

<b>High Level Review of the Mt Pleasant Operation Mine Optimisation Modification Environmental Assessment May 2017</b>	
<b>Date:</b>	2 July 2018
<b>To:</b>	The President of the Hunter Thoroughbred Breeders Association
<b>From:</b>	Rod Carr, Director at Marsden Jacob Associates

## Background

This high-level review memorandum has been prepared at the request of the Hunter Thoroughbred Breeders Association. The purpose of the report is to identify any economic assessment related issues contained in the modification application reports.

The following documents have been briefly reviewed in the preparation of this memorandum:

- NSW Government, Guidelines for the economic assessment of mining and coal seam gas proposals, December 2015
- Referral Letter: Department of Planning and Environment to Independent Planning Commission of NSW, 8 June 2018
- Assessment Report: Department of Planning and Environment, Mount Pleasant Coal Mine Extension of Mine Life (DA 92/97 MOD 3) Environmental Assessment Report
- Environmental Assessment: MACH Energy, Mount Pleasant Operation, Mine Optimisation Modification, May 2017
- Environmental Assessment: Coal & Allied Operations Pty Ltd, Mount Pleasant Mine Environmental Impact Statement, Volume 1 and Volume 10, September 1997
- MACH Energy Australia and Bengalla Mining Company, Joint Public Statement, 24 April 2018

## Review Findings

### 1. No economic assessment has been undertaken

The consent authority needs a detailed and thorough economic (cost benefit) analysis to inform consent considerations under the *Environmental Planning and Assessment Act 1997*.

Marsden Jacob has been unable to identify an economic assessment of the mine in any of the available documents, including the applicant's environmental assessment, the Department of Planning and Environment's assessment report, and the original application (1997).

This means that there is no available cost benefit analysis of the impact of the proposed modification on the social, environmental and economic impacts. Currently the only available information is on coal royalties and employment estimates.

The current application is not in compliance with the requirements of the *Guidelines for the economic assessment of mining and coal seam gas proposals*. These guidelines state that *“Under section 78A of the EP&A Act, a development application for State Significant development must be accompanied by an Environmental Impact Statement (EIS) ... The economic assessment, comprising the CBA (cost-benefit analysis) and LEA (local effects analysis), forms part of the EIS.”* (page 1)

## 2. Base case considerations

As previously discussed, no economic assessment was undertaken as part of the initial approval process for the mine. However, even if one were undertaken it would no longer be relevant as the base case has substantially changed, as confirmed by a number of submissions which called for a cumulative impact assessment to be undertaken.

In a cost benefit analysis, the costs and benefits of the project case are compared to the costs and benefits ‘without’ the project. The without project case is called the ‘base case’. The guidelines state the following:

*“The purpose of establishing a clear base case is to focus on the incremental change in economic, environmental and social impacts caused by the project relative to the existing land use.*

*The base case should include existing and already approved (but not yet operational) projects that will interact with the mining or coal seam gas project. This will ensure the cost benefit analysis at the project level accounts for cumulative impacts and threshold effects to the extent possible.”* (page 7)

Earlier analysis could not be relied upon, because in 1997 the base case was very different to 2018. Key changes include:

1. Mining: Significant mine development in the region, which mean that the base line noise, particulate, water, heritage and amenity impacts (to name a few) are very different.
2. Agriculture: Land use changes have occurred, including the thoroughbred, viticulture, cropping and broadacre agriculture sectors.
3. Urban: The urban environment has also changed.

## 3. Impact considerations

Mining projects cause environmental impacts to air quality, noise, biodiversity, greenhouse gas emissions, groundwater, surface water, aboriginal heritage, non-aboriginal heritage, visual amenity, and public infrastructure (such as water supply, roads and energy).

The economic analysis needs to consider all of these issues to be compliant with the NSW Guidelines, when assessing the net present value to the NSW community in a manner that accounts for all direct and indirect costs and benefits.

This analysis has not been undertaken.

Furthermore, even if it were undertaken at the time of the initial environmental impact statement (for which no evidence has been found) it could not be relied upon because the base case has changed (see above), and the sophistication of the collective knowledge base has significantly improved, both in terms of the science of impact assessment and the valuation of impacts.

#### **4. Undisclosed private contract**

Based on the parties' own press release, it would appear that some of Bengalla Mining Company's private commercial concerns about the modification application have been dealt with to their mutual satisfaction but on terms that are not available to the Independent Planning Commission or the public.

Consequently, the financial consequences appear to have been resolved but this does not mean that the economic implications of the development have necessarily been resolved. This issue needs to be carefully and properly considered in any economic assessment of the proposal, because at this time the net economic costs or benefits to the state are unknown.

#### **Concluding remarks**

The current application does not include an economic assessment, so it will not be possible for the Independent Planning Commission to include consideration of the economic consequences of the proposed mine in their evaluation.

Section 79C of the EP&A Act (Clause 1, sub clauses b and e) states that in determining an application, the consent authority must evaluate a number of factors, with both the quantitative and qualitative findings of the cost-benefit analysis and local effects analysis to be included – alongside other information – in the evaluation.

#### **Statement of Confidentiality**

The contents of this document and any attachments are confidential and are intended solely for the addressee. The information may also be legally privileged. If you have received this document in error, any use, reproduction or dissemination is strictly prohibited. If you are not the intended recipient, please immediately notify the sender by reply e-mail or phone and delete this document and its attachments, if any.

#### **Disclaimer**

This document has been prepared in accordance with the scope of services described in the contract or agreement between Marsden Jacob Associates Pty Ltd ACN 072 233 204 (Marsden Jacob) and the Client. This document is supplied in good faith and reflects the knowledge, expertise and experience of the advisors involved. The document and findings are subject to assumptions and limitations referred to within the document. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the Client. Marsden Jacob accepts no responsibility whatsoever for any loss occasioned by any person acting or refraining from action because of reliance on the document. Furthermore, the document has been prepared solely for use by the Client and Marsden Jacob Associates accepts no responsibility for its use by other parties.

## Talking Points

Marsden Jacob Associates, one of Australia's leading independent economic and financial advisory firms, has undertaken an expert review of the economic analysis of the Mt Pleasant Operation Mine Optimisation Modification Environmental Assessment.

### **Not in compliance with the guidelines**

Marsden Jacob found that the current application is not in compliance with the requirements of the *Guidelines for the economic assessment of mining and coal seam gas proposals* (The Guidelines).

The Guidelines state that "Under section 78A of the EP&A Act, a development application for State Significant development must be accompanied by an Environmental Impact Statement (EIS). The economic assessment, comprising the CBA (cost-benefit analysis) and LEA (local effects analysis), forms part of the EIS."

### **No cost-benefit analysis was undertaken for the original approval**

Marsden Jacob was not able to find a cost benefit analysis in 1997 EIS.

However, even if an economic analysis were undertaken in 1997 it could not be relied upon because the base case – without project case – has substantially changed.

The guidelines state that: "The base case should include existing and already approved (but not yet operational) projects that will interact with the mining or coal seam gas project. This will ensure the cost benefit analysis at the project level accounts for cumulative impacts and threshold effects to the extent possible."

### **Undisclosed private contract**

Based on the parties' own press release, it would appear that Bengalla Mining Company's private commercial concerns about the modification application have been dealt with to their mutual satisfaction but on terms that are not available to the Independent Planning Commission or the public.

While the financial differences have been resolved, this does not mean that the economic consequences of the development have necessarily been mitigated. This issue needs to be carefully and properly considered in an economic assessment of the proposal, that transparently considers and reports on costs and benefits in a manner that is compliant with the Guidelines.



**Stephenson**

---

Environmental Management Australia

---

**REVIEW OF DOCUMENTS RELATING TO AIR QUALITY  
MOUNT PLEASANT COAL MINE EXTENSION OF MINE LIFE  
(DA 92/97 MOD 3) – D512/18**

**PROJECT No.: 5976/18**

**DATE: 28 JUNE 2018**

**PREPARED FOR HUNTER THOROUGHBRED BREEDERS ASSOCIATION (HTBA)**

---



**Stephenson**

**Environmental Management Australia**

Peter W Stephenson & Associates Pty Ltd  
ACN 002 600 526 (Incorporated in NSW)  
ABN 75 002 600 526

52A Hampstead Road  
Auburn NSW 2144 Australia  
Tel: (02) 9737 9991

E-Mail: [info@stephensonenv.com.au](mailto:info@stephensonenv.com.au)

---

**REVIEW OF DOCUMENTS RELATING TO AIR QUALITY  
MOUNT PLEASANT COAL MINE EXTENSION OF MINE LIFE  
(DA 92/97 MOD 3) – D512/18**

**PROJECT No.: 5976/18**

**DATE: 28 JUNE 2018**

**PREPARED FOR HUNTER THOROUGHBRED BREEDERS ASSOCIATION (HTBA)**

---

**P W STEPHENSON**

## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	REFERENCE DOCUMENTS .....	4
<b>2</b>	<b>AIR QUALITY PARAMETERS AND BACKGROUND AMBIENT AIR QUALITY .....</b>	<b>5</b>
2.1	AIR QUALITY PARAMETERS .....	5
2.2	AIR QUALITY – APPLICABLE CRITERIA .....	5
<b>3</b>	<b>AMBIENT AIR QUALITY - INADEQUATELY ASSESSED .....</b>	<b>6</b>
<b>4</b>	<b>CONCLUSIONS AND RESPONSE TO SECRETARY’S ENVIRONMENTAL ASSESSMENT REPORT ....</b>	<b>9</b>
	<b>APPENDIX A – AMBIENT AIR QUALITY MONITORING - PARTICULATE MATTER CONCENTRATIONS 2015 - 2017 .....</b>	<b>I</b>
	<b>APPENDIX B – OZONE PREDICTIONS 2030 - 2050 .....</b>	<b>I</b>
	<b>APPENDIX C – CURRICULUM VITAE – PETER W STEPHENSON .....</b>	<b>I</b>

## TABLE OF FIGURES

FIGURE 1-1	MT PLEASANT OPERATION COAL MINE IN UPPER HUNTER VALLEY NSW .....	2
FIGURE 1-2	MOUNT PLEASANT OPERATION COAL MINE MOD 3 .....	3

## TABLE OF APPENDIX FIGURES

FIGURE A-1	NSW OEH MUSWELLBROOK AAQMS PM <sub>10</sub> & PM <sub>2.5</sub> DAILY AVERAGES, 2016 .....	II
FIGURE A-2	NSW OEH MUSWELLBROOK AAQMS PM <sub>10</sub> & PM <sub>2.5</sub> DAILY MAXIMA, 2016 .....	III
FIGURE A-3	NSW OEH MUSWELLBROOK AAQMS PM <sub>10</sub> & PM <sub>2.5</sub> ANNUAL AVERAGES, 2015 & 2016 .....	IV
FIGURE A-4	NSW OEH MUSWELLBROOK AAQMS PM <sub>10</sub> & PM <sub>2.5</sub> ANNUAL MAXIMA, 2015 & 2016 .....	V
FIGURE A-5	NSW OEH MUSWELLBROOK AAQMS PM <sub>10</sub> & PM <sub>2.5</sub> DAILY MAXIMA, 2017 .....	VI
FIGURE A-6	NSW OEH MUSWELLBROOK AAQMS PM <sub>10</sub> & PM <sub>2.5</sub> ANNUAL AVERAGES, 2016 & 2017 .....	VII
FIGURE A-7	NSW OEH MUSWELLBROOK AAQMS PM <sub>10</sub> & PM <sub>2.5</sub> MONTHLY MAXIMA, 2016 .....	VIII
FIGURE A-8	NSW OEH MUSWELLBROOK AAQMS PM <sub>10</sub> & PM <sub>2.5</sub> MONTHLY MAXIMA, 2017 .....	IX
FIGURE B-1	OZONE PREDICTIONS 2030-2050 .....	II

# 1 INTRODUCTION

Peter Stephenson, Managing Director of Stephenson Environmental Management Australia (SEMA) (CV attached as Appendix C) was requested by the Hunter Thoroughbred Breeders Association (HTBA) to undertake a review and critique of the air quality matters referred to in the assessment of the proposal conducted by the NSW Department of Planning and Environment in the Independent Planning Commission of New South Wales Proceedings No. D512/18 regarding the Mount Pleasant Operation Coal Mine Extension of Mine Life.

This review has been prepared in accordance with the following documents:

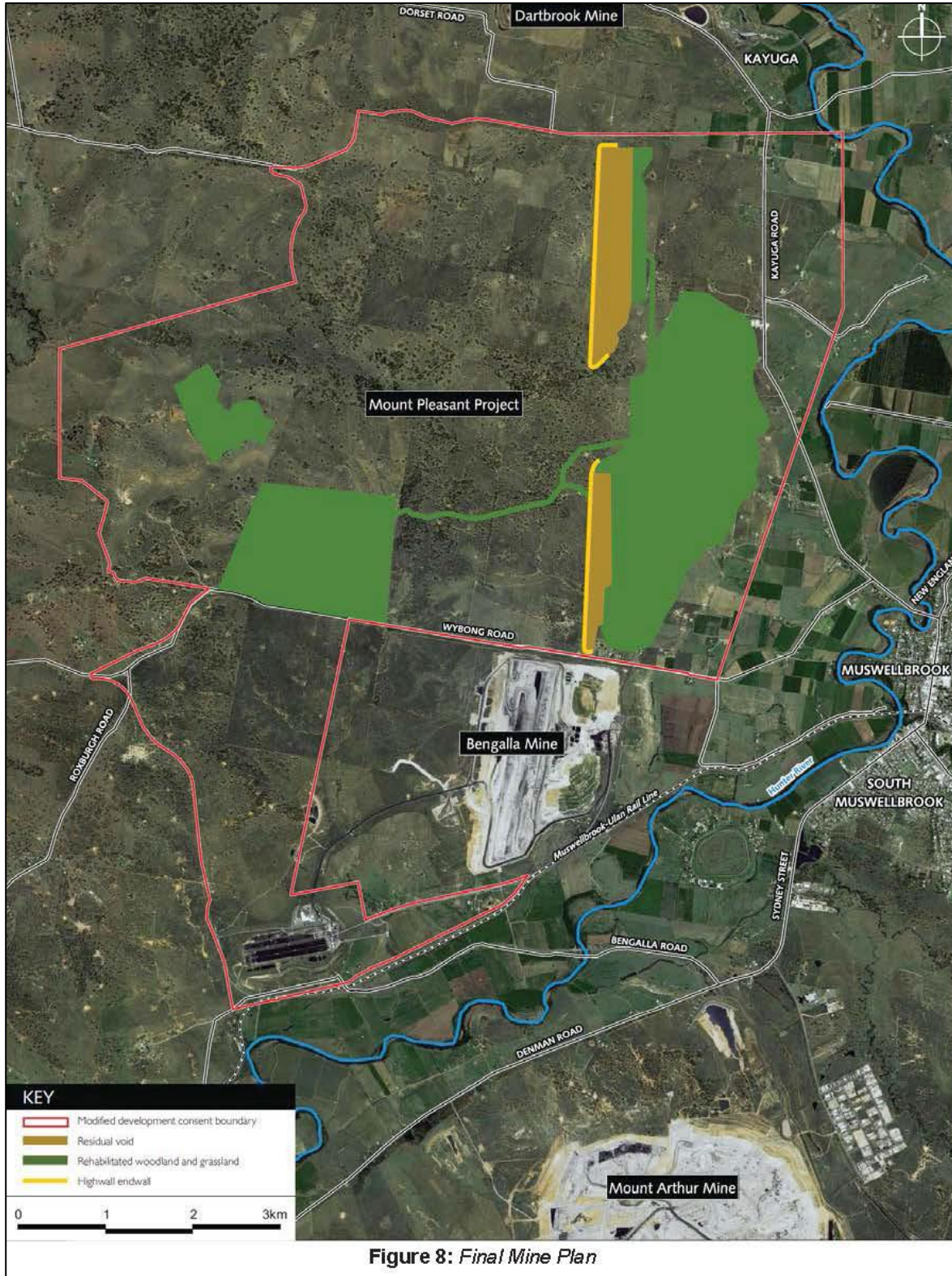
- Land & Environment Court Practice Note Class 4;
- Division 2, Part 31 of the Uniform Civil Procedure Rules (UPCR); and,
- Expert Witness Code of Conduct, Schedule 7 UPCR.

Figure 1.1 shows the location of the Mount Pleasant mine project relative to surrounding mines and townships of Kayuga and Muswellbrook.

Figure 1.2 shows the Mount Pleasant Operation Coal Mine MOD 3 in detail.

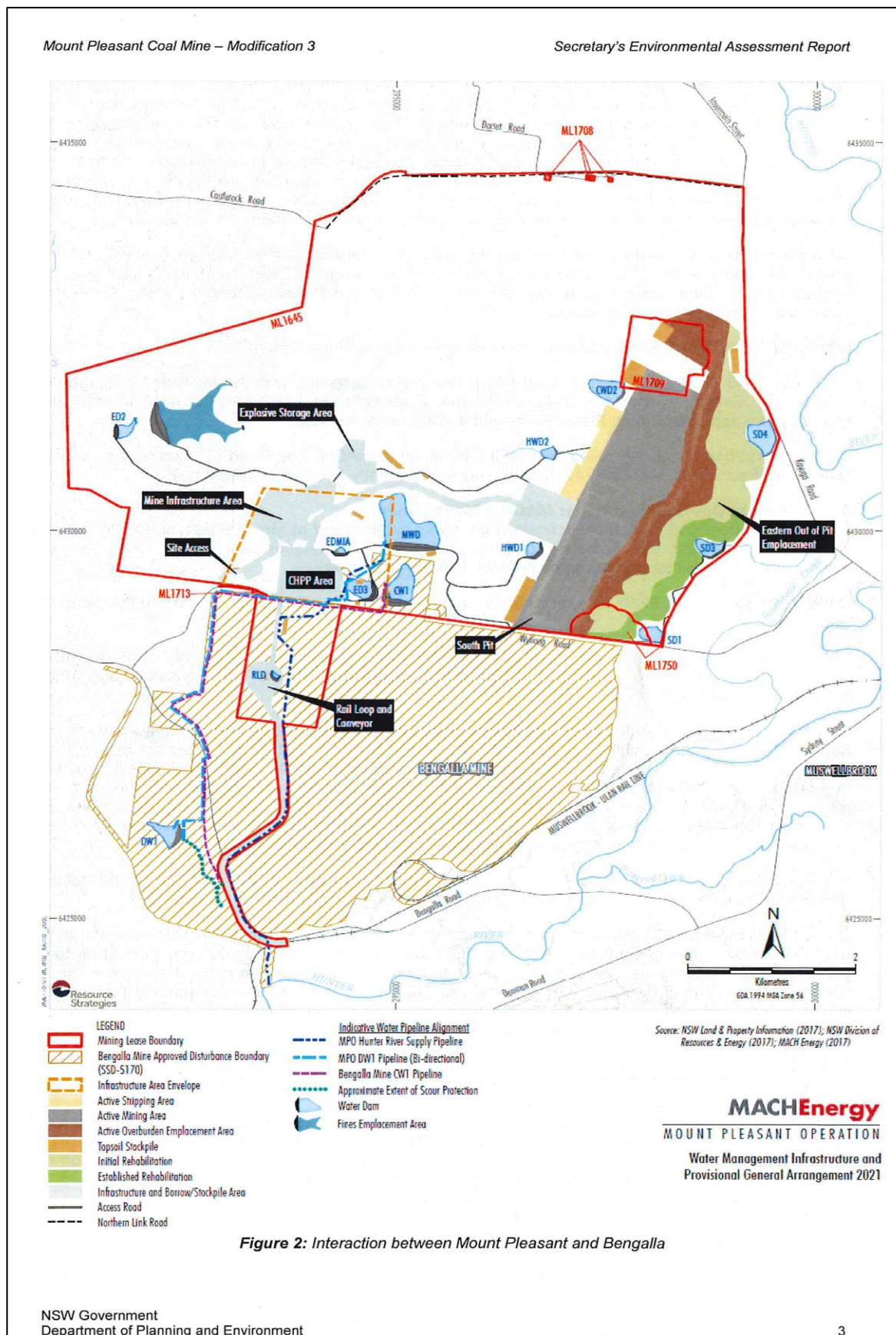


**FIGURE 1-1 MOUNT PLEASANT OPERATION COAL MINE IN UPPER HUNTER VALLEY NSW**



Source: Mach Energy Australia 2017

FIGURE 1-2 MOUNT PLEASANT OPERATION COAL MINE MOD 3



## 1.1 REFERENCE DOCUMENTS

Reference documents reviewed during the preparation of this review and critique are:

**Bengalla Mining Company Pty Limited (2017)** Supplementary Submission Mount Pleasant Coal Project - DA 92/97 Modification 3. Lodged by MACH Energy Australia Pty Limited (MACH Energy) on 16 June 2017. 27 July 2017.

**Department of Planning and Environment (NSW) (2018)**, Mount Pleasant Cola Mine Extension of Mine Life (DA 92/97 MOD 3). Secretary's Environmental Assessment Report (Section 75 of the Environmental Planning and Assessment Act 1979) 8 June 2018.

**Department of Environment, Land, Water and Planning, Victoria (2018)**, Clean air for all Victorians - Victoria's Air Quality Statement 2018 currently open for public review and feedback till 30 June 2018.

**Lacressonniere G (April 2014)** European Air Quality in the 2030s and 2050s: Impact of global and regional emission trends and of climate change. Atmospheric Environment V 92 August 2014 pp348-358.

**NSW DEC (now EPA) (2005)** Approved Methods for Modelling and Assessment of Air Pollutants in NSW.

**NSW Environment Protection Authority (2015)** - New South Wales State of the Environment Report, 2015 (Section 8, Air) (2015).

**National Environment Protection Council Annual Reports 2011; 2012; 2013; 2015 & 2016.**

**NSW Environment Protection Authority (various years):** annual reports and state of environment reports.

**NSW Office of Environment and Heritage (various years): Ambient** Air Quality monitoring results at Upper Hunter sites of Muswellbrook; Muswellbrook NW.

**Pacific Environment Limited (PEL) (2014)**, Upper Hunter Air Quality Particle Model (UHAQPM) (9 October 2014).

**Samoli, E et al (2013)**, Associations between Fine and Coarse Particles and Mortality in Mediterranean Cities. Results of MED-PARTICLES Project. Environmental Health Perspectives (On-line 17 May 2013).

**State of the Environment (SoE) report 2016** Australian Government including SoE-Atmosphere for major cities -SoE-health impacts of air pollution ambient air quality 2016.

**Todoroski Air Sciences (2017)** Mount Pleasant Operation Mine Optimisation Modification. Air Quality and Greenhouse Gas Assessment. 26 May 2017.

## **2 AIR QUALITY PARAMETERS AND BACKGROUND AMBIENT AIR QUALITY**

### **2.1 AIR QUALITY PARAMETERS**

Air quality emissions and their predicted impacts have been reviewed. The air quality parameters of interest, that are relevant to this assessment, are 24 hour and annual particulate matter criteria.

### **2.2 AIR QUALITY – APPLICABLE CRITERIA**

Applicable Air Quality Criterion Limits, as defined in the National Environment Protection (Ambient Air Quality) Measure (NEPM) that apply to this assessment are:

- PM<sub>10</sub> : 24 hour average of 50 microgram per cubic metre (ug/m<sup>3</sup>) and 25 ug/m<sup>3</sup> for the annual averaging period; and,
- PM<sub>2.5</sub>: 24 hour averaging period of 25 ug/m<sup>3</sup> and 8 ug/m<sup>3</sup> for the annual averaging period;
- Furthermore, the Consolidated Consent references the following:
  - *Air quality management for the Mount Pleasant Project will be undertaken in accordance with the Air Quality Management Plan which is a requirement under the existing development consent.*

### 3 AMBIENT AIR QUALITY - INADEQUATELY ASSESSED

The following review refers to the Todoroski Air Sciences (TAS) Air Quality and Greenhouse Gas Assessment report prepared for Mach Energy Australia. The section numbering is maintained for ease of cross-referencing.

In essence, this report accepts that the existing monitoring of ambient air quality, in particular PM<sub>10</sub> and PM<sub>2.5</sub>, is representative of the air quality impacts on Muswellbrook area currently, and shows that in the future it will not improve but will diminish further, if the modification is approved:-

---

#### TAS 3.1 Development Consent limits Table 3.1

*Comment: DA Consent DA 92/97 does not include PM<sub>2.5</sub> data.*

**TAS "3.2 EPL conditions....**Air quality criteria and other air quality related conditions stipulated in EPL 20850 are generally consistent with those prescribed in Development Consent DA 92/97, with the exception of Conditions O3.4 to O3.8, which state:..."

*Comment: The report does not expand on the conditions and the inconsistency with the conditions between the EPL and the DA.*

---

#### TAS 3.3 NSW EPA IAC

"Please note that these updates are not reflected in the Development Consent and EPL conditions for the Mount Pleasant Operation (or any other project in the vicinity) and therefore are not used to evaluate compliance for the existing operations."

*Comment: PM<sub>2.5</sub> data is included here in Table 3.2. The Report states that the latest PM<sub>2.5</sub> has not been referenced in this assessment, as above.*

**TAS "4.2.1 PM<sub>10</sub> & TSP monitoring ....** The available PM<sub>10</sub> monitoring data from the Upper Hunter air quality monitoring network (UHAQMN) monitoring stations is summarised in **Table 4-1**, and indicates that the annual average PM<sub>10</sub> concentrations are below the relevant criterion of 25µg/m<sup>3</sup>. The maximum 24-hour average PM<sub>10</sub> concentrations recorded at these stations exceed the relevant criterion of 50µg/m<sup>3</sup> at times during the review period."

*Comment: The Report acknowledges that the local air quality at times exceeds the maximum 24-hour average PM<sub>10</sub> concentration. Refer Tables 4.1 and 4.2.*

*Furthermore, the plots of data presented in Appendix A of this assessment report show regular exceedances for most of the year. This diminished air quality is the product of previous Planning NSW decisions and further development without radical rework of the mines emission controls will further diminish local air quality.*

---

**TAS “4.2.2 PM<sub>2.5</sub> monitoring... Table 4-2** indicates that the annual average PM<sub>2.5</sub> concentrations in Muswellbrook were above the relevant criterion of 8µg/m<sup>3</sup> for the periods reviewed, and that the maximum 24-hour average PM<sub>2.5</sub> concentrations exceeded the relevant criterion of 25µg/m<sup>3</sup> at times during the period reviewed.”

*Comment: The report acknowledges local air quality at times exceeds the maximum 24-hour average PM<sub>2.5</sub> concentration and the annual criterion. Refer Table 4.2.*

---

**TAS “5.5 Dust mitigation and management ....** Reactive dust mitigation strategies include high dust concentration alarms to alert staff of the potential for dust impacts to arise. For example, the reactive dust mitigation strategies would also incorporate the condition outlined in EPL 20850 requiring all dust generating activities to be ceased during specific adverse conditions.”

*Comment: Query the response time for reactive as opposed to proactive dust mitigation measures with large scale machinery and operations.*

*Furthermore, if this form of dust management is so efficient, why has it not been implemented in the past?*

*Alternatively, if it has been utilized then it has failed to manage the fine particulate emissions?*

---

**TAS “6.1.1 Consent criteria...** The receptor locations at which levels above the consent criteria are predicted to arise are all far removed from the Mount Pleasant Operation and the impact occurs irrespective of the proposed Modification, i.e. the background levels including other projects already exceed the criteria at all of the potentially affected receptors. It is also noted that these receptors are subject to acquisition.”

*Comment: Acknowledges that levels exceed but justifies with acquisition. This approach has not addressed the air quality.*

---

**TAS “10 SUMMARY AND CONCLUSIONS ...** The results indicate that annual average PM<sub>10</sub> dust impacts may potentially arise at a small number of privately-owned receptor locations... The new (2017) NSW EPA impact assessment criteria of 25µg/m<sup>3</sup> may also be exceeded at a small number of privately-owned receptors, primarily due to existing elevated dust levels.

Furthermore, it is concluded that PM<sub>10</sub> and PM<sub>2.5</sub> dust impacts will be adequately managed with reactive dust mitigation strategies and real-time/predicted management systems.

Finally, “Overall, relative to the approved Mount Pleasant Operation, the potential air quality impacts associated with the Mount Pleasant Operation

incorporating the Modification are significantly lower, as would be expected with the reduced total emissions”.

**Comment:** *This total lower emissions claim is not verifiable in the report because there is lack of explanation or justification provided. The controls used on the input emissions data appear to be over-estimated and should be justified in the public arena. Comparison of Mount Pleasant Operations emissions with other adjacent mines in this part of the Upper Hunter is unsubstantiated.*

*Modification AQIA acknowledges that compliance criteria levels will be exceeded.*

*Justifies such exceedances as the responsibility of other mines and only impacts some private residences that could be acquired.*

*There is NO acknowledgement of any responsibility for the current air quality in Muswellbrook by Mount Pleasant Operation.*

*AQIA on behalf of MPO blames winter exceedances on wood fires in Muswellbrook but does acknowledge that mines also contribute to these exceedances.*

*However, it does show contribution of MPO on top of background levels of PM<sub>10</sub> and PM<sub>2.5</sub>.*

#### **4 CONCLUSIONS AND RESPONSE TO SECRETARY'S ENVIRONMENTAL ASSESSMENT REPORT**

The Department concludes in their Secretary's Environmental Assessment Report (DA 92/97 MOD 3) that the modification is approvable and that,

*"These benefits outweigh the potential adverse social and environmental impacts of the proposed extension to an existing approved mine's life".*

The benefits referred to are payment of coal royalties and continued employment of site workers.

Accordingly it has been determined by the Department, that from an air quality perspective, the proposed Extension of Mine Life till 2026 will be suitable for residential occupation even though the air quality already exceeds criteria for fine particles.

In our view this is not correct and does not address the current non-compliant ambient air quality and diminished air quality in Muswellbrook. This diminished air quality is a product of previous Planning decisions on coal mining in the Upper Hunter and will not improve without addressing the source of the emissions of fine particulate matter.



---

**APPENDIX A – AMBIENT AIR QUALITY MONITORING - PARTICULATE MATTER  
CONCENTRATIONS 2015 - 2017**

FIGURE A-1 NSW OEH MUSWELLBROOK AAQMS PM<sub>10</sub> & PM<sub>2.5</sub> DAILY AVERAGES, 2016

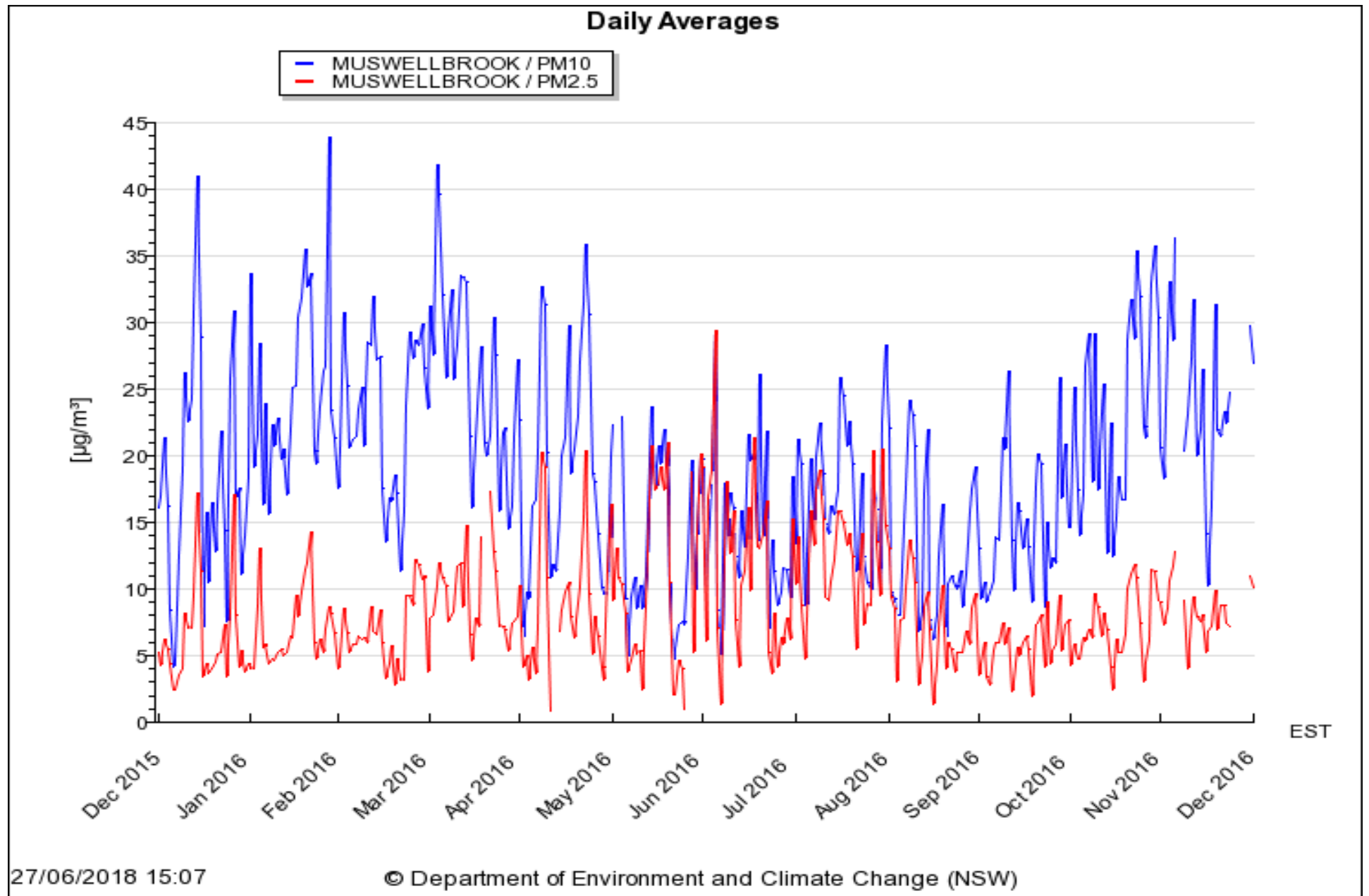


FIGURE A-2 NSW OEH MUSWELLBROOK AAQMS PM<sub>10</sub> & PM<sub>2.5</sub> DAILY MAXIMA, 2016

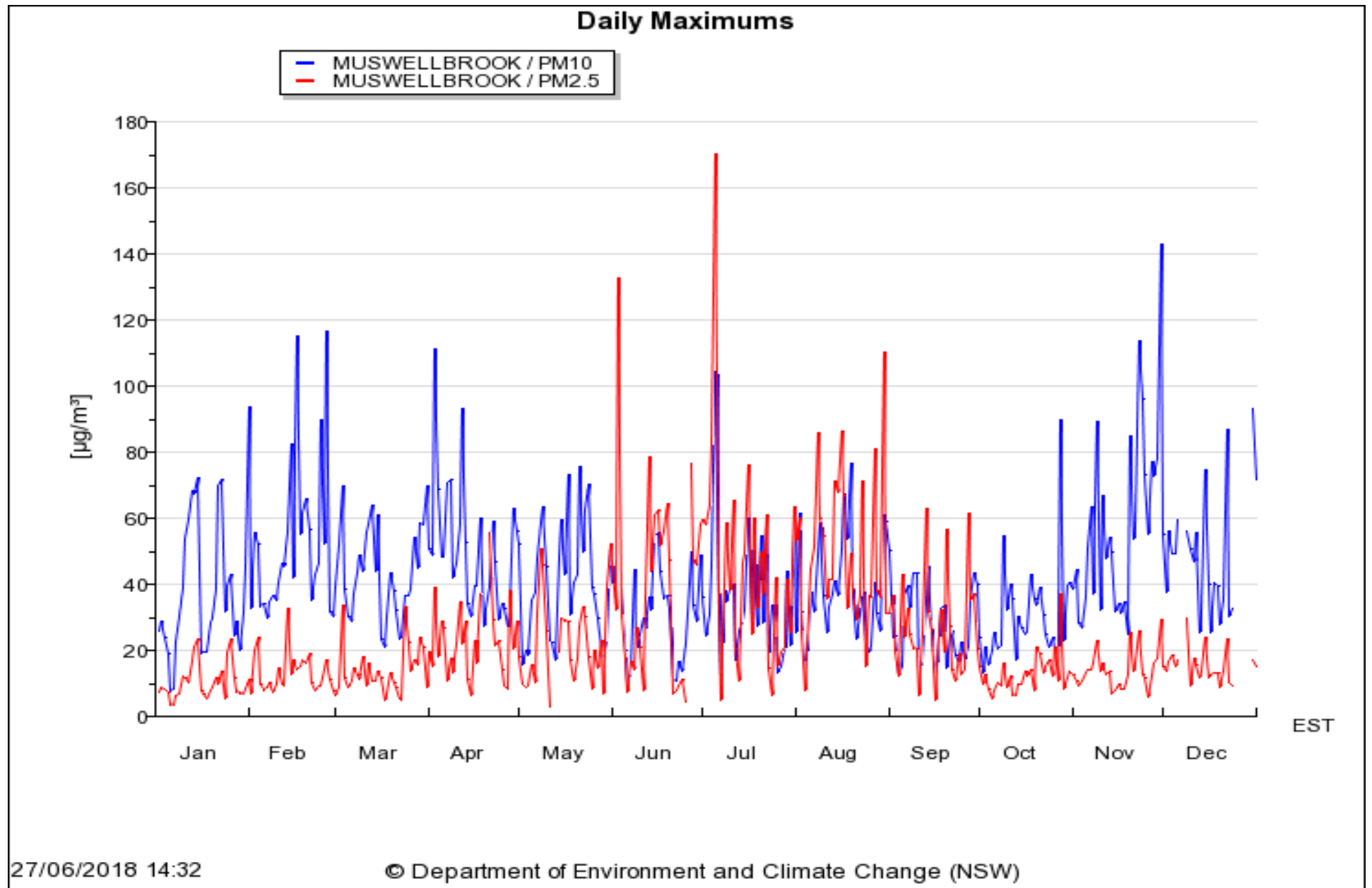


FIGURE A-3 NSW OEH MUSWELLBROOK AAQMS PM<sub>10</sub> & PM<sub>2.5</sub> ANNUAL AVERAGES, 2015 & 2016

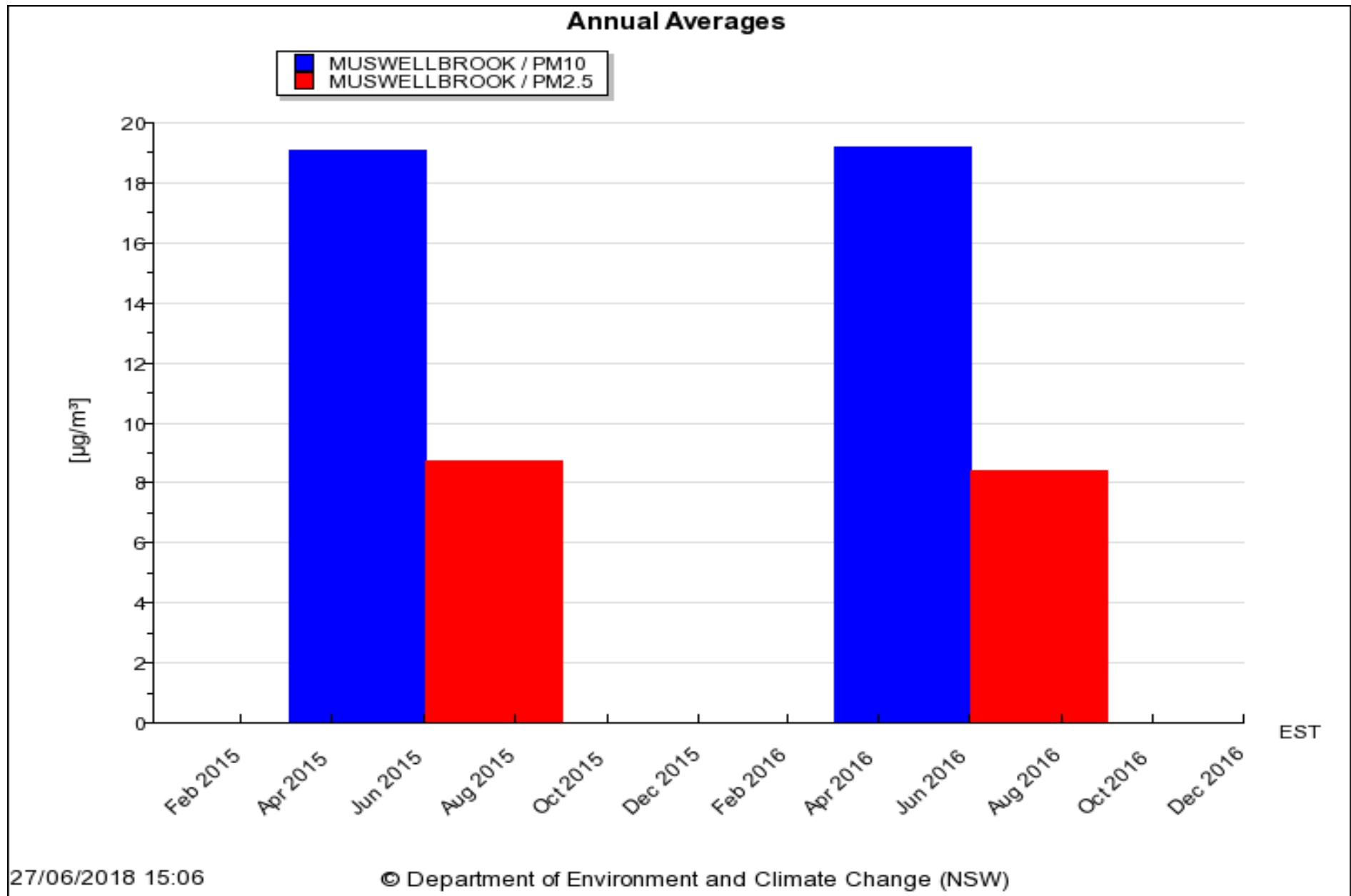


FIGURE A-4 NSW OEH MUSWELLBROOK AAQMS PM<sub>10</sub> & PM<sub>2.5</sub> ANNUAL MAXIMA, 2015 & 2016

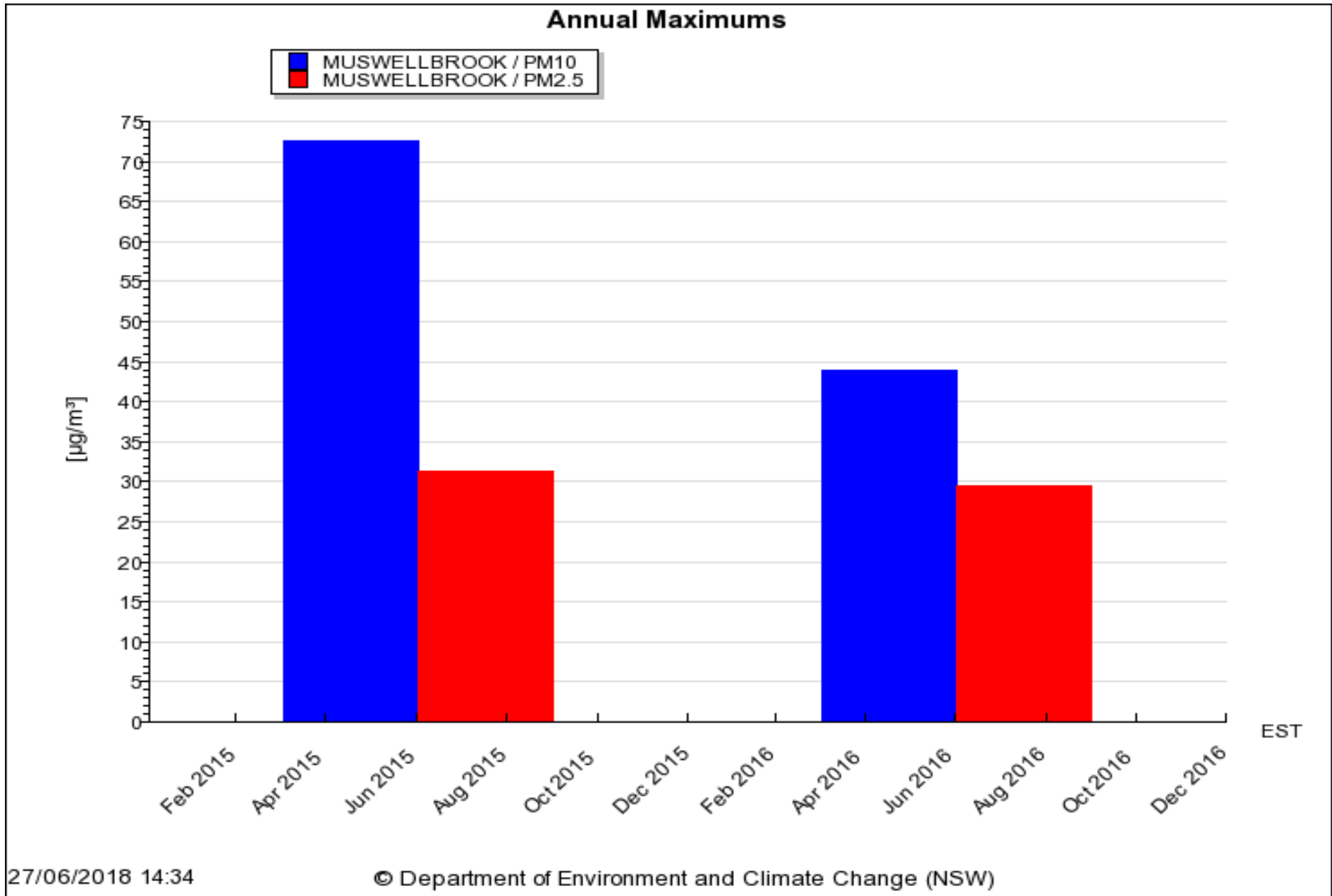


FIGURE A-5 NSW OEH MUSWELLBROOK AAQMS PM<sub>10</sub> & PM<sub>2.5</sub> DAILY MAXIMA, 2017

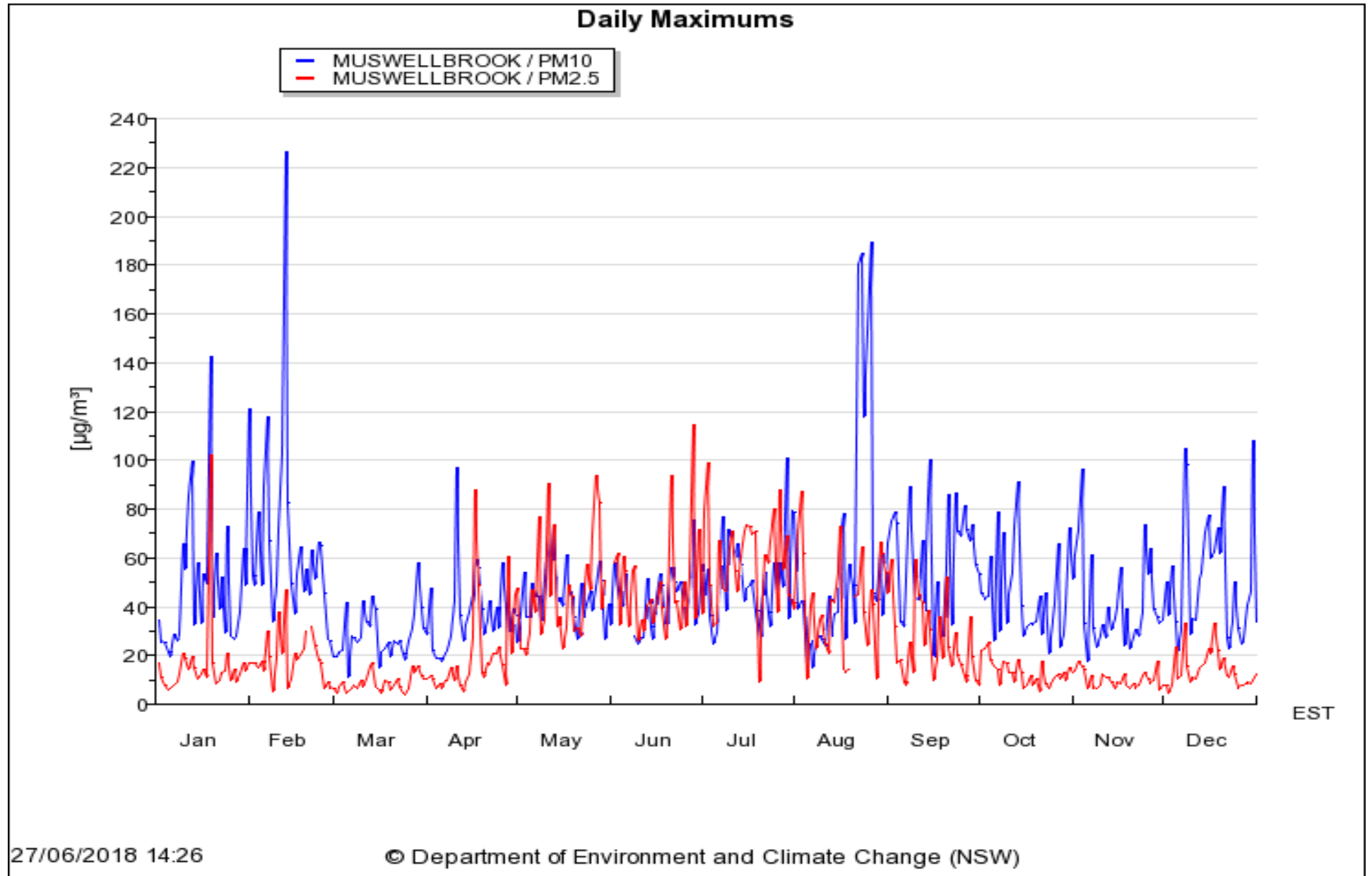


FIGURE A-6 NSW OEH MUSWELLBROOK AAQMS PM<sub>10</sub> & PM<sub>2.5</sub> ANNUAL AVERAGES, 2016 & 2017

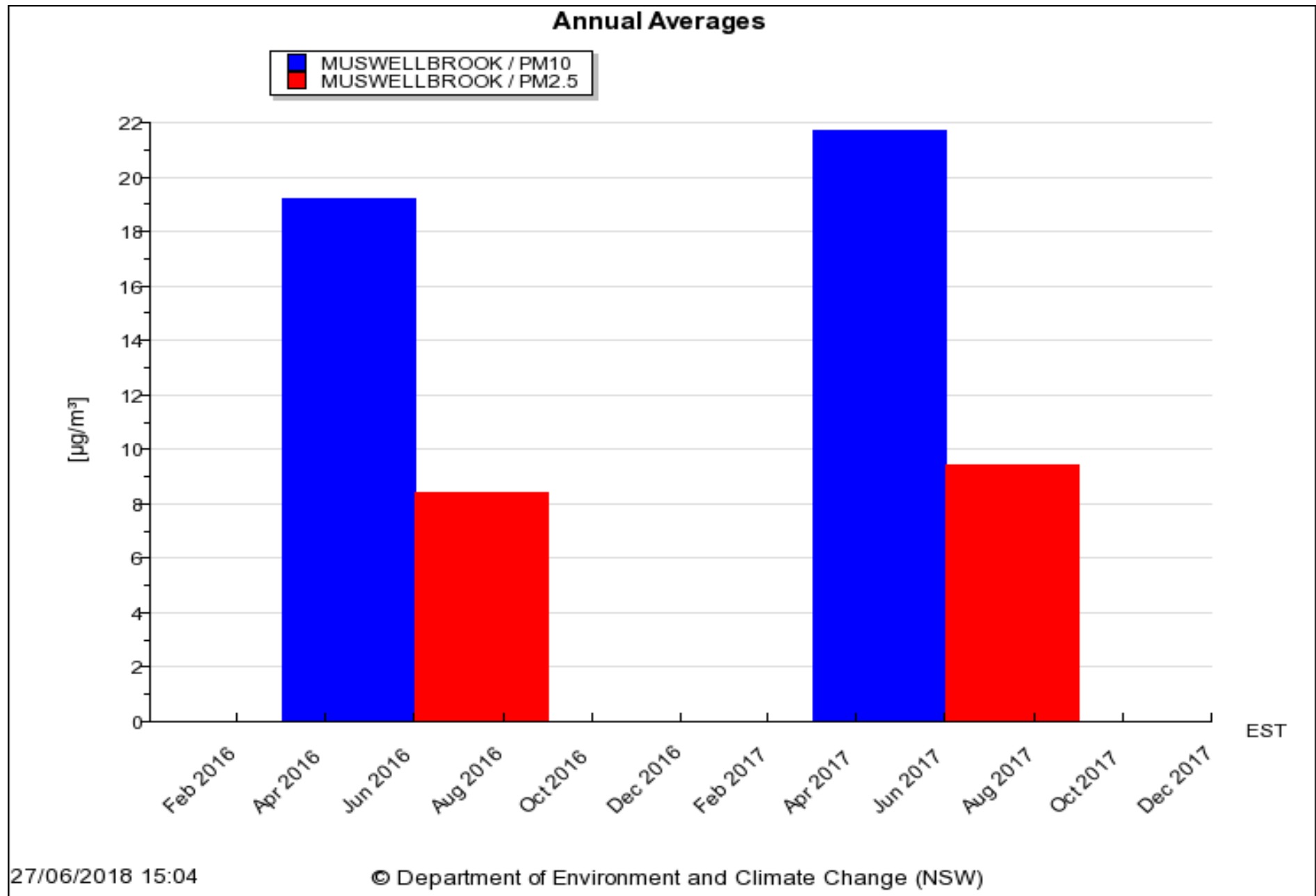


FIGURE A-7 NSW OEH MUSWELLBROOK AAQMS PM<sub>10</sub> & PM<sub>2.5</sub> MONTHLY MAXIMA, 2016

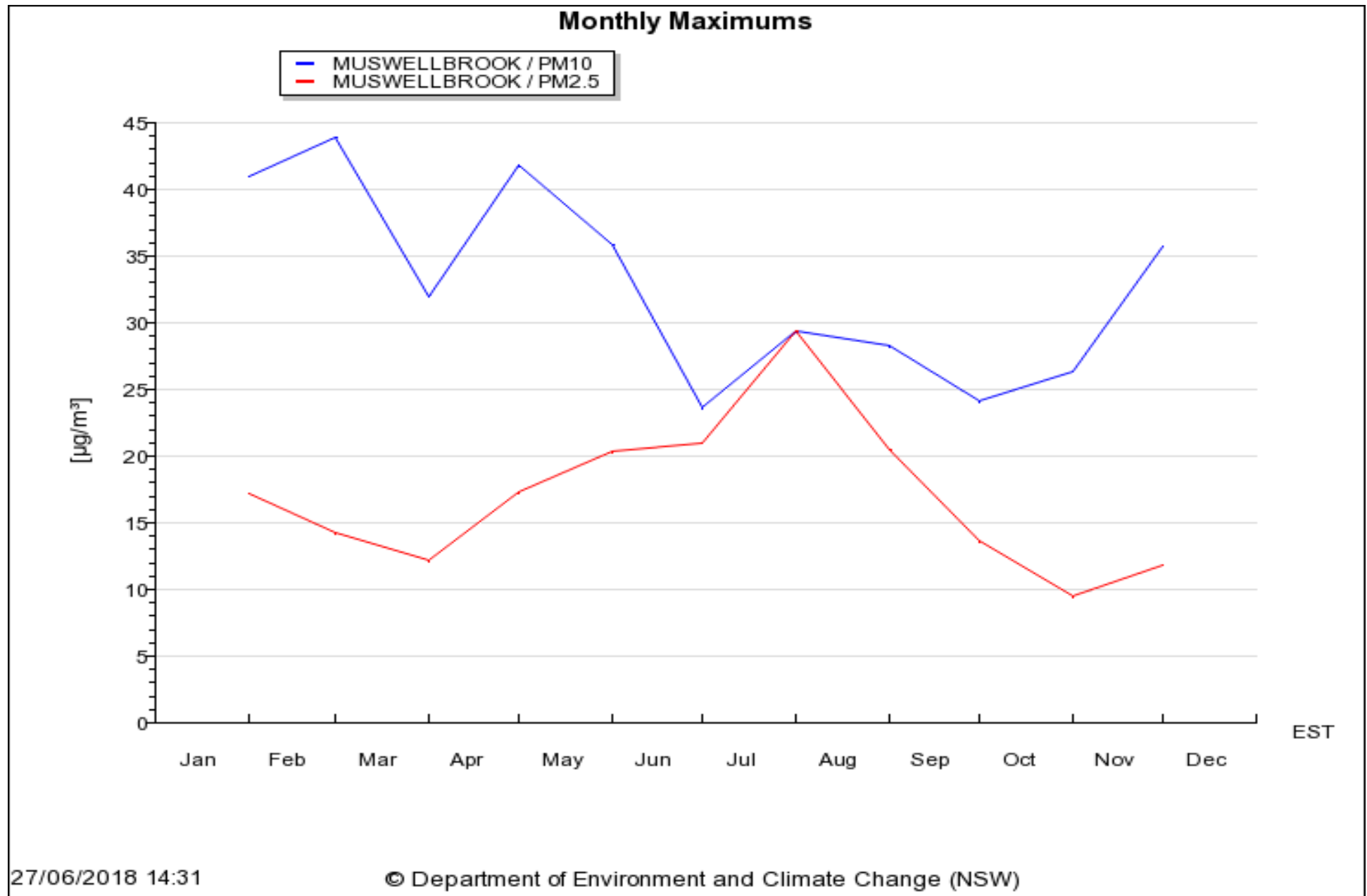
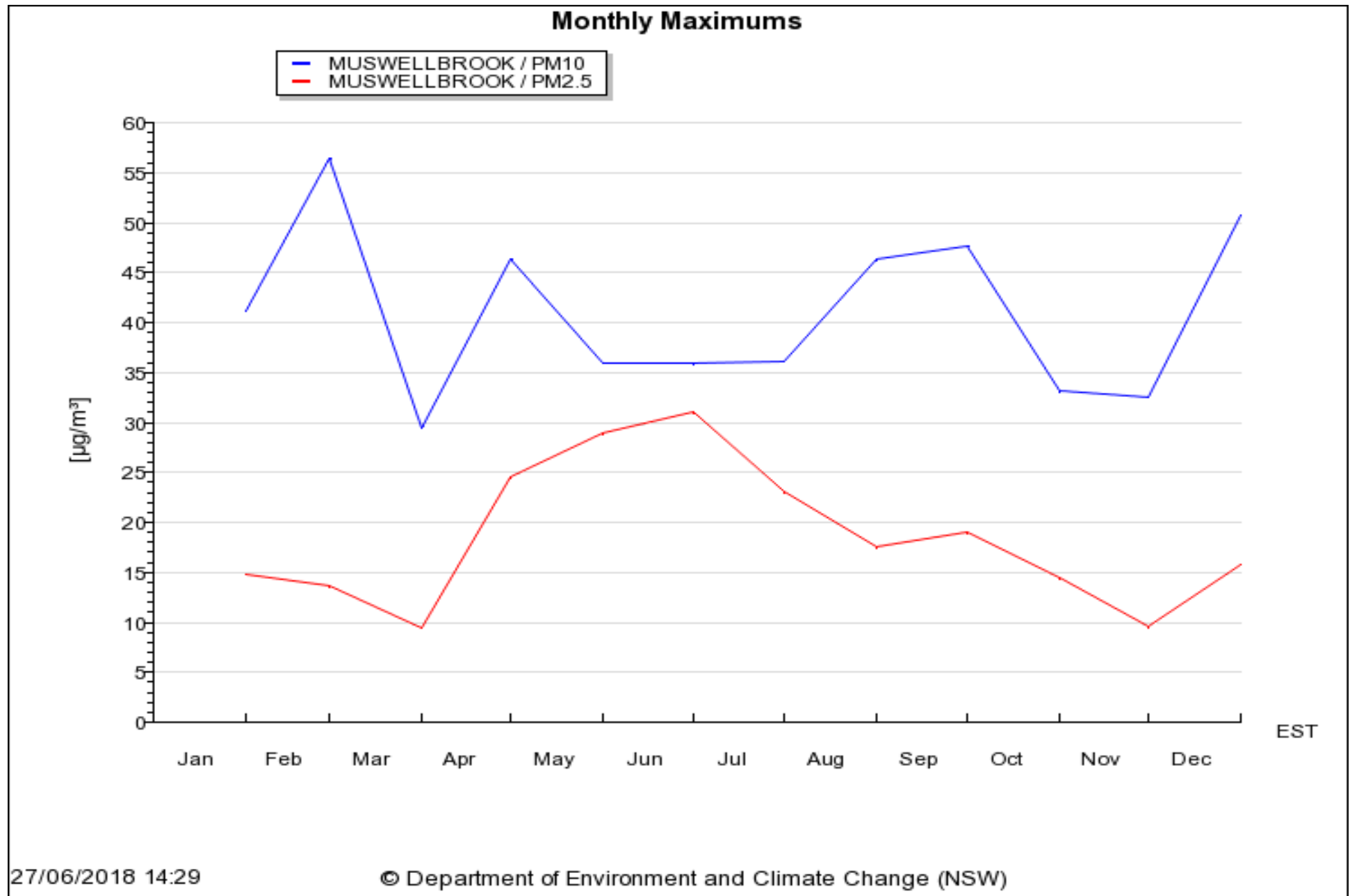




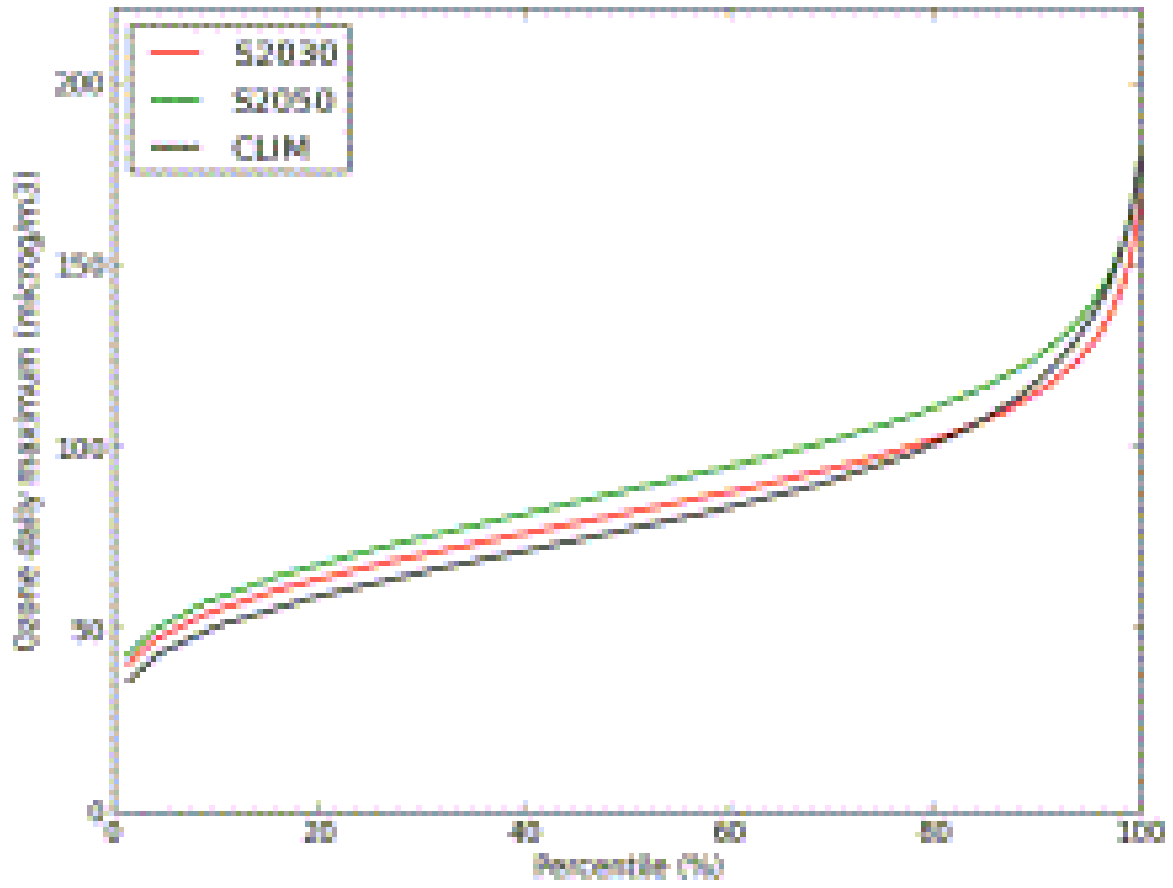
FIGURE A-8 NSW OEH MUSWELLBROOK AAQMS PM<sub>10</sub> & PM<sub>2.5</sub> MONTHLY MAXIMA, 2017



---

## **APPENDIX B – OZONE PREDICTIONS 2030 - 2050**

FIGURE B-1 OZONE PREDICTIONS 2030-2050



Source: Lacressonnaire, G. Atmos Env 92: August 2014

---

**APPENDIX C – CURRICULUM VITAE – PETER W STEPHENSON**

## PETER WILLIAM STEPHENSON

### PRINCIPAL CONSULTANT / MANAGING DIRECTOR / LECTURER & VISITING EXAMINER/ EXPERT WITNESS

M.App.Sc., (Chemical Engineering & Industrial Chemistry), UNSW

Dip.App.Sc., (Biochemistry & Organic Chemistry), Swinburne Institute of Technology.

Environmental Impact Assessment Certificate, Sydney University

### DISTINGUISHING QUALITIES

- Environmental management, mitigation and control
- Air quality and odour testing and management
- Air quality and odour impact assessment
- Odour and flavour chemistry
- Industrial and environmental noise
- Expert Witness

### PROFESSIONAL APPOINTMENTS

Industry Representative, NSW Load Based Licensing Technical Review Panel (2000-2006)

Consultant to Oil companies and Australian Taxation Office (ATO) (1986 to 1998) to develop the Vapour Recovery algorithm which was used to determine tax rebates for recovered petroleum vapours that previously had duty paid.

Appointed to Commonwealth NGO National Environment Protection Measures Consultative Group

Appointed to UNSW Institute of Environmental Studies Advisory Committee

Associate Fellow, Australian Institute of Management

National President (2002 to present), Air Pollution Control Equipment Manufacturers Association (APCEMA)

Foundation Member, CH19/1 Subcommittee of Standards Association of Australia - Preparation of Stationary Source Emission Standards AS 4323.1, AS 4323.2 and AS 4323.3 - odour - Dynamic Olfactometry.

Committee Member (NSW Branch) and member of Clean Air Society of Australia and New Zealand (CASANZ)

Foundation Member (1982) & Federal Secretary (1989-1997) Training Activities Committee CAZANZ

Member, Air & Waste Management Association - formerly known as Air Pollution Control Association (USA)

Member, Health Safety & Environment Committee (1979-1991) Chamber of Manufactures of NSW

Member, Environmental Working Group, Australian Industry Group (1988 to present)

---

## UNIVERSITY APPOINTMENTS

UTS Faculty of Design, Architecture & Building - Lecturer Environmental Management and Indoor Air Quality in the Built Environment.

UWS Faculty of Engineering - Lecturer

Macquarie University - Examiner - Graduate School of the Environment, 1993-1994

## PUBLICATIONS, PRESENTATIONS AND PAPERS

### AIR POLLUTION CONTROL EQUIPMENT MANUFACTURERS ASSOCIATION (APCEMA)

Lecturer: Topics include Air Quality; Dust & Fume Control; Odour Measurement & Control; Indoor Air Quality & Emission Measurement Instrumentation. 1990 to present. Approx 40 x 2-day seminars in Australia, NZ, Malaysia and Indonesia.

### AUSTRALIAN SUSTAINABLE BUSINESS NETWORK (ASBN)

Lecturer, Facilitator: Odour & Emissions Management, Annual workshops 1999-2016

### AUSTRALIAN INDUSTRY GROUP

Lecturer & Facilitator: Odour Management Workshops - 10 workshops 1995- 2011

### ENVIRO 04 CONFERENCE

Ambient Air Odour Measurement for Air Quality Testing 2004, Sydney

### AUSTRALIAN INDUSTRY GROUP

Presenter: NSW Environmental Legislative Updates - 2004, 2005 and 2006

### AIR QUALITY ISSUES AND ALUMINA ISSUES

Albany International, Gladstone 2003, 2005, Port Kembla 2004, Gosford 2006, Karratha 2008 & 2010

### ODOUR MANAGEMENT FOR RETAIL FOOD BUSINESS

NSW DEC, South Sydney Regional Organisation of Councils, Sydney, 2004

### ODOUR MEASUREMENT and CHEMISTRY OF ODOUR NEUTRALISING AGENTS

Industrial Odour Control Course, CASANZ Sydney, 1992

### SAMPLING & CONTROL - AIRBORNE PARTICLE EMISSIONS FROM BAGASSE FIRED BOILERS

Air Pollution Control Equipment Sdn & PT ERA Rasada, Indonesia, 1992

### ASBESTOS IN PUBLIC BUILDINGS - INDOOR AIR POLLUTION & HEALTH WORKSHOP

University of Sydney, 1990

### CASE STUDY - ODOUR CONTROL - CHICKEN OFFAL RENDERING INDUSTRY

Air Pollution Control - presented to NSW State Pollution Control Commission, 1990

## **STEPHENSON ENVIRONMENTAL MANAGEMENT AUSTRALIA (SEMA)**

Managing Director and Principal Consultant - 1983 – Present.

Stephenson Environmental Management Australia (SEMA) & Odour Research Laboratories Australia (ORLA) consult to industry, local, state and federal government utilities with independent advice in monitoring, analysis and control of:

- Emissions to atmosphere (NATA accredited) - stack, ambient, air toxics and odour
  - Odour measurement to AS4323.3 and AS4323.4 (NATA accredited olfactometry laboratory)
  - Odour impact assessment and management
  - Airborne occupational health contaminants (workplace)
  - Atmospheric dispersion modelling
  - Indoor air quality
  - Industrial and environmental noise
  - Environmental impact assessment
  - Environmental audits

## **SELECTION OF SEMA CONSULTANCY WORK**

### **WASTE MINES GAS POWER STATIONS**

Emissions monitoring and management at Glennies Creek, Teralba, Tahmoor in NSW and Oaky Creek (Glencore/Xstrata) and Daandine (Arrow Energy/Clarke Energy) in Central Queensland Bowen Basin.

### **UNDERGROUND COAL MINES, COAL PROCESSING AND ASSOCIATED VENTILATION EMISSIONS MONITORING**

Appin, Tower (BHP Billiton), Blakefield South, Bulga Underground (Glencore/Xstrata) coal mines, Illawarra Coal & Coke (Corrimal & Coalcliff)

### **COAL FIRED POWER STATIONS**

Emissions monitoring at NSW Power Stations (Bayswater, Liddell, Vales Point, Eraring, Mt. Piper, Wallerawang) and Callide C in Queensland.

### **LANDFILL and SEWERAGE DIGESTOR GASES as FUEL for WASTE GAS POWER STATIONS**

Various sites in NSW

### **VAPOUR RECOVERY UNITS & VAPOUR EMISSION CONTROL SYSTEMS (VECS)**

Emissions collection efficiency and recovered liquid product for Australian east coast fuel terminals including BP, Caltex, Esso, Vopak, Mobil, Shell, SMP and VIVA Energy

### **THERMAL OXIDISERS COMBUSTION CONTROL SYSTEMS**

Shell Bitumen & printing companies - IPMG, Hannanprint, Offset Alpine and Fairfax

---

**SOUTH AUSTRALIA EPA**

Development of Air Sampling and Analysis Methods Manual

**CROSS CITY TUNNEL NSW DEPARTMENT of PLANNING**

Auditor for airborne emissions

**EMISSIONS TO AIR INVENTORY**

Emissions inventory of air discharged from Sydney Kingsford Smith Airport. Prepared inventory for inclusion in FAC Air Quality Management Plan

**THIRD RUNWAY AIR QUALITY IMPACT STUDY & AIR QUALITY MONITORING**

Sydney Kingsford Smith Airport – AQIS prepared for Kinhill Engineers on behalf of FAC and AQM over 3 years for Baulderstone during construction.

**NORTH WEST TRANSPORT OPTIONS & STUDY (F2)**

Air quality EIS for NSW RTA - Member F2 East Maunsell study team; Member F2 West Manidis Roberts /SMEC study team.

**PARK STREET (CROSS CITY) TUNNEL**

Air quality EIS for NSW Department of Main Roads. Member Wargon Chapman & Partners and Manidis Roberts study team. (1990)

**SYDNEY HARBOUR TUNNEL**

Portal and discharge stack dispersion studies plus on-going consultation to Sydney Harbour Tunnel Co. re airborne emissions and emission dispersion (1986 - 1993)

**SYDNEY HARBOUR TUNNEL**

Air quality EIS for NSW DMR. Member Cameron McNamara EIS study team. (1986)

**BENNELONG POINT SYDNEY OPERA HOUSE CAR PARK**

Air quality EIS and general consulting to NSW Department of Public Works re odour, dusts and airborne emissions

**EASTERN DISTRIBUTOR, SYDNEY**

Air quality EIS and working paper for Eastern Distributor NSW DMR. The air quality component of Jackson, Teece, Chesterman, Willis study team.

**EASTWOOD COUNTY ROAD SCHEME**

Air quality EIS for Eastwood Country Road Scheme NSW DMR. Member Cameron McNamara/Travers Morgan study team

**NSW PUBLIC WORKS DEPARTMENT, NSW LOCAL GOVERNMENT COUNCILS (Wyang, Gosford, Great Lakes), SYDNEY WATER, MELBOURNE WATER**

Air quality studies and odour control related to trunk sewer systems.



---

**STACK, AMBIENT, AIR TOXICS & ODOUR FOR FOLLOWING:**

AGL  
Alcoa  
Arrow Energy  
Alstom Power  
Austral Bricks  
Australian Bulk Minerals  
Australian Refined Alloys  
Boeing  
Bonds Australia  
Boral  
Borg  
BP  
Bridgestone TG  
Caltex Refineries  
Capral  
Clarke-Energy  
Cleanaway  
Colgate  
CSR  
DIC Graphics  
DSITIA  
Dunlop  
EDL  
Elf Farm  
Esso  
Glencore Xstrata  
Leighton Contractors, Cross City Tunnel  
Macquarie Generation  
Mobil  
Nationwide Oils  
O-I Australia  
Orica  
Qenos  
PPG Australia  
Renewed Metals Technologies  
Shell Refining  
Shoalhaven Starches  
SMP  
Tooheys LionCo  
Veolia  
VIVA Energy  
Vopak  
Woodside

# Mount Pleasant Mine Operation Modification 3 —Strategic Review of Aboriginal Heritage —Secretary’s Environmental Assessment Report

---

## 1.0 Introduction

GML Heritage has been commissioned to prepare a high-level review of cultural heritage matters relating to the Mount Pleasant coal mine project. This short report is focussed on Aboriginal heritage.

The project proponent for the Mount Pleasant Coal Project is MACH Energy Australia Pty Ltd (MACH). The consent authority is the Independent Planning Commission of NSW.

Development Consent (DA92/97) for the project was granted by the Minister for Urban Affairs and Planning on 22 December 1999. The original DA consent has since been modified on several occasions. Modification 1 on 19 September 2011 amended the mine infrastructure layout and to permit an alternative coal transportation corridor to be constructed. On 29 March 2017 DA92/97 was modified again (Modification 2) to permit the relocation of the South Pit Haul Road. On 31 May 2017 MACH lodged Modification 3 to extend the operational life of the Mount Pleasant coal project. Modification 3 seeks to extend the coal mining activities by an additional 6 years to 22 December 2026. The Modification also includes an extension the Eastern Out of Pit Emplacement Area (OEA) by around 67 hectares. The Mount Pleasant Rail loop and associated infrastructure will be removed and the mine workforce will be increased from 250 to 350 staff.

On 22 September 2017 MACH lodged Modification 4 for the relocation of a rail infrastructure corridor.

This strategic review has been prepared with reference to the *Secretary’s Environmental Assessment Report 2 June 2018* prepared by the Department of Planning and Environment, and the *Mount Pleasant Operation-Mine Optimisation Modification Environmental Assessment*, MACH Energy 31 May 2017.

It is noted that the Secretary’s Environmental Assessment Report has concluded its assessment of the Modification 3 and considers it is approvable. In considering the objects of the EP&A Act, the Secretary’s report states against Object 1.3(a) that the ‘proposed modification has been designed to minimise potential environmental and heritage impacts where practicable’.<sup>1</sup> Object 1.3(f) is required to consider ‘the sustainable management of built and cultural heritage (including Aboriginal heritage)’. Consideration of this object stated ‘the Department believes that the proposed modification has been designed to minimise potential environmental and heritage impacts where practicable, including on threatened biodiversity and Aboriginal cultural heritage items’.<sup>2</sup>

## 2.0 Aboriginal Heritage

Aboriginal heritage is addressed in Table 2 in section 5.6 ‘other impacts’<sup>3</sup>. In the consideration of impact on Aboriginal heritage it is noted that

- 74 known Aboriginal sites will be subject to direct impact through this modification (Figure 22, reproduced below);
- citing communicating with the OEH, that existing Aboriginal heritage approvals provide the ability to ‘harm’ these sites;
- the sites do not hold ‘high archaeological’ cultural value, but all Aboriginal heritage material is culturally significant to Aboriginal communities; and

---

<sup>1</sup> *Secretary’s Environmental Assessment Report, Mount Pleasant Coal Mine-Modification 3*, 8 June 2018, p 7.

<sup>2</sup> *Ibid*, pp 7-8.

<sup>3</sup> *Ibid*, p25.

- relevant Aboriginal heritage strategies, plans and programs need to be updated to reflect the proposed changes, should Modification 3 be approved.

The (2017 Section 4.7.1) EIA details that a significant quantity of Aboriginal archaeological work has been undertaken through two Aboriginal Heritage Impact Permits (AHIPs), issued under Section 90 of the *National Parks and Wildlife Act 1977*. The various reports cited were not available as part of the EIA and have not been sighted or reviewed. The methods and means of identifying Aboriginal heritage values is not provided. It is noted that mapping of Aboriginal heritage focuses on physical sites; there is no discussion of intangible sites or social values.

The nature (type) of Aboriginal sites located within the Modification 3 area is unknown, and not available for review. As such, it is uncertain whether Aboriginal sites which contain physical evidence beyond stone artefact will be impacted by this modification. However, this point is nullified giving regard to the statutory approval to harm all Aboriginal objects under AHIP #C0002053.

A requirement of the mine approval was the preparation of an Aboriginal Cultural Heritage Management Plan. This plan was prepared by RTCA between 2007 and 2014; the final version 6 August 2014 has been reviewed. The plan provides a range of measures and controls for various types of Aboriginal heritage. The management described is detailed and, if implemented, should provide adequate impacts and mechanism for offsetting impacts to Aboriginal cultural heritage.

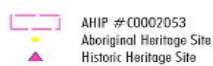
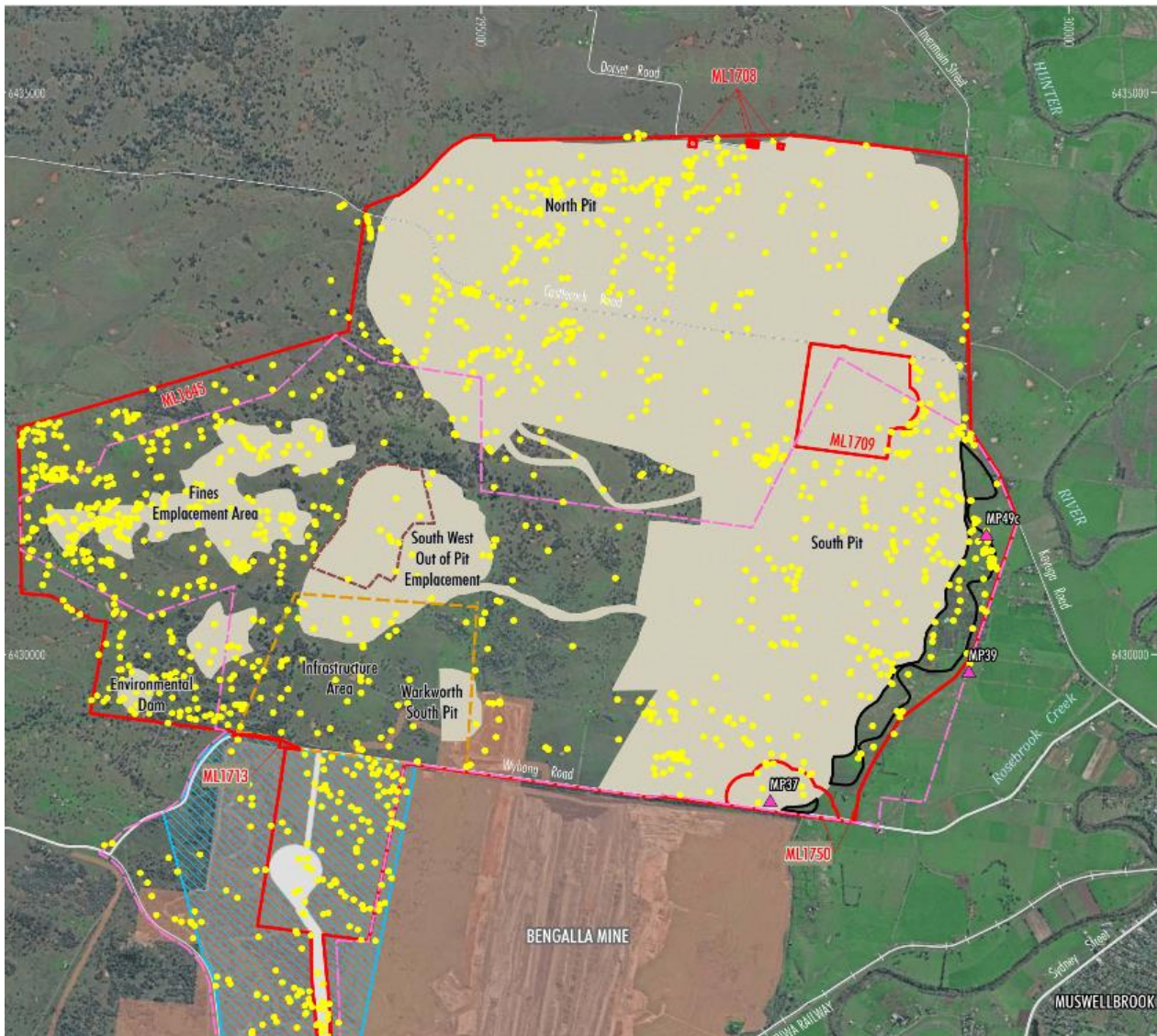
In the context of recent large land use decisions relating to Aboriginal heritage in the Hunter Valley, two matters can be considered relevant:

- Whether the process of Aboriginal heritage assessment has considered the range of social values present across the Valley; and
- Whether an assessment of cumulative impact to Aboriginal heritage is being considered.

Whilst neither of these matters can be reviewed due to an absence of relevant reporting documents, the issue of an AHIP by the OEHL for the mine, indicates the OEHL considers the assessment values process was adequate.

However, it is considered that cumulative impact to Aboriginal heritage in the Hunter Valley (as a consequence of all mining operations) is not a matter which is being given sufficient consideration by mining proponents, consultants or State government. The modification represents a further holistic impact to Aboriginal heritage, one which is not being adequately considered by the Department of Planning and Environment, with respect to Object 1.3(f) of the EP&A Act.

A whole of Country approach would probably demonstrate the extent of existing mining has now removed considerable quantities; however, this would not be commissioned by a single mining entity, is beyond the feasible scope of work for a consultant preparing a heritage report, and does not appear to be a priority of State government.



Notes: \* Excludes some project components such as water management infrastructure, infrastructure within the Infrastructure Area Envelope, offsite coal transport infrastructure, road diversions, access tracks, topsoil stockpiles, power supply, temporary offices, other ancillary works and construction disturbances.

\* Relinquishment excludes more flexible and relatively minor infrastructure such as light vehicle roads, disturbance associated with monitoring, water management structures and other ancillary infrastructure.

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); Department of Planning and Environment (2016); MACH Energy (2017)  
Orthophoto: MACH Energy (Aug 2016)

**MACHEnergy**  
MOUNT PLEASANT OPERATION  
Relevant Aboriginal and Historic Heritage Sites

**Figure 22**

### 3.0 Discussion and Conclusion

- A additional 74 known Aboriginal sites will be subject to direct impact through this modification.
- This impact is approved by the OEH under AHIP #C0002053, with management delivered under the Aboriginal Cultural Heritage Management Plan.
- In the Secretary’s Environmental Assessment of Aboriginal Heritage pre-existing assessments and technical reports prepared by the proponent and its consultants have relied upon in considering the proposed modification.

- The impacts on the Aboriginal cultural landscape and cumulative impact to Aboriginal heritage across the region has not been considered in the assessment of this Modification. Aboriginal heritage considered only tangible sites.
- The statement in the SEAR that 'MACH acknowledged that all Aboriginal heritage material is culturally significant'<sup>4</sup> can be considered flippant in the context of the Aboriginal heritage assessment and management process, and notably the definitions under the ICOMOS Burra Charter, connecting intangible and tangible heritage (Article 1). Tangible value has been ascribed precedence over intangible value, and the context and setting of this place is ignored by the assessment and SEAR.
- The assessment by the department with respect to the rehabilitation and final landform<sup>5</sup> states 'the proposed final landform would result in a landform with improved structural stability and visual amenity. The improved final landform would positively address concerns over cumulative impact on visual amenity in the Upper Hunter. With respect to the regional Aboriginal cultural landscape, its aesthetic and visual qualities, this statement is disingenuous. The changed final landform will hold no Aboriginal cultural value, no Aboriginal cultural sites and/or places, and it will further add to the cumulative impact to Aboriginal heritage and changes to the unmined remnant Aboriginal cultural landscape. The impacts arising from cumulative impact, mining, and rehabilitation on the region's Aboriginal cultural heritage are not considered or addressed in the SEAR.
- The conclusion in the Secretary's assessment report that Modification 3 'has been designed to minimise potential environmental and heritage impacts where practicable' is not supported by the direct and irreversible impacts, approved under AHIP #C0002092. The assessment that Aboriginal heritage 'would be satisfactorily managed under existing conditions of consent, the AHMP and AHIP' demonstrates an assumption by the SEAR that Aboriginal heritage is only associated with physical archaeological sites, and that the Hunter Valley contains no Aboriginal cultural landscape or intangible values.

---

<sup>4</sup> Ibid, p25.

<sup>5</sup> Ibid, pp21-24

# Mount Pleasant Mine Operation Modification 3

## —Strategic Review of Historic Heritage

## —Secretary’s Environmental Assessment Report

---

**Sydney Office**  
Level 6  
372 Elizabeth Street  
SURRY HILLS NSW Australia 2010  
T +61 2 9319 4811  
E heritage@gml.com.au

**Canberra Office**  
2A Mugga Way  
RED HILL ACT Australia 2603  
T +61 2 6273 7540  
E heritage@gml.com.au

**GML Heritage Pty Ltd**  
ABN 60 001 179 362

### 1.0 Introduction

GML Heritage has been commissioned to prepare a high-level review of cultural heritage matters relating to the Secretary’s Environmental Assessment of Modification 3 for the Mount Pleasant coal project. This short report is focussed on historic heritage. The project proponent for the Mount Pleasant coal project is MACH Energy Australia Pty Ltd (MACH). The consent authority is the Independent Planning Commission of NSW.

Development Consent (DA92/97) for the project was granted by the Minister for Urban Affairs and Planning on 22 December 1999. The original DA consent has since been modified on several occasions. Modification 1 on 19 September 2011 amended the mine infrastructure layout and to permit an alternative coal transportation corridor to be constructed. On 29 March 2017 DA92/97 was modified again (Modification 2) to permit the relocation of the South Pit Haul Road. On 31 May 2017 MACH lodged Modification 3 to extend the operational life of the Mount Pleasant coal project. Modification 3 seeks to extend the coal mining activities by an additional 6 years to 22 December 2026. The Modification also includes an extension the Eastern Out of Pit Emplacement Area (OEA) by around 67 hectares. The Mount Pleasant Rail loop and associated infrastructure will be removed and the mine workforce will be increased from 250 to 350 staff.

On 22 September 2017 MACH lodged Modification 4 for the relocation of a rail infrastructure corridor.

This strategic review has been prepared with reference to the *Secretary’s Environmental Assessment Report 2 June 2018* prepared by the Department of Planning and Environment and the *Mount Pleasant Operation-Mine Optimisation Modification Environmental Assessment*, MACH Energy 31 May 2017.

It is noted that the Secretary’s Environmental Assessment Report has concluded its assessment of the Modification 3 and considers it is approvable. Regarding historic heritage the Secretary’s report concludes that the ‘proposed modification has been designed to minimise potential environmental and heritage impacts where practicable’.<sup>1</sup>

---

<sup>1</sup> Secretary’s Environmental Assessment Report, Mount Pleasant Coal Mine-Modification 3, 8 June 2018, pp 7-8.

## 2.0 Historic Heritage

Historic heritage is addressed in Table 2 in section 5.6 'other impacts'. In the consideration of impact on historic heritage it is noted that 'the historic heritage survey did not identify any historic heritage items located within the Eastern OEA extension. MACH is not proposing to disturb any additional historic heritage items, not already permitted to be disturbed'.<sup>2</sup> It is further noted that the proposed modification will not affect any items listed on the State Heritage Register. The Report recommends that MACH will be required to revise and update relevant strategies, plans and programs to reflect Modification 3.

The Environmental Assessment for the Mount Pleasant Modification 3 focuses on historic heritage in section 4.7 Heritage. It is noted that a heritage study was undertaken by Veritas Archaeology and History Service in 2014. That study identified 55 historic heritage sites within DA 92/97 area and on land immediately adjacent to the project boundary.<sup>3</sup> None of the heritage sites identified within the DA92/94 boundary are listed on the *Muswellbrook Local Environmental Plan 2009* (LEP), however, several sites outside the DA boundary are listed as heritage items on Schedule 5 of the LEP. There are three heritage sites adjacent to or within the Emplacement Extension, as circled in dashed black and shown on Figure 22 of the Environmental Assessment (see below), including:

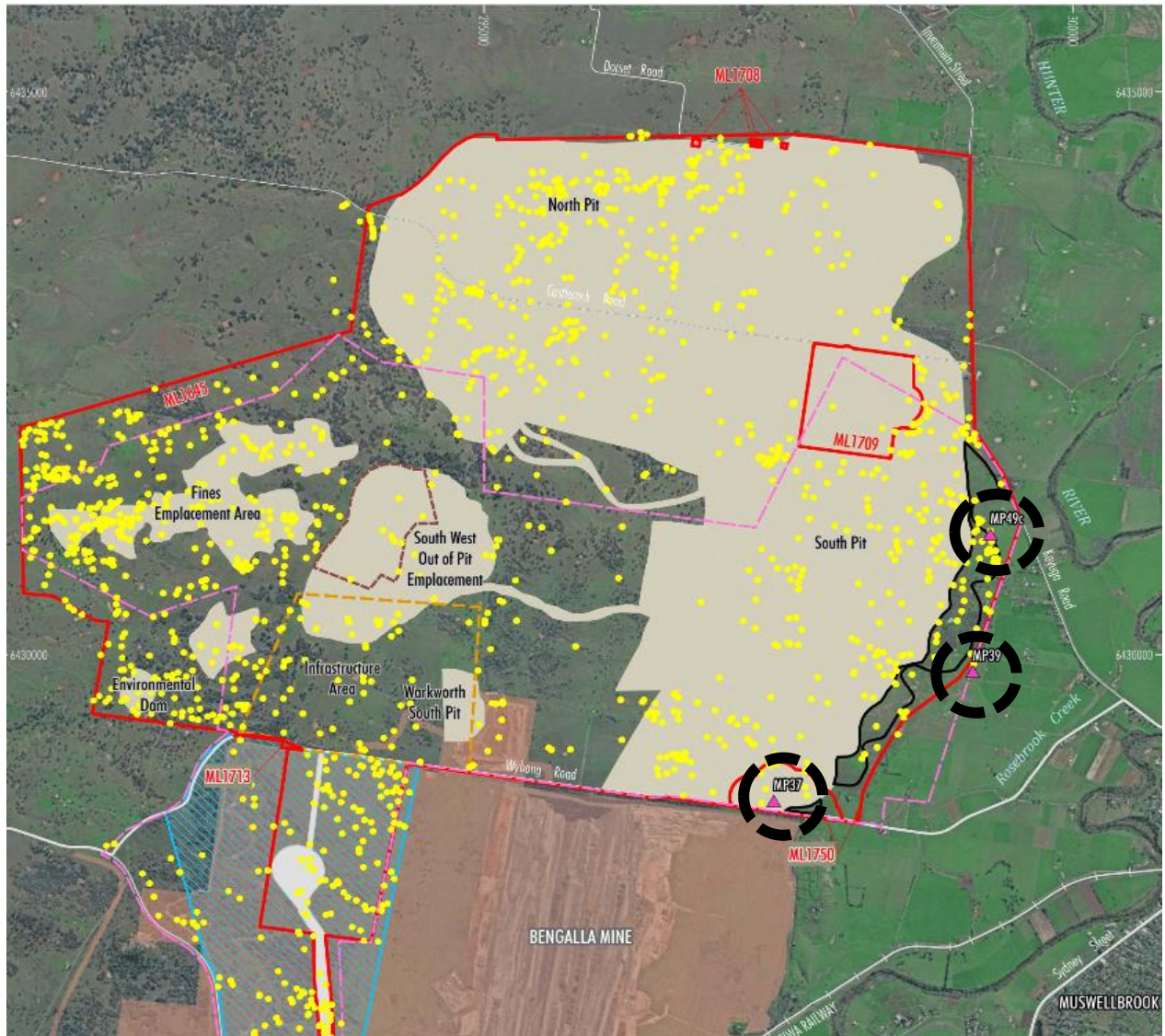
- MP49c former (potential) dairy site with some scattered surface remains;
- MP39; 'Rosebrook Quarry, a former sandstone quarry. Is assessed as having High local heritage significance as it illustrates technical achievement in the quarrying of building stone and includes evidence of a process that has since been discontinued; and
- MP37 'Berrywood Homestead' a 20<sup>th</sup> century homestead with outbuildings). Assessed as being High local significance as it is associated with a significant activity and historical phase.

The Environmental Assessment states that MP49c is approximately 10 metres away from the Emplacement Extension. Both MP37 Berrywood Homestead and MP49c, the former potential dairy will be disturbed by the approved open cut mining activity and associated infrastructure. MP39, the former quarry may be subjected to indirect impacts due to mining activity. Management of the heritage sites will be subject to the measures and requirements in the historic heritage management strategy.

---

<sup>2</sup> Ibid, p 25.

<sup>3</sup> MACH Energy Mount Pleasant Operation, Mine Optimisation Modification, Environmental Assessment, 31 May 2017, p



**LEGEND**

	Mining Lease Boundary
	Infrastructure Area Envelope
	Indicative Offsite Coal Transport Infrastructure
	Approximate Extent of Approved Surface Development (1997 EIS Year 20)*
	Emplacement Extension
	Area Relinquished for Overburden Emplacement and Major Infrastructure <sup>o</sup>
	Conveyor/Services Corridor Envelope
	Bengalla Mine Approved Disturbance Boundary (SSD-5170)

	AHIP #C0002053
	Aboriginal Heritage Site
	Historic Heritage Site

Notes: \* Excludes some project components such as water management infrastructure, infrastructure within the Infrastructure Area Envelope, offsite coal transport infrastructure, road diversions, access tracks, topsoil stockpiles, power supply, temporary offices, other ancillary works and construction disturbance.  
<sup>o</sup> Relinquishment excludes more flexible and relatively minor infrastructure such as light vehicle roads, disturbance associated with monitoring, water management structures and other ancillary infrastructure.

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); Department of Planning and Environment (2016); MACH Energy (2017)  
 Orthophoto: MACH Energy (Aug 2016)

**MACH Energy**  
 MOUNT PLEASANT OPERATION  
 Relevant Aboriginal and Historic Heritage Sites

Figure 22

### 3.0 Discussion and Conclusion

- Three heritage sites identified in the 2014 will be directly and indirectly affected by the Emplacement Extension.
- Both MP37 Berrywood Homestead and MP49c, the former potential dairy, were already approved for disturbance as part of DA92/97 for approved open cut mining activity and associated infrastructure.



- MP39, the former quarry may be subject to indirect impacts due to mining activity.
- In the Secretary's Environmental Assessment of Historic Heritage pre-existing assessments and technical reports prepared by the proponent and its consultants have been relied upon in considering the Modification 3.
- The 2014 Heritage Study commissioned for the coal project includes historical primary sources for each of the identified heritage sites. The significance assessments under the State Heritage criteria for each of the 55 sites identified in the Heritage Study are cursory. Notwithstanding that, what is demonstrated by the primary evidence, both documentary and physical, represents a significant pattern and system of local land uses and rural pastoral activities, infrastructure and operations across a historical cultural landscape from 1830 to 1970. It is an organically evolved landscape that has evolved over time through patterns of human use in response to the natural environment.
- The direct and indirect impacts on the physical evidence is considered in brief the 2014 Heritage Study on a site by site basis, however, the heritage values and the significance of the complex of 55 heritage sites across the cultural landscape has not been previously considered or assessed. Further it appears that the social/spiritual, scientific, and aesthetic values associated with the 55 heritage sites have not been considered in any detail.
- The impacts on the historic cultural landscape have not been considered in the assessment of Modification 3 as it has not been addressed in previous technical assessments.
- Heritage curtilages to conserve and interpret the heritage significance have not been determined for any of the heritage items that are impacted by Modification 3. As such the impact of the Modification on each item's significance cannot be adequately and comprehensively assessed and determined.
- Under an existing condition of consent the proponent is required to update all relevant plans, strategies and programs to reflect the proposed changes. Article 6 of the ICOMOS Burra Charter, Australia's best practice guide for heritage places, states that 'understanding cultural significance comes first, then policy and finally management'. Management of a heritage place must be based on an understanding of cultural significance. It follows, that unless and until heritage significance is assessed and understood, policy and management cannot be developed.
- The conclusion in the Secretary's assessment report that Modification 3 'has been designed to minimise potential environmental and heritage impacts where practicable' is not supported by the analysis in the technical reports. The assessment and understanding of heritage significance associated with the 3 heritage items is not complete. The historical cultural landscape and heritage curtilages have not been considered.

# MINING REVIEW

**MACH Mt Pleasant Operation MOD3 EA IPC Presentation**

**4 July 2018**

Review conducted by Michael White  
BE Mining (Hons), MBA, GAICD  
Resources Consultant

## There are two Key Issues identified in the MACH MOD3 Environmental Assessment:

1. There is an underestimation in amount of mining equipment required to meet the mine production schedule. The additional equipment required will produce more noise and more dust and is not included in the current noise and air quality monitoring.
2. Changing the operating strategy for the deposition of the coal fines rejects will result in poorer environmental and visual amenity outcomes and in my opinion is inconsistent with the current approval

**Key Issue 1:** Underestimated mining equipment requirements have resulted in underestimated impacts in the noise and dust modelling

**Noise and dust modelling has been conducted in the Environmental Assessment by MACH for three years selected from the Mt Pleasant Production schedule meant to represent worst case scenarios for generation of noise and dust. These are years 2018, 2021 and 2025.**

<b>Year</b>	<b>Waste Rock Volume million bcms</b>	<b>Waste rock Liebherr 996 Excavators</b>	<b>Waste rock Hitachi Ex 3600 Excavators</b>
2018	15.71	2	0
2021	31.28	2	1
2025	28.52	2	2

**Key Issue 1:** Underestimated mining equipment requirements have resulted in underestimated impacts in noise and dust modelling

## 2021 annual production volume achievable vs MOD3 EA production schedule for waste rock

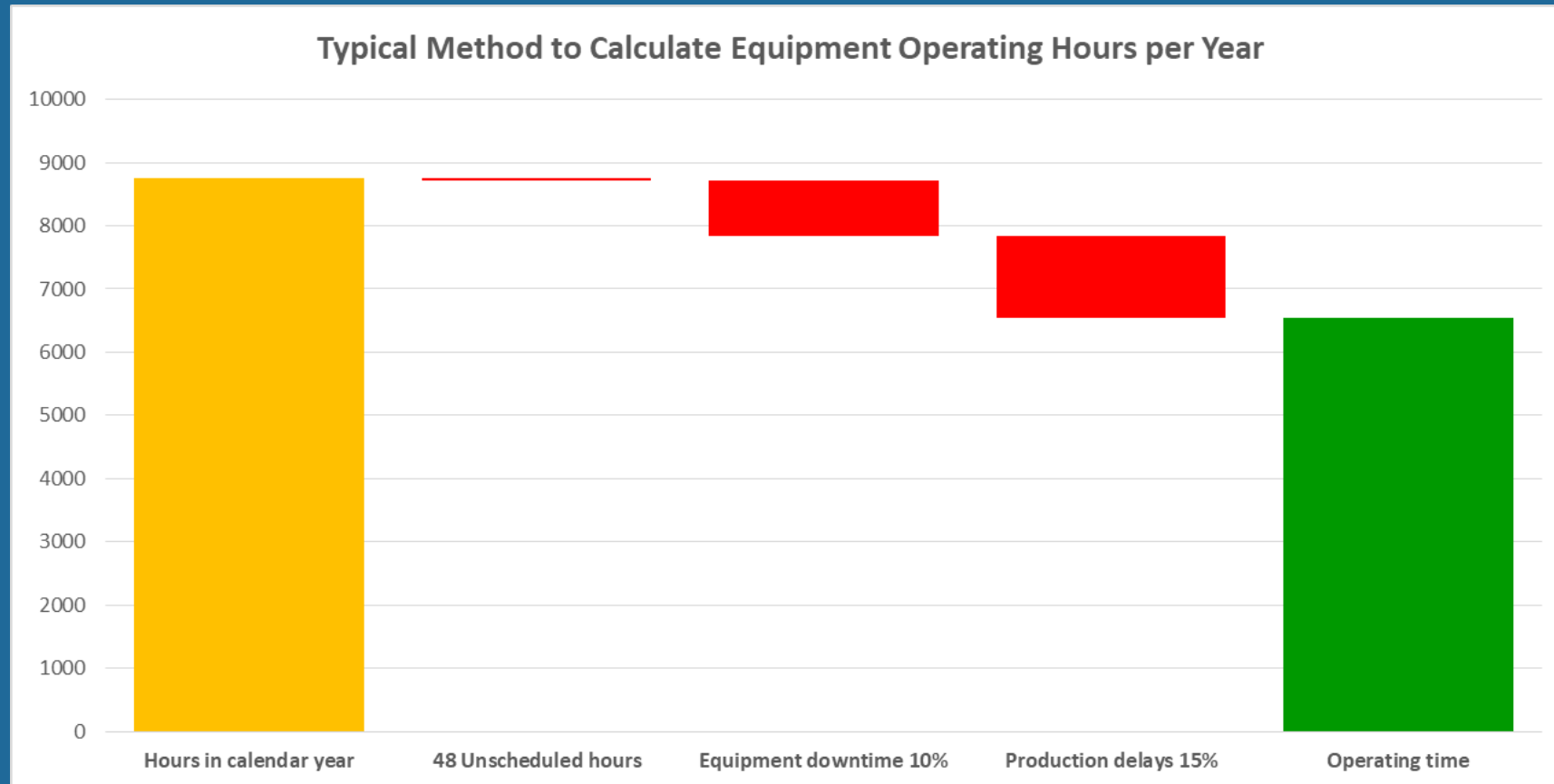
2 x Liebherr 996 Excavators  
1 x Hitachi Ex 3600 Excavator

MACH MOD3 Waste rock schedule Volume for 2021	Likely output range for each 996 excavator	Likely output for 996 fleet (2)	Likely output for Ex 3600 excavator	Likely total waste output achievable for total excavator fleet	Estimated waste volume shortfall in 2021
31.28 million bcms	8-10 million bcms	16-20 million bcms	4-5 million bcms	20-25 million bcms	<b>6-11 million bcms</b>

**Key Issue 1:** Underestimated mining equipment requirements have resulted in underestimated impacts in noise and dust modelling

**Equipment annualised production capacity is calculated as follows:**

- Annual operating time is arrived at after deducting unscheduled time , maintenance delays and production delays from calendar hours
- Annual output = Annual operating time (hrs) X average production rate per hour



**Key Issue 1:** Underestimated mining equipment requirements have resulted in underestimated impacts in noise and dust modelling

## Why Mt Pleasant Mine will not to achieve global benchmark excavator annual production levels:

### **Maintenance downtime challenges at Mt Pleasant**

- Noise attenuation components fitted to mining equipment slows maintenance tasks due to access issues
- Noise attenuation components fitted to mining equipment restrict airflow increasing overheating delays in hot weather

### **Production downtime challenges at Mt Pleasant**

- Delays due to wet weather caused by slippery conditions for trucks in high clay content overburden
- Delays due to fog caused by low visibility
- Delays waiting for dust suppression on roads, and dig and dump locations
- Delays caused by regional high winds and unfavourable wind directions
- Delays caused by forced relocation of equipment in response to environmental conditions

**Key Issue 1:** Underestimated mining equipment requirements have resulted in underestimated impacts in noise and dust modelling

**Why Mt Pleasant Mine will not to achieve global benchmark excavator annual production levels:**

**Production rate (bcm/operating hr) challenges at Mt Pleasant**

- Reduced output due to wet weather caused by slippery conditions for trucks slowing truck cycle times
- Reduce output due to fog slowing truck cycle times
- Waiting on truck delays due to unplanned truck downtime causing insufficient truck numbers for the planned haulage
- Excavator dig set-ups not allowing maximised output due to bench dip angles
- Excavator dig set-ups not allowing maximised output due to bench face heights



**Key Issue 1:** Underestimated mining equipment requirements have resulted in underestimated impacts in noise and dust modelling

**The 2021 shortfall of 6-11 million bcms of waste rock movement has to be recovered by using additional equipment**

**When additional excavators are used to make up the quantity shortfall additional trucks and additional dozer and watercart operating hours will also be required.**

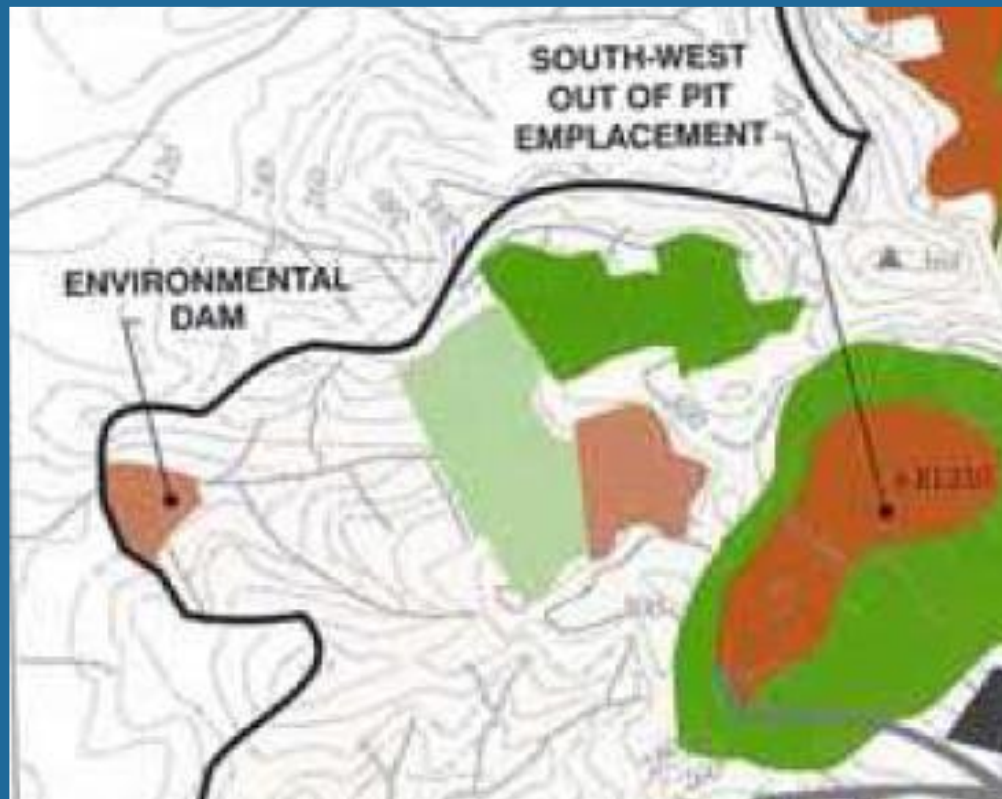
**This additional equipment operating creates additional dust and additional noise. These additional impacts have not been modelled or assessed.**

## Key Issue 2: Significant and Negative Changes to the Fine Rejects Emplacement Operational Management Strategy

<b>Operating strategy as approved in the 1999 DA 92/97</b>	<b>Operating strategy as described in MACH MOD3 EA</b>
<p>Fines rejects are pumped to a series of stepped emplacements. (There are 9 in total)</p>	<p>Construction of one large dam (emplacement area) for all fines rejects during the life of the project</p>
<p>As each emplacement fills another will be placed immediately downstream</p>	<p>An embankment (dam wall) is constructed at the downstream end of the Fines Emplacement Area catchment</p>
<p>The filled emplacement will be allowed to dry out before being covered by a layer of rock, topsoiled and then revegetated</p>	<p>The embankment is progressively raised throughout the life of the Mt Pleasant Operation as additional storage is required</p>
<p>Water from rehabilitated areas in the top of the catchment will then be diverted around the central dam in order to maximise downstream flows of natural run-off</p>	
<p>Progressive development of storages will minimise the extent of catchment disturbed at any one time</p>	
<p>A series of emplacement terraces will be constructed and shaped to blend into the surrounding topography</p>	

## Key Issue 2: Significant Negative Changes to the Fine Rejects Emplacement Operational Management Strategy

### 1997 EIS Year 10 Fines Emplacement Area



### Part of MACH MOD3 EA Figure 12 showing single large Fine Tailings Emplacement Area 2025



## Key Issue 2: Significant and Negative Changes to the Fine Rejects Emplacement Operational Management Strategy

This so-called “contemporary” strategy proposed in MOD3 EA is a retrograde step and is at odds with the current approval.

- It does not maximise natural runoff downstream flows.
- It does not minimise the disturbed area footprint of the Fines Emplacement Area
- It does not have a multiple cell arrangement
- It does not seek to blend in with the surrounding topography. There will be one large embankment much higher than the proposed terrace embankments
- It does not allow for early and progressive rehabilitation
- It does not allow for any rehabilitation to occur in the Fines Emplacement Area until several years after mine closure assuming the rejects have dried out sufficiently to allow for capping

## **Key Issue 2: Significant and Negative Changes to the Fine Rejects Emplacement Operational Management Strategy**

There have been no technical reasons provided in the MOD3 EA as to why the currently approved Operating Strategy cannot be executed.

The reasons for this proposed change in Operating Strategy seem to be solely financial.

The approved Operating Strategy described in the 1997 EIS will require more equipment and ongoing management effort than the MOD3 proposed Operating Strategy.

This should not be viewed as valid justification to approve the adoption of the significantly different and significantly poorer environmental approach to managing the Fines Emplacement Area contained in MACH MOD 3 Environmental Assessment.

## Summary of key issues

1. The noise and dust modelling inputs for mining equipment numbers are understated. This makes the current noise and dust modelling inaccurate and the impacts understated.

The Independent Planning Commission cannot rely upon the current noise and dust modelling results.

2. For the Fines Emplacement Area there is no justification offered to support approval of a significantly different and significantly poorer environmental approach to the operating strategy.



## **Review of the Mt Pleasant Operation MOD3 Mine Optimisation Modification**

**Report prepared for HTBA June 2018**

**Michael White**

*THE AUTHOR*

*Michael White is a Resources Consultant. He holds an honours degree in Mining Engineering and an MBA. He has over 25 years' experience in operational and technical roles working for major mining companies in Australia and internationally. He has 14 years' experience working in the open cut coal industry in New South Wales and Queensland, including eight years in the roles of Operations Manager and General Manager at BHP Mt Arthur Coal.*

## Summary

Two significant issues have been identified in this review of the Mt Pleasant Operation MOD3 Mine Optimisation Modification.

Issue 1 identifies deficiencies in the noise and dust modelling resulting from an underestimation in mining equipment required to meet the mine production schedule.

Issue 2 identifies the proposal to significantly change the operating strategy for the Mt Pleasant Mine Fines Rejects Emplacement Area which will result in poorer environmental and visual amenity outcomes and in my opinion is inconsistent with the current approval.

### Issue 1: Underestimation of site noise and dust generation from mobile equipment fleets.

The number and type of mining equipment operating each shift are basic building blocks that are used as inputs for site noise and air quality modelling.

To achieve the production schedule in MOD3 in 2021 additional mining equipment would be required over and above the equipment numbers used by MACH Energy in the noise and air quality modelling.

This raises serious questions as to validity of the current noise and air quality modelling results and as such the impacts of the MACH MOD3 operation as described on the surrounding community.

Table 4-1 below is an extract from MACH MOD 3 Appendix A – Noise and Blasting Assessment. The excavators used for overburden/waste rock removal in 2021 are circled in red.

**Table 4-1 Indicative Sound Power Levels and Number of Plant Items**

Fleet/ Infrastructure Item	Indicative Model <sup>1</sup>	Location/ Function	Number of Equipment						Sound Power Level L <sub>max</sub> (dBA) On Grade/on Incline
			Year 2018		Year 2021		Year 2025		
			Day	Night	Day	Night	Day	Night	
Haul Trucks	CAT 789	Coal removal	6	6	6	6	6	6	114 / 116
	CAT 789	Reject material removal	1	1	1	1	1	1	114 / 116
	CAT 789	Waste rock removal	-	-	5	5	10	10	114 / 116
	Hitachi EH4500	Waste rock removal	9	9	8	8	8	8	114 / 116
	CAT 793	Topsoil removal	2	-	2	-	-	-	114 / 116
Dozers	CAT 45t articulated	Fine Rejects Emplacement Lift	-	-	3	-	-	-	112
	CAT D10T	Waste rock emplacement	2	2	3	3	4	4	114
	CAT D10T	In pit support	-	2	-	1	1	1	114
	CAT D10T	Topsoil removal	2	-	1	-	-	-	114
	CAT D11T	Infrastructure area	2	2	2	2	2	2	114
Wheeled Dozer	CAT D6	Fine Rejects Emplacement Lift	-	-	1	-	-	-	110
	CAT 854G	In-pit support	1	1	1	2	2	2	112
	CAT 854G	Topsoil emplacement	-	-	1	-	-	-	112
Excavators	Hitachi EX3600	Coal removal	1	1	1	1	1	1	115
	Hitachi EX3600	Waste rock removal	-	-	1	1	2	2	115
	Liebherr 996	Waste rock removal	2	2	2	2	2	2	116
	CAT 336	Topsoil removal	1	-	1	-	-	-	108
Loader	Hitachi ZX850	Fine Rejects Emplacement Lift	-	-	1	-	-	-	111
	CAT 994F	Coal removal	1	1	1	1	1	1	115
Drills	Reedmill SK-F	Waste rock blasting	1	1	1	1	1	1	118
	D75KS-AU	Waste rock blasting	1	1	1	1	1	1	118
	DP1100i	Waste rock blasting	-	-	-	-	1	1	118

The years 2018, 2021 and 2025 were selected by the proponent for both noise and air quality modelling. These are selected as years where the impacts are likely to be greatest due to the locations and scale of mining activity.



The Mine Schedule showing year by year material movement quantities is provided in Table 2 MACH MOD 3 Main Text p.28

**Table 2**  
**Indicative Mine Schedule Incorporating the Modification**

Year	Waste Rock (Mbcm)	ROM Coal (Mtpa)	Product Coal (Mtpa)	Coarse Reject (Mtpa)	Fine Reject (Mtpa)
2017	4.74	0.26	0.20	0.03	0.03
2018	15.71	4.06	2.92	0.51	0.63
2019	23.09	7.54	5.54	0.90	1.11
2020	24.58	10.50	7.70	1.25	1.55
2021	31.28	10.50	7.92	1.15	1.43
2022	27.25	10.50	7.77	1.22	1.51
2023	25.34	10.50	7.75	1.23	1.52
2024	27.23	10.50	7.63	1.28	1.59
2025	28.52	10.50	7.80	1.21	1.50
2026	24.07	10.50	7.46	1.36	1.69

Referencing both tables the following information is clear:

- In year 2021 the waste rock scheduled for movement is 31.28 million bank cubic metres (Table 2)
- The excavators used to move this quantity of waste rock are 2 x Liebherr 996 excavators and 1 x Hitachi Ex 3600 excavator with associated truck fleets. (Table 4.1)

**Annualised productive capacity for excavators based on the author’s experience**

For any piece of equipment there is a finite number of operating hours per year when it can be productively used.

**Scheduling**

Typically in the Hunter Valley, coal mines will have 48 hours of unscheduled time per year based around Christmas Day and Boxing Day. The remaining 363 days are scheduled for production.

**Availability**

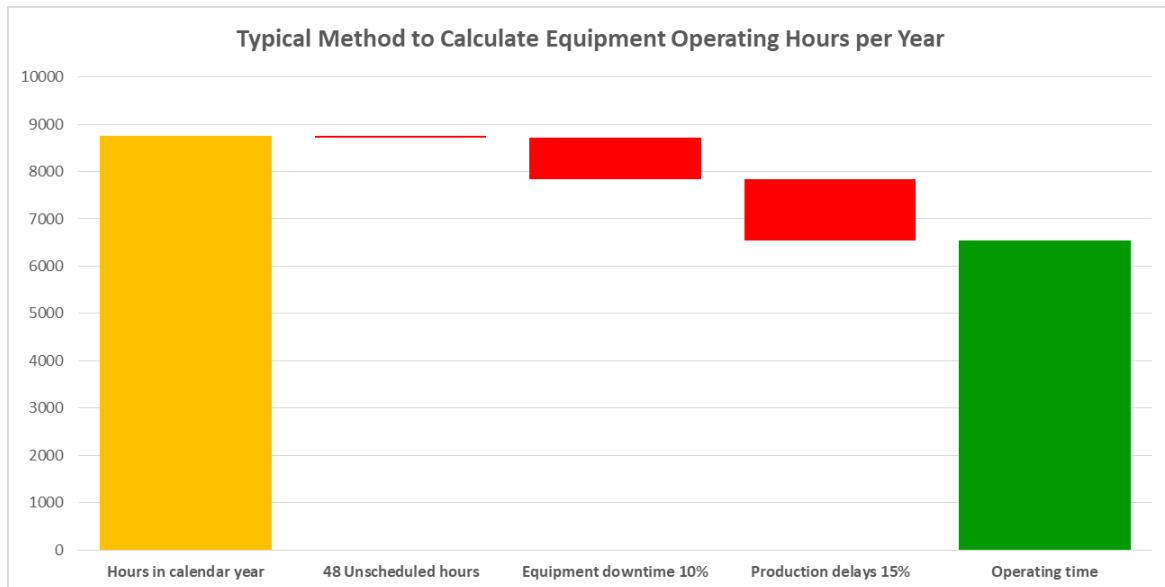
Maintenance downtime time both planned and breakdown does occur and prevents the equipment from being available during those periods. Good maintenance practice should see these delays at no more than 10% of scheduled time. This is described as a machine availability of 90% of scheduled time.

**Utilisation of available time**

When the equipment is available there are then production delays which will occur. A good utilisation would see delays kept to 15% of available time. This is described as a machine utilisation of 85% of available time.

Once all these delays have been deducted from the calendar hours the remaining time is hours of operating time. The annual output is then a function of

$$\text{Annual Output} = \text{Production Rate per Hr} \times \text{Annual Operating Hours}$$



For the Mt Pleasant Operation EA the production outputs that have been assumed by MACH from these 3 excavators are unrealistic because in the author's experience annualised per machine production rates above 10 million bcms per annum by Liebherr 996 excavators are very challenging to achieve in any mining operation.

To achieve the 2021 scheduled waste rock quantity of 31.28 Mbcm per year (Table 2) would require the two Liebherr 996 excavators to be producing around **13 million bcms per unit per year** and around **6 million bcms per year** from the Hitachi Ex3600.

In the author's experience the best case combined output for these 3 machines would be around 25million bcms per year at this site. The likely output range would be 20-25 million bcms per year.

This leaves a production shortfall of between 6 and 11 million bcms in 2021. This is a deficit of between 19% and 35%. This waste rock volume can only be moved by turning on more equipment. This additional equipment has not been included in noise and dust modelling for Mt Pleasant in 2021. It will generate more noise and dust and the impacts will be over and above the current modelling results.

**The Mt Pleasant equipment productivity challenges are:**

**Availability will be reduced by:**

- Noise attenuation components negatively impact equipment availability because restricted access makes for more maintenance effort and takes more time per maintenance task
- Reduced airflow caused by noise attenuation panels means higher equipment operating temperatures and increased downtime in very hot weather due to overheating

**Utilisation will be reduced by:**

- Wet weather delays. High clay content in overburden makes for poor traction for truck haulage in the wet and rain will cause delays
- Fog delays. This area is often blanketed in heavy fog in cooler months. Poor visibility causes production delays
- Dust delays caused by waiting for water carts – hot windy weather will negatively impact output
- Unfavourable wind direction and high wind speeds will cause production delays and shutdowns
- Equipment relocations in response to pro-active noise management which cause further production delays

**Production rates during operating time will be reduced by:**

- Wet weather slowing haulage and causing excavator “wait on truck” delays
- Poor visibility slowing haulage and causing excavator “wait on truck” delays
- Insufficient truck numbers at times causing excavator “wait on truck” delays
- Some on-bench set ups will not be optimal for excavator output due to in pit slopes and varying interburden or overburden thickness

When additional excavators are used to make up the waste rock quantity short fall, additional trucks and additional dozer and watercart operating hours will also be required. This additional equipment operating creates additional dust and noise. These additional impacts have not been included in the MOD3 noise and air quality modelling.

A decision cannot be made on the MACH MOD3 application by the Independent Planning Commission based on the current understated noise and dust modelling results.

## Issue 2: Significant and Negative Changes to the Fine Rejects Emplacement Operational Management Strategy

### The Currently Approved Fines Emplacement Operating Strategy

In 1999 when the original Mt Pleasant consent DA92/99 was given it was based on the 1997 Mt Pleasant EIS which among other things contained the following statement:

#### Sustainable Development

The groundwater and surface water studies conducted at Mt. Pleasant have been designed to address the principles of ecologically sustainable development as outlined in the EP&A Act. Two principles are relevant to the groundwater and surface management strategies and potential impacts arising therefrom. These are *the precautionary principle* and *the principle of intergenerational equity*.

1997 EIS Volume 3a Supplementary Report 3 Mt Pleasant Water Management Studies PPK Report p.vi

In 1999 when the original Mt Pleasant consent DA92/99 was given it was based on the following Fines Emplacement Area operating strategy as described in the 1997 Mt Pleasant Mine EIS :

A preliminary strategy for progressive rehabilitation has been considered as part of the general operating plan, which will enable fine reject to be capped and revegetated on an ongoing basis during the life of the storage facility.

1997 EIS Volume 3b Supplementary Report 4 Mt Pleasant Fine Rejects Storage Facility CMPS&F Report p.6

In recognition of the advantages of progressive rehabilitation eg improved public perception and risk minimisation from the reduction of total catchment contamination yield etc, it is proposed that the natural gully profiles be utilised in constructing the separate fine reject storage areas, to facilitate early and progressive rehabilitation.

1997 EIS Volume 3b Supplementary Report 4 Mt Pleasant Fine Rejects Storage Facility CMPS&F Report p.8

“Water from rehabilitated areas in the top of the catchment will then be diverted around the central dam in order to maximise downstream flows... ...Ultimately, a series of emplacement terraces will be constructed. They will be shaped to blend into the surrounding topography.”

1997 EIS Ch6 p.6.21

#### 1999 Commission of Inquiry Findings on Fines Rejects (Tailings) Disposal

A Commission of Inquiry was also conducted into the environmental aspects of the 1997 Mt Pleasant Development Application and the hearings were conducted in 1998 and 1999. There was also a public hearing conducted for the Water License Application in 1999. The Commission of Inquiry’s Report was finalised in May 1999.

The Inquiry required Coal and Allied to consider alternative methods and technologies for the fine coal rejects emplacement and as an outcome the Inquiry accepted the proponent’s conclusion that:

**Alternative 3: Use and ongoing rehabilitation of small tailings dams** was the preferred option. As stated by Coal and Allied “this option has low technical risk and allows on-going early rehabilitation of the dams areas. It is the preferred option on technical and economic grounds.”



## **The Proposed MACH MOD3 Fines Emplacement Area Operating Strategy**

In MACH MOD 3 EA a significant change in operating strategy is proposed:

“The Fines Emplacement Area strategy described in the 1997 EIS involved the construction of a series of cells beginning in the upper section of the Fines Emplacement Area catchment. Consistent with current engineering practice, MACH Energy has adopted a more contemporary approach to developing the Fines Emplacement Area. This involves construction of the embankment at the downstream end of the Fines Emplacement Area catchment. The embankment would be progressively raised throughout the life of the Mount Pleasant Operation as additional storage capacity is required.”

MACH MOD3 EA Main Text 2.8 Water Management p.15

This so-called “contemporary” approach is a retrograde step and should not be recognised as generally in accordance with the current approval.

- It does not maximise natural runoff downstream flows.
- It does not minimise the disturbed area footprint of the Fines Emplacement Area
- It does not have a multiple cell arrangement
- It does not seek to blend in with the surrounding topography
- It does not allow for early and progressive rehabilitation
- It does not allow for any rehabilitation to occur in the Fines Emplacement Area until several years after mine closure

There have been no technical reasons provided in the MOD3 EA as to why the currently approved Operating Strategy cannot be executed. The reasons for this proposed change in operating strategy seem to be solely financial. The 1997 operating strategy would require more equipment and ongoing management effort than the MOD3 proposed operating strategy.

This should not be viewed as valid justification to approve the adoption of the significantly different and significantly poorer environmental approach to managing the Fines Emplacement Area contained in MACH MOD 3 Environmental Assessment.

In my opinion it is clear that the 1997 fine tailings emplacement strategy containing multiple cells and offering earlier rehabilitation was specifically detailed and considered in the 1999 Approval process and does not allow discretionary, significant and poorer environmental outcome changes to be made by MACH Energy.

MACH MOD3 EA Main Text Figure 10 p.25 showing the one big footprint fines rejects storage facility

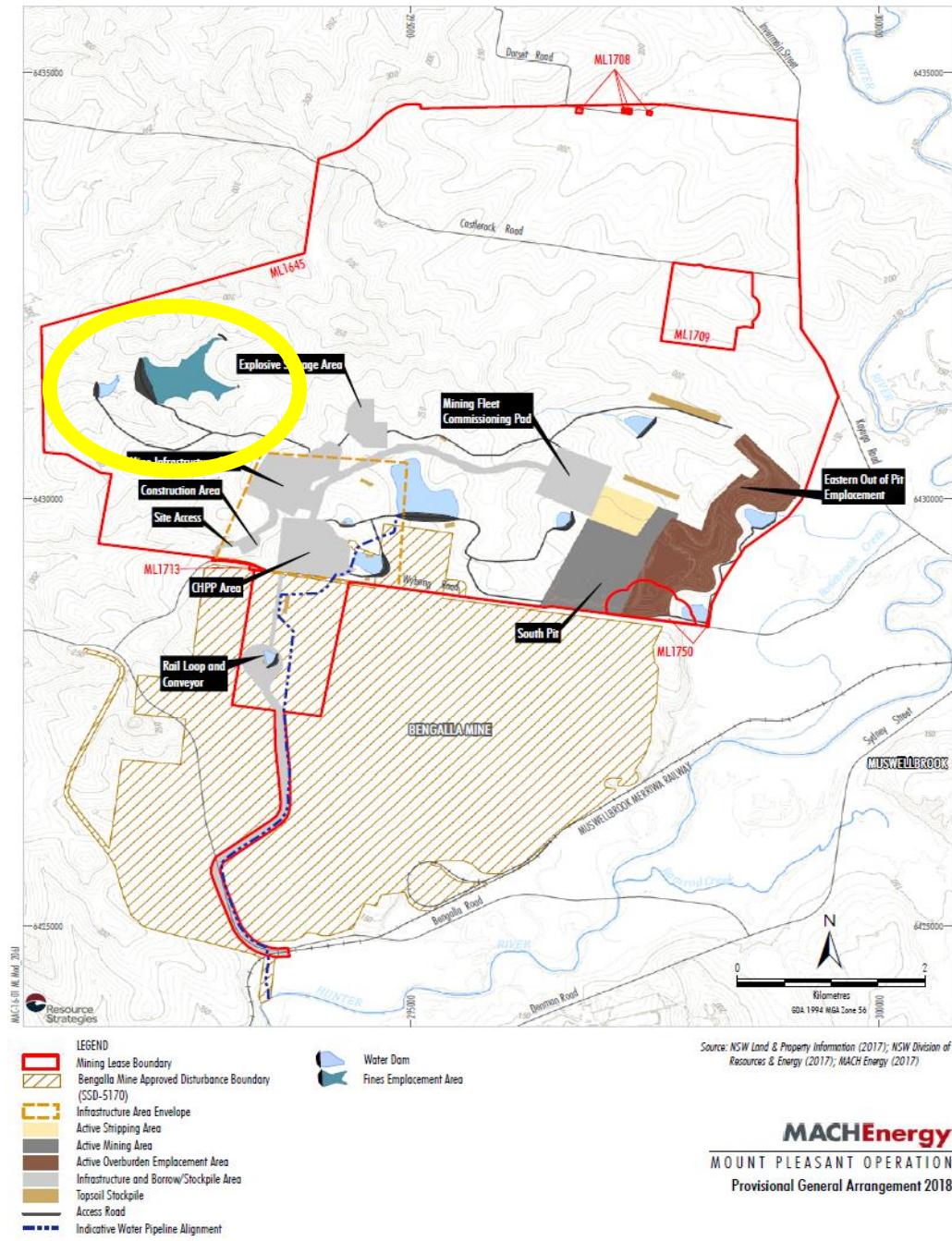


Figure 10

## Some general comments

There are several aspects to this project that the author finds in his experience to be both unique and somewhat troubling.

### Infrastructure Lifespan

This project is currently constructing a rail spur, rail loop and train load out and has constructed pumping and pipeline infrastructure to supply water to the site from the Hunter River. I believe the capital costs involved would be approximately \$50 million.

The proposed DPE Conditions of Consent contains the following condition:

#### Removal of Rail Loop and Infrastructure Corridor

37. The Applicant must, by no later than 31 October 2022:
- (a) remove all infrastructure associated with the development within Mining Lease No. 1645 (ML 1645) south of Wybong Road (other than infrastructure which the operator of the Bengalla mine agrees with the Applicant, in writing, can remain in situ);
  - (b) do all things available to transfer or cause the grant of a mining lease over that part of ML 1645 south of Wybong Road to the operator of Bengalla mine or its nominee;
  - (c) transfer the freehold land owned by the Applicant within ML 1645 south of Wybong Road to the operator of Bengalla mine (or its nominee) at rural market value; and
  - (d) release any easements for pipeline and rail spur within or in the vicinity of ML 1645 south of Wybong Road which benefit land owned by the Applicant.

To comply with this condition the MACH Energy will need to begin removal of this infrastructure by May 2022. Today the construction of this infrastructure is not currently complete. This infrastructure will have a life of less than four years.

This is probably achieving the dubious status of being the world's shortest life rail loop and train load-out ever built.

### Mine life extension for only six years

This MOD3 application is for an extension to mine life from 2020 to 2026. It is understood that Mach Energy is investing approximately \$600 million to develop Mt Pleasant mine.

Mach has now lodged a MOD4 application to build a new rail spur, Wybong Road rail overpass, rail loop and train load out as well as new Hunter River pumps and pipelines. It is my estimate this infrastructure will be of similar capital cost to the current build – an additional \$50 million. No material from the current rail spur and loop, train load-out and pumping infrastructure can be re-used in the proposed MOD4 infrastructure because it needs to be operating until the MOD4 infrastructure is built and commissioned.

It is not credible that the mine life is intended by MACH Energy to be only for this short period. To properly be able to assess the impacts of the Mt Pleasant Mine an assessment period for a mine life of 21 years should be required.

The IPC is currently being faced with a challenge to properly understand and assess this project. This challenge is similar to trying to decipher a large mosaic by only being able to see six tiles.



## Background

This report has been compiled for the purposes of identifying any mining related actual or potential issues related to the MACH Mt Pleasant Mine Optimisation Modification currently scheduled for an Independent Planning Commission determination hearing in early July 2018.

The documents reviewed or referenced upon which this report was based include:

- MACH Energy Mount Pleasant MOD3 Environmental Assessment - Main Text
- MACH Energy Mount Pleasant MOD3 Environmental Assessment - Appendix A – Noise and Blasting Assessment
- MACH Energy Mount Pleasant MOD3 Environmental Assessment - Appendix B – Air Quality and Greenhouse Gas Assessment
- MACH Energy Mount Pleasant MOD3 Environmental Assessment – Appendix E – Site Water Balance Review
- MACH Energy Response to Submissions
- NSW Government Department of Planning & Environment Assessment Report Mt Pleasant Coal Mine Extension of Mine Life (DA 92/97 MOD3)
- Coal & Allied Mt Pleasant EIS 1997
- MACH Energy Mt Pleasant Operation Rail Modification Environmental Assessment Dec 2017 (DA 92/97 MOD 4)
- NSW Government Department of Planning & Environment Proposed Consolidated Consent Conditions Mt Pleasant Coal Mine Extension of Mine Life (DA 92/97 MOD3)
- Report of the Commission Of Inquiry into the Proposed Mount Pleasant Open Cut Coal Mine by Coal & Allied Operations Pty Ltd, Muswellbrook, May 1999

This confidential high level review document has been prepared at the request of Ms Hellen Georgopoulos for HTBA. This document is intended solely for discussion between Michael White and his clients. It should not be regarded as suitable for use by any other person or for any other purpose and cannot be relied upon except as explicitly agreed in writing by the author. No part of this document may be copied without the prior approval of the author

In preparing this review the author has relied upon publicly available information and his professional experience as a mining engineer. All views expressed are judgements and all projections are estimates and should not be construed as forward looking forecasts. Whilst efforts have been made (within the constraints of the engagement) to confirm that the views and projections are reasonable, the author does not guarantee their accuracy or offer any form of warranty or indemnity regarding their use.

Your ref  
Our ref 601163-00  
File ref

# ARUP

President  
Hunter Thoroughbred Breeders Association

Level 17  
1 Nicholson Street  
East Melbourne VIC 3002  
Australia

t +61 3 9668 5500  
d +61 3 9668 5564  
f +61 3 9663 1546

frank.butera@arup.com  
www.arup.com

20 July 2018

Dear Sirs,

## Confidential and Without Prejudice

### Mount Pleasant Coal Mine Modification 3 (Modification) Preliminary Peer Review of Noise and Blasting Impacts

Arup Pty Ltd (Arup) has been retained by the Hunter Thoroughbred Breeders Association (HTBA) to undertake an assessment of the noise and vibration from blasting from the proposed *modification to Mount Pleasant Coal Mine which includes extension of the life of the open cut mine by 6 years (to 2026)*. We understand MACH Energy Australia Pty Ltd (MACH Energy) acquired the Mount Pleasant operation from Coal Allied Operations Pty Ltd (Coal & Allied) on 4 August 2016.

Wilkinson Murray have prepared a comprehensive report with respect to the assessment of noise and vibration from blasting for the proposed project.

It our understanding that reports have been prepared for the Environment Impact Statement currently on exhibition for the proposed expansion of the exiting Mount Pleasant Coal Mine. Arup has undertaken a high-level review of Wilkinson Murray's *Mount Pleasant Operation, Mine Optimisation Modification, Noise & Blasting Assessment, Version A*, dated 24 May 2017 (WM Report).

Arup's preliminary findings and suggested *Actions* are listed below.

The WM Report does not provide confidence with respect to operational noise and vibration from blasting, that all aspects of the project have been completed in an adequate and proper manner according to *current* "best practise" assessments and methodologies. In summary the WM Report is akin to a comprehensive desktop assessment. The report does not provide sufficient information with respect to future operations of the Mount Pleasant Coal Mine and associated impacts to the nearby sensitive communities.

Details where the WM Report fails to provide adequate information are summarised below:

### 3.3 Background Noise Survey Page 11

The WM Report relies on back ground noise measurements published in previous noise studies associated with Mount Pleasant Coal Mine. Although, this may be an acceptable practise, there is no clear and concise understanding that links the relevance of background noise measurements undertaken during the feasibility stage of Mount Pleasant which may be over two decade ago, to the current Application.

It is our standing that the WM Report relies on data obtained prior to the submission of the Environmental Impact Statement (EIS) completed in 1999. If so, there is no definitive understanding within the WM Report that a noise assessment undertaken leading up to the submission of the EIS in 1999 is relevant for the current application.

It is best practise to undertake background noise level measurements to verify noise limits set by the NSW INP<sup>1</sup> and Development Consent DA 92/97. The WM Report does not submit background noise information to verify the proposed noise limits.

The WM Report identifies noise sensitive receivers not previously investigated. It is not clear how previously completed back ground noise measurements have been utilised for these noise sensitive receivers.

### 3.4 Modifying Factor Adjustments Page 11 & 12

This section speculates about the impact of low frequency noise associated with the proposed expansion to the coal mine. The WM Report suggests that noise penalties may be applied *if* a future scenario demonstrates excessive low frequency noise. Since, low frequency noise is known to be common to mining activities an assessment acknowledging the impact of low frequency noise is to be completed. The assessment must demonstrate clearly how intrusive low frequency noise will be managed prior the commencement of operations.

Applying noise partialities once the project commences is inappropriate and reactive to a known noise source. It is recommended for the WM Report identify and mitigate the impact of low frequency noise emissions.

In our opinion, this assessment is not complete.

### 4.2 Noise Model Procedures Page 13

The WM Report uses a software package known as ENM. ENM was developed in the early in 1990's, however is no longer supported, maintained or distributed by the developer RTA Technology (RTA). Further, RTA encourages the use of modern environmental noise modelling software such as SoundPlan or CadnaA.

ENM is no longer commercially available, hence it is unlikely further revisions of the INP<sup>2</sup> would prescribe the specific use of ENM. The EPA or NSW Planning & Environment do not have the capability to operate ENM and on that basis are unable to verify noise predictions completed within the WM Report. For these reasons ENM is not considered best practise.

---

<sup>1</sup> NSW EPA Industrial Noise Policy 2000

<sup>2</sup> The current version of the NSW INP was issued in 2000. In September 2015 the NSW EPA released *Draft Industrial Noise Guideline*. There are significant difference in the assessment procedures between the INP released in 2000 and the proposed changes issued as a draft in September 2015.

It should be noted that in September 2015 the NSW EPA released the *Draft Industrial Noise Guideline* (Draft Guidelines). If the Draft Guidelines are implemented the following areas of the WM Report will no longer be considered compliant:

- There are significant changes to *Best Management Practise* to control noise emissions. The Draft Guidelines considers noise mitigation at the *receiver* to be the least-preferred option and should only be considered once all other options have been exhausted.
- The assessment of temperature inversion conditions are described using stability category instead of temperature lapse rate. Hence, since ENM is no longer supported it is unlikely to be adopted for Draft Guidelines.

Further, the noise modelling has not been calibrated for local conditions, this is unfortunate since utilising noise monitoring data from nearby existing mine sites or based on the experience that Wilkinson Murray contributes to the project, calibrating theoretical noise models is fundamental to demonstrating compliance with the noise limits. In our opinion the noise modelling is incomplete. The noise modelling within the WM Report does not suggest a best practise methodology.

#### 5.1.1 Investigation of Feasible & Reasonable Noise Mitigation Measures – No. 3 Page 17

The WM Report often refers to:

- “*low noise*” *noise attenuated mobile fleet and contemporary technology fixed plant* (Low Noise Equipment)

The WM Report presents results while utilising Low Noise Equipment as commented above. This suggests that the noise modelling and noise data presented in the WM Report incorporates equipment or “technology” to control noise emissions from site operations.

However, the WM Report fails to provide supporting Low Noise Equipment information that it has relied on. There is no supporting information that defines:

- The extent of attenuation associated with any aspect of the Low Noise Equipment
- Does Low Noise Equipment concept impact productivity?
- Specifically, how the Low Noise Equipment concept will be fitted to equipment or procedures.

In our opinion, comments regarding Low Noise Equipment have not been verified which is inconsistent with best practise.

#### 8.1 Airblast Overpressure & Vibration Criteria – Page 35

The WM Report refers to *Australian Standard 2187.2 – 2006 Explosives – Storage and use, Part 2: Use of explosives*. The regulatory framework suggests to also consider use of *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZECC).

ANZECC suggests similar blast limits for structures and provides further guidance to control human comfort:

- 2.2.3 *Experience has shown that for almost all sites a ppv of less than 1 mm/sec is generally achieved. It is recognised that this is not practicable to achieve a ppv of this level at all sites and hence a recommended maximum of 5 mm/sec has been selected. However, it is recommended that a level of 2*

*mm/sec (ppv) be considered as the long term regulatory goal for the control of ground vibration.*

The WM Report only considers limits with respect to structure. It is recommended that an appropriate human comfort criteria be established.

Further, since the Mount Pleasant Coal Mine is in the vicinity operational mines it would be advantageous to demonstrate the monitored results rather than theoretical levels predicated by the WM Report which relies on generic assumptions.

### **Noise and Blasting Summary:**

We provide the following information

- Background noise measurements to establish noise limits are incomplete. There is no supporting information that suggests that previously completed assessments are relevant.
- Noise emitted from the proposed developed has been assessed with modified noise data (Low Noise Equipment). There is no supporting documentation from the manufacturer confirming the reduction in noise level.
- The noise modelling has been undertaken with software no longer consider to best practise. The noise model has not been calibrate to represent existing operations.
- The blasting criteria has been established for damage to structure. A human comfort criteria is to be considered. The vibration calculations are to be calibrated based on existing site assessments.
- The WM Report appears to complied based on information and data no longer relevant the current scenario. This is not considered to best practise.

This assessment is considered to be a preliminary review and detailed assessment of the WM Report and application may be completed as instructed.

We trust the above information is appropriate at this stage of the project, should you require additional information please do not hesitate to contact me.

Yours sincerely

A handwritten signature in black ink, appearing to read 'F. Butera', with a horizontal line underneath the name.

Frank Butera  
Associate



# Mount Pleasant

Mine Optimisation Modification  
Visual Impact Statement



*Prepared for:*



*Prepared by:*

**MICHAEL WRIGHT**  
REGISTERED LANDSCAPE ARCHITECT

---

# Contents

---

Contents	III
01 Introduction	01
02 Importance of Landscape	03
03 Response to the Landscape and Visual Impact Assessment Report	05
04 Summary Conclusion	13
Appendix - A Environmental Impact Assessment Practice Note	15



THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY

This statement has been prepared for the Hunter Thoroughbred Breeding Association in response to the proposed Mt Pleasant Operation Mine Optimisation Modification (the Modification), an extension to the existing open cut coal mine located around the base of Mt Pleasant.

The Mt Pleasant operation is located in the upper region of the Hunter Valley about 180 kilometres north of Sydney. The site is located at Mt Pleasant, immediately west of the town of Muswellbrook and in close proximity to Aberdeen, north of the site. The site is on the western slopes located near the floor of a valley with the land rising around the site to the east and north. The location of the site within three kilometres of Muswellbrook results in a large number of sensitive receivers, such as residential dwellings, schools and shops being exposed to the potential visual impacts of the Mine Modification. A number of roads are also located around the proposed mine site including the main north-south road through the Hunter Valley, the New England Highway (Figure 1).

MACH Energy has prepared an Environmental Assessment Statement based on Geoffrey Britton's Visual Assessment on behalf of Coal and Allied (1997). This statement provides a review of the Landscape and Visual Impact Assessment (L&VIA) prepared for the Environmental Assessment by MACH Energy (May 2017). This response has been prepared based on a review of the EA report, site analysis and an established understanding of the existing landscape character and the range of land uses which occur across and adjacent to the Mt Pleasant site.

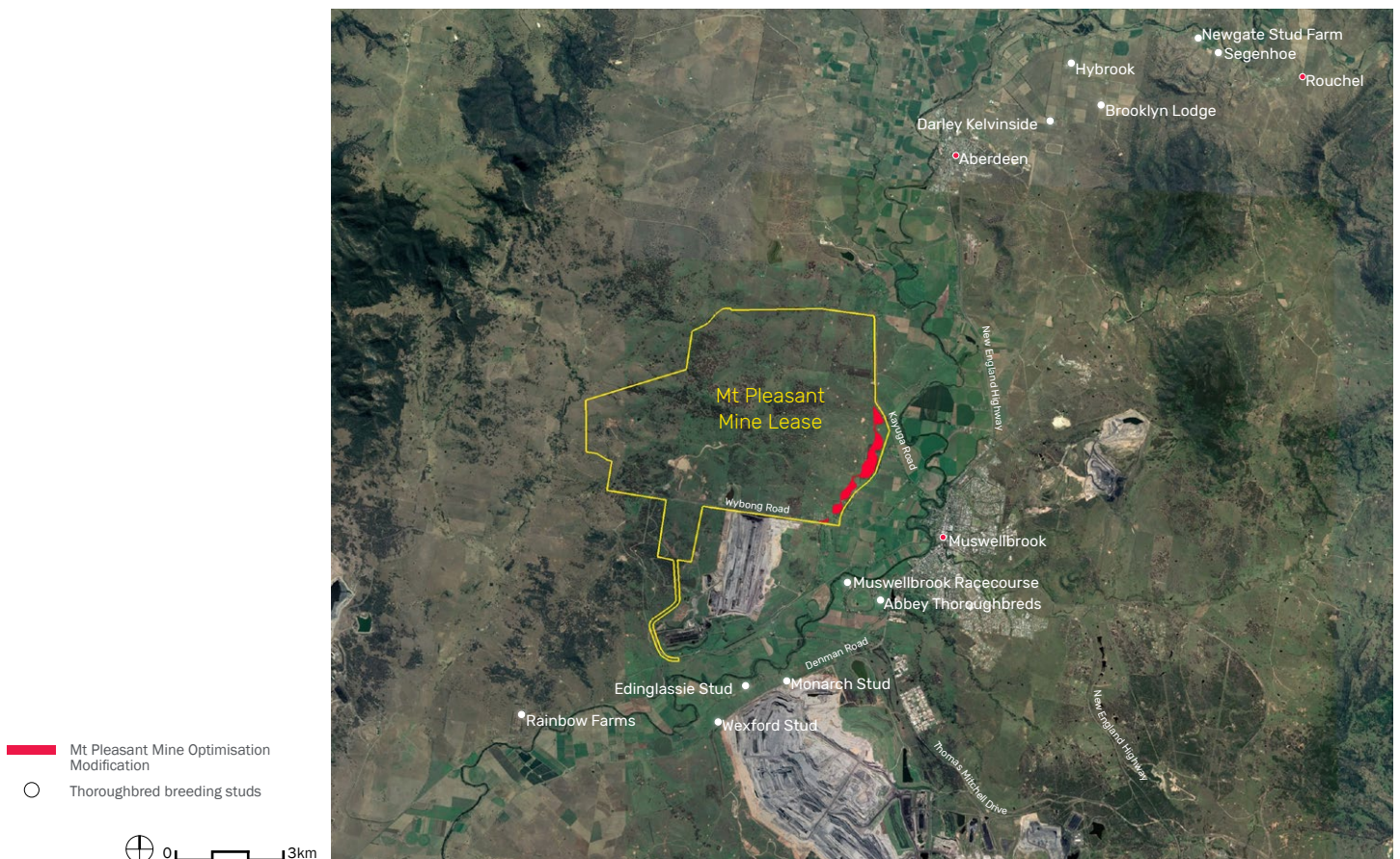


Figure 1. Location of the Proposal



Figure 2. View towards the forested ranges of the Wollemi National Park

## 02

# Importance of Landscape

This section provides a brief description of the important aspects of the landscape setting in which the Mt Pleasant Coal Mine, Muswellbrook, Aberdeen and the Hunter Thoroughbred Breeding studs are geographically located. The Hunter Valley is defined to the north by the Barrington Tops National Park and to the south by the Wollemi National Park (Figure 2), with the Hunter River flowing through fertile alluvial floodplains between these ranges. The importance of the Hunter River landscape that includes and surrounds the Mt Pleasant site is internationally acknowledged as an area of unique agricultural, cultural, scenic and visual importance.

The floodplain around the Hunter River has been identified as Strategic Agricultural Land (SAL) in the Upper Hunter Strategic Land Use Plan (SLURP). The Plan states that *“The most productive and highest value cropping lands in the region are the alluvial floodplains along the major rivers and the volcanic soil plains of the Upper Hunter LGA.”* (Page 18 SLURP) The SLURP also recognises the importance of the region’s *“clean and green”* branding to the agricultural industries in the Hunter Valley. The proposed modification is located immediately adjacent to these alluvial floodplains along the Hunter River.

The SLURP also identifies the river floodplain and adjoining slopes, directly adjacent to the proposed Modification, as part of the SAL Equine Critical Industry Cluster. The SLURP recognises the unique combination of temperate climate, protected aspect and varied terrain, as well as proximity to Sydney and a lack of tropical diseases, as key attractors for the equine industry.

This unique environment provided the optimum conditions required for the Hunter Valley’s multi-billion dollar Thoroughbred Breeding industry, which is a nationally and internationally significant industry and one of only three international ‘Centres of Excellence’ worldwide.

*“Our industry is based on access to clean water, clean air and topography that blends rich valley pastures for lactating mares and their foals and more testing, rugged terrain for the development of young thoroughbred lungs and limbs. Clean air and water supplies are critical to our industry and our clean, green and serene, Thoroughbred champion producing character and reputation”* (Hunter Thoroughbred Breeders Association).

Tourism is a major industry in the Hunter Valley. Scenic qualities are a key component of the Hunter’s vital tourism industry. The SLURP (2012) states that:

*“The identity of a rural landscape and its scenic qualities are intrinsic to tourism.”*

Open cut coal mining in close proximity to Thoroughbred breeding areas is evidently one of the most incompatible neighbouring land uses for these studs. The presence of such an intrusive and damaging land use adjacent to, and in the vicinity of a Thoroughbred breeding stud is contrary to recognised best practices that have been established over the last two centuries.

The Mt Pleasant Mine was granted Development Consent DA 92/97 in 1999, to carry out mining operations for a period of 21 years. The Mt Pleasant Operation was also determined to be a Controlled Action in 2011 and was subsequently approved under the Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act) in 2012 (EPBC 2011/5795). This EPBC Act approval remains in effect until October 2035. The Mt Pleasant Mine was subsequently purchased from Coal and Allied by MACH Energy who re-commenced operation in 2016.

The Modification would primarily comprise two components:

- An extension to the time limit on mining operations to provide for open cut mining operations to 22 December 2026
- Extensions to the South Pit Eastern Out of Pit Emplacement.

The additional waste rock capacity provided in the proposed emplacement extension would enable MACH Energy to avoid the need to emplace waste rock material in the approved South West Out of Pit Emplacement. In addition, the Modification also involves some revisions to the final landform that would remain should mining operations cease at the end of 2026 and a revision to the peak construction workforce to 350 people (MACH Energy, 2017).



# 03

## Response to the Landscape and Visual Impact Assessment Report

### Response to the Environmental Assessment for the Proposed Mine Operations

The Environmental Assessment produced by MACH Energy in 2017 is incomplete and deficient in information required to complete a true analysis of the impact of the proposed Modification.

#### *Proposed Mine Final Landform Lacks Detail*

It is difficult to make an accurate and informed judgement on the proposed final landform with an absence of cross sections showing the existing and proposed landforms. The manner in which the emplacement extension ties into the existing landform is critical to the visual impact of the emplacement. The EA's omission of cross sections or elevations of the existing and proposed landforms results in a proposal that cannot truly assess this aspect of the Modification.

#### *Staging and Rehabilitation Lacks Detail*

There is insufficient information provided about the developmental staging of the mine to adequately explain the sequence and likely visual impact at various stages of the mine operation. There are not enough stages demonstrated in the General Arrangement Plan (Figures 10, 11 and 12 of the EA) to adequately assess the visual impacts overtime. The EA needs to include earth modelling plans with contours for every 5 years illustrating changes in the landform over this time. There is also a significant leap in site development from the 2025 General Arrangement Plan (Figure 3) to the 2026 Final Landform Plan (Figure 32 of the EA). There is an unrealistic transition from active mining in 2025 to fully rehabilitated landscape and landform in 2026. This depiction of such rapid change only damages the credibility of the EA and reduces the accuracy of its findings.

#### *New Location for Waste Rock Emplacement More Exposed*

The Modification results in the emplacement of waste rock in the most visually obvious location of the whole mine area; at the base of the slope adjacent to the Hunter River floodplain and directly opposite Muswellbrook which is located on the opposite slopes of the valley, looking directly across at the mine area. The South West Out of Pit emplacement was approximately 4km west of the eastern Mine Lease Boundary whereas this Modification places all of these earthworks immediately adjacent to Mine Lease Boundary. This would be a significant change to the visual impact on the local area and particularly the township of Muswellbrook.

#### *Justification for the Mine Modification Unclear*

The EA for the mine modification states that the extension of the South Pit Eastern Out of Pit Emplacement will “*better align with the underlying topography*” however there is no evidence provided which explains what this means in terms of the physical and visual setting. Without drawings to explain how this extra waste rock improves the final landform it is difficult to understand the justification for this modification, other than that it is 4km closer to the pit than the South West Out of Pit Emplacement.

### Inadequate Visual Impact Assessment

#### *Reliance on a 20 Year Old Assessment*

The MACH Energy report (May 2017) for the proposed Modification relies heavily on the Geoffrey Britton Visual Assessment report (1997) prepared for Coal and Allied, for the assessment of the proposed works, including the selection of the viewpoints from which to assess the visual impacts of this mine Modification. The methodology used in the Geoffrey Britton report is inconsistent and does not meet the accepted standards of current visual impact assessments. The reliance of the MACH Energy report on this earlier report compounds the errors and inaccuracies made in the assessment of the visual impacts in the original report.

While there are variations on visual assessment methodologies, the Roads and Maritime Services guideline for Landscape Character and Visual Impact Assessment (EIA-N04) provides a well developed and generally accepted methodology in the industry. A copy of this guideline has been attached to this statement in Attachment A.

### *Extensive Visual Catchment Not Acknowledged*

The Geoffrey Britton report (1997) identifies a number of viewpoints from sensitive receivers including Muswellbrook, Aberdeen and Wybong Road. A subsequent Landscape Management Plan (2012) prepared for Coal and Allied illustrates a viewshed analysis (Figure 4) of the locality that establishes the Mt Pleasant site as a prominent location within view from an extensive catchment including extensive areas of Muswellbrook and Aberdeen.

The MACH Energy report does not reference this report and therefore does not adequately assess the visual impact of the proposed Modification on the range of receivers within this catchment. Of the viewpoints that were chosen, visual simulations were prepared for only three. The EA states that the mine landforms would not be visible from the other viewpoints, however this is not demonstrated.

Figures 5, 6, and 7 illustrate the extent of views over the mine site from three locations in Muswellbrook and demonstrate the degree of exposure these and other similar locations would have to the proposed mine modification. These viewpoints and others, should have been acknowledged and assessed in the EA to more accurately show the level of visual impact that this modification would have on the residents and motorists in the area.

### *Viewpoints Not Representative of the Affected Area*

The EA report fails to identify all of the appropriate viewpoints from which the Modification would be visible. There are numerous viewpoints within the elevated urban areas of Muswellbrook as well as along local roads that should have been assessed (Refer Figures 4, 5, 6). One viewpoint cannot be used as representative viewpoint for an entire area. The lack of adequate numbers of viewpoints from sensitive receivers significantly affects the ability to thoroughly analyse the Modification and determine the true visual impacts.

The EA states that the toe of the emplacement would be 'better aligned' with the existing landform, although how this is achieved is not explained. The extension of waste emplacement would however bring mining activity closer to, and be more visible for, the residents and motorists in the surrounding catchment.

The assessment states as Viewpoint 7 (VP7) was previously assessed as being high impact, the increased proximity doesn't change the visual impact classification. This does not reflect the change of visual impact as proximity has a significant bearing on visual impact assessment. The assessment should have increased the number of viewpoints at the eastern ends of Wybong and Kayuga Roads where the impacts of this modification is greatest. Assessing the existing viewpoints at the western end of the site, well away from this modification presents an inaccurate depiction of the overall visual impact of the Modification.

The viewpoints chosen for the photomontages are not the most impacted viewpoints, for example VP1 in Figure 5 is an elevated view from the New England Highway which is above the EA Viewpoint 6, located on the railway line below. This highway viewpoint is more exposed and closer to the proposed modification than the EA's Viewpoint 5 on the New England Highway and should have been selected for assessment and a photomontage.

The MACH Energy report suggests that the impact on a number of the chosen viewpoints would be reduced from high to moderate and from moderate to low as a result of a number of factors. The document states that many viewers are now accustomed to significant modifications to the landscape in the region. This is not an acceptable argument for 'lessening' the impact of future proposed works and modifications and indicates that current and past mitigation measures are not effective in the region.

The report argues that receivers from New England Highway would be less sensitive as they are 'transitory' and would therefore not be exposed to the views of the mine for any length of time. This is an unacceptable mitigating factor as the importance of the highway as the major arterial route used by tourists, clients of the Thoroughbred studs and locals is fundamental to the image and brand of the Hunter Valley as a whole. The evaluation of a reduced sensitivity on this basis is not an accurate reflection of importance of this route.

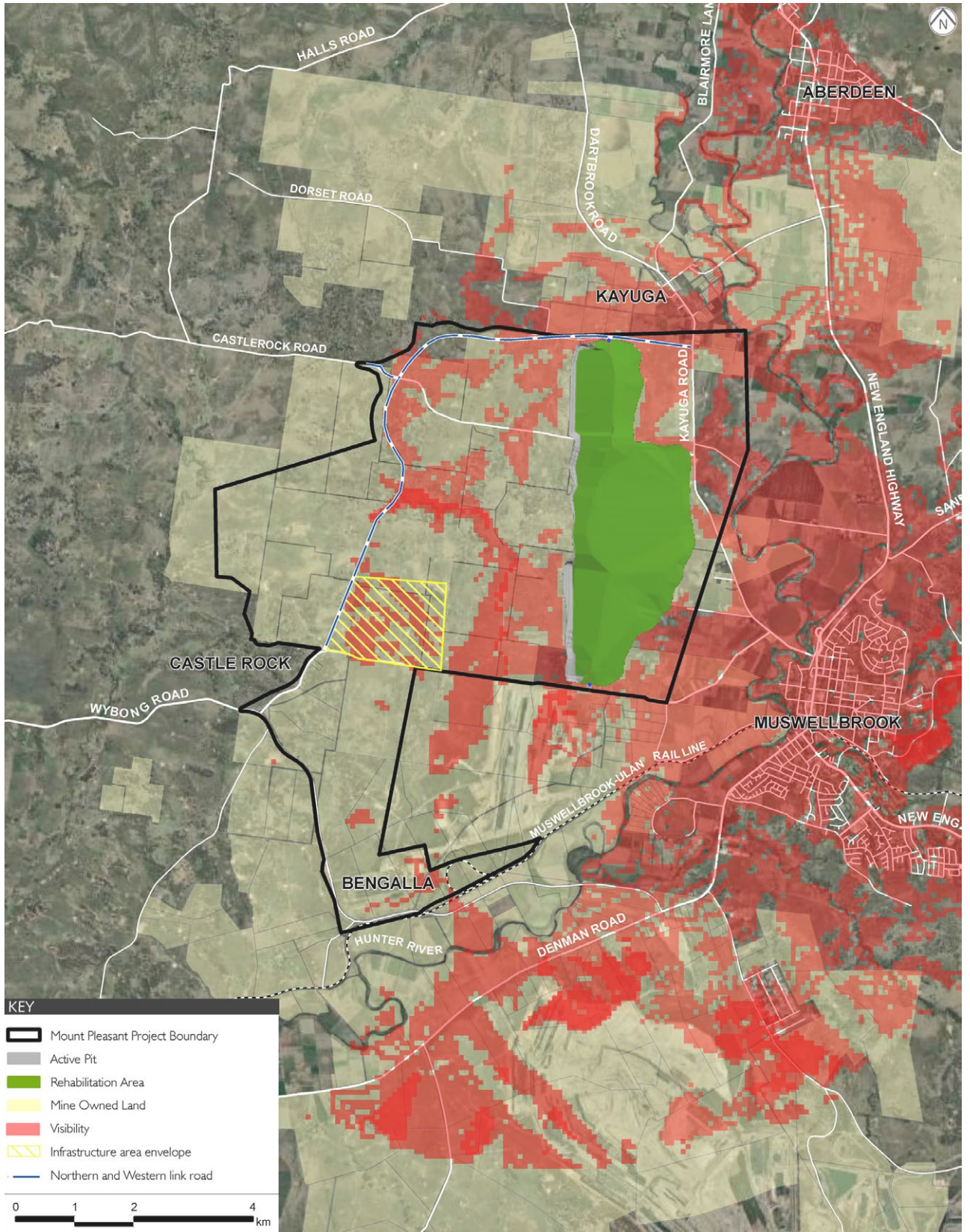


Figure 4. Viewshed analysis of proposed mining operations (2020)  
 Source: Mt Pleasant Project Landscape Management Plan, 2012



# 03



Figure 5. VP1 - View from A15 New England Highway looking west towards the proposed mine



Figure 6. VP2 - View from Burgundy Street in Muswellbrook looking west towards the proposed mine



Figure 7. VP3 - View from Queen Street in Muswellbrook looking west towards the proposed mine

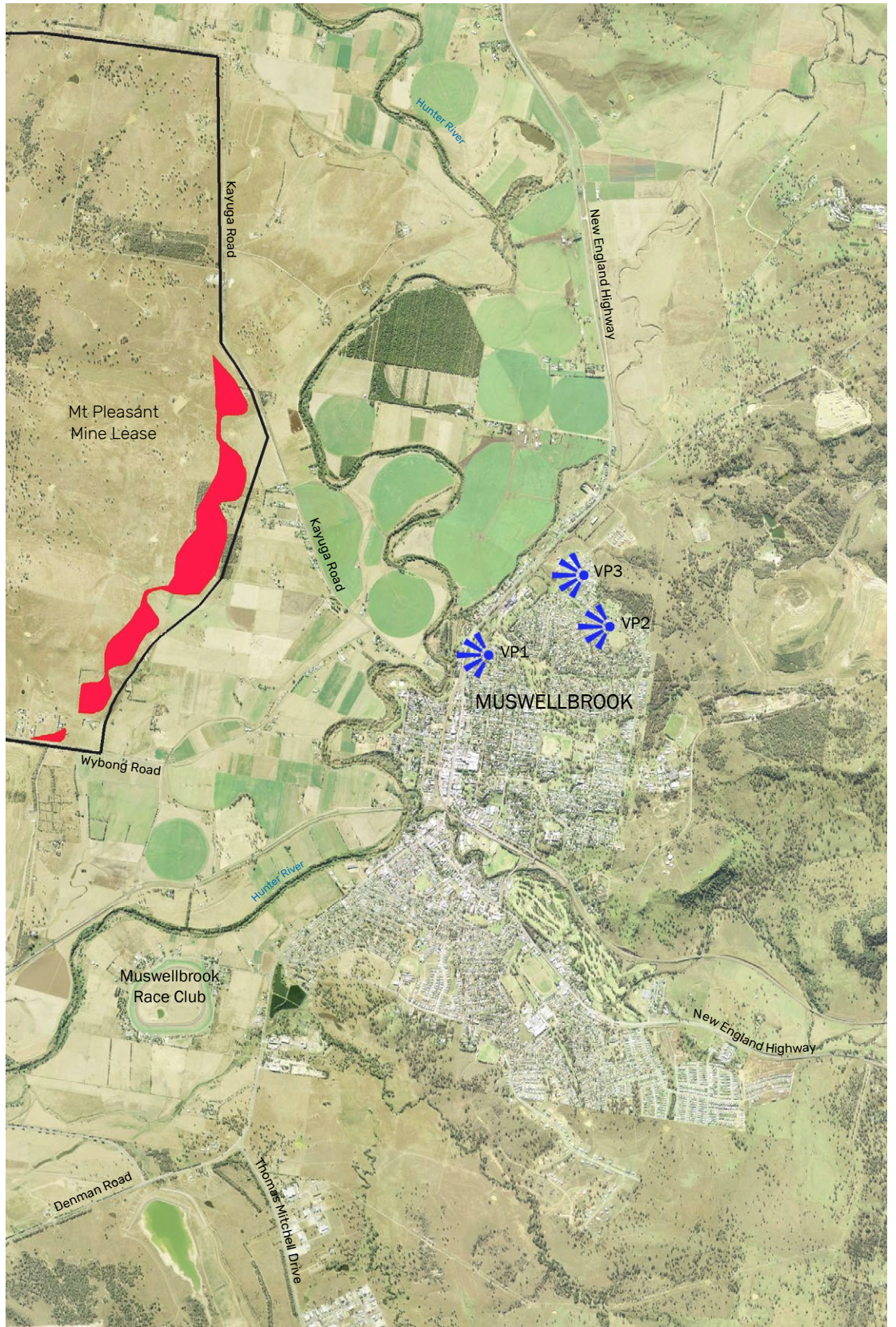


Figure 8. Viewpoint locations in Muswellbrook

- Mt Pleasant Mine - Operation Modification (Indicative)
- Viewpoint not assessed by Environmental Assessment

# 03

## Indirect and Dynamic Visual Impacts

The EA visual impact assessment fails to consider Indirect or Dynamic visual impacts throughout the report. This is significant due to the proximity of the mine to the urban areas of Muswellbrook and Aberdeen, the New England Highway and local roads, as well as rural properties. Indirect visual impacts manifest in a number of different forms including dust from blasting, excavation, overburden emplacement and vehicles on haul roads, gas plumes from blasting, smoke, lighting operations at night and a range of mining vehicles on public roads (Figure 11).

Indirect visual impacts are a very significant risk to the operations and viability of the Thoroughbred breeding studs particularly an event such as the Mt Arthur botched blast in February 2014 in which highly visible clouds of orange gas was observed across a wide area (Figure 10). There is also a risk of indirect visual impacts from wind borne dust off the exposed earth and rock in the pit. Dust suppression measures, which focus generally on haul roads, are not considered an adequate mitigating measure.

Light pollution is another significant and daily indirect visual impact that has not been considered by the report. Mining operations produce considerable levels of light that can in some instances equate to that of suburban and urban areas (Figure 9). The generated light pollution would affect the existing dark rural sky of the region. The exclusion of this impact along with other potential indirect impacts in the report are unacceptable and question the overall assessment of visual impact put forward within the report.

Dynamic visual impacts relate to travelling through or over the landscape in both space and time, as well as information coverage on social and conventional media. Previous PACs for the proposed Drayton South Mine have stated the combination of social and conventional media report on incidents at an open cut coal mine “*have the potential to represent a significant reputational risk to the studs*” Review PAC 2015, p38).

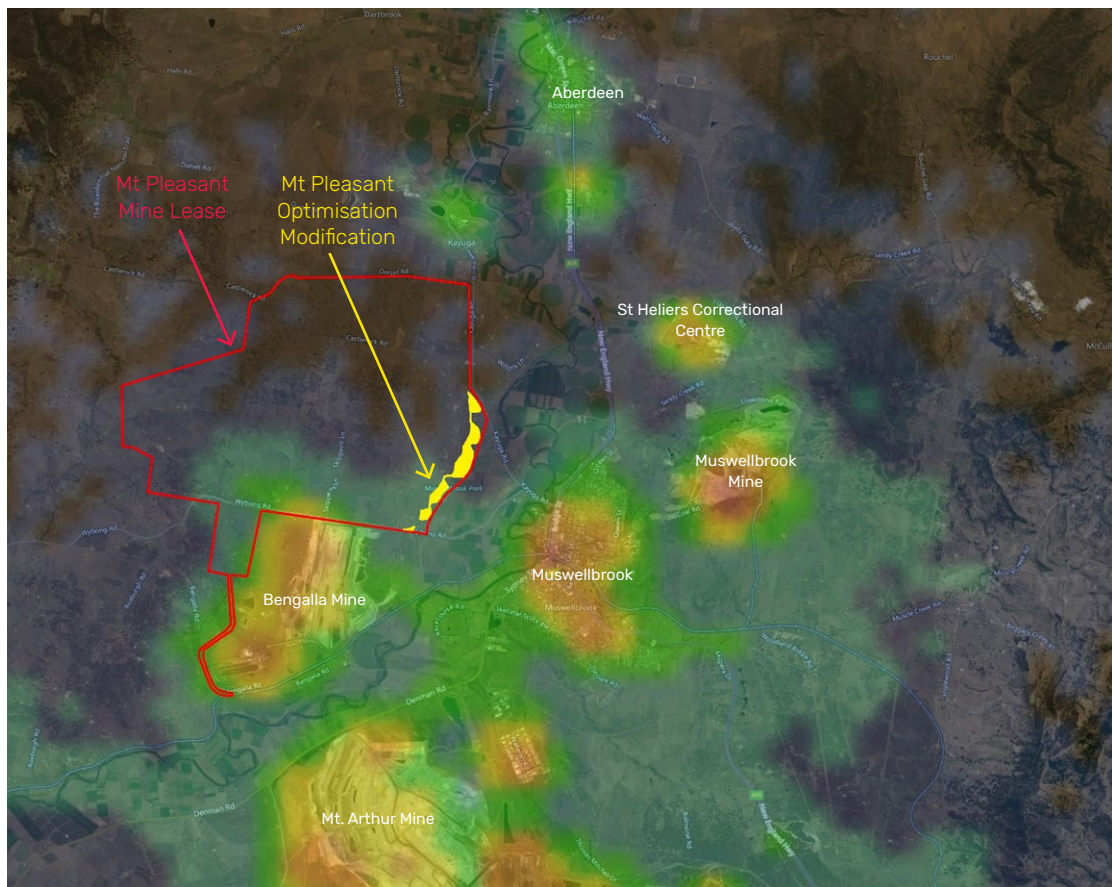


Figure 9. Light Pollution Levels in the Mt Pleasant region of the Upper Hunter

Source: <https://www.lightpollutionmap.info/#zoom=12&lat=-3795520&lon=16792864&layers=0BTFFFFFFFF>

# 03



Figure 10. Media photos of highly visible gases emanating from the botched Mt Arthur Blast in 2014.  
Source: Muswellbrook Chronicle 21/02/14



Figure 11. Media photos of highly visible smoke from the Hazelwood Coal Mine fire at Morwell in Victoria, which burned for 45 days in 2014.  
Source: The Guardian 27/02/14, Skynews 04/03/14

THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY

# 04

## Summary Conclusion

Open cut coal mining has the largest impact of any land use in a rural setting. The scale and footprint of these mines are very difficult to conceal from the public view. By contrast, Thoroughbred breeding studs have the highest standards of landscape visual quality and presentation, which relates directly to their reputation and image. This is also the case for the towns of the Hunter Valley region, which heavily relies on the tourist industry.

There is no recognition in the EA of the importance of the Hunter River Valley landscape to the towns of Muswellbrook and Aberdeen, and the surrounding locality in terms of scenic quality, amenity and identity of the region. The EA does not consider the proximity of the Modification to the towns of Muswellbrook and Aberdeen or the surrounding high value agricultural industries, including the Thoroughbred studs. This lack of buffer between the mine and the town and/or studs should have been considered in the report visual impact assessment.

As discussed above, the visual impact assessment carried out by MACH Energy in 2017 is considered to be incomplete and deficient in information required for an acceptable visual impact assessment. The sensitive receivers within the towns and the agricultural areas which include the Equine and Viticulture industries, as well as locals and tourists require a level of consideration and analysis of potential impacts, which has not been implemented in the assessment. It is clear that an understanding has not been developed of the full range of receivers located within the area nor their sensitivity to this intrusive land use, particularly the range of impacts on the Thoroughbred studs. It is recognised that these studs require the highest level of landscape visual quality and presentation as well as clean physical and visual environment.

The direct, indirect and dynamic visual impacts that the Modification would have on these receivers has not been considered in the MACH Energy report. As a consequence there has been no other mitigation measures proposed in the EA other than to contour the final landform and undertake rehabilitation on the batters of the waste emplacement. Given the degree of visual exposure of the towns, roads and rural properties and their close proximity to this mine, this level of mitigation is insufficient to satisfactorily mitigate the visual impacts of the mine.

THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY

---

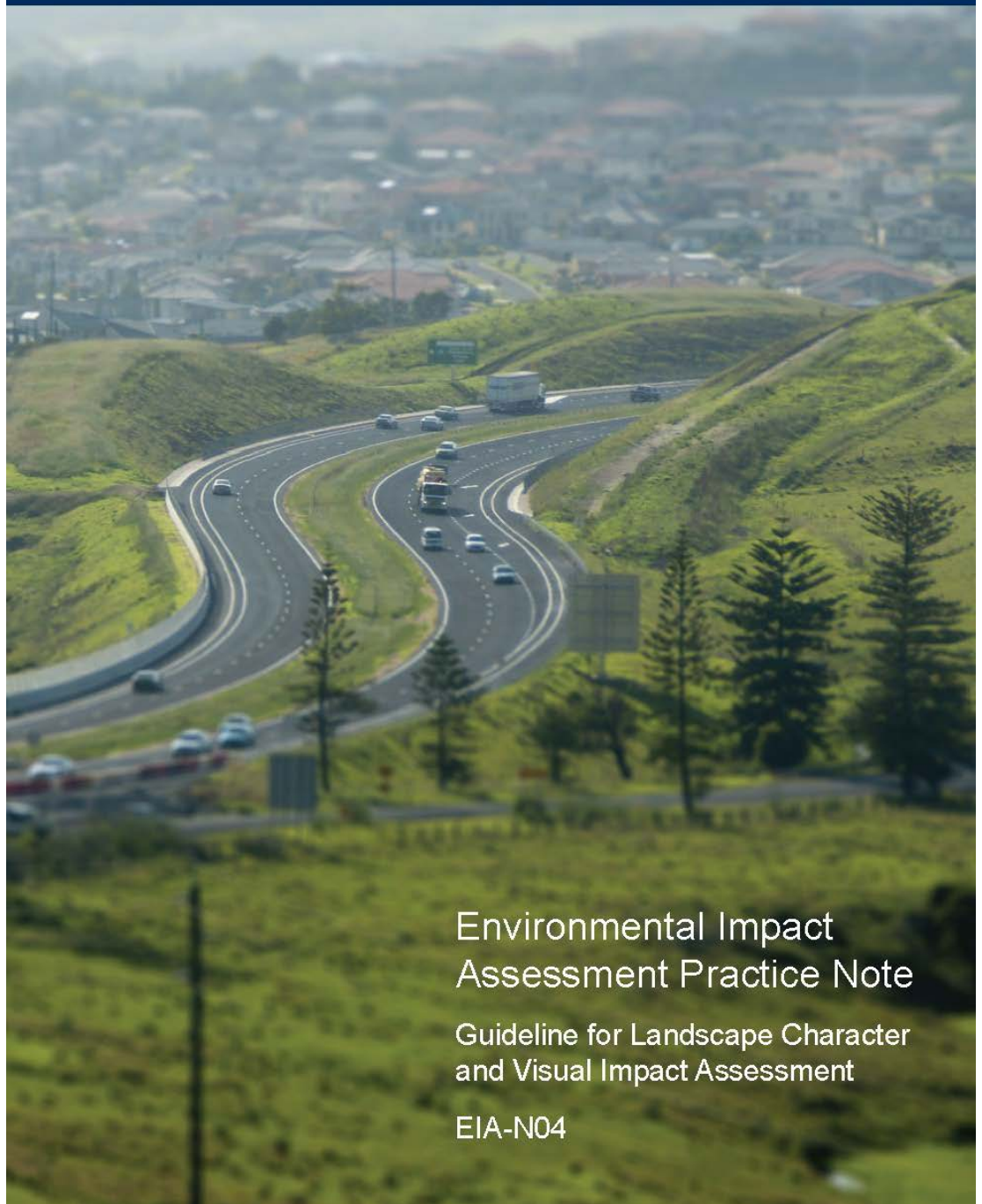
## Appendix A

# Environmental Impact Assessment Practice Note

---



**Transport**  
Roads & Maritime  
Services



## Environmental Impact Assessment Practice Note

Guideline for Landscape Character  
and Visual Impact Assessment

EIA-N04



THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY

## About this release

Reference number	EIA-N04		
Title	Guidelines for landscape character and visual impact assessment		
Parent procedure	EIA-Practice Notes		
Approval and authorisation		Name	Effective date
Prepared by	Manager, Centre for Urban Design	Gareth Collins	28-03-13
Approved by	Manager Environmental Planning and Assessment	Joy Duncan	28-03-13
Location		File name	
G:\RNI\NETDEV\URBAN DESIGN\		EIA-N04 Version 2-0.indd	
Document status			
Version 2-0		XX-XX-XX	
Version	Date	Revision Description	
1-0	24-03-2009	First issue	
2-0	28-03-2013	First reissue	

Prepared by  
 Centre for Urban Design  
 Roads and Maritime Services  
 Level 17, 101 Miller Street  
 North Sydney, NSW 2060  
 T 02 8588 5780  
 F 02 8588 4175

THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY

# Contents

About this release.....	i
Guideline for landscape character and visual impact assessment.....	v
1. Introduction.....	1
1.1 The purpose of landscape character and visual impact assessment.....	1
1.2 How landscape character and visual impact assessment is integrated with urban design policy.....	1
1.3 Audience for the document.....	2
1.4 The difference between landscape character impact and visual impact.....	2
2. Assessment terminology.....	4
3. Scope of landscape character and visual impact assessment.....	5
4. Assessment Methodology.....	6
4.1 Landscape character and visual impact assessment process.....	6
4.2 How to measure landscape character impact and visual impact.....	7
4.3 Quantifying impacts.....	7
5. Landscape character assessment tasks.....	8
5.1 Analyse existing landscape character and its sensitivity.....	8
5.2 Identify landscape character zones.....	9
5.3 Assess landscape character impacts.....	10
6. Visual impact assessment tasks.....	12
6.1 Assess the visibility of the proposal.....	12
6.2 Identify key existing viewpoints and their sensitivity.....	12
6.3 Assess visual impacts.....	12
7. Integrating landscape character and visual impact assessment with project design and approvals.....	14
7.1 Refine the concept design to avoid and minimise adverse landscape character and visual impacts.....	14
7.2 Develop a strategy to manage landscape character and visual impacts.....	15
7.3 Combining landscape character and visual impact assessment with urban design reporting in environmental assessment documents.....	16
7.4 Assessment checklist.....	17
Appendix A.....	18
References.....	19
Responsibilities.....	19
Related procedures, guidance notes and templates.....	19

THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY

# Guideline for landscape character and visual impact assessment

## Key points

- This practice note applies to projects and concept plans for which RMS is seeking determination or approval to proceed under Part 4, Part 5 and Part 5.1 of the *Environmental Planning and Assessment Act 1979 (EP&A Act)*.
- Landscape character and visual impact assessment addresses both impacts on the character of a place and the views within that place.
- Landscape character relates to the built, natural and cultural aspects that makes a place unique.
- The purpose of landscape character and visual impact assessment is to improve design outcomes and avoid negative impacts of a proposal, report on impacts and propose mitigation of those impacts.
- Landscape character and visual impact assessment is related to the RMS urban design process in that it addresses visual and character issues – two aspects of a good urban design outcome.
- Landscape Architects from the RMS list of registered contractors, experienced in landscape character and visual impact assessment and urban design, must be used to carry out landscape character and visual impact assessment.

THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY

# 1. Introduction

This document has been prepared to guide the carrying out of landscape character and visual impact assessments under the *Environmental Planning and Assessment Act 1979* (EP&A Act). It sets down the terminology, process and methodology for assessment to ensure that it is carried out consistently, to a high standard and properly integrated with other environmental assessment practices, urban design policy and also the *ProjectPack* and *MinorProject* project management processes.

## 1.1 The purpose of landscape character and visual impact assessment

There are two main purposes of landscape character and visual impact assessment:

- 1 To inform the development of the preferred route and concept design so that the proposal can avoid and minimise impacts up front. It must be commenced early in the environmental impact assessment (EIA) process to achieve this goal and integrated with the design process. (see figures 1 and 2)
- 2 To inform RMS, other agencies and the community about the landscape character and visual impact of the proposal and what avoidance, management and mitigation strategies would be implemented.

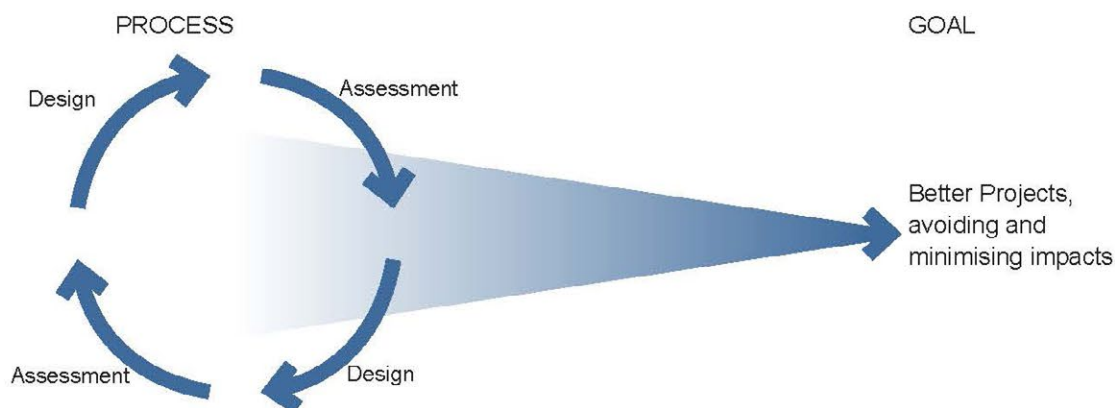


Figure 1 Assessment should not be carried out in isolation from design.

Design and assessment iteration leads to better design outcomes with lesser impacts and fewer costly mitigation measures.

## 1.2 How landscape character and visual impact assessment is integrated with urban design policy

Urban design in RMS describes both a process for producing good design outcomes and the product of that process. It addresses how a project fits into an area, how it supports the local connections and how it contributes to the quality of the public domain. Clearly landscape character and views are a significant part of these goals, but not the whole story.

Landscape character and visual impact assessment measures and reports on how well the design fits into the built, natural and community landscape and how well it responds to what people see. It therefore provides important feedback into the design -development process.





Figure 2 Visual and landscape character issues relate to many principles described in RMS urban design policy.

### 1.3 Audience for the document

The practice note is to be used by

- planning, urban design, architecture and landscape architecture professionals
- those who will be appointing and working with the above professionals such as project managers and environmental assessment managers.

The practice note does not replace the need for professional involvement in the fields of landscape character and visual assessment. The RMS Centre for Urban Design can provide advice on the use of experts registered under the RMS Registration Scheme for Construction Industry Contractors.

### 1.4 The difference between landscape character impact and visual impact

The practice note differentiates between *landscape character assessment* – the assessment of impact on the aggregate of an area’s built, natural and cultural character or sense of place and *visual assessment* – the assessment of impact on views.

Landscape character and visual assessment are equally important. Landscape character assessment helps determine the overall impact of a project on an area's character and sense of place. Visual impact assessment helps define the day to day visual effects of a project on people's views.

This dual assessment helps differentiate options, improve route alignment decisions and improve design outcomes.



Figure 3 The difference between landscape character assessment and visual assessment.

Landscape character assessment sums up an area's sense of place including all built, natural and cultural aspects, covering towns, countryside and all shades between. Visual assessment addresses people's views of an area from their homes or other places of value in the community.

## 2. Assessment terminology

There can be confusion if consistent terminology is not applied. For example the words view, visual, visibility, aesthetics, character, urban design and landscape all have distinct meanings yet are often used in an interchangeable way in different studies or reports. The following list of definitions should therefore be followed in the landscape character and visual impact assessment process.

Aesthetics	Relating to the sense of the beautiful or science of aesthetics ie the deduction, from nature and taste, the rules and principles of beauty.
Director General's Requirements (DGRs)	The environmental assessment requirements of the Director-General of the Department of Planning and Infrastructure for State-Significant Infrastructure projects
Desired future character	A term used to capture the desirable future outcome or vision for an area as set down in planning documents or as professionally assessed and envisaged by urban designers or other built environment professionals
EIAG	RMS Environmental Impact Assessment Guidelines
EIA	Environmental Impact Assessment
EP&A Act	Environmental Planning and Assessment Act 1979
Impact	The effect of a proposal, which can be adverse or beneficial, when measured against an existing condition
Landscape	All aspects of a tract of land, including landform, vegetation, buildings, villages, towns, cities and infrastructure.
Landscape architecture	A profession involved with the assessment, design and management of the built and natural environment.
Landscape character	The combined quality of built, natural and cultural aspects that make up an area and provide its unique sense of place.
Landscape character zone	An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately adjacent
Magnitude	The measurement of the scale, form and character of a development proposal when compared to the existing condition. In the case of visual assessment this also relates to how far the proposal is from the viewer. Combined with sensitivity, magnitude provides a measurement of impact.
REF	Review of Environmental Factors
Sensitivity	The sensitivity of a landscape character zone or view and its capacity to absorb change. In the case of visual impact this also relates to the type of viewer and number of viewers. Combined with magnitude, sensitivity provides a measurement of impact.
Urban design	Urban design in RMS is the process and product of designing projects so that they: fit sensitively with the built natural and community environment; contribute to the functioning of the community; and contribute to the quality of the public domain for the community and road users. Architects, engineers, environmental experts, landscape architects, planners and urban designers are all involved in urban design. Urban designers are generally landscape architects and architects that have extended their expertise into the field of urban design.
VEM	A Visual Envelope Map, also referred to as 'viewshed' or visual catchment, is the area within which a project can be seen at eye level above ground. Its extent will usually be defined by a combination of landform, vegetation and built elements.
View	The sight or prospect of a landscape or scene.
Visibility	The state or fact of being visible or seen.
Visual impact	The impacts on the views from residences, workplaces and public places.

Table 1 Terminology.

### 3. Scope of landscape character and visual impact assessment

The following diagram outlines the landscape character and visual impact assessment tasks which should be carried out in the environmental assessment process. The level of detail in the assessment should be tailored to the level of broader environmental assessment and the specific needs of the project. The Centre for Urban Design should be contacted prior to commencement of Environmental Assessment to confirm the level of assessment required.

TYPE OF ENVIRONMENTAL ASSESSMENT	LEVEL OF LANDSCAPE CHARACTER & VISUAL IMPACT ASSESSMENT REQUIRED	EXAMPLE PROJECT TYPES
Preliminary Environmental Investigation (PEI), Route Options Investigation	Summary landscape character impact assessment (an overview of steps 5.1-5.3)	
State Significant Infrastructure (Part 5.1 of the Environmental Planning and Assessment Act)	For all State Significant Infrastructure Part 5.1 projects a detailed landscape character and visual impact assessment (sections 5 and 6 of this guideline) should be carried out by an urban design contractor from the Registration Scheme For Construction Industry Contractors.  The Director General's Requirements issued for a project may describe particular issues relating to landscape character and visual impact which require detailed assessment.	Significant projects such as Woolgoolga to Ballina on the Pacific Highway, and Foxground and Berry Bypass on the Princes Highway.  Projects with proximity to or potential impact to environmentally sensitive areas such as the Windsor Bridge Replacement Project.
Project Review of Environmental Factors (Part 5 of the EP&A act), Development application (Part 4 of the EP&A Act)	For Part 5 activities requiring a Project REF (may include but not limited to dual carriageway upgrades, bus projects, major river and coastal bridges, town bypasses and interchanges) a detailed landscape character and visual impact assessment (sections 5 and 6 of this guideline) should be carried out, by an urban design contractor from the Registration Scheme For Construction Industry Contractors, to assist in route selection and to avoid and minimise impacts in concept design development.  For activities under Part 5 requiring a Project REF of a smaller scale than those described above (including but not limited to new overbridges, single carriageway upgrades, intersections and new ramps) a visual impact assessment only (section 6 of this guideline) should be carried out, tailored to match the scale and complexity of the project.	Road upgrades in growth areas e.g. Bringelly Road, Schofields Road and the Central Coast Highway  Bus Priority Projects including Church Street, North Parramatta  Larger congestion management projects including Boundary Street Upgrade, Roseville and F3 & Pacific Highway Interchange Upgrade, Wahroonga  Sydney Harbour wharf upgrade projects  Smaller Congestion management projects such as Princes Highway and Mowbray Road Intersection, Chatswood and Princes Highway and Presidents Avenue intersection, Kogarah.  Smaller scale projects with impact to environmentally sensitive areas such as the Doyles West slip on the Oxley Highway
Minor Works Review of Environmental Factors	For Part 5 activities requiring a Minor Works REF, refer to the Minor Works REF Template (EIA-P05-G01-T05) checklist, particularly at part 3 under the headings "Trees" and "Landscape Character and Visual Amenity", replicated in Appendix A, to assess whether the work requires landscape character and visual impact assessment and mitigation.	Smaller Congestion Management projects such as Bus Priority in Bridge Street at the Intersection With King Georges Road, Penshurst, maintenance projects

Table 2 Landscape character and visual impact assessment in environmental assessment.

## 4. Assessment Methodology

### 4.1 Landscape character and visual impact assessment process

The following diagram shows the relationship between landscape character and visual impact assessment tasks and design. It illustrates the iterative nature design of and assessment and how good design can avoid and minimise impacts. The assessment tasks are not separate to the design process but should be used to continually improve a project as it develops.

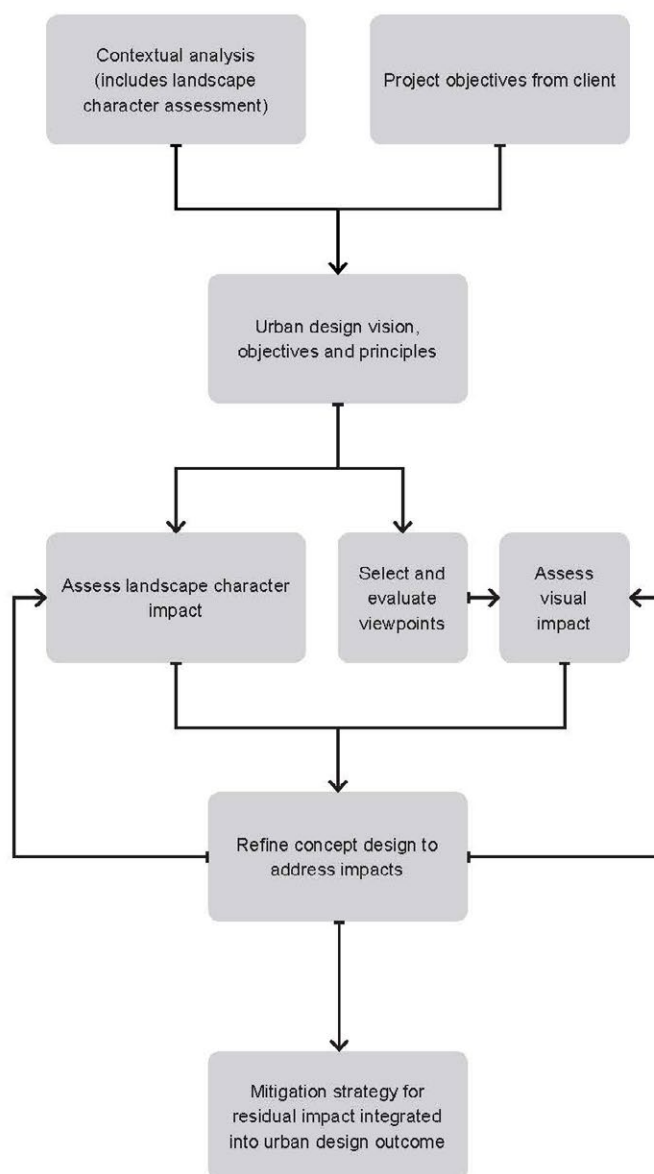


Figure 4 The relationship of assessment to project development.

## 4.2 How to measure landscape character impact and visual impact

The landscape character impact and visual impact of the proposal should be separately assessed.

The method to measure impact is based on the combination of the **sensitivity** of the existing area or view to change and the **magnitude** (scale, character, distance) of the proposal on that area or view.

## 4.3 Quantifying impacts

Sensitivity refers to the qualities of an area, the type number and type of receivers and how sensitive the existing character of the setting is to the proposed change. For example a pristine natural environment will be more sensitive to change than a built up industrial area.

Magnitude refers to the nature of the project. For example a large interchange would have a very different impact on landscape character than a localised road widening in the same area.

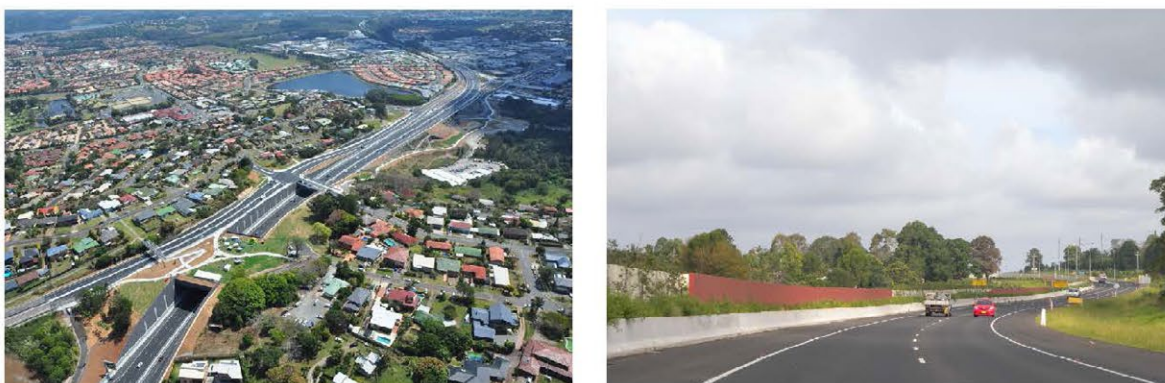


Figure 5 The Pacific Highway at Banora Point and nearby Alstonville Bypass have very different magnitudes of impact. The combination of sensitivity and magnitude will provide the rating of the landscape character for a project or individual character zone, or visual impact for viewpoints. (see figure 6 for grading values).

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High	High Impact	High-Moderate	Moderate	Negligible
	Moderate	High-Moderate	Moderate	Moderate-low	Negligible
	Low	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Figure 6 Landscape character and visual impact grading matrix.

A judgement must be made as to the quality and extent of the design solution in assessing magnitude and impact. Determining a low impact based on the assumption that the very highest quality design outcome will be achieved could be unrealistic and misleading. However it is equally misleading to determine impacts based on the very worst outcomes. A balance must be found but it is usually better to err on the side of caution.

For the purposes of assessment, the basic project concept - its location, form and key elements designed in accordance with other similar recent projects and the RMS urban design guidelines – should be assessed. The residual adverse impacts identified in the assessment would then be mitigated where possible, with the mitigation measures integrated into the concept design. This provides a more transparent approach differentiating between concept design work to avoid impacts and mitigation work to minimise impacts.

## 5. Landscape character assessment tasks

### 5.1 Analyse existing landscape character and its sensitivity

Based on desktop and field analyses, the existing character of the area under investigation should be assessed and described using both text and images. The analysis should cover the following aspects and their combined effect:

- The planning designations of an area relating to landscape character (including desired future character), scenic quality and conservation or heritage areas, whether federal, state or local.
- The topographical qualities of an area – whether it is hilly, rolling, flat, mountainous etc.
- The natural drainage of an area – the rivers, creeks, lakes and how these affect character.
- The geological quality of an area – whether it is rocky, alluvial, has deep or thin soils etc.
- The ecological characteristics and land cover of an area – whether it is forested, wetland, scrub, grass etc and the type of cover and dominant flora species
- The agricultural qualities of an area and how these contribute to character – for example dairy/ cane farming, forestry, wheat, and the types of field boundaries and farm structures.
- How the settlements (farms, villages towns cities) fit into their natural setting.
- The parks and open space in the settlements and the character and quality of these areas.
- The main cultural and recreational characteristics of an area - the parks, popular walks, meeting places, community features and cultural icons.
- The style of architecture, the materials, forms, historical mixes and design qualities.
- The spatial qualities of an area - how enclosed or open it is, as defined by ridge lines vegetation and built form.
- The infrastructure environment – the scale and pattern of rail, footpaths, roads, bridges, electricity pylons, dams etc. Also the style and form of boundaries, fences, walls, lighting and other associated infrastructure elements.
- Major economic or industrial features such as factories, quarries, business parks etc.

The analysis should include a discussion of sensitivity of the areas landscape character, i.e. the inherent capability of the are to absorb change caused by the proposal, and the rationale for the rating of sensitivity given.



Figure 7 Landscape character should describe the natural setting, the human intervention and shaping of that setting – including the settlements within it – and the interaction between place and community. It applies to both rural areas and built up areas.

## 5.2 Identify landscape character zones

If required because of the size or complexity of the project, the study area should be broken down into different character zones of broadly homogenous characteristics or strongly defined spatial qualities. For example ridgelines often divide the character of the landscape, built areas have a different character to rural areas, river landscapes differ from coastal landscape types.

It may be desirable to treat heritage items or areas as a separate character zone if they are of such significance that impacts on them should be identified separately.

The purpose of dividing the area into character zones is to make the assessment process easier to understand, more accurate and context sensitive.





Figure 8 Areas of the landscape can be divided into character zones.

Dividing the landscape into zones (where appropriate) can assist in improving the design for each zone and provide a more accurate assessment of the impacts on different places.

### 5.3 Assess landscape character impacts

The impact of the proposal on each character zone should be assessed. Impacts should be based on both the sensitivity of the character zone and magnitude of the proposal in that zone.

A judgement must be made as to the quality and extent of the ultimate design solution when assessing magnitude and impact at concept design stage. For the purposes of assessment, the basic project design - its location, the vertical and horizontal alignment and overall three dimensional form of the road, heights of cuttings and fill embankments, the location and form of bridges, the landscape at an early stage of growth form – based in accordance with other similar recent projects and the RMS urban design guidelines – should be assessed. The impacts identified in the assessment would be avoided and minimised where possible through refinement of the concept design prior to its finalisation as described in part seven of this document.

As stated above, for the purposes of assessment, the basic project concept should be assessed. Assessing landscape character impact of the basic unadorned concept design provides a more transparent approach.



Figure 9 It is important to assess the landscape character impact of the basic concept design rather than an assumed level of finish and design quality. In this example at the Eastern Distributor, the impacts would be based on the form of the road in cutting rather than the finished architectural solution.

## 6. Visual impact assessment tasks

### 6.1 Assess the visibility of the proposal

The extent of the area that the proposal will be visible from should be defined. To do this a Visual Envelope Map (VEM) should be produced, illustrating the likely visual catchment of the project. The visual catchment should be primarily related to existing landform, however a description of the obscuring effect of vegetation and buildings should be included if appropriate.

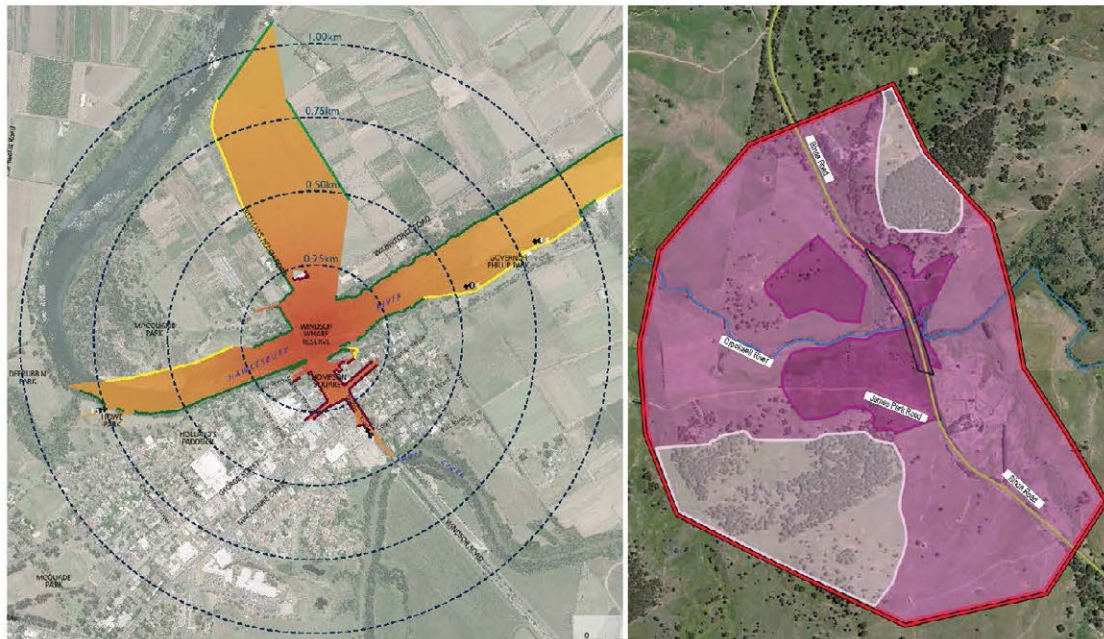


Figure 10 Two examples of Visual Envelope Maps

### 6.2 Identify key existing viewpoints and their sensitivity

In consultation with the project team, a schedule of representative viewpoints within reasonable distance of the project and within the visual catchment should be developed. These should include residential properties (grouped into areas if appropriate), public buildings (eg schools, places of worship, libraries, museums, galleries), public spaces (eg parks, plazas, popular walks, meeting places), heritage items and key businesses (eg hotels, restaurants, offices).

Once selected, the viewpoints should be rated as to their sensitivity to change by the proposal. Visual sensitivity refers to the quality of the existing view and how sensitive the view is to the proposed change. Visual sensitivity is related to the direction of view, the composition of the view and may include more than one character zone.

### 6.3 Assess visual impacts

The impact of the proposal on each viewpoint or group of viewpoints should be assessed. Impacts should be based on a composite of the sensitivity of the view and magnitude of the proposal in that view (see figure 6 for grading values).

Magnitude refers to the nature – scale, size, character – of the project and its proximity to the viewer. For example, a development situated one kilometre from the viewpoint, will have a much reduced visual effect than one 100m away.

Again a judgement must be made as to the quality of design outcome in assessing magnitude and impact. As with landscape character impacts a balance must be found.



Figure 11 Assessing the visual impact of the basic concept design.

Determining a low visual impact based on the assumption that a cutting will be clean exposed rock, or densely vegetated, could be misleading. A realistic impact should be ascribed based upon the cutting in its early stages of revegetation or with the possibility of the need for stabilisation works. Mitigation of such an impact would then focus on techniques to ensure a good vegetation cover, or well designed stabilisation work. It would be even better to use this feedback to minimise or avoid the need for the cutting entirely.

The assessment of visual sensitivity and magnitude and the combined visual impact should be set down in a comprehensive schedule or table with descriptions and photographs to justify all analysis and conclusions. Animations, photomontages and sketches should be provided illustrating the final built outcome in its setting. Illustrations must be realistic and present the likely outcome rather than the desired 'ideal' outcome. In many cases sketches portray a more flexible appearance allowing changes to occur throughout the road development process.

View	Description of setting	Sensitivity of view <sup>[1]</sup>
A01	Looking south towards project from north abutment of Alfords Point Bridge	H
A02	Looking south from within project from approximate Chainage 200	H
A03	Looking south from within project from	H

View	Visual Sensitivity <sup>[1]</sup>	Element of project visible	Nature of Impact <sup>[2]</sup>	Magnitude of Visual Effect <sup>[3]</sup>	Summary	Resultant rating of visual impact <sup>[1]</sup>
A01	H	Widened carriageway commencing at merge at end of bridge	A	G	Distance to works makes impact negligible at this location	G
A02	H	Widened carriageway, median barrier and barrier to shared path, potential noise barrier and associated screen planting in distance	A	L	Vegetation and sandstone cutting on western verge are unaffected by proposal. Potential noise barrier in distance on western verge would increase level of impact	M
A03	H	Widened carriageway, median barrier	A	L	Vegetation and sandstone cutting on western verge are unaffected by proposal. Potential noise barrier in distance on western verge would increase level of impact	M

Figure 12 Extract of schedule of viewpoints presented at two stages: initial analysis and then impact assessment for the Alfords Point Road Southern Approach project.

## 7. Integrating landscape character and visual impact assessment with project design and approvals

### 7.1 Refine the concept design to avoid and minimise adverse landscape character and visual impacts

Once an early understanding of the likely landscape character and visual impacts is established, feedback must be provided to the project design team so that measures to avoid or minimise the likely adverse impacts can be explored at an early enough stage to influence options selection and concept design. (Refer to *Beyond the Pavement* and associated guideline documents.)



Figure 13 RMS urban design policy and guidance documents 'Beyond the Pavement' and the suite of urban design guideline documents should inform the whole design process from options to implementation.



Figure 14 The difference between avoiding and mitigating impacts.

Locating the road alignment at the bottom of the hill and in redundant land alongside the rail line helped avoid landscape character and visual impacts. The residual noise impacts and the impacts of crossing the road still had to be mitigated but the mitigation measures of walls and bridges were well designed and integrated architecturally with the whole project.

## 7.2 Develop a strategy to manage landscape character and visual impacts

In collaboration with the design team, develop a strategy and principles to mitigate landscape character and visual impacts during detail design and construction. Report on any impacts already avoided or minimised in the design process. Refer to 'Beyond the Pavement' guideline documents on landscape, shotcrete, noise walls and bridges. The mitigation measures may be adopted as safeguards and commitments in the REF.

A mitigation strategy can range from a series of measures to screen visual impacts such as planting or mounding to particular design techniques to help integrate the proposal into its setting and make it visually attractive instead of jarring. All mitigation measures must be integrated with the overall design of the project.



Figure 15 Mitigating impacts through good design.

Producing a good design outcome can turn a project with a major impact into a project that has a lesser impact or that is a positive outcome. In this example on Tarban Creek Bridge, a basic solution has been transformed by design into an outcome that is more respectful of the bridge and its setting and has helped gain community approval.



Figure 16 The value of endemic species in vegetative screening.

Native species grow quickly, are hardy, tuned to the local climate and contribute to local biodiversity. This area, seeded less than 2 years before this photographic was taken, is now established and quickly developing into a valuable contribution to the forest.

### 7.3 Combining landscape character and visual impact assessment with urban design reporting in environmental assessment documents

Landscape character and visual impact assessment is a part of the environmental assessment process, yet there are many commonalities with the RTAs urban design policy, a fact which is reflected in the need for similar professional involvement. For example:

- Landscape character and visual impact assessment reports on impacts, provides feedback into concept design development and sets strategies for ongoing design development.
- The analysis of landscape character and views also informs the contextual analysis stage of the urban design process.

Consequently reporting on the urban design work undertaken should be combined with landscape character and visual impact assessment reporting, to facilitate integration and cost efficiencies.

The document would normally form a working paper to form part of the broader environmental assessment. Therefore the information it contains should be structured to be consistent with the main body of the Environmental Impact Assessment or REF and other working papers. The report should be structured to contain the following information in the order listed:

- An initial description of the existing situation.
- A description of the proposal and its impacts.
- Safeguards and mitigation measures to be adopted should the project proceed.

The following table shows how this approach would be adopted for a project's urban design report.

Title - Urban design report and landscape character & visual impact assessment	
1	Contextual analysis including the landscape character analysis
2	Urban design objectives and principles
3	Urban design concept (description and illustrations of the whole project)
4	Landscape character impact assessment
5	Visibility of proposal (including key viewpoints)
6	Visual impact assessment
7	Landscape character and visual impact mitigation strategy

Figure 17 Structure for combined urban design and impact assessment report

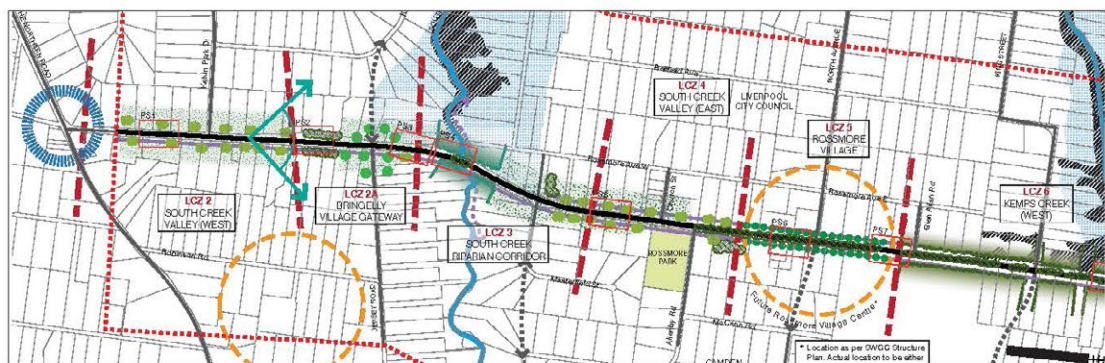


Figure 18 Extract of concept design for Bringelly Road indicating design responses at each Landscape Character Zone

When developing the impact mitigation strategy, the following points should be considered

- Include a discussion of any impacts already avoided or minimised through the design process.
- The strategy to mitigate adverse impacts should be structured as a series of commitments which will be realistic for the project team to adopt in project's detailed design phase after approval is granted.
- These opportunities should not be a wish list but be broadly discussed and evaluated by the project team as a whole. If they require coordination with other agencies or private landholders than early consultation will be required to take them to a point of certainty by the time environmental assessment is finalised.

The author of the urban design report should review the summary of the urban design response, landscape character impact and visual impact contained in the main body of the EA document to ensure that there is consistency between the two documents.

#### 7.4 Assessment checklist

For preparers and reviewers of the landscape character and visual assessment the following checklist should be of assistance:

1. Does the assessment of character portray a comprehensive impression in text and images of the character of the study area?
2. Are landscape character impacts distinct from visual impacts?
3. Are the impacts derived from an assessment of sensitivity and magnitude?
4. Are the ratings of sensitivity and magnitude and hence overall impact reasonable and consistent?
5. How has the impact assessment influenced the concept design? What design changes have been undertaken that will help avoid the need for costly mitigation?
6. Are the mitigation strategies clear, cost effective, integrated with the concept design (ie should appear as a seamless part of the project not an 'add on') and in accordance with RTA urban design guidelines?
7. Is there consistency between the urban design report and the main body of the Environmental Assessment document



## Appendix A

### Visual impact checklist for routine and minor works

The following checklist should be completed by project managers or environmental officers to ascertain whether a more detailed visual assessment should be carried out for projects assessed under Part 5 assessment – routine and minor works (EIA-P05-1). If in doubt regarding the following questions consult the Urban Design Section.

### Visual impact checklist for routine and minor works

	Yes	No	N/A
Is the proposal adjacent to an important physical or cultural element or landscape? (heritage items and areas, distinctive or historic built form, National Parks, conservation areas, scenic highways etc)			
Does the proposal obstruct or intrude upon the character or views of a valued landscape or urban area. For example local significant topography, a rural landscape or a park, a river lake or the ocean or a historic or distinctive townscape or landmark?			
Does the proposal require the removal of mature trees or other significant stands of vegetation, either native or introduced?			
Does the proposal result in large areas of shotcrete visible from the road or adjacent properties?			
Does the proposal involve new noise walls or visible changes to existing noise walls?			
Does the proposal involve the removal or reuse of large areas of road corridor landscape, either verges or medians?			
Does the proposal involve significant changes to the appearance of a bridge (including piers, girders, abutments and parapets) that are visible from the road or residential areas?			
If involving lighting, will the proposal create unwanted light spillage on residential properties at night?			
Would any new structures or features being constructed result in over shadowing to adjoining properties or areas?			

### Recommended actions

If any of the criteria are answered 'Yes', an attempt should be made to avoid the impact through amending the proposed design.

If avoidance is not possible, a visual impact assessment should be considered in consultation with a member of the Urban Design Section and carried out in accordance with section 6 of this document.

## References

Beyond the Pavement urban design policy, process and principles 2009  
Bridge Aesthetics 2012  
Shotcrete Design Guideline 2005  
Noise Wall Design Guideline 2007  
Landscape Guideline 2008

## Responsibilities

The Senior Manager Urban Design is responsible for ensuring that this information is maintained.

## Related procedures, guidance notes and templates

### **Reference documents:**

RMS *Environmental Impact Assessment Guidelines*

### **Contact details:**

Senior Manager Urban Design  
RMS Centre for Urban Design  
02 8588 5780

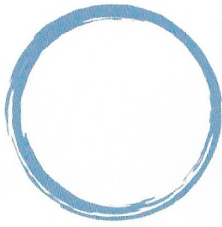
Senior Environmental Specialist (Planning & Assessment)  
RMS Environment Branch  
02 8588 5726

**Effective date:** 28/03/13 (Version 2.0)

**First published:** 24/03/09

**Review date:** 28/03/14





4/18 Barton Road  
Hawthorne, QLD,  
AUSTRALIA, 4171  
Tel: (+61) 407 076 577

## OD Hydrology

19 July 2018

Hunter Thoroughbred Breeders Association  
P.O. Box 538  
Scone NSW 2337

**Attn: Ross Cole**

**Re: Review of “Mount Pleasant Operation DA92/97 – Modification 3  
Environmental Assessment”**

Dear Ross,

The following provides a summary of key issues as determined under high-level review of the following documents:

- (1) NSW Department of Planning & Environment (2018), Mount Pleasant Coal Mine Extension of Mine Life (DA 92/97 MOD 3) Environmental Assessment Report, signed/dated 8/6/2018
- (2) Herron NF, Macfarlane C, Beringen H, Brandon C, Schmidt RK, Post DA, Henderson BL, McVicar TR, Lewis S and Buettikofer H (2018) Assessing impacts of coal resource development on water resources in the Hunter subregion: key findings. Product 5: Outcome synthesis for the Hunter subregion from the Northern Sydney Basin Bioregional Assessment. Department of the Environment and Energy, Bureau of Meteorology, CSIRO and Geoscience Australia, Australia.  
<http://data.bioregionalassessments.gov.au/product/NSB/HUN/5>.
- (3) HEC (2017), Mount Pleasant Operation Mine Optimisation Modification Site Water Balance Review. Appendix E to Mount Pleasant Operation Mine Optimisation Modification Environmental Assessment
- (4) Bengalla Mining Company supplementary submission dated 27 July 2017.

The following provides a summary of key review findings in respect to the proposed modification and information presented in the above documents.

## **Key points from review include:**

### **(1) Significant gaps/ommissions/oversights in what has been considered by the Dept in the EAR:**

- There is no discussion or mention of consideration or assessment of potential groundwater impacts within Departmental EAR. Groundwater impacts are a potentially significant issue for local and regional surface and groundwater behaviour, particularly in regards cumulative impacts of ongoing and increasing mine activity in the area (see section below re: regional impact assessment (ref 2 above))
- There is no discussion or request for assessment of the cumulative impacts on surface and groundwater in local watercourse and aquifers, or the wider Hunter surface water and hydrogeological characteristics.
- There has ben no meaningful critique or independent verificaiton of the risk of unauthorised discharge from the FEA which the EPA specifically references as an area of concern and recommended that “all discharges from the FEA be contained onsite”.
- No independent verification of proposed water supply reliabilty and risk of shortfall. Total ave demand. Section 4.3 of the HEC water report openly describes significant risk of significant periods of opertional disruption (i.e. up to 2 years of lost operation total out of the 6 planned). Dept EAR makes no mention.
- Conditions of consent remain the normal set of generally high-level statements for the development of management plans and response plans. No specific targets or defined performance criteria.

### **(2) Key issues for project risk**

- There is a basic lack of robust understanding of the real risk of unauthorised discharge to Sandy Creek and other water courses. Nominally of the order of 5-10% over the 6-years of proposed extension. Indicates risk of either (i) off-site impacts (e.g. cost/operational impact on Bengalla) and/or (ii) operational disruptions (i.e. storage of water in pits) which have likely not been included in financial/economic assessment (suggest forwarding to MJA to comment).
- Based on the available water balance information, the project runs a high risk of experiencing periods of lost operation over the 6 years of extension – with HEC reporting credible climatic conditions under which 2 years out of 6 would comprise lost operastion due to water supply shortfall. This has likely not been included in financial/economic analyses (suggest forwarding to MJA to comment). The EA includes no valid supply shortfall mitigation or contingency plan.
- No additional groundwater assessment has been reported since original 1997 EIS. “Comptemporay groundwater modelling”is described as having been commissioned but no further information is provided apart from that the model will be consistent with the Australian Groundwater Modelling guidelines (discussed further below).

### **(3) Material change to surface water management system**

- MOD3 EA documents consistently state that there are no significant changes to the approved water management systems at site, however key components of the system now have fundamentally different functions, and therefore design and assessment requirements, than under the approved plan.
- From a water management perspective, ED2 no longer performs the purpose/function of an 'Environmental Dam' but is now simply a 'sediment dam' and is no longer a component of the Mine Water Management System but rather the Clean Water Diversion System (as defined in 1997 EIS Section 6.4.3 Water Pollution Management).
- With ED2 now a clean water dam, the original function of the environmental dam would now need to be provided by the fines emplacement embankment (i.e. interception, capture and storage of mine water within the mine water management system - no external discharge). As such, the fines wall/embankment would need to be designed to a similar standard and dam type as the original environmental dams.
- In the 1997 EIS, Environmental Dams were described as being "impermeable" to prevent off-site discharge as well as featuring specific components of dam design to ensure minimisation, interception and collection of any seepage for pumping to the mine water dam.
- However Table 1 of MOD3 EA (page 7) states that the fines emplacement walls are still to be constructed using coarse rejects (as they were in the 1997 EIS) - i.e. seepage of fines area leachate/runoff from the fines emplacement through the embankment and into ED2, with (due to lower design standards associated with being in the clean water system) subsequent likely discharge to Sandy Creek.
- The only reference to seepage management is a broad, conceptual statement of "Any seepage from the Fines Emplacement Area is to be captured in a subsurface seepage collection system located at the toe of the Fines Emplacement Area embankment and will be pumped back to the fine rejects storage area" without any reference to design standards, criteria or detail of operation and potential risks.
- Also, no real detail re likelihood of spill from the fines emplacement embankment - only reported understanding of spill risk is reliant on a model which while incorporating daily rainfall data does not explicitly assess spill risk against design rainfall events.
- If seepage/spill of fines leachate/runoff occurs into ED2, the MOD3 proposed design criteria is now as a sediment dam only (as it is now in the 'clean' water diversion system), with a high probability (of the order of 50%) of external discharge over the project life.
- Therefore, with no clear change to design standards/features of the fine emplacement wall, protection from external discharge from the fines

emplacement appears wholly reliant on the design and operation of a "subsurface seepage collection system at the toe of the Fines Emplacement Area embankment" which hasn't really been described. Therefore current info requires an assumption that system will be robust, reliable and sufficient to ensure no movement of fines reject water

#### **(4) Material changes to effects on groundwater**

Noting that there has been no updated groundwater assessment reported since 1997 EIS assessment, all issues previously raised remain relevant and valid, including those reported by Bengalla Mining Company in their supplementary submission dated 27 July 2017, including the following key outcomes of an independent review:

##### **Key modifications to mining**

AGE list the following key mining differences (and consequent effect on groundwater impacts) between the MOD3 proposal and the approved plan:

- The 1997 EIS proposed mining from four different pits over a 21-year period. MOD3 proposes to reduce this to a single pit.
- The timing of extraction from the proposed MOD3 pit is also different to the 1997 pit progression as the mining will be via truck and shovel rather than dragline methods.

And conclude that *"These changes proposed to the mine plan will change the predicted impacts to groundwater resources."*

##### **Comparison of proposal against Aquifer Interference Policy (AIP) requirements**

The AIP provides a set of criteria for assessing acceptable levels of impact on groundwater systems, and AGE undertook comparison of the MOD3 proposal against the requirements of the AIP. Key outcomes include:

- *Predict the total amount of water that will be taken from each connected groundwater or surface water source on an annual basis as a result of the activity?* **Not addressed**
- *Predicted the total amount of water that will be taken from each connected groundwater or surface water source after the closure of the activity?* **Not addressed**
- *Described how and in what proportions this take will be assigned to the affected aquifers and connected surface water sources?* **Not addressed**
- *Determined if there are sufficient water entitlements and water allocations that are able to be obtained for the activity?* **Not addressed**
- *Considered the rules of the relevant water sharing plan and if it can meet these rules?* **Not addressed**
- *Considered the effect that activation of existing entitlement may have on future available water determinations?* **Not addressed**
- *Developed a strategy to account for any water taken beyond the life of the operation of the Project?* **Not addressed**

- *Predicted the total amount of water that will be taken from each connected groundwater or surface water source after the closure of the activity?* **Not addressed**

In total, based on direct comparison of the proposal against AIP requirements, AGE found the project either only partially addressed, or did not address at all, seventeen (17) of the twenty-one (21) applicable requirements.

#### **Compliance against National Australian Groundwater Modelling guidelines:**

AGE undertook detailed review of the “construction, calibration and uncertainty of groundwater models provided in the 1997 Environmental Impact Statement for the Mount Pleasant project against the current Australian groundwater modelling guidelines”. The guidelines provide a consistent industry framework for reviewers to assess whether a model is ‘fit for purpose’.

Key outcomes of the independent review undertaken by AGE include:

- *Is the conceptual model based on all available data, presented clearly and reviewed by an appropriate reviewer?* **No**
- *Does the model design conform to best practice?* **No**
- *Is the model calibration satisfactory?* **Unclear**
- *Do the model predictions conform to best practice?* **Not currently**

With the overarching outcome regarding validity of the reported groundwater modelling in supporting the mine modification application comprising:

- *Is the model fit for purpose?* **Not currently**

#### **(5) Cumulative/regional impact**

- Herron et al o their regional impact assessment indicate potentially significant risks to hydrological conditions, with the Mt Pleasant project area and surrounding catchment located within specifically delineated zones of potential change (reproduced in Figure 1 below, noting Mt Pleasant is located to the west and slightly north of Muswellbrook).
- Directly relevant assessment outcomes:
  - Modelling indicates potentially large changes in flow regime in Wyong River, Loders Creek, Saddlers Creek, Wollar Creek and a number of ephemeral creeks, with some of the areas predicted to be impacted the most (eg. “50% chance of exceeding an increase of more than 200 low flows days per year”) associated with the Mt Pleasant and surrounding projects.
  - Changes in water availability in the Hunter Regulated River at Greta are very likely (greater than 95% chance) to exceed 5 GL per year, but very unlikely to exceed 12 GL per year, over the period 2013 to 2042 – with implications for water security and supply reliability.





**Figure 1 The zone of potential hydrological change**

I trust the information is useful and if you wish to discuss any or clarify anything further, please do not hesitate to call.

Yours sincerely,

**Owen Droop**

*Director/Principal Water Resources Engineer*