300	6	<5				
ES1022163-001	2 November 2010	1610	S87 (pre flocc)	8.33	332	38	4	<5				
ES1022525-001	4 November 2010	1530	S87 (post flocc)	8.72	339	10	3	<5				
ES1022922-01	10 November 2010	940	S816	9.19	1140	14	3	<5				
ES1022922-02	10 November 2010	1020	SD9	7.94	168	16	11	<5				
ES1022922-03	10 November 2010	1000	SD16	9.49	831	11	5	<5				
ES1022922-04	10 November 2010	1010	S814	7.72	323	56	5	<5				
ES1105082-001	9 March 2011	1120	SD17	8.38	393	42	6	<5				
ES1105082-002	9 March 2011	0915	S816	7.17	968	20	6	<5				
ES1105082-003	9 March 2011	1200	VOID	7.95	2540	78	6	<5				
ES1105082-004	9 March 2011	1050	SD9	7.98	186	30	11	<5				
ES1105082-005	9 March 2011	1110	SD16	8.71	762	27	5	<5				
ES1105082-006	9 March 2011	1015	S814	8.17	361	43	6	<5				
ES1109209-001	3 May 2011	11:00	SD16	8.58	1020	22	6	<5	<0.001	0.002	0.014	<0.01
ES1109209-002	3 May 2011	11:20	S814	7.9	434	24	6	<5	<0.001	0.002	0.004	<0.01
ES1109209-003	3 May 2011	10:40	SD17	8.92	2040	20	6	<5	<0.001	0.004	0.014	<0.01
ES1109209-004	3 May 2011	10:50	S816	8.58	1030	13	4	<5	0.003	0.2	0.029	<0.01
-	3 May 2011	-	VOID	Dry								
ES1116908-001	4 August 2011	14:10	SD16	8.64	975	32	8	<5	<0.001	0.002	0.011	<0.01
ES1116908-002	4 August 2011	14:25	S814	8.33	414	24	6	<5	<0.001	0.001	0.003	<0.01
ES1116908-003	4 August 2011	13:40	SD17	8.53	925	10	8	<5	<0.001	0.002	0.006	<0.01
ES1116908-004	4 August 2011	13:10	S816	8.52	891	24	4	<5	0.004	0.002	0.028	<0.01
ES1116908-005	4 August 2011	13:10	VOID	8.52	2890	49	5	<5		0.015		
ES1124591-001	9 November 2011	13:00	SD16	9.03	791	20	7	<5	<0.001	0.003	0.010	<0.01
ES1124591-002	9 November 2011	12:30	S814	7.84	431	20	5	<5	<0.001	0.002	0.004	<0.01
ES1124591-003	9 November 2011	13:20	SD17	8.39	448	56	6	<5	<0.001	0.002	0.003	<0.01
ES1124591-004	9 November 2011	11:10	S816	8.39	646	6	3	<5	0.003	0.002	0.026	<0.01
ES1124591-005	9 November 2011	14:00	VOID	8.08	1790	158	3	<5				
ES1204830-001	29 February 2012	1240	SD16	7.96	365	34	2	<5	<0.001	0.001	0.009	<0.01
ES1204830-002	29 February 2012	1220	S814	8.15	443	174	5	<5	<0.001	0.002	0.003	<0.01
ES1204830-003	29 February 2012	1145	SD17	8.23	434	18	7	<5	<0.001	0.003	0.004	<0.01
ES1204830-004	29 February 2012	1200	S816	8.17	433	23	1	<5	0.001	0.001	0.012	<0.01
ES1204830-007	29 February 2012	1115	VOID	8.3	727	1620	2	<5		0.008		
ES1205971-001	9 March 2012	10:05	S823 Pre-flocc	7.84	148	70	4	<5				
ES1205971-002	10 March 2012	10:00	S823 24hrs post flocc	7.82	159	60	16	<5				
ES1205971-003	11 March 2012	9:30	S823 48hrs post flocc	7.75	158	61	16	<5				
ES1205277-001	2 March 2012	10:05	SD16 Pre-flocc	8.17	351	16	2	<5				
ES1205277-002	2 March 2012	10:25	S814 Pre-flocc	8.13	452	50	5	<5				
ES1210729-001	2 May 2012	11:40	SD16	8.37	388	14	2	<5	<0.001	<0.001	0.008	<0.01
ES1210729-002	2 May 2012	12:00	S814	9.08	1060	57	5	<5	<0.001	0.002	0.004	<0.01
ES1210729-003	2 May 2012	10:30	SD17	8.74	602	8	6	<5	<0.001	0.001	0.006	<0.01
ES1210729-004	2 May 2012	10:45	S816	7.87	456	6	1	<5	0.001	0.001	0.013	<0.01
ES1210729-005	2 May 2012	10:00	VOID	8.26	2080	10	1	<5	0.002	0.009	0.048	<0.01
ES1210729-006	2 May 2012	11:15	GCR1	7.99	689	104	35	<5	<0.001	0.003	0.002	<0.01
ES1211990-001	11 May 2012	16:00	S823		246	18	8	<5				
ES1212919-001	22 May 2012	1:50	S824		373	42	11	<5				
ES1212919-002	22 May 2012	2:30	S814		980	42	5	<5				
ES1212919-003	22 May 2012	2:55	SD16		400	35	2	<5				
ES1212919-004	22 May 2012	3:05	SD9		133	36	8	<5				
ES1212919-005	22 May 2012	3:25	SD17		618	20	6	<5				
ES1213239-001	28 May 2012	7:45	SD17	8.58	558	16	7	<5				
ES1213239-002	28 May 2012	8:05	SD9	7.97	136	37	8	<5				
ES1213239-003	28 May 2012	8:25	S814	8.21	661	53	5	<5				
ES1213239-004	28 May 2012	8:40	S824	8.21	351	42	11	<5				
ES1215160-001	18 June 2012	9:30	S814	8.05	513	92	5	<5				
ES1215160-002	18 June 2012	9:30	SD16	8.13	445	25	4	<5				
ES1215160-003	18 June 2012	9:30	SD9	7.95	137	23	8	<5				
ES1215160-004	18 June 2012	9:30	SD17	8.54	533	14	6	<5				
ES1215160-005	18 June 2012	9:30	Canyon SD	8.13	304	87	9	<5				

Sample No.	Date	Time	Sample Location	pH	EC (µS/cm)	Total Suspended Solids (mg/L)	Total Organic Carbon (TOC)	Grease & Oil (mg/L)	Antimony	Arsenic	Molybdenum	Selenium
ES1217223-001	11 July 2012	4:33	NCD	7.19	174	150	19	<5				
ES1218109-001	20 July 2012	11:30	SB23-After Floc	7.92	254	16	3	<5				
ES1218108-001	23 July 2012	11:00	SD16-Background info	8.02	450	25	3	<5				
ES1218108-002	23 July 2012	11:15	SD14-After floc	7.94	590	35	3	<5				
ES1219866-001	14 August 2012	10:40	SD16	8.1	454	<5	3	<5	<0.001	0.001	0.008	<0.01
ES1219866-002	14 August 2012	11:00	SB14	8.11	646	<5	7	<5	<0.001	0.002	0.007	<0.01
ES1219866-003	14 August 2012	10:00	SD17	8.08	465	<5	5	<5	<0.001	0.001	0.004	<0.01
ES1219866-004	14 August 2012	10:15	SB16	7.96	561	<5	2	<5	0.003	0.002	0.02	<0.01
ES1219866-005	14 August 2012	9:40	VOID	8.39	2220	<5	2	<5				
ES1219866-006	14 August 2012	11:40	GCR1	7.82	190	16	19	<5	<0.001	0.002	<0.001	<0.01
ES1219866-007	14 August 2012	11:20	GCR2	7.72	182	12	17	<5	<0.001	0.002	<0.001	<0.01
ES1227081-001	14 November 2012	11:10	SD16	9.84	679	100	6	<5	<0.001	0.004	0.01	<0.01
ES1227081-002	14 November 2012	10:40	SB14	8.85	890	24	3	<5	<0.001	<0.001	0.006	<0.01
ES1227081-003	14 November 2012	10:15	SD17	8.7	700	14	4	<5	<0.001	<0.001	0.006	<0.01
ES1227081-004	14 November 2012	10:00	SB16	8.69	707	76	1	<5	0.004	0.002	0.026	<0.01
ES1227081-005	14 November 2012	9:30	VOID	8.62	2870	10	<1	<5				
ES1302567-001	1 February 2013	15:10	SD9 pre floc	7.44	262	43	7	<5				
ES1302567-002	1 February 2013	13:10	SD9 post floc	7.39	267	82	8	<5				
ES1303969-001	20 February 2013	15:00	SD9-Pre Discharge	7.89	275	18	8	<5				
ES1305311-001	6 March 2013	10:40	SD16	7.69	252	288	5	<5	<0.001	0.005	0.001	<0.01
ES1305311-002	6 March 2013	11:00	SB14	7.81	378	99	4	<5	<0.001	0.001	0.002	<0.01
ES1305311-003	6 March 2013	10:20	SD17	8	229	91	4	<5	<0.001	<0.001	0.002	<0.01
ES1305311-004	6 March 2013	9:30	SB16A	8.01	365	240	4	<5	0.002	0.004	0.013	<0.01
ES1305311-005	6 March 2013	9:50	VOID	8.23	1620	16	2	<5				
ES1305311-006	6 March 2013	11:20	GCR1	7.43	126	106	5	<5	<0.001	<0.001	<0.001	<0.01
ES1305311-007	6 March 2013	11:40	GCR2	7.42	173	48	16	<5	<0.001	0.002	<0.001	<0.01
ES1312392-001	30 May 2013	11:20	SD16	8.16	341	100	7	<5	<0.001	0.003	0.003	<0.01
ES1312392-002	30 May 2013	11:00	SB14	8.42	538	38	6	<5	<0.001	0.002	0.003	<0.01
ES1312392-003	30 May 2013	10:00	SD17	8.47	334	49	6	<5	<0.001	0.002	0.003	<0.01
ES1312392-004	30 May 2013	10:30	SB16A	8.25	530	108	10	<5	0.004	0.004	0.018	<0.01
ES1312392-005	30 May 2013	9:30	VOID	8.51	3120	45	4	<5				
ES1317665-001	7 August 2013	10:20	SD16	8.49	390	7	6	<5	<0.001	0.001	0.003	<0.01
ES1317665-002	7 August 2013	10:40	SB14	8.96	570	8	7	<5	<0.001	<0.001	0.002	<0.01
ES1317665-003	7 August 2013	10:00	SD17	8.59	371	9	4	<5	<0.001	<0.001	0.003	<0.01
ES1317665-004	7 August 2013	9:30	SB16A	8.05	585	20	7	<5	0.005	0.003	0.022	<0.01
ES1317665-005	7 August 2013	11:30	VOID	8.35	2660	29	6	<5				
ES1317665-006	7 August 2013	11:00	TAR-GCD	7.4	155	52	16	<5	<0.001	0.002	<0.001	<0.01
ES1317665-007	7 August 2013	11:15	TAR-GCU	7.42	208	14	20	<5	<0.001	0.003	<0.001	<0.01
ES1324032-001	5 November 2013	9:35	SD16	9.42	538	29	15	<5	<0.001	0.004	0.004	<0.01
ES1324032-002	5 November 2013	9:35	SB14	8.55	1070	172	17	<5	<0.001	0.002	0.005	<0.01
ES1324032-003	5 November 2013	8:45	SD17	8.87	573	21	9	<5	<0.001	0.002	0.005	<0.01
ES1324032-004	5 November 2013	9:10	SB16A	8.8	918	38	8	<5	0.008	0.005	0.04	<0.01
ES1324032-005	5 November 2013	11:00	VOID	8.25	2530	11	29	<5		0.01		
ES1403679-001	20 February 2014	11:05	SD16	8.35	432	65	6	<5	<0.001	0.006	0.003	<0.01
ES1403679-002	20 February 2014	11:25	SB14	8.09	393	1280	8	<5	<0.001	0.005	<0.001	0.01
ES1403679-004	20 February 2014	9:10	SB16A	8.61	713	330	8	<5	0.004	0.01	0.023	<0.01
ES1403679-005	20 February 2014	10:15	VOID	8.63	1350	22	1	<5	0.007	0.026	0.101	<0.01
ES1403679-006	20 February 2014	11:45	GCU	6.69	115	433	23	<5	<0.001	0.005	0.001	<0.01

Wet Weather Discharge Results

Sample No.	Sample Location	Date	Time	pH	Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)	Grease & Oil (mg/L)	Total Organic Carbon (mg/L)	Comments
26194.01	BCU	1 March 2007	1600	6.8	165	193	<2		
26194.02	NCU	1 March 2007	1530	7.0	105	78	4		
26194.03	NCD	1 March 2007	1545	6.5	65	304	<2		
26194.04	BCD	2 March 2007	900	6.4	105	45	4		
26194.05	SD1	2 March 2007	1345	7.5	540	524	3		
26194.06	SD2	2 March 2007	1350	7.8	610	290	2		
27779.01	BCD	23 August 2007	1015	6.2	110	23	<2		
27779.02	SD8	23 August 2007	1035	6.8	475	5	<2		
27779.03	BCU	23 August 2007	1100	6.8	180	46	2		
29122.01	SB14	17 January 2008	1420	7.3	570	100	<2		
29122.02	SD17	17 January 2008	1500	7.6	425	837	<2		
29122.03	SD8	17 January 2008	1715	7.4	725	173	<2		
29297.01	BCU	6 February 2008	1505	7.1	120	20	<2		
29297.02	SD9	6 February 2008	1525	7.4	220	42	<2		
29297.03	SD8	6 February 2008	1535	8.2	1170	26	<2		
29297.04	SD17	6 February 2008	1615	7.9	420	476	<2		
29297.05	BCD	6 February 2008	1700	7.3	135	9	<2		
32813.01	BCU	17 February 2009	1418	6.8	275	35	<2		
32813.02	SD9	17 February 2009	1510	7.1	90	22	<2		
32813.03	BCD	17 February 2009	1530	6.5	130	32	<2		
ES1000141-001	SD16	4 January 2010	1600	7.3	729	51	<5	20	
ES1000141-002	NC-D	4 January 2010	1630	7.56	189	29	<5	28	
ES1000141-003	NC-U	4 January 2010	1725	7.42	181	68	<5	20	
ES1000141-004	BC-D	4 January 2010	1750	7.43	125	5	<5	35	
ES1002193	SD16	8 February 2010	1055	7.63	633	242	7	3	
ES1002886-001	SD17	15 February 2010	1315	7.56	252	1020	<5	4	
ES1002886-002	SD9	15 February 2010	1350	7.18	55	75	<5	11	
ES1002886-003	SD16	15 February 2010	1400	7.54	741	263	<5	7	
ES1002886-004	BCU	15 February 2010	1445	7.22	63	94	<5	13	
ES1002886-005	NCD	15 February 2010	1505	7.09	101	40	<5	19	
ES1002886-006	NCD	15 February 2010	1525	6.89	71	40	<5	26	
ES1002886-007	NCU	15 February 2010	1545	6.6	78	24	<5	30	
ES1006095-001	SD16	31 March 2010	0850	7.95	816	23	<5	3	
ES1013940-001	SB14	14 July 2010	1255	8.04	246	30	<5	7	
ES1015037-003	SB14	28 July 2010	1354	7.71	74	41	<5	15	
ES1015037-001	NCU	28 July 2010	1312	8.05	26	1940	<5	10	
ES1015037-002	NCD	28 July 2010	1325	7.53	379	44	<5	16	
ES1015611-001	BCD	3 August 2010	1115	8.03	101	32	<5	28	
ES1016049-005	SB14	10 August 2010	1300	6.76	233	2630	<5	<10	
ES1016049-001	NCU	10 August 2010	1200	7.51	34	766	<5	7	
ES1016049-002	NCD	10 August 2010	1215	7.14	72	616	<5	8	
ES1016049-004	BCU	10 August 2010	1250	6.66	65	94	<5	13	
ES1016049-003	BCD	10 August 2010	1230	6.7	78	39	<5	19	
ES1016144-001	SD16	11 August 2010	1150	8.42	727	64	<5	4	
ES1016144-002	SD9	11 August 2010	1200	7.27	116	28	<5	12	
ES1016962-001	SD16	20 August 2010	1230	8.76	748	22	9	4	
ES1016962-002	SB14	20 August 2010	1250	8.36	264	666	33	5	
ES1016962-003	BCD	20 August 2010	1310	8.29	115	26	22	32	
ES1017959-001	SD16	2 September 2010	1620				<5		Resample for oil and grease only
ES1017959-002	SB14	2 September 2010	1630				5		
ES1017959-003	BCD	2 September 2010	1600				<5		
ES1018430-002	SB14	10 September 2010	1220	7.71	298	548	<5	5	
ES1018430-001	BCD	10 September 2010	1120	6.64	99	66	<5	22	
ES1018625-001	SB14	15 September 2010	0820	7.63	272	231	5	5	
ES1018625-002	SD16	15 September 2010	0840	8.52	795	21	<5	5	
ES1018625-003	SD9	15 September 2010	0850	7.28	110	78	<5	19	
ES1023143-001	SB14	12 October 2010	0930	6.75	98	58	6	17	
ES1023279-001	BCD	16 October 2010	1055	6.58	143	85	8	17	
ES1023279-002	NCD	16 October 2010	1115	6.86	140	118	<5	22	
ES1024688-001	SD16	1 December 2010	1130	8.03	857	6	<5	6	
ES1025100-001	SB14	3 December 2010	0800	7.64	321	122	<5	5	
ES1025103-001	BCD	6 December 2010	1420	6.72	152	46	<5	23	
ES1025678-001	SD17	10 December 2010	1000	7.31	232	152	<5	14	
ES1025678-002	NCD	10 December 2010	1030	6.97	132	79	<5	15	
ES1025678-003	NCU	10 December 2010	1055	6.57	29	181	<5	10	
ES1025678-004	SD16	10 December 2010	1140	8.14	800	45	<5	5	
ES1025678-005	SD9	10 December 2010	1200	7.25	118	66	<5	10	
ES1025678-006	SB14	10 December 2010	1210	6.9	77	156	<5	18	
ES1025678-007	BCD	10 December 2010	1230	6.83	77	65	<5	15	

Sample No.	Sample Location	Date	Time	pH	Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)	Grease & Oil (mg/L)	Total Organic Carbon (mg/L)	Comments
ES1119817-001	NCD	9 September 2011	1030	7.14	76	76	<5	14	38.2mm in the previous 24 hours. Reported to EPA.
ES1119817-002	SB14	9 September 2011	1100	7.53	276	131	<5	9	
ES1119817-003	SD9	9 September 2011	1110	7.1	43	50	<5	12	
ES1121350-001	SB14	29 September 2011	1050	7.69	293	414	<5	5	38.6mm of rainfall on the day of discharge and 2.6mm on the previous day. Reported to EPA.
ES1121350-002	SD9	29 September 2011	1100	7.13	91	228	<5	7	
ES1121350-003	NCD	29 September 2011	1115	6.98	48	144	<5	10	
ES1124940-001	SD9	14 November 2011	1030	7.98	227	144	<5	10	34.0mm of rainfall on the previous day. Reported to EPA.
ES1124940-002	BCD	14 November 2011	1110	7.34	131	29	<5	35	
ES1125587-001	SD16	18 November 2011	0910	7.52	596	64	<5	8	62.5mm of rainfall in preceding 5 days. Reported to EPA.
ES1125587-003	BCD	18 November 2011	1000	6.72	222	32	<5	87	
ES1125587-004	NCD	18 November 2011	1019	7	115	147	<5	26	
ES1125587-005	NCU	18 November 2011	1030	6.57	26	146	<5	7	
ES1125999-001	BCD	23 November 2011	1540	6.64	79	24	<5	27	41.4mm of rainfall on the day.
ES1125999-002	NCD	23 November 2011	1555	7.04	103	133	<5	20	
ES1125999-003	NCU	23 November 2011	1610	6.64	28	98	<5	10	
ES1125999-004	BCU	23 November 2011	1640	7.27	177	64	<5	28	
ES1126008-001	SD17	24 November 2011	1025	7.7	304	620	<5	14	41.4mm of rainfall on previous day. Reported to EPA.
ES1202202-001	SB23	31 January 2012	1145	7.74	188	1340	<5	6	37.6mm of rainfall in previous 5 days. Reported to EPA.
ES1202202-002	SD9	31 January 2012	1130	7.39	48	116	<5	5	
ES1202202-003	SD16	31 January 2012	1150	7.79	301	124	<5	4	
ES1202202-004	SB14	31 January 2012	1200	7.92	356	1170	<5	3	
ES1202202-005	SB24	31 January 2012	1220	7.28	76	37	<5	11	
ES1202202-006	BCU	31 January 2012	1355	6.76	306	584	<5	14	
ES1202202-007	NCU	31 January 2012	1430	7.23	174	78	<5	14	
ES1202202-008	NCD	31 January 2012	1450	7.13	167	132	<5	9	
ES1202506-001	GCDW	31 January 2012	0710	7.6	710	2720	<5	10	Non Licenced Discharge. Reported to EPA and Penalty Infringement Notices issued.
ES1202506-002	BCD	31 January 2012	1230	7.15	102	30	<5	13	
ES1204080-001	BCU	21 February 2012	1020	7.91	633	6	<5	7	64.8mm of rainfall in preceding 5 days. This exceeds the 90%ile 5 day event criteria and therefore TSS exceedances were not reported to EPA.
ES1204080-002	GCD	21 February 2012	1047	8.01	696	35	<5	11	
ES1204080-003	GCU	21 February 2012	1100	7.59	401	12	<5	38	
ES1204080-004	SB14	21 February 2012	1115	8.07	661	193	<5	7	
ES1204080-005	SD16	21 February 2012	1125	7.64	339	59	<5	5	
ES1204080-006	SB23	21 February 2012	1140	7.6	137	396	<5	15	
ES1204197-001	BCD	21 February 2012	1400	7.7	471	5	<5	24	
ES1204197-002	NCD	21 February 2012	1425	8.17	903	29	<5	11	
ES1204197-003	NCU	21 February 2012	1500	7.79	379	<5	<5	23	
ES1214029-001	NCD	4 June 2012	1100	7.67	345	30	<5	14	No Discharge
ES1217574-001	GCD	12 July 2012	0520	7.56	166	79	<5	23	Not reportable - rainfall exceeded 38.4mm (45.4mm)
ES1217574-002	GCU	12 July 2012	0540	7.04	103	388	<5	24	
ES1217574-003	BCD	12 July 2012	0610	7.2	147	122	<5	25	
ES1217577-001	SD9	12 July 2012	1545	7.6	127	37	<5	10	
ES1217577-002	SB23	12 July 2012	1600	7.86	234	910	<5	7	
ES1217577-003	SB14	12 July 2012	1625	8.07	448	932	<5	5	
ES1302188-001	NCD	29 January 2013	1155	6.73	187	88	<5	38	No Discharge
ES1302188-002	NCU	29 January 2013	1211	6.9	158	7	<5	40	
ES1302188-003	BCD	29 January 2013	1225	6.68	167	45	<5	78	
ES1302188-004	GCD	29 January 2013	1240	7.01	143	116	<5	21	
ES1302188-005	GCU	29 January 2013	1252	6.9	112	32	<5	19	
ES1302188-006	BCU	29 January 2013	1312	6.99	188	72	<5	26	
ES1305146-001	SB23	4 March 2013	1130	7.92	174	752	<5	4	Not reportable - rainfall exceeded 38.4mm (60.4mm)
ES1406432-001	TAR-NCU	21 March 2014	0100	6.93	34	160	<5	10	No Discharge
ES1406432-002	TAR-NCD	21 March 2014	0116	7.31	94	1370	<5	10	
ES1406545-001	TAR-NCD	25 March 2014	1330	7.04	166	631	<5	12	No Discharge
ES1406545-002	TAR-NCU	25 March 2014	1350	7.05	93	72	<5	17	
ES1407115-001	BCU	28 March 2014	0800	7.19	131	88	<5	13	Rainfall event exceeded 38.4mm, not reportable
ES1407115-002	GCD	28 March 2014	0818	7.24	97	219	<5	9	
ES1407115-003	GCU	28 March 2014	0842	7.18	97	89	<5	10	
ES1407115-004	SD9	28 March 2014	0858	7.21	271	12	<5	16	
ES1407115-005	BCD	28 March 2014	0918	6.92	87	89	<5	14	
ES1407115-007	NCD	28 March 2014	1128	7.12	188	103	<5	26	
ES1407115-008	NCU	28 March 2014	1142	6.99	121	26	<5	28	

Appendix 6

GROUNDWATER MONITORING DATA

[illegible]

[illegible]

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals														Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36							
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L				Vanadium (V) - mg/L	Zinc (Zn) - mg/L	Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L		Sodium (Na) - mg/L	Potassium (K) - mg/L	Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L											Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L					
ANZECC Guideline - stock drinking water								5	0.5					0.1	1	1	1		0.1		1			20	0.002			1000						1000											1500	400		4000				
TEMPELMORE																																																				
MW5	2-Jun-06		2.78	3.4	6.9				0.006																		1530	17	13	373	6		169	138				472														
MW5	9-Sep-06		2.98	3.6																																																
MW5	11-Jan-07		3.56	4.18	7.25				0.003				<0.0001	<0.001		<0.001		<0.001		0.013			0.09			4870	44	49	1070	13		1060	435				836															
MW5	18-Apr-07		2.98	3.6																																																
MW5	10-Jul-07		3.85	4.47	7.59	1360	19.7		0.002				<0.0001	<0.005		0.001		<0.001		0.009			0.111	<0.0001		1930	14	15	13	5		291	161				380								1.32	<20	3490					
MW5	18-Jul-07		3.87	4.49																																																
MW5	7-Aug-07	1230	3.92	4.54																																																
MW5	22-Aug-07	1500	3.88	4.5																																																
MW5	5-Sep-07	1200	3.84	4.46																																																
MW5	24-Sep-07	1410	3.86	4.48																																																
MW5	11-Oct-07	1200	3.91	4.53																																																
MW5	26-Nov-07	1515	3.94	4.56																																																
MW5	29-Jan-08	1520	3.06	3.68																																																
MW5	4-Mar-08	1405	3.01	3.63																																																
MW5	4-Apr-08	1200	3.07	3.69																																																
MW5	23-Apr-08	1500	3.15	3.77	7.9	3550	19.9		0.012				0.00017	0.006		0.027		0.054		0.042			0.11	<0.0001		3260	29	33	696	13		553	332				630															
MW5	21-Aug-08	1305	3.10	3.72																																																
MW5	29-Oct-08	1840	2.97	3.59	7.3	3300	19.1		0.008				<0.00005	0.005		0.004		0.018		0.007			0.028	<0.0001		3400	21	24	640	11		560	290				680							<0.025	0.57							
MW5	29-Jan-09	1050	3.12	3.73																																																
MW5	17-Jun-09		3.33	4.18	7.7	2390	19.6		0.012	0.054	<0.001		<0.0001	0.002	0.003	0.02	1.66	0.019	0.586	0.006		<0.01	0.105	<0.0001		2120	13	15	485	8	23.2	315	120	<1	<1	486	486	21.1	4.6	0.07				1370								
MW5	14-Sep-09	1314	3.52	4.32																																																
MW5	14-Dec-09	1200	3.76	4.56	7.21	6900	28.4	0.04	0.016					<0.001		0.002	0.19	<0.001	1.4	0.022			0.078	<0.0001	7.44	7460	9	106	1870	28	91	1720	678	<1	<1	1110	1110	84.9	3.44		<0.01	<0.01	<0.01									
MW5	25-Feb-10	1035	2.91	3.71																																																
MW5	11-May-10	1145	3	3.8	7.73	6590	22		0.032	0.426	0.001		0.009	0.024	0.032	0.07	23	0.068	1.59	0.071		0.05	0.277	<0.0001		5920	38	70	1210	17	60.5	1260	491	<1	<1	838	838	62.4	1.53	0.1				3630								
MW5	30-Aug-10	1210	2.6	3.4	7.85	1740	22.8																																													
MW5	9-Nov-10	1115	2.48	3.28	7.35	2620	24.1																																													

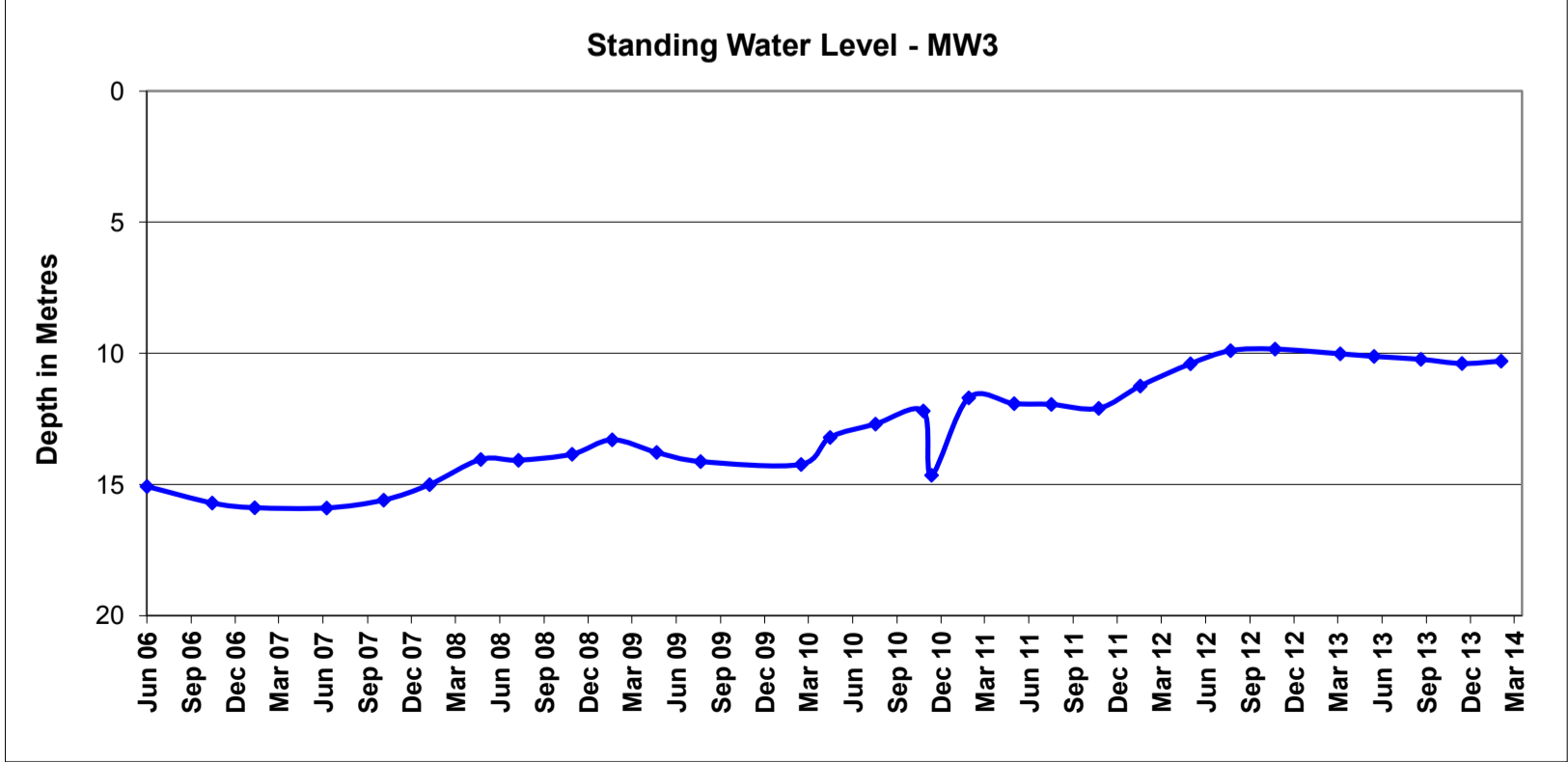
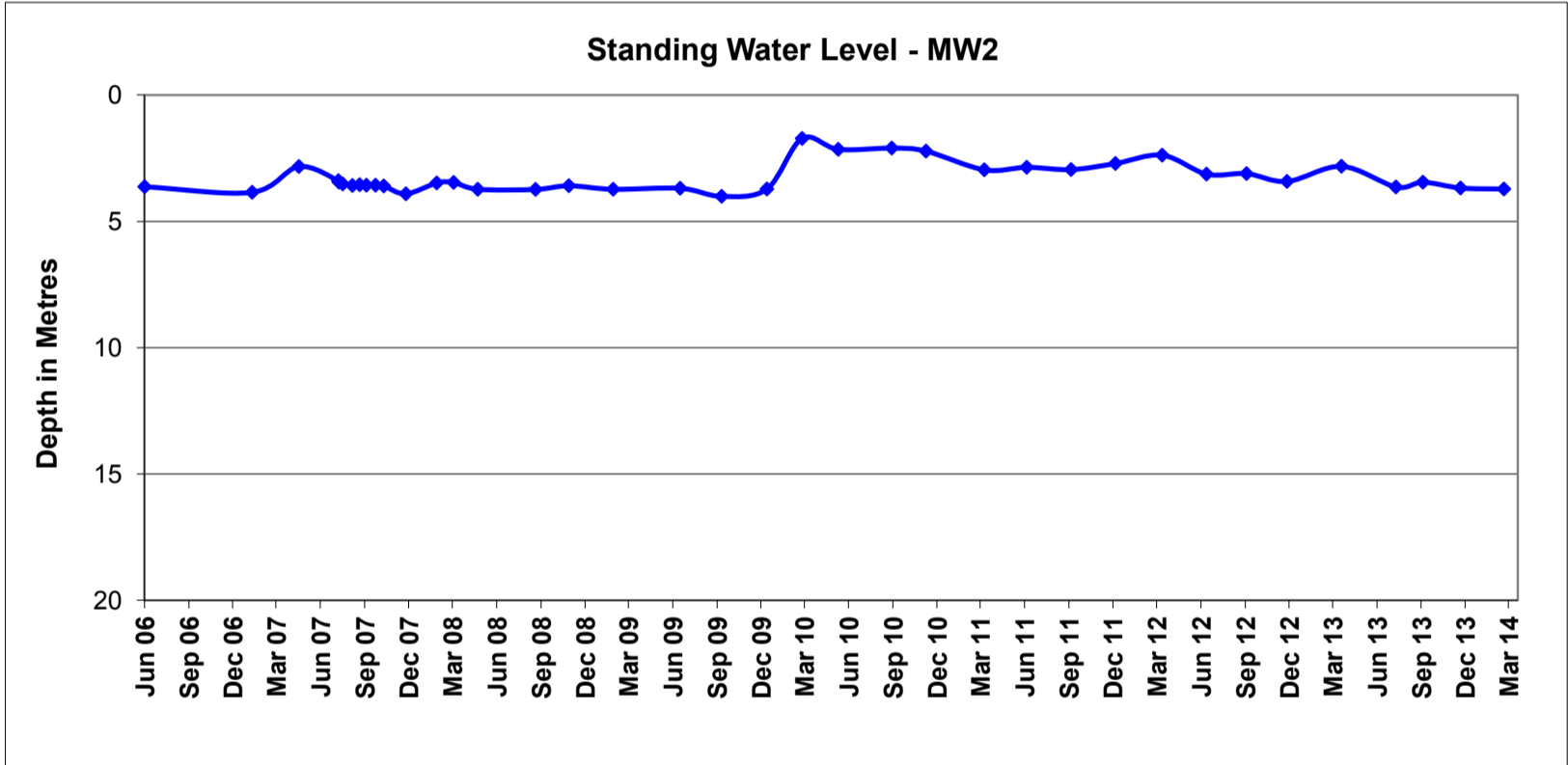
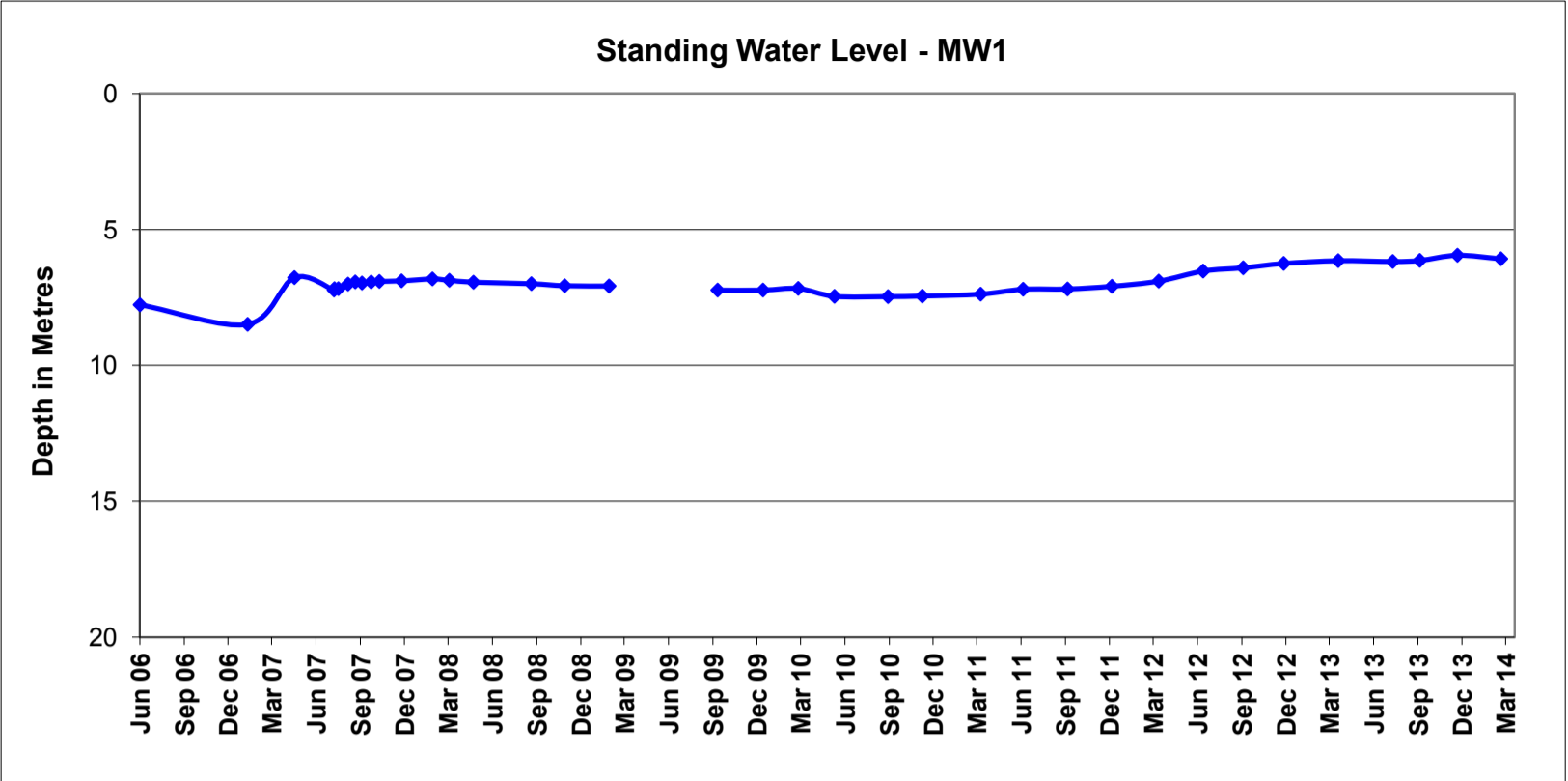
Sample Location	Date	Time	Depth to Ground - mgtl	Depth to Stand - m bdoc	Field Parameters			Total Metals															pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N - mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36					
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L			Zinc (Zn) - mg/L	Mercury (Hg) - mg/L	Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L		Sodium (Na) - mg/L	Potassium (K) - mg/L	Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L											Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L			
ANZECC Guideline - stock drinking water							5	0.5				0.1	1	1	1		0.1		1			20	0.002			1000						1000											1500	400		4000				
TARRAWONGA MINE																																																		
MW7	2-Jun-06		73.47	74.3	7.2			0.002																	2250	45	43	536	12		202	34																		
MW7	9-Sep-06		79.67	80.5																					1960	23	36	459	8		189	22																		
MW7	11-Jan-07		76.17	77	7.32			<0.001				<0.0001	<0.005		<0.001							0.05	<0.0001		1960	23	36	459	8		189	22																		
MW7	18-Apr-07		76.07	76.9																																														
MW7	10-Jul-07		77.06	77.89	7.24	2250	18.7	<0.001				<0.0001	<0.005		0.001		<0.001		0.018			0.106	<0.0001		2270	35	36	458	10		170	23												4.38	<20	410				
MW7	18-Jul-07		77.1	77.93																																														
MW7	7-Aug-07	1340	78.29	79.12																																														
MW7	22-Aug-07	1430	78.45	79.28																																														
MW7	5-Sep-07	1140	78.6	79.43																																														
MW7	24-Sep-07	1350	78.56	79.39																																														
MW7	11-Oct-07	1140	78.72	79.55																																														
MW7	26-Nov-07	1440	79.34	80.17																																														
MW7	29-Jan-08	1500	79.8	80.63																																														
MW7	4-Mar-08	1335	80.27	81.10																																														
MW7	22-Apr-08	1200	80.85	81.68	7.6	2440	21.9	<0.001				0.00014	0.004		0.033		0.25		0.017			0.12	<0.0001		2370	52	45	483	11		188	5												1050						
MW7	21-Aug-08	1526	83.74	84.57																																														
MW7	29-Oct-08	0915	85.99	86.81	7.4	2310	24.8		0.001						0.00006	0.005		0.014		0.088		0.009			2300	48	44	470	13		180	24													<0.025	0.3				
MW7	28-Jan-09	1615	86.99	87.8																																														
MW7	17-Jun-09	0915	86.45	87.5	7.4	2440	20.7	<0.001	0.2	<0.001		<0.0001	0.001	<0.001	0.057	0.43	0.054	0.047	0.007			<0.01	0.13	<0.0001		2280	46	44	481	11	27.1	169	16	<1	<1	1050	1050	26.1	1.96	0.17					1430					
MW7	27-Aug-09	1225	89.99	91.04																																														
MW7	23-Dec-09	1355	89.53	90.58	7.55	2230	27.4	0.03	<0.001				<0.001		0.002	0.26	0.004	0.075	0.007			0.015	<0.0001	7.49	2240	5	46	556	9	28.5	182	17.1	<1	<1	1050	1050	26.5	3.58		<0.01	<0.01	<0.01								
MW7	25-Feb-10	1355	89.64	90.69																																														
MW7	11-May-10	1400	89.85	90.9	8.32	2950	23.9	<0.001	0.227	<0.001		<0.0001	<0.001	<0.001	0.009	1.5	0.046	0.11	0.017			<0.01	0.054	<0.0001		2330	42	41	478	9	26.5	182	15.9	<1	<1	1010	1010	25.6	1.72	0.45					1380					
MW7	30-Aug-10	1400	90.48	91.53	7.52	2385	24.7																																											
MW7	10-Nov-10	0900	90.38	91.43	7.47	2010	26																																											
MW7	14-Mar-11	1210	90.95	92	7.24	2075	26.2	0.2	<0.001				<0.001	0.094		0.74	0.036	0.155	0.01				0.274	<0.0001	7.57	2220	41	41	493	11	27.1	225	23	<1	<1	951	951	25.8	2.43		<0.01	0.07	0.07							
MW7	21-Jun-11	1400	91.31	92.36	7.55	2180	22.3																																											
MW7	8-Sep-11	0950	92.49	93.54	7.35	2160	22.5	0.09	0.001	0.18	<0.001		<0.0001	<0.001	<0.001	0.006	0.41	0.028	0.059	0.007			<0.01	0.047	<0.0001	7.84	2550	10	36	545	10	27.4	255	29	<1	<1	936	936	26.5	1.66	0.55	<0.01	0.02	0.02	1510					
MW7	9-Dec-11	1000	93.89	94.94	7.7	2200	26.8																																											
MW7	19-Mar-12	1345	95.05	96.10	7.25	2460	24.9	0.31	<0.001	0.186	<0.001		<0.0001	0.002	<0.001	0.032	0.61	0.065	0.059	0.009			<0.01	0.085	<0.0001	7.82	2650	35	34	622	11	31.9	321	45	<1	<1	991	991	29.8	3.34	0.52	<0.01	0.03	0.03	1590					
MW7	14-Jun-12	1040	97.70	98.75	7.6	2900	23.6																																											
MW7	6-Sep-12	1150	98.95	100.00	7.33	2730	25.2	0.52	0.002	0.205	<0.001		<0.0001	0.002	<0.001	0.088	2.84	0.114	0.057	0.005			<0.01	0.19	<0.0001	7.93	2840	18	21	678	8	32.3	342	50	<1	<1	1140	1140	33.5	1.79	0.61	<0.01	0.05	0.05	1760					
MW7	28-Nov-12	0945	101.99	103.04	No sample - water too deep for bail																																													
MW7	20-Mar-13	1200	102.49	103.54	No sample - water too deep for bail																																													
MW7	11-Jul-13	1315	103.65	104.7	No sample - water too deep for bail																																													
MW7	5-Sep-13	1325	103.65	104.7	No sample - water too deep for bail																																													
MW7	22-Nov-13	1025	103.43	104.48	No sample - water too deep for bail																																													
MW7	20-Feb-14	1000	103.55	104.6	No sample - water too deep for bail																																													
TARRAWONGA MINE																																																		
MW8	2-Jun-06		13.06	13.8	6.7			<0.001																	2240	161	48	298	9		426	46																		
MW8	9-Sep-06		13.16	13.9																																														
MW8	11-Jan-07		13.41	14.15	6.7			<0.001				<0.0001	<0.005		0.002		0.001		0.007			0.16	<0.0001		2260	180	53	319	7		411	80																		
MW8	18-Apr-07		12.86	13.6																																														
MW8	9-Jul-07		13.62	14.36	6.																																													

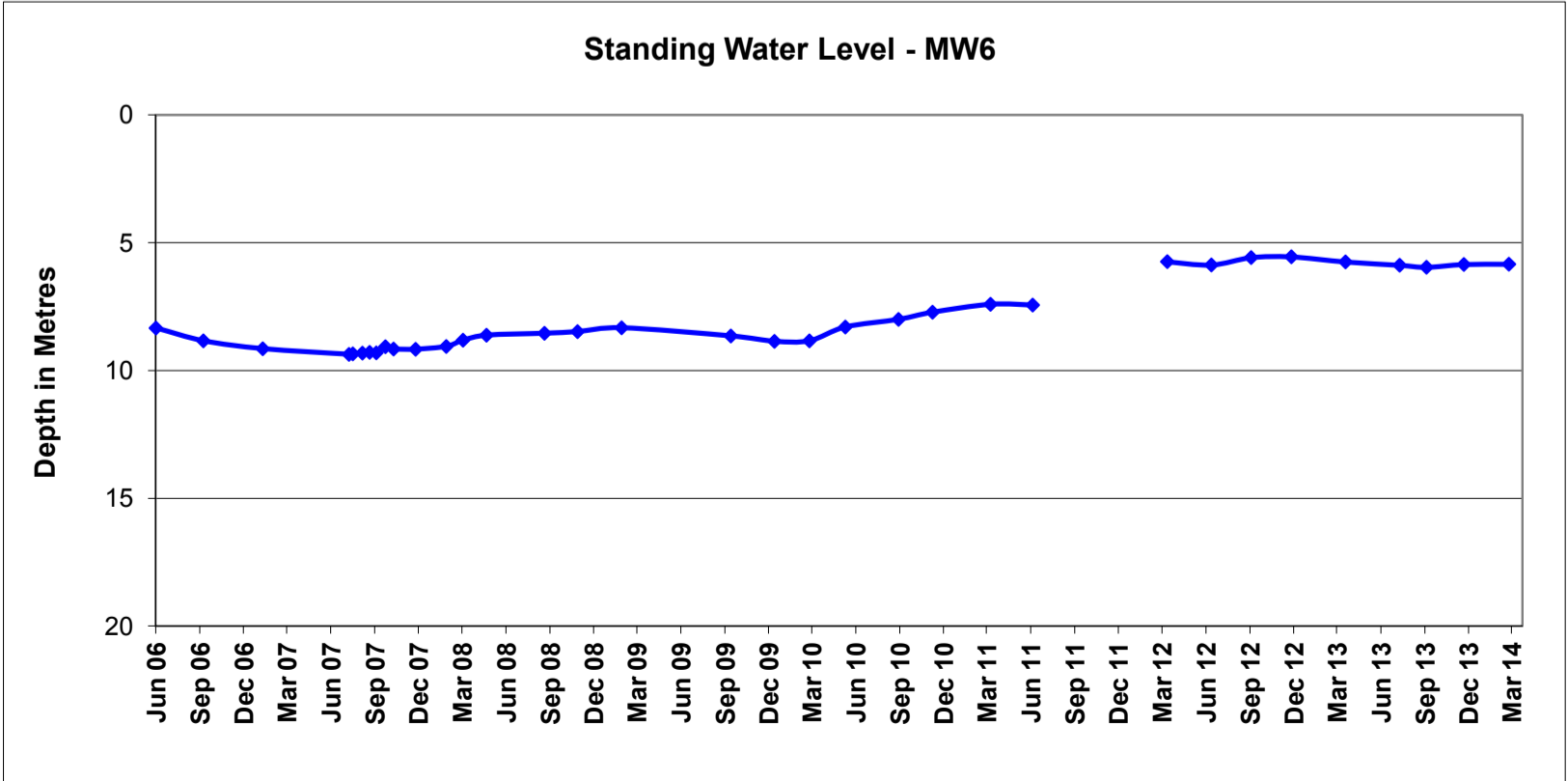
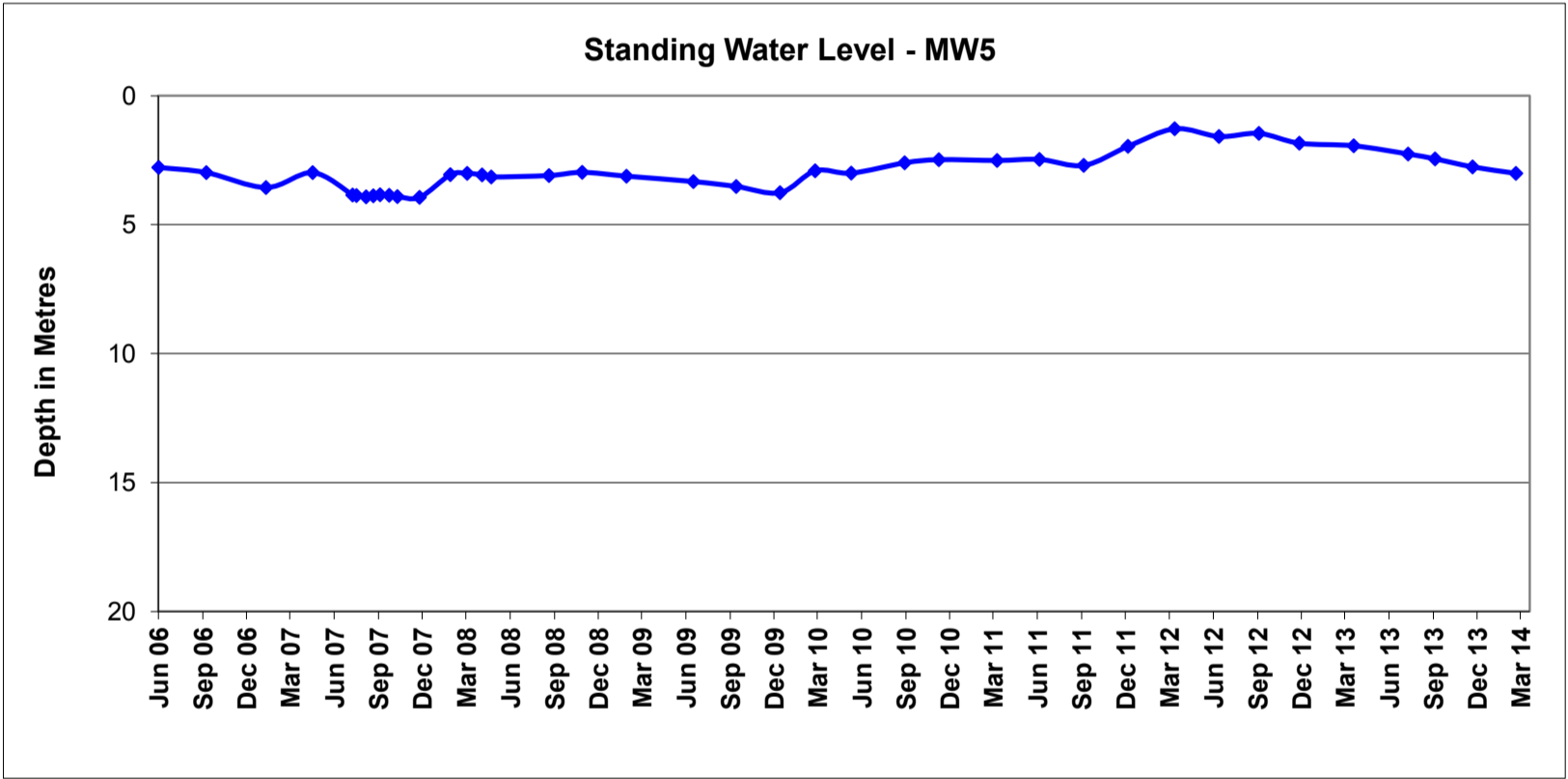
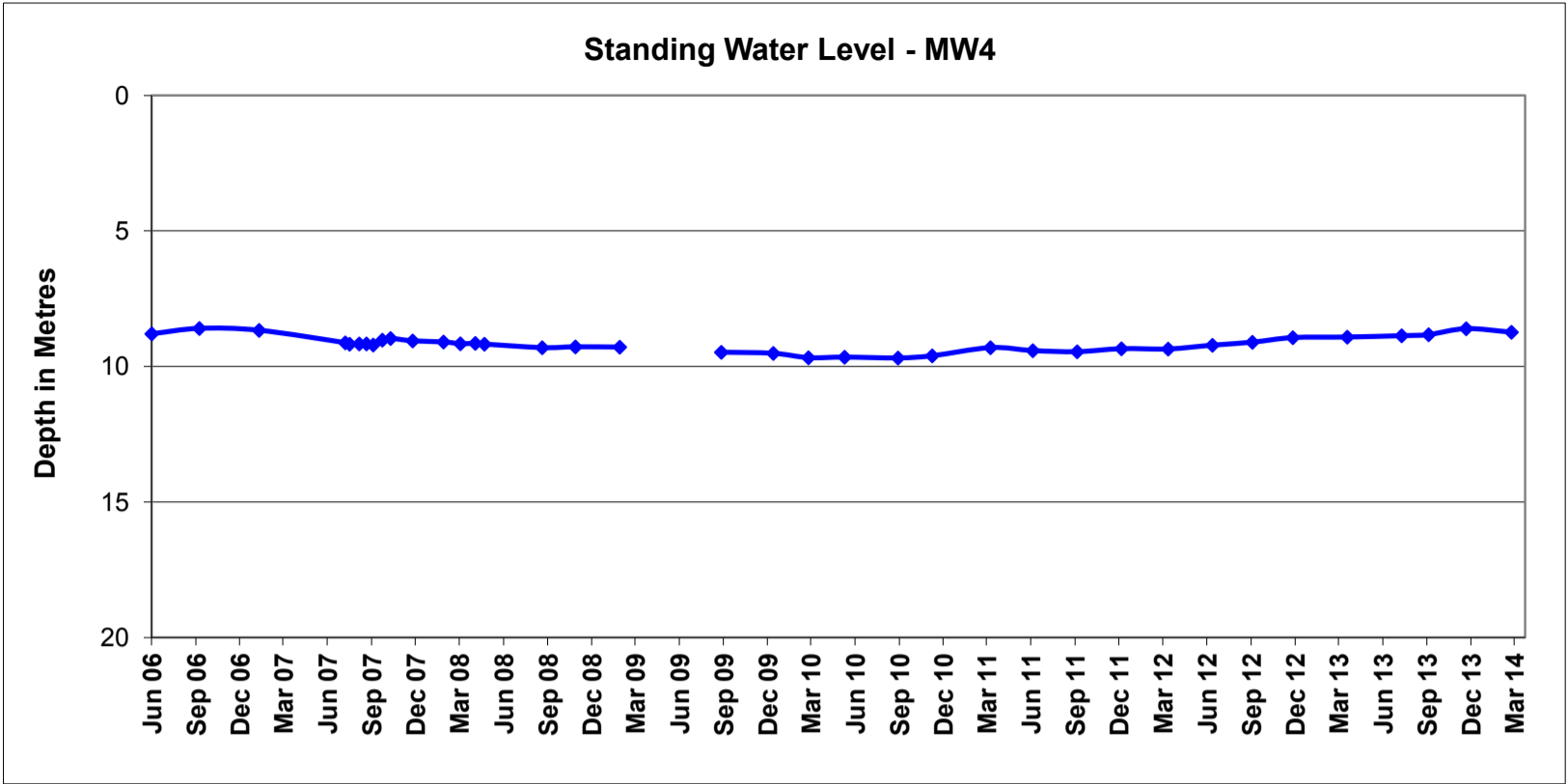
Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand- mbtoc	Field Parameters			Total Metals														pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N - mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L			Vanadium (V) - mg/L	Zinc (Zn) - mg/L	Mercury (Hg) - mg/L	Calcium (Ca) - mg/L		Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L	Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L											Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
					5	0.5							0.1	1	1	1		0.1		1						20	0.002							1000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

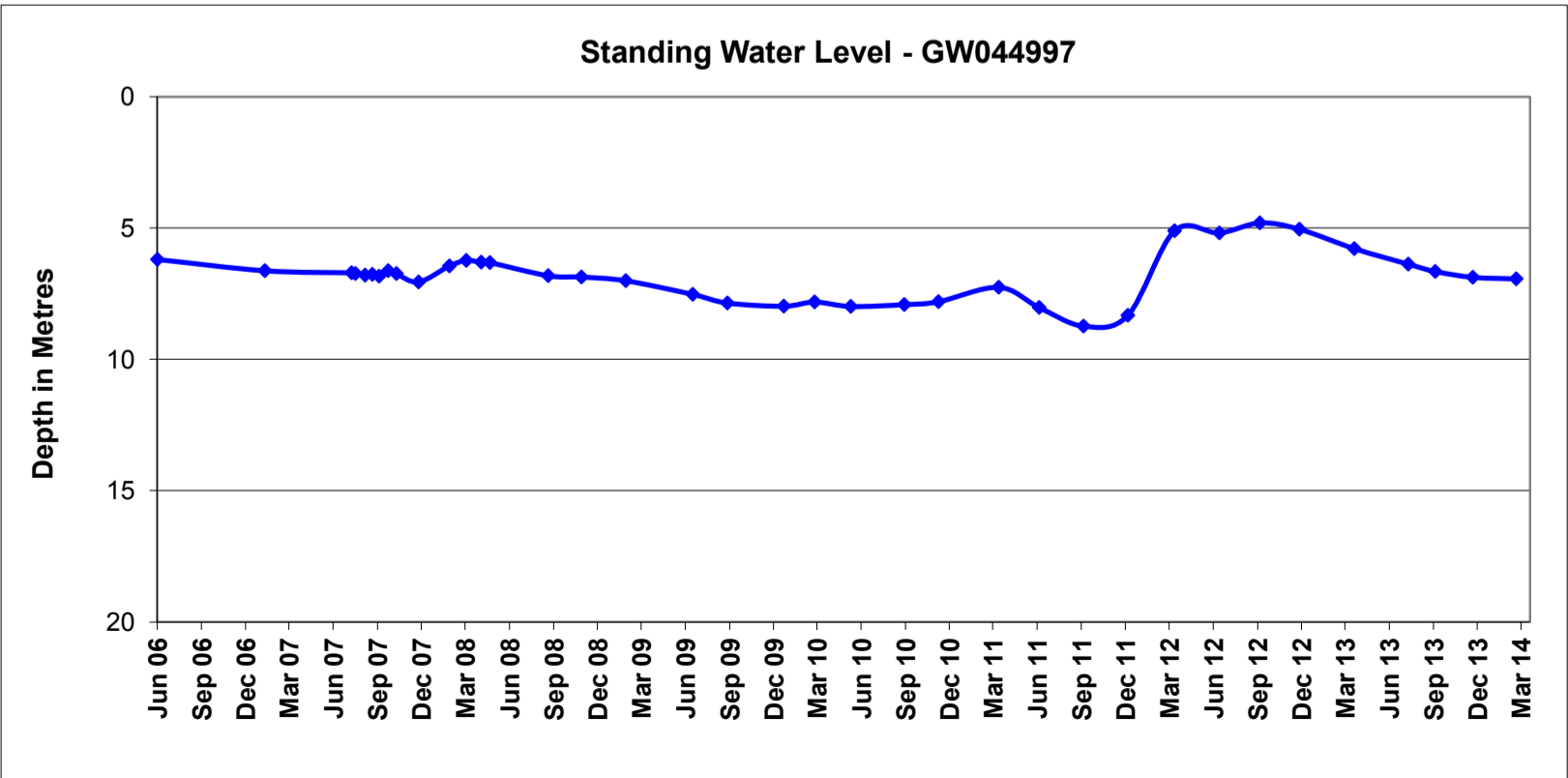
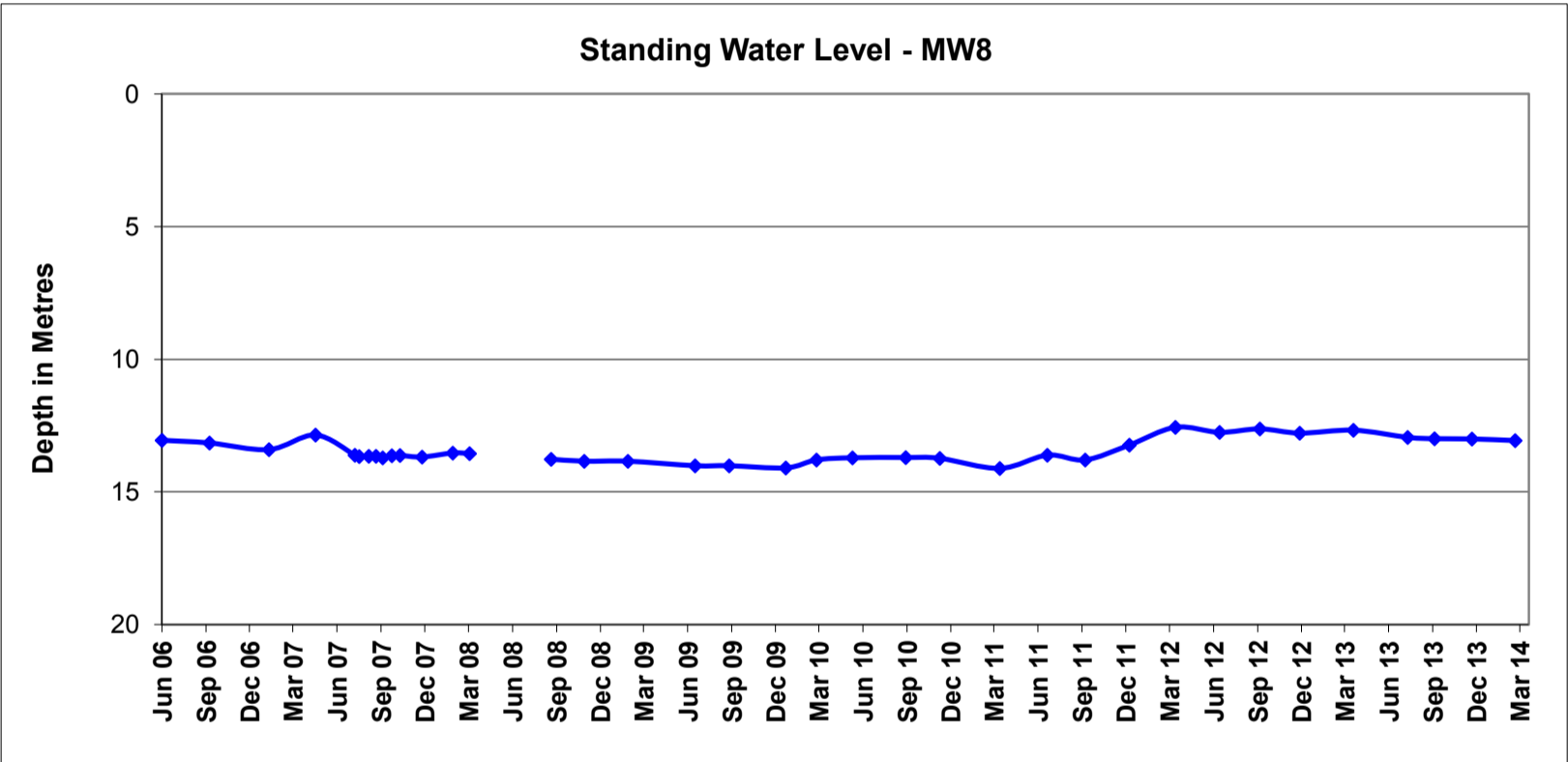
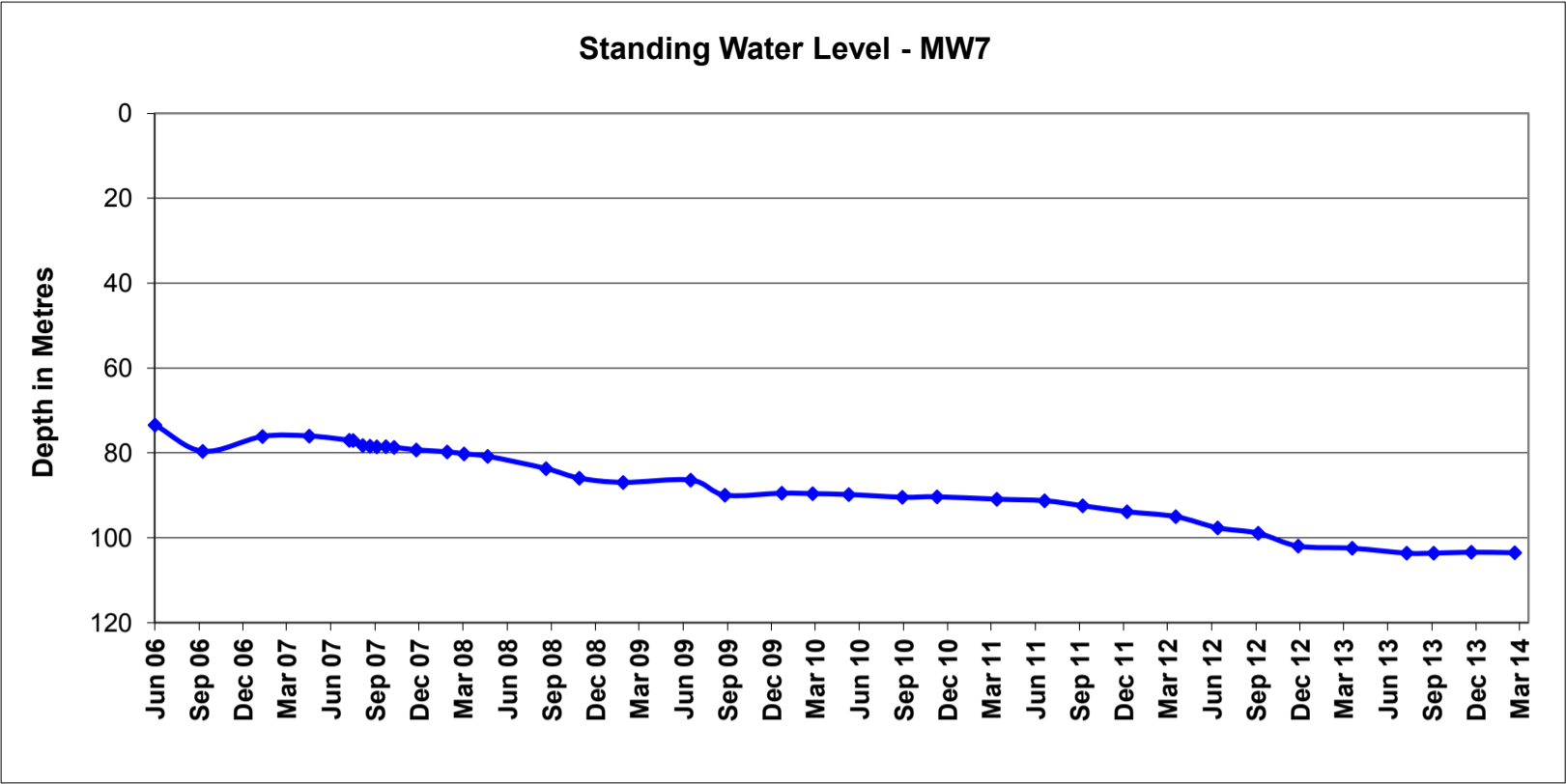
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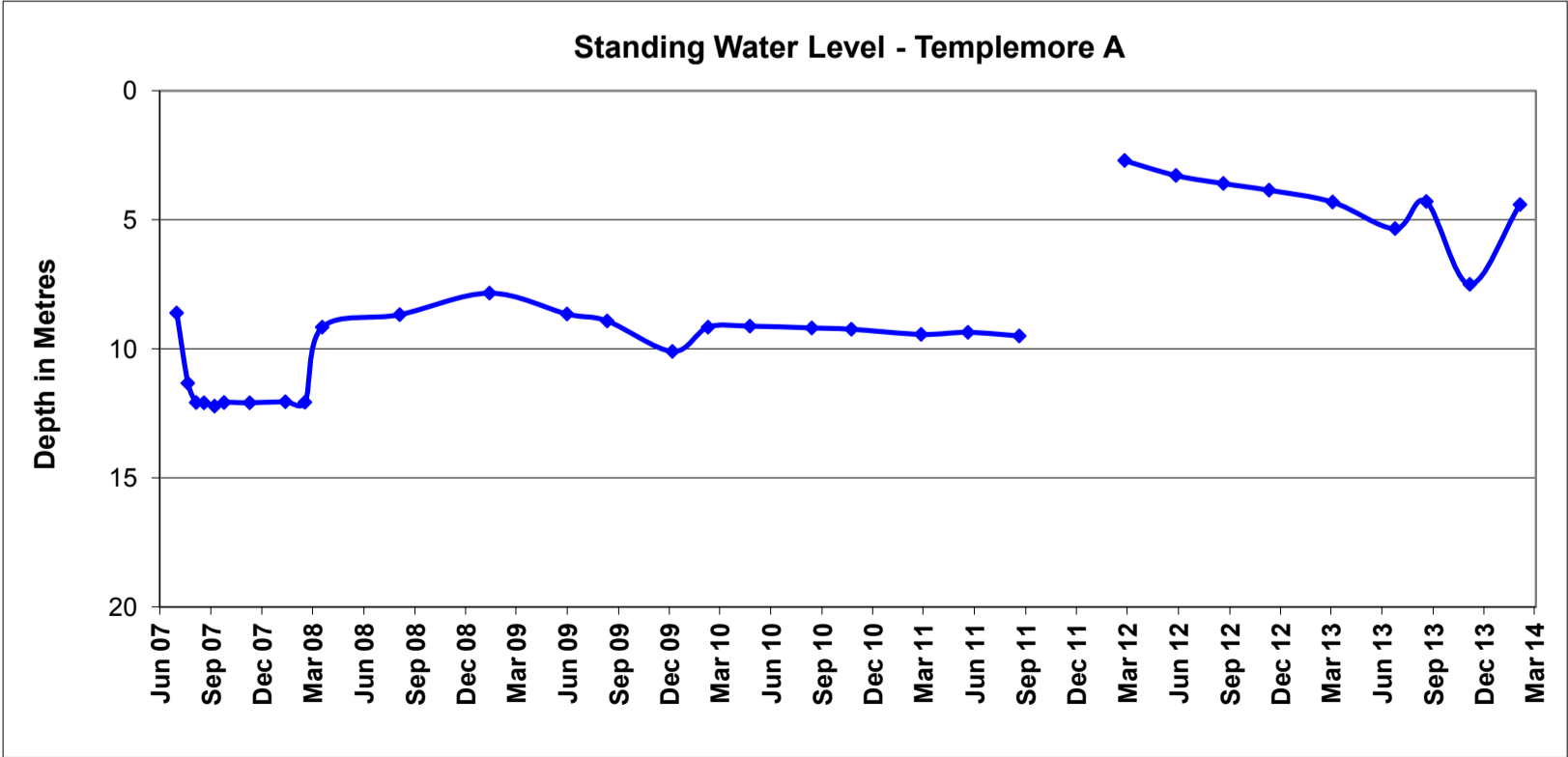
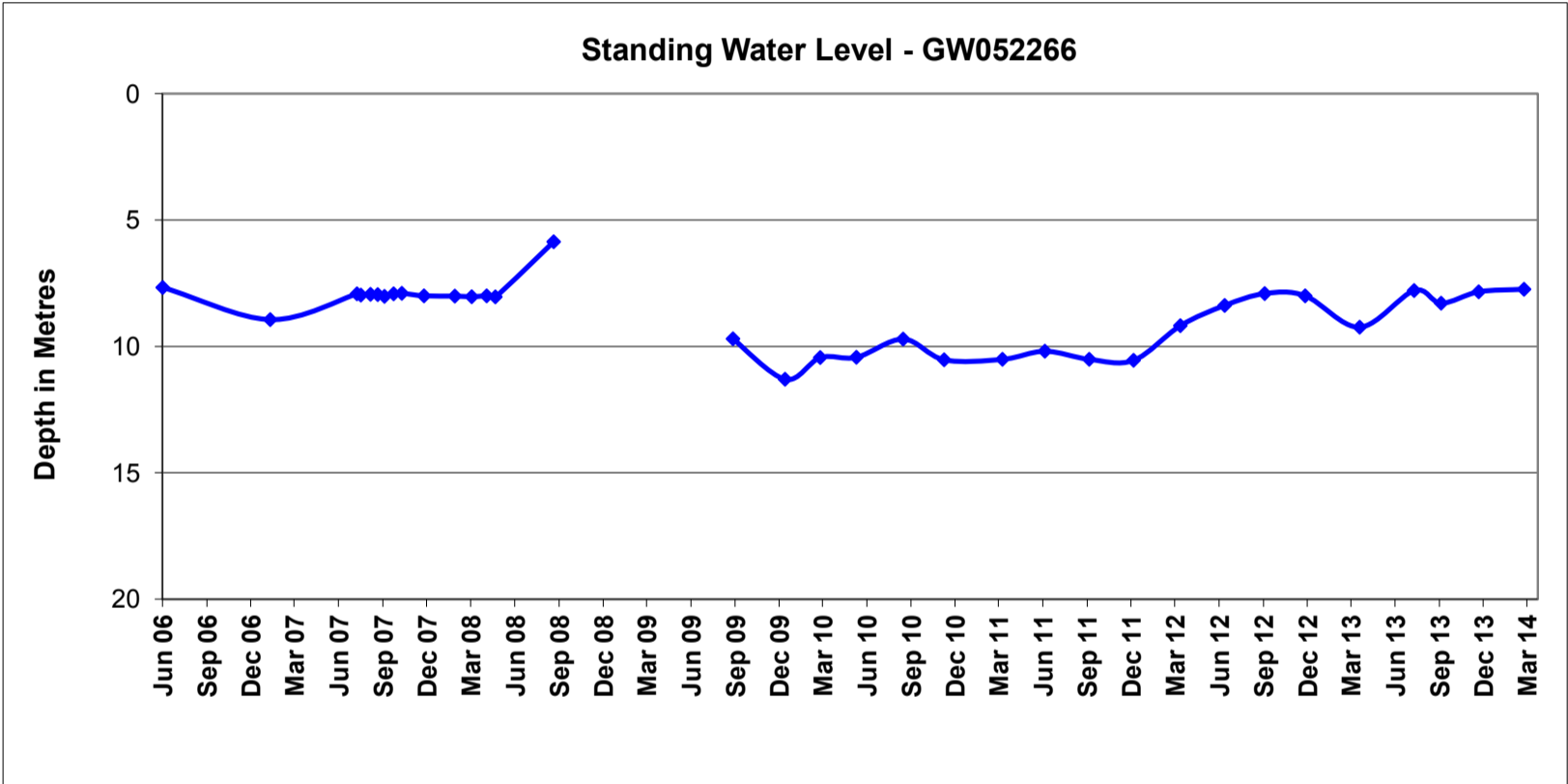
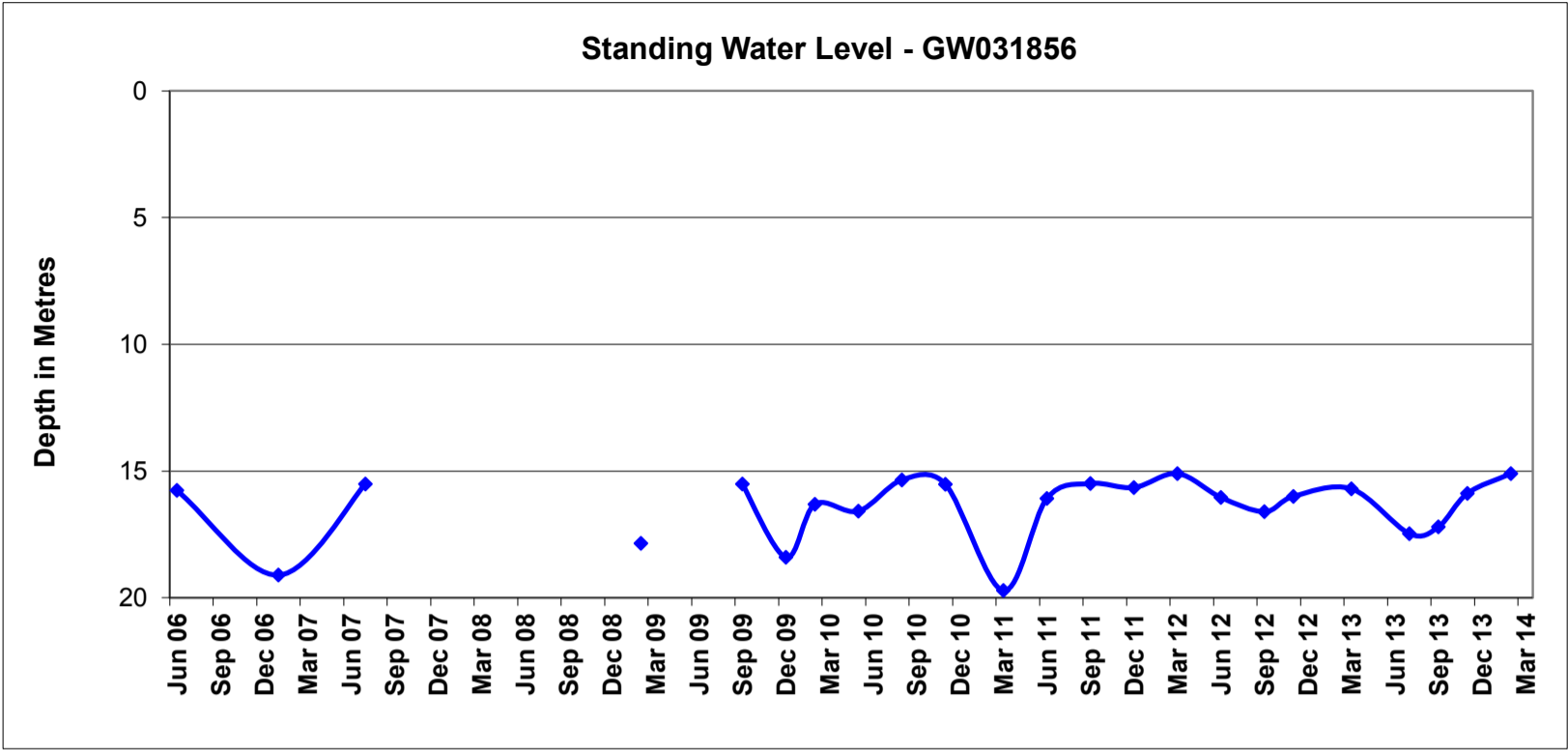
Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand- mbtoc	Field Parameters			Total Metals															Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N - mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L				Zinc (Zn) - mg/L	Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L		Potassium (K) - mg/L	Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L											Alkalinity - mg/L																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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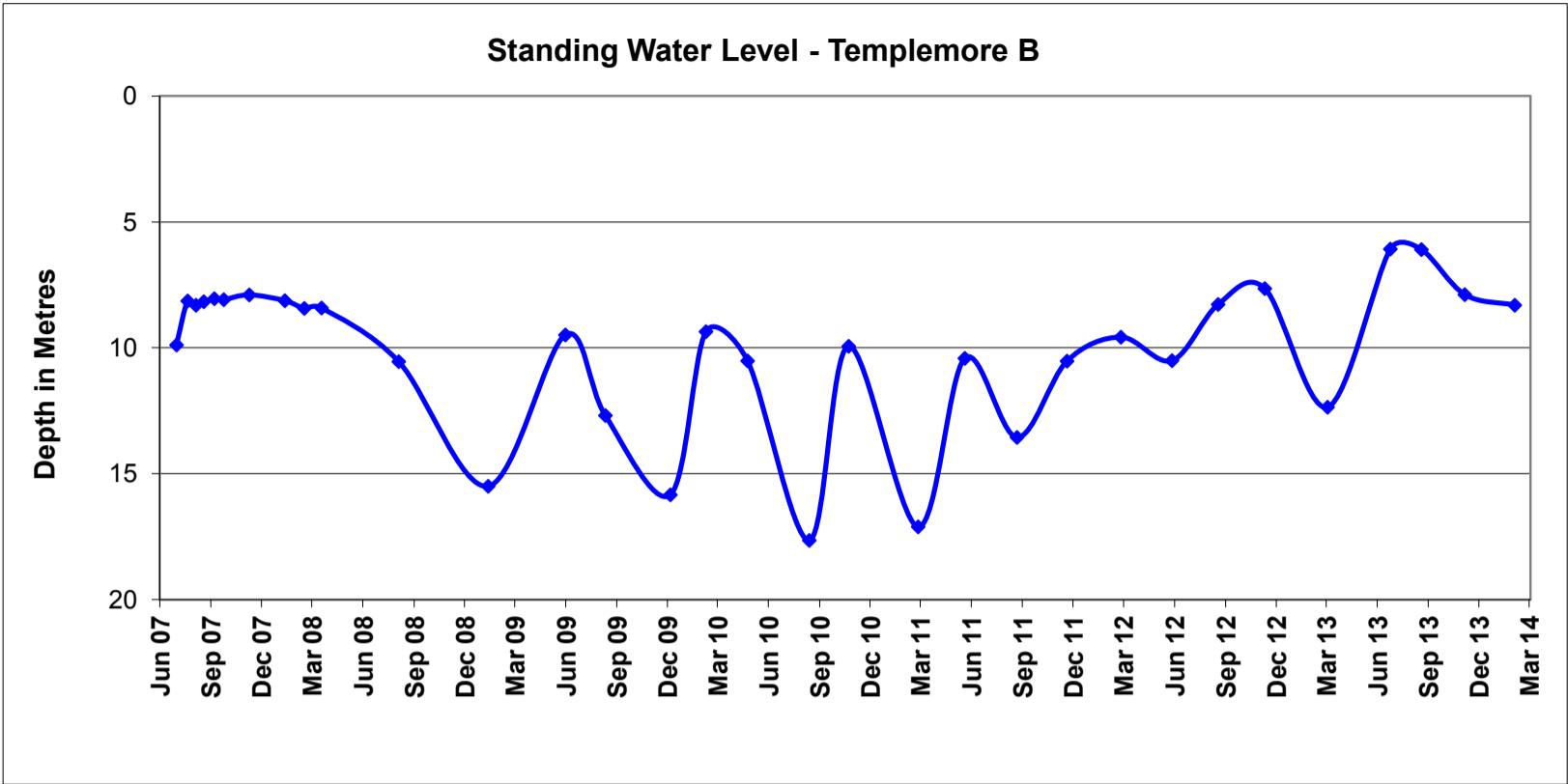
Denotes dissolved metals











Appendix 7

REHABILITATION MONITORING REPORT



Tarrawonga Coal Mine – Rehabilitation Monitoring Report

Volume 1

Spring 2013

Prepared for
Whitehaven Coal Mining Limited

16 June 2014



DOCUMENT TRACKING

ITEM	DETAIL
Project Name	Tarrawonga Rehabilitation Monitoring Report – Spring 2013 (Volume 1)
Project Number	13ARMECO-0014
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Reviewed by	Dr Peter Hancock
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Status	Final
Version Number	2
Last saved on	16 June 2014
Cover photo	Woodland Rehabilitation Plot 7 - Tarrawonga Coal Mine (L. Copeland)

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Abbreviations

ABBREVIATION	DESCRIPTION
CL	Coal Lease
DPI	NSW Department of Primary Industries
EL	Exploration Lease
ELA	Eco Logical Australia
EMS	Environmental Management System
MCP	Mine Closure Plan
ML	Mining Lease
MOP	Mining Operations Plan
NDVI	Normalised differential Vegetation i]Index
PAB	Photosynthetically Active Biomass
RMP	Rehabilitation Monitoring Program
TPFC	True Projected Foliage Cover
TSC Act	<i>Threatened Species Conservation Act 1995</i> (NSW)
WCM	Whitehaven Coal Mining

Key outcomes

- Assessment of Normalised Differential Vegetation Index (NDVI) of multi-spectral imagery captured on 25 August 2013 and 30 September 2012 identified an increase in groundcover across most of the site.
- Monitoring of woodland areas yielded results that are consistent with drought conditions, i.e. decrease in native cover and increase in litter.
- African Boxthorn is present on site. This should be removed and managed to prevent proliferation.

Recommendations

- Image capture for subsequent monitoring periods should be undertaken between late August and early September to minimise seasonal variations and allow field validation.
- Additional shrub species should be planted in the rehabilitation zones to improve habitat complexity. It is important that species selected for planting are native to the local area.
- According to the Rehabilitation Monitoring Program the following are due in 2014:
 - Landscape stability assessment using LiDAR
 - Soil conductivity assessment (due between 2014 and 2016).

1 Introduction

This Rehabilitation Monitoring Report has been prepared by Eco Logical Australia (ELA) for Whitehaven Coal Mining Limited (WCM) in accordance with the Rehabilitation Monitoring Program (RMP) for Tarrawonga Coal Mine (ELA 2011).

1.1 Background

Tarrawonga Coal Mine (Tarrawonga) commenced operations in 2006 when it was known as the “East Boggabri Coal Mine”. An extension within the original Mining Lease (ML) 1579 was granted in 2010. A further expansion was proposed in 2011 which goes beyond the boundary of ML 1579 to the east into Exploration Licence (EL) 5967 and to the north into Coal Lease (CL) 368. The latest expansion will increase the total life of mine coal production to around 55 Mt with a total mine life of approximately 23 years (TCPL 2011). Conditional approval to this expansion was granted in January 2013.

WCM is committed to the progressive rehabilitation of the mine area to restore landscape functionality (WCM 2010). There is also emphasis on the re-establishment of native vegetation across the site to provide amenable links to vegetation on the site and to the north in Leard State Forest.

1.2 Project scope

This rehabilitation monitoring report documents the spring 2013 survey results and subsequent data analysis. Rehabilitation monitoring surveys were undertaken in accordance with the RMP for Tarrawonga Coal Mine (ELA 2011) and included:

- Remote-sensing based landscape assessment (multi-spectral imagery)
- Native vegetation and fauna surveys
- Analysis of results including statistical analysis.

1.3 Aims & objectives

The aim of this monitoring report is to document the spring 2013 survey results and provide a quantitative assessment of rehabilitation performance against nearby unmined (i.e. control) landscapes. Specific monitoring objectives include:

- Quantitative tracking of rehabilitation performance
- Assess key aspects of flora (upper, mid and lower strata) and fauna in woodland areas
- Compare data with previous monitoring
- Evaluate monitoring results against monitoring triggers and rehabilitation objectives as outlined in the RMP
- Provide recommendations to assist with the improvement of rehabilitation or monitoring methods.

1.4 Report structure

This report is presented in two volumes. Volume 1 contains a summary of the rehabilitation objectives and provides a summary of the spring 2013 monitoring program, including results, conclusion and recommendations. Volume 2 contains the collated field survey data from 2011, 2012 and 2013 monitoring periods and 2013 weather data.

1.5 Rehabilitation monitoring - management triggers

A multi-scale, multi-data source monitoring approach has been adopted at Tarrawonga. Remote sensing has been used to monitor the entire target area including control areas while targeted field work was implemented for agricultural and native vegetation environments, with surveys directed into control and impact areas.

A two-tiered system of triggers for management was developed in the RMP as a response to any changes identified via remote sensing. The first tier of response is triggered by changes detected in the remote sensing time series analysis which instigates further investigation including targeted rapid on-ground assessments. The second tier of response is triggered if changes are confirmed or discovered on-ground. These triggers instigate the development of site specific management responses and remedial actions.

Management triggers are detailed further in Rehabilitation Monitoring Program for Tarrawonga Coal Mine (ELA 2011).

2 Rehabilitation objectives

A summary of the objectives for rehabilitation at Tarrawonga as stated in the relevant management plans, is provided in Table 2-1 (ELA 2011).

Table 2-1: Summary of rehabilitation objectives for Tarrawonga Mine

Stated objective (EMS, MOP, MCP)
Establish areas of native vegetation that link with remnant native vegetation and contribute to local and regional habitat corridors
Maintain and/or restore biodiversity and ecological integrity of areas affected by mining or agriculture within the mining lease
Maintain and/or re-establish agricultural land (pasture establishment) of comparable land capability to that of the pre-disturbance environment
Provide a revegetated post-mining landform which is consistent with surrounding landforms and, with the exception of the final void, provides no obvious evidence of a prior mining land use
Create low maintenance, geotechnically stable final landform
Minimise visual exposure by ensuring rehabilitation blends with the adjoining landscape
Minimise erosion and sedimentation
Establish rehabilitated areas that will provide habitat for fauna and corridors for fauna movement between rehabilitated areas, regrowth areas and remnant vegetation
Control vermin, feral animals and noxious weeds
Ensure successful implementation of the approved biodiversity offset strategy
Monitor rehabilitation success in terms of physical and biological parameters
Native vegetation re-establishment / extension using locally collected seed
Develop and implement a Flora and Fauna monitoring program which provides statistically valid conclusions on rehabilitation success and recommendations for improved outcomes (if required)
Monitor rehabilitation success in terms of physical and biological parameters
Exclude bushfire and control noxious weeds and feral animals
Successfully develop native vegetation communities within the stock exclusion zone (i.e. rehabilitated areas and remnants) which emulate the structure and floristics of undisturbed areas (as demonstrated by monitoring)
Successfully establish more extensive native vegetation communities that currently exist in the area of the mine
Rehabilitated areas used by native fauna (as demonstrated by monitoring)
Rehabilitation / offset strategy refinement on the basis of monitoring outcomes, site experience and improved technologies
Maximise the area of land re-established to Class III land capability land while recognizing the emphasis is on native vegetation conservation
Re-instate areas of agricultural land on the "Thuin" property

Stated objective (EMS, MOP, MCP)

Elsewhere, landform establishment, soil application and vegetation establishment consistent with pre-disturbance land capabilities.

3 Methods

Monitoring completed in spring 2013 was undertaken in accordance with the methods prescribed in the RMP (ELA 2011) (Table 3-1). Rehabilitation in the agricultural zones has yet to occur, so there was monitoring for these zones in 2013.

Table 3-1: Multi-scale monitoring program

Data source	Type	Scale	Purpose
Remote sensing	LiDAR (every 3 years)	Entire site	Topographic form and change Woodland parameters
	Multi-spectral imaging (annually)	Entire site	Agricultural pasture cover/biomass Woodland cover/biomass Erosion monitoring Direct field survey
	EM38/31 (every 3 – 5 years)	Pasture zones	Soil moisture and nutrient zones
Woodland survey	Vegetation survey (annually)	Woodland zones	Woodland health and function
	Fauna survey (Birds – winter and spring)	Woodland zones	Woodland health and function
	Soil survey (every 4 years)	Woodland zones	Soil condition
Agricultural survey	Pasture survey (annually)	Pasture zones	Pasture biomass and composition
	Soil Survey (every 3 years)	Pasture zones	Soil nutrient status

As per recommendations in the 2012 Rehabilitation Monitoring Report (ELA 2013) five native vegetation monitoring plots were established in Leard State Forest to serve as control sites. Five additional native vegetation plots were also established in Rehabilitated Zone 3 & 4 (Volume 2; Section 2).

3.1 Survey dates

Multi-spectral imagery was captured across the entire target area (including control areas) on 25 August 2013 using 4-Band WorldView-2.

Monitoring of native vegetation areas was conducted on 2 December 2013 and 9 and 10 January 2014 by Botanist Dr Lachlan Copeland and Environmental Scientist Emily Southwell.

Terrestrial fauna and habitat monitoring of native vegetation areas was undertaken by Ecologist Dr Stephen Debus between 2 and 3 September 2013; and by Stephen Debus and Environmental Scientist Rebecca McCue between 21 and 23 October 2013.

3.2 Weather

Temperatures in the three months preceding the spring monitoring period were cool to warm, with average minimum temperatures lower than the historical mean and average maximum temperatures higher than the historical mean (Figure 3-1; Volume 2, Section 1). Rainfall in the six months preceding

the spring surveys was below average, with the exception of June 2013 where rainfall was twice the monthly average (Figure 3-2; Volume 2, Section 1).

Conditions were dry during both bird surveys. The minimum temperatures during the winter bird survey were close to the historical average, whilst maximum temperatures were between 2.8 and 4.2°C above the historical average (Volume 2, Section 1). Minimum temperatures during the spring bird survey were between 1.2 and 7.9°C above the historical mean, whilst maximum temperatures ranged from being close to the historical mean up to 8.5°C above (Volume 2, Section 1).

Conditions were dry during both flora surveys. Minimum temperature for the December 2013 survey date was 6.2°C below the historical mean, whilst maximum temperature was 0.2°C below. Minimum temperatures during the January 2014 survey dates were 0.4 and 3°C below the historical mean, whilst maximum temperatures were 3.1 and 1.5°C below (Volume 2, Section 1).

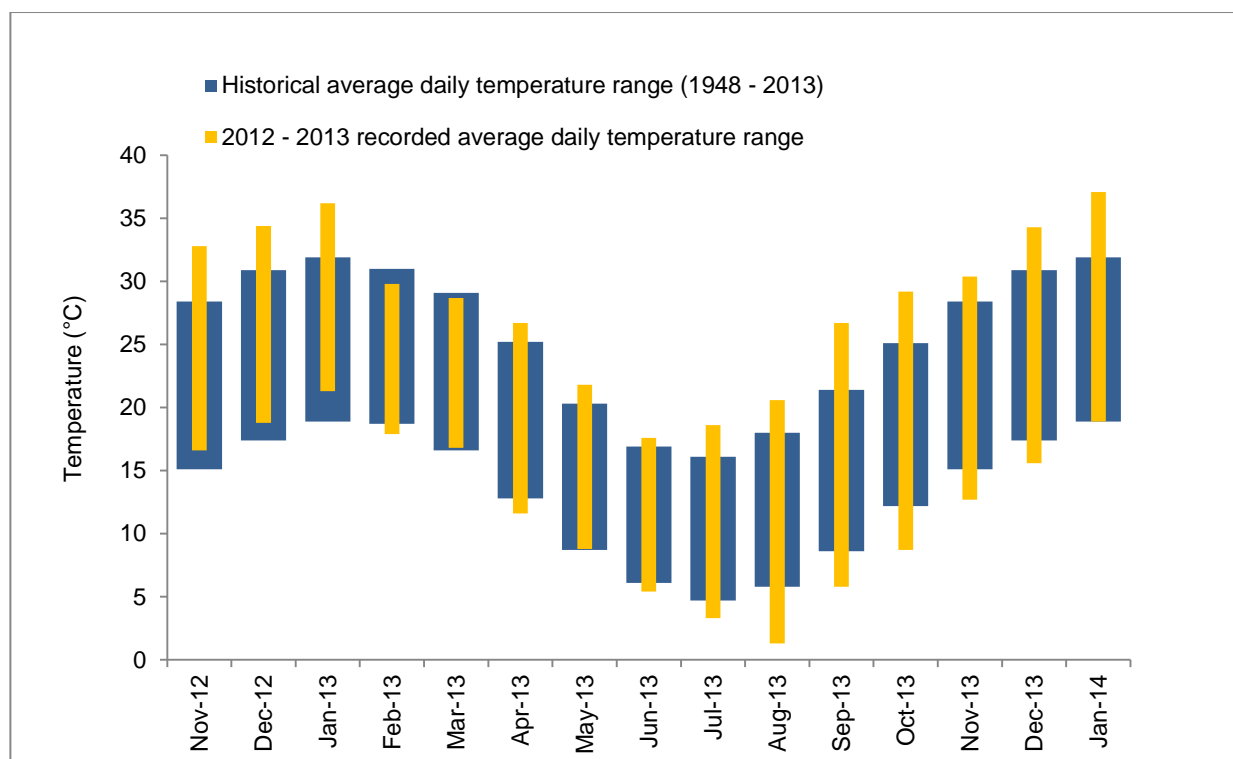


Figure 3-1: Historical average and recorded average daily temperature range (Gunnedah Resource Centre 55024; BoM 2014)

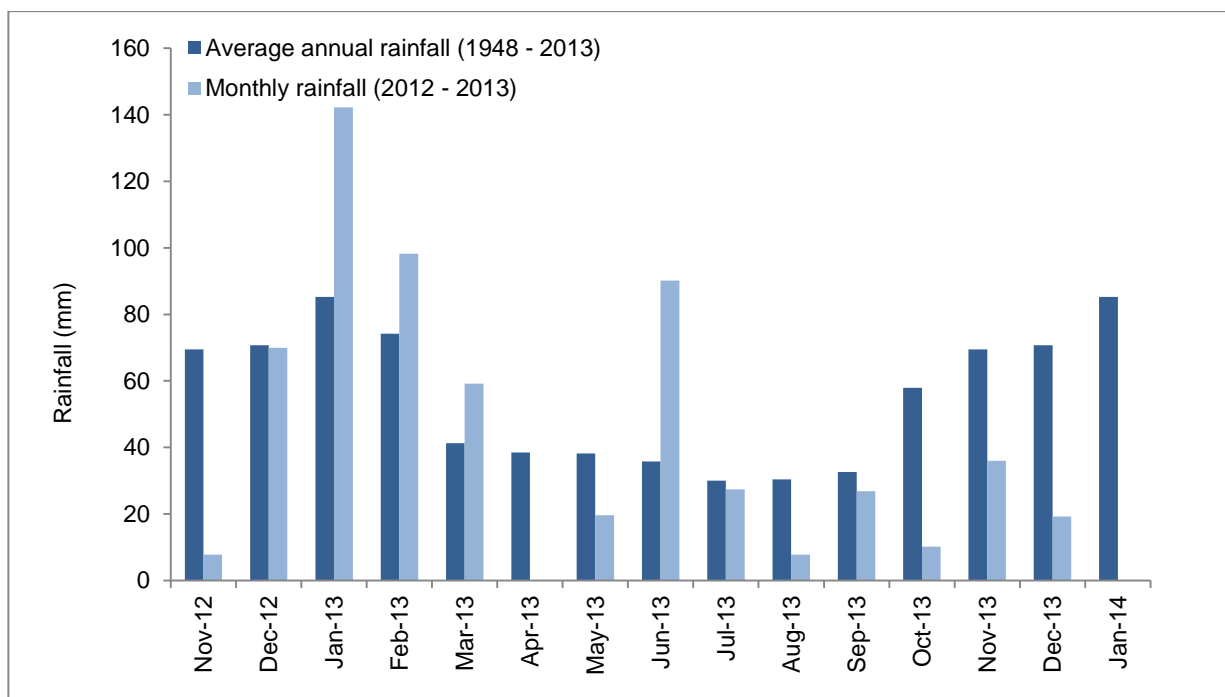


Figure 3-2: Historical average and recorded monthly rainfall (Gunnedah Resource Centre 55024; BoM 2014)

4 Results & discussion

4.1 Remote sensing

Changes in the Normalised Differential Vegetation Index (NDVI) of multi-spectral imagery captured on 25 August 2013 and 30 September 2012 were assessed. These identified an increase in groundcover across most of the site. One area of significant increase in photosynthetically active biomass (PAB) was identified in the southern portion of Pasture Rehabilitation Zone (Figure 4-1; Volume 2, Section 2). Field validation by WCM found the area to have an increase in weed cover, particularly Mayne's Pest. This is not an environmental or noxious weed, so no specific management action is required.

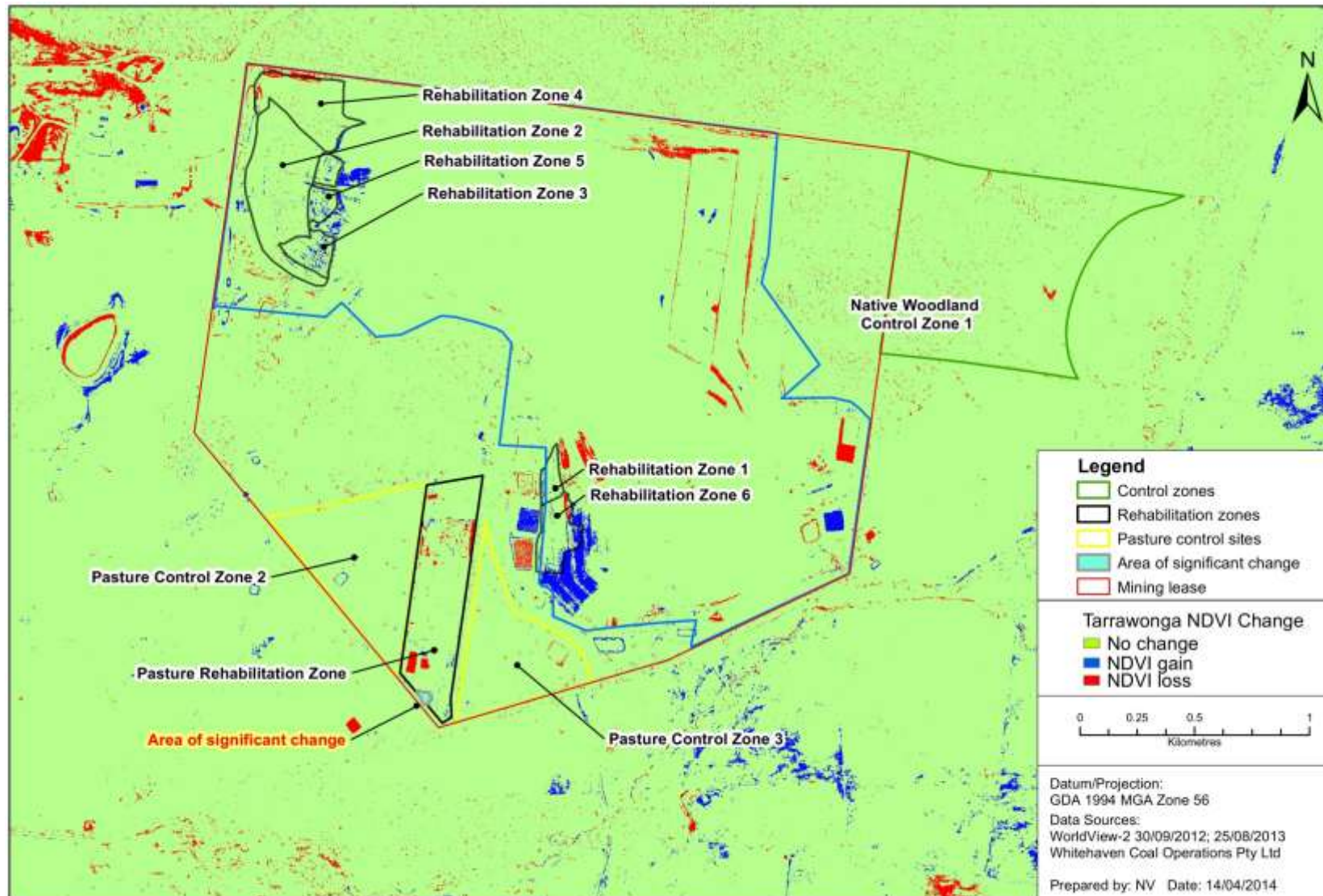
Scattered areas of increase and decrease in PAB across the image can be attributed to shadow position and slight image shift; this is particularly pronounced around dam perimeters (Figure 4-1).

4.1.1 Monitoring triggers

NDVI analysis identified an area of significant weed increase. Field investigations confirmed that the species were not environmental or noxious weeds, so no specific management actions were triggered (ELA 2011) (Table 4-1). It is recommended that regular weed management protocols are applied in this area.

Table 4-1: Remote sensing monitoring triggers for management

Trigger	Investigation	Management
Remote sensing change detection identifies areas of significant change (> +/-2 std dev from average) in area greater than 0.1 ha	Investigate sources of change via desktop assessment: 1. Obvious external influence e.g. fire, major storm, or unrelated development) 2. Potentially due to weed infestation, erosion / sedimentation, poor cover establishment	Respond to change based on likely source of impact: 1. Identify region of change and tag it as non-project specific impact 2. Undertake directed field investigation via rapid field checking protocol (Table 5-11 in ELA 2011)



This map is not guaranteed to be free from error or omission. Eco Logical Australia Pty Ltd and its employees disclaim liability for any act done on the information in the map and any consequences of such acts or omissions.

Figure 4-1: NDVI change detection analysis; including area of significant change (>0.1 ha) requiring field investigation

4.2 Woodland surveys

4.2.1 Vegetation

Woodland rehabilitation is yet to reach a stage where there is a canopy layer present; as such there is no True Projected Foliage Cover (TPFC) for any of the rehabilitated plots. Some of the planted trees now form a midstorey layer in all of the plots from Rehab Zone 3 & 4, and in two of the plots in Rehab Zone 2 (Volume 2, Section 3). Midstorey TPFC is low in the rehabilitation plots, compared with the control plots.

The midstorey layer of the control plots consist of shrub species and juvenile trees, while the midstorey of rehabilitated plots is dominated almost entirely by juvenile trees that will grow into the canopy (Volume 2, Section 4.3 and 4.4). This suggests that, once mature, the rehabilitated sites may have a midstorey layer that lacks the diversity and structural complexity of the control plots. The current lack of similarity between control and rehabilitated vegetation communities is confirmed by Cluster and nMDS analyses (Volume 2, Figures 3-2 to 3-4), where the two treatments are completely separate in the plot.

Native groundcover communities in the rehabilitated and control areas showed a large amount of spatial and temporal variation for most sites (see Cluster and nMDS analysis in Volume 2, Section 3.6). This indicates that the groundcover vegetation is naturally variable. There is more similarity between plots in Rehab Zones 3 and 4 and the control zones than there is with plots in Rehab Zone 2. Of particular concern are dense patches of *Chloris gayana* (Rhodes Grass) in Rehab Zone 2, which can be a major threat to the establishment of native pastures and can eventually become a monoculture.

Lycium ferocissimum (African Boxthorn), a noxious weed, persists at both rehabilitation monitoring zones. The control of noxious weeds on private land is the responsibility of the land owner or occupier and is one of the management objectives for Tarrawonga Mine. African Boxthorn is classified as Class 4, so should be managed to reduce spread and inhibit reproduction. WCM should refer to the site MCP for weed management procedures. NSW Department of Primary Industries (DPI) also recommend suitable management methods (DPI 2012).

Groundcover composition had been affected by higher than average maximum temperatures and lower than average rainfall. Native species groundcover is lower in Rehab Zone 2 and significantly lower ($p < 0.05$) in the Control zone than it was in 2012. Concomitantly, litter cover is significantly higher in both these zones (Volume 2, Section 3.7).

Rehab Zone 2 has significantly lower % native groundcover and significantly higher % exotic groundcover than both control zones. Native groundcover at Rehab Zone 3 & 4 is not significantly lower than Control (LSF) whilst exotic groundcover is not significantly higher than Control 1. These results, coupled with groundcover species composition analysis suggests seed selection for rehabilitation undertaken after 2008 is more reflective of species found in the control zones (Rehab Zone 2 was rehabilitated in 2007/2008 and Rehab Zone 3 & 4 in 2008/2009).

The amount of Large Woody Debris (LWD) has either increased or remained steady in Control 1 monitoring plots. LWD in Rehab Zone 2 has remained steady with the exception of Plot 10 where it has more than doubled; this is likely to be as a result of management activities. No sections of LWD were recorded in Rehabilitation Zone 3 & 4 plots.

4.2.2 Terrestrial fauna & habitat

There continues to be higher species richness, representing more guilds, at the control sites compared with the rehabilitated sites. However, species richness is increasing at both rehabilitated sites, with at

least twice as many species recorded in September 2013 than September 2012. Fewer species were recorded in October 2013 than September 2013 across all sites, which is indicative of hot and dry conditions (Figure 4-2).

The nMDS plots show a clear difference in bird species composition between the control plots and the rehabilitated plots (Volume 2, Figure 4-2). Bird species composition at the rehabilitated zones varies between sites and over time. In the control areas composition appears more stable, with data from all plots and all monitoring periods clustered more closely together (Volume 2, Section 4).

The Rehabilitation Monitoring Program for Tarrawonga Coal Mine (ELA 2011) recommends targeted monitoring for several threatened bird species; four of these species as well as six additional threatened bird species have been recorded on site since rehabilitation monitoring began in 2011. During the 2013 monitoring period five threatened bird species were recorded in the control zones, one of which was also recorded in Fauna Rehab 01 (Table 4-2). These species include:

- *Chthonicola sagittata* (Speckled Warbler)
- *Climacteris picumnus* (Brown Treecreeper)
- *Daphoenositta chrysoptera* (Varied Sittella)
- *Hieraaetus morphnoides* (Little Eagle)
- *Neophema pulchella* (Turquoise Parrot)

Of the non-bird fauna *Macropus giganteus* (Eastern Grey Kangaroo) and *Macropus robustus* (Common Wallaroo) were noted in all monitoring zones. *Wallabia bicolor* (Swamp Wallaby) was also recorded in the control zones. These species have been recorded in previous years. *Cryptoblepharus virgatus* (Wall Skink) was recorded in Fauna Rehab 1, whilst *Varanus varius* (Lace Monitor) was recorded in Fauna Control 3.

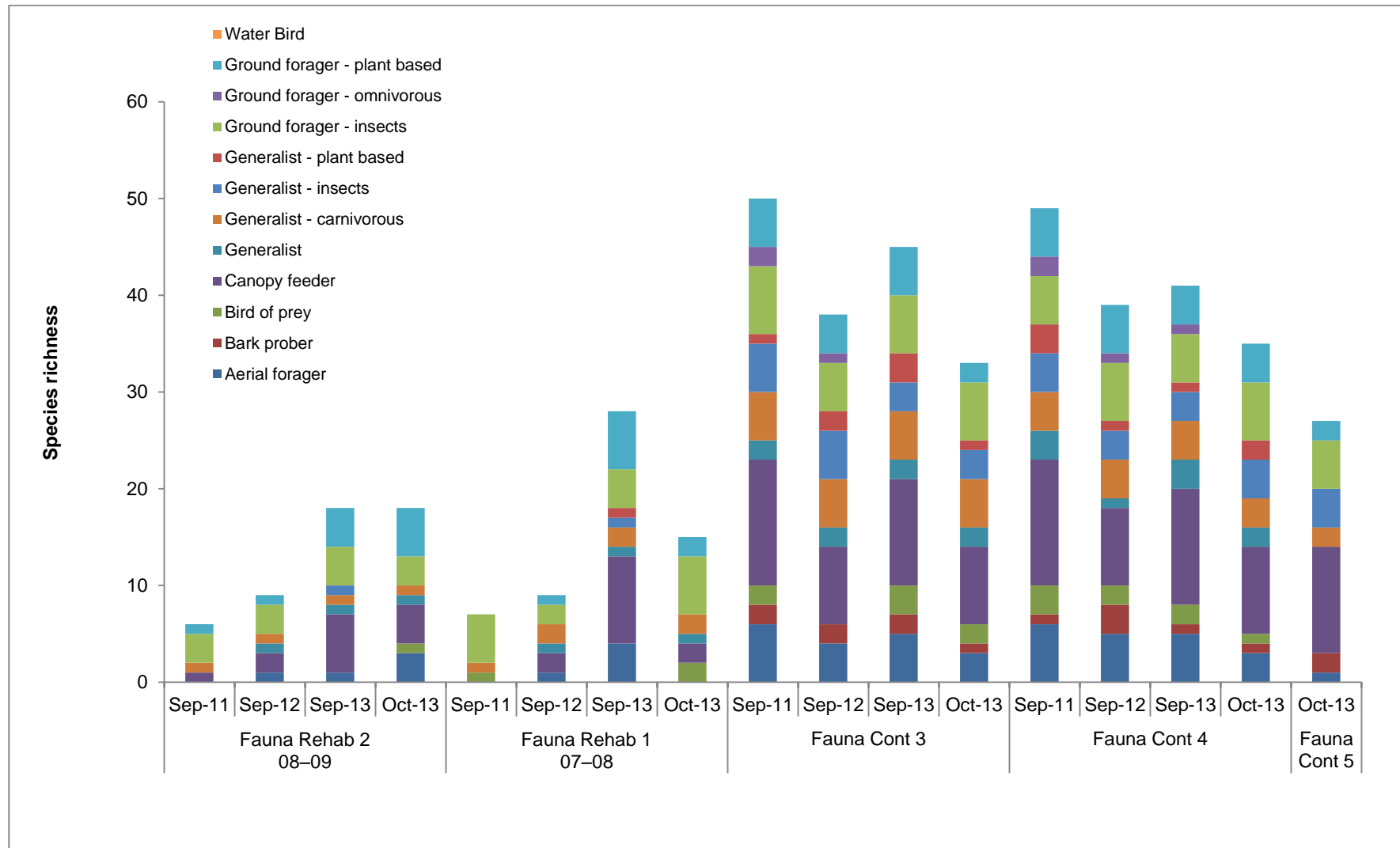


Figure 4-2: Bird species richness and associated feeding guilds recorded at all monitoring sites (2011, 2012, 2013)

Table 4-2: Threatened bird species recorded, including those requiring target searches (cells shaded green) as per the RMP, at Tarrawonga Mine (2011, 2012, 2013)

Species	Conservation status	Fauna Rehab 01			Fauna Rehab 02			Fauna Control 03			Fauna Control 04			Fauna Control 05
		2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2013
<i>Calyptorhynchus lathami</i> Glossy Black Cockatoo	TSC Act - Vulnerable	not yet recorded on site												
<i>Chthonicola sagittata</i> Speckled Warbler	TSC Act - Vulnerable			X				X	X	X	X	X	X	X
<i>Circus assimilis</i> Spotted Harrier	TSC Act - Vulnerable	X									X			
<i>Climacteris picumnus</i> Brown Treecreeper	TSC Act - Vulnerable									X		X		
<i>Daphoenositta chrysoptera</i> Varied Sittella	TSC Act - Vulnerable							X	X	X				
<i>Glossopsitta pusilla</i> Little Lorikeet	TSC Act - Vulnerable							X						
<i>Hieraaetus morphnoides</i> Little Eagle	TSC Act - Vulnerable									X		X	X	
<i>Hirundapus caudacutus</i> White-throated Needletail	EPBC Act - Migratory										X			
<i>Lophoictinia isura</i> Square-tailed Kite	TSC Act - Vulnerable							X						
<i>Melanodryas cucullata</i> Hooded Robin	TSC Act - Vulnerable	not yet recorded on site												
<i>Neophema pulchella</i> Turquoise Parrot	TSC Act - Vulnerable							X		X				
<i>Pomatostomus temporalis temporalis</i> Grey-crowned Babbler	TSC Act - Vulnerable	not yet recorded on site												

4.2.3 Soil survey

Soil surveys are recommended every 4 years (ELA 2011) and are next due in 2015.

4.2.4 Monitoring triggers

Weed infestation is the only monitoring trigger requiring action at present (Table 4-3).

Table 4-3: Management recommendations for woodland zones

Trigger	2013 monitoring outcomes	Management
Statistically significant decline detected in either: <ul style="list-style-type: none"> • Native overstorey (cover, health, richness, recruitment) • Mid storey (cover, richness) • Ground cover (cover, richness) • Weeds (cover, richness) • % ground cover 	Significant decline in native species cover as a result of drought conditions.	No management actions required at this stage.
Exotic fauna	No feral animals recorded on site	No management actions required at this stage.
Weed infestation	African Boxthorn persists on site	Refer to MCP and/or DPI for management procedures
Soil erosion	None identified	No management actions required at this stage.

5 Conclusion & recommendations

5.1 Remote sensing

Image capture and NDVI analysis occurred in September prior to the 2013 spring field surveys. WCM were notified of areas of significant increases in vegetation growth and undertook field verification. A weed infestation was identified in the southern portion of Pasture Rehabilitation Zone; none of the weeds were listed as significant so no management action is required.

Image capture for 2014 should occur in early spring to reduce seasonal variation in NDVI analysis and to enable field verification. Soil assessments were undertaken in 2011 and according to the RMP are next due between 2014 and 2016. Land surface stability assessment using LiDAR is also recommended in the RMP. Acquisition of these data will enable quantitative temporal comparison of key land surface condition parameters in both the agricultural and native vegetation environments.

5.2 Woodland surveys

Monitoring of woodland areas yielded results that are consistent with drought conditions, i.e. decrease in native cover and increase in litter, so there are no management recommendations in relation to this.

The following suggestions are made to improve monitoring and rehabilitation outcomes:

- Additional shrub species should be planted in the rehabilitation zones to improve habitat complexity. It is important that species selected for planting are native to the local area.
- African Boxthorn is present on site in low abundance; this should be eradicated to prevent proliferation.
- Fauna monitoring should be undertaken in July-August for winter birds and September-October for spring birds.
- Soil surveys in the woodland zones are recommended every 4 years (ELA 2011) and are next due in 2015.

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Tarrawonga Coal Mine – Rehabilitation Monitoring Report

Volume 2

Spring 2013

Prepared for
Whitehaven Coal Mining Limited

11 June 2014



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1 Weather data

Table 1-1: Daily weather data from Tarrawonga Mine at time of field surveys

	Date	Min temp (°C)	Average temp (°C)	Max temp (°C)	Rainfall (mm)	Min Wind Speed (m/s)	Average Wind Speed (m/s)	Max Wind Speed (m/s)
Fauna	2/09/2013	1.9	13.7	26.1	0	0	1.1	2.5
	3/09/2013	2	15.2	26	0	0	1.6	0
	21/10/2013	12.5	23.8	33.7	0	0	1.1	0.8
	22/10/2013	13.8	26	35.3	0	0	1.8	7
	23/10/2013	17.2	26.3	33.7	0	0	2.7	2.7
Flora	2/12/2013*	11.2	-	30.7	0	-	-	43
	9/01/2014*	18.5	-	28.8	0	-	-	41
	10/01/2014*	15.9	-	30.4	0	-	-	31

*Data obtained from Gunnedah Airport AWS 055202 (BoM 2014)

Table 1-2: Tarrawonga Mine and Gunnedah historical monthly weather data

Month	Tarrawonga Mine Monthly Mean [#]						Historical Averages [*]			
	Min Temp (°C)	Max Temp (°C)	Rainfall (mm)	Cumulative rainfall (mm)	No. of rain days	Maximum daily rainfall (mm)	Min Temp (°C)	Max Temp (°C)	Rainfall (mm)	No. of rain days
Nov-12	13.95	32.38	13	13.0	5	6.0	15.1	28.4	69.5	6.2
Dec-12	16.60	34.22	39.0	52.0	8	18.4	17.4	30.9	70.7	6.5
Jan-13	20.15	35.99	138.2	190.2	7	67.8	18.9	31.9	85.3	6.1
Feb-13	15.54	29.60	51.0	241.2	8	20.0	18.7	31	74.2	5.4
Mar-13	13.92	28.74	77.6	318.8	9	54.4	16.6	29.1	41.3	3.9
Apr-13	6.88	26.53	3.0	321.8	1	1.0	12.8	25.2	38.5	3.4
May-13	5.17	21.67	21.6	343.4	8	11.8	8.7	20.3	38.2	4.2
Jun-13	4.19	17.27	136.0	479.4	16	24.0	6.1	16.9	35.8	4.6
Jul-13	2.56	18.62	21.4	500.8	8	24.2	4.7	16.1	30	4.9
Aug-13	1.54	20.80	5.0	505.8	3	4.2	5.8	18	30.4	4.6
Sep-13	5.26	27.06	21.8	527.6	2	15.8	8.6	21.4	32.6	4.6
Oct-13	8.08	29.04	13.0	540.6	4	10.2	12.2	25.1	57.9	6
Nov-13	11.58	30.42	120.0	660.6	9	21.2	15.1	28.4	69.5	6.2
Dec-13*	15.60	34.30	19.2	679.8	6	10.8	17.4	30.9	70.7	6.5
Jan-14*	18.3	36.3	0.0	679.8	0	6.4	18.9	31.9	85.3	6.1

[#] Tarrawonga Mine data^{*} Gunnedah Resource Centre Station 55024 (BoM 2014)

2 Remote sensing analysis

Zone	Year Rehabilitated	Comment*
Rehabilitation Zone 1	2009/2010	Increase in PAB around western perimeter and along centre contour of zone. Significant decrease in PAB outside of the zone, immediately to the east, due to mine activities.
Rehabilitation Zone 2	2007/2008	No significant change.
Rehabilitation Zone 3	2008/2009	Increase in PAB scattered throughout zone - possible increase in canopy cover and/or groundcover.
Rehabilitation Zone 4	2008/2009	No significant change.
Rehabilitation Zone 5	2012/2013	Increase in PAB scattered throughout zone - possibly due to increase in groundcover.
Rehabilitation Zone 6	2012/2013	Significant increase in PAB along southern and eastern perimeter of zone due to an increase in groundcover. Significant decrease in north-eastern corner of zone due to a reduction in groundcover. Significant increase in groundcover outside of the zone, immediately to the south and east, due to rehabilitation works.
Native Woodland Control Zone 1	N/A	No significant change with the exception of one small area which is a dam.
Pasture Rehabilitation Zone	2012/2013	Significant decrease in groundcover in the northern section of zone. Significant decrease in groundcover in southern section of zone due to infrastructure activities. Small areas of increase in southern section, one area of significant increase near the southern perimeter of the zone that could be weeds.
Pasture Control Zone 2	N/A	No significant change.
Pasture Control Zone 3	N/A	No significant change.
Outside of Mining Lease	N/A	Areas of significant increase and decrease in PAB attributed to land management practices to the south of the lease. No areas of significant change within Leard State Forest with the exception of mine extension.

* Significant change determined by (areas >0.1 ha with $>\pm 2$ standard deviations from average)

3 Native vegetation monitoring

Table 3-1: Location of native vegetation monitoring plots

Treatment		Plot	Start Easting	Start Northing	Transect Bearing (°)
Control 1	Established 2011	1	229693	6607097	240
		2	229734	6607621	240
		3	229584	6607459	90
		4	229407	6607627	70
		5	229501	6607813	270
Rehab Zone 2		6	227083	6608091	10
		7	227053	6607908	20
		8	227063	6607720	160
		9	227203	6607927	360
		10	227208	6607711	210
Rehab Zone 3 & 4	Established 2013	11	227247	6607537	320
		12	227328	6608043	80
		13	227224	6608137	270
		14	227330	6608154	80
		15	227153	6608231	250
Control (LSF)		16	230451	6608213	220
		17	230631	6608205	110
		18	230398	6608070	330
		19	230237	6607982	10
		20	230496	6607909	180

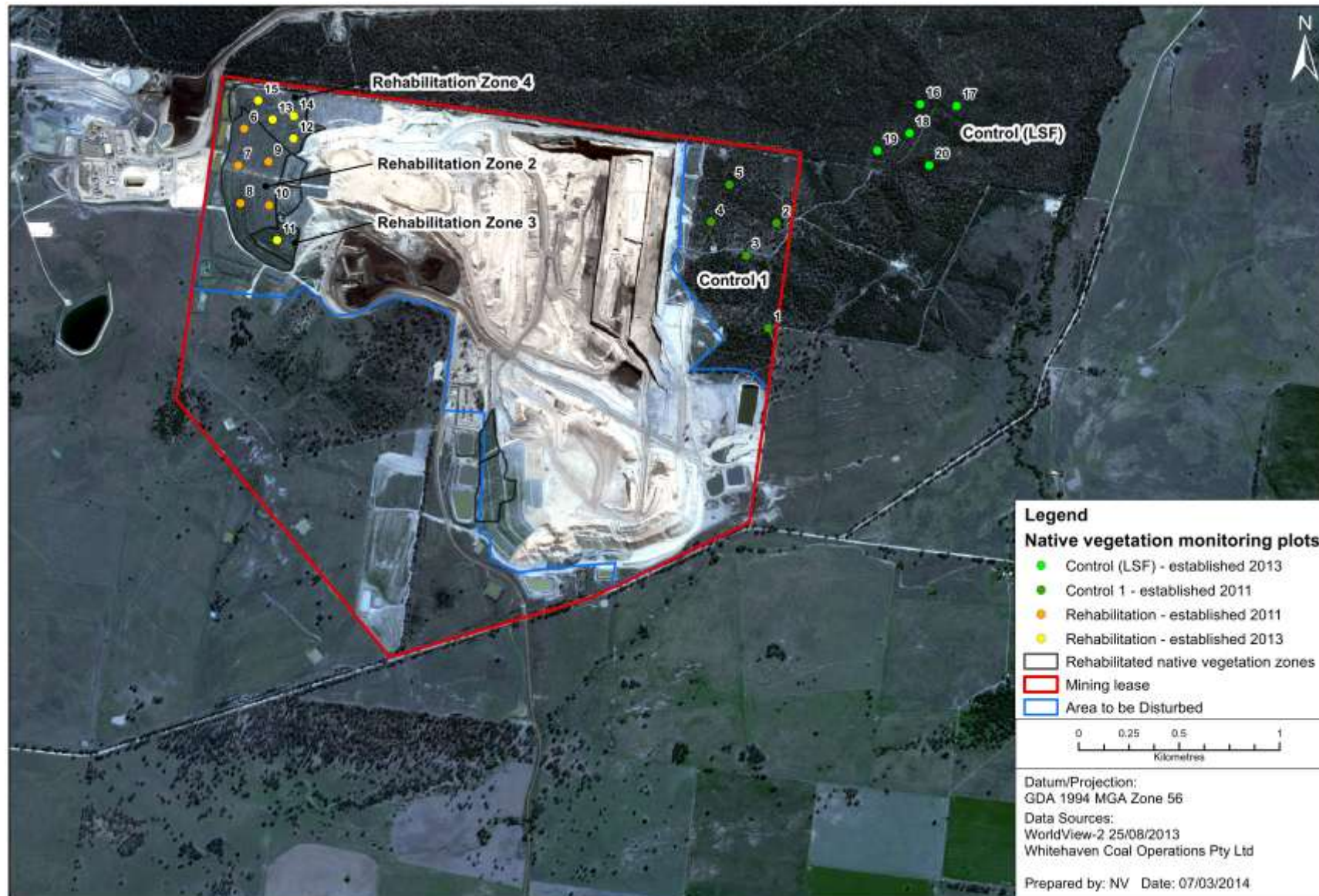


Figure 3-1: Native vegetation monitoring plots

3.1 Plot photographs

2011



2012



2013



2011



2012

No image taken

2013



2011

2012

2013

No image taken

Plot 5



January 2013



Plot 6



2011



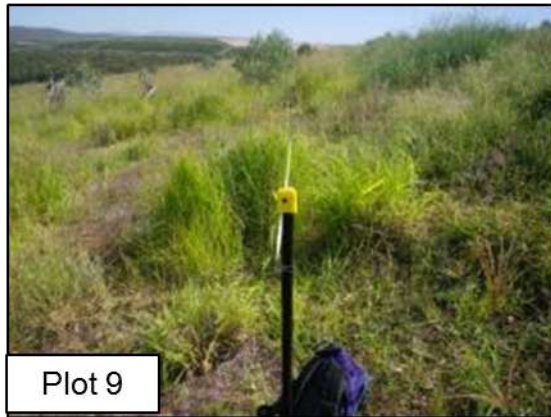
2012



January 2014



2011



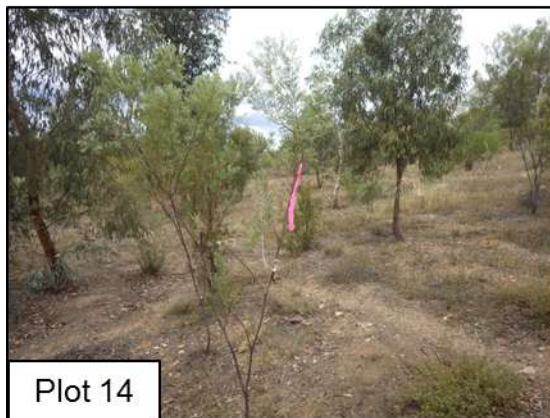
2012



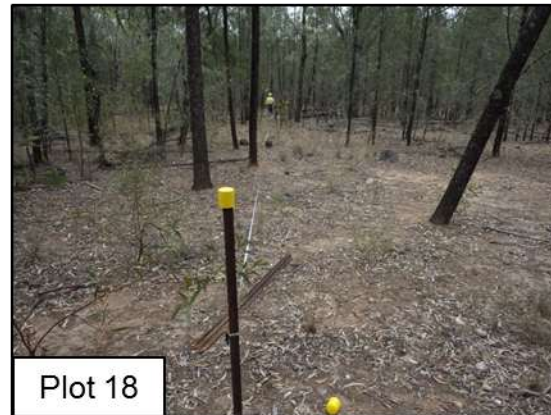
January 2014



Established January 2014



Established January 2014



3.2 Canopy & midstorey information

Table 3-2: Habitat characteristics of control plots 1 to 5 (2011, 2012, 2013)

Treatment		Control 1														
Plot number		1			2			3			4			5		
Monitoring year		2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
Vegetation type		Eucalyptus crebra; Callitris glaucophylla shrubby woodland			Partially cleared Callitris glaucophylla/Eucalyptus crebra woodland						E. crebra; C. glaucophylla woodland			Callitris glaucophylla, Eucalyptus crebra woodland		
Canopy DBH Thresholds	More than 1 stratum?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Large Tree \geq	60	60	60	60	-	-	60	-	-	60	-	-	60	-	-
	Mature Tree \geq	30	30	30	30	-	-	30	-	-	30	-	-	30	-	-
	Advanced Regrowth (xcm to x cm)	10 to 30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sapling \leq xcm to xcm	1 to 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Seedlings < xcm dbh	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Canopy \geq xm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Midstorey xm to xm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ground layer \leq xm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Canopy Species and Age Classes	No. of native canopy species	3	2	3	2	1	2	2	1	1	3	2	2	2	1	1
	No. of large trees	0	0	0	0	0	0	0	1	1	1	1		0	0	0
	Juveniles present (Y/N)	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
	Mature trees present (Y/N)	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Seedlings present (Y/N)	N	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	N	Y	Y
	Advanced regrowth present (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Coarse Woody Debris	Total length of of CWD (m)	56	97	133	30	32	38	9	58	56	78	86	81	42	66	78
	No. of sections of CWD	25	39	57	11	10	17	3	24	23	26	36	42	12	30	35
Midstorey,	No. of native midstorey species	9	6	8	0	5	4	2	4	3	7	5	4	0	4	4

Treatment		Control 1														
Plot number		1			2			3			4			5		
Monitoring year		2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
Vegetation type		Eucalyptus crebra; Callitris glaucophylla shrubby woodland			Partially cleared Callitris glaucophylla/Eucalyptus crebra woodland						E. crebra; C. glaucophylla woodland			Callitris glaucophylla, Eucalyptus crebra woodland		
Understorey Species	No. of native species in ground layer	22	14	13	0	16	20	30	19	15	33	13	27	0	12	13
Transect	% Projected Crown Cover- Canopy Species	36	12	30	0	0	0	12	10	14	44	26	54	12	6	46
	% Projected Crown Cover - Midstorey Species	14	20	24	6	14	20	6	6	4	20	28	10	68	62	36
	% True Projected Crown Cover- Canopy Species	5	2	5	0	0	0	3	3	2	8	5	7	2	2	6
	% True Projected Crown Cover - Midstorey Species	1	3	2	11	2	2	1	18	1	3	5	1	9	6	3

Table 3-3: Habitat characteristics of rehabilitated plots 6 to 7 (2011, 2012, 2013)

Treatment		Rehab Zone 2 (rehabilitated 2007/2008)														
Plot number		6			7			8			9			10		
Monitoring year		2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
Vegetation type		Rehab area - derived grassland														
Canopy DBH Thresholds	More than 1 stratum?	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Large Tree \geq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mature Tree \geq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Advanced Regrowth (xcm to x cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sapling \leq xcm to xcm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Seedlings < xcm dbh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Canopy \geq xm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Midstorey xm to xm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ground layer \leq xm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Canopy Species and Age Classes	No. of native canopy species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	No. of large trees	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Juveniles present (Y/N)	N	N	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
	Mature trees present (Y/N)	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Seedlings present (Y/N)	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Advanced regrowth present (Y/N)	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Coarse Woody Debris	Total length of of CWD (m)	68	82	89	31	101	70	0	0	0	26	47	49	28	29	67
	No. of sections of CWD	11	27	20	7	46	16	0	0	0	6	17	12	8	14	12
Midstorey, Understorey Species	No. of native midstorey species	0	0	0	3	4	4	4	5	4	3	5	4	4	2	5
	No. of native species in ground layer	14	10	7	9	6	4	22	6	14	12	6	8	6	4	4

Treatment		Rehab Zone 2 (rehabilitated 2007/2008)														
Plot number		6			7			8			9			10		
Monitoring year		201 1	201 2	Jan- 14	201 1	201 2	Jan- 14	201 1	201 2	Jan- 14	201 1	201 2	Jan- 14	201 1	201 2	Jan- 14
Vegetation type		Rehab area - derived grassland														
Transect	% Projected Crown Cover- Canopy Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	% Projected Crown Cover - Midstorey Species	0	0	0	0	0	0	0	0	0	0	8	14	4	4	8
	% True Projected Crown Cover- Canopy Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	% True Projected Crown Cover - Midstorey Species	0	0	0	0	0	3	0	0	3	0	2	2	0	1	4

Table 3-4: Habitat characteristics of rehabilitated plots 11 to 15 and control plots 16 to 20 (established during 2013 monitoring period)

Treatment		Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
Plot number		11	12	13	14	15	16	17	18	19	20
Monitoring year		Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
Vegetation type		Mine Rehab					E. crebra; C. glaucophylla woodland		E. crebra woodland		
Canopy DBH Thresholds	More than 1 stratum?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Large Tree ≥	-	-	-	-	-	60	60	60	60	60
	Mature Tree ≥	-	-	-	-	-	30	30	30	30	30
	Advanced Regrowth (xcm to x cm)	-	-	-	-	-	10 to 30	10 to 30	10 to 30	10 to 30	10 to 30
	Sapling ≤ xcm to xcm	-	-	-	-	-	-	-	-	-	-
	Seedlings < xcm dbh	-	-	-	-	-	-	-	-	-	-
	Canopy ≥ xm	-	-	-	-	-	-	-	-	-	-
	Midstorey xm to xm	-	-	-	-	-	-	-	-	-	-
	Ground layer ≤ xm	-	-	-	-	-	-	-	-	-	-
Canopy Species and Age Classes	No. of native canopy species	0	0	0	0	0	2	3	2	2	2
	No. of large trees	0	0	0	0	0	2	1	1	0	0
	Juveniles present (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Mature trees present (Y/N)	N	N	N	N	N	Y	Y	Y	Y	Y
	Seedlings present (Y/N)	N	Y	Y	Y		Y	Y	Y	Y	Y
	Advanced regrowth present (Y/N)	Y	N	N	N	N	Y	Y	Y	Y	Y
Coarse Woody Debris	Total length of of CWD (m)	0	0	0	0	0	128	87	197	200	53
	No. of sections of CWD	0	0	0	0	0	45	41	75	60	22
Midstorey, Understorey Species	No. of native midstorey species	7	8	8	10	6	6	6	5	6	4
	No. of native species in ground layer	15	13	13	14	10	22	14	14	14	15
Transect	% Projected	0	0	0	0	0	74	26	42	34	86

Treatment		Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
Plot number		11	12	13	14	15	16	17	18	19	20
Monitoring year		Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
Vegetation type		Mine Rehab					E. crebra; C. glaucophylla woodland		E. crebra woodland		
	Crown Cover- Canopy Species										
	% Projected Crown Cover - Midstorey Species	12	16	12	16	2	18	12	34	12	2
	% True Projected Crown Cover- Canopy Species	0	0	0	0	0	3	3	7	7	11
	% True Projected Crown Cover - Midstorey Species	5	3	2	3	60	2	2	6	1	20

3.3 Overstorey & midstorey cover scores (20 x 50 m woodland plots)

Table 3-5: Overstorey & midstorey cover scores in 20 x 50 m plots for control plots 1 to 5 (2011, 2012, 2013)

Overstorey/ Midstorey (O/M)	Species	Control 1														
		Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
		2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
M	<i>Acacia cheelii</i> Motherumbah				1	1	1									
M	<i>Acacia deanei</i> Green Wattle															
M	<i>Acacia decora</i> Western Silver Wattle	3	2	2	1	1		1	1	1	1		2	2	2	2
M	<i>Acacia leiocalyx</i>															
M	<i>Allocasuarina luehmannii</i> Bulloak															
M	<i>Alstonia constricta</i> Bitter Bark	1			1		1									
M	<i>Amyema miquelii</i>										2					
M	<i>Amyema</i> sp.			1								1	1			
M	<i>Beyeria viscosa</i> Pinkwood										2	1	2	1		
M	<i>Brachychiton populneus</i> Flame Tree			1												
M	<i>Callitris glaucophylla</i> White Cypress Pine	4	4		3	3		2	2	2	3	3		4	4	3
M	<i>Cassinia arcuata</i> Sifton Bush															
M	<i>Cassinia laevis</i> Cough Bush	2	1	1	1	1	1		1		1			1	2	2
M	<i>Casuarina cristata</i> Belah															

Overstorey/ Midstorey (O/M)	Species	Control 1														
		Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
		2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
M	<i>Dodonaea viscosa</i> subsp. <i>angustifolia</i> Sticky Hop Bush	1												1	1	1
M	<i>Eremophila</i> sp.															
M	<i>Eucalyptus albens</i> White Box															
M	<i>Eucalyptus blakelyi</i> Blakely's Red Gum															
M	<i>Eucalyptus crebra</i> Narrow-leaved Ironbark											1				
M	<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark												1			
M	<i>Eucalyptus microcarpa</i> Grey Box															
M	<i>Eucalyptus populnea</i> subsp. <i>bimbil</i> Bimble Box															
M	<i>Eucalyptus</i> sp. Ironbark															
M	<i>Eucalyptus</i> sp. Red Gum															
M	<i>Eucalyptus</i> sp. Spotted Gum															
M	<i>Eucalyptus viridis</i> Green Mallee															
M	<i>Euclayptus melliodora</i> Yellow Box															
M	<i>Geijera parviflora</i> Wilga	1		1				1	1	1						

Overstorey/ Midstorey (O/M)	Species	Control 1														
		Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
		2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
M	<i>*Lycium ferocissimum</i> African Boxthorn															
M	<i>Lysiana subfalcata</i>	1		1							2					
M	<i>Marsdenia viridiflora</i> Native Pear			1												
M	<i>Notelaea microcarpa</i> var. <i>microcarpa</i> Velvet Mock Olive						1				1					
M	<i>Olearia</i> ssp. aff. <i>Elliptica</i>															
M	<i>Parsonsia</i> <i>eucalyptophylla</i> Gargaloo	1	1													
M	<i>Pimelea neo-anglica</i> Poison Pimelea										1					
M	<i>Pittosporum</i> <i>angustifolium</i> Weeping Pittosporum	1	1	1												
M	<i>Psyrdrax odorata</i> Shiny-leaved Canthium		1													
M	<i>Senna artemisioides</i>															
O	<i>Callitris glaucophylla</i> White Cypress Pine			4			3						3			3
O	<i>Eucalyptus crebra</i> Narrow-leaved Ironbark	3	3	3	1	1	2	3	3	3	3	3	3	3	2	3
O	<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark										1	1				
O	<i>Eucalytus albens</i> White Box		2	2												
Total species		10	8	11	6	5	6	4	5	4	10	6	6	6	5	6

Overstorey/ Midstorey (O/M)	Species	Control 1														
		Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
		2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013

*Denotes exotic species

Table 3-6: Overstorey & midstorey cover scores in 20 x 50 m plots for rehabilitated plots 6 to 10 (2011, 2012, 2013)

Overstorey/ Midstorey (O/M)	Species	Rehab Zone 2 (rehabilitated 2007/2008)														
		Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
		2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
M	<i>Acacia cheelii</i> Motherumbah															
M	<i>Acacia deanei</i> Green Wattle															
M	<i>Acacia decora</i> Western Silver Wattle															
M	<i>Acacia leiocalyx</i>															
M	<i>Allocasuarina luehmannii</i> Bulloak								1			1				
M	<i>Alstonia constricta</i> Bitter Bark															
M	<i>Amyema miquelii</i>															
M	<i>Amyema</i> sp.															
M	<i>Beyeria viscosa</i> Pinkwood															
M	<i>Brachychiton populneus</i> Flame Tree															
M	<i>Callitris glaucophylla</i> White Cypress Pine															
M	<i>Cassinia arcuata</i> Sifton Bush															
M	<i>Cassinia laevis</i> Cough Bush															
M	<i>Casuarina cristata</i> Belah						1	1			1		1	1		1
M	<i>Dodonaea viscosa</i> subsp. <i>angustifolia</i> Sticky Hop Bush															

Overstorey/ Midstorey (O/M)	Species	Rehab Zone 2 (rehabilitated 2007/2008)														
		Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
		2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
M	<i>Eremophila</i> sp.															
M	<i>Eucalyptus albens</i> White Box				1			1	1	1	1			2	1	1
M	<i>Eucalyptus blakelyi</i> Blakely's Red Gum				1	2	1	1	1	1		1	2	1	2	2
M	<i>Eucalyptus crebra</i> Narrow-leaved Ironbark											1				
M	<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark															
M	<i>Eucalyptus microcarpa</i> Grey Box						1			2						
M	<i>Eucalyptus populnea</i> subsp. <i>bimbil</i> Bimble Box				1	1	1				1	1	1	1	1	2
M	<i>Eucalyptus</i> sp. Ironbark															
M	<i>Eucalyptus</i> sp. Red Gum					1			1			1				
M	<i>Eucalyptus</i> sp. Spotted Gum															
M	<i>Eucalyptus viridis</i> Green Mallee				1											
M	<i>Euclayptus melliodora</i> Yellow Box							1			1		2	1	1	1
M	<i>Geijera parviflora</i> Wilga															
M	* <i>Lycium ferocissimum</i> African Boxthorn						1	1	1	1	1					
M	<i>Lysiana subfalcata</i>															

Overstorey/ Midstorey (O/M)	Species	Rehab Zone 2 (rehabilitated 2007/2008)														
		Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
		2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
M	<i>Marsdenia viridiflora</i> Native Pear															
M	<i>Notelaea microcarpa</i> var. <i>microcarpa</i> Velvet Mock Olive															
M	<i>Olearia</i> ssp. aff. <i>Elliptica</i>															
M	<i>Parsonsia</i> <i>eucalyptophylla</i> Gargaloo															
M	<i>Pimelea neo-anglica</i> Poison Pimelea															
M	<i>Pittosporum</i> <i>angustifolium</i> Weeping Pittosporum															
M	<i>Psyrdrax odorata</i> Shiny-leaved Canthium															
M	<i>Senna artemisioides</i>															
O	<i>Callitris glaucophylla</i> White Cypress Pine															
O	<i>Eucalyptus crebra</i> Narrow-leaved Ironbark															
O	<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark															
O	<i>Eucalyptus albens</i> White Box															
Total species		0	0	0	4	3	5	5	5	4	5	5	4	5	4	5

*Denotes exotic species

Table 3-7: Overstorey & midstorey cover scores in 20 x 50 m plots for rehabilitated plots 11 to 15 and control plots 16 to 20 (established for 2013 monitoring period)

Overstorey/ Midstorey (O/M)	Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
		Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
		Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
M	<i>Acacia cheelii</i> Motherumbah						2				
M	<i>Acacia deanei</i> Green Wattle								1	1	
M	<i>Acacia decora</i> Western Silver Wattle		3	1	3		1	2		2	1
M	<i>Acacia leiocalyx</i>								3	2	
M	<i>Allocasuarina luehmannii</i> Bulloak										
M	<i>Alstonia constricta</i> Bitter Bark						1				
M	<i>Amyema miquelii</i>										
M	<i>Amyema</i> sp.										
M	<i>Beyeria viscosa</i> Pinkwood							2	2		
M	<i>Brachychiton populneus</i> Flame Tree			2		1	1				
M	<i>Callitris glaucophylla</i> White Cypress Pine						2				
M	<i>Cassinia arcuata</i> Sifton Bush	1									
M	<i>Cassinia laevis</i> Cough Bush	1							1	3	
M	<i>Casuarina cristata</i> Belah		1	1	1	1					

Overstorey/ Midstorey (O/M)	Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
		Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
		Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
M	<i>Dodonaea viscosa</i> subsp. <i>angustifolia</i> Sticky Hop Bush		2		2						
M	<i>Eremophila</i> sp.		1		1						
M	<i>Eucalyptus albens</i> White Box		2			2					
M	<i>Eucalyptus blakelyi</i> Blakely's Red Gum	2		1	1						
M	<i>Eucalyptus crebra</i> Narrow-leaved Ironbark	2	2		1						
M	<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark										
M	<i>Eucalyptus microcarpa</i> Grey Box	1	2			2					
M	<i>Eucalyptus populnea</i> subsp. <i>bimbil</i> Bimble Box	2				2					
M	<i>Eucalyptus</i> sp. Ironbark			1	1						
M	<i>Eucalyptus</i> sp. Red Gum				1						
M	<i>Eucalyptus</i> sp. Spotted Gum										
M	<i>Eucalyptus viridis</i> Green Mallee	1									
M	<i>Euclayptus melliodora</i> Yellow Box			2	2	2					
M	<i>Geijera parviflora</i> Wilga							1			

Overstorey/ Midstorey (O/M)	Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
		Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
		Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
M	* <i>Lycium ferocissimum</i> African Boxthorn		1	1							
M	<i>Lysiana subfalcata</i>							1			
M	<i>Marsdenia viridiflora</i> Native Pear										
M	<i>Notelaea microcarpa</i> var. <i>microcarpa</i> Velvet Mock Olive								1		1
M	<i>Olearia</i> ssp. aff. <i>Elliptica</i>						1				
M	<i>Parsonsia eucolyptophylla</i> Gargaloo										1
M	<i>Pimelea neo-anglica</i> Poison Pimelea							1			1
M	<i>Pittosporum angustifolium</i> Weeping Pittosporum							1		1	
M	<i>Psyrdrax odorata</i> Shiny-leaved Canthium									1	
M	<i>Senna artemisioides</i>		1	1	2						
O	<i>Callitris glaucophylla</i> White Cypress Pine						3	3	3	3	3
O	<i>Eucalyptus crebra</i> Narrow-leaved Ironbark						3	3	3	3	3
O	<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark										
O	<i>Eucalytus albens</i> White Box							1			
Total species		7	9	8	10	6	8	9	7	8	6

*Denotes exotic species

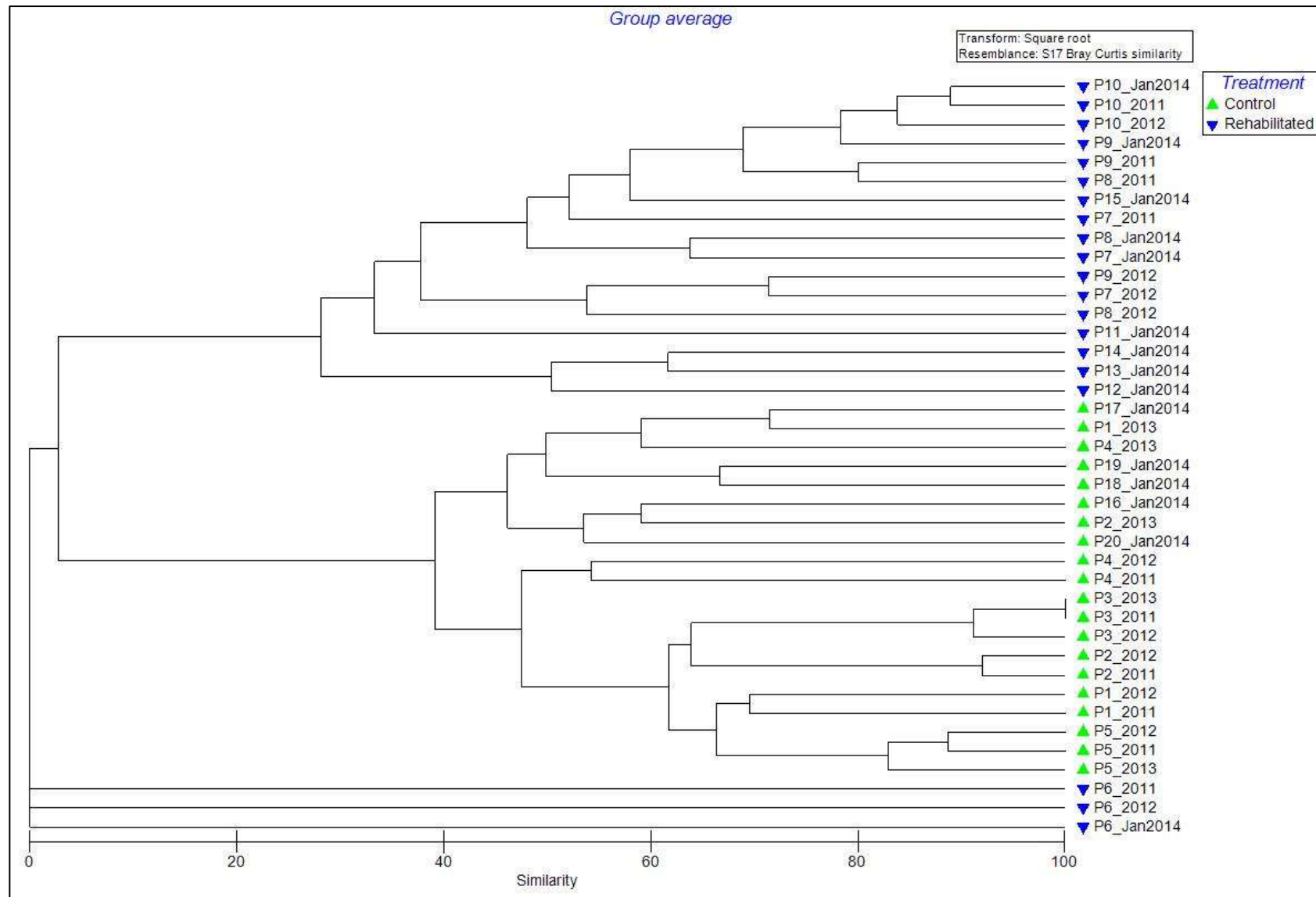


Figure 3-2: Cluster analysis of midstorey and canopy species composition in monitoring plots

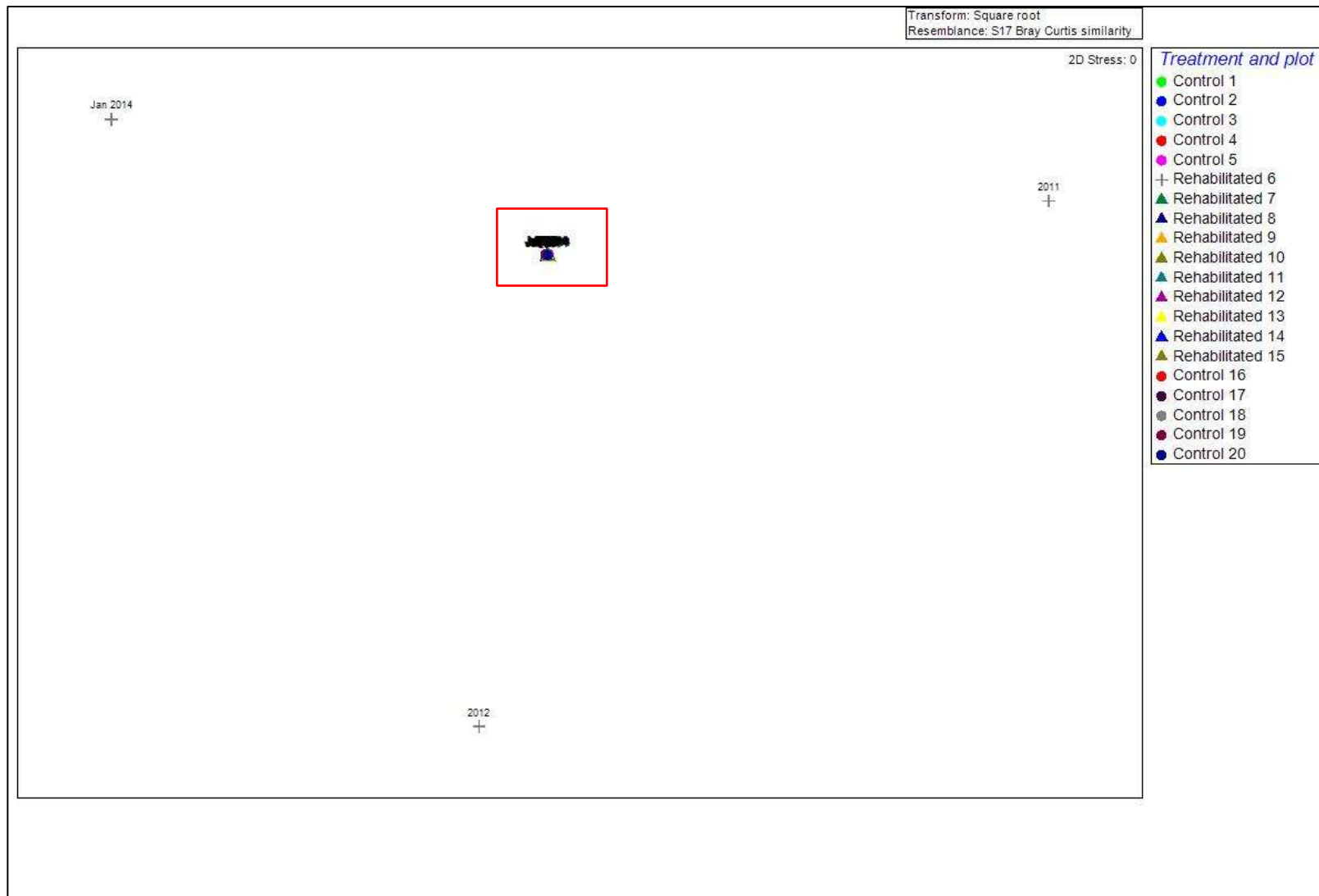


Figure 3-3: nMDS of midstorey and canopy species composition in monitoring plots (red square indicates data captured in nMDS subset in Figure 3-4)

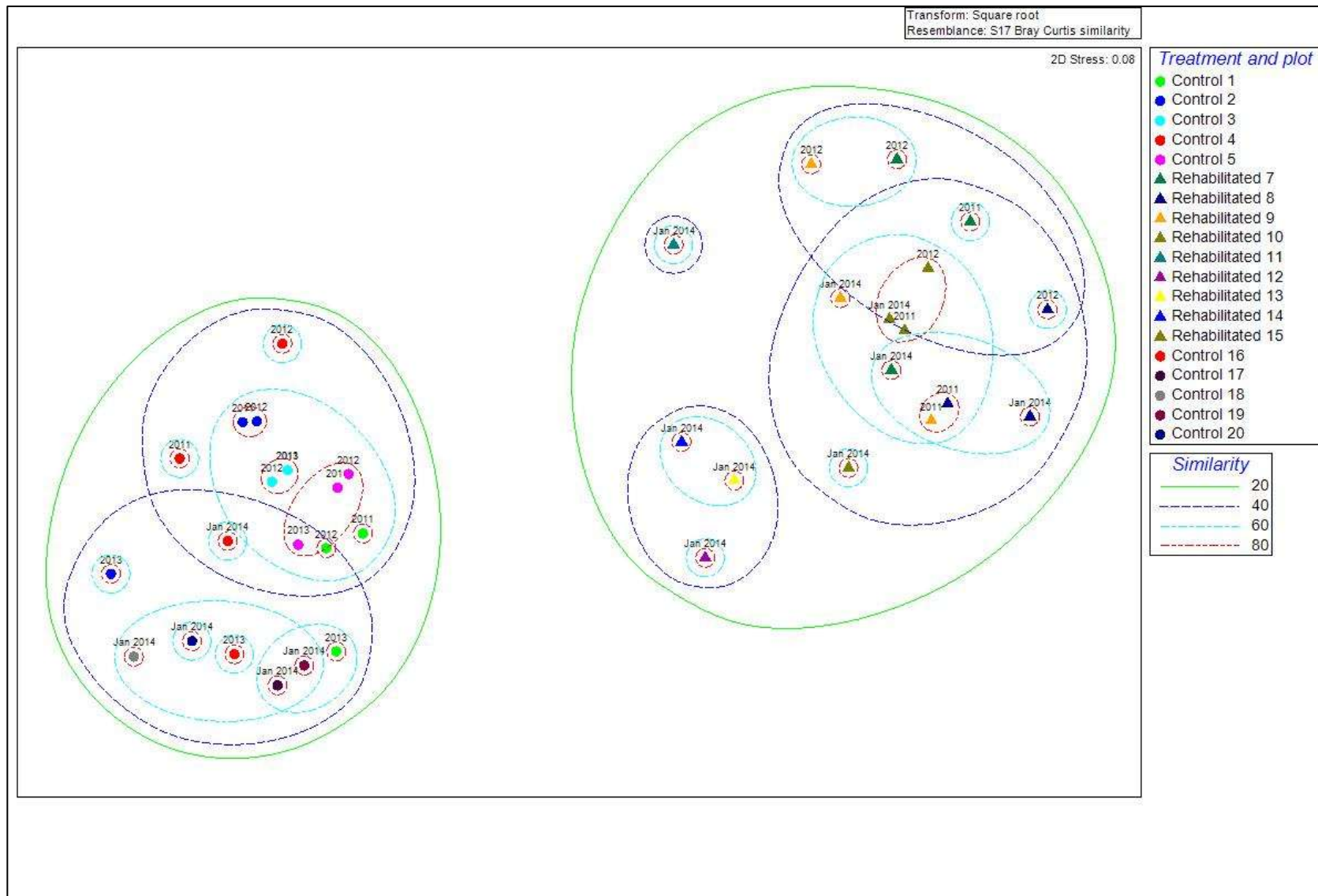


Figure 3-4: nMDS subset of midstorey and canopy species composition in monitoring plots

3.4 Tree & shrub species >1 m tall in 20 x 20 m plot

Table 3-8: Overstorey and midstorey cover scores in 20 x 20 m plots for control plots 1 to 5 (2011, 2012, 2013)

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>Acacia cheelii</i>				1	1										
<i>Acacia deanei</i>															
<i>Acacia decora</i> Western Silver Wattle	3	2	2	1	1		1	1		2		1	1	2	2
<i>Acacia leiocalyx</i>															
<i>Allocasuarina luehmannii</i> Bulloak															
<i>Alstonia constricta</i>	1			1											
<i>Amyema miquelii</i>										2	1				
<i>Beyeria viscosa</i> Pinkwood										1	1	1			
<i>Brachychiton populnea</i>															
<i>Callitris glaucophylla</i> White Cypress Pine	4	4	4	3	3	3	1		2	3	3	3	4	3	3
<i>Cassinia laevis</i> Cough Bush	1	1	1	1	1	1		1		1	1		1	2	2
<i>Casuarina cristata</i>															
<i>Dodonaea viscosa subsp. angustifolia</i> Sticky Hop-bush	1												1	1	1
<i>Dodonaea viscosa subsp. cuneata</i> Sticky Hop-bush															
<i>Eremophila</i> sp.															
<i>Eucalyptus albens</i> White Box	1	1	1												

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>Eucalyptus blakelyi</i> Blakely's Red Gum															
<i>Eucalyptus crebra</i> Narrow-leaved Ironbark	3	2	3	1	1	2	3	2	3	3	3	3	3	2	1
<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark												1			
<i>Eucalyptus melliodora</i>															
<i>Eucalyptus microcarpa</i> Inland Grey Box															
<i>Eucalyptus populnea</i>															
<i>Eucalyptus</i> sp. (Spotted Gum)															
<i>Eucalyptus</i> sp. (Ironbark)															
<i>Eucalyptus</i> sp. (Red Gum)															
<i>Eucalyptus viridis</i>															
<i>Geijera parviflora</i> Wilga	1		1				1	1	1						
* <i>Lycium ferocissimum</i> African Boxthorn															
<i>Lysiana subfalcata</i>										2					
<i>Notalaea microcarpa</i>										1					
<i>Parsonia eucalyptophylla</i> Gargaloo	1	1													
<i>Pimelea neo-anglica</i>															
<i>Pittosporum angustifolium</i>															
<i>Psydrax odoratum</i> Shiny-leaved Canthium	1	1													

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>Psydrax</i> sp.															
<i>Senna artemisioides</i>															
Total	10	7	6	6	5	3	4	4	3	8	5	5	5	5	5

*Denotes exotic species

Table 3-9: Overstorey & midstorey cover scores in 20 x 20 m plots for rehabilitated plots 6 to 10 (2011, 2012, 2013)

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
<i>Acacia cheelii</i>														2	
<i>Acacia deanei</i>															
<i>Acacia decora</i> Western Silver Wattle															
<i>Acacia leiocalyx</i>															
<i>Allocasuarina luehmannii</i> Bulloak								1			1				
<i>Alstonia constricta</i>														2	
<i>Amyema miquelii</i>															
<i>Beyeria viscosa</i> Pinkwood															
<i>Brachychiton populnea</i>															
<i>Callitris glaucophylla</i> White Cypress Pine															
<i>Cassinia laevis</i> Cough Bush															
<i>Casuarina cristata</i>						1	1		1	1		1	1		1
<i>Dodonaea viscosa subsp. angustifolia</i> Sticky Hop-bush															
<i>Dodonaea viscosa subsp. cuneata</i> Sticky Hop-bush															
<i>Eremophila</i> sp.															
<i>Eucalyptus albens</i> White Box				1			1	1		1			1		1
<i>Eucalyptus blakelyi</i> Blakely's Red Gum					1	1	1	1	2		1	2			1

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
<i>Eucalyptus crebra</i> Narrow-leaved Ironbark											1				
<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark														1	
<i>Eucalyptus melliodora</i>										1		2	1		
<i>Eucalyptus microcarpa</i> Inland Grey Box						1			1						
<i>Eucalyptus populnea</i>				1	1	1							1		2
<i>Eucalyptus</i> sp. (Spotted Gum)					1			1			1				
<i>Eucalyptus</i> sp. (Ironbark)															
<i>Eucalyptus</i> sp. (Red Gum)															
<i>Eucalyptus viridis</i>				1			1								
<i>Geijera parviflora</i> Wilga															
* <i>Lycium ferocissimum</i> African Boxthorn				1		1	1	1	1	1			1	1	
<i>Lysiana subfalcata</i>															
<i>Notalaea microcarpa</i>															
<i>Parsonia eucalyptophylla</i> Gargaloo															
<i>Pimelea neo-anglica</i>															
<i>Pittosporum angustifolium</i>															
<i>Psyrax odoratum</i> Shiny-leaved Canthium															
<i>Psyrax</i> sp.															

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
<i>Senna artemisioides</i>															
Total	0	0	0	4	3	5	5	5	4	4	4	3	5	4	4

*Denotes exotic species

Table 3-10: Overstorey and midstorey cover scores in 20 x 20 m plots for rehabilitated plots 11 to 15 and control plots 16 to 20 (2011, 2012, 2013)

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>Acacia cheelii</i>						2				
<i>Acacia deanei</i>								1		
<i>Acacia decora</i> Western Silver Wattle		3	2	3		1	1		1	
<i>Acacia leiocalyx</i>								3	2	
<i>Allocasuarina luehmannii</i> Bulloak										
<i>Alstonia constricta</i>						1				
<i>Amyema miquelii</i>										
<i>Beyeria viscosa</i> Pinkwood								2		
<i>Brachychiton populnea</i>						1				
<i>Callitris glaucophylla</i> White Cypress Pine						3	3		3	3
<i>Cassinia laevis</i> Cough Bush								1	3	
<i>Casuarina cristata</i>		1	1	1	1					
<i>Dodonaea viscosa subsp. angustifolia</i> Sticky Hop-bush										
<i>Dodonaea viscosa subsp. cuneata</i> Sticky Hop-bush		1		2						
<i>Eremophila</i> sp.		1		1						
<i>Eucalyptus albens</i> White Box		1			1		1			
<i>Eucalyptus blakelyi</i> Blakely's Red Gum	1		1	1						

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>Eucalyptus crebra</i> Narrow-leaved Ironbark	1	2				3	3		3	3
<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark										
<i>Eucalyptus melliodora</i>			2	2	1					
<i>Eucalyptus microcarpa</i> Inland Grey Box	1	2			1					
<i>Eucalyptus populnea</i>			2		2					
<i>Eucalyptus</i> sp. (Spotted Gum)										
<i>Eucalyptus</i> sp. (Ironbark)				1						
<i>Eucalyptus</i> sp. (Red Gum)										
<i>Eucalyptus viridis</i>	1									
<i>Geijera parviflora</i> Wilga										
* <i>Lycium ferocissimum</i> African Boxthorn			1							
<i>Lysiana subfalcata</i>										
<i>Notalaea microcarpa</i>								1		1
<i>Parsonia eucalyptophylla</i> Gargaloo										
<i>Pimelea neo-anglica</i>							1			1
<i>Pittosporum angustifolium</i>									1	
<i>Psydrax odoratum</i> Shiny-leaved Canthium										
<i>Psydrax</i> sp.										

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>Senna artemisioides</i>		2	1	2						
Total	4	8	7	8	5	6	5	5	6	4

*Denotes exotic species

3.5 Groundcover species – Braun-Blanquet cover scores

Table 3-11: Groundcover species cover scores in 20 x 50 m control plots 1 to 5 (2011, 2012, 2013)

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>*Abutilon</i> sp.															
<i>*Anagallis arvensis</i> Scarlet Pimpernel								2							
<i>*Aristida leptopoda</i> White Speargrass															
<i>Aristida personata</i> Purple Wire-grass	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
<i>*Aster subulatus</i> Wild Aster															
<i>Austrostipa ramossissima</i> Stout Bamboo Grass															
<i>Austrostipa scabra</i> Speargrass	2	3	2	3	4	2	4	4	2	3	2	2	3	2	2
<i>Austrostipa</i> sp.								2							
<i>Austrostipa verticillata</i>															
<i>*Bidens subalternans</i>															
<i>Boerharvia</i> sp. Tar-vine				1	1								1		
<i>Bothriochloa decipiens</i> Red Grass		2		2			2	2			2				
<i>Bothriochloa</i> sp			1						3						
<i>Brachychiton populneus</i> Kurrajong											1				

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>Brunoniella australis</i> Blue Trumpet	2			1		1						1	2		2
<i>Bulbine</i> sp.															
<i>Calotis cuneifolia</i> Purple Burr-daisy		1											1		
<i>Calotis lappulacea</i> Yellow Burr-daisy	2		1	2		1	2		2	1		1	2		
<i>Carex inversa</i> Knob Sedge															
* <i>Carthamus lanatus</i> Saffron Thistle															
* <i>Centaurea melitensis</i> Maltese Cockspur															
* <i>Centaureum erythraea</i> Common Centaury															
* <i>Centaureum</i> sp.															
<i>Chamaesyce</i> sp.			1												
<i>Cheilanthes distans</i> Bristly cloak fern					2	1				2					
<i>Cheilanthes siberi</i> Poison Mulga Fern				2	2	2	2	2	2	2	2	2	2	1	2
* <i>Chloris gayana</i> Rhodes Grass															
<i>Chloris truncata</i> Windmill Grass							2			1					
<i>Chloris ventricosa</i> Plump Windmill Grass				2	2	1				1					

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>*Chondrilla juncea</i> Skeleton Weed															
<i>Chrysocephalum apiculatum</i> Yellow Buttons					1	1					2		2	2	2
<i>Chrysocephalum semipapposum</i> Clustered Everlasting															
<i>Clematis microphylla</i> Small-leaved Clematis												1			
<i>Convolvulus graminetinus</i>															
<i>*Conyza bonariensis</i> Flaxleaf Fleabane															
<i>*Cyclospermum leptophyllum</i> Slender Celery															
<i>Cymbopogon refractus</i> Barbed Wire Grass	2	2	1	3	3		1	2		3	3	3	2	2	3
<i>Cynodon dactylon</i> Couch															
<i>Cyperus fulvus</i> Sticky Sedge				2	2	1	1								
<i>Cyperus gracilis</i> Slender Flat-sedge	1						2			2		2	2		
<i>Desmodium brachypodium</i> Large Tick-trefoil		2	2	2		2	2	2	2	2	1	2	2	1	2
<i>Desmodium varians</i> Slender Tick-trefoil	1		1	1			1			1			1		
<i>Dichanthium sericeum</i> Queensland Bluegrass															

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>Dichondra repens</i> Kidney Weed															
<i>Dichondra</i> sp. A	2			2		2	2			3		2			1
<i>Digitaria breviglumis</i>							1								
<i>Digitaria brownii</i> Cotton Panic Grass	1						1								
<i>Digitaria divaricatissima</i> Umbrella Grass							2								
<i>Echinopogon caespitosus</i> Bushy Hedge-hog Grass				1											
<i>*Echium plantagineum</i> Paterson's Curse															
<i>Einadia hastata</i> Berry Saltbush															
<i>Einadia polygonoides</i>															
<i>Elymus scaber</i>								1							
<i>Enneapogon nigricans</i> Nineawns	2							2							
<i>Enneapogon</i> sp. Nineawns				2		2	2		2	2		1	2		
<i>Enteropogon acicularis</i>			1		2			2	1		1				
<i>Eragrostis lecanuaria</i> Bristly Love-grass															
<i>Eragrostis leptostachya</i> Paddock Love-grass		1												2	1
<i>Eragrostis setifolia</i> Bristly Love-grass							2			1					

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>Erichloa</i> sp.															
<i>Eriochloa pseudoacrotricha</i> Early Spring Grass															
<i>Euchiton sphaericus</i> Cudweed										2					
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	1					1						2			
<i>Fimbristylis dichotoma</i> Common Fringe-sedge				1			1						2		
<i>Geijera parviflora</i> Wilga														1	
* <i>Glandularia aristigera</i> Mayne's Pest							1		1						
<i>Glossocardia bidens</i> Native Cobblers Pegs	2						1			1		1	2		
<i>Glycine clandestina</i> Variable glycine	1	1	2			2	1		1			1			1
<i>Glycine tabacina</i>				1									1		
* <i>Gomphrena celosioides</i> Gomphrena Weed															
<i>Gonocarpus elatus</i>					2										
<i>Gonocarpus</i> sp.				1											
<i>Goodenia glabra</i>	1		1							1			1		
<i>Goodenia hederacea</i> Forest goodenia															
<i>Haloragis heterophylla</i> Rough Raspwort													1		
<i>Hibbertia obtusifolia</i> Hoary Guniea Flower															

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>Hypericum gramineum</i> Small St John's Wort													1		
<i>Indigofera adesmiifolia</i> Tick indigo															
<i>Juncus sp.</i>															
* <i>Lactuca serriola</i> Prickly lettuce															
<i>Laxmannia gracilis</i> Slender Wire Lily															
<i>Leiocarpa panaetoides</i> Wooly Buttons															
* <i>Lepidium africanum</i>								2							
* <i>Lepidium bonariense</i>															
<i>Leptochloa sp.</i>															
<i>Leptorhynchos panaetoides</i>															
* <i>Linaria arvensis</i>	1			1						2					
* <i>Lolium rigidum</i> Wimmera Ryegrass															
<i>Lomandra filiformis</i> Savannah Blue		1				1		2				1		2	
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>		1								1	1	1			1
<i>Maireana microphylla</i> Small-leaf Bluebush				1	1			1	1						
* <i>Malvastrum americanum</i> Spiked Malvastrum															
<i>Medicago polymorpha</i> Burr Medic															

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>*Medicago sativa</i> Lucerne															
<i>*Medicago sp.</i>															
<i>*Misopates orontium</i> Lesser Snapdragon							1		1						
<i>Olearia</i> spp. aff. <i>elliptica</i>															
<i>Oncinocalyx betchei</i>	1	1		2	2	2	1	2	1			1			
<i>Opercularia diphylla</i>															
<i>*Opuntia stricta</i> Common Prickly Pear				1	1	1				1	1	1			
<i>Oxalis</i> sp. Soursob												1	1		
<i>Panicum effusum</i> Hairy Panic		2		3	2		3	1		2					
<i>*Panicum maximum</i>															
<i>Paspalidium</i> sp.	1	2		2		2			2	1		2	2		
<i>*Petrorhagia nanteuillii</i> Proliferous Pink				2			2	2							
<i>Phyllanthus virgatus</i>				1						1		1	1		
<i>Pimelea</i> sp.				1											
<i>Poa sieberiana</i>															
<i>*Polygonum aviculare</i> Wireweed															
<i>*Rapistrum rugosum</i> Turnip Weed															
<i>Rostellularia adscendens</i> Pink Tongues	2			2									2		1

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>Rumex brownii</i> Swamp dock										1					
* <i>Rumex crispus</i> Curled Dock															
<i>Rumex crystallinus</i> Shiny Dock															
<i>Rytidosperma longifolia</i>															
<i>Rytidosperma racemosum</i> var. <i>obtusatum</i>	2									2	1		2		
<i>Rytidosperma</i> sp. Wallaby Grass			2			2									
<i>Salsola kali</i>									1						
* <i>Schukuhria pinnata</i> Dwarf Marigold							2								
<i>Sclerolaena birchii</i> Galvanised Burr															
<i>Sclerolaena muricata</i> Black Rolypoly															
<i>Scutellaria humilus</i> Dwarf Skullcap										2	2				
<i>Senecio quadridentatus</i> Cotton Fireweed										1					
* <i>Setaria incrassata</i> Purple Pigeon Grass															
<i>Sida corrugata</i> Corrugated Sida													1		
<i>Sida cunninghamii</i> Ridged Sida								1		1		2			
<i>Sida</i> sp.												2			

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>*Sida spinosa</i>										1					
<i>Sida subspicata</i>	1		2	2		2	2	1	2	2					
<i>*Sisymbrium orientale</i> Indian Hedge Mustard															
<i>Solanum cinereum</i> Narrawa Burr												1			
<i>Solanum esuriale</i> Quena															
<i>*Solanum nigrum</i> Black-berry Nightshade															
<i>Solanum parvifolium</i>	1	2					1		2						
<i>*Sonchus oleraceus</i> Common Sowthistle															
<i>Sporobolus creber</i> Slender Rat's Tail Grass							1							2	
<i>Stackhousia viminea</i> Slender Stackhousia				1	1	2									
<i>Swainsona galegifolia</i> Smooth Darling-pea														2	1
<i>Tephrosia brachyodon</i>												2	1		
<i>Themeda australis</i> Kangaroo Grass														2	
<i>*Trifolium arvense</i> Haresfoot Clover															
<i>*Trifolium campestre</i> Hop Clover															
<i>*Urochloa panicoides</i> Urochloa Grass															

Species	Control 1														
	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
<i>Verbena bonariensis</i> Purpletop															
* <i>Verbena caracasana</i>															
<i>Verbena gaudichaudii</i>															
* <i>Verbena litoralis</i>															
* <i>Vicia</i> sp.															
<i>Vittadinia cuneata</i> Fuzzweed								1			2	1			
<i>Vittadinia dissecta</i> Dissected New Holland daisy													1		
<i>Vittadinia muelleri</i>				1											
<i>Vittadinia</i> sp. Fuzzweed	2						1			2			1		
<i>Wahlenbergia communis</i> Tufted Bluebell	2			2	1		1	1		2					
<i>Wahlenbergia</i> sp. Bluebell													1		
<i>Xerochrysum bracteatum</i> Golden Everlasting				2			3	1							
<i>Xerochrysum viscosum</i> Sticky Everlasting										1					
<i>Zornia dyctiocarpa</i> Zornia				1											
Total species	23	14	13	34	17	21	32	22	17	33	14	26	29	12	13

*Denotes exotic species

Braun-Blanquet cover scores: 1=projected foliage cover <5% of the plot, plants uncommon; 2=projected foliage cover <5% of the plot, plants common; 3=projected foliage cover 6-25% of the plot; 4=projected foliage cover of 26-50% of the plot; 5=projected foliage cover of 51-75% of the plot; 6=projected foliage cover of 76-100% of the plot.

Table 3-12: Groundcover species cover scores in 20 x 50 m rehabilitated plots 6 to 10 (2011, 2012, 2013)

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
<i>*Abutilon</i> sp.															
<i>*Anagallis arvensis</i> Scarlet Pimpernel		2	2			2		2			2			1	1
<i>*Aristida leptopoda</i> White Speargrass									1						
<i>Aristida personata</i> Purple Wire-grass								3	2			1			1
<i>*Aster subulatus</i> Wild Aster	1				2			1						1	
<i>Austrostipa ramossissima</i> Stout Bamboo Grass															
<i>Austrostipa scabra</i> Speargrass								2	2		1				
<i>Austrostipa</i> sp.															
<i>Austrostipa verticillata</i>															
<i>*Bidens subalternans</i>															
<i>Boerharvia</i> sp. Tar-vine															
<i>Bothriochloa decipiens</i> Red Grass							3	4	3						
<i>Bothriochloa</i> sp															
<i>Brachychiton populneus</i> Kurrajong															
<i>Brunoniella australis</i> Blue Trumpet															
<i>Bulbine</i> sp.															

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
<i>Calotis cuneifolia</i> Purple Burr-daisy															
<i>Calotis lappulacea</i> Yellow Burr-daisy	1	2	1				1		2						
<i>Carex inversa</i> Knob Sedge	1								2						
* <i>Carthamus lanatus</i> Saffron Thistle	2	1	1	1	2	2				2		2			
* <i>Centaurea melitensis</i> Maltese Cockspur								2	2						
* <i>Centaureum erythraea</i> Common Centaury														1	
* <i>Centaureum</i> sp.	2												1		
<i>Chamaesyce</i> sp.									1						
<i>Cheilanthes distans</i> Bristly cloak fern															
<i>Cheilanthes siberi</i> Poison Mulga Fern															
* <i>Chloris gayana</i> Rhodes Grass	4	5	4	4	5	5		2	2	4	5	4	5	6	4
<i>Chloris truncata</i> Windmill Grass							2								
<i>Chloris ventricosa</i> Plump Windmill Grass															
* <i>Chondrilla juncea</i> Skeleton Weed				1		1									
<i>Chrysocephalum apiculatum</i> Yellow Buttons															

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
<i>Chrysocephalum semipapposum</i> Clustered Everlasting															
<i>Clematis microphylla</i> Small-leaved Clematis															
<i>Convolvulus graminetinus</i>			1				1			1			1		
* <i>Conyza bonariensis</i> Flaxleaf Fleabane		1	2	2		1	2			2		1	2		1
* <i>Cyclospermum leptophyllum</i> Slender Celery	1		2		1									1	
<i>Cymbopogon refractus</i> Barbed Wire Grass							2			1					
<i>Cynodon dactylon</i> Couch	2														
<i>Cyperus fulvus</i> Sticky Sedge															
<i>Cyperus gracilis</i> Slender Flat-sedge															
<i>Desmodium brachypodium</i> Large Tick-trefoil															
<i>Desmodium varians</i> Slender Tick-trefoil															
<i>Dichanthium sericeum</i> Queensland Bluegrass							2								
<i>Dichondra repens</i> Kidney Weed	1					1									
<i>Dichondra</i> sp. A		1													
<i>Digitaria breviglumis</i>															

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
<i>Digitaria brownii</i> Cotton Panic Grass															
<i>Digitaria divaricatissima</i> Umbrella Grass							3								
<i>Echinopogon caespitosus</i> Bushy Hedge-hog Grass															
* <i>Echium plantagineum</i> Paterson's Curse		2									1				
<i>Einadia hastata</i> Berry Saltbush															
<i>Einadia polygonoides</i>		1					1			1					
<i>Elymus scaber</i>															
<i>Enneapogon nigricans</i> Nineawns															
<i>Enneapogon</i> sp. Nineawns									2						
<i>Enteropogon acicularis</i>															
<i>Eragrostis lecanuaria</i> Bristly Love-grass															
<i>Eragrostis leptostachya</i> Paddock Love-grass															
<i>Eragrostis setifolia</i> Bristly Love-grass															
<i>Erichloa</i> sp.															
<i>Eriochloa pseudoacrotricha</i> Early Spring Grass	2						3			2					
<i>Euchiton sphaericus</i> Cudweed	1									1					

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>															
<i>Fimbristylis dichotoma</i> Common Fringe-sedge															
<i>Geijera parviflora</i> Wilga															
* <i>Glandularia aristigera</i> Mayne's Pest	3	3	3	3	3	2	2	3	3	2	3	2	2	3	2
<i>Glossocardia bidens</i> Native Cobblers Pegs															
<i>Glycine clandestina</i> Variable glycine							2						1		
<i>Glycine tabacina</i>															
* <i>Gomphrena celosioides</i> Gomphrena Weed								1							
<i>Gonocarpus elatus</i>															
<i>Gonocarpus</i> sp.															
<i>Goodenia glabra</i>															
<i>Goodenia hederacea</i> Forest goodenia															
<i>Haloragis heterophylla</i> Rough Raspwort															
<i>Hibbertia obtusifolia</i> Hoary Guniea Flower															
<i>Hypericum gramineum</i> Small St John's Wort															
<i>Indigofera adesmiifolia</i> Tick indigo															
<i>Juncus</i> sp.												1			

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
<i>*Lactuca serriola</i> Prickly lettuce	2	2	1	1		1	2	1	1				2		
<i>Laxmannia gracilis</i> Slender Wire Lily															
<i>Leiocarpa panaetoides</i> Woolly Buttons		2	1	1				2		1	2	2	1	2	1
<i>*Lepidium africanum</i>	2	1						1	1						
<i>*Lepidium bonariense</i>	1						2								
<i>Leptochloa</i> sp.															
<i>Leptorhynchos panaetoides</i>															
<i>*Linaria arvensis</i>															
<i>*Lolium rigidum</i> Wimmera Ryegrass		2									2				
<i>Lomandra filiformis</i> Savannah Blue															
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>															
<i>Maireana microphylla</i> Small-leaf Bluebush							3	3	3	1	1	1			
<i>*Malvastrum americanum</i> Spiked Malvastrum							1								
<i>Medicago polymorpha</i> Burr Medic										1					
<i>*Medicago sativa</i> Lucerne							2	2							
<i>*Medicago</i> sp.		2						2					1		
<i>*Misopates orontium</i> Lesser Snapdragon									1						

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
<i>Olearia</i> spp. aff. <i>elliptica</i>															
<i>Oncinocalyx betchei</i>															
<i>Opercularia diphylla</i>															
* <i>Opuntia stricta</i> Common Prickly Pear															
<i>Oxalis</i> sp. Soursob							1								
<i>Panicum effusum</i> Hairy Panic							1								
* <i>Panicum maximum</i>	3			2		1				3		2	3		2
<i>Paspalidium</i> sp.							1		1						
* <i>Petrorhagia nanteuillii</i> Proliferous Pink															
<i>Phyllanthus virgatus</i>															
<i>Pimelea</i> sp.															
<i>Poa sieberiana</i>															
* <i>Polygonum aviculare</i> Wireweed	2														
* <i>Rapistrum rugosum</i> Turnip Weed		1	2		1		1	1	2	2	2	2			2
<i>Rostellularia adscendens</i> Pink Tongues															
<i>Rumex brownii</i> Swamp dock											1	1	1		
* <i>Rumex crispus</i> Curled Dock	1	1													
<i>Rumex crystallinus</i> Shiny Dock		1													

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
<i>Rytidosperma longifolia</i>															
<i>Rytidosperma racemosum</i> var. <i>obtusatum</i>															
<i>Rytidosperma</i> sp. Wallaby Grass				1			2		1				1		1
<i>Salsola kali</i>				1											
* <i>Schukuhria pinnata</i> Dwarf Marigold										2			2		
<i>Sclerolaena birchii</i> Galvanised Burr	2	1	1	1	1		1	1	1	1					
<i>Sclerolaena muricata</i> Black Rolypoly															
<i>Scutellaria humilis</i> Dwarf Skullcap															
<i>Senecio quadridentatus</i> Cotton Fireweed	1	2	1	1	2	1				1	2				
* <i>Setaria incrassata</i> Purple Pigeon Grass	2			3						3			3		2
<i>Sida corrugata</i> Corrugated Sida		1													
<i>Sida cunninghamii</i> Ridged Sida		1							1						
<i>Sida</i> sp.															
* <i>Sida spinosa</i>	2		2	2			1		2			2			2
<i>Sida subspicata</i>			1							1		1			
* <i>Sisymbrium orientale</i> Indian Hedge Mustard								1							

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
<i>Solanum cinereum</i> Narrawa Burr															
<i>Solanum esuriale</i> Quena															
* <i>Solanum nigrum</i> Black-berry Nightshade	1					1				1					
<i>Solanum parvifolium</i>															
* <i>Sonchus oleraceus</i> Common Sowthistle													2		
<i>Sporobolus creber</i> Slender Rat's Tail Grass							1								
<i>Stackhousia viminea</i> Slender Stackhousia															
<i>Swainsona galegifolia</i> Smooth Darling-pea															
<i>Tephrosia brachyodon</i>															
<i>Themeda australis</i> Kangaroo Grass															
* <i>Trifolium arvense</i> Haresfoot Clover				1		2									
* <i>Trifolium campestre</i> Hop Clover		2						2							
* <i>Urochloa panicoides</i> Urochloa Grass										1					
<i>Verbena bonariensis</i> Purpletop			2												
* <i>Verbena caracasana</i>		2			1										
<i>Verbena gaudichaudii</i>						1	1			1	1	1			

Species	Rehab Zone 2 (rehabilitated 2007/2008)														
	Plot 6			Plot 7			Plot 8			Plot 9			Plot 10		
	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14	2011	2012	Jan-14
* <i>Verbena litoralis</i>	1														
* <i>Vicia</i> sp.				1	1	1		1							
<i>Vittadinia cuneata</i> Fuzzweed					1	1		1	2						
<i>Vittadinia dissecta</i> Dissected New Holland daisy															
<i>Vittadinia muelleri</i>			2											1	1
<i>Vittadinia</i> sp. Fuzzweed	2			2			1			1		2	2		
<i>Wahlenbergia communis</i> Tufted Bluebell	1						1						1		
<i>Wahlenbergia</i> sp. Bluebell															
<i>Xerochrysum bracteatum</i> Golden Everlasting	1			1			1								
<i>Xerochrysum viscosum</i> Sticky Everlasting															
<i>Zornia dyctiocarpa</i> Zornia															
Total species	27	23	17	18	11	15	29	21	22	23	12	15	17	8	12

*Denotes exotic species

Braun-Blanquet cover scores: 1=projected foliage cover <5% of the plot, plants uncommon; 2=projected foliage cover <5% of the plot, plants common; 3=projected foliage cover 6-25% of the plot; 4=projected foliage cover of 26-50% of the plot; 5=projected foliage cover of 51-75% of the plot; 6=projected foliage cover of 76-100% of the plot.

Table 3-13: Groundcover species cover scores in 20 x 50 m control plots 1 to 5 (2011, 2012, 2013)

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>*Abutilon</i> sp.		3	2	2	1					
<i>*Anagallis arvensis</i> Scarlet Pimpernel										
<i>*Aristida leptopoda</i> White Speargrass		1								
<i>Aristida personata</i> Purple Wire-grass	3			2	1	2	2	3	3	3
<i>*Aster subulatus</i> Wild Aster	1									
<i>Austrostipa ramossissima</i> Stout Bamboo Grass	2			1						
<i>Austrostipa scabra</i> Speargrass	2	1	2			2		2	2	2
<i>Austrostipa</i> sp.										
<i>Austrostipa verticillata</i>						2				
<i>*Bidens subalternans</i>	2									
<i>Boerharvia</i> sp. Tar-vine			1	1						
<i>Bothriochloa decipiens</i> Red Grass			2	2	2					
<i>Bothriochloa</i> sp	2	2							2	
<i>Brachychiton populneus</i> Kurrajong										
<i>Brunoniella australis</i> Blue Trumpet							1			
<i>Bulbine</i> sp.										1

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>Calotis cuneifolia</i> Purple Burr-daisy						1		1		
<i>Calotis lappulacea</i> Yellow Burr-daisy	1			1						1
<i>Carex inversa</i> Knob Sedge	1			2						
* <i>Carthamus lanatus</i> Saffron Thistle	2				1					
* <i>Centaurea melitensis</i> Maltese Cockspur										
* <i>Centaureum erythraea</i> Common Centaury										
* <i>Centaureum</i> sp.										
<i>Chamaesyce</i> sp.			1							
<i>Cheilanthes distans</i> Bristly cloak fern										
<i>Cheilanthes siberi</i> Poison Mulga Fern						1	1	2		2
* <i>Chloris gayana</i> Rhodes Grass			1		2					
<i>Chloris truncata</i> Windmill Grass										
<i>Chloris ventricosa</i> Plump Windmill Grass		1	2							
* <i>Chondrilla juncea</i> Skeleton Weed	1									
<i>Chrysocephalum apiculatum</i> Yellow Buttons					1			2		1

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>Chrysocephalum semipapposum</i> Clustered Everlasting						1	2			
<i>Clematis microphylla</i> Small-leaved Clematis										
<i>Convolvulus graminetinus</i>										
* <i>Conyza bonariensis</i> Flaxleaf Fleabane										
* <i>Cyclospermum leptophyllum</i> Slender Celery										
<i>Cymbopogon refractus</i> Barbed Wire Grass		2			2	2	2	2	2	2
<i>Cynodon dactylon</i> Couch										
<i>Cyperus fulvus</i> Sticky Sedge								1		
<i>Cyperus gracilis</i> Slender Flat-sedge							1			
<i>Desmodium brachypodium</i> Large Tick-trefoil		1			2	2	3	2	2	3
<i>Desmodium varians</i> Slender Tick-trefoil						1				
<i>Dichanthium sericeum</i> Queensland Bluegrass										
<i>Dichondra repens</i> Kidney Weed										
<i>Dichondra</i> sp. A						1				2
<i>Digitaria breviglumis</i>										

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>Digitaria brownii</i> Cotton Panic Grass										
<i>Digitaria divaricatissima</i> Umbrella Grass										
<i>Echinopogon caespitosus</i> Bushy Hedge-hog Grass										
* <i>Echium plantagineum</i> Paterson's Curse	2									
<i>Einadia hastata</i> Berry Saltbush						1				
<i>Einadia polygonoides</i>	2	1		1						
<i>Elymus scaber</i>										
<i>Enneapogon nigricans</i> Nineawns										
<i>Enneapogon</i> sp. Nineawns					1	2	1		1	2
<i>Enteropogon acicularis</i>										
<i>Eragrostis lecanuaria</i> Bristly Love-grass										
<i>Eragrostis leptostachya</i> Paddock Love-grass										
<i>Eragrostis setifolia</i> Bristly Love-grass										
<i>Erichloa</i> sp.	2									
<i>Eriochloa pseudoacrotricha</i> Early Spring Grass										
<i>Euchiton sphaericus</i> Cudweed										

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>									1	
<i>Fimbristylis dichotoma</i> Common Fringe-sedge										
<i>Geijera parviflora</i> Wilga										
* <i>Glandularia aristigera</i> Mayne's Pest	2	2	2	2	3					
<i>Glossocardia bidens</i> Native Cobblers Pegs									1	
<i>Glycine clandestina</i> Variable glycine			1							
<i>Glycine tabacina</i>		1		1						
* <i>Gomphrena celosioides</i> Gomphrena Weed										
<i>Gonocarpus elatus</i>										
<i>Gonocarpus</i> sp.										
<i>Goodenia glabra</i>										
<i>Goodenia hederacea</i> Forest goodenia								1		
<i>Haloragis heterophylla</i> Rough Raspwort										
<i>Hibbertia obtusifolia</i> Hoary Guniea Flower						1				
<i>Hypericum gramineum</i> Small St John's Wort										
<i>Indigofera adesmiifolia</i> Tick indigo						1				
<i>Juncus</i> sp.	1									

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>*Lactuca serriola</i> Prickly lettuce										
<i>Laxmannia gracilis</i> Slender Wire Lily								1		
<i>Leiocarpa panaetioides</i> Wooly Buttons	1									
<i>*Lepidium africanum</i>	1									
<i>*Lepidium bonariense</i>										
<i>Leptochloa sp.</i>							2			
<i>Leptorhynchos panaetioides</i>										
<i>*Linaria arvensis</i>										
<i>*Lolium rigidum</i> Wimmera Ryegrass										
<i>Lomandra filiformis</i> Savannah Blue						1		1		
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>						1	1	1	1	
<i>Maireana microphylla</i> Small-leaf Bluebush			2							
<i>*Malvastrum americanum</i> Spiked Malvastrum										
<i>Medicago polymorpha</i> Burr Medic										
<i>*Medicago sativa</i> Lucerne										
<i>*Medicago sp.</i>										
<i>*Misopates orontium</i> Lesser Snapdragon										

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>Olearia</i> spp. aff. <i>elliptica</i>									1	
<i>Oncinocalyx betchei</i>							1			1
<i>Opercularia diphylla</i>									1	
* <i>Opuntia stricta</i> Common Prickly Pear						1	1			2
<i>Oxalis</i> sp. Soursob										
<i>Panicum effusum</i> Hairy Panic						1				
* <i>Panicum maximum</i>										
<i>Paspalidium</i> sp.		2	2	2		2	2		2	2
* <i>Petrorhagia nanteuillii</i> Proliferous Pink										
<i>Phyllanthus virgatus</i>										
<i>Pimelea</i> sp.										
<i>Poa sieberiana</i>							1			1
* <i>Polygonum aviculare</i> Wireweed										
* <i>Rapistrum rugosum</i> Turnip Weed	3	2		2	2					
<i>Rostellularia adscendens</i> Pink Tongues						1			1	2
<i>Rumex brownii</i> Swamp dock										
* <i>Rumex crispus</i> Curled Dock										
<i>Rumex crystallinus</i> Shiny Dock										

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>Rytidosperma longifolia</i>						3		1		
<i>Rytidosperma racemosum</i> var. <i>obtusatum</i>										
<i>Rytidosperma</i> sp. Wallaby Grass	2									
<i>Salsola kali</i>	1			1						
* <i>Schukuhria pinnata</i> Dwarf Marigold										
<i>Sclerolaena birchii</i> Galvanised Burr			1							
<i>Sclerolaena muricata</i> Black Rolypoly		1								
<i>Scutellaria humilis</i> Dwarf Skullcap										
<i>Senecio quadridentatus</i> Cotton Fireweed	2									
* <i>Setaria incrassata</i> Purple Pigeon Grass										
<i>Sida corrugata</i> Corrugated Sida										
<i>Sida cunninghamii</i> Ridged Sida										
<i>Sida</i> sp.										
* <i>Sida spinosa</i>	3		2	2	3					
<i>Sida subspicata</i>	1	1	2	2	2					
* <i>Sisymbrium orientale</i> Indian Hedge Mustard	2									
<i>Solanum cinereum</i> Narrawa Burr										

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>Solanum esuriale</i> Quena			2	2						
* <i>Solanum nigrum</i> Black-berry Nightshade										
<i>Solanum parvifolium</i>						1	2	1		1
* <i>Sonchus oleraceus</i> Common Sowthistle										
<i>Sporobolus creber</i> Slender Rat's Tail Grass					1					
<i>Stackhousia viminea</i> Slender Stackhousia										
<i>Swainsona galegifolia</i> Smooth Darling-pea										
<i>Tephrosia brachyodon</i>										
<i>Themeda australis</i> Kangaroo Grass										
* <i>Trifolium arvense</i> Haresfoot Clover										
* <i>Trifolium campestre</i> Hop Clover										
* <i>Urochloa panicoides</i> Urochloa Grass										
<i>Verbena bonariensis</i> Purpletop					1					
* <i>Verbena caracasana</i>										
<i>Verbena gaudichaudii</i>										
* <i>Verbena litoralis</i>										
* <i>Vicia</i> sp.										

Species	Rehab Zone 3 & 4 (rehabilitated 2008/2009)					Control (LSF)				
	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20
	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14	Jan-14
<i>Vittadinia cuneata</i> Fuzzweed	2	1	1	2	2	1				
<i>Vittadinia dissecta</i> Dissected New Holland daisy										
<i>Vittadinia muelleri</i>										
<i>Vittadinia</i> sp. Fuzzweed										
<i>Wahlenbergia communis</i> Tufted Bluebell										
<i>Wahlenbergia</i> sp. Bluebell										
<i>Xerochrysum bracteatum</i> Golden Everlasting										
<i>Xerochrysum viscosum</i> Sticky Everlasting										
<i>Zornia dyctiocarpa</i> Zornia										
Total species	25	15	16	17	16	23	15	14	13	16

*Denotes exotic species

Braun-Blanquet cover scores: 1=projected foliage cover <5% of the plot, plants uncommon; 2=projected foliage cover <5% of the plot, plants common; 3=projected foliage cover 6-25% of the plot; 4=projected foliage cover of 26-50% of the plot; 5=projected foliage cover of 51-75% of the plot; 6=projected foliage cover of 76-100% of the plot.

3.6 Native groundcover species composition data analysis

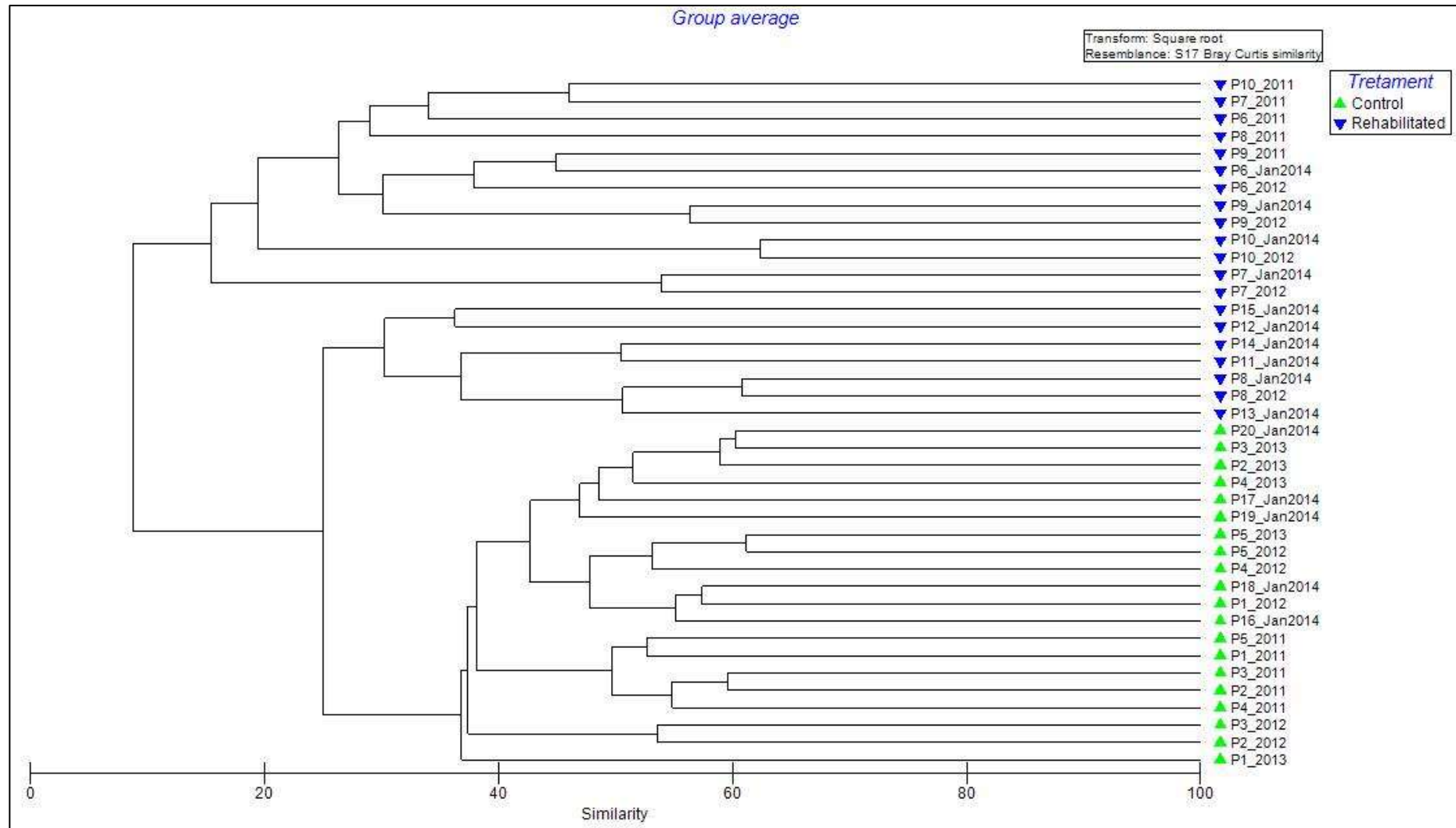


Figure 3-5: Cluster analysis of native groundcover species abundance in monitoring plots for 2011, 2012 and 2013

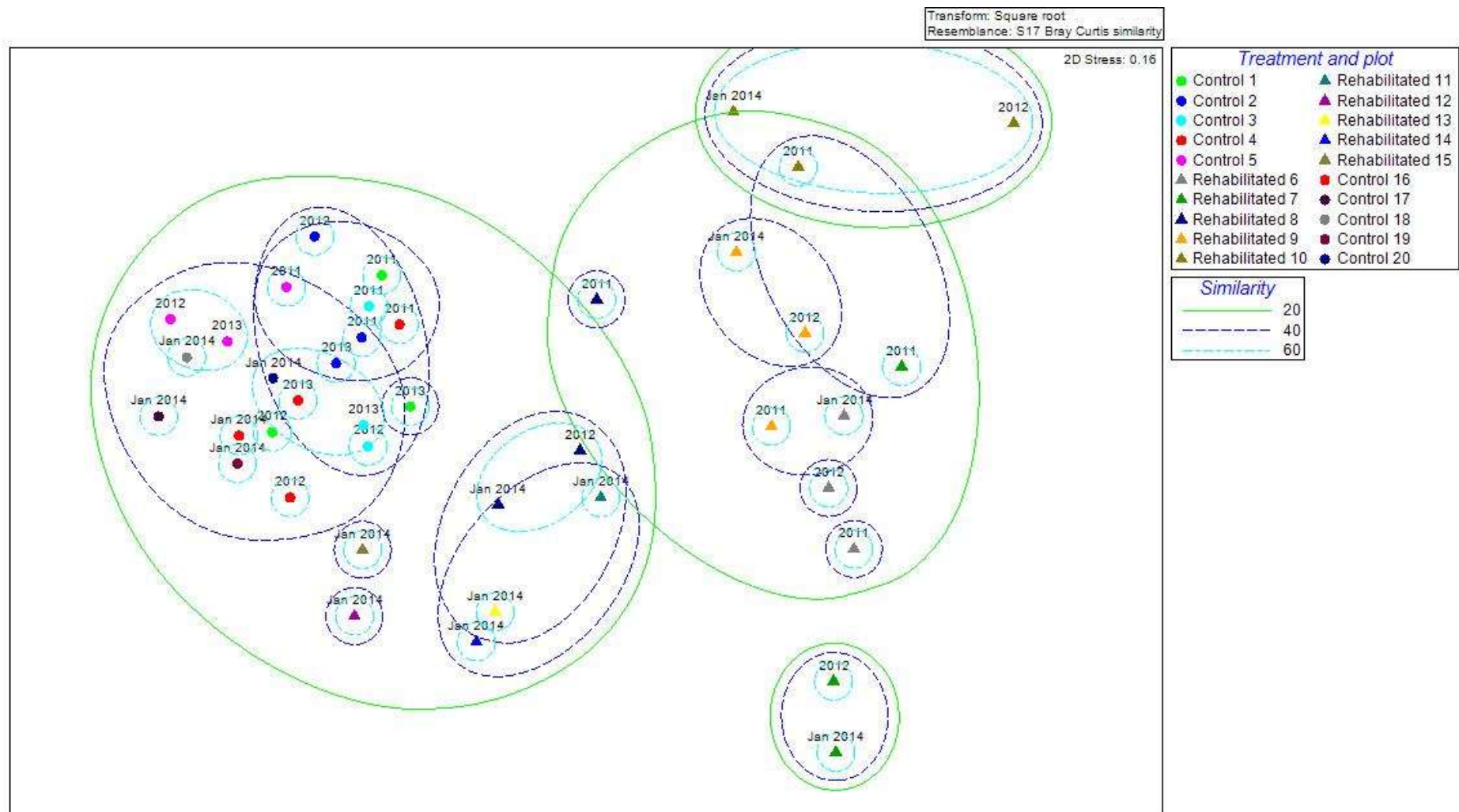


Figure 3-6: Non-metric multi-dimensional scaling plot for native groundcover species abundance in monitoring plots for 2011, 2012 and 2013

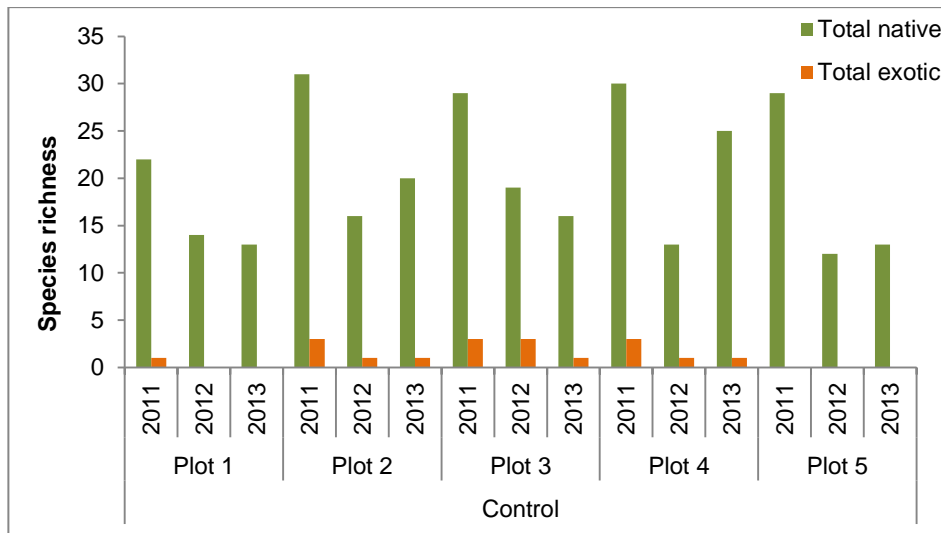


Figure 3-7: Groundcover species richness at Control 1 monitoring plots (2011, 2012, 2013)

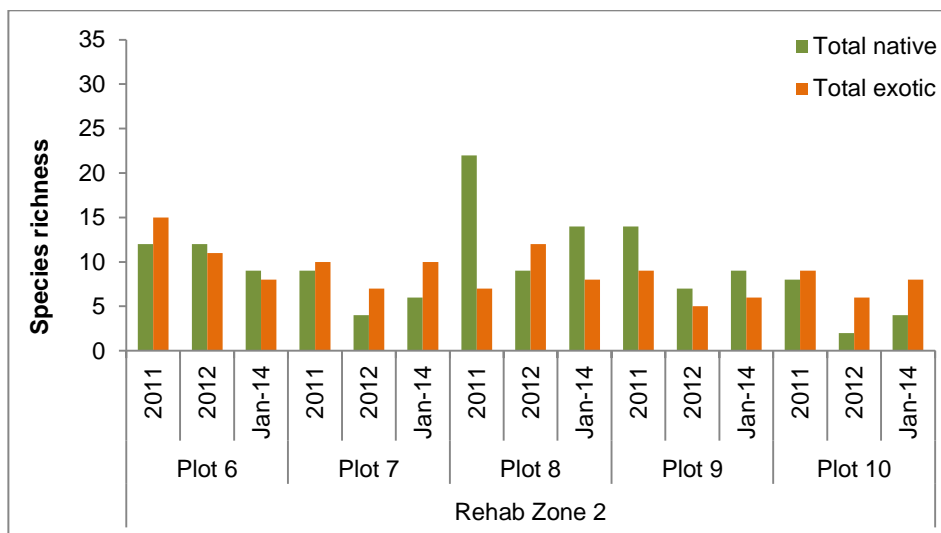


Figure 3-8: Groundcover species richness at Rehab Zone 2 (rehabilitated 2007/2008) (2011, 2012, 2013)

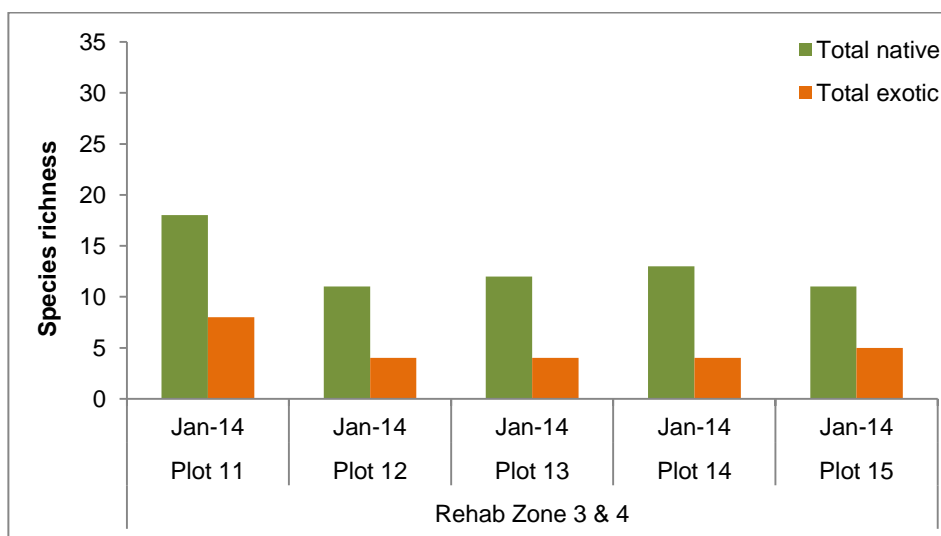


Figure 3-9: Groundcover species richness at Rehab Zone 3 & 4 (rehabilitated 2008/2009) (January 2014)

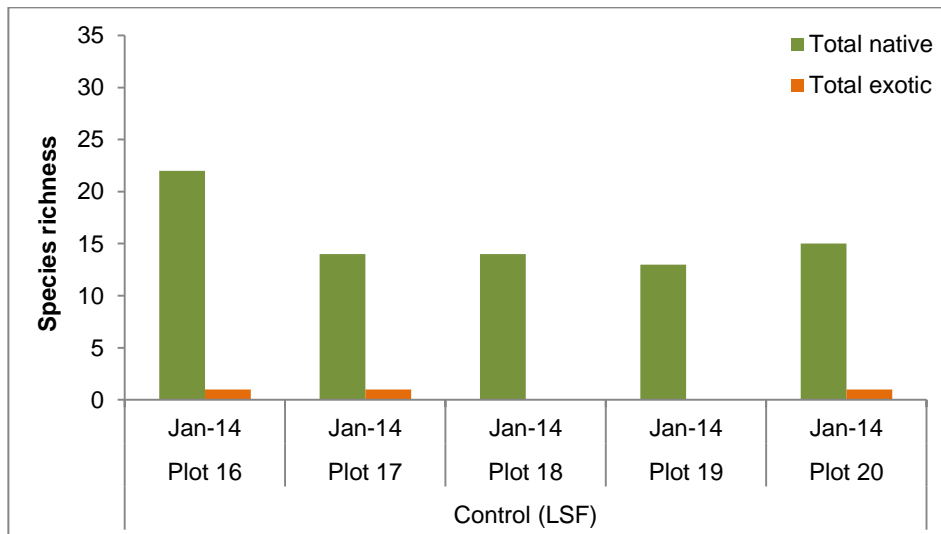


Figure 3-10: Groundcover species richness at Control (LSF) (January 2014)

3.7 Groundcover composition

Table 3-14: Groundcover composition (2011, 2012, 2013)

Zone	Plot	Native species cover (%)			Exotic species cover (%)			Leaf litter cover (%)			Cryptogam cover (%)			Bare ground (%)			Rocks (%)		
		2011	2012	2013/14	2011	2012	2013/14	2011	2012	2013/14	2011	2012	2013/14	2011	2012	2013/14	2011	2012	2013/14
Control 1	1	44	60	24	0	0	0	34	38	56	0	0	0	22	2	20	0	0	0
	2	50	70	36	0	0	4	28	24	42	2	4	8	20	2	10	0	0	0
	3	46	68	30	4	6	4	36	24	58	0	2	0	14	0	8	0	0	0
	4	44	62	46	0	0	0	38	36	46	0	2	0	0	0	8	18	0	0
	5	16	50	40	0	0	0	30	38	50	18	10	2	34	0	6	2	2	2
Rehab zone 2	6	16	0	4	48	80	54	10	20	40	0	0	0	26	0	2	0	0	0
	7	2	0	0	72	84	52	8	14	46	0	0	0	18	2	2	0	0	0
	8	38	80	14	30	2	22	10	18	44	0	0	0	22	0	18	0	0	2
	9	8	4	0	54	72	28	14	20	38	0	0	0	24	4	34	0	0	0
	10	0	0	0	74	68	38	4	32	62	0	0	0	22	0	0	0	0	0
Rehab zone 3 & 4	11	Plot established for 2013 monitoring		26	Plot established for 2013 monitoring		26	Plot established for 2013 monitoring		56	Plot established for 2013 monitoring		0	Plot established for 2013 monitoring		4	Plot established for 2013 monitoring		0
	12			6															
	13			14															
	14			26															
	15			14															
Control (LSF)	16			14															
	17			40															
	18			12															
	19			20															

Zone	Plot	Native species cover (%)			Exotic species cover (%)			Leaf litter cover (%)			Cryptogam cover (%)			Bare ground (%)			Rocks (%)		
		2011	2012	2013/14	2011	2012	2013/14	2011	2012	2013/14	2011	2012	2013/14	2011	2012	2013/14	2011	2012	2013/14
	20			36			2			52			6			4			0
Min (all sites)		0	0	0	0	0	0	4	14	26	0	0	0	0	0	0	0	0	0
Max (all sites)		50	80	46	74	84	54	38	38	68	18	10	8	34	4	42	18	2	4
Average		26	39	20	28	31	14	21	26	50	2	2	1	20	1	15	2	0	1

Table 3-15: Groundcover ANOVA results (note cells shaded green indicate no significant temporal change ($p>0.05$) within zones; cells shaded red indicate significant ($p<0.05$) temporal change within zones)

Monitoring zone		Control 1			Rehab zone 2			Rehab zone 3 & 4	Control (LSF)
Monitoring year		2011	2012	2013	2011	2012	2013	2013	2013
Native cover (%)	Mean	40 ^A	62	35.2 ^A	12.8	16.8	3.6	17.2	24.4
	Standard deviation	13.64	7.87	8.56	15.4	35.37	6.07	8.67	12.84
	P-value	0.00			0.65			n/a	n/a
Exotic cover (%)	Mean	0.8	1.2	1.6	55.6	61.2	38.8	15.2	0.4
	Standard deviation	1.79	2.68	2.19	18.19	33.69	14.18	7.43	0.89
	P-value	0.86			0.33			n/a	n/a
Leaf litter (%)	Mean	33.2 ^A	32 ^A	50.4	9.2 ^A	20.8 ^A	46	43.6	58
	Standard deviation	4.15	7.35	6.69	3.63	6.72	9.49	12.28	6.78
	P-value	0.00			0.00			n/a	n/a
Bare ground (%)	Mean	18 ^A	0.8 ^B	10.4 ^{AB}	22.4 ^A	1.2 ^B	11.2 ^{AB}	25.2	12.4
	Standard deviation	12.41	1.1	5.55	2.97	1.79	14.67	14.74	11.44
	P-value	0.02			0.01			n/a	n/a

Common superscript indicates no significant difference in means ($p>0.05$)

Table 3-16: Summary statistics for groundcover composition recorded in 2013. (note cells shaded green indicate no significant difference ($p>0.05$) between zones; cells shaded red indicate significant ($p<0.05$) difference between zones)

	Control 1	Rehab zone 2	Rehab Zone 3&4	Control LSF
Native ground cover (%)				
Mean	35.2 ^A	3.6 ^C	17.2 ^{BC}	24.4 ^B
Standard deviation	8.56	6.07	8.67	12.84
p-value	0.00			
Exotic ground cover (%)				
Mean	1.6 ^{BC}	38.8 ^A	15.2 ^B	0.4 ^C
Standard deviation	2.19	14.18	7.43	0.89
p-value	0.00			
Litter cover (%)				
Mean	50.4	46	43.6	58
Standard deviation	6.93	9.49	12.28	6.78
p-value	0.10			
Bare ground (%)				
Mean	0.4	0.4	1.2	0.8
Standard deviation	0.89	0.89	1.79	1.1
p-value	0.69			

Common superscript indicates no significant difference in means ($p>0.05$)

4 Fauna data

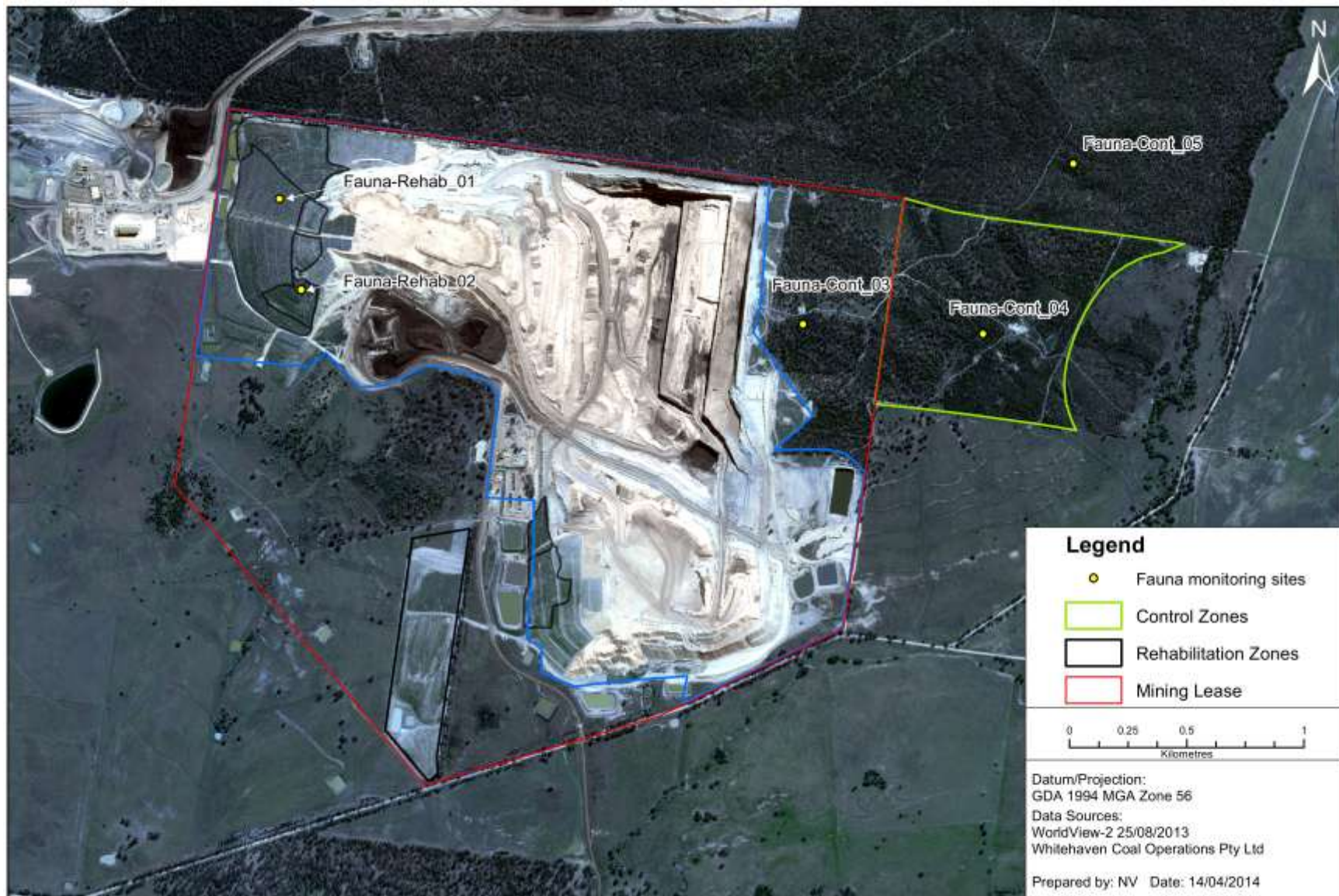


Figure 4-1: Fauna monitoring sites (2013)

Table 4-1: Bird species recorded (2011, 2012, 2013)

Species	Guild	Fauna Rehab 1 07–08				Fauna Rehab 2 08–09				Fauna Cont 3				Fauna Cont 4				Fauna Cont 5 LSF (est spring 2013)	Opportunistic
		Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Oct-13	Oct-13
<i>Acanthagenys rufogularis</i> Spiny-cheeked Honeyeater	Canopy feeder			X			X		X	X	X	X	X	X	X	X	X		
<i>Acanthiza apicalis</i> Inland Thornbill	Generalist - insects									X	X	X	X	X		X	X	X	
<i>Acanthiza chrysorrhoa</i> Yellow-rumped Thornbill	Ground forager - insects			X	X			X		X	X	X	X		X	X			
<i>Acanthiza lineata</i> Striated Thornbill	Canopy feeder																	X	
<i>Acanthiza nana</i> Yellow Thornbill	Canopy feeder									X	X	X	X	X	X	X	X	X	
<i>Acanthiza reguloides</i> Buff-rumped Thornbill	Ground forager - insects												X				X	X	
<i>Acanthiza uropygialis</i> Chestnut-rumped Thornbill	Generalist - insects										X				X				
<i>Anthochaera carnuculata</i> Red Wattlebird	Canopy feeder																	X	
<i>Accipiter cirrocephalus</i> Collared Sparrowhawk	Bird of prey											X		X	X				
<i>Accipiter fasciatus</i> Brown Goshawk	Bird of prey															X			X
<i>Alisterus scapularis</i> Australian King-Parrot	Canopy feeder													X					

Species	Guild	Fauna Rehab 1 07–08				Fauna Rehab 2 08–09				Fauna Cont 3				Fauna Cont 4				Fauna Cont 5 LSF (est spring 2013)	Opportunistic
		Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Oct-13	Oct-13
<i>Anthus novaeseelandiae</i> Australasian Pipit	Ground forager - insects	X			X	X	X												
<i>Aprosmictus erythropterus</i> Red-winged Parrot	Canopy feeder													X					
<i>Aquila audax</i> Wedge-tailed Eagle	Bird of prey									X		X	X			X			
<i>Artamus cyanopterus</i> Dusky Woodswallow	Aerial forager								X	X	X	X		X	X	X	X		
<i>Artamus superciliosus</i> White-browed Woodswallow	Generalist - insects												X		X		X	X	
<i>Barnardius zonarius</i> Australian Ringneck	Generalist - plant based										X	X		X			X		
<i>Cacatua galerita</i> Sulphur-crested Cockatoo	Generalist - plant based											X		X					
<i>Cacomantis flabelliformis</i> Fan-tailed Cuckoo	Generalist - insects											X							
<i>Cacomantis variolosus</i> Brush Cuckoo	Canopy feeder									X									
<i>Chalcites basalis</i> Horsfield's Bronze- Cuckoo	Generalist - insects										X			X		X		X	
<i>Chalcites lucidus</i> Shining Bronze- Cuckoo	Generalist - insects									X									

Species	Guild	Fauna Rehab 1 07–08				Fauna Rehab 2 08–09				Fauna Cont 3				Fauna Cont 4				Fauna Cont 5 LSF (est spring 2013)	Opportunistic
		Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Oct-13	Oct-13
<i>Chalcites osculans</i> Black-eared Cuckoo	Generalist - insects									X									
* <i>Chthonicola sagittata</i> Speckled Warbler	Ground forager - insects				X					X	X	X	X	X	X	X	X	X	
<i>Cincloramphus mathewsi</i> Rufous Songlark	Ground forager - insects	X		X				X		X		X		X					
* <i>Circus assimilis</i> Spotted Harrier	Bird of prey	X												X					
* <i>Climacteris picumnus</i> Brown Treecreeper	Bark prober											X			X				
<i>Colluricincla harmonica</i> Grey Shrike-thrush	Generalist - carnivorous									X	X	X	X	X		X	X		
<i>Coracina novaehollandiae</i> Black-faced Cuckoo- shrike	Generalist - insects							X		X	X			X			X		
<i>Corcorax melanoramphos</i> White-winged Chough	Ground forager - insects														X				
<i>Cormobates leucophaea</i> White-throated Treecreeper	Bark prober									X	X	X	X	X	X	X	X	X	
<i>Corvus coronoides</i> Australian Raven	Generalist - carnivorous	X			X				X	X	X	X	X	X	X	X	X		
<i>Coturni xypsilophora</i> Brown Quail	Ground forager - plant based	X			X			X						X					

Species	Guild	Fauna Rehab 1 07–08				Fauna Rehab 2 08–09				Fauna Cont 3				Fauna Cont 4				Fauna Cont 5 LSF (est spring 2013)	Opportunistic
		Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Oct-13	Oct-13
<i>Cracticus nigrogularis</i> Pied Butcherbird	Generalist - carnivorous		X	X	X		X		X	X	X	X	X		X	X			
<i>Cracticus tibicen</i> Australian Magpie	Generalist - carnivorous				X			X		X	X	X							
<i>Cracticus torquatus</i> Grey Butcherbird	Generalist - carnivorous											X		X	X	X			
<i>Dacelo novaeguineae</i> Laughing Kookaburra	Generalist - carnivorous												X		X				
<i>*Daphoenositta chrysoptera</i> Varied Sittella	Bark prober									X	X		X					X	
<i>Dicaeum hirundinaceum</i> Mistletoebird	Canopy feeder		X	X	X			X	X	X		X	X	X	X	X	X	X	
<i>Elanus axillaris</i> Blackshouldered Kite	Bird of prey				X				X				X						
<i>Eolophus roseicapillus</i> Galah	Ground forager - plant based			X				X							X				
<i>Eopsaltria australis</i> Eastern Yellow Robin	Ground forager - insects									X	X	X		X	X	X			
<i>Eurystomus orientalis</i> Dollarbird	Aerial forager									X									
<i>Falco berigora</i> Brown Falcon	Bird of prey				X														
<i>Falco cenchroides</i> Nankeen Kestrel	Bird of prey				X		X												
<i>Falcunculus frontatus</i> Crested Shrike-tit	Bark prober														X				

Species	Guild	Fauna Rehab 1 07–08				Fauna Rehab 2 08–09				Fauna Cont 3				Fauna Cont 4				Fauna Cont 5 LSF (est spring 2013)	Opportunistic
		Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Oct-13	Oct-13
<i>Geopelia humeralis</i> Bar-shouldered Dove	Ground forager - plant based									X	X			X	X	X	X		
<i>Geopelia striata</i> Peaceful Dove	Aerial forager			X						X	X				X	X		X	
<i>Gerygone albogularis</i> White-throated Gerygone	Canopy feeder			X															
<i>Gerygone fusca</i> Western Gerygone	Canopy feeder			X				X	X	X		X	X			X		X	
<i>*Glossopsitta pusilla</i> Little Lorikeet	Canopy feeder									X									
<i>Grallina cyanoleuca</i> Magpie Lark	Ground forager - insects				X												X		
<i>Haliastur sphenurus</i> Whistling Kite	Bird of prey													X					
<i>*Hieraetus morphnoides</i> Little Eagle	Bird of prey											X			X		X		
<i>^Hirundapus caudacutus</i> White-throated Needletail	Aerial forager													X					
<i>Hirundo neoxena</i> Welcome Swallow	Aerial forager										X		X	X	X	X			
<i>Lalage sueurii</i> White-winged Triller	Aerial forager			X					X	X		X		X		X			
<i>Lichenostomus chrysops</i> Yellow-faced Honeyeater	Canopy feeder														X	X		X	

Species	Guild	Fauna Rehab 1 07–08				Fauna Rehab 2 08–09				Fauna Cont 3				Fauna Cont 4				Fauna Cont 5 LSF (est spring 2013)	Opportunistic
		Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Oct-13	Oct-13
<i>Lichenostomus fuscus</i> Fuscous Honeyeater	Canopy feeder										X								
<i>Lichenostomus penicillatus</i> White-plumed Honeyeater	Canopy feeder			X						X	X	X	X	X	X	X	X	X	
<i>Lichenostomus virescens</i> Singing Honeyeater	Generalist		X	X	X		X	X	X	X	X	X	X	X		X	X		
<i>Lichmera indistincta</i> Brown Honeyeater	Canopy feeder													X					
<i>*Lophoictinia isura</i> Square-tailed Kite	Bird of prey									X									
<i>Malurus cyaneus</i> Superb Fairy-wren	Ground forager - insects	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
<i>Malurus lamberti</i> Variegated Fairywren	Ground forager - insects				X														
<i>Malurus leucopterus</i> White-winged Fairy-wren	Ground forager - insects	X	X	X	X	X	X	X	X										
<i>Manorina melanocephala</i> Noisy Miner	Generalist													X		X			
<i>Megalurus timoriensis</i> Tawny Grassbird	Ground forager - insects	X																	
<i>Melithreptus brevirostris</i> Brown-headed Honeyeater	Canopy feeder									X				X		X		X	

Species	Guild	Fauna Rehab 1 07–08				Fauna Rehab 2 08–09				Fauna Cont 3				Fauna Cont 4				Fauna Cont 5 LSF (est spring 2013)	Opportunistic
		Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Oct-13	Oct-13
<i>Melopsittacus undulatus</i> Budgerigar	Ground forager - plant based											X							
<i>Merops ornatus</i> Rainbow Bee-eater	Aerial forager											X	X				X		
<i>Microeca fascians</i> Jacky Winter	Aerial forager			X															
<i>Neochmia modesta</i> Plum-headed Finch	Ground forager - plant based							X											
<i>Neophema pulchella</i> Turquoise Parrot	Ground forager - plant based									X		X							
<i>Ocyphaps lophotes</i> Crested Pigeon	Ground forager - plant based			X	X					X	X	X	X			X	X		
<i>Pachycephala rufiventris</i> Rufous Whistler	Canopy feeder			X						X	X	X	X	X	X	X	X	X	
<i>Pardalotus punctatus</i> Spotted Pardalote	Canopy feeder			X				X		X		X		X		X			
<i>Pardalotus striatus</i> Striated Pardalote	Canopy feeder			X				X			X	X	X	X	X	X	X		
<i>Petrochelidon ariel</i> Fairy Martin	Aerial forager																		
<i>Petrochelidon nigricans</i> Tree Martin	Aerial forager									X		X		X	X				
<i>Petroica goodenovii</i> Red-capped Robin	Ground forager - insects									X	X	X	X	X	X		X	X	
<i>Phaps chalcoptera</i> Common Bronzewing	Ground forager - plant based			X	X			X	X						X			X	

Species	Guild	Fauna Rehab 1 07–08				Fauna Rehab 2 08–09				Fauna Cont 3				Fauna Cont 4				Fauna Cont 5 LSF (est spring 2013)	Opportunistic
		Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Oct-13	Oct-13
<i>Philemon citreogularis</i> Little Friarbird	Canopy feeder										X	X		X		X	X		
<i>Philemon corniculatus</i> Noisy Friarbird	Canopy feeder							X		X		X	X			X	X	X	
<i>Platycercus eximius</i> Eastern Rosella	Ground forager - plant based									X	X	X		X	X	X	X		
<i>Plectorhyncha lanceolata</i> Striped Honeyeater	Generalist - plant based			X						X	X	X	X	X	X	X	X		
<i>Pomatostomus superciliosus</i> White-browed Babbler	Ground forager - insects									X						X			
<i>Psephotus haematonotus</i> Red-rumped Parrot	Ground forager - plant based								X					X					
<i>Ptilonorhynchus maculatus</i> Spotted Bowerbird	Canopy feeder									X							X		
<i>Rhipidura albiscapa</i> Grey Fantail	Generalist - insects			X						X	X	X	X	X	X	X	X	X	
<i>Rhipidura leucophrys</i> Willie Wagtail	Aerial forager		X	X			X	X	X	X	X	X	X	X	X	X	X		
<i>Robin Eopsaltria</i> Easter Yellow Robin	Ground forager - insects												X				X	X	
<i>Smicrornis brevirostris</i> Weebill	Canopy feeder		X	X	X	X	X	X	X	X	X	X		X	X			X	
<i>Strepera graculina</i> Pied Currawong	Generalist - carnivorous			X						X	X		X	X			X	X	

Species	Guild	Fauna Rehab 1 07–08				Fauna Rehab 2 08–09				Fauna Cont 3				Fauna Cont 4				Fauna Cont 5 LSF (est spring 2013)	Opportunistic
		Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Sep-11	Sep-12	Sep-13	Oct-13	Oct-13	Oct-13
<i>Struthidea cinerea</i> Apostlebird	Ground forager - omnivorous									X				X	X				
<i>Sturnus vulgaris</i> Common Starling	Ground forager - omnivorous																		
<i>Taeniopygia bichenovii</i> Double-barred Finch	Ground forager - plant based			X	X			X		X	X	X	X	X	X	X	X	X	
<i>Taeniopygia guttata</i> Zebra Finch	Ground forager - plant based		X		X		X	X											
<i>Threskiornis molucca</i> Australian White Ibis	Water Bird																		X
<i>Turnix varia</i> Painted Button-quail	Ground forager - omnivorous									X	X			X		X			
<i>Zosterops lateralis</i> Silvereye	Generalist									X	X	X	X	X	X	X	X		
Total		8	8	26	20	4	10	20	16	50	38	45	33	49	39	41	35	26	2

* Denotes threatened under the TSC Act; ^ Denotes migratory or marine under the EPBC Act; # Denotes introduced species

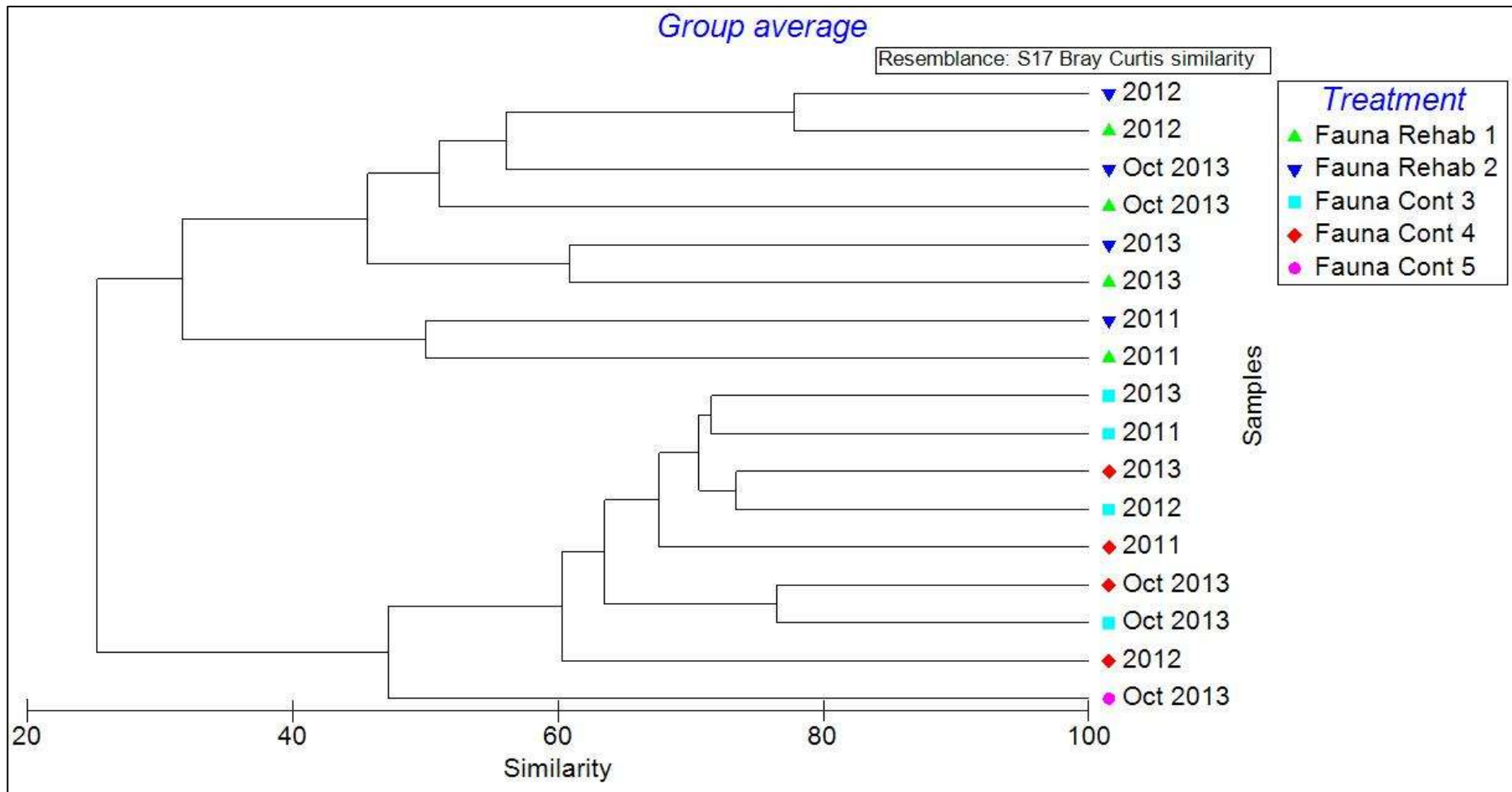


Figure 4-2: Cluster analysis of bird species recorded at all monitoring sites for 2011, 2012 and 2013 monitoring periods

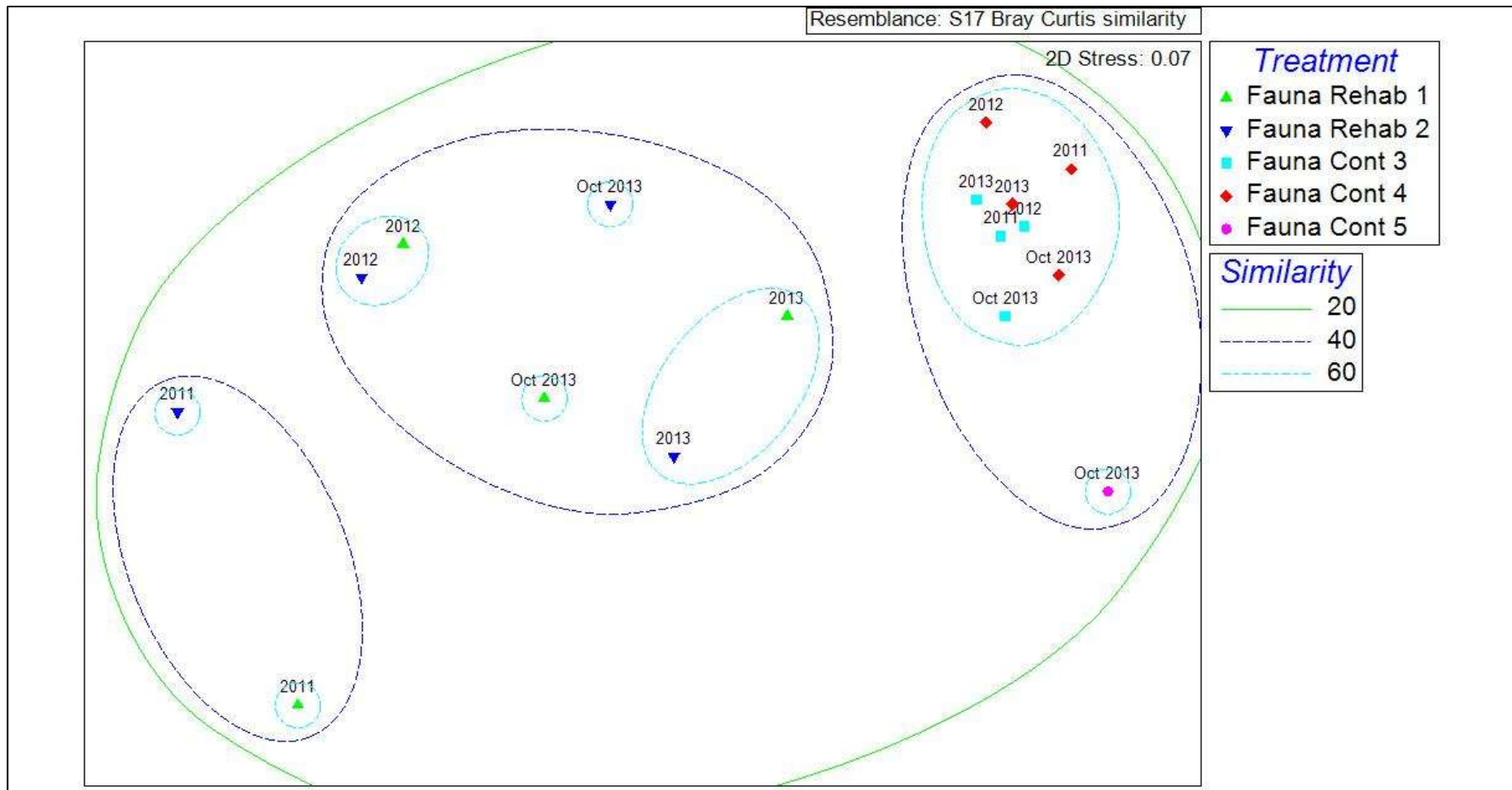


Figure 4-3: Non-metric multi-dimensional scaling plot for bird species recorded at all monitoring sites for 2011, 2012 and 2013 monitoring periods

Table 4-2: Fauna species recorded across all monitoring zones (2011, 2012, 2013)

Scientific Name	Common Name	Fauna Rehab 1				Fauna Rehab 2				Fauna Cont 3				Fauna Cont 4			
		2011	2012	Sep-13	Oct-13	2011	2012	Sep-13	Oct-13	2011	2012	Sep-13	Oct-13	2011	2012	Sep-13	Oct-13
Mammals																	
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	X	X		X		X		X	X	X		X		X		X
<i>Macropus robustus</i>	Common Wallaroo		X		X		X		X	X	X				X		
<i>Macropus rufogriseus</i>	Red-necked Wallaby														X		
<i>#Oryctolagus cuniculus</i>	Rabbit									X							
<i>Wallabia bicolor</i>	Swamp Wallaby										X		X		X		X
Total		1	2	0	2	0	2	0	2	3	3	0	2	0	4	0	2
Amphibians																	
<i>Crinia signifera</i>	Eastern Froglet													X			
<i>Limnodynastes fletcheri</i>	Barking Marsh-Frog													X			
<i>Litoria peronii</i>	Peron’s Tree-Frog													X			
Total		0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
Reptiles																	
<i>Cryptoblepharus virgatus</i>	Wall Skink				X												
<i>Morethia boulengeri</i>	Boulenger’s Skink				X					X				X	X		
<i>Pogona barbata</i>	Eastern Bearded Dragon										X						
<i>Varanus varius</i>	Lace Monitor												X		X		
Total		0	0	0	2	0	0	0	0	1	1	0	1	1	2	0	0

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Appendix 8

BLAST MONITORING RESULTS

Environmental Blast Monitoring

SHOT NO	DATE	MONITOR LOCATION	PEAK GROUND PRESSURE (mm/s)	PEAK OVERPRESSURE (dBL)	TIME
428	3/05/2013	Tarrawonga Station	0.4200	100.90	12:02:00
428	3/05/2013	Templemore	0.8900	104.70	12:02:02
429	7/05/2013	Tarrawonga Station	DNT		11:55:00
429	7/05/2013	Templemore	1.8500	93.80	11:55:00
430	9/05/2013	Tarrawonga Station	DNT		11:58:00
430	9/05/2013	Templemore	0.5000	99.30	11:58:00
431	22/05/2013	Tarrawonga Station	DNT		12:46:00
431	22/05/2013	Templemore	0.3400	106.20	12:46:00
432	28/05/2013	Tarrawonga Station	0.7300	107.10	11:58:00
432	28/05/2013	Templemore	DNT		11:58:00
433	6/06/2013	Tarrawonga Station	2.4300	104.70	12:18:00
433	6/06/2013	Templemore	0.3700	103.50	12:18:00
434	12/06/2013	Tarrawonga Station	DNT		11:57:00
434	12/06/2013	Templemore	DNT		11:57:00
435	14/06/2013	Tarrawonga Station	DNT		12:00:00
435	14/06/2013	Templemore	0.6000	104.90	12:00:00
436	20/06/2013	Tarrawonga Station	0.3600	109.50	11:48:00
436	20/06/2013	Templemore	1.1800	106.90	11:48:00
437	28/06/2013	Tarrawonga Station	DNT		11:59:00
437	28/06/2013	Templemore	1.4000	84.00	11:59:00
438	8/07/2013	Tarrawonga Station	DNT		12:09:00
438	8/07/2013	Templemore	1.6050	0.77	12:09:00
439	12/07/2013	Tarrawonga Station	0.4500	80.50	11:57:00
439	12/07/2013	Templemore	1.4200	101.40	11:57:00
440	16/07/2013	Tarrawonga Station	DNT		11:54:00
440	16/07/2013	Templemore	0.3600	102.30	11:54:00
441	25/07/2013	Tarrawonga Station	DNT		12:09:00
441	25/07/2013	Templemore	1.4400	100.70	12:09:00
442	29/07/2013	Tarrawonga Station	0.2100	105.90	11:59:53
442	29/07/2013	Templemore	0.5600	109.40	12:00:00
443	7/08/2013	Tarrawonga Station	0.2300	112.00	15:12:00
443	7/08/2013	Templemore	1.0800	114.30	15:12:00
444	9/08/2013	Tarrawonga Station	0.1600	106.90	11:59:00
444	9/08/2013	Templemore	DNT		11:59:00
445	15/08/2013	Tarrawonga Station	0.0800	85.90	11:56:03
445	15/08/2013	Templemore	0.3800	92.90	11:56:03
446	23/08/2013	Tarrawonga Station	DNT		12:01:00
446	23/08/2013	Templemore	0.7100	116.50	12:01:00
447	29/08/2013	Tarrawonga Station	DNT		14:08:00
447	29/08/2013	Templemore	0.7900	97.30	14:08:00
448	5/09/2013	Tarrawonga Station	DNT		11:59:00
448	5/09/2013	Templemore	0.6600	98.70	11:59:00
449	11/09/2013	Tarrawonga Station	0.1600	100.10	12:07:00
449	11/09/2013	Templemore	0.4900	110.60	12:07:00
450	27/09/2013	Tarrawonga Station	DNT		12:01:00
450	27/09/2013	Templemore	DNT		12:01:00
451	11/10/2013	Tarrawonga Station	0.7900	102.10	11:59:00
451	11/10/2013	Templemore	DNT		11:59:00

SHOT NO	DATE	MONITOR LOCATION	PEAK GROUND PRESSURE (mm/s)	PEAK OVERPRESSURE (dBL)	TIME
452	16/10/2013	Tarrawonga Station	0.6500	103.30	12:05:00
452	16/10/2013	Templemore	DNT		12:05:00
453	25/10/2013	Tarrawonga Station	0.3400	102.90	12:00:00
453	25/10/2013	Templemore	1.0400	108.60	12:00:00
454	31/10/2013	Tarrawonga Station	0.1600	94.10	11:58:00
454	31/10/2013	Templemore	0.7300	107.50	11:58:05
455	7/11/2013	Tarrawonga Station	DNT		11:59:00
455	7/11/2013	Templemore	0.8600	102.10	11:59:27
456	15/11/2013	Tarrawonga Station	DNT		12:00:00
456	15/11/2013	Templemore	1.3400	102.10	12:00:00
457	19/11/2013	Tarrawonga Station	0.1800	95.10	15:08:00
457	19/11/2013	Templemore	0.8600	101.50	15:08:00
458	28/11/2013	Tarrawonga Station	DNT		12:34:00
458	28/11/2013	Templemore	0.1400	108.00	12:34:00
459	4/12/2013	Tarrawonga Station	DNT		16:28:00
459	4/12/2013	Templemore	DNT		16:28:00
460	13/12/2013	Tarrawonga Station	1.7033	107.00	12:14:00
460	13/12/2013	Templemore	DNT		12:14:00
461	24/12/2013	Tarrawonga Station	0.4400	101.00	12:00:00
461	24/12/2013	Templemore	DNT		12:00:00
462	13/01/2014	Tarrawonga Station	0.0200	84.50	12:14:58
462	13/01/2014	Templemore	0.0600	96.60	12:14:58
463	16/01/2014	Tarrawonga Station	0.1800	89.00	12:28:09
463	16/01/2014	Templemore	0.6600	95.60	12:28:09
464	28/01/2014	Tarrawonga Station	0.4200	87.70	12:03:12
464	28/01/2014	Templemore	1.3700	93.70	12:03:12
465	7/02/2014	Tarrawonga Station	0.1400	91.10	12:20:03
465	7/02/2014	Templemore	1.1000	101.30	12:20:03
466	14/02/2014	Tarrawonga Station	0.6100	106.30	12:46:29
466	14/02/2014	Templemore	1.9800	112.10	12:46:29
467	17/02/2014	Tarrawonga Station	0.1200	99.20	12:00:08
467	17/02/2014	Templemore	0.8100	100.30	12:00:08
468	19/02/2014	Tarrawonga Station	0.0100	98.80	11:56:00
468	19/02/2014	Templemore	0.0000	102.70	11:56:00
469	5/03/2014	Tarrawonga Station	0.1500	105.60	11:58:26
469	5/03/2014	Matong	0.1800	109.10	11:58:26
470	11/03/2014	Tarrawonga Station	0.3300	102.30	12:09:09
470	11/03/2014	Matong	0.3100	96.20	12:09:09
471	18/03/2014	Tarrawonga Station	1.1700	102.80	12:15:29
471	18/03/2014	Matong	0.6600	97.50	12:15:29
472	21/03/2014	Tarrawonga Station	0.3900	101.70	14:41:24
472	21/03/2014	Matong	0.3800	102.20	14:41:24
473	3/04/2014	Tarrawonga Station	0.2100	97.60	12:01:04
473	3/04/2014	Matong	0.1700	98.30	12:01:04
474	4/04/2014	Tarrawonga Station	0.0800	101.50	12:27:42
474	4/04/2014	Matong	0.0400	95.20	12:27:42
475	8/04/2014	Tarrawonga Station	0.0700	98.60	11:49:31
475	8/04/2014	Matong	0.0800	100.60	11:49:31
476	15/04/2014	Tarrawonga Station	0.3400	102.10	11:57:37
476	15/04/2014	Matong	0.2700	103.10	11:57:37
477	17/04/2014	Tarrawonga Station	0.5900	94.30	12:20:32
477	17/04/2014	Matong	0.4700	96.40	12:20:32

Appendix 9

NOISE MONITORING RESULTS



Project No: 04095

ATTENDED NOISE MONITORING – JUNE 2013

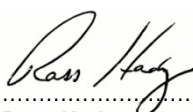
Tarrawonga Coal Mine

Boggabri, NSW

Prepared for:

Whitehaven Coal Pty Limited
PO Box 600
Gunnedah NSW 2380

Author:

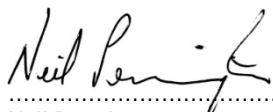


Ross Hodge

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July 2013

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APPENDIX A Description of Acoustical Terms

1.0 INTRODUCTION

This letter report presents the results of attended operational noise compliance monitoring conducted for the Tarrawonga Coal Mine (TCM) in the period between 26 June and 2 July, 2013. The monitoring commenced on June 26 with day, evening and night surveys completed. After the day time survey on June 27, however, rain in the area caused mining activities to be suspended. The monitoring was postponed and recommenced, at the first available opportunity, with the evening survey on Monday July 1.

The monitoring was carried out generally in accordance with the requirements of Environment Protection Licence (EPL 12365) and other relevant Australian Standards and guidelines.

1.1 Noise Monitoring Locations

Noise monitoring locations defined in Section M7.4 of EPL 12365 are listed in the table below and shown on Figure 1.

EPA Identification No.	Description of Location
<i>N1</i>	<i>Within 30m of the residence on property "Tarrawonga"</i>

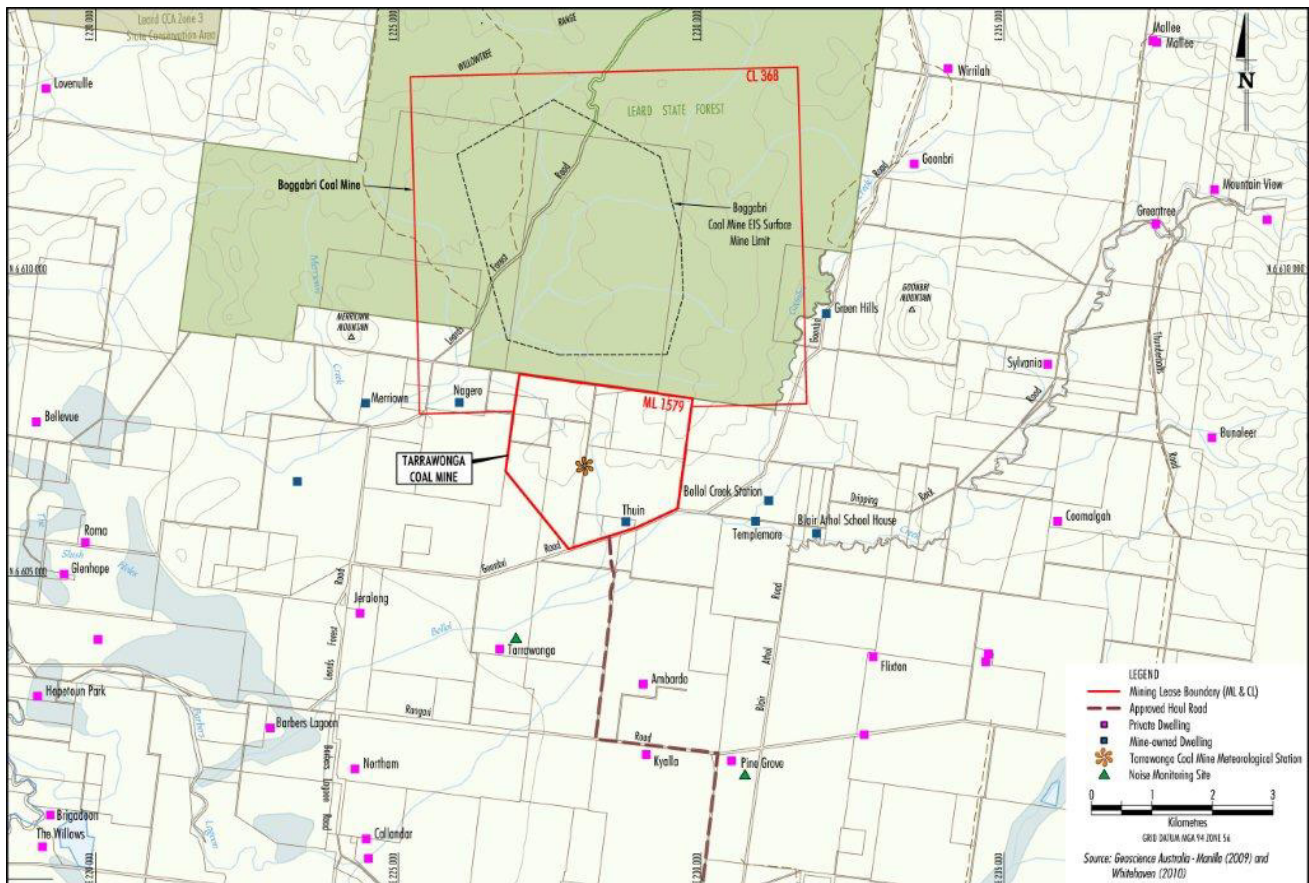


Figure 1 – Noise Monitoring Location

1.2 Monitoring Frequency and Duration

Section M7.7 of EPL 12365 states that the attended noise monitoring must be conducted;

- at each of the locations detailed above.

- b) quarterly in a reporting period.
- c) during each day, evening and night period for a minimum of:
 - 1.5 hours during the day;
 - 30 minutes during the evening; and
 - 1 hour during the night.
- d) occur for three consecutive operating days. As described above the monitoring had to be carried out over a longer period than this due to rain.

2.0 NOISE CRITERIA AND CONDITIONS

2.1 Noise Assessment Criteria

Noise generated at the premises must not exceed the noise limits in the table below.

Locality and Location	Day Leq (15 min)	Evening Leq (15 min)	Night Leq (15 min)	Night L1 (1 min)
<i>Kyalla</i>	37	37	37	45
<i>All other surrounding residences</i>	35	35	35	45

2.2 Monitoring Location Definition

EPL 12365 states that to determine compliance with the Leq (15 min) operational noise criteria the noise measurement equipment must be located:

- Approximately on the property boundary, where any dwelling is situated 30m or less from the property boundary closest to the premises; or
- Within 30m of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30m from the property boundary closest to the premises; or, where applicable
- Within 50m of the boundary of a National Park or Nature Reserve.

In relation to L1 (1 min) noise limits the noise measurement equipment must be located within 1m of a dwelling façade.

2.3 Applicable Meteorological Conditions

The noise limits apply under all meteorological conditions except for the following;

1. Wind speeds greater than 3m/s at 10m above ground level; or
2. Stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or

3. Stability category G temperature inversion conditions.

2.4 Other Conditions

To determine compliance with the Leq (15 min) operational noise criteria the modification factors detailed in Section 4 of the NSW industrial Noise policy must be applied, as appropriate, to the measured noise levels.

3.0 NOISE MONITORING PROCEDURE

3.1 Monitoring Equipment

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 and 2260 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters” and have current NATA calibration. Field calibration is carried out at the start and end of each monitoring period.

A-weighted noise levels were measured over the appropriate monitoring periods (90 minutes/day, 30 minutes/evening and 60 minutes/night) with data acquired at 1 or 2 second statistical intervals and the meter set to “fast” response. Each 1 or 2 second measurement is accompanied by a third-octave band spectrum from 20 - 20k Hz which is required for analysing INP ‘modifying factors’. Time based field notes allow for determination of the relative contributions to the overall noise level of all significant noise sources.

3.2 Measurement Analysis

The operational noise criteria for compliance with Section L 4.1 of EPL 12365 are based on a 15 minute Leq noise level. The procedures detailed in Section M 7.7 of EPL 12365 require noise monitoring for significantly longer periods than that of the compliance criteria. To determine compliance with the EPL conditions the worst case 15 minute period, in relation to mine noise, was extracted from each measurement and compared to the criteria in Section L 4.1.

This worst case 15 minute Leq noise level for each monitoring period is shown in the tables below. Where the noise from TCM was audible Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

Due to the close proximity, relative to the receiver, of TCM and the nearby Boggabri Coal Mine (BCM), it is sometimes not always possible to determine the partial contributions of emissions from each mine to the overall measured noise level. Where this is the case the total measured mine noise is shown in the tables as “mine”. Where the total measured mine noise is equal to, or greater than, the noise criterion for TCM an estimate of the relative contributions of each mine has been made based on the field observations and data analysis.

When no mine noise was audible at a monitoring location, a representative 15 minute noise measurement was made with observations carried out for the remainder of the applicable time period. In these instances, the measured noise level for the representative 15 minute period is that shown in the tables below.

The compliance measurement locations are different for each of the operational and sleep disturbance noise. That is, the sleep disturbance criterion is typically applicable at 1m from the façade of a bedroom window.

To avoid undue disturbance to residents the L1 (1 min) noise level from the operational measurements are used to show general compliance with the sleep disturbance criterion. That is, as the distance between the noise source and the operational noise monitoring location is significantly greater than the distance between the operational noise monitoring location and the sleep disturbance monitoring location (i.e. 1m from the facade of the house) there will be little variation in L1 (1 min) levels between the two monitoring locations.

It must be noted, however, that the sleep disturbance criterion is to be measured near a bedroom window. As the internal layout of each residence is not known, to consider a worst case, this is assumed to be facing the operational noise monitoring location.

Meteorological data used in this report were taken from the meteorological station at the Whitehaven operated Rocglen Coal Mine (located approximately 14km to the south of TCM. Stability class information is that interpreted by the meteorological station software.

3.3 Special Conditions

Before the noise surveys, Spectrum Acoustics personnel were briefed on the current location(s) of activities.

4.0 RESULTS AND DISCUSSION

4.1 Measured Operational Noise Levels

Measured noise levels are summarised in **Tables 1 to 8**. The total measured Leq (15 min) is shown. Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the various noise sources. The identified noise sources are listed, along with the contribution of each source, in descending order (shown in brackets). Mine noise from TCM is shown in the tables in bold type.

Table 1 TCM Operational Noise Monitoring Results – 26 June 2013 (day)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Identified Noise Sources
Tarrawonga	9:01 am	39	0.5 m/s-27	Birds & insects (36), mine noise (35) (TCM est. 34), cattle (26)

Table 2 TCM Operational Noise Monitoring Results – 26 June 2013 (evening)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Identified Noise Sources
Tarrawonga	7:39 pm	35	1.9 m/s-123	TCM (34)* , plane (29)

TCM = trucks on private haul road

Table 3 TCM Operational Noise Monitoring Results – 26 June 2013 (night)					
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Stability Class	Identified Noise Sources
Tarrawonga	10:05 pm	23	Calm	G	Traffic (20), cattle (20), TCM inaudible

Table 4 TCM Operational Noise Monitoring Results – 27 June 2013 (day)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Identified Noise Sources
Tarrawonga	1:10 pm	34	2.7 m/s-187	TCM (32)* , birds & insects (29)

TCM = trucks on private haul road plus mine hum

Table 5 TCM Operational Noise Monitoring Results – 1 July 2013 (evening)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Identified Noise Sources
Tarrawonga	8:18 pm	33	2.8 m/s-160	TCM (33)*

TCM = trucks on private haul road

Table 6 TCM Operational Noise Monitoring Results – 1 July 2013 (night)					
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Stability Class	Identified Noise Sources
Tarrawonga	11:10 pm	20	1.3 m/s-114	D/E	Cattle (20), TCM inaudible

Table 7 TCM Operational Noise Monitoring Results – 2 July 2013 (day)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Identified Noise Sources
Tarrawonga	9:52 am	38	3.5 m/s-120	Birds & insects (37), TCM (30)*

TCM = trucks on private haul road

Table 8 TCM Operational Noise Monitoring Results – 2 July 2013 (evening)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Identified Noise Sources
Tarrawonga	7:41 pm	37	0.5 m/s-125	Birds & insects (34), mine noise (31) (TCM est. 30), cattle (30)

TCM = trucks on private haul road plus mine hum

<p align="center">Table 9 TCM Operational Noise Monitoring Results – 2 July 2013 (night)</p>					
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Stability Class	Identified Noise Sources
Tarrawonga	10:32 pm	25	Calm	E/F	Cattle & frogs (25), TCM inaudible

4.2 Discussion of Results

The results in Tables 3 and 9 show that noise emissions from TCM did not exceed the operational noise criterion at any location or time throughout the June/July 2013 monitoring survey(s).

4.2.1 Modifying Factor Corrections

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

4.3 Sleep Disturbance

The results of the sleep disturbance monitoring are shown below in **Table 10**. During the monitoring periods TCM was inaudible at all times.

<p align="center">Table 10 TCM Sleep Disturbance Monitoring Results</p>			
Location	Time	dB(A),L1 (1 min)	Wind speed/ direction
Tarrawonga (26/6)	10:05 pm	n/a	Calm
Tarrawonga (1/7)	11:10 pm	n/a	1.3 m/s 114
Tarrawonga (2/7)	10:32 pm	n/a	Calm

APPENDIX A

DESCRIPTION OF ACOUSTICAL TERMS

Table A1
Definition of acoustical terms

Term	Description
dB(A)	The quantitative measure of sound heard by the human ear, measured by the A- Scale Weighting Network of a sound level meter expressed in decibels (dB).
SPL	Sound Pressure Level. The incremental variation of sound pressure above and below atmospheric pressure and expressed in decibels. The human ear responds to pressure fluctuations, resulting in sound being heard.
STL	Sound Transmission Loss. The ability of a partition to attenuate sound, in dB.
Lw	Sound Power Level radiated by a noise source per unit time re 1pW.
Leq	Equivalent Continuous Noise Level - taking into account the fluctuations of noise over time. The time-varying level is computed to give an equivalent dB(A) level that is equal to the energy content and time period.
L1	Average Peak Noise Level - the level exceeded for 1% of the monitoring period.
L90	"Background" Noise Level - the level exceeded for 90% of the monitoring period.



17 July 2013

Ref: 06259/4836

Mr. Danny Young

Whitehaven Coal Pty Ltd

PO Box 600

GUNNEDAH NSW 2380

RE: WHITEHAVEN COAL – ROAD TRAFFIC NOISE MONITORING, JUNE 2013

This letter report presents the results of a road noise measurements conducted for the Tarrawonga Coal Mine (TCM) and Rocglen Coal Mine (RCM). The measurements were conducted at “Brooklyn” and “Werona” on Blue Vale Road with the intention of determining the $L_{Aeq(1\text{ hour})}$ noise contribution from mine-related vehicles, particularly coal haul trucks. There are two separate residences on “Brooklyn” and noise measurements were made at, or near, the front of both residences. Residence 1 is closest to Blue Vale Road (approximately 90m) whilst Residence 2 is approximately 480m from the road.

The approvals granted for TCM and RCM state that the cumulative noise level from traffic generated by the two mines must not exceed 60 dB(A), $L_{Aeq(1\text{ hour})}$ during the day and 55 dB(A), $L_{Aeq(1\text{ hour})}$ during the night at these locations. For the purposes of traffic noise assessment the *Environmental Criteria for Road Traffic Noise* (ECRTN) defines day as 7am – 10pm and night as 10pm – 7am. On Sundays and public holidays the daytime transition changes to 8am.

The noise measurements were made adjacent to the front (eastern) facade of Residences 1 and 2 at “Brooklyn” between 4:26 pm and 5:28 pm and at “Werona” between 3:05 pm and 4:07 pm on Tuesday, June 25, 2013 with third-octave band Bruel & Kjaer Observer sound level meters (IEC Type 1). The sound level meters were placed on tripods and recorded continuously at 1-second statistical intervals while notes on passing vehicles were written down.

The monitoring was originally carried out in April 2013 (19/4/13) but this coincided with a period of low numbers of truck movements associated with TCM and RCM. Consequently the reporting of this monitoring was not completed and the monitoring rescheduled.

Over the course of the measurement period at "Brooklyn" there were 60 coal truck movements related to TCM and RCM. Other noise sources observed throughout the monitoring period included a contribution from birds, planes and other traffic on Blue Vale Road. All of this extraneous noise was removed during the analysis process.

The calculated contribution from mine-related vehicles to the overall noise level at Residence 1 at "Brooklyn" was **57 dB(A), L_{eq} (1 hour)**. This is below the daytime criterion of **60 dB(A) L_{eq} (1 hour)**.

The calculated contribution from mine-related vehicles at Residence 2 was **43 dB(A), L_{eq} (1 hour)**. This is below the daytime criterion of **60 dB(A) L_{eq} (1 hour)**.

Over the course of the measurement period at "Werona" there were 61 coal truck movements related to TCM and RCM.

The total measured contribution from mine-related vehicles at "Werona" was **47 dB(A), L_{eq} (1 hour)**. This is below the daytime criterion of **60 dB(A) L_{eq} (1 hour)**.

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

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge

Acoustical Consultant

Review:



Neil Pennington

Acoustical Consultant



Project No: 04095

ATTENDED NOISE MONITORING – SEPTEMBER 2013

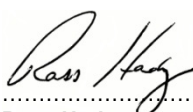
Tarrawonga Coal Mine

Boggabri, NSW

Prepared for:

Whitehaven Coal Pty Limited
PO Box 600
Gunnedah NSW 2380

Author:

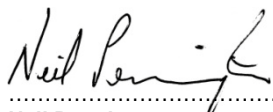


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Principal / Director

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Principal / Director

October 2013

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APPENDIX A Description of Acoustical Terms

1.0 INTRODUCTION

This letter report presents the results of attended operational noise compliance monitoring conducted for the Tarrawonga Coal Mine (TCM) over a four day period between 25 September and 28 September, 2013.

The monitoring was carried out generally in accordance with the requirements of Environment Protection Licence (EPL 12365) and other relevant Australian Standards and guidelines.

1.1 Noise Monitoring Locations

Noise monitoring locations defined in Section M7.4 of EPL 12365 are listed in the table below and shown on Figure 1.

EPA Identification No.	Description of Location
N1	Within 30m of the residence on property "Tarrawonga"

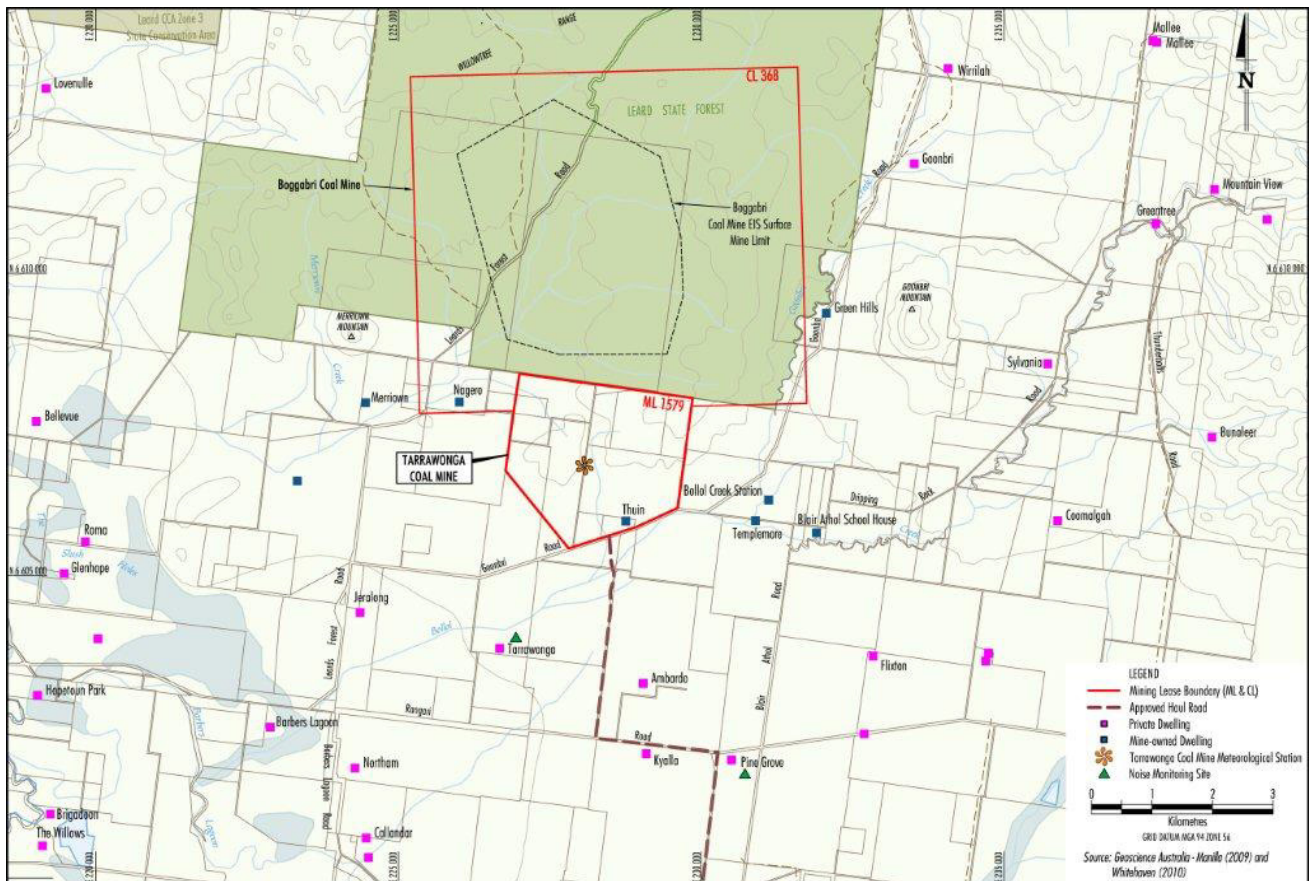


Figure 1 – Noise Monitoring Location

1.2 Monitoring Frequency and Duration

Section M7.7 of EPL 12365 states that the attended noise monitoring must be conducted;

- at each of the locations detailed above.
- quarterly in a reporting period.

- c) during each day, evening and night period for a minimum of:
- 1.5 hours during the day;
 - 30 minutes during the evening; and
 - 1 hour during the night.
- d) occur for three consecutive operating days. Note that the monitoring had to be carried out over a longer period than this due to high winds during the day time of September 26.

2.0 NOISE CRITERIA AND CONDITIONS

2.1 Noise Assessment Criteria

Noise generated at the premises must not exceed the noise limits in the table below.

Locality and Location	Day Leq (15 min)	Evening Leq (15 min)	Night Leq (15 min)	Night L1 (1 min)
<i>Kyalla</i>	37	37	37	45
<i>All other surrounding residences</i>	35	35	35	45

2.2 Monitoring Location Definition

EPL 12365 states that to determine compliance with the Leq (15 min) operational noise criteria the noise measurement equipment must be located:

- Approximately on the property boundary, where any dwelling is situated 30m or less from the property boundary closest to the premises; or
- Within 30m of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30m from the property boundary closest to the premises; or, where applicable
- Within 50m of the boundary of a National Park or Nature Reserve.

In relation to L1 (1 min) noise limits the noise measurement equipment must be located within 1m of a dwelling façade.

2.3 Applicable Meteorological Conditions

The noise limits apply under all meteorological conditions except for the following;

1. Wind speeds greater than 3m/s at 10m above ground level; or
2. Stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or

3. Stability category G temperature inversion conditions.

2.4 Other Conditions

To determine compliance with the Leq (15 min) operational noise criteria the modification factors detailed in Section 4 of the NSW industrial Noise policy must be applied, as appropriate, to the measured noise levels.

3.0 NOISE MONITORING PROCEDURE

3.1 Monitoring Equipment

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 and 2260 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters” and have current NATA calibration. Field calibration is carried out at the start and end of each monitoring period.

A-weighted noise levels were measured over the appropriate monitoring periods (90 minutes/day, 30 minutes/evening and 60 minutes/night) with data acquired at 1 or 2 second statistical intervals and the meter set to “fast” response. Each 1 or 2 second measurement is accompanied by a third-octave band spectrum from 20 - 20k Hz which is required for analysing INP ‘modifying factors’. Time based field notes allow for determination of the relative contributions to the overall noise level of all significant noise sources.

3.2 Measurement Analysis

The operational noise criteria for compliance with Section L 4.1 of EPL 12365 are based on a 15 minute Leq noise level. The procedures detailed in Section M 7.7 of EPL 12365 require noise monitoring for significantly longer periods than that of the compliance criteria. To determine compliance with the EPL conditions the worst case 15 minute period, in relation to mine noise, was extracted from each measurement and compared to the criteria in Section L 4.1.

This worst case 15 minute Leq noise level for each monitoring period is shown in the tables below. Where the noise from TCM was audible Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

Due to the close proximity, relative to the receiver, of TCM and the nearby Boggabri Coal Mine (BCM), it is sometimes not always possible to determine the partial contributions of emissions from each mine to the overall measured noise level. Where this is the case the total measured mine noise is shown in the tables as “mine”. Where the total measured mine noise is equal to, or greater than, the noise criterion for TCM an estimate of the relative contributions of each mine has been made based on the field observations and data analysis.

When no mine noise was audible at a monitoring location, a representative 15 minute noise measurement was made with observations carried out for the remainder of the applicable time period. In these instances, the measured noise level for the representative 15 minute period is that shown in the tables below.

The compliance measurement locations are different for each of the operational and sleep disturbance noise. That is, the sleep disturbance criterion is typically applicable at 1m from the façade of a bedroom window.

To avoid undue disturbance to residents the L1 (1 min) noise level from the operational measurements are used to show general compliance with the sleep disturbance criterion. That is, as the distance between the noise source and the operational noise monitoring location is significantly greater than the distance between the operational noise monitoring location and the sleep disturbance monitoring location (i.e. 1m from the facade of the house) there will be little variation in L1 (1 min) levels between the two monitoring locations.

It must be noted, however, that the sleep disturbance criterion is to be measured near a bedroom window. As the internal layout of each residence is not known, to consider a worst case, this is assumed to be facing the operational noise monitoring location.

Meteorological data used in this report were taken from a mine operated meteorological station at the located approximately 4km to the east of the TCM open cut. Temperature inversion information is taken from the Boggabri Coal Mine met tower with temperature sensors at 2m and 52m above ground level.

3.3 Special Conditions

Before the noise surveys, Spectrum Acoustics personnel were briefed on the current location(s) of activities.

4.0 RESULTS AND DISCUSSION

4.1 Measured Operational Noise Levels

Measured noise levels are summarised in **Tables 1 to 9**. The total measured Leq (15 min) is shown. Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the various noise sources. The identified noise sources are listed, along with the contribution of each source, in descending order (shown in brackets). Mine noise from TCM is shown in the tables in bold type.

Table 1 TCM Operational Noise Monitoring Results – 25 September 2013 (day)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Identified Noise Sources
Tarrawonga	12:13 pm	39	2.7 m/s - 267	Birds & insects (39), TCM (20)

Table 2 TCM Operational Noise Monitoring Results – 25 September 2013 (evening)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Identified Noise Sources
Tarrawonga	7:52 pm	34	3.2 m/s - 11	Mine noise (33)*, TCM (est. 32) , insects (27)

*TCM = trucks on private haul road (30), mine hum (28)

Table 3 TCM Operational Noise Monitoring Results – 25/26 September 2013 (night)					
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Temperature Inversion °C/100m	Identified Noise Sources
Tarrawonga	12:54 am	34	3.8 m/s - 13	+8.8	Mine noise (34), TCM (est. 34), insects (22)

Table 4 TCM Operational Noise Monitoring Results – 26 September (evening)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Identified Noise Sources
Tarrawonga	7:42 pm	29	0.6 m/s-184	Wind (28), TCM (21)*

TCM = trucks on private haul road

Table 5 TCM Operational Noise Monitoring Results – 26/27 September 2013 (night)					
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Temperature Inversion °C/100m	Identified Noise Sources
Tarrawonga	12:37 am	22	1.2 m/s-196	+7.4	Insects (22), TCM inaudible

Table 6 TCM Operational Noise Monitoring Results – 27 September 2013 (day)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Identified Noise Sources
Tarrawonga	10:38 am	35	3.2 m/s-162	Birds & insects (35), TCM (20)

Table 7 TCM Operational Noise Monitoring Results – 27 September 2013 (evening)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Identified Noise Sources
Tarrawonga	8:06 pm	40	1.4 m/s-356	Insects (40), cattle (30), TCM inaudible

Table 8 TCM Operational Noise Monitoring Results – 27 September 2013 (night)					
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Temperature Inversion °C/100m	Identified Noise Sources
Tarrawonga	10:02 pm	30	1.5 m/s-398	+13.0	Mine noise (30), TCM est. (27),

Table 9 TCM Operational Noise Monitoring Results – 28 September 2013 (day)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction(°)	Identified Noise Sources
Tarrawonga	7:35 am	40	1.3 m/s-182	Mine noise (38), TCM (est. 37), birds & insects (36)

4.2 Discussion of Results

The results in Tables 1 to 9 show that noise emissions from TCM exceeded the operational noise criterion at the Tarrawonga monitoring location during the day on September 28.

The Tarrawonga property retains acquisition rights in the Project Approval for the Tarrawonga Mine as a consequence of modelled noise predictions exceeding 35dB(A). The measured level of 37 dB(A) attributed to Tarrawonga operations is consistent with the modelled predictions established in the noise model for the modification to Tarrawonga operations in 2010. As a consequence, the noise limit of 35dB(A) does not apply at the Tarrawonga receiver.

4.2.1 Modifying Factor Corrections

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

4.3 Sleep Disturbance

The results of the sleep disturbance monitoring are shown below in **Table 10**.

Table 10 TCM Sleep Disturbance Monitoring Results				
Location	Time	dB(A),L1 (1 min)	Wind speed/ direction(°)	Temperature Inversion °C/100m
Tarrawonga (25-26/9)	12:54 am	40	3.8 m/s - 13	+8.8
Tarrawonga (26-27/9)	12:37 am	n/a	1.2 m/s-196	+7.4
Tarrawonga (27/9)	10:02 pm	35	1.5 m/s-398	+13.0

The results in Table 10 show that the L1 (1 min) noise criterion was not exceeded during the monitoring periods.

APPENDIX A

DESCRIPTION OF ACOUSTICAL TERMS

Table A1
Definition of acoustical terms

Term	Description
dB(A)	The quantitative measure of sound heard by the human ear, measured by the A- Scale Weighting Network of a sound level meter expressed in decibels (dB).
SPL	Sound Pressure Level. The incremental variation of sound pressure above and below atmospheric pressure and expressed in decibels. The human ear responds to pressure fluctuations, resulting in sound being heard.
STL	Sound Transmission Loss. The ability of a partition to attenuate sound, in dB.
Lw	Sound Power Level radiated by a noise source per unit time re 1pW.
Leq	Equivalent Continuous Noise Level - taking into account the fluctuations of noise over time. The time-varying level is computed to give an equivalent dB(A) level that is equal to the energy content and time period.
L1	Average Peak Noise Level - the level exceeded for 1% of the monitoring period.
L90	"Background" Noise Level - the level exceeded for 90% of the monitoring period.



Project No: 04095

ATTENDED NOISE MONITORING – DECEMBER 2013

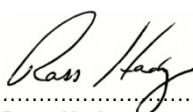
Tarrawonga Coal Mine

Boggabri, NSW

Prepared for:

Whitehaven Coal Pty Limited
PO Box 600
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Author:

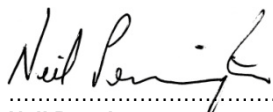


Ross Hodge

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December 2013

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APPENDIX A Description of Acoustical Terms

1.0 INTRODUCTION

This letter report presents the results of attended operational noise compliance monitoring conducted for the Tarrawonga Coal Mine (TCM) over a three day period between 2 and 4 December, 2013.

The monitoring was carried out generally in accordance with the requirements of Environment Protection Licence (EPL 12365) and other relevant Australian Standards and guidelines.

1.1 Noise Monitoring Locations

Noise monitoring locations defined in Section M7.4 of EPL 12365 are listed in the table below and shown on Figure 1.

EPA Identification No.	Description of Location
N1	Within 30m of the residence on property "Tarrawonga"

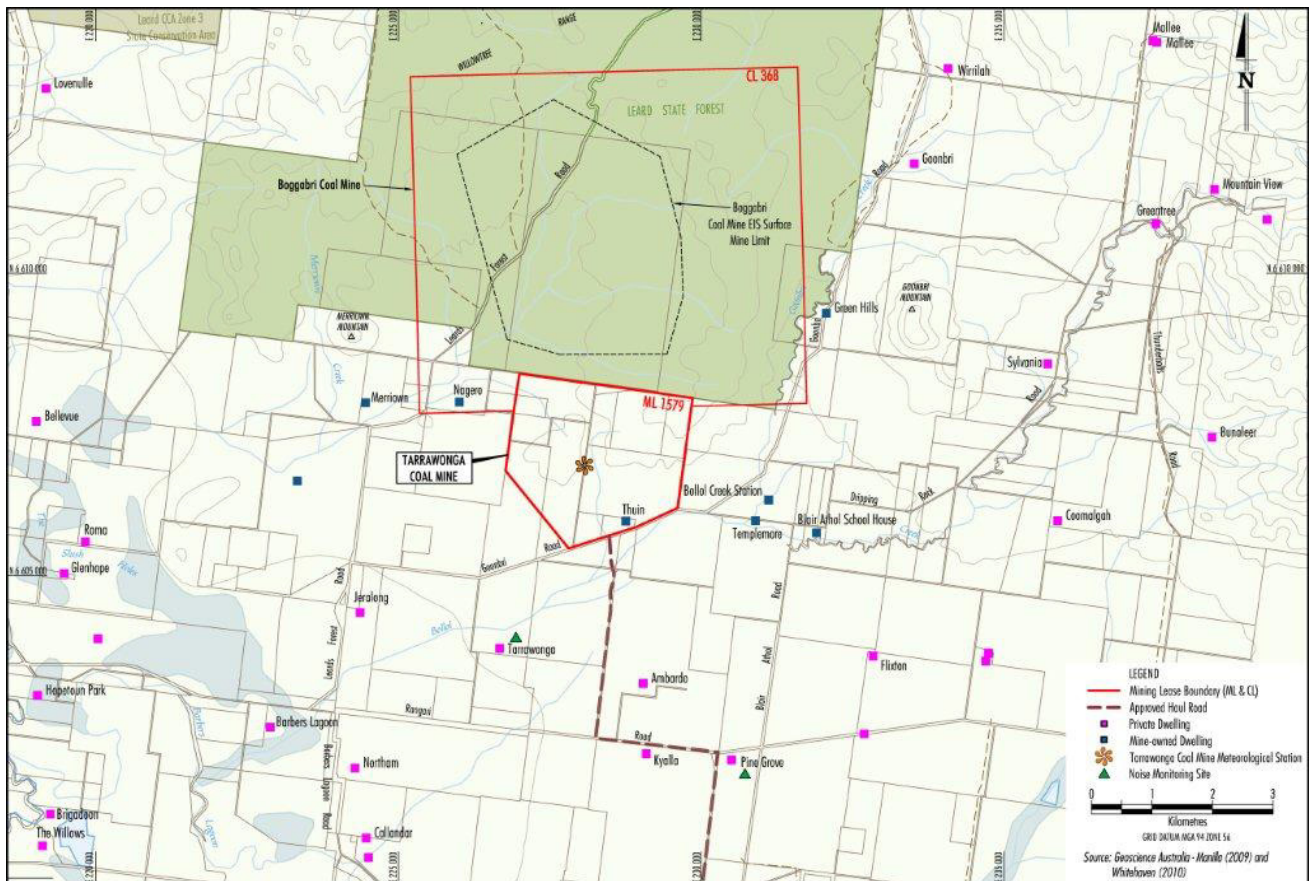


Figure 1 – Noise Monitoring Location

1.2 Monitoring Frequency and Duration

Section M7.7 of EPL 12365 states that the attended noise monitoring must be conducted;

- at each of the locations detailed above.
- quarterly in a reporting period.

c) during each day, evening and night period for a minimum of:

- 1.5 hours during the day;
- 30 minutes during the evening; and
- 1 hour during the night.

d) occur for three consecutive operating days.

2.0 NOISE CRITERIA AND CONDITIONS

2.1 Noise Assessment Criteria

Noise generated at the premises must not exceed the noise limits in the table below.

Locality and Location	Day Leq (15 min)	Evening Leq (15 min)	Night Leq (15 min)	Night L1 (1 min)
<i>Kyalla</i>	37	37	37	45
<i>All other surrounding residences</i>	35	35	35	45

2.2 Monitoring Location Definition

EPL 12365 states that to determine compliance with the Leq (15 min) operational noise criteria the noise measurement equipment must be located:

- Approximately on the property boundary, where any dwelling is situated 30m or less from the property boundary closest to the premises; or
- Within 30m of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30m from the property boundary closest to the premises; or, where applicable
- Within 50m of the boundary of a National Park or Nature Reserve.

In relation to L1 (1 min) noise limits the noise measurement equipment must be located within 1m of a dwelling façade.

2.3 Applicable Meteorological Conditions

The noise limits apply under all meteorological conditions except for the following;

1. Wind speeds greater than 3m/s at 10m above ground level; or
2. Stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
3. Stability category G temperature inversion conditions.

2.4 Other Conditions

To determine compliance with the Leq (15 min) operational noise criteria the modification factors detailed in Section 4 of the NSW industrial Noise policy must be applied, as appropriate, to the measured noise levels.

3.0 NOISE MONITORING PROCEDURE

3.1 Monitoring Equipment

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 and 2260 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters” and have current NATA calibration. Field calibration is carried out at the start and end of each monitoring period.

A-weighted noise levels were measured over the appropriate monitoring periods (90 minutes/day, 30 minutes/evening and 60 minutes/night) with data acquired at 1 or 2 second statistical intervals and the meter set to “fast” response. Each 1 or 2 second measurement is accompanied by a third-octave band spectrum from 20 - 20k Hz which is required for analysing INP ‘modifying factors’. Time based field notes allow for determination of the relative contributions to the overall noise level of all significant noise sources.

3.2 Measurement Analysis

The operational noise criteria for compliance with Section L 4.1 of EPL 12365 are based on a 15 minute Leq noise level. The procedures detailed in Section M 7.7 of EPL 12365 require noise monitoring for significantly longer periods than that of the compliance criteria. To determine compliance with the EPL conditions the worst case 15 minute period, in relation to mine noise, was extracted from each measurement and compared to the criteria in Section L 4.1.

This worst case 15 minute Leq noise level for each monitoring period is shown in the tables below. Where the noise from TCM was audible Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

Due to the close proximity, relative to the receiver, of TCM and the nearby Boggabri Coal Mine (BCM), it is sometimes not always possible to determine the partial contributions of emissions from each mine to the overall measured noise level. Where this is the case the total measured mine noise is shown in the tables as “mine”. Where the total measured mine noise is equal to, or greater than, the noise criterion for TCM an estimate of the relative contributions of each mine has been made based on the field observations and data analysis.

When no mine noise was audible at a monitoring location, a representative 15 minute noise measurement was made with observations carried out for the remainder of the applicable time period. In these instances, the measured noise level for the representative 15 minute period is that shown in the tables below.

The compliance measurement locations are different for each of the operational and sleep disturbance noise. That is, the sleep disturbance criterion is typically applicable at 1m from the façade of a bedroom window.

To avoid undue disturbance to residents the L1 (1 min) noise level from the operational measurements are used to show general compliance with the sleep disturbance criterion. That is, as the distance between the noise source and the operational noise monitoring location is significantly greater than the distance between the operational noise monitoring location and the sleep disturbance monitoring location (i.e. 1m from the facade of the house) there will be little variation in L1 (1 min) levels between the two monitoring locations.

It must be noted, however, that the sleep disturbance criterion is to be measured near a bedroom window. As the internal layout of each residence is not known, to consider a worst case, this is assumed to be facing the operational noise monitoring location.

Meteorological data used in this report were taken from a mine operated meteorological station at the located approximately 4km to the east of the TCM open cut. Temperature inversion information is taken from the Boggabri Coal Mine met tower with temperature sensors at 2m and 52m above ground level.

3.3 Special Conditions

Before the noise surveys, Spectrum Acoustics personnel were briefed on the current location(s) of activities.

4.0 RESULTS AND DISCUSSION

4.1 Measured Operational Noise Levels

Measured noise levels are summarised in **Tables 1 to 9**. The total measured Leq (15 min) is shown. Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the various noise sources. The identified noise sources are listed, along with the contribution of each source, in descending order (shown in brackets). Mine noise from TCM is shown in the tables in bold type.

Table 1 TCM Operational Noise Monitoring Results – 2 December 2013 (day)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Tarrawonga	12:24 pm	42	2.1/S	Birds & insects (42), TCM (26)

Table 2 TCM Operational Noise Monitoring Results – 2 December 2013 (evening)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Tarrawonga	7:31 pm	39	0.6/SE	Birds & insects (38), TCM (33)

Table 3 TCM Operational Noise Monitoring Results – 2 December 2013 (night)					
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Temperature Inversion °C/100m	Identified Noise Sources
Tarrawonga	10:05 pm	50	1.6/SE	+5.3	Insects (50), TCM (33)

Table 4 TCM Operational Noise Monitoring Results – 3 December 2013 (day)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Tarrawonga	12:17 pm	37	1.5/S	Birds & insects (37), TCM (20)

Table 5 TCM Operational Noise Monitoring Results – 3 December (evening)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Tarrawonga	9:13 pm	33	0.9/NNW	TCM (32), insects (26)

Table 6 TCM Operational Noise Monitoring Results – 3 December 2013 (night)					
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Temperature Inversion °C/100m	Identified Noise Sources
Tarrawonga	1:25 am	42	0.9/N	+11.4	Insects (40), TCM (37)

Table 7 TCM Operational Noise Monitoring Results – 4 December 2013 (day)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Tarrawonga	7:52 am	41	1.5/SSW	TCM (40), birds & insects (34)

Table 8 TCM Operational Noise Monitoring Results – 4 December 2013 (evening)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Tarrawonga	7:49 pm	41	2.2/N	Birds & insects (39), TCM (37)

Table 9 TCM Operational Noise Monitoring Results – 4 December 2013 (night)					
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Temperature Inversion °C/100m	Identified Noise Sources
Tarrawonga	12:43 am	37	3.8/N	Lapse	TCM (35), insects (32)

4.2 Discussion of Results

The results in Tables 1 to 9 show that noise emissions from TCM exceeded the operational noise criterion at the Tarrawonga monitoring location during the night on December 3 and the day and evening on December 4.

The Tarrawonga property retains acquisition rights in the Project Approval for the Tarrawonga Mine as a consequence of modelled noise predictions exceeding 35dB(A). Agreement has recently been reached in terms of acquisition of the Tarrawonga property, and as a consequence, it is now considered Project Related. As a consequence, the noise limit of 35dB(A) no longer applies at the Tarrawonga receiver.

4.2.1 Modifying Factor Corrections

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

4.3 Sleep Disturbance

The results of the sleep disturbance monitoring are shown below in **Table 10**.

Table 10 TCM Sleep Disturbance Monitoring Results				
Location	Time	dB(A),L1 (1 min)	Wind speed/ direction	Temperature Inversion °C/100m
Tarrawonga (2/12)	10:05 pm	35	1.6/SE	+5.3
Tarrawonga (4/12)	1:25 am	42	0.9/N	+11.4
Tarrawonga (5/12)	12:43 am	48	3.8/N	Lapse

The results in Table 10 show that the measured L1 (1 min) noise level was higher than the criterion during the monitoring on December 5. As indicated above, the Tarrawonga property is now Project Related and the sleep disturbance criterion is not considered applicable.

APPENDIX A

DESCRIPTION OF ACOUSTICAL TERMS

Table A1
Definition of acoustical terms

Term	Description
dB(A)	The quantitative measure of sound heard by the human ear, measured by the A- Scale Weighting Network of a sound level meter expressed in decibels (dB).
SPL	Sound Pressure Level. The incremental variation of sound pressure above and below atmospheric pressure and expressed in decibels. The human ear responds to pressure fluctuations, resulting in sound being heard.
STL	Sound Transmission Loss. The ability of a partition to attenuate sound, in dB.
Lw	Sound Power Level radiated by a noise source per unit time re 1pW.
Leq	Equivalent Continuous Noise Level - taking into account the fluctuations of noise over time. The time-varying level is computed to give an equivalent dB(A) level that is equal to the energy content and time period.
L1	Average Peak Noise Level - the level exceeded for 1% of the monitoring period.
L90	"Background" Noise Level - the level exceeded for 90% of the monitoring period.



Project No: 04095

ATTENDED NOISE MONITORING – MARCH 2014

Tarrawonga Coal Mine

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March 2014

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APPENDIX A Description of Acoustical Terms

1.0 INTRODUCTION

This letter report presents the results of attended operational noise compliance monitoring conducted for the Tarrawonga Coal Mine (TCM) over a four day period between 3 and 6 March, 2014.

The monitoring was carried out generally in accordance with the requirements of Environment Protection Licence (EPL 12365) and other relevant Australian Standards and guidelines.

1.1 Noise Monitoring Locations

Noise monitoring locations defined in Section M7.4 of EPL 12365 are listed in the table below and shown on Figure 1.

EPA Identification No.	Description of Location
N1	Within 30m of the residence on property "Tarrawonga"

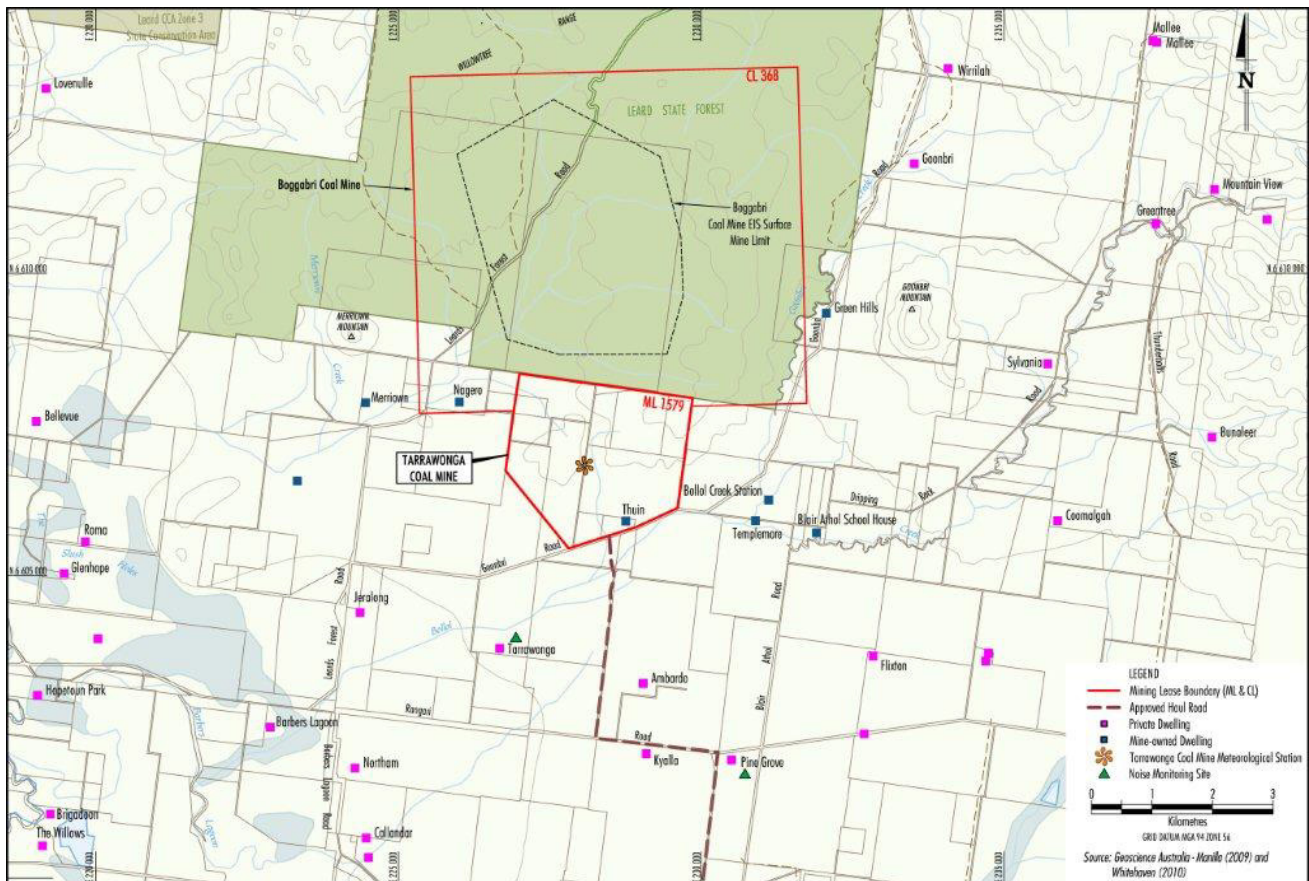


Figure 1 – Noise Monitoring Location

1.2 Monitoring Frequency and Duration

Section M7.7 of EPL 12365 states that the attended noise monitoring must be conducted;

- at each of the locations detailed above.
- quarterly in a reporting period.

c) during each day, evening and night period for a minimum of:

- 1.5 hours during the day;
- 30 minutes during the evening; and
- 1 hour during the night.

d) occur for three consecutive operating days.

2.0 NOISE CRITERIA AND CONDITIONS

2.1 Noise Assessment Criteria

Noise generated at the premises must not exceed the noise limits in the table below.

Locality and Location	Day Leq (15 min)	Evening Leq (15 min)	Night Leq (15 min)	Night L1 (1 min)
<i>Kyalla</i>	37	37	37	45
<i>All other surrounding residences</i>	35	35	35	45

2.2 Monitoring Location Definition

EPL 12365 states that to determine compliance with the Leq (15 min) operational noise criteria the noise measurement equipment must be located:

- Approximately on the property boundary, where any dwelling is situated 30m or less from the property boundary closest to the premises; or
- Within 30m of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30m from the property boundary closest to the premises; or, where applicable
- Within 50m of the boundary of a National Park or Nature Reserve.

In relation to L1 (1 min) noise limits the noise measurement equipment must be located within 1m of a dwelling façade.

2.3 Applicable Meteorological Conditions

The noise limits apply under all meteorological conditions except for the following;

1. Wind speeds greater than 3m/s at 10m above ground level; or
2. Stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
3. Stability category G temperature inversion conditions.

2.4 Other Conditions

To determine compliance with the Leq (15 min) operational noise criteria the modification factors detailed in Section 4 of the NSW industrial Noise policy must be applied, as appropriate, to the measured noise levels.

3.0 NOISE MONITORING PROCEDURE

3.1 Monitoring Equipment

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 and 2260 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters” and have current NATA calibration. Field calibration is carried out at the start and end of each monitoring period.

A-weighted noise levels were measured over the appropriate monitoring periods (90 minutes/day, 30 minutes/evening and 60 minutes/night) with data acquired at 1 or 2 second statistical intervals and the meter set to “fast” response. Each 1 or 2 second measurement is accompanied by a third-octave band spectrum from 20 - 20k Hz which is required for analysing INP ‘modifying factors’. Time based field notes allow for determination of the relative contributions to the overall noise level of all significant noise sources.

3.2 Measurement Analysis

The operational noise criteria for compliance with Section L 4.1 of EPL 12365 are based on a 15 minute Leq noise level. The procedures detailed in Section M 7.7 of EPL 12365 require noise monitoring for significantly longer periods than that of the compliance criteria. To determine compliance with the EPL conditions the worst case 15 minute period, in relation to mine noise, was extracted from each measurement and compared to the criteria in Section L 4.1.

This worst case 15 minute Leq noise level for each monitoring period is shown in the tables below. Where the noise from TCM was audible Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

Due to the close proximity, relative to the receiver, of TCM and the nearby Boggabri Coal Mine (BCM), it is sometimes not always possible to determine the partial contributions of emissions from each mine to the overall measured noise level. Where this is the case the total measured mine noise is shown in the tables as “mine”. Where the total measured mine noise is equal to, or greater than, the noise criterion for TCM an estimate of the relative contributions of each mine has been made based on the field observations and data analysis.

When no mine noise was audible at a monitoring location, a representative 15 minute noise measurement was made with observations carried out for the remainder of the applicable time period. In these instances, the measured noise level for the representative 15 minute period is that shown in the tables below.

The compliance measurement locations are different for each of the operational and sleep disturbance noise. That is, the sleep disturbance criterion is typically applicable at 1m from the façade of a bedroom window.

To avoid undue disturbance to residents the L1 (1 min) noise level from the operational measurements are used to show general compliance with the sleep disturbance criterion. That is, as the distance between the noise source and the operational noise monitoring location is significantly greater than the distance between the operational noise monitoring location and the sleep disturbance monitoring location (i.e. 1m from the facade of the house) there will be little variation in L1 (1 min) levels between the two monitoring locations.

It must be noted, however, that the sleep disturbance criterion is to be measured near a bedroom window. As the internal layout of each residence is not known, to consider a worst case, this is assumed to be facing the operational noise monitoring location.

Meteorological data used in this report were taken from a mine operated meteorological station at the located approximately 4km to the east of the TCM open cut. Temperature inversion information is taken from the Boggabri Coal Mine met tower with temperature sensors at 2m and 52m above ground level.

3.3 Special Conditions

Before the noise surveys, Spectrum Acoustics personnel were briefed on the current location(s) of activities.

4.0 RESULTS AND DISCUSSION

4.1 Measured Operational Noise Levels

Measured noise levels are summarised in **Tables 1 to 9**. The total measured Leq (15 min) is shown. Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the various noise sources. The identified noise sources are listed, along with the contribution of each source, in descending order (shown in brackets). Mine noise from TCM is shown in the tables in bold type.

Table 1 TCM Operational Noise Monitoring Results – 3 March 2014 (evening)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Tarrawonga	9:11 pm	38	0.9/SE	TCM (35) , wind (34), insects (29)

Table 2 TCM Operational Noise Monitoring Results – 3 March 2014 (night)					
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Temperature Inversion °C/100m	Identified Noise Sources
Tarrawonga	1:17 am	38	1.2/ESE	+3.1	(TCM 35) , insects (35)

Table 3 TCM Operational Noise Monitoring Results – 4 March 2014 (day)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Tarrawonga	1:22 pm	30	0.9/SE	Birds & insects (30), TCM (21)

Table 4 TCM Operational Noise Monitoring Results – 4 March 2014 (evening)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Tarrawonga	7:38 pm	36	Calm	Birds & insects (33), TCM (33)

Table 5 TCM Operational Noise Monitoring Results – 4 March 2014 (night)					
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Temperature Inversion °C/100m	Identified Noise Sources
Tarrawonga	10:11 pm	37	0.5/SSE	+1.7	TCM (35), insects (33)

Table 6 TCM Operational Noise Monitoring Results – 5 March 2014 (day)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Tarrawonga	1:54 pm	29	0.9/SW	Birds & insects (28), TCM (20)

Table 7 TCM Operational Noise Monitoring Results – 5 March 2014 (evening)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Tarrawonga	9:24 pm	43	Calm	Birds & insects (43), TCM (24)

Table 8 TCM Operational Noise Monitoring Results – 5 March 2014 (night)					
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Temperature Inversion °C/100m	Identified Noise Sources
Tarrawonga	1:21 am	37	0.1/SSE	+2.1	TCM (34), insects (34)

Table 9 TCM Operational Noise Monitoring Results – 6 March 2014 (day)				
Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Tarrawonga	10:40 am	29	1.2/NW	Birds & insects (27), TCM (24)

4.2 Discussion of Results

The results in Tables 1 to 9 show that noise emissions from TCM did not exceed the operational noise criterion at the Tarrawonga monitoring location at any time during the survey.

4.2.1 Modifying Factor Corrections

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

4.3 Sleep Disturbance

The results of the sleep disturbance monitoring are shown below in **Table 10**.

Table 10 TCM Sleep Disturbance Monitoring Results				
Location	Time	dB(A),L1 (1 min)	Wind speed/ direction	Temperature Inversion °C/100m
Tarrawonga (3/3/14)	1:17 am	42	1.2/ESE	+3.1
Tarrawonga (4/3/14)	10:11 pm	43	0.5/SSE	+1.7
Tarrawonga (5/3/14)	1:21 am	40	0.1/SSE	+2.1

The results in Table 10 show that the measured L1 (1 min) noise level did not exceed the sleep disturbance criterion during any of the night time monitoring throughout the survey.

APPENDIX A

DESCRIPTION OF ACOUSTICAL TERMS

Table A1
Definition of acoustical terms

Term	Description
dB(A)	The quantitative measure of sound heard by the human ear, measured by the A- Scale Weighting Network of a sound level meter expressed in decibels (dB).
SPL	Sound Pressure Level. The incremental variation of sound pressure above and below atmospheric pressure and expressed in decibels. The human ear responds to pressure fluctuations, resulting in sound being heard.
STL	Sound Transmission Loss. The ability of a partition to attenuate sound, in dB.
Lw	Sound Power Level radiated by a noise source per unit time re 1pW.
Leq	Equivalent Continuous Noise Level - taking into account the fluctuations of noise over time. The time-varying level is computed to give an equivalent dB(A) level that is equal to the energy content and time period.
L1	Average Peak Noise Level - the level exceeded for 1% of the monitoring period.
L90	"Background" Noise Level - the level exceeded for 90% of the monitoring period.

Appendix 10

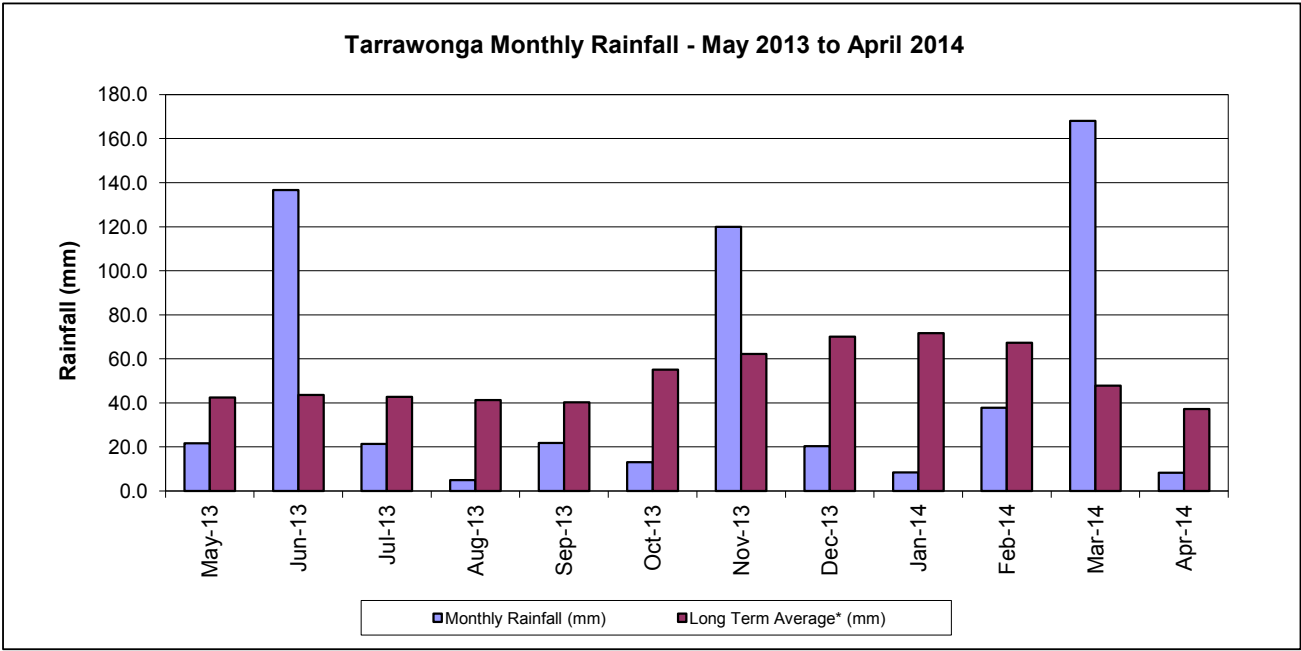
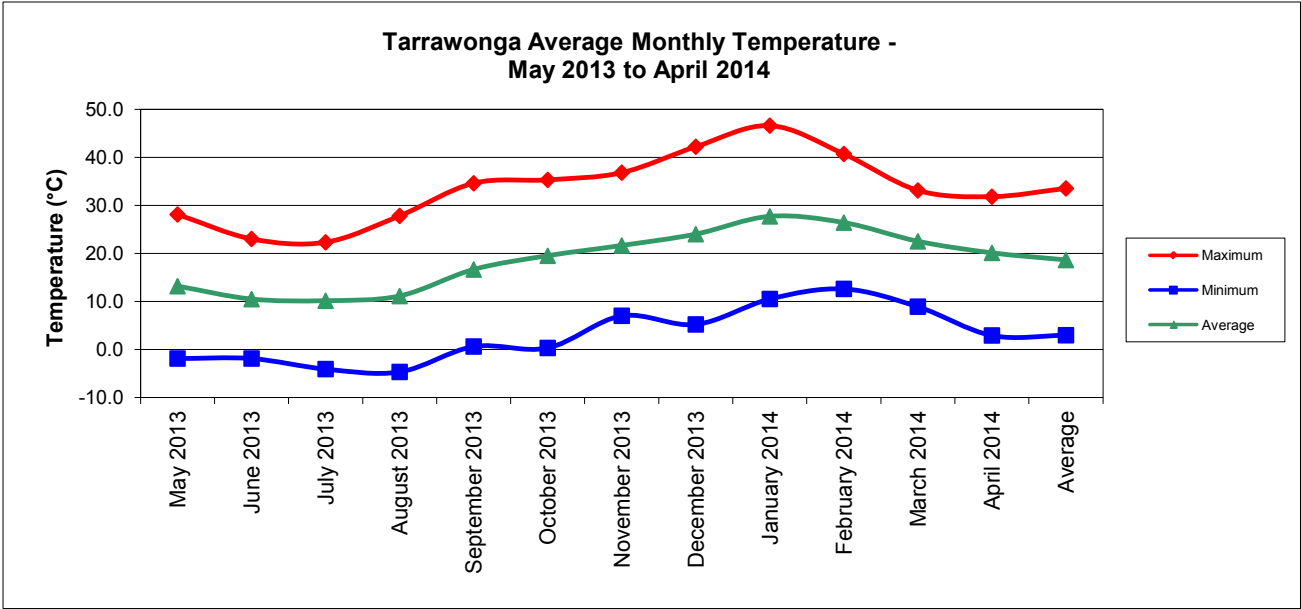
METEOROLOGICAL DATA

Tarrawonga Coal Mine Average Monthly Results

Month	Minimum Air Temp (°C)	Average Air Temp (°C)	Maximum Air Temp (°C)	Minimum Relative Humidity (%)	Average Relative Humidity(%)	Maximum Relative Humidity (%)	Minimum Wind Speed (m/s)	Average Wind Speed (m/s)	Maximum Wind Speed (m/s)
May 2013	-1.9	13.2	28.1	23.7	65.8	99.1	0.0	1.2	8.6
June 2013	-1.9	10.5	23.0	27.6	81.8	99.4	0.0	0.9	5.6
July 2013	-4.1	10.1	22.3	30.3	75.6	99.5	0.0	0.9	6.9
August 2013	-4.7	11.1	27.8	16.7	62.5	99.8	0.0	1.2	7.3
September 2013	0.6	16.6	34.6	8.8	49.9	98.3	0.0	1.4	9.2
October 2013	0.3	19.5	35.3	7.5	40.3	98.3	0.0	1.9	10.7
November 2013	7.0	21.6	36.8	9.0	46.9	98.8	0.0	0.7	9.8
December 2013	5.2	24.0	42.2	9.3	44.2	97.1	0.0	1.2	8.6
January 2014	10.5	27.7	46.6	6.2	37.9	93.3	0.0	1.9	9.9
February 2014	12.6	26.4	40.7	9.4	46.4	98.0	0.0	1.5	11.6
March 2014	8.9	22.5	33.1	20.5	61.6	98.4	0.0	1.5	8.0
April 2014	2.9	20.1	31.8	25.4	66.7	97.1	0.0	1.3	6.1
Average	3.0	18.6	33.5	16.2	56.6	98.1	0.0	1.3	8.5
Minimum	-4.7	10.1	22.3	6.2	37.9	93.3	0.0	0.7	5.6
Maximum	12.6	27.7	46.6	30.3	81.8	99.8	0.0	1.9	11.6
Total									

Month	Monthly Rainfall (mm)	Long Term Average* (mm)	Cumulative Rainfall (mm)	Number of Rain Days (≥1mm)
May 2013	21.6	42.5	21.6	5
June 2013	136.6	43.6	158.2	7
July 2013	21.4	42.7	179.6	4
August 2013	5.0	41.3	184.6	1
September 2013	21.8	40.3	206.4	2
October 2013	13.0	55.1	219.4	1
November 2013	120.0	62.2	339.4	7
December 2013	20.4	70	359.8	4
January 2014	8.4	71.7	368.2	2
February 2014	37.8	67.3	406.8	3
March 2014	168.0	47.8	574.0	9
April 2014	8.2	37.2	582.2	2
Total	582.2	621.7	582.2	47

* Long term average is from Gunnedah Pool (Station 055023) 1877 - 2014



Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
Module Id : M2 (Templemore 10m)
Requested Report Date : 2013/06/01
Requested Report Hour : 00
Chart Available : no

Main Data Summary

Record Time	Temperature									Prevailing Wind									Solar Rad		
	2m			10m			60m			Humidity			Speed			Gust	Dir	Rain			
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max				(m/s)	(m/s)	(°)
					(°C)						(%)										(W/m²)
2013/05/01 00:00:00	15.8	5.0	28.1	17.8	8.5	27.5	-99.0	-99.0	-99.0	55.2	26.1	80.8	0.1	0.0	0.0	6.8	310	0.0	-99.0	-99.0	
2013/05/02 00:00:00	17.9	6.9	28.0	19.1	10.5	26.9	-99.0	-99.0	-99.0	58.4	30.7	90.1	1.4	0.0	0.0	8.7	296	0.0	-99.0	-99.0	
2013/05/03 00:00:00	16.0	9.2	23.2	17.3	12.2	22.5	-99.0	-99.0	-99.0	56.8	35.1	85.6	2.5	0.0	6.0	8.9	155	0.0	-99.0	-99.0	
2013/05/04 00:00:00	15.1	9.0	25.2	16.3	9.6	24.1	-99.0	-99.0	-99.0	59.0	31.7	82.5	0.7	0.0	1.7	6.8	121	0.0	-99.0	-99.0	
2013/05/04 00:00:00	13.1	2.2	25.2	15.4	6.7	24.2	-99.0	-99.0	-99.0	59.1	23.7	97.7	0.7	0.0	2.1	5.3	190	0.0	-99.0	-99.0	
2013/05/06 00:00:00	15.6	8.2	23.4	15.9	8.6	22.8	-99.0	-99.0	-99.0	59.2	38.1	83.4	2.9	0.0	4.9	9.9	130	0.0	-99.0	-99.0	
2013/05/07 00:00:00	15.7	8.2	24.3	16.8	10.8	23.5	-99.0	-99.0	-99.0	56.0	31.3	80.3	2.6	0.0	4.5	7.1	115	0.0	-99.0	-99.0	
2013/05/08 00:00:00	14.9	4.1	24.4	16.4	7.2	23.4	-99.0	-99.0	-99.0	58.5	28.3	96.1	1.4	0.0	4.2	6.6	124	0.0	-99.0	-99.0	
2013/05/09 00:00:00	13.3	4.3	23.9	15.4	7.2	23.2	-99.0	-99.0	-99.0	64.6	32.7	94.7	0.6	0.0	0.0	5.9	175	0.0	-99.0	-99.0	
2013/05/10 00:00:00	12.8	2.7	23.7	15.0	6.3	23.1	-99.0	-99.0	-99.0	62.4	26.0	96.2	2.1	0.0	5.0	7.9	119	0.0	-99.0	-99.0	
2013/05/11 00:00:00	15.0	3.1	25.2	16.6	6.6	24.3	-99.0	-99.0	-99.0	58.8	25.5	96.3	1.6	0.0	4.9	6.8	128	0.0	-99.0	-99.0	
2013/05/12 00:00:00	15.1	5.2	25.3	16.9	9.0	24.5	-99.0	-99.0	-99.0	56.6	25.1	94.0	0.6	0.0	3.1	5.6	73	0.0	-99.0	-99.0	
2013/05/13 00:00:00	15.7	8.2	23.1	16.0	9.9	22.6	-99.0	-99.0	-99.0	65.5	38.1	96.9	0.7	0.0	1.9	9.7	287	7.6	-99.0	-99.0	
2013/05/14 00:00:00	14.3	5.3	19.4	14.5	8.8	18.5	-99.0	-99.0	-99.0	78.8	54.3	97.3	1.3	0.0	3.9	5.5	295	5.0	-99.0	-99.0	
2013/05/15 00:00:00	11.0	2.9	18.3	11.7	5.3	16.9	-99.0	-99.0	-99.0	66.8	38.7	95.3	1.1	0.0	1.0	5.3	319	0.0	-99.0	-99.0	
2013/05/16 00:00:00	12.8	6.4	20.3	13.7	8.8	18.8	-99.0	-99.0	-99.0	70.6	40.7	96.5	1.9	0.0	1.7	9.0	310	1.6	-99.0	-99.0	
2013/05/17 00:00:00	10.4	2.6	18.9	12.0	6.5	17.5	-99.0	-99.0	-99.0	74.2	33.9	98.6	1.1	0.0	0.8	8.8	275	0.2	-99.0	-99.0	
2013/05/18 00:00:00	9.5	0.8	16.5	10.6	3.5	15.4	-99.0	-99.0	-99.0	67.3	38.7	96.4	1.2	0.0	1.1	7.4	252	0.0	-99.0	-99.0	
2013/05/19 00:00:00	10.1	1.1	17.4	11.6	4.6	16.1	-99.0	-99.0	-99.0	63.4	34.7	93.6	1.9	0.0	1.3	9.3	254	0.0	-99.0	-99.0	
2013/05/20 00:00:00	7.8	0.2	17.9	9.5	2.5	17.3	-99.0	-99.0	-99.0	72.6	36.7	96.2	0.2	0.0	2.2	5.6	351	0.0	-99.0	-99.0	
2013/05/21 00:00:00	10.8	2.8	19.5	11.9	4.3	18.4	-99.0	-99.0	-99.0	67.4	36.9	95.5	0.9	0.0	2.0	5.2	326	0.0	-99.0	-99.0	
2013/05/22 00:00:00	10.5	9.6	12.7	10.9	9.9	12.5	-99.0	-99.0	-99.0	83.8	66.6	97.6	0.4	0.0	0.6	8.2	206	5.6	-99.0	-99.0	
2013/05/23 00:00:00	12.3	10.2	15.2	12.3	10.3	14.6	-99.0	-99.0	-99.0	85.1	65.4	97.5	1.4	0.0	2.5	5.1	169	0.4	-99.0	-99.0	
2013/05/24 00:00:00	13.3	8.4	18.0	13.6	9.7	17.6	-99.0	-99.0	-99.0	72.5	44.0	96.1	3.3	0.0	8.6	13.7	175	1.0	-99.0	-99.0	

Continued on next page

Record Time	Temperature									Prevailing Wind									Solar Rad	
	2m			10m			60m			Humidity			Speed			Gust	Dir	Rain		
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	(m/s)	(°)	(mm)	Avg	Max
					(°C)						(%)					(m/s)			(W/m ²)	
2013/05/25 00:00:00	10.4	2.0	19.9	12.6	6.5	19.3	-99.0	-99.0	-99.0	75.3	36.6	99.1	1.5	0.0	1.1	8.4	160	0.0	-99.0	-99.0
2013/05/26 00:00:00	9.0	-0.1	20.6	11.2	2.9	20.1	-99.0	-99.0	-99.0	72.1	29.5	98.5	0.3	0.0	2.7	4.7	357	0.0	-99.0	-99.0
2013/05/27 00:00:00	8.8	-1.9	21.7	10.9	0.9	21.0	-99.0	-99.0	-99.0	68.6	24.9	97.7	0.2	0.0	2.2	4.2	150	0.2	-99.0	-99.0
2013/05/28 00:00:00	16.8	14.1	20.9	17.9	16.1	20.7	-99.0	-99.0	-99.0	62.0	48.3	73.9	0.0	0.0	3.0	0.0	-99	0.0	-99.0	-99.0
2013/05/29 00:00:00	16.3	9.5	23.9	16.1	11.5	-99.0	-99.0	-99.0	-99.0	55.3	30.8	79.5	1.5	0.0	4.1	6.8	73	0.0	-99.0	-99.0
2013/05/30 00:00:00	14.0	4.5	23.5	15.4	6.6	22.6	-99.0	-99.0	-99.0	66.0	38.3	95.0	0.3	0.0	2.2	7.8	27	0.0	-99.0	-99.0
2013/05/31 00:00:00	14.1	5.7	24.3	15.4	8.2	23.0	-99.0	-99.0	-99.0	69.4	38.8	94.5	0.3	0.0	2.3	4.5	298	0.0	-99.0	-99.0

Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
Module Id : M2 (Templemore 10m)
Requested Report Date : 2013/06/01
Requested Report Hour : 00
Chart Available : no

Main Data Summary

Record Time	Temperature									Prevailing Wind									Solar Rad		
	2m			10m			60m			Humidity			Speed			Gust	Dir	Rain			
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max				(m/s)	(m/s)	(°)
					(°C)						(%)										(W/m²)
2013/05/01 00:00:00	15.8	5.0	28.1	17.8	8.5	27.5	-99.0	-99.0	-99.0	55.2	26.1	80.8	0.1	0.0	0.0	6.8	310	0.0	-99.0	-99.0	
2013/05/02 00:00:00	17.9	6.9	28.0	19.1	10.5	26.9	-99.0	-99.0	-99.0	58.4	30.7	90.1	1.4	0.0	0.0	8.7	296	0.0	-99.0	-99.0	
2013/05/03 00:00:00	16.0	9.2	23.2	17.3	12.2	22.5	-99.0	-99.0	-99.0	56.8	35.1	85.6	2.5	0.0	6.0	8.9	155	0.0	-99.0	-99.0	
2013/05/04 00:00:00	15.1	9.0	25.2	16.3	9.6	24.1	-99.0	-99.0	-99.0	59.0	31.7	82.5	0.7	0.0	1.7	6.8	121	0.0	-99.0	-99.0	
2013/05/04 00:00:00	13.1	2.2	25.2	15.4	6.7	24.2	-99.0	-99.0	-99.0	59.1	23.7	97.7	0.7	0.0	2.1	5.3	190	0.0	-99.0	-99.0	
2013/05/06 00:00:00	15.6	8.2	23.4	15.9	8.6	22.8	-99.0	-99.0	-99.0	59.2	38.1	83.4	2.9	0.0	4.9	9.9	130	0.0	-99.0	-99.0	
2013/05/07 00:00:00	15.7	8.2	24.3	16.8	10.8	23.5	-99.0	-99.0	-99.0	56.0	31.3	80.3	2.6	0.0	4.5	7.1	115	0.0	-99.0	-99.0	
2013/05/08 00:00:00	14.9	4.1	24.4	16.4	7.2	23.4	-99.0	-99.0	-99.0	58.5	28.3	96.1	1.4	0.0	4.2	6.6	124	0.0	-99.0	-99.0	
2013/05/09 00:00:00	13.3	4.3	23.9	15.4	7.2	23.2	-99.0	-99.0	-99.0	64.6	32.7	94.7	0.6	0.0	0.0	5.9	175	0.0	-99.0	-99.0	
2013/05/10 00:00:00	12.8	2.7	23.7	15.0	6.3	23.1	-99.0	-99.0	-99.0	62.4	26.0	96.2	2.1	0.0	5.0	7.9	119	0.0	-99.0	-99.0	
2013/05/11 00:00:00	15.0	3.1	25.2	16.6	6.6	24.3	-99.0	-99.0	-99.0	58.8	25.5	96.3	1.6	0.0	4.9	6.8	128	0.0	-99.0	-99.0	
2013/05/12 00:00:00	15.1	5.2	25.3	16.9	9.0	24.5	-99.0	-99.0	-99.0	56.6	25.1	94.0	0.6	0.0	3.1	5.6	73	0.0	-99.0	-99.0	
2013/05/13 00:00:00	15.7	8.2	23.1	16.0	9.9	22.6	-99.0	-99.0	-99.0	65.5	38.1	96.9	0.7	0.0	1.9	9.7	287	7.6	-99.0	-99.0	
2013/05/14 00:00:00	14.3	5.3	19.4	14.5	8.8	18.5	-99.0	-99.0	-99.0	78.8	54.3	97.3	1.3	0.0	3.9	5.5	295	5.0	-99.0	-99.0	
2013/05/15 00:00:00	11.0	2.9	18.3	11.7	5.3	16.9	-99.0	-99.0	-99.0	66.8	38.7	95.3	1.1	0.0	1.0	5.3	319	0.0	-99.0	-99.0	
2013/05/16 00:00:00	12.8	6.4	20.3	13.7	8.8	18.8	-99.0	-99.0	-99.0	70.6	40.7	96.5	1.9	0.0	1.7	9.0	310	1.6	-99.0	-99.0	
2013/05/17 00:00:00	10.4	2.6	18.9	12.0	6.5	17.5	-99.0	-99.0	-99.0	74.2	33.9	98.6	1.1	0.0	0.8	8.8	275	0.2	-99.0	-99.0	
2013/05/18 00:00:00	9.5	0.8	16.5	10.6	3.5	15.4	-99.0	-99.0	-99.0	67.3	38.7	96.4	1.2	0.0	1.1	7.4	252	0.0	-99.0	-99.0	
2013/05/19 00:00:00	10.1	1.1	17.4	11.6	4.6	16.1	-99.0	-99.0	-99.0	63.4	34.7	93.6	1.9	0.0	1.3	9.3	254	0.0	-99.0	-99.0	
2013/05/20 00:00:00	7.8	0.2	17.9	9.5	2.5	17.3	-99.0	-99.0	-99.0	72.6	36.7	96.2	0.2	0.0	2.2	5.6	351	0.0	-99.0	-99.0	
2013/05/21 00:00:00	10.8	2.8	19.5	11.9	4.3	18.4	-99.0	-99.0	-99.0	67.4	36.9	95.5	0.9	0.0	2.0	5.2	326	0.0	-99.0	-99.0	
2013/05/22 00:00:00	10.5	9.6	12.7	10.9	9.9	12.5	-99.0	-99.0	-99.0	83.8	66.6	97.6	0.4	0.0	0.6	8.2	206	5.6	-99.0	-99.0	
2013/05/23 00:00:00	12.3	10.2	15.2	12.3	10.3	14.6	-99.0	-99.0	-99.0	85.1	65.4	97.5	1.4	0.0	2.5	5.1	169	0.4	-99.0	-99.0	
2013/05/24 00:00:00	13.3	8.4	18.0	13.6	9.7	17.6	-99.0	-99.0	-99.0	72.5	44.0	96.1	3.3	0.0	8.6	13.7	175	1.0	-99.0	-99.0	

Continued on next page

Record Time	Temperature									Prevailing Wind									Solar Rad	
	2m			10m			60m			Humidity			Speed			Gust	Dir	Rain		
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	(m/s)	(°)	(mm)	Avg	Max
					(°C)						(%)					(m/s)			(W/m ²)	
2013/05/25 00:00:00	10.4	2.0	19.9	12.6	6.5	19.3	-99.0	-99.0	-99.0	75.3	36.6	99.1	1.5	0.0	1.1	8.4	160	0.0	-99.0	-99.0
2013/05/26 00:00:00	9.0	-0.1	20.6	11.2	2.9	20.1	-99.0	-99.0	-99.0	72.1	29.5	98.5	0.3	0.0	2.7	4.7	357	0.0	-99.0	-99.0
2013/05/27 00:00:00	8.8	-1.9	21.7	10.9	0.9	21.0	-99.0	-99.0	-99.0	68.6	24.9	97.7	0.2	0.0	2.2	4.2	150	0.2	-99.0	-99.0
2013/05/28 00:00:00	16.8	14.1	20.9	17.9	16.1	20.7	-99.0	-99.0	-99.0	62.0	48.3	73.9	0.0	0.0	3.0	0.0	-99	0.0	-99.0	-99.0
2013/05/29 00:00:00	16.3	9.5	23.9	16.1	11.5	-99.0	-99.0	-99.0	-99.0	55.3	30.8	79.5	1.5	0.0	4.1	6.8	73	0.0	-99.0	-99.0
2013/05/30 00:00:00	14.0	4.5	23.5	15.4	6.6	22.6	-99.0	-99.0	-99.0	66.0	38.3	95.0	0.3	0.0	2.2	7.8	27	0.0	-99.0	-99.0
2013/05/31 00:00:00	14.1	5.7	24.3	15.4	8.2	23.0	-99.0	-99.0	-99.0	69.4	38.8	94.5	0.3	0.0	2.3	4.5	298	0.0	-99.0	-99.0

Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
Module Id : M2 (Templemore 10m)
Requested Report Date : 2013/07/01
Requested Report Hour : 00
Chart Available : no

Main Data Summary

Record Time	Temperature									Prevailing Wind									Solar Rad	
	Avg	2m Min	Max	Avg	10m Min	Max	Avg	60m Min	Max	Avg	Humidity Min	Max	Avg	Speed Min	Max	Gust	Dir	Rain	Avg	Max
					(°C)						(%)			(m/s)		(m/s)	(°)	(mm)	(W/m ²)	
2013/05/31 00:00:00	14.8	8.5	20.8	15.4	9.5	20.1	-99.0	-99.0	-99.0	73.6	44.7	95.8	0.0	0.0	0.0	0.0	-99	0.6	-99.0	-99.0
2013/06/01 00:00:00	13.9	7.3	18.3	14.4	9.1	18.6	-99.0	-99.0	-99.0	85.8	62.2	97.9	0.0	0.0	0.0	0.0	-99	32.2	-99.0	-99.0
2013/06/02 00:00:00	8.2	1.4	17.0	9.9	4.3	16.6	-99.0	-99.0	-99.0	80.3	44.4	99.3	1.1	0.0	2.1	7.1	184	0.2	132.9	547.0
2013/06/04 00:00:00	7.7	-1.0	18.9	9.3	0.9	18.6	-99.0	-99.0	-99.0	78.3	36.9	98.2	0.2	0.0	2.4	5.3	109	0.0	140.1	558.1
2013/06/05 00:00:00	9.9	1.7	20.5	11.0	3.5	19.6	-99.0	-99.0	-99.0	80.2	42.8	98.9	0.5	0.0	0.0	4.9	334	0.2	111.5	588.1
2013/06/06 00:00:00	14.6	8.6	19.5	15.0	10.1	19.3	-99.0	-99.0	-99.0	76.9	59.4	94.3	0.7	0.0	2.4	4.2	355	0.0	54.9	554.5
2013/06/07 00:00:00	16.4	12.3	20.5	17.1	13.3	19.8	-99.0	-99.0	-99.0	77.0	57.6	95.1	0.0	0.0	0.0	0.0	-99	0.0	51.5	419.6
2013/06/08 00:00:00	13.5	5.9	22.0	14.8	9.3	21.4	-99.0	-99.0	-99.0	78.0	40.8	98.4	0.0	0.0	0.0	0.0	-99	0.0	126.1	553.5
2013/06/09 00:00:00	12.6	4.4	22.4	13.8	7.0	21.4	-99.0	-99.0	-99.0	79.8	47.9	98.1	0.0	0.0	0.0	0.0	-99	0.0	111.7	487.4
2013/06/10 00:00:00	12.4	8.0	14.6	13.0	9.0	14.5	-99.0	-99.0	-99.0	93.7	82.6	98.8	0.0	0.0	0.0	0.0	-99	23.6	21.6	166.5
2013/06/11 00:00:00	11.0	6.8	18.4	11.6	7.9	17.9	-99.0	-99.0	-99.0	92.8	69.3	99.1	0.5	0.0	0.0	4.2	191	0.6	86.8	577.4
2013/06/12 00:00:00	14.2	7.2	23.0	14.9	8.8	22.3	-99.0	-99.0	-99.0	89.0	56.8	98.6	1.5	0.0	1.4	13.9	359	13.4	49.9	558.2
2013/06/13 00:00:00	13.3	10.9	16.0	13.4	11.7	15.3	-99.0	-99.0	-99.0	83.3	69.1	97.8	2.8	0.7	5.6	8.7	315	5.0	63.4	485.1
2013/06/14 00:00:00	11.3	9.9	13.7	11.2	10.0	13.0	-99.0	-99.0	-99.0	81.7	66.8	92.1	3.2	2.0	5.5	8.4	309	0.4	58.8	390.6
2013/06/15 00:00:00	11.0	5.1	16.0	11.3	6.9	15.1	-99.0	-99.0	-99.0	80.5	56.2	96.6	2.2	0.0	2.2	6.1	295	0.6	68.1	495.1
2013/06/16 00:00:00	7.4	1.6	15.2	8.3	3.0	14.7	-99.0	-99.0	-99.0	84.1	46.7	98.8	0.3	0.0	0.7	4.5	325	0.0	119.2	573.8
2013/06/17 00:00:00	7.8	0.7	15.1	8.7	2.7	14.5	-99.0	-99.0	-99.0	75.5	43.5	98.4	0.8	0.0	2.9	6.0	319	0.2	109.6	612.0
2013/06/18 00:00:00	6.8	-0.3	14.9	8.1	2.8	14.4	-99.0	-99.0	-99.0	74.5	44.8	99.1	0.8	0.0	2.3	5.6	311	0.0	118.3	528.0
2013/06/19 00:00:00	6.2	-1.2	14.7	7.7	0.4	14.1	-99.0	-99.0	-99.0	78.9	50.8	97.8	0.9	0.0	0.0	7.9	133	0.0	114.3	557.9
2013/06/20 00:00:00	7.7	2.7	14.3	8.8	4.8	13.8	-99.0	-99.0	-99.0	83.1	52.3	97.7	1.0	0.0	1.3	5.5	115	0.0	72.1	390.5
2013/06/21 00:00:00	8.8	2.0	17.4	9.8	4.4	16.2	-99.0	-99.0	-99.0	78.8	39.1	97.6	0.4	0.0	0.0	5.1	301	0.0	121.0	541.6
2013/06/22 00:00:00	6.2	-1.3	17.0	8.2	1.2	16.2	-99.0	-99.0	-99.0	78.9	39.2	99.3	0.9	0.0	0.0	6.0	161	0.0	125.9	546.5
2013/06/23 00:00:00	6.8	-1.9	18.2	8.6	0.6	17.2	-99.0	-99.0	-99.0	75.9	35.8	98.4	0.5	0.0	0.7	5.3	185	0.0	128.9	516.9
2013/06/24 00:00:00	8.0	-0.7	17.2	9.1	1.8	16.3	-99.0	-99.0	-99.0	69.2	27.6	99.2	1.8	0.0	1.8	7.7	287	0.0	124.8	558.5

Continued on next page

Record Time	Temperature									Prevailing Wind									Solar Rad	
	2m			10m			60m			Humidity			Speed			Gust	Dir	Rain		
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	(<i>m/s</i>)	(°)	(<i>mm</i>)	Avg	Max
					(°C)						(%)								(<i>W/m²</i>)	
2013/06/25 00:00:00	7.1	1.7	11.4	7.7	3.6	11.1	-99.0	-99.0	-99.0	87.1	68.0	99.0	1.6	0.0	2.2	7.1	320	28.8	47.3	449.0
2013/06/26 00:00:00	8.5	0.1	16.0	8.9	0.9	15.8	-99.0	-99.0	-99.0	86.2	61.7	99.4	0.6	0.0	0.0	5.3	145	0.2	96.3	546.7
2013/06/27 00:00:00	11.2	5.5	16.6	12.0	7.7	16.3	-99.0	-99.0	-99.0	90.3	67.1	98.4	0.8	0.0	3.4	4.4	125	18.4	52.0	424.6
2013/06/28 00:00:00	13.1	7.6	19.7	13.7	9.3	18.4	-99.0	-99.0	-99.0	83.2	52.9	98.2	0.7	0.0	1.6	5.7	149	0.2	89.6	639.5
2013/06/29 00:00:00	11.8	9.4	15.9	12.2	10.2	15.3	-99.0	-99.0	-99.0	92.3	75.4	98.2	0.6	0.0	0.0	5.3	160	11.8	50.6	596.5
2013/06/30 00:00:00	11.8	7.2	16.5	11.9	8.3	16.0	-99.0	-99.0	-99.0	84.0	63.1	99.0	2.4	0.0	1.3	8.1	158	0.2	80.6	576.8

Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
Module Id : M2 (Templemore 10m)
Requested Report Date : 2013/08/01
Requested Report Hour : 00
Chart Available : no

Main Data Summary

Record Time	Temperature									Humidity									Prevailing Wind				Dir	Rain	Solar Rad	
	Avg	2m Min	Max	Avg	10m Min (°C)	Max	Avg	60m Min	Max	Avg	Min	Max	Avg	Min	Max	Speed (m/s)	Gust (m/s)	Dir (°)	Rain (mm)	Avg	Max					
2013/07/01 00:00:00	11.4	3.4	18.1	12.3	6.7	17.5	-99.0	-99.0	-99.0	81.2	58.1	98.3	2.5	0.0	0.0	10.5	165	0.0	121.3	552.6						
2013/07/02 00:00:00	9.8	2.7	19.0	11.5	4.8	18.5	-99.0	-99.0	-99.0	82.9	47.9	99.3	1.0	0.0	0.8	6.3	153	0.0	118.2	510.1						
2013/07/03 00:00:00	8.7	1.0	19.7	9.9	2.2	19.0	-99.0	-99.0	-99.0	82.6	41.6	99.2	0.4	0.0	2.4	4.7	334	0.2	130.3	525.2						
2013/07/04 00:00:00	12.4	1.4	22.3	13.1	3.6	21.1	-99.0	-99.0	-99.0	72.1	44.2	99.0	1.5	0.0	6.2	9.2	322	0.2	112.8	572.1						
2013/07/05 00:00:00	15.7	4.0	20.9	16.4	6.9	20.2	-99.0	-99.0	-99.0	53.9	30.3	94.7	2.4	0.0	2.2	9.0	300	0.0	114.6	530.4						
2013/07/06 00:00:00	6.5	-0.4	17.0	8.5	1.9	16.3	-99.0	-99.0	-99.0	74.9	31.4	98.3	0.7	0.0	2.2	6.1	286	0.0	135.5	532.0						
2013/07/07 00:00:00	4.6	-3.6	14.7	6.2	-1.2	14.1	-99.0	-99.0	-99.0	73.9	32.1	96.9	0.4	0.0	2.6	6.1	127	0.0	138.0	539.5						
2013/07/08 00:00:00	4.5	-4.1	15.4	6.4	-1.9	14.9	-99.0	-99.0	-99.0	76.2	34.9	97.0	0.5	0.0	0.6	5.5	161	0.0	137.3	536.6						
2013/07/09 00:00:00	8.9	-1.1	16.3	10.2	3.3	15.9	-99.0	-99.0	-99.0	65.9	39.7	96.6	2.6	0.0	3.1	8.1	120	0.0	76.2	591.2						
2013/07/10 00:00:00	12.2	8.0	16.5	12.6	10.1	16.0	-99.0	-99.0	-99.0	65.4	50.7	81.5	0.0	0.0	0.0	0.0	-99	0.0	61.0	409.5						
2013/07/11 00:00:00	12.1	5.6	20.1	12.9	7.2	19.3	-99.0	-99.0	-99.0	74.6	46.0	95.9	0.0	0.0	0.0	0.0	-99	0.0	134.0	550.1						
2013/07/12 00:00:00	10.2	4.7	17.7	11.3	6.9	17.3	-99.0	-99.0	-99.0	82.7	51.2	97.4	0.0	0.0	0.0	0.0	-99	0.0	75.2	517.2						
2013/07/13 00:00:00	9.8	1.4	20.5	11.1	2.7	19.8	-99.0	-99.0	-99.0	79.4	39.4	99.5	0.0	0.0	0.0	0.0	-99	0.0	135.0	533.5						
2013/07/14 00:00:00	10.8	2.5	20.2	12.0	5.5	19.3	-99.0	-99.0	-99.0	77.6	44.5	98.7	0.0	0.0	0.0	0.0	-99	0.0	137.7	4180.1						
2013/07/15 00:00:00	13.1	7.9	19.9	13.5	9.4	19.1	-99.0	-99.0	-99.0	84.1	51.4	96.9	0.0	0.0	0.8	0.0	-99	4.0	71.7	622.9						
2013/07/16 00:00:00	13.6	9.3	20.3	14.3	11.3	19.8	-99.0	-99.0	-99.0	88.5	59.4	97.9	0.1	0.0	1.0	4.2	132	2.6	76.7	573.6						
2013/07/17 00:00:00	12.5	5.5	21.4	13.5	6.8	20.6	-99.0	-99.0	-99.0	84.3	51.7	98.9	0.1	0.0	0.7	5.0	309	0.2	111.4	579.7						
2013/07/18 00:00:00	13.0	6.2	20.2	14.3	8.0	19.4	-99.0	-99.0	-99.0	79.4	53.6	98.2	0.2	0.0	3.1	6.3	254	0.0	107.2	534.1						
2013/07/19 00:00:00	16.0	11.6	20.9	16.3	12.9	20.6	-99.0	-99.0	-99.0	76.5	54.7	97.2	2.1	0.0	1.2	12.7	2	3.2	60.0	552.6						
2013/07/20 00:00:00	13.4	9.2	18.7	13.8	10.4	17.7	-99.0	-99.0	-99.0	77.0	51.3	98.1	2.5	0.0	6.9	9.8	312	10.8	88.4	581.1						
2013/07/21 00:00:00	8.9	3.8	15.3	9.8	5.3	14.1	-99.0	-99.0	-99.0	66.8	38.6	94.8	1.3	0.0	4.3	6.5	328	0.0	139.4	680.2						
2013/07/22 00:00:00	7.4	1.2	15.7	8.8	3.2	14.7	-99.0	-99.0	-99.0	72.3	36.4	97.4	1.7	0.0	2.1	9.8	320	0.0	126.5	665.8						
2013/07/23 00:00:00	7.5	0.1	14.9	8.6	4.2	13.5	-99.0	-99.0	-99.0	68.9	44.0	96.1	1.5	0.0	0.0	9.5	294	0.0	114.3	679.4						
2013/07/24 00:00:00	6.9	-1.5	15.8	8.5	1.1	15.3	-99.0	-99.0	-99.0	77.7	50.4	98.6	1.2	0.0	1.2	8.7	148	0.0	142.6	591.1						

Continued on next page

Record Time	Temperature									Prevailing Wind									Solar Rad	
	2m			10m			60m			Humidity			Speed			Gust	Dir	Rain		
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	(<i>m/s</i>)	(°)	(<i>mm</i>)	Avg	Max
					(°C)						(%)									(<i>W/m²</i>)
2013/07/25 00:00:00	7.4	-1.3	17.5	9.1	1.0	16.9	-99.0	-99.0	-99.0	80.3	48.4	98.9	0.4	0.0	2.0	7.1	177	0.0	149.9	579.2
2013/07/26 00:00:00	8.0	0.2	18.6	9.5	2.5	17.9	-99.0	-99.0	-99.0	76.9	36.3	98.5	0.2	0.0	2.9	5.2	325	0.0	150.0	583.6
2013/07/27 00:00:00	7.0	-2.9	19.1	8.8	-0.3	18.8	-99.0	-99.0	-99.0	76.3	34.2	98.3	0.2	0.0	2.2	4.2	207	0.2	158.4	601.5
2013/07/28 00:00:00	9.5	0.3	20.6	11.1	2.5	20.3	-99.0	-99.0	-99.0	73.6	37.6	96.5	0.4	0.0	2.2	7.1	269	0.0	143.9	657.3
2013/07/29 00:00:00	12.2	2.1	21.1	13.7	5.1	20.2	-99.0	-99.0	-99.0	64.5	31.9	96.6	1.0	0.0	2.2	5.7	34	0.0	119.3	818.2
2013/07/30 00:00:00	9.8	0.9	19.7	11.5	4.6	18.6	-99.0	-99.0	-99.0	76.8	43.8	97.2	0.5	0.0	2.3	203.0	235	0.0	144.1	1304.9
2013/07/31 00:00:00	10.2	1.3	19.0	11.4	4.0	18.2	-99.0	-99.0	-99.0	78.4	50.6	99.1	1.9	0.0	2.3	7.9	151	0.0	136.0	719.6

Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
Module Id : M2 (Templemore 10m)
Requested Report Date : 2013/09/01
Requested Report Hour : 00
Chart Available : no

Main Data Summary

Record Time	Temperature									Prevailing Wind									Solar Rad	
	Avg	2m Min	Max	Avg	10m Min	Max	Avg	60m Min	Max	Avg	Humidity Min	Max	Avg	Speed Min	Max	Gust (m/s)	Dir (°)	Rain (mm)	Avg	Max
					(°C)						(%)			(m/s)					(W/m ²)	
2013/08/01 00:00:00	11.1	2.4	20.6	12.3	5.6	19.1	-99.0	-99.0	-99.0	76.6	43.6	99.3	0.6	0.0	1.1	7.4	121	0.0	141.9	599.3
2013/08/02 00:00:00	9.7	2.2	19.9	11.6	4.6	19.1	-99.0	-99.0	-99.0	78.1	42.1	98.3	1.3	0.0	1.6	8.0	298	0.0	83.7	683.7
2013/08/03 00:00:00	9.5	1.3	18.8	11.3	4.4	17.9	-99.0	-99.0	-99.0	66.3	34.9	94.5	1.6	0.0	0.9	8.9	307	0.2	150.4	744.6
2013/08/04 00:00:00	9.7	0.8	18.8	11.1	3.2	17.5	-99.0	-99.0	-99.0	71.7	40.4	97.8	1.3	0.0	0.0	13.0	290	0.0	150.8	730.2
2013/08/05 00:00:00	9.2	1.5	18.6	10.8	4.1	17.4	-99.0	-99.0	-99.0	72.2	36.0	98.1	1.0	0.0	2.0	7.1	320	0.0	158.8	694.1
2013/08/06 00:00:00	10.9	-0.5	20.6	12.1	1.8	19.9	-99.0	-99.0	-99.0	62.1	34.5	96.3	1.9	0.0	1.9	10.1	335	0.0	163.4	647.2
2013/08/07 00:00:00	15.8	7.4	22.9	16.8	11.5	21.5	-99.0	-99.0	-99.0	42.8	23.1	82.1	2.2	0.0	2.4	10.8	323	0.0	121.8	813.5
2013/08/08 00:00:00	8.7	1.0	14.1	9.5	4.9	13.5	-99.0	-99.0	-99.0	68.9	40.7	94.5	2.7	0.0	2.3	11.9	254	0.0	126.2	693.3
2013/08/09 00:00:00	8.1	-2.0	17.9	9.5	1.1	17.1	-99.0	-99.0	-99.0	70.9	36.6	98.1	0.4	0.0	2.2	6.1	26	0.0	162.9	653.9
2013/08/10 00:00:00	11.2	2.2	22.5	13.3	4.6	22.2	-99.0	-99.0	-99.0	60.9	26.0	92.0	0.6	0.0	1.5	4.7	7	0.0	166.3	621.0
2013/08/11 00:00:00	12.1	2.0	22.5	13.7	4.6	21.7	-99.0	-99.0	-99.0	63.9	29.2	93.6	0.8	0.0	1.0	6.1	7	0.0	123.8	760.8
2013/08/12 00:00:00	14.2	2.9	26.8	15.4	6.0	26.0	-99.0	-99.0	-99.0	59.7	19.5	94.7	2.0	0.0	1.4	12.8	277	0.0	152.2	739.1
2013/08/13 00:00:00	8.9	-0.5	20.8	10.8	0.8	19.7	-99.0	-99.0	-99.0	65.2	18.4	99.3	0.3	0.0	2.7	6.1	56	0.0	175.3	664.3
2013/08/14 00:00:00	10.2	2.5	21.5	11.8	4.1	20.7	-99.0	-99.0	-99.0	57.9	21.2	87.3	0.5	0.0	1.8	6.4	314	0.0	128.6	704.7
2013/08/15 00:00:00	8.8	-1.1	18.0	10.8	3.9	17.2	-99.0	-99.0	-99.0	56.8	21.1	92.5	1.3	0.0	2.4	8.2	201	0.0	182.3	662.7
2013/08/16 00:00:00	9.7	-4.7	22.0	11.6	-1.1	21.0	-99.0	-99.0	-99.0	51.2	16.7	93.1	1.6	0.0	4.5	6.9	27	0.0	184.9	682.7
2013/08/17 00:00:00	13.1	6.1	18.5	14.0	9.1	17.8	-99.0	-99.0	-99.0	76.3	34.7	98.7	1.3	0.0	1.9	9.8	318	4.4	56.5	432.5
2013/08/18 00:00:00	10.1	1.2	21.1	11.5	2.8	19.8	-99.0	-99.0	-99.0	66.9	24.7	99.8	0.7	0.0	1.4	6.5	307	0.4	186.9	681.4
2013/08/19 00:00:00	12.6	1.6	21.1	14.3	6.4	20.2	-99.0	-99.0	-99.0	49.6	21.5	86.5	2.7	0.0	7.3	12.5	284	0.0	176.7	713.1
2013/08/20 00:00:00	6.4	-2.6	13.7	7.8	2.5	12.9	-99.0	-99.0	-99.0	60.5	28.9	95.1	2.8	0.0	1.4	11.6	223	0.0	190.1	700.6
2013/08/21 00:00:00	5.1	-3.5	15.3	7.1	0.4	14.5	-99.0	-99.0	-99.0	66.3	33.2	91.6	0.4	0.0	1.4	6.9	245	0.0	186.1	676.2
2013/08/22 00:00:00	7.5	-1.9	17.0	9.0	0.1	15.8	-99.0	-99.0	-99.0	60.7	28.9	93.5	1.5	0.0	1.1	9.5	303	0.0	147.2	865.6
2013/08/23 00:00:00	12.3	4.5	19.4	13.1	7.7	18.5	-99.0	-99.0	-99.0	48.1	32.2	84.4	2.5	0.0	1.9	10.0	281	0.0	164.2	784.1
2013/08/24 00:00:00	10.5	1.8	20.2	12.3	4.0	19.4	-99.0	-99.0	-99.0	70.5	40.5	95.5	0.3	0.0	2.2	6.5	237	0.0	180.3	815.2

Continued on next page

Record Time	Temperature									Prevailing Wind									Solar Rad	
	2m			10m			60m			Humidity			Speed			Gust	Dir	Rain		
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	(<i>m/s</i>)	(°)	(<i>mm</i>)	Avg	Max
					(°C)						(%)								(<i>W/m²</i>)	
2013/08/25 00:00:00	11.2	0.4	23.2	12.9	3.9	21.9	-99.0	-99.0	-99.0	68.3	28.9	97.4	0.7	0.0	2.2	7.1	290	0.0	193.9	692.5
2013/08/26 00:00:00	11.7	0.9	23.5	13.7	2.0	22.4	-99.0	-99.0	-99.0	62.4	23.5	94.8	0.2	0.0	0.8	5.8	72	0.0	196.4	710.6
2013/08/27 00:00:00	13.0	2.0	24.8	15.1	4.7	23.9	-99.0	-99.0	-99.0	58.2	24.4	94.7	0.6	0.0	2.9	8.2	302	0.0	197.3	715.1
2013/08/28 00:00:00	13.2	1.8	24.9	15.1	4.6	24.1	-99.0	-99.0	-99.0	59.2	26.5	94.4	0.4	0.0	4.2	6.3	106	0.0	195.1	706.7
2013/08/29 00:00:00	16.6	3.2	27.8	18.0	7.4	26.9	-99.0	-99.0	-99.0	49.6	16.9	90.6	0.5	0.0	4.4	7.7	357	0.0	193.7	704.6
2013/08/30 00:00:00	19.1	8.7	27.0	20.5	13.5	26.9	-99.0	-99.0	-99.0	52.3	30.1	82.5	2.9	0.0	2.3	14.9	344	0.0	194.9	694.6
2013/08/31 00:00:00	14.1	6.0	21.1	15.1	8.3	20.7	-99.0	-99.0	-99.0	63.8	35.8	85.3	0.0	0.0	1.5	6.3	278	0.0	79.5	584.1

Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
 Module Id : M2 (Templemore 10m)
 Requested Report Date : 2013/10/01
 Requested Report Hour : 00
 Chart Available : no

Main Data Summary

Record Time	Temperature									Humidity			Prevailing Wind				Dir	Rain	Solar Rad	
	Avg	2m Min	Max	Avg	10m Min	Max	Avg	60m Min	Max	Avg	Min	Max	Avg	Speed Min	Max	Gust (m/s)	(°)	(mm)	Avg	Max
					(°C)						(%)			(m/s)					(W/m ²)	
2013/09/01 00:00:00	14.7	5.0	25.9	16.8	8.1	25.2	-99.0	-99.0	-99.0	61.6	23.1	98.3	1.1	0.0	1.8	7.1	145	0.0	197.6	731.6
2013/09/02 00:00:00	13.7	1.9	26.1	16.0	5.3	25.2	-99.0	-99.0	-99.0	56.4	17.8	94.0	0.9	0.0	2.5	5.5	148	0.0	209.0	758.2
2013/09/03 00:00:00	15.2	2.0	26.0	16.8	4.4	25.2	-99.0	-99.0	-99.0	56.9	28.6	96.3	1.6	0.0	0.0	7.0	98	0.0	193.7	736.4
2013/09/04 00:00:00	14.2	4.0	25.3	16.5	7.6	23.9	-99.0	-99.0	-99.0	59.2	26.8	92.5	0.4	0.0	2.3	6.8	118	0.0	204.2	747.4
2013/09/05 00:00:00	13.8	3.2	25.5	15.6	5.7	24.8	-99.0	-99.0	-99.0	62.0	27.4	94.0	0.3	0.0	1.7	5.8	309	0.0	257.4	15470.9
2013/09/06 00:00:00	15.4	4.1	27.4	17.2	6.3	26.5	-99.0	-99.0	-99.0	58.1	24.2	92.7	0.4	0.0	1.8	4.8	324	0.0	206.2	732.2
2013/09/07 00:00:00	16.8	4.9	29.1	18.9	7.7	28.0	-99.0	-99.0	-99.0	50.1	19.1	86.6	1.2	0.0	2.0	9.8	318	0.0	209.5	772.0
2013/09/08 00:00:00	17.7	5.6	31.4	19.6	8.1	29.9	-99.0	-99.0	-99.0	47.7	15.5	84.4	0.8	0.0	1.6	7.2	318	0.0	193.8	796.4
2013/09/09 00:00:00	18.6	5.3	29.9	19.6	8.9	28.4	-99.0	-99.0	-99.0	47.8	20.7	87.6	1.4	0.0	6.3	9.4	326	0.0	208.2	740.6
2013/09/10 00:00:00	22.2	15.3	28.3	22.5	17.4	27.4	-99.0	-99.0	-99.0	35.1	22.1	53.8	3.4	1.0	8.9	14.1	330	0.0	214.1	760.3
2013/09/11 00:00:00	14.9	4.9	25.8	17.4	10.0	25.1	-99.0	-99.0	-99.0	47.4	9.5	92.5	0.3	0.0	2.6	5.8	199	0.0	229.6	811.2
2013/09/12 00:00:00	14.8	1.3	25.9	16.1	5.5	24.8	-99.0	-99.0	-99.0	42.0	18.2	81.1	1.1	0.0	2.0	6.6	269	0.0	211.7	799.0
2013/09/13 00:00:00	18.5	8.8	27.6	19.1	11.5	26.6	-99.0	-99.0	-99.0	44.2	22.6	70.2	1.8	0.0	6.8	11.5	104	0.0	193.2	774.3
2013/09/14 00:00:00	18.3	7.4	26.9	19.6	12.1	25.7	-99.0	-99.0	-99.0	48.0	16.4	88.2	2.8	0.0	1.4	12.4	303	0.0	226.6	781.9
2013/09/15 00:00:00	15.9	3.4	24.9	16.9	6.6	23.8	-99.0	-99.0	-99.0	51.7	23.9	91.4	0.7	0.0	2.8	8.3	153	0.0	211.5	809.1
2013/09/16 00:00:00	14.4	10.7	19.7	14.9	12.5	20.1	-99.0	-99.0	-99.0	87.3	64.4	98.0	0.9	0.0	9.2	18.0	329	19.4	27.1	117.8
2013/09/17 00:00:00	15.8	8.5	20.8	16.0	10.6	19.8	-99.0	-99.0	-99.0	69.2	51.1	96.6	3.3	0.0	9.1	13.0	311	2.4	163.4	841.3
2013/09/18 00:00:00	18.2	9.9	24.5	18.4	11.9	23.6	-99.0	-99.0	-99.0	51.7	27.4	89.7	2.9	0.0	7.4	10.5	320	0.0	228.9	919.8
2013/09/19 00:00:00	15.5	5.3	23.5	16.8	9.8	22.1	-99.0	-99.0	-99.0	52.2	25.6	91.6	1.9	0.0	0.6	9.4	268	0.0	238.4	816.5
2013/09/20 00:00:00	12.6	2.4	23.4	14.0	6.3	22.4	-99.0	-99.0	-99.0	58.6	23.1	95.6	2.9	0.0	2.5	13.5	274	0.0	234.9	818.7
2013/09/21 00:00:00	11.5	0.9	21.8	13.0	3.1	21.4	-99.0	-99.0	-99.0	61.7	29.3	94.7	0.1	0.0	1.6	5.8	43	0.0	237.9	810.4
2013/09/22 00:00:00	14.0	3.9	25.1	15.8	5.9	24.3	-99.0	-99.0	-99.0	52.5	16.2	91.9	0.2	0.0	1.7	6.6	282	0.0	243.9	849.2
2013/09/23 00:00:00	19.4	4.2	29.7	20.2	7.1	28.7	-99.0	-99.0	-99.0	36.6	13.2	85.0	1.9	0.0	7.5	10.9	322	0.0	246.7	838.5
2013/09/24 00:00:00	23.0	10.5	32.1	24.7	16.3	31.2	-99.0	-99.0	-99.0	27.7	11.0	64.2	2.8	0.0	2.4	16.3	314	0.0	208.1	819.6

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Record Time	Temperature									Prevailing Wind									Solar Rad	
	2m			10m			60m			Humidity			Speed			Gust	Dir	Rain		
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	(<i>m/s</i>)	(°)	(<i>mm</i>)	Avg	Max
					(°C)						(%)									(<i>W/m²</i>)
2013/09/25 00:00:00	21.7	5.9	33.7	22.8	9.8	32.5	-99.0	-99.0	-99.0	37.0	12.4	82.3	1.2	0.0	5.6	9.6	327	0.0	249.1	845.3
2013/09/26 00:00:00	21.8	6.5	34.6	23.1	13.4	33.0	-99.0	-99.0	-99.0	33.8	10.9	69.6	2.7	0.0	1.9	14.9	257	0.0	244.2	822.6
2013/09/27 00:00:00	14.9	0.6	28.5	17.2	5.5	27.5	-99.0	-99.0	-99.0	40.7	8.8	87.6	0.8	0.0	0.0	6.4	136	0.0	260.8	894.5
2013/09/28 00:00:00	17.4	5.6	30.8	19.2	9.4	29.4	-99.0	-99.0	-99.0	37.3	8.8	69.3	1.9	0.0	0.0	11.6	261	0.0	254.0	853.7
2013/09/29 00:00:00	15.4	2.6	27.1	17.2	6.4	25.7	-99.0	-99.0	-99.0	43.3	16.6	77.4	0.3	0.0	2.2	6.5	135	0.0	257.7	875.7
2013/09/30 00:00:00	18.6	3.3	30.6	20.4	7.3	29.7	-99.0	-99.0	-99.0	39.4	15.1	80.5	1.4	0.0	5.8	8.2	317	0.0	259.3	876.7

Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
Module Id : M2 (Templemore 10m)
Requested Report Date : 2013/11/01
Requested Report Hour : 00
Chart Available : no

Main Data Summary

Record Time	Temperature									Prevailing Wind									Solar Rad	
	2m			10m			60m			Humidity			Speed			Gust	Dir	Rain		
	Avg	Min	Max	Avg	Min (°C)	Max	Avg	Min	Max	Avg	Min (%)	Max	Avg	Min (m/s)	Max				(m/s)	(°)
2013/10/01 00:00:00	22.7	15.3	31.6	22.9	15.6	30.5	-99.0	-99.0	-99.0	55.4	23.3	98.3	2.9	0.0	4.2	1243.6	344	11.0	173.6	7592.2
2013/10/02 00:00:00	18.0	10.6	25.5	18.5	12.4	24.3	-99.0	-99.0	-99.0	66.2	36.9	96.1	1.7	0.0	0.9	8.5	302	0.0	216.3	1023.4
2013/10/03 00:00:00	13.8	3.4	19.6	14.7	8.1	18.1	-99.0	-99.0	-99.0	48.9	24.4	87.6	3.1	0.0	0.8	12.9	232	0.0	200.6	1036.1
2013/10/04 00:00:00	11.3	0.3	22.3	12.9	2.3	21.5	-99.0	-99.0	-99.0	57.7	20.5	94.4	0.7	0.0	1.8	7.7	149	0.0	266.0	867.5
2013/10/05 00:00:00	15.9	2.3	28.6	17.3	4.7	27.3	-99.0	-99.0	-99.0	46.8	14.5	90.7	1.3	0.0	2.8	8.0	308	0.0	262.8	912.7
2013/10/06 00:00:00	19.4	3.8	31.9	21.3	7.7	30.9	-99.0	-99.0	-99.0	35.0	8.7	81.5	1.6	0.0	1.8	9.6	311	0.0	289.4	907.9
2013/10/07 00:00:00	18.5	8.0	27.5	20.5	12.0	26.5	-99.0	-99.0	-99.0	32.5	14.0	58.0	1.2	0.0	4.7	8.3	253	0.0	216.2	906.0
2013/10/08 00:00:00	14.9	3.5	25.3	16.5	7.0	24.3	-99.0	-99.0	-99.0	48.3	14.8	90.3	1.9	0.0	1.0	12.5	213	0.0	276.0	907.5
2013/10/09 00:00:00	17.4	3.7	30.2	18.5	6.6	29.5	-99.0	-99.0	-99.0	46.0	15.1	90.0	0.6	0.0	4.4	6.1	290	0.8	276.7	916.9
2013/10/10 00:00:00	23.9	10.7	33.0	24.4	12.0	32.1	-99.0	-99.0	-99.0	28.0	15.2	55.6	2.7	0.5	8.0	13.0	328	0.0	278.5	915.4
2013/10/11 00:00:00	22.8	8.4	30.0	24.1	15.3	28.9	-99.0	-99.0	-99.0	27.4	10.2	64.1	1.4	0.0	1.6	12.7	245	0.0	263.6	901.6
2013/10/12 00:00:00	20.7	3.5	34.2	21.7	6.9	33.2	-99.0	-99.0	-99.0	40.2	19.7	71.7	1.1	0.0	4.3	8.7	345	0.0	260.2	975.0
2013/10/13 00:00:00	26.1	18.9	32.2	26.0	19.5	31.6	-99.0	-99.0	-99.0	39.1	20.6	66.7	3.8	1.3	10.7	16.1	337	0.6	182.0	960.7
2013/10/14 00:00:00	15.1	6.6	23.6	15.5	10.5	22.4	-99.0	-99.0	-99.0	45.5	15.3	84.5	3.3	0.0	1.1	15.8	234	0.6	277.1	920.2
2013/10/15 00:00:00	12.9	0.4	24.8	14.4	3.3	23.4	-99.0	-99.0	-99.0	42.6	13.3	86.6	0.4	0.0	2.1	6.8	149	0.0	289.0	931.0
2013/10/16 00:00:00	18.3	4.2	29.0	19.2	7.4	27.8	-99.0	-99.0	-99.0	34.3	14.6	66.0	1.9	0.0	6.5	15.3	332	0.0	279.4	970.2
2013/10/17 00:00:00	24.7	16.9	32.4	24.7	18.7	31.6	-99.0	-99.0	-99.0	31.1	18.6	47.0	3.3	0.7	9.9	14.8	330	0.0	240.5	916.0
2013/10/18 00:00:00	19.2	10.9	26.2	19.3	13.5	24.7	-99.0	-99.0	-99.0	39.3	26.2	65.7	2.8	0.0	8.4	11.3	130	0.0	251.2	949.5
2013/10/19 00:00:00	19.9	11.6	28.9	20.2	12.1	28.0	-99.0	-99.0	-99.0	43.8	14.4	76.7	2.3	0.0	3.9	8.2	113	0.0	288.1	936.4
2013/10/20 00:00:00	22.4	10.2	32.4	23.1	12.0	30.9	-99.0	-99.0	-99.0	43.5	19.5	82.1	0.1	0.0	2.0	6.8	291	0.0	285.9	914.0
2013/10/21 00:00:00	23.8	12.5	33.7	24.7	14.3	32.2	-99.0	-99.0	-99.0	41.3	23.1	65.9	1.1	0.0	0.8	7.6	280	0.0	283.7	906.2
2013/10/22 00:00:00	26.0	13.8	35.3	26.4	15.3	34.1	-99.0	-99.0	-99.0	38.0	19.5	68.3	1.8	0.0	7.0	11.4	311	0.0	280.9	897.8
2013/10/23 00:00:00	26.3	17.2	33.7	26.7	19.9	32.1	-99.0	-99.0	-99.0	36.4	23.0	63.0	2.7	0.0	2.7	12.9	304	0.0	226.6	929.2
2013/10/24 00:00:00	19.2	6.9	26.4	19.5	12.4	24.6	-99.0	-99.0	-99.0	34.5	12.9	52.9	3.5	0.0	1.3	11.1	215	0.0	289.3	962.1

Continued on next page

Record Time	Temperature									Humidity			Prevailing Wind			Dir (°)	Rain (mm)	Solar Rad (W/m ²)		
	2m			10m			60m						Speed							Gust (m/s)
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max					
2013/10/25 00:00:00	15.6	1.9	27.9	17.4	6.3	26.9	-99.0	-99.0	-99.0	31.1	8.0	69.4	1.2	0.0	1.4	7.0	239	0.0	307.7	985.5
2013/10/26 00:00:00	15.7	3.4	26.9	17.6	7.4	25.6	-99.0	-99.0	-99.0	28.2	9.7	55.5	1.4	0.0	1.8	9.1	226	0.0	307.6	1002.8
2013/10/27 00:00:00	16.6	3.5	29.0	18.5	7.4	27.5	-99.0	-99.0	-99.0	30.4	7.5	61.3	0.4	0.0	1.6	7.3	183	0.0	308.0	996.6
2013/10/28 00:00:00	20.6	7.3	31.6	21.3	10.3	30.0	-99.0	-99.0	-99.0	31.0	17.3	50.3	1.4	0.0	6.3	12.2	317	0.0	269.2	949.7
2013/10/29 00:00:00	24.0	13.6	30.1	24.1	15.8	28.9	-99.0	-99.0	-99.0	37.6	12.2	65.6	3.1	0.0	4.8	18.0	305	0.0	199.1	1133.5
2013/10/30 00:00:00	19.2	8.3	27.2	19.3	11.3	25.6	-99.0	-99.0	-99.0	50.1	23.2	90.0	2.5	0.0	6.5	9.8	149	0.0	297.1	973.9
2013/10/31 00:00:00	19.7	9.0	29.2	20.8	11.4	28.1	-99.0	-99.0	-99.0	38.5	10.8	80.3	0.6	0.0	4.4	7.3	140	0.0	299.1	1037.6

Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
Module Id : M2 (Templemore 10m)
Requested Report Date : 2013/12/01
Requested Report Hour : 00
Chart Available : no

Main Data Summary

Record Time	Temperature									Humidity			Prevailing Wind				Dir	Rain	Solar Rad	
	Avg	2m Min	Max	Avg	10m Min	Max	Avg	60m Min	Max	Avg	Min	Max	Avg	Speed Min	Max	Gust			Avg	Max
					(°C)						(%)			(m/s)		(m/s)	(°)	(mm)	(W/m ²)	
2013/11/01 00:00:00	20.1	7.5	30.7	21.4	11.8	29.5	-99.0	-99.0	-99.0	36.3	17.2	64.4	0.4	0.0	2.8	6.9	282	0.0	303.3	1033.5
2013/11/02 00:00:00	24.0	12.5	32.8	24.5	14.6	31.5	-99.0	-99.0	-99.0	35.2	20.8	59.3	2.2	0.0	2.3	11.1	308	0.0	277.7	1021.3
2013/11/03 00:00:00	26.0	14.4	35.8	26.9	18.3	34.5	-99.0	-99.0	-99.0	28.2	9.9	63.6	2.9	0.0	103.7	6189.7	282	0.0	255.5	9337.4
2013/11/04 00:00:00	18.9	8.2	26.2	19.3	12.1	25.0	-99.0	-99.0	-99.0	36.5	16.1	79.4	3.1	0.0	6.4	10.1	163	0.0	315.0	990.3
2013/11/05 00:00:00	19.0	8.8	27.4	18.7	10.2	26.6	-99.0	-99.0	-99.0	35.2	16.1	57.3	3.9	0.0	4.8	11.4	131	0.0	312.2	986.8
2013/11/06 00:00:00	21.2	11.6	30.5	21.5	12.9	29.7	-99.0	-99.0	-99.0	39.9	19.9	66.6	0.8	0.0	2.0	7.4	138	0.0	302.4	958.2
2013/11/07 00:00:00	23.4	13.0	33.1	24.0	14.5	31.6	-99.0	-99.0	-99.0	34.4	17.4	59.1	0.8	0.0	2.1	8.8	265	0.0	312.7	969.1
2013/11/08 00:00:00	28.2	15.3	35.9	28.2	18.1	34.5	-99.0	-99.0	-99.0	24.8	14.4	50.1	1.9	0.1	7.8	11.1	314	0.0	309.7	963.4
2013/11/09 00:00:00	26.8	17.6	35.7	27.0	20.7	34.0	-99.0	-99.0	-99.0	36.0	20.3	58.0	2.6	0.0	2.1	14.2	290	0.0	263.0	951.8
2013/11/10 00:00:00	20.8	8.0	30.8	21.3	11.3	29.5	-99.0	-99.0	-99.0	42.6	20.6	67.1	0.8	0.0	7.7	10.8	189	0.0	198.5	1011.0
2013/11/11 00:00:00	19.7	11.4	30.2	19.9	13.9	28.2	-99.0	-99.0	-99.0	68.6	29.8	98.4	1.7	0.0	10.5	18.8	129	32.2	251.1	1015.4
2013/11/12 00:00:00	21.5	11.6	30.6	22.0	16.8	29.3	-99.0	-99.0	-99.0	57.6	15.2	94.1	0.0	0.0	0.0	0.0	-99	1.8	257.5	1025.3
2013/11/13 00:00:00	25.4	11.7	31.8	26.1	17.0	30.3	-99.0	-99.0	-99.0	23.3	10.3	62.3	0.0	0.0	0.0	0.0	-99	0.0	412.9	1003.8
2013/11/14 00:00:00	20.2	7.5	31.4	21.6	11.0	30.1	-99.0	-99.0	-99.0	35.4	9.4	75.8	0.0	0.0	0.0	0.0	-99	0.0	336.7	1024.3
2013/11/15 00:00:00	20.4	7.0	31.0	21.7	10.4	29.9	-99.0	-99.0	-99.0	32.7	9.0	75.8	0.0	0.0	0.0	0.0	-99	0.0	333.3	1041.8
2013/11/16 00:00:00	17.1	10.2	28.0	17.9	11.8	26.7	-99.0	-99.0	-99.0	62.5	19.6	89.5	0.0	0.0	0.0	0.0	-99	1.6	205.4	1282.1
2013/11/17 00:00:00	18.2	11.6	26.6	18.1	12.5	24.9	-99.0	-99.0	-99.0	55.4	26.1	84.5	0.0	0.0	0.0	0.0	-99	0.0	261.5	1048.9
2013/11/18 00:00:00	15.1	9.3	21.2	15.2	11.3	19.9	-99.0	-99.0	-99.0	74.2	44.7	93.7	0.0	0.0	0.0	0.0	-99	3.8	177.5	870.4
2013/11/19 00:00:00	18.4	9.8	26.8	18.6	10.9	26.2	-99.0	-99.0	-99.0	69.3	36.7	98.8	0.0	0.0	0.0	0.0	-99	0.2	301.3	981.5
2013/11/20 00:00:00	23.7	15.3	32.5	24.5	16.6	31.8	-99.0	-99.0	-99.0	44.4	16.0	82.1	0.0	0.0	0.0	0.0	-99	0.0	315.5	1026.0
2013/11/21 00:00:00	27.0	15.5	36.8	27.4	18.5	35.5	-99.0	-99.0	-99.0	38.2	14.5	74.5	0.0	0.0	0.0	0.0	-99	0.0	317.4	1042.1
2013/11/22 00:00:00	24.6	16.8	29.8	24.8	19.3	28.6	-99.0	-99.0	-99.0	59.3	40.4	95.2	0.0	0.0	0.0	0.0	-99	7.2	142.1	739.2
2013/11/23 00:00:00	20.4	15.8	27.8	20.9	16.9	27.2	-99.0	-99.0	-99.0	81.5	46.4	98.5	0.0	0.0	0.0	0.0	-99	38.0	137.8	952.6
2013/11/24 00:00:00	20.7	11.6	29.8	21.6	14.0	28.2	-99.0	-99.0	-99.0	54.3	16.5	98.8	0.0	0.0	0.0	0.0	-99	0.2	335.8	1003.3

Continued on next page

Record Time	Temperature									Prevailing Wind									Solar Rad	
	2m			10m			60m			Humidity			Speed			Gust	Dir	Rain		
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max					
					($^{\circ}C$)						($\%$)			(m/s)		(m/s)	($^{\circ}$)	(mm)	(W/m^2)	
2013/11/25 00:00:00	20.4	9.1	29.8	20.9	11.8	28.8	-99.0	-99.0	-99.0	48.7	18.1	89.8	0.0	0.0	0.0	0.0	-99	0.0	320.7	1068.8
2013/11/26 00:00:00	20.3	9.2	28.8	20.4	11.5	28.0	-99.0	-99.0	-99.0	47.6	20.2	91.5	0.0	0.0	0.0	0.0	-99	0.0	341.0	1025.6
2013/11/27 00:00:00	20.9	10.6	30.4	21.5	11.7	29.3	-99.0	-99.0	-99.0	43.1	13.2	84.3	0.0	0.0	0.0	0.0	-99	0.0	341.7	1013.8
2013/11/28 00:00:00	23.9	8.8	34.1	24.7	12.3	33.4	-99.0	-99.0	-99.0	36.8	15.7	74.7	0.0	0.0	0.0	0.0	-99	0.0	311.8	1013.3
2013/11/29 00:00:00	20.9	15.5	29.5	21.5	16.0	29.8	-99.0	-99.0	-99.0	77.4	24.6	98.5	0.0	0.0	0.0	0.0	-99	35.0	32.4	304.1
2013/11/30 00:00:00	19.9	12.3	26.8	19.8	13.7	26.2	-99.0	-99.0	-99.0	58.2	29.4	94.8	0.0	0.0	0.0	0.0	-99	0.0	324.0	1076.8

Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
Module Id : M2 (Templemore 10m)
Requested Report Date : 2014/01/01
Requested Report Hour : 00
Chart Available : no

Main Data Summary

Record Time	Temperature									Prevailing Wind									Solar Rad	
	Avg	2m Min	Max	Avg	10m Min	Max	Avg	60m Min	Max	Avg	Humidity Min	Max	Avg	Speed Min	Max	Gust	Dir	Rain	Avg	Max
					(°C)						(%)			(m/s)		(m/s)	(°)	(mm)	(W/m ²)	
2013/12/01 00:00:00	19.7	10.2	27.0	19.9	12.2	26.3	-99.0	-99.0	-99.0	51.7	24.6	89.6	0.0	0.0	0.0	0.0	-99	0.0	339.6	1019.1
2013/12/02 00:00:00	21.3	11.2	29.4	21.8	13.8	28.8	-99.0	-99.0	-99.0	46.7	18.9	90.6	0.0	0.0	0.0	0.0	-99	0.0	333.2	1135.9
2013/12/03 00:00:00	21.5	9.5	32.2	23.0	12.0	31.9	-99.0	-99.0	-99.0	47.5	12.0	92.5	0.0	0.0	0.0	0.0	-99	0.0	347.2	1024.4
2013/12/04 00:00:00	24.6	11.0	33.9	13.6	14.7	-99.0	-99.0	-99.0	-99.0	41.4	19.0	80.5	0.0	0.0	7.1	0.0	-99	2.2	285.2	1196.0
2013/12/05 00:00:00	19.8	8.4	28.1	20.2	12.0	28.5	-99.0	-99.0	-99.0	61.1	24.6	97.1	4.0	0.0	1.2	17.7	268	11.6	205.0	1151.2
2013/12/06 00:00:00	15.2	5.2	24.4	16.1	7.8	23.4	-99.0	-99.0	-99.0	47.7	14.5	93.8	2.0	0.0	2.4	11.2	229	0.0	349.5	1030.7
2013/12/07 00:00:00	18.0	5.2	29.6	19.7	8.1	29.4	-99.0	-99.0	-99.0	44.6	13.5	87.9	0.5	0.0	2.5	8.7	340	0.0	344.4	1038.6
2013/12/08 00:00:00	22.1	8.7	32.2	23.4	11.5	31.3	-99.0	-99.0	-99.0	43.9	18.6	81.8	1.1	0.0	2.6	9.2	272	0.0	343.0	1031.5
2013/12/09 00:00:00	27.4	16.6	34.4	27.7	17.5	33.7	-99.0	-99.0	-99.0	37.6	21.9	69.0	1.7	0.0	1.2	10.3	327	0.0	268.6	985.3
2013/12/10 00:00:00	26.3	16.9	32.6	26.8	22.5	31.8	-99.0	-99.0	-99.0	52.0	33.9	80.0	1.6	0.0	0.0	12.6	310	4.0	199.1	1061.3
2013/12/11 00:00:00	22.1	10.5	32.7	23.6	13.3	31.9	-99.0	-99.0	-99.0	43.1	12.9	84.9	1.4	0.0	0.0	10.0	244	0.0	261.0	1060.3
2013/12/12 00:00:00	22.7	11.3	33.0	24.4	14.7	32.3	-99.0	-99.0	-99.0	39.2	15.1	73.6	0.3	0.0	3.5	5.6	34	0.0	342.6	1023.5
2013/12/13 00:00:00	24.9	12.8	34.9	26.1	16.4	34.3	-99.0	-99.0	-99.0	37.3	13.3	77.9	0.7	0.0	1.8	7.6	287	0.0	339.7	1033.3
2013/12/14 00:00:00	24.7	11.8	35.5	26.3	15.8	34.6	-99.0	-99.0	-99.0	34.3	12.1	60.4	0.7	0.0	5.9	9.2	242	0.0	289.2	1129.6
2013/12/15 00:00:00	26.7	15.2	34.9	26.6	16.6	34.6	-99.0	-99.0	-99.0	45.5	19.9	84.7	0.9	0.0	7.1	9.8	149	0.0	308.3	1154.3
2013/12/16 00:00:00	24.0	18.7	32.8	24.2	19.3	31.7	-99.0	-99.0	-99.0	55.5	30.9	81.9	2.5	0.0	4.9	14.3	116	0.6	208.7	1186.7
2013/12/17 00:00:00	24.4	15.1	31.8	24.8	17.4	31.5	-99.0	-99.0	-99.0	47.8	20.7	85.8	1.9	0.0	1.3	8.5	114	0.4	330.5	1066.5
2013/12/18 00:00:00	25.3	14.7	33.6	25.8	16.8	33.0	-99.0	-99.0	-99.0	41.2	20.1	74.4	1.8	0.0	1.0	9.8	143	0.0	337.2	996.0
2013/12/19 00:00:00	25.1	13.5	34.8	26.2	16.5	34.0	-99.0	-99.0	-99.0	40.1	14.0	78.8	1.0	0.0	3.1	8.4	130	0.0	339.5	997.4
2013/12/20 00:00:00	27.0	14.6	36.0	28.0	18.0	35.5	-99.0	-99.0	-99.0	35.3	19.3	69.7	0.3	0.0	0.5	8.3	234	0.0	334.0	992.5
2013/12/21 00:00:00	29.9	17.4	38.5	30.5	20.3	38.1	-99.0	-99.0	-99.0	33.2	16.7	64.2	0.2	0.0	3.9	7.6	2	0.0	329.7	981.8
2013/12/22 00:00:00	31.7	22.7	38.4	31.8	23.6	36.9	-99.0	-99.0	-99.0	31.1	18.9	54.5	1.8	0.0	7.0	11.4	280	0.0	313.3	1037.1
2013/12/23 00:00:00	31.0	25.7	37.0	30.9	25.9	35.6	-99.0	-99.0	-99.0	30.0	21.4	44.4	3.0	0.0	0.0	13.5	333	0.0	279.7	1069.3
2013/12/24 00:00:00	27.3	21.2	32.8	27.5	21.6	32.5	-99.0	-99.0	-99.0	48.2	28.7	78.5	0.8	0.0	3.4	6.3	211	0.0	128.4	637.5

Continued on next page

Record Time	Temperature									Prevailing Wind									Solar Rad	
	2m			10m			60m			Humidity			Speed			Gust	Dir	Rain		
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max					
					(°C)						(%)			(m/s)		(m/s)	(°)	(mm)	(W/m²)	
2013/12/25 00:00:00	23.9	19.9	30.2	23.9	20.4	29.1	-99.0	-99.0	-99.0	69.6	46.7	88.1	0.9	0.0	6.2	993.6	161	0.0	112.3	4807.6
2013/12/26 00:00:00	26.2	19.7	34.4	26.2	19.9	33.0	-99.0	-99.0	-99.0	57.5	26.8	92.9	2.1	0.0	1.0	11.6	286	1.6	253.5	1129.8
2013/12/27 00:00:00	27.0	15.3	36.3	27.5	17.0	35.7	-99.0	-99.0	-99.0	44.5	16.2	90.3	0.9	0.0	2.8	10.5	188	0.0	310.1	1028.3
2013/12/28 00:00:00	28.6	18.0	37.7	28.9	19.7	37.6	-99.0	-99.0	-99.0	41.2	16.1	81.6	0.6	0.0	2.7	8.5	282	0.0	330.4	1043.5
2013/12/29 00:00:00	30.2	19.3	42.2	30.7	22.0	40.8	-99.0	-99.0	-99.0	32.7	9.3	60.0	1.6	0.0	8.6	13.0	250	0.0	334.7	984.1
2013/12/30 00:00:00	26.7	15.6	35.6	26.7	17.3	34.7	-99.0	-99.0	-99.0	41.3	15.5	74.5	2.2	0.8	6.2	8.6	155	0.0	321.0	1060.5
2013/12/31 00:00:00	26.5	14.4	36.7	27.4	16.7	35.8	-99.0	-99.0	-99.0	32.7	5.8	71.0	1.3	0.0	2.3	8.5	203	0.0	334.4	1061.2

Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
Module Id : M2 (Templemore 10m)
Requested Report Date : 2014/02/01
Requested Report Hour : 00
Chart Available : no

Main Data Summary

Record Time	Temperature									Prevailing Wind									Solar Rad	
	Avg	2m Min	Max	Avg	10m Min	Max	Avg	60m Min	Max	Avg	Humidity Min	Max	Avg	Speed Min	Max	Gust	Dir	Rain	Avg	Max
					(°C)						(%)			(m/s)		(m/s)	(°)	(mm)	(W/m ²)	
2014/01/01 00:00:00	29.0	18.7	37.6	29.1	20.8	36.4	-99.0	-99.0	-99.0	37.3	17.1	73.7	0.5	0.0	4.9	10.6	276	0.0	309.7	1044.5
2014/01/02 00:00:00	31.6	24.7	38.9	31.8	26.0	38.3	-99.0	-99.0	-99.0	32.3	15.9	41.7	0.8	0.0	3.8	10.9	324	0.0	192.3	1063.0
2014/01/03 00:00:00	37.2	27.2	46.6	37.3	28.3	45.6	-99.0	-99.0	-99.0	21.8	7.4	39.3	3.1	0.9	9.9	14.8	304	0.0	261.2	1071.7
2014/01/04 00:00:00	29.7	16.9	37.2	30.1	22.2	35.9	-99.0	-99.0	-99.0	25.2	6.5	50.8	3.0	0.0	0.0	10.2	248	0.0	344.7	1025.7
2014/01/05 00:00:00	25.8	10.5	37.3	27.0	13.4	35.6	-99.0	-99.0	-99.0	25.5	6.2	54.9	2.1	0.0	7.7	11.4	297	0.0	345.0	1022.5
2014/01/06 00:00:00	25.4	12.7	36.2	26.5	16.6	34.6	-99.0	-99.0	-99.0	19.2	7.6	42.7	2.1	0.0	1.4	14.1	221	0.0	345.5	1027.0
2014/01/07 00:00:00	23.5	10.6	34.9	24.4	13.8	33.7	-99.0	-99.0	-99.0	35.2	14.7	57.7	2.4	0.0	9.3	13.3	134	0.0	334.3	1009.6
2014/01/08 00:00:00	24.9	19.5	33.2	24.7	19.8	31.6	-99.0	-99.0	-99.0	47.5	28.3	60.7	4.4	0.4	8.7	11.5	108	0.0	244.3	1195.2
2014/01/09 00:00:00	23.4	18.6	28.4	23.4	19.9	27.8	-99.0	-99.0	-99.0	48.3	32.9	61.9	2.7	0.0	2.8	9.3	122	0.0	160.9	999.0
2014/01/10 00:00:00	24.3	16.8	31.1	24.6	18.5	29.9	-99.0	-99.0	-99.0	45.7	28.8	68.5	0.4	0.0	1.9	8.0	191	0.0	224.6	1069.0
2014/01/11 00:00:00	25.3	15.5	34.6	25.8	17.4	33.6	-99.0	-99.0	-99.0	46.3	23.2	78.2	0.5	0.0	2.8	9.3	217	0.0	246.6	1210.4
2014/01/12 00:00:00	28.8	16.9	37.5	29.2	19.0	36.4	-99.0	-99.0	-99.0	35.3	17.3	69.5	1.7	0.0	6.9	10.6	134	0.0	305.0	1006.2
2014/01/13 00:00:00	28.5	20.6	36.0	28.5	21.5	35.2	-99.0	-99.0	-99.0	38.7	19.4	64.6	2.4	0.0	6.1	8.7	143	0.0	324.0	1018.1
2014/01/14 00:00:00	28.9	18.2	36.3	29.1	20.5	35.7	-99.0	-99.0	-99.0	37.4	14.5	72.4	1.7	0.0	5.9	10.4	120	0.0	323.0	1053.9
2014/01/15 00:00:00	30.0	21.2	37.4	30.0	22.0	37.0	-99.0	-99.0	-99.0	33.7	15.3	60.3	1.0	0.1	5.8	9.6	89	0.0	326.8	983.1
2014/01/16 00:00:00	29.6	20.3	38.1	29.7	21.6	37.5	-99.0	-99.0	-99.0	40.2	15.8	73.1	0.8	0.0	4.2	18.5	142	4.6	324.2	975.0
2014/01/17 00:00:00	30.0	19.9	37.8	30.3	22.0	37.4	-99.0	-99.0	-99.0	36.0	14.0	75.9	0.4	0.0	5.0	8.5	227	0.2	324.1	1008.1
2014/01/18 00:00:00	30.0	22.5	37.9	30.2	22.9	37.0	-99.0	-99.0	-99.0	29.2	15.5	47.8	0.3	0.0	3.4	8.2	348	0.0	326.4	980.7
2014/01/19 00:00:00	29.9	18.1	38.9	30.0	21.9	37.6	-99.0	-99.0	-99.0	30.4	17.9	59.7	1.1	0.0	4.4	14.6	288	0.0	297.2	966.7
2014/01/20 00:00:00	30.9	21.3	40.8	31.2	22.0	39.7	-99.0	-99.0	-99.0	36.0	14.7	67.0	1.3	0.0	5.1	12.2	272	0.0	296.7	963.3
2014/01/21 00:00:00	30.8	19.6	41.8	31.0	21.1	40.4	-99.0	-99.0	-99.0	39.7	8.5	82.8	2.2	0.0	6.8	10.3	246	0.0	308.8	970.0
2014/01/22 00:00:00	27.6	21.3	35.6	27.9	22.9	35.2	-99.0	-99.0	-99.0	49.3	17.9	79.8	3.5	0.0	9.4	14.1	134	0.2	181.8	842.5
2014/01/23 00:00:00	24.1	17.9	30.2	24.4	18.7	29.5	-99.0	-99.0	-99.0	57.0	32.7	93.3	2.2	0.0	5.3	10.9	81	3.2	151.1	1052.2
2014/01/24 00:00:00	24.7	15.9	30.5	25.1	18.5	29.4	-99.0	-99.0	-99.0	57.2	38.5	81.8	1.5	0.0	3.7	11.1	332	0.0	154.0	979.5

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Record Time	Temperature									Humidity									Prevailing Wind			Rain	Solar Rad	
	2m			10m			60m						Speed			Gust	Dir		Avg	Max				
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	(m/s)	(m/s)	(°)	(mm)	(W/m ²)				
	(°C)												(%)			(m/s)								
2014/01/25 00:00:00	25.2	16.4	33.5	25.2	17.9	32.9	-99.0	-99.0	-99.0	49.9	18.3	86.2	2.4	0.0	6.3	9.4	164	0.2	275.7	985.4				
2014/01/26 00:00:00	24.7	16.7	32.5	24.5	17.5	31.8	-99.0	-99.0	-99.0	41.8	18.8	63.7	4.4	2.0	7.2	11.2	128	0.0	317.5	966.8				
2014/01/27 00:00:00	24.8	15.0	32.9	24.9	16.3	32.3	-99.0	-99.0	-99.0	39.5	19.6	67.1	2.6	0.0	6.2	9.5	112	0.0	320.5	980.5				
2014/01/28 00:00:00	26.6	17.4	34.7	26.6	19.4	34.6	-99.0	-99.0	-99.0	37.9	19.4	66.1	1.7	0.0	5.7	8.2	93	0.0	322.1	990.4				
2014/01/29 00:00:00	28.0	18.0	36.6	28.1	20.2	36.4	-99.0	-99.0	-99.0	32.8	13.5	59.7	1.5	0.0	3.4	11.6	92	0.0	324.7	990.0				
2014/01/30 00:00:00	28.0	16.8	36.5	28.1	18.4	36.0	-99.0	-99.0	-99.0	32.0	13.6	64.6	1.6	0.0	5.8	9.7	104	0.0	325.6	1004.9				
2014/01/31 00:00:00	27.6	17.3	36.7	27.9	19.3	36.3	-99.0	-99.0	-99.0	32.8	13.2	60.9	1.2	0.0	0.0	9.4	111	0.0	325.3	1009.5				

Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
Module Id : M2 (Templemore 10m)
Requested Report Date : 2014/03/01
Requested Report Hour : 00
Chart Available : no

Main Data Summary

Record Time	Temperature									Prevailing Wind									Solar Rad	
	Avg	2m Min	Max	Avg	10m Min	Max	Avg	60m Min	Max	Avg	Humidity Min	Max	Avg	Speed Min	Max	Gust	Dir	Rain		
					(°C)						(%)			(m/s)		(m/s)	(°)	(mm)	Avg	Max
																			(W/m ²)	
2014/02/01 00:00:00	28.8	15.3	40.7	29.5	18.0	39.7	-99.0	-99.0	-99.0	34.0	9.4	72.5	1.6	0.0	2.2	13.0	111	0.0	315.6	976.4
2014/02/02 00:00:00	29.0	16.8	38.0	29.6	19.3	37.4	-99.0	-99.0	-99.0	29.7	15.6	51.4	0.7	0.0	5.8	9.0	168	0.0	308.9	959.9
2014/02/03 00:00:00	27.1	17.8	34.9	27.8	20.1	34.5	-99.0	-99.0	-99.0	36.7	18.2	65.3	1.1	0.0	2.5	10.1	128	0.0	311.0	955.7
2014/02/04 00:00:00	26.6	17.7	34.9	26.8	19.7	33.8	-99.0	-99.0	-99.0	40.4	23.7	64.9	3.5	0.0	11.4	16.5	162	0.0	289.2	931.8
2014/02/05 00:00:00	23.5	16.0	31.2	23.2	16.8	29.9	-99.0	-99.0	-99.0	48.8	27.3	75.3	4.5	0.8	8.3	14.9	151	0.0	285.2	1022.4
2014/02/06 00:00:00	23.2	16.9	31.3	23.3	17.3	30.9	-99.0	-99.0	-99.0	42.2	21.1	61.5	2.3	0.4	5.3	8.4	134	0.0	272.0	1097.6
2014/02/07 00:00:00	24.1	13.1	34.6	25.1	15.5	33.3	-99.0	-99.0	-99.0	40.4	15.1	76.3	0.7	0.0	4.3	8.1	185	0.0	310.3	961.0
2014/02/08 00:00:00	26.8	14.6	36.8	28.1	17.5	36.2	-99.0	-99.0	-99.0	30.6	12.9	58.4	1.0	0.0	1.9	8.2	141	0.0	312.1	974.3
2014/02/09 00:00:00	28.3	16.4	38.2	29.4	19.0	37.5	-99.0	-99.0	-99.0	32.0	14.7	62.4	0.6	0.0	2.4	6.8	267	0.0	306.8	954.6
2014/02/10 00:00:00	30.5	18.3	40.1	31.1	21.2	39.0	-99.0	-99.0	-99.0	28.1	11.9	51.8	1.6	0.0	5.9	9.8	144	0.0	301.0	940.1
2014/02/11 00:00:00	29.1	20.2	38.4	29.5	21.5	37.7	-99.0	-99.0	-99.0	40.0	19.6	73.4	0.9	0.0	6.8	10.2	224	0.0	275.6	957.3
2014/02/12 00:00:00	30.0	18.6	40.4	30.4	20.2	39.5	-99.0	-99.0	-99.0	36.0	16.3	68.8	0.7	0.0	6.1	7.7	263	0.0	288.4	919.9
2014/02/13 00:00:00	31.2	24.5	37.9	31.2	25.5	37.1	-99.0	-99.0	-99.0	37.2	20.7	56.0	0.8	0.0	5.2	10.7	305	0.0	267.1	958.2
2014/02/14 00:00:00	28.3	23.1	32.2	28.3	23.6	32.0	-99.0	-99.0	-99.0	53.4	36.5	85.4	1.2	0.0	5.2	7.9	127	0.0	110.4	966.2
2014/02/15 00:00:00	30.7	25.3	36.2	31.0	25.6	35.9	-99.0	-99.0	-99.0	42.3	25.6	68.3	1.2	0.0	4.8	11.4	33	0.0	80.8	402.7
2014/02/16 00:00:00	26.5	19.0	36.4	26.8	19.6	35.6	-99.0	-99.0	-99.0	58.4	28.8	96.1	0.4	0.0	11.6	15.2	247	11.0	118.6	948.8
2014/02/17 00:00:00	23.3	18.3	29.7	23.4	19.0	29.1	-99.0	-99.0	-99.0	71.5	46.6	94.1	2.6	0.0	4.9	7.4	138	0.0	130.7	604.9
2014/02/18 00:00:00	25.7	18.5	33.2	25.8	19.0	32.8	-99.0	-99.0	-99.0	65.5	40.5	92.2	0.7	0.0	3.5	9.2	26	1.0	179.5	1066.2
2014/02/19 00:00:00	24.6	21.3	29.5	24.9	21.7	29.1	-99.0	-99.0	-99.0	78.4	58.5	98.0	1.6	0.0	1.8	10.7	351	25.0	74.1	737.1
2014/02/20 00:00:00	24.2	18.7	28.3	24.6	19.0	28.0	-99.0	-99.0	-99.0	66.4	49.1	87.5	0.7	0.0	0.0	6.0	264	0.8	139.4	817.4
2014/02/21 00:00:00	21.6	12.6	32.3	22.5	14.1	31.4	-99.0	-99.0	-99.0	51.3	14.9	90.2	1.0	0.0	1.4	6.6	222	0.0	274.0	1066.6
2014/02/22 00:00:00	24.7	16.4	31.8	24.9	18.6	31.2	-99.0	-99.0	-99.0	53.5	32.1	79.9	2.7	0.0	5.8	8.4	129	0.0	229.9	1057.6
2014/02/23 00:00:00	23.9	15.7	30.9	23.9	16.6	30.4	-99.0	-99.0	-99.0	49.1	24.9	85.5	3.4	0.0	7.1	10.5	133	0.0	278.1	917.3
2014/02/24 00:00:00	23.8	13.8	31.2	24.4	16.9	31.1	-99.0	-99.0	-99.0	47.2	22.8	86.9	1.1	0.0	1.6	7.3	133	0.0	273.1	1015.6

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Record Time	Temperature									Humidity									Prevailing Wind				Rain	Solar Rad	
	2m			10m			60m						Speed			Gust	Dir		Avg	Max					
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max										
						(°C)						(%)			(m/s)	(m/s)	(°)	(mm)	(W/m²)						
2014/02/25 00:00:00	25.1	17.6	32.0	25.5	18.9	31.9	-99.0	-99.0	-99.0	48.9	25.7	75.7	0.2	0.0	2.1	7.4	116	0.0	240.0	969.6					
2014/02/26 00:00:00	26.1	19.1	31.7	26.4	21.9	30.6	-99.0	-99.0	-99.0	45.5	29.5	66.4	1.6	0.0	1.5	8.7	309	0.0	205.3	821.4					
2014/02/27 00:00:00	27.2	20.2	34.7	27.5	21.1	35.2	-99.0	-99.0	-99.0	46.5	24.2	70.8	0.8	0.0	8.3	11.4	133	0.0	234.9	1034.6					
2014/02/28 00:00:00	23.2	19.3	27.9	23.4	19.6	27.7	-99.0	-99.0	-99.0	65.2	40.6	95.0	1.8	0.0	5.5	7.9	147	3.0	81.4	662.1					

Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
Module Id : M2 (Templemore 10m)
Requested Report Date : 2014/04/01
Requested Report Hour : 00
Chart Available : no

Main Data Summary

Record Time	Temperature									Humidity			Prevailing Wind				Dir	Rain	Solar Rad	
	Avg	2m Min	Max	Avg	10m Min	Max	Avg	60m Min	Max	Avg	Min	Max	Avg	Speed Min	Max	Gust			Avg	Max
					(°C)						(%)			(m/s)		(m/s)	(°)	(mm)	(W/m ²)	
2014/03/01 00:00:00	22.0	19.0	28.7	22.1	19.3	28.6	-99.0	-99.0	-99.0	76.3	44.3	96.9	2.4	0.2	7.1	9.2	141	3.8	127.7	878.0
2014/03/02 00:00:00	22.9	18.4	29.8	22.8	18.7	28.6	-99.0	-99.0	-99.0	69.3	44.9	88.6	3.4	0.0	2.2	10.1	149	0.0	242.5	1022.2
2014/03/03 00:00:00	24.4	15.6	32.1	24.6	17.4	31.2	-99.0	-99.0	-99.0	56.9	31.4	92.8	2.9	0.0	4.3	10.9	139	0.0	221.0	1017.5
2014/03/04 00:00:00	24.6	18.2	30.4	24.7	19.1	30.0	-99.0	-99.0	-99.0	47.4	31.7	67.9	2.8	0.5	5.7	7.1	119	0.0	219.3	1038.7
2014/03/05 00:00:00	24.9	17.0	31.9	25.1	18.6	30.7	-99.0	-99.0	-99.0	48.1	30.5	75.4	0.5	0.0	5.7	8.9	239	0.0	212.5	992.0
2014/03/06 00:00:00	24.9	17.0	32.7	25.1	18.4	32.3	-99.0	-99.0	-99.0	55.7	25.2	86.1	1.4	0.0	7.0	10.2	165	0.0	239.7	923.1
2014/03/07 00:00:00	24.5	17.6	32.9	24.6	18.9	32.2	-99.0	-99.0	-99.0	57.4	27.6	83.8	1.0	0.0	2.4	10.3	142	0.0	219.4	947.0
2014/03/08 00:00:00	24.3	16.9	31.1	24.6	18.6	30.7	-99.0	-99.0	-99.0	53.9	27.2	85.3	1.8	0.0	5.1	8.7	126	0.0	226.5	930.2
2014/03/09 00:00:00	24.7	15.7	31.2	25.0	18.1	31.0	-99.0	-99.0	-99.0	44.7	25.4	75.1	2.2	0.3	5.6	8.5	106	0.0	229.6	931.7
2014/03/10 00:00:00	24.6	15.8	31.7	25.0	17.6	31.2	-99.0	-99.0	-99.0	43.9	22.7	71.5	2.6	0.0	7.2	11.6	116	0.0	251.6	857.6
2014/03/11 00:00:00	24.1	16.3	31.5	24.5	17.7	31.7	-99.0	-99.0	-99.0	45.2	22.6	76.1	2.6	0.0	1.3	8.8	121	0.0	252.5	859.0
2014/03/12 00:00:00	23.6	14.3	31.4	24.5	16.9	31.0	-99.0	-99.0	-99.0	45.3	21.4	78.7	0.6	0.0	1.6	7.2	182	0.0	248.8	867.0
2014/03/13 00:00:00	24.7	15.1	33.0	25.5	16.9	32.5	-99.0	-99.0	-99.0	45.0	20.5	74.9	1.0	0.0	1.2	22.1	166	0.0	252.5	1942.5
2014/03/14 00:00:00	23.4	18.9	27.4	23.5	19.9	26.8	-99.0	-99.0	-99.0	53.5	37.7	73.0	0.8	0.0	2.2	9.5	13	0.2	157.5	1007.4
2014/03/15 00:00:00	23.4	13.5	32.2	23.7	15.0	31.1	-99.0	-99.0	-99.0	54.4	25.3	91.7	0.8	0.0	4.4	9.6	300	0.0	196.4	861.0
2014/03/16 00:00:00	24.5	17.3	32.8	25.1	19.0	31.9	-99.0	-99.0	-99.0	52.9	25.8	93.9	1.9	0.0	3.1	22.3	301	1.4	154.0	816.6
2014/03/17 00:00:00	19.5	9.6	28.7	20.5	11.8	28.1	-99.0	-99.0	-99.0	56.4	24.3	95.8	0.8	0.0	0.6	6.9	206	0.2	245.2	824.3
2014/03/18 00:00:00	21.2	8.9	31.9	22.3	11.1	31.6	-99.0	-99.0	-99.0	49.4	24.8	87.6	0.8	0.0	0.8	534.5	221	0.0	243.0	1624.4
2014/03/19 00:00:00	24.7	16.4	33.1	25.1	18.2	32.6	-99.0	-99.0	-99.0	52.4	23.7	70.8	1.9	0.0	3.0	11.2	127	0.0	156.1	865.3
2014/03/20 00:00:00	23.4	18.6	27.3	23.7	19.3	26.5	-99.0	-99.0	-99.0	48.9	36.4	63.9	2.8	0.6	5.8	7.7	104	0.0	103.1	587.5
2014/03/21 00:00:00	20.6	16.8	26.1	21.0	17.2	25.6	-99.0	-99.0	-99.0	75.9	50.2	97.6	1.4	0.0	0.0	7.1	116	21.6	133.0	938.8
2014/03/22 00:00:00	21.9	14.7	30.6	22.6	16.0	30.8	-99.0	-99.0	-99.0	68.2	26.4	97.3	0.4	0.0	1.9	4.8	230	0.0	228.6	809.2
2014/03/23 00:00:00	22.1	14.7	31.9	22.7	16.5	31.4	-99.0	-99.0	-99.0	62.9	27.4	92.1	0.9	0.0	8.0	10.9	90	7.4	216.4	839.7
2014/03/24 00:00:00	18.7	14.2	24.2	19.1	15.0	24.4	-99.0	-99.0	-99.0	84.4	56.3	98.4	0.5	0.0	3.4	11.5	122	38.0	93.1	673.7

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Record Time	Temperature									Humidity			Prevailing Wind			Dir (°)	Rain (mm)	Solar Rad		
	2m			10m			60m						Speed		Gust (m/s)			Avg	Max	
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min						Max
					(°C)					(%)			(m/s)							
2014/03/25 00:00:00	19.8	14.9	26.2	20.1	15.8	25.6	-99.0	-99.0	-99.0	79.4	48.4	96.9	1.3	0.0	3.2	7.6	111	2.4	112.4	894.6
2014/03/26 00:00:00	18.6	16.7	20.1	18.8	17.0	20.1	-99.0	-99.0	-99.0	90.3	82.5	96.5	2.4	0.0	6.1	4159.8	119	25.0	43.1	4930.0
2014/03/27 00:00:00	18.4	17.1	22.0	18.7	17.3	21.9	-99.0	-99.0	-99.0	92.2	70.4	98.0	1.4	0.0	3.3	10.3	98	60.4	30.5	247.5
2014/03/28 00:00:00	19.8	17.7	23.1	19.9	17.9	22.8	-99.0	-99.0	-99.0	86.1	71.7	96.6	0.4	0.0	1.6	6.6	218	7.4	88.6	488.7
2014/03/29 00:00:00	19.9	14.6	26.9	20.1	15.2	26.8	-99.0	-99.0	-99.0	80.7	47.9	97.6	0.1	0.0	1.9	4.5	174	0.2	181.9	762.0
2014/03/30 00:00:00	22.1	15.1	29.3	22.6	15.8	29.1	-99.0	-99.0	-99.0	69.7	37.7	96.3	0.9	0.0	0.5	5.8	171	0.0	208.8	744.1
2014/03/31 00:00:00	22.2	15.9	29.7	22.7	16.8	30.5	-99.0	-99.0	-99.0	72.0	36.6	95.6	0.8	0.0	2.3	6.1	185	0.0	205.7	726.0

Meteorological Daily Statistics Summary

Unit Id : Whitehaven Master (Sentinex99)
Module Id : M2 (Templemore 10m)
Requested Report Date : 2014/05/01
Requested Report Hour : 00
Chart Available : no

Main Data Summary

Record Time	Temperature									Humidity									Prevailing Wind				Dir	Rain	Solar Rad	
	Avg	2m Min	Max	Avg	10m Min (°C)	Max	Avg	60m Min	Max	Avg	Min	Max	Avg	Speed Min (m/s)	Max	Gust (m/s)	(°)	(mm)	Avg	Max						
																					(W/m²)	(W/m²)				
2014/04/01 00:00:00	22.1	16.2	28.8	22.5	17.2	28.2	-99.0	-99.0	-99.0	75.2	47.6	96.0	0.6	0.0	1.9	5.0	252	0.0	190.7	863.7						
2014/04/02 00:00:00	22.7	17.5	29.7	23.1	18.4	29.1	-99.0	-99.0	-99.0	73.7	44.9	93.7	1.0	0.0	1.5	7.0	266	0.0	179.7	877.7						
2014/04/03 00:00:00	22.8	15.8	31.8	23.5	17.1	32.5	-99.0	-99.0	-99.0	74.9	36.3	96.9	0.3	0.0	2.2	4.0	252	0.0	199.6	708.7						
2014/04/04 00:00:00	23.1	18.8	29.1	23.5	19.6	28.4	-99.0	-99.0	-99.0	75.7	50.0	94.5	1.5	0.0	1.5	9.5	291	0.6	133.0	807.1						
2014/04/05 00:00:00	22.5	18.8	28.4	22.8	19.6	27.8	-99.0	-99.0	-99.0	80.4	54.6	96.8	1.5	0.0	0.8	7.5	277	0.0	134.0	781.9						
2014/04/06 00:00:00	21.1	15.7	26.6	21.6	17.4	26.3	-99.0	-99.0	-99.0	72.1	42.5	95.7	2.2	0.0	2.3	8.7	174	0.0	186.5	807.7						
2014/04/07 00:00:00	19.2	11.7	25.6	19.8	13.8	25.5	-99.0	-99.0	-99.0	62.8	40.9	93.6	2.8	0.0	6.1	8.6	124	0.0	192.9	728.3						
2014/04/08 00:00:00	18.4	12.2	25.6	19.5	14.1	25.4	-99.0	-99.0	-99.0	63.1	36.7	90.7	1.6	0.0	0.0	6.3	130	0.0	193.3	710.5						
2014/04/09 00:00:00	18.5	10.2	27.3	19.6	11.8	27.4	-99.0	-99.0	-99.0	72.1	39.0	96.5	0.3	0.0	0.0	4.5	193	0.0	186.2	687.1						
2014/04/10 00:00:00	19.9	12.5	26.2	20.8	14.2	26.3	-99.0	-99.0	-99.0	72.1	50.0	95.1	0.2	0.0	2.3	3.8	51	0.0	133.5	760.3						
2014/04/11 00:00:00	22.3	17.5	27.5	22.8	18.2	27.1	-99.0	-99.0	-99.0	66.5	46.7	91.9	2.0	0.0	2.0	9.3	290	0.8	151.5	696.1						
2014/04/12 00:00:00	19.6	12.9	25.2	20.4	15.3	25.2	-99.0	-99.0	-99.0	69.6	44.0	95.8	0.9	0.0	2.0	5.3	164	0.0	184.6	888.2						
2014/04/13 00:00:00	18.1	10.0	25.6	19.0	12.5	25.4	-99.0	-99.0	-99.0	68.5	35.8	96.6	2.1	0.0	1.4	7.1	148	0.0	181.9	699.6						
2014/04/14 00:00:00	18.6	13.1	25.3	19.1	14.4	25.1	-99.0	-99.0	-99.0	65.2	41.8	88.4	2.6	0.0	3.4	8.2	132	0.0	166.7	682.4						
2014/04/15 00:00:00	17.1	9.1	24.4	17.9	12.2	24.3	-99.0	-99.0	-99.0	66.3	39.1	96.1	2.2	0.0	2.4	7.6	136	0.0	153.5	797.9						
2014/04/16 00:00:00	16.2	8.9	24.0	17.6	11.5	24.2	-99.0	-99.0	-99.0	70.2	39.3	95.4	1.4	0.0	0.7	5.8	144	0.0	173.4	743.5						
2014/04/17 00:00:00	14.6	6.7	24.3	16.5	9.5	24.1	-99.0	-99.0	-99.0	72.6	33.2	96.8	0.7	0.0	0.7	4.7	190	0.0	166.3	734.2						
2014/04/18 00:00:00	14.5	5.7	25.0	16.6	8.7	25.1	-99.0	-99.0	-99.0	68.0	33.7	95.5	0.7	0.0	0.0	7.2	252	0.0	183.9	672.1						
2014/04/19 00:00:00	15.3	6.9	25.4	17.2	9.5	25.1	-99.0	-99.0	-99.0	65.6	32.3	92.7	0.9	0.0	0.0	8.9	307	0.0	156.4	841.8						
2014/04/20 00:00:00	13.8	4.6	24.1	15.6	6.9	23.5	-99.0	-99.0	-99.0	65.7	33.5	96.8	1.6	0.0	0.0	8.3	307	0.0	181.1	659.8						
2014/04/21 00:00:00	13.2	2.9	24.8	15.4	6.0	24.4	-99.0	-99.0	-99.0	63.4	25.4	93.3	0.8	0.0	2.3	7.0	320	0.0	180.1	671.6						
2014/04/22 00:00:00	16.6	4.7	27.2	17.8	6.7	27.1	-99.0	-99.0	-99.0	63.8	37.7	94.6	1.2	0.0	0.0	9.2	316	0.0	149.9	656.5						
2014/04/23 00:00:00	19.3	12.0	27.9	21.2	14.7	27.6	-99.0	-99.0	-99.0	59.5	30.6	88.1	1.9	0.0	2.4	9.3	325	0.0	162.4	628.8						
2014/04/24 00:00:00	18.9	8.8	28.8	20.6	11.1	28.9	-99.0	-99.0	-99.0	61.5	27.1	93.6	1.1	0.0	1.5	8.2	329	0.0	164.3	624.7						

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Record Time	Temperature									Humidity									Prevailing Wind			Rain	Solar Rad	
	2m			10m			60m						Speed			Gust	Dir		Avg	Max				
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max		(°)	(mm)	(W/m ²)					
	(°C)															(m/s)	(m/s)							
2014/04/25 00:00:00	20.7	15.0	28.4	21.6	16.4	29.3	-99.0	-99.0	-99.0	57.1	31.9	85.7	1.0	0.0	3.9	10.0	94	1.0	139.2	716.2				
2014/04/26 00:00:00	18.5	10.1	25.9	19.5	12.1	25.5	-99.0	-99.0	-99.0	65.3	39.3	91.7	1.1	0.0	3.0	7.6	297	0.0	110.6	742.4				
2014/04/27 00:00:00	19.4	13.7	24.7	20.3	15.5	24.9	-99.0	-99.0	-99.0	69.8	47.5	93.5	0.1	0.0	0.0	4.1	3	0.0	68.5	285.0				
2014/04/28 00:00:00	17.8	10.7	26.1	19.2	13.3	26.6	-99.0	-99.0	-99.0	71.6	38.7	96.9	1.3	0.0	0.0	6.0	135	0.0	151.1	627.7				
2014/04/29 00:00:00	16.5	7.8	25.4	17.9	10.7	24.8	-99.0	-99.0	-99.0	75.4	46.8	97.1	0.9	0.0	1.7	83.4	281	0.0	153.4	1556.5				
2014/04/30 00:00:00	15.6	11.8	19.3	16.6	13.8	19.1	-99.0	-99.0	-99.0	85.1	75.6	95.2	0.8	0.0	2.9	4.2	305	5.8	46.6	563.8				