

MANGOOKLA COAL

Modification 6 - Response to Submissions

Prepared for Mangookla Coal Operations Pty Ltd | August 2013



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Mangoola Coal Modification 6

Final

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Table of Contents

Chapter 1	Introduction	1
1.1	Overview	1
1.2	Current operations	1
1.3	Proposed modification	1
1.4	Proponent	2
1.5	Approval process	3
Chapter 2	Submissions summary	5
2.1	Introduction	5
2.2	Submissions received	5
2.3	Response methodology	6
Chapter 3	Agency submissions	9
3.1	Division of Resources and Energy	9
3.1.1	Changes to final landform	9
3.1.2	Functional domains and rehabilitation objectives	10
3.1.3	Rehabilitation management plan	12
3.2	Department of Primary Industries	12
3.2.1	Office of Water	12
3.2.2	Office of Agricultural Sustainability and Food Security	15
3.2.3	Fisheries NSW	15
3.3	Office of Environment and Heritage	16
3.4	NSW Health	16
3.4.1	Noise	16
3.4.2	Air quality	17
3.4.3	Social	21
3.5	Environment Protection Authority	21
3.5.1	Noise	21
3.5.2	Air quality	24
3.5.3	Surface water	25
3.6	Roads and Maritime Services	26
Chapter 4	Local government submissions	27
4.1	Introduction	27
4.2	Social impacts	27
4.3	Biodiversity impacts	27
4.4	Amenity impacts	28
4.5	Final landform and rehabilitation	28
4.6	Surface water discharges	29

Table of Contents *(Cont'd)*

4.7	Voluntary planning contributions	30
Chapter 5	Individual and community/special interest group submissions	31
5.1	Noise and vibration	31
5.1.1	Assessment approach – noise	31
5.1.2	Assessment approach – blast vibration and overpressure	35
5.1.3	Noise impacts	38
5.1.4	Blast vibration and overpressure impacts	39
5.1.5	Traffic noise (road and rail)	40
5.1.6	Cumulative impacts	41
5.1.7	Changes to the noise management zone	41
5.1.8	Changes to the acquisition zone	42
5.2	Air quality	42
5.2.1	Assessment approach – dust impacts	43
5.2.2	Assessment approach - blast fume impacts	45
5.2.3	Predicted dust impacts	46
5.2.4	Cumulative impacts	47
5.2.5	Greenhouse gas impacts	48
5.3	Health	48
5.4	Traffic	52
5.5	Surface water	53
5.5.1	Discharges under the Hunter River Salinity Trading Scheme	53
5.5.2	Water quality impacts	53
5.5.3	Water supply	54
5.6	Social aspects	55
5.6.1	Community infrastructure and services	55
5.6.2	Sense of community and social amenity	57
5.7	Agriculture	58
5.7.1	Impacts to downstream agricultural users	58
5.7.2	Agricultural land uses	58
5.8	Rehabilitation	59
5.9	Visual	60
5.10	Approval process and scale of modification	61
5.11	Consultation	62
5.12	Property values	62
5.13	Groundwater	64
5.13.1	Groundwater assessment	64
5.13.2	Final void water levels and quality	65
5.14	Economic	66

Table of Contents *(Cont'd)*

5.15	Cumulative impacts	66
5.15.1	Diversity of regional economy	66
5.15.2	Strain on community infrastructure and services	69
5.16	Project justification	69
5.16.1	Extraction rate increase	69
5.16.2	HRSTS discharges	70
5.16.3	On site gravel production	71
Chapter 6	Updated statement of commitments	73
Abbreviations		87
References		

Appendices

A	Matters raised in submissions	
---	-------------------------------	--

Tables

1.1	Overview of proposed modification	2
3.1	Rehabilitation domain objectives	11
5.1	Contribution of different sources to coarse and fine particulate matter	50
5.2	Median house and unit sales prices in Denman and Muswellbrook 2004-2012 (realestate.com.au)	63
6.1	Proposed amendments to the statement of commitments	73
A.1	Matters raised in submissions	A.1

Figures

1.1	Regional context	4
2.1	Origin of submissions	7
2.2	Key matters raised - individual and community/special interest groups	8
5.1	Noise and vibration matters raised	31
5.2	Residential receptors and land ownership	36
5.3	Air quality matters raised	43

1 Introduction

1.1 Overview

Mangoola Coal Operations Pty Limited (Mangoola Coal) operates the Mangoola Coal mine, an open-cut coal mine, approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman (refer to Figure 1.1). Project approval 06_0014 (PA 06_0014) for the Mangoola Coal project was originally granted in June 2007 under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

Mangoola Coal proposes to modify PA 06_0014 (Modification 6) under Section 75W of the EP&A Act. An environmental assessment (EA) was prepared by EMGA Mitchell McLennan Pty Limited (EMM) dated 23 May 2013, on behalf of Mangoola Coal, to accompany the modification application. The EA describes the proposed modification in detail, assesses its potential impacts and proposes measures that will be implemented, subject to approval, to avoid, minimise and/or offset potential impacts. The EA was publicly exhibited between 29 May 2013 and 28 June 2013, and submissions invited.

This response to submissions report has been prepared by EMM on behalf of Mangoola Coal to respond to the matters raised in the submissions.

1.2 Current operations

PA 06_0014 includes approval for Mangoola Coal to extract up to 10.5 million tonnes per annum (Mtpa) run-of-mine (ROM) coal over a period of 21 years.

Open-cut mining commenced at Mangoola Coal in September 2010. Extraction is being undertaken in the Northern Pit.

1.3 Proposed modification

The key modification sought is an increase in the maximum rate of extraction from 10.5 Mtpa ROM coal to 13.5 Mtpa ROM coal, through efficiencies already realised at the coal handling and preparation plant (CHPP) and relatively minor alterations to site infrastructure. Associated with this change are the following key aspects:

- increase in equipment numbers to support increased mining intensity (though the operation will remain a truck and shovel/excavator operation);
- increase in employee numbers to support additional equipment and operational needs and requirements. Up to 150 additional employees, employed over the next few years to meet peak operational capacity and continue to maintain a safe and efficient operation. Additionally, up to 90 full-time equivalent contractors may also be required and are considered in this assessment;
- amendment to blasting conditions to increase frequency of blasting from five blasts per week to six blasts per week and removing the condition relating to maximum instantaneous charge (MIC);
- re-define one temporary ROM stockpile to a permanent (life-of-mine) ROM stockpile;
- utilisation of suitable mined waste rock for on-site gravel production. Up to 50,000 tonnes per annum of gravel may be crushed for use on site; and

- discharge of saline water to the Hunter River under the rules and regulations of the Hunter River Salinity Trading Scheme (HRSTS).

A comparison of the current operations and proposed modification is summarised in Table 1.1.

Table 1.1 Overview of proposed modification

Aspect	Current operations	Proposed modification
Extraction limit	10.5 Mtpa.	13.5 Mtpa.
Project approval term	21 years (to Nov 2029).	No change.
Operating hours	Seven days per week, 24 hours per day.	No change.
Number of employees (operation only)	Operational workforce of 300 personnel.	Increase from 300 operational employees to 450 full time equivalent operational employees at peak production, plus up to 90 contractors (as required).
Mining methods	Open-cut truck and shovel operation.	No change to method, but a change in the total equipment fleet.
Mining areas	Within approved project disturbance boundary.	No change.
Infrastructure	Infrastructure comprises: • CHPP and associated infrastructure; • Northern Access Road and Wybong Road intersection; • rail infrastructure; • administration and employee facilities; • electrical power reticulation; • telecommunication cables; • water supply and sewage systems; • tailings and water management infrastructure including the Hunter River Pump Station and Hunter River Pipeline; • workshop and refuelling facilities; • lighting; and • explosives storage.	The following alterations to infrastructure are sought under the proposed modification: • Approval for re-defining one temporary ROM stockpile to a permanent (life-of-mine) ROM stockpile. • Approval for discharge of site water to the Hunter River under the rules and regulations of the HRSTS utilising the existing Hunter River Pipeline and Hunter River Pump Station. • Minor additional water management infrastructure such as pumping equipment at the PWD and relocation/realignment of some small sediment dams would be required within the approved project disturbance boundary. • Approval for utilisation of suitable mined waste rock for on-site gravel production, including crushing of up to 50,000 tpa of gravel for use on site.
External coal transport	Transport of coal via rail, maximum of 10 trains per day.	No change in maximum daily number of trains.

1.4 Proponent

Since lodgement of the EA, the proponent's name has changed from Xstrata Mangoola Pty Limited to Mangoola Coal Operations Pty Limited. This has occurred following the merger of Glencore and Xstrata, which was completed on 2 May 2013 creating one of the world's largest global diversified natural resource companies. The name of the proponent is now Mangoola Coal Operations Pty Limited.

1.5 Approval process

An application to modify PA 06_0014 was submitted to the Department of Planning and Infrastructure (DP&I) on 27 May 2013. Accompanying the application was the EA and supporting technical reports. The EA and technical reports were prepared in accordance with the Director-General requirements issued by the Director-General for Planning and Infrastructure on 3 December 2012.

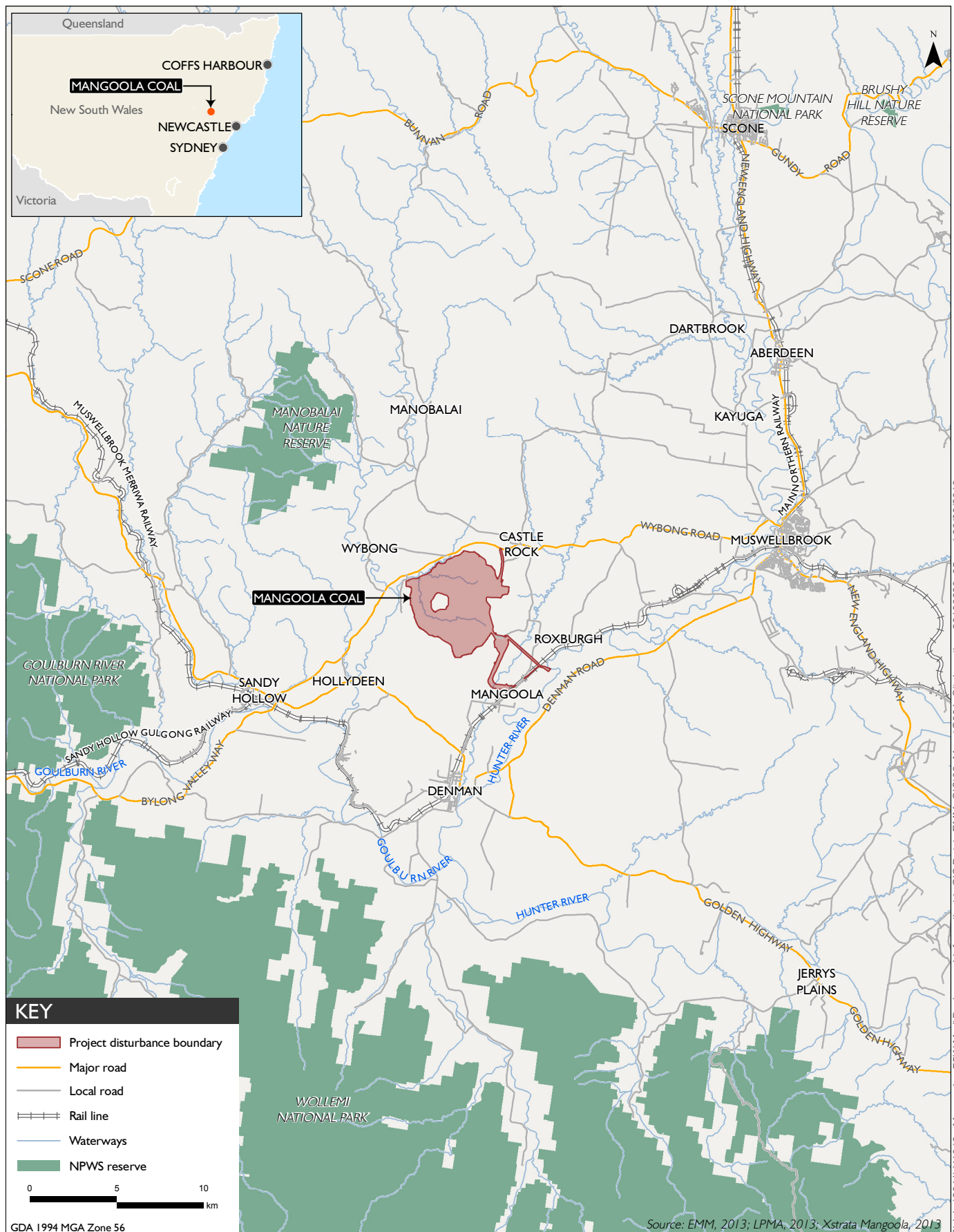
The EA and technical reports were placed on public exhibition for 31 days between 29 May 2013 and 28 June 2013.

A total of 75 submissions were received on the proposed modification. Of these, 56 submissions were received from individuals, 11 from community/special interest groups, seven from state government agencies, and one from local government.

All of the submissions received from individuals and all but one submission received from community/special interest groups objected to the proposed modification. None of the submissions from state government agencies or local government objected to the proposed modification. A summary of the submissions received and matters raised are provided in the table in Appendix A.

The determining authority for the proposed modification is the NSW Minister for Planning and Infrastructure; although in this instance, as more than 25 objections have been received from the public, the determination will be delegated to the NSW Planning Assessment Commission (PAC).

The DP&I will prepare the Director-General's Environmental Assessment Report and conditions if approval is recommended.



Regional context

Mangoola Coal Modification 6 - Response to Submissions

Figure I.1

2 Submissions summary

2.1 Introduction

This chapter summarises submissions received on the EA for the proposed modification and the approach adopted to respond to matters raised. All submissions are available on the DP&I's website:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5732

2.2 Submissions received

Submissions were received from the following government authorities, community/special interest groups, and individuals:

- NSW government authorities (seven submissions):
 - Department of Trade and Investment, Regional Infrastructure and Services :
 - Division of Resources and Energy (DRE);
 - Department of Primary Industries (DPI) (submissions received from three agencies) – Office of Water (NOW), Office of Agricultural Sustainability and Food Security and Fisheries NSW;
 - Office of Environment and Heritage (OEH);
 - NSW Health – Hunter New England Local Health District;
 - Roads and Maritime Services (RMS); and
 - Environment Protection Authority (EPA);
- local government – Muswellbrook Shire Council (MSC) (one submission);
- community/special interest groups (11 submissions):
 - Hunter Communities Network;
 - Hunter Equine;
 - Hunter Thoroughbred Breeders Association;
 - Hunter Environmental Lobby Inc.;
 - Redman Park Pty Ltd;
 - Rivers SOS;
 - Inglewood Vineyards;
 - Upper Hunter Tours;

- Darley;
- Construction Forestry Mining and Energy Union;
- Wybong Action Group; and
- individuals (56 submissions).

The origin (local government area) of individual and community/special interest group submissions is shown in Figure 2.1. A summary of key matters raised is shown in Figure 2.2.

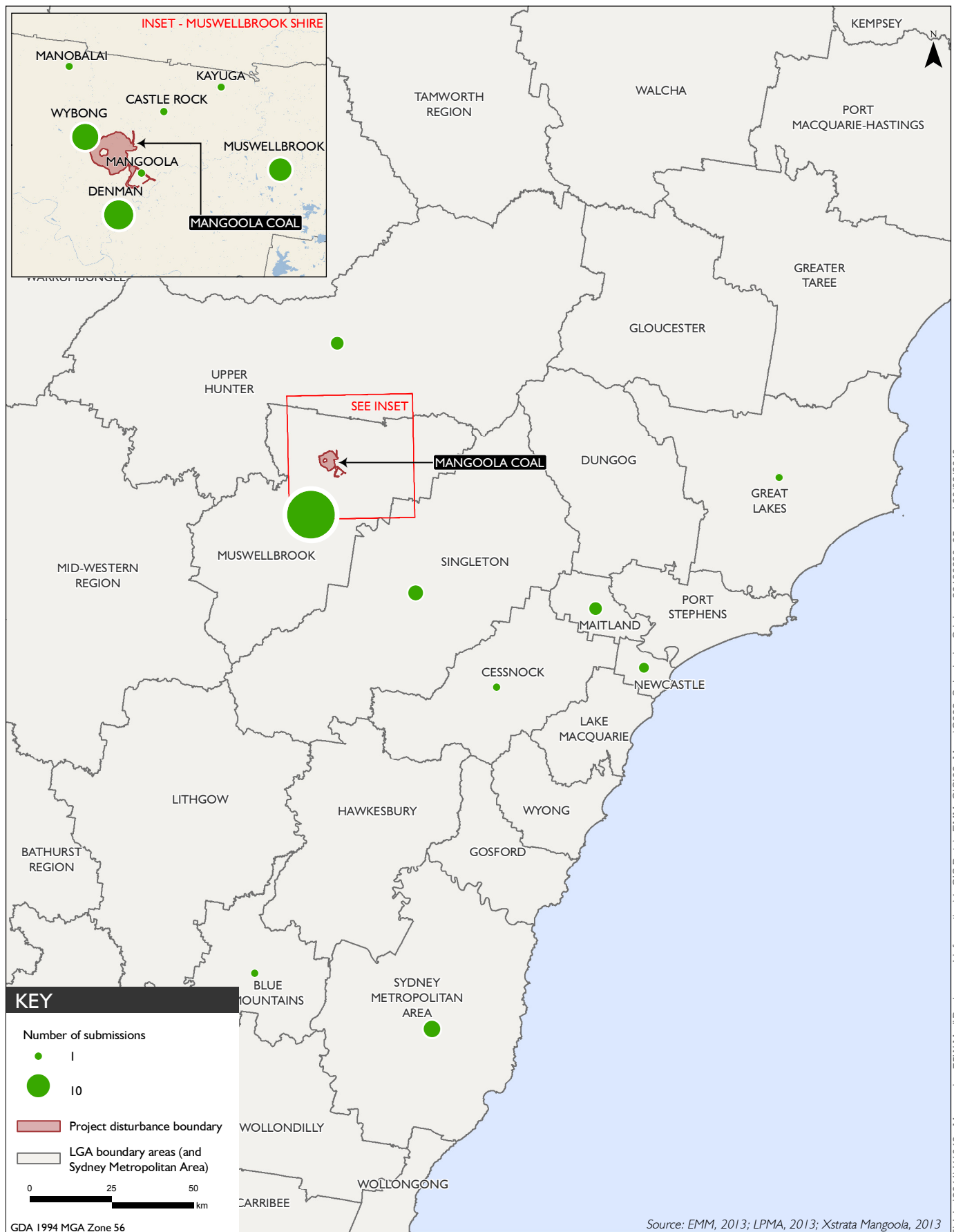
Mangoola Coal acknowledges and thanks all stakeholders for taking the time to review the EA, and prepare and submit a response.

2.3 Response methodology

All submissions received were reviewed and matters raised summarised into the table presented in Appendix A.

Submissions are grouped under the four categories described above and identified with a prefix: I for individuals, C for community/special interest groups, LG for local government, and A for state government agencies. Where matters raised in submissions required a response, each matter was assigned a category, such as 'water' or 'air quality', as well as an identification code representing the respondent and matter number. For example, C-6.1 refers to the first matter raised in community/special interest group submission number six.

A response to the substantive issues raised in submissions has been prepared by EMM, Mangoola Coal and the technical specialists that undertook the assessments in the EA. Responses are provided in the following chapters.



Origin of submissions - individual and community/special interest groups

Mangoola Coal Modification 6 - Response to Submissions

Figure 2.1

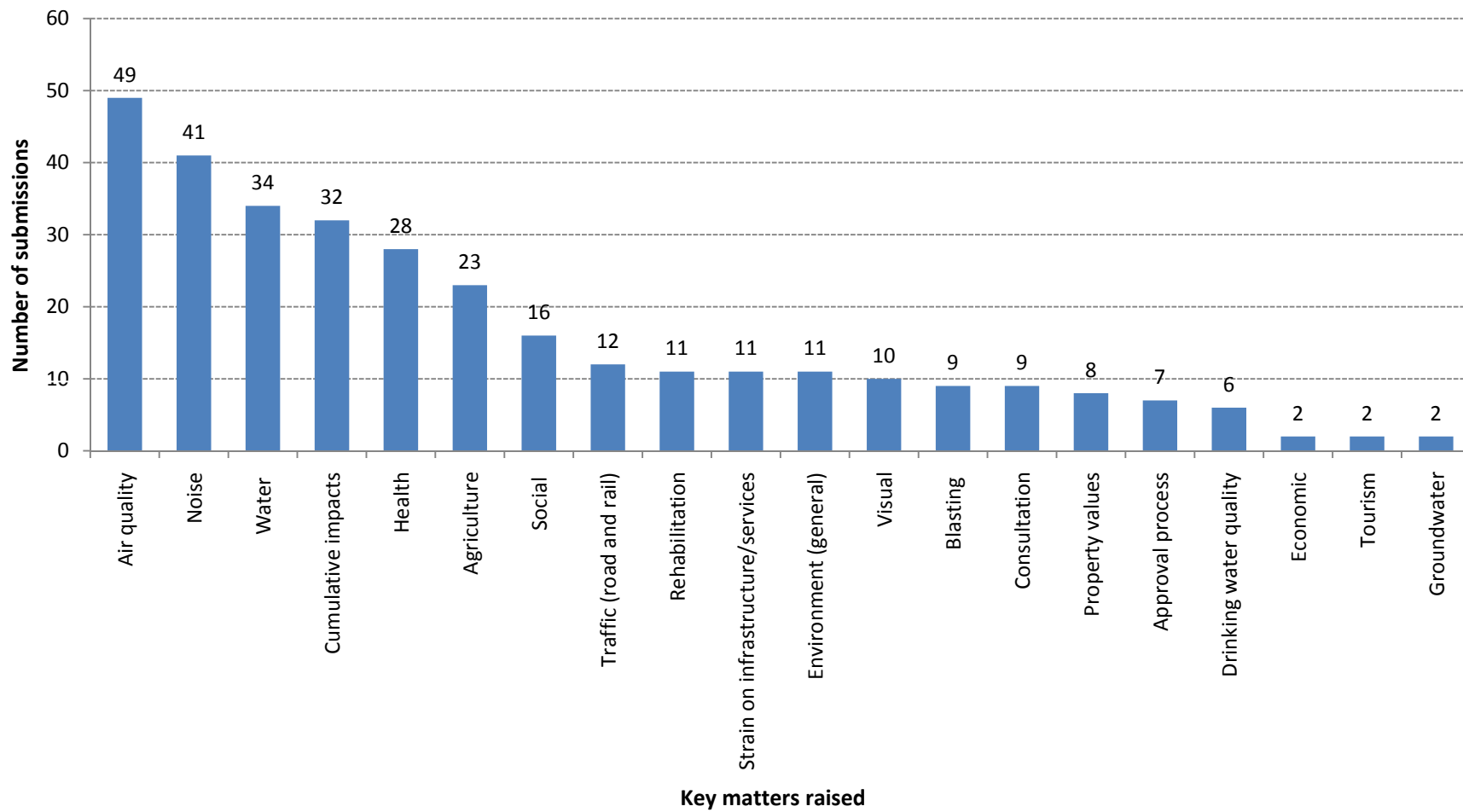


Figure 2.2 Key matters raised - individual and community/special interest groups

3 Agency submissions

3.1 Division of Resources and Energy

DRE raised matters in its submission regarding rehabilitation and mine closure. Mangoola Coal personnel met with DRE on 13 August 2013 to discuss the comments raised by DRE regarding its submission on the proposed modification. The objective of the meeting was to confirm with DRE the appropriate stage and mechanism to address the recommendations in their submission. DRE representatives confirmed that the appropriate mechanism to address its recommendations is primarily the mining operations plan (MOP). Mangoola Coal's current MOP expires in December 2013 and a new MOP will need to be prepared and submitted. Should the proposed modification be approved, the MOP will be updated to reflect conditions of PA_06_0014 as modified, and DRE's recommendations.

Information responding to matters raised by DRE is provided in the sections below.

3.1.1 Changes to final landform

DRE stated that the EA did not address rehabilitation activities as a result of increased coal extraction and changes to the landform, or stockpiling of ROM coal. The following were requested to be assessed prior to approval:

- impact of the final landform on surface water management to reduce the potential for soil erosion and reliance on infrastructure such as drop structures;
- impact to rehabilitation as a result of changes to the rehabilitation schedule;
- revise the final landform to make the final landform more consistent with the surrounding landscape; and
- assess the potential for spontaneous combustion related to stockpiling of ROM coal and identify management actions to minimise the risk and how this would be monitored.

Since commencement of mining activities in September 2010, Mangoola Coal has undertaken rehabilitation in accordance with a Rehabilitation and Offset Management Plan (ROMP) as required under Schedule 3, Condition 42 of PA 06_0014, and an approved MOP as required as condition of Mangoola Coal's Mining Lease (ML) 1626. Rehabilitation activities and progress is reported as part of the Annual Environmental Management Report (AEMR).

As described in Sections 4.11 and 16.8 of the EA, the proposed modification may result in minor changes to the approved final landform, being progression of rehabilitation at a faster rate (due to the increased maximum rate of extraction), and a greater portion of the overburden emplacement area established at the maximum height of 240 m RL. Mined areas would continue to be progressively rehabilitated commensurate with disturbance rates and in accordance with PA 06_0014 and the approved conceptual final landform (as described in the ROMP and MOP) as soon as practicable following disturbance, and generally in accordance with the mining sequence presented in the EA (Figures 4.1 – 4.3 in the EA).

No change is sought to the approved conceptual final landform described in the ROMP and MOP, which have been prepared to the satisfaction of the Director-General of the DP&I and approved by DRE respectively. However, as described in Section 16.8 of the EA, Mangoola Coal remains committed to continual improvement and is currently working to create a more natural landform design to achieve sustainability outcomes, create a more aesthetic and integrated landscape, improve habitat values and restore ecological function. The process of sustainable landform design requires consultation with appropriately qualified specialists to ensure the final design (inclusive of emplacement design, with specific reference to vertical relief and drainage) is able to effectively manage runoff events, minimise erosion, sustain plant growth and maximise use of natural resources for growth medium and habitat restoration. The final landform also needs to be safely constructed following site procedures and utilising site equipment and three-dimensional modelling software where possible.

Mangoola Coal is trialling sustainable landform design enhancements under current operations which, if viable may be implemented across the site where feasible. The changes would be in relation to the shaping of the landform (ie undulations instead of flat surfaces where appropriate) and the way by which the surface water will reach its eventual destination (eg gullies and ponds/riffles created to look like a more natural part of the landscape). The sustainable landform design will not require amendment to the approved maximum landform height, approved project disturbance boundary, or general surface water catchments. Assessment of the trial will be communicated with DRE, DP&I and other stakeholders as part of the AEMR and ongoing consultation with relevant stakeholders. If required, Mangoola Coal will update the MOP to reflect any changes to emplacement design, vertical relief and drainage resulting from successful sustainable landform trials.

Stockpiling of ROM coal at Mangoola Coal includes the implementation of the existing spontaneous combustion management plan to minimise risk associated with spontaneous combustion, monitor potential causes of spontaneous combustion events, and actions that can be implemented in the event of spontaneous combustion occurring. The proposed modification does not require amendment to this management plan.

3.1.2 Functional domains and rehabilitation objectives

DRE stated that the EA did not provide a sufficient description of the Mangoola Coal's functional domains including tailings dams, waste emplacements, final voids, infrastructure areas, and did not describe whether the specific performance objectives and standards of each domain have changed as a result of the proposed modification. DRE required the following issues to be addressed prior to approval:

- identify the functional domains of the project and describe the rehabilitation objectives for each domain in light of final landform changes; and
- propose strategic completion criteria for each domain having regard to the various phases of rehabilitation (ie decommissioning, landform establishment, growth medium development, ecosystem establishment, ecosystem development) and outline the proponent's commitment to progressive rehabilitation.

Mangoola Coal's ROMP and Landscape Management Plan have been prepared to the satisfaction of the Director-General of the DP&I and define the mine closure domains and rehabilitation objectives for each domain. The approved domains and rehabilitation objectives are in Table 3.1. The proposed modification will not result in a change to either the domains or the rehabilitation objectives of each domain.

Table 3.1 Rehabilitation domain objectives

Domain	Domain objectives
1 – Mining Infrastructure Area	• All non-heritage infrastructure removed to ensure the site is safe and free of hazardous materials.
2 – Rail loop	• All non-heritage infrastructure removed to ensure the site is safe and free of hazardous materials.
3 – Open cut mine	• Landform suitable for final land use and compatible with surrounding landscape as sustainable native ecosystem.
4 – Final void	• The area is safe and does not present a hazard to people or the environment.
5 – Anvil Creek realignment	• Landform suitable for final land use and compatible with surrounding landscape as sustainable native ecosystem.
6 – Conservation offset area	• Soil - Provide soil chemical and physical properties that are comparable with the reference sites, or alternate growth medium that is suitable for the establishment and maintenance of the selected vegetation species. • Native ecosystem established. • The area does not present a bushfire hazard to surrounding areas. • Revegetation of 172 hectares of current grasslands with native treed vegetation. • Revegetation/Regeneration is sustainable for the long term and only requires maintenance that is consistent with analogue sites. • Minimal active accelerated erosion.
7 – Habitat enhancement offset area	• Revegetation of 342 hectares of current grasslands with native treed vegetation. • Revegetation/regeneration is sustainable for the long term and only requires maintenance that is consistent with analogue sites. • Minimal active accelerated erosion.
8 – Sustainable agriculture offset area	• To allow for managed grazing of these areas while establishing 45 hectares of treed vegetation in the form of shelter belts. • Revegetation/Regeneration is sustainable for the long term and only requires maintenance that is consistent with analogue sites. • Minimal active accelerated erosion.
9 – Northern biodiversity corridor	• Revegetation of 357 hectares of current grasslands with native treed vegetation. • Revegetation/Regeneration is sustainable for the long term and only requires maintenance that is consistent with analogue sites. • Minimal active accelerated erosion.
10 – Western biodiversity corridor	• Revegetation of 178 hectares of current grasslands with native treed vegetation. • Revegetation/Regeneration is sustainable for the long term and only requires maintenance that is consistent with analogue sites. • Minimal active accelerated erosion.

Preliminary completion criteria have been developed for each domain, and are described in the ROMP. Mangoola Coal's Landscape Management Plan includes a conceptual mine closure plan and final void management plan.

As required by PA 06_0014, detailed mine closure and final void management plans will be developed within five years of mine closure and include detailed completion criteria for each domain having regard to the various phases of rehabilitation identified by DRE. Mangoola Coal will review the MOP to ensure it reflects the approved rehabilitation domains and objectives.

3.1.3 Rehabilitation management plan

Recommended approval conditions provided by DRE required the preparation and implementation of a rehabilitation plan which:

- addresses all aspects of rehabilitation and mine closure, including post mining land use assessment, rehabilitation objectives, completion criteria and rehabilitation monitoring;
- include a final landform design sympathetic with the surrounding topography of the area and considers natural drainage design and relief patterns and principles; and
- include a life of mine tailings strategy prepared by a team of suitably qualified and experienced persons which addresses all aspects of life of mine tailings incorporating design, operation, water balance and decommissioning including rehabilitation and closure.

Mangoola Coal already meets the above requirements through its current project approval conditions, including requirements for an approved ROMP and MOP, as described above. No substantial changes to the final landform or progressive rehabilitation are proposed. Therefore, no new conditions are required.

Mangoola Coal will review the MOP to reflect any relevant changes resulting from successful sustainable landform trials, described in Section 3.1.1.

The proposed modification does not include any changes to the management of tailings and reject emplacement. Therefore the management of tailings and reject emplacement will continue in accordance with the approved MOP, and no new conditions are required.

3.2 Department of Primary Industries

3.2.1 Office of Water

The NOW provided comments in its submission on groundwater, licensing requirements, water supply contingency measures and recommended approval conditions, and stated in its submission that “the Office of Water has no objections or further requirements for the modification proposal”.

i Groundwater

NOW states in its submission that the existing commitments and conditions under PA 06_0014 relating to groundwater management are considered appropriate for the management of the proposed modification, and that the proposed modification does not alter Mangoola Coal’s existing licensing requirements under the *Water Act 1912* and *Water Management Act 2000*. Their submission included an assessment of water take against the Aquifer Interference Policy. No specific issues were raised in relation to the proposed modification.

No further groundwater issues were raised in relation to the proposed modification.

ii Licensing requirements

NOW stated in its submission that the proponent holds high security and general security category access licences from the Hunter Regulated River Water Source and aquifer category access licences from the Wybong Creek Water Source, however it has no records of the proponent holding any unregulated category access licences from the Wybong Creek Water Source.

Mangoola Coal holds 1,349 share components within the Wybong Creek Water Source out of a total of 7,942 ML allocated to surface water licences (at the commencement of the water sharing plan). Of the 1,349 share components, at least 685 are unregulated units (Appendix 1 of Mangoola Coal's Water Management Plan).

Mangoola Coal will continue to liaise with NOW to ensure that all water taken is appropriately accounted for. It is noted that the predicted drawdown from the Wybong Creek catchment, which is approved and licensed under current operations, is not predicted to change as a result of the proposed modification.

NOW stated in its submission that the existing commitments and requirements of PA 06_0014 will continue to manage groundwater during mining operations.

No further licensing issues were raised in relation to the proposed modification.

iii Water supply contingencies

NOW noted and supported that Mangoola Coal is investigating contingency measures for water supply shortfalls during periods of drought, and that potential contingency measures include the transfer of existing licences held for the Hunter Regulated River Alluvial Water Source by Mangoola Coal for mining purposes.

No issues regarding contingencies were raised in relation to the proposed modification.

iv Recommended approval conditions

NOW recommended the following conditions, should the proposed modification be approved:

1. The proponent is required to estimate the volumes of water taken from both the surface water covered by the *Water Sharing Plan for the Wybong Creek Water Source* and the *Water Sharing Plan for the Hunter Regulated River Water Source* and obtain sufficient licensed entitlement to account for take from all water sources managed under the *Water Management Act 2000*.

(Note: Actual allocation may vary from time to time due to changes in available water determination. The NSW Office of Water has no records of proponent holding an unregulated category access licences from the Wybong Water Source. The proponent is required to account for all surface water taken from the Wybong Water Source in excess of the harvestable rights and exemptions under the *Water Management Act 2000*).

The proposed modification will not result in a change to Mangoola Coal's water take. As part of its annual review of the site water balance Mangoola Coal estimates the volumes of surface water from relevant water sharing plans required for mining purposes in the forthcoming year. The annual review ensures that operations are adequately licensed.

Surface water take from the catchments covered under the *Water Sharing Plan for the Wybong Creek Water Source* and the *Water Sharing Plan for the Hunter Regulated River Water Source* is approved under current operations. No changes to volumes of water take are proposed as a result of the proposed modification. Mangoola Coal holds water access licences for both the Hunter River Unregulated and Alluvial water sources and Wybong Creek Water Source.

Mangoola Coal holds 1,349 share components out of a total of 7,942 ML allocated to surface water licences (at the commencement of the water sharing plan) within the Wybong Creek Water Source. Of the 1,349 share components, at least 685 are unregulated units (Appendix 1 of Mangoola Coal's Water Management Plan).

Under PA 06_0014, Mangoola Coal is not permitted to use water from the Wybong Creek Water Source for mining, unless the water is collected as an incidental result of approved mining activities within the project disturbance area or used for revegetation purposes associated with the implementation of the Offset Strategy. Current operations do not use water from the Wybong Creek Water Source except under harvestable rights provisions, if the water has come into contact with coal (saline water), or if the water is captured within the saline or dirty water dams on site (which fall within the excluded works exemptions). Water for the mine is extracted from the Hunter River. No changes are sought to these licence provisions under the proposed modification.

Therefore, this proposed condition is not required.

2. The proponent is required to obtain all necessary licences and approvals under the *Water Act 1912*.

Mangoola Coal's current operations are in accordance with licences and approvals under the *Water Act 1912*. The proposed modification will not alter licensing requirements under the *Water Act 1912*. Therefore, no additional condition is required.

3. The proponent is required to hold or retire sufficient licensed entitlement to cover the perpetual take of water flowing into the final void (and out of the evaporative sink) at the cessation of mining.

Mangoola Coal's Final Void Management Plan (part of the Landscape Management Plan) requires assessment of the final void as part of the detailed mine closure planning within five years of closure. This will address the requirements of Condition 43 of PA 06_0014, which includes developing design criteria and specification of the final void based on verification of groundwater modelling predictions, re-assessment of the post-mining groundwater equilibrium and assessment of interactions between creeks and the final void. As part of regular groundwater verification modelling, Mangoola Coal will estimate perpetual water take associated with the final void and ensure it retains sufficient licences at cessation of mining should the final void become an evaporative sink. Therefore, no additional condition is required.

4. The proponent must adhere to the approved groundwater monitoring program.

Mangoola Coal accepts the intent of this proposed condition. However, this condition is an unnecessary duplication of the requirements in Condition 35, Schedule 3 of PA 06_0014. As described in Section 16.2 of the EA, Mangoola Coal will continue to implement its existing Groundwater Monitoring Program required under PA 06_0014. Therefore, no additional condition is required.

5. The proponent must provide the report identified in condition 4 to the NSW Office of Water when requested, and include it in the annual environmental monitoring report.

Mangoola Coal accepts the intent of this proposed condition. However, this condition is an unnecessary duplication of the requirements in Condition 35, Schedule 3 and Condition 4, Schedule 5 of PA 06_0014. Therefore, no additional condition is required.

Under current operations, groundwater monitoring results are reviewed monthly by Mangoola Coal and made available via the Mangoola Coal website quarterly. Monitoring results are reported annually in the AEMR.

6. The Site Water Management Plan should include:

- (i) a methodology to estimate the annual volume of surface water and alluvial groundwater intercepted by the operation;
- (ii) a groundwater monitoring and contingency plan;

(iii) review and validation of model predictions using groundwater monitoring data; and

(iv) strategies to manage water in the post mining landscape to minimise harm to water sources or their dependent ecosystems.

Mangoola Coal accepts the intent of this proposed condition. However, this condition is an unnecessary duplication of the requirements in conditions 31, 32, 33, 34, 35 and 36 in Schedule 3 of PA 06_0014, which incorporates the requirements under (i), (ii), (iii) and (iv). Therefore, no additional condition is required.

Mangoola Coal will continue to implement the Water Management Plan under the proposed modification.

3.2.2 Office of Agricultural Sustainability and Food Security

The Office of Agricultural Sustainability and Food Security states in its submission that:

The stated potential effect on water appears only to be in relation to saline discharges into the Hunter River which will be in accordance with the Hunter River Salinity Trading Scheme. Consequently, effects on agriculture are expected to be minimal and will operate within existing conditions. No additional impacts to agriculture are predicted to result from the proposed modification.

No issues regarding agricultural or other impacts were raised regarding the proposed modification.

3.2.3 Fisheries NSW

Fisheries NSW raised concerns about the potential increase in saline water entering the Hunter River. To effectively manage this issue Fisheries NSW recommended approval conditions to ensure Mangoola Coal complies with the HRSTS, and require Mangoola Coal to implement a suitable monitoring program (including reporting requirements) to determine any significant impacts on the aquatic biota in the Hunter River associated with the increased discharge of the saline water. The design of this program should be in consultation with and subject to approval of Fisheries NSW prior to implementation.

Mangoola Coal has consulted with Scott Carter at Fisheries NSW regarding the recommended approval conditions. Mangoola Coal believes that the intent of the recommended approval conditions will be covered by the enforceable requirements of the HRSTS (eg monitoring of quantity and quality of discharges) and PA 06_0014, and through the required variation to the environment protection licence (EPL). The discharges proposed under the modification will be in strict accordance with HRSTS, which is administered by the EPA and guided by a committee that includes representatives from the NSW government, industry and the community.

Under the HRSTS and enforced through PA 06_0014 and required variation to the EPL, Mangoola Coal will monitor the volume and salinity of discharges at the discharge point, as well as monitoring within the Hunter River downstream of the discharge point during discharges. In addition, Mangoola Coal implements an existing Surface Water Monitoring Plan (SWMP) for current operations which has been developed in accordance with the requirements of PA 06_0014. Under the SWMP, Mangoola Coal monitors water quality (electrical conductivity (EC), total dissolved solids (TDS), total suspended solids (TSS), and pH) monthly at 17 locations, including three locations in the Hunter River - two upstream (SW14 and SW15) and one downstream (SW17) of the proposed discharge point. Speciation monitoring of other parameters is also required annually at these locations.

As described in Section 11.5 of the EA, Mangoola will update the SWMP to manage and monitor discharges to the Hunter River under the rules and regulations of the HRSTS, including:

- describe the rules, regulations and operating parameters of the HRSTS and Mangoola Coal's responsibilities;
- include a requirement for notification of downstream water users within 1 km of the proposed discharge point when discharges to the Hunter River (dictated by the rules and regulations of the HRSTS) are scheduled; and
- water quality in the saline water zone, including the PWD, will be monitored routinely, and prior to discharge, to ensure that guideline trigger values are met.

There is an established process for review and reporting of water quality (including comparison with baseline conditions) as part of the SWMP and AEMR which will continue to be implemented under the proposed modification, and will include reporting on water quality during discharge events. In addition, the EPA has included the requirement for a saline dispersion study and dispersion lag time study as part of their proposed varied EPL conditions. These conditions would be finalised as part of an application to vary Mangoola Coal's EPL to include discharges to the Hunter River. The results of these studies can be made available to Fisheries NSW if requested.

3.3 Office of Environment and Heritage

OEH stated that as the modification was not going to have an impact on biodiversity/threatened species, Aboriginal cultural heritage, flooding and surface water management, OEH declined to make a submission for the modification.

3.4 NSW Health

3.4.1 Noise

NSW Health raised concerns regarding noise impacts. Responses to these matters (summarised and indented below) are provided.

It is unclear whether properties within the acquisition zone receive noise mitigation measures to protect occupants. Mangoola Coal should demonstrate that the community residing within the noise impacted area have been consulted and that the predicted noise levels and proposed mitigation measures are acceptable to them.

There is an existing process in place under PA 06_0014 (Schedule 3 Condition 8) for landowners affected by noise levels in excess of 35 dB(A) in both the management and acquisition zone to request mitigation measures be implemented at their dwellings. Two residences in the acquisition zone have requested and had mitigation measures installed. Of the 53 properties with dwellings in the management zone for current operations, 29 have requested and had, or are in the process of having, noise mitigation measures installed.

Condition 8 of Schedule 3 includes a process for dispute resolution where parties cannot reach agreement on reasonable and feasible mitigation measures, or for residences not identified in PA 06_0014 as being affected by noise levels exceeding 35 dB(A), but where operational noise monitoring demonstrates sustained exceedences.

Acceptability of noise levels and criteria as specified in the project approval is determined by the *NSW Industrial Noise Policy* (INP) (DEC 2000) and government regulators which provides some certainty for surrounding residences, and consistency for application of the planning processes across NSW.

A complaints mechanism for residences should be incorporated into the proposed noise monitoring program which enables both rapid assessment and corrective measures (if required) to be implemented.

Mangoola Coal operates a toll free, 24 hour a day community hotline and implements community complaints procedures for residents to register complaints. Mangoola Coal investigates complaints immediately and undertakes corrective action to rectify complaints where possible. Schedule 4 of PA 06_0014 also provides procedures for landowners to request an independent review of the impacts of Mangoola Coal on their land, if a landowner considers the impact assessment criteria specified in PA 06_0014 are being exceeded.

3.4.2 Air quality

NSW Health raised a number of concerns regarding air quality impacts. Responses to these matters (summarised and indented below) are provided.

Significant incremental impacts in PM₁₀ levels are not highlighted – the assessment focuses on criteria exceedances. There are other receptors subject to substantial incremental increases in PM₁₀ that do not necessarily exceed the annual average 30 µg/m³ criteria such as receptor 110 and 130 in year 2 with a 5 µg/m³ increase in annual average PM₁₀ due to the project. In Year 5, receptors 110, 130, and 148 experience a predicted incremental increase of annual PM₁₀ of 5, 7, and 6 µg/m³ respectively. These receptors are not identified in the tables summarising the main receptor impact because the summary tables focus on criteria exceedances.

The Air Quality and Greenhouse Gas Assessment (Appendix F of the EA) compares the predicted air quality emissions from the proposed modification (incremental and total) against the EPA's impact assessment criteria (DEC 2005) to assess potential air quality impacts. The incremental impact is defined by DEC (2005) as 'the predicted impacts due to the pollutant source alone'. Exceedances of the EPA impact assessment criteria were identified in Appendix F and Section 9.4 of the EA.

The EPA's assessment criteria reflect health and amenity-based impact assessment criteria for the protection of ambient air quality. Presently, there is only a criterion for total (ie incremental plus background) annual average PM₁₀; there are no standards or criteria to judge what represents a significant incremental increase in annual average exposure to PM₁₀. In part this may be because there can be large variations in the measured annual average PM₁₀ level over short distances. A good example to illustrate this can be found in the data that is measured in Camberwell village in the Hunter Valley, which has four TEOM monitors all located within very close proximity. Annual average levels measured in Camberwell vary by approximately 10 µg/m³ between monitors approximately 400 m apart (Ashton Coal 2013).

The predicted incremental (and total) impacts of the proposed modification for each receptor are presented in Chapter 11 of the Air Quality and Greenhouse Gas Assessment (Appendix F of the EA). The incremental impacts of the proposed modification include the entire Mangoola Coal operations (not the predicted incremental increase of annual PM₁₀ due to the proposed modification relative to current operations as suggested by NSW Health, or the existing levels of PM₁₀ in the ambient air). Nominally, the incremental difference over existing levels would be approximately proportional to the change in activity and, therefore, may only be approximately 22% (ie the proposed increase of extraction) of the levels shown in the results (eg an incremental level of 7 µg/m³ would represent a nominal 1.5 µg/m³ change in existing exposure, which is a minimal increase). Note that this is very approximate and would vary due to factors such as the specific location of mining activity and location of receptors.

Residents of impacted mine-owned housing should be warned of potential health risks and should provide informed consent demonstrating that they have been alerted to these.

Prospective tenants of Mangoola Coal-owned dwellings are alerted to mining related activities and possible impacts, including air quality, as part of the tenancy application process to help inform their decision to occupy the residence. Further, tenants are provided with a copy of the NSW Public Health Unit's *Mine Dust and You* fact sheet prior to entering into a tenancy agreement. At any time during a tenancy, tenants can make a written request to Mangoola Coal if they believe that that mining related impacts are unacceptable. If Mangoola cannot resolve the issue with the tenants, they have the option of terminating their tenancy without penalty.

The modelled air quality predictions from the Air Quality and Greenhouse Gas Assessment (Appendix F of the EA) for the proposed modification will be reviewed by Mangoola Coal to determine the suitability of mine-owned dwellings for habitation during certain periods of the mine life.

Should the proposed modification be approved, where mine-owned dwellings are currently tenanted and a tenant chooses to vacate the property based on the modelled air quality predictions for the proposed modification, they will be permitted to do so without penalty. Mangoola Coal may also determine the certain properties are unsuitable for habitation for certain periods, which may necessitate Mangoola Coal to request a tenant to vacate a dwelling. This would be undertaken in accordance with the conditions of the tenancy agreement.

It is noted that Mangoola Coal owns a number of dwellings which are unable to be inhabited due to factors such as structural integrity and their close proximity to the mine (and therefore significantly affected by noise and dust) for the duration of mine life which were included in the Air Quality and Greenhouse Gas Assessment. A number of these are scheduled to be demolished.

Existing and prospective tenants are able to access monthly environmental monitoring results, including air quality monitoring, from Mangoola Coal's environmental monitoring network. Results are available on Mangoola Coal's website, www.xstratamangoola.com.au.

Air quality impacts on mine-owned residences may result in some being unsuitable for habitation for certain periods, resulting in management options such as abandonment, demolition or exclusion; these could have significant impacts on the social character of the area.

The Air Quality and Greenhouse Gas Assessment predicts that a total of 23 currently tenanted mine-owned dwellings would be affected by air quality levels that exceed relevant impact assessment criteria at some point during the mine life. The greatest number of tenanted (mine-owned) dwellings predicted to be affected would occur in Year 2 (15 tenanted dwellings), followed by Year 5 (nine tenanted dwellings) and Year 10 (six tenanted dwellings). Impacts at individual dwellings would generally occur for a period (up to several years) over the mine life, rather than for the entire mine life.

At present, impact assessment criteria are the only available measure to judge whether a receptor is adversely affected. There is no known guidance to assist a mine or the NSW government in assessing, for example, whether air quality impacts due to slight exceedances of the criteria for a limited period would outweigh the negative effects of the re-location of an individual receptor, or the disaggregation of a community.

Mangoola Coal will review [modelled](#) air quality predictions from the Air Quality and Greenhouse Gas Assessment (Appendix F of the EA) for the proposed modification at mine-owned dwellings to determine whether properties are suitable for habitation at certain periods of the mine life. If dwellings are required to be vacated for a period of time due to air quality and potential health impacts, this is likely to be temporary, and therefore social impacts would not be significant.

The EA assumes that PM₁₀ level goals will remain static throughout duration of the project. Even if regulatory goals do not decrease, societal expectations of cleaner air will increase. Urban air in Sydney will continue to improve in quality while the air quality in the vicinity of the project will worsen and in many areas exceed the PM₁₀ levels in Sydney.

The EA provides a prediction of air quality impacts against contemporary criteria. Mangoola Coal will comply with the relevant air quality criteria and the conditions of PA 06_0014 and its EPL.

EPA has recently implemented state-wide pollution reduction programs (PRP) on all open cut mines which include investigation and implementation of measures to minimise dust. The site-specific determinations of best practice measures that have been undertaken across coal mines in NSW have documented a significant decrease in the quantity of dust emissions from mining. They verify that the adoption of best management practice controls is resulting in significant decreases in dust emissions released per unit of coal production.

Mangoola Coal's current operations have recently undergone a process to benchmark, and implement best management practice dust mitigation, as part of the EPA's PRP and site-specific determination of best practice measures to reduce emissions of particulate matter (see *Mangoola Coal – Coal Mine Particulate Matter Control Best Management Practice Determination*, available on Mangoola Coal's website). These measures are enforced through Mangoola Coal's EPL, which will apply to the proposed modification. Best management practice involves continuous improvement principles and regular reviews, and evaluations would be conducted to ensure that all reasonable and feasible mitigations, as they become available, are applied to future operations. Such continuous improvement is likely to occur over the life of Mangoola Coal's operations.

The *New South Wales State of the Environment 2012* (EPA 2012) report shows a decreasing trend in PM₁₀ levels in Sydney. It is also understood that there is a large uptake of diesel passenger cars occurring in Australia. The increased uptake of diesel passenger vehicles in European cities was accompanied by an increase in fine particulate levels. Therefore, it is not clear whether the decreasing trend in PM₁₀ levels will continue in Sydney.

It is noted that a comparison of impacts between the general population of Sydney and individual receptors near Mangoola Coal cannot be made on a reasonable, like-for-like basis. EPA's monitoring locations in Sydney are 'performance monitoring' sites, compliant with the National Environmental Protection Measure (NEPM) that have been carefully positioned well away from the influence of sources such as industry and highways, as required by the NEPM. These sites provide a measure of the baseline exposure of the population as a whole. Air quality monitoring locations near Mangoola Coal are equivalent to 'peak' monitoring sites, and are positioned at locations to determine impacts from mining. These sites are used to manage the potential maximum impacts of Mangoola Coal's operations.

If a like-for-like comparison were to be made between the air quality experienced by the most impacted receptors in Sydney, with the worst impacted receptors near Mangoola, it would almost certainly lead to the opposite conclusion to that made by NSW Health.

The EA does not provide specific analysis of issues associated with water quality from rainwater tanks at residences without reticulated water supply. The installation of first flush systems and extending tank cleaning program are mentioned as proposed strategies. It would be appropriate to utilise the Hunter New England Population Health guidelines and apply its recommendations and standards to rainwater tanks within the vicinity of the mine in a proactive manner. A management system of taking complaints and rectifying issues identified would also be considered.

There is no evidence in this assessment, or in previous studies to suggest that dust deposition would affect drinking water quality. Previous studies include an investigation of potential health impacts of trace elements in coal dust in rainwater tanks (Lucas, 2009), and a study into lead levels in rainwater near coal mines (Noller, 2009). Lucas (2009) conducted leaching tests on various coal types and analysed rainwater from tanks and taps near a major coal terminal. The study found no trace element exceeded Australian Drinking Water Guideline levels, and indicated a minimal likelihood of coal dust in rainwater tanks being an issue with respect to human health. Noller (2009) analysed dust/sludge in rainwater collection systems close to mining in the Hunter valley and at locations distant from mining. Samples were also taken of surface dust on window sills, troughs, house floors etc, as well as samples of dust in the ambient air. These were analysed for substances including lead, coal dust, overburden fines and topsoil.

The results found no significant difference in drinking water between locations close to coal mining operations and those at distant sites, including Newcastle town water. Some tanks had not been cleaned for some time or at any time ever, and showed higher sludge levels. NSW Health guideline (NSW Health, 2008) recommends that sludge is cleaned from tanks every two years.

Notwithstanding, to address community concerns regarding dust impacts to drinking water quality, Mangoola Coal implements a program of installation of first flush systems on residential rain water tanks (at the request of landowners) within 4 km of active mining (in the approved project disturbance boundary). In this proposed modification, Mangoola Coal proposes to expand this zone to include landowners within 6 km of active mining. This includes cleaning of rainwater tanks and replacing filters on rainwater filtration systems once per year within 4 km, and once every two years within 6 km. This has been communicated to stakeholders through the EA, and Mangoola Coal's community newsletter (July 2013).

3.4.3 Social

NSW Health recommended that the proponent demonstrate community satisfaction with the proposed mitigation strategies outlined in the EA and Social Impact and Opportunities Assessment (SIOA) (Appendix I in the EA). The effectiveness of these measures should be monitored over time as part of the proposed social impact monitoring program, and adjustments made as necessary.

Mangoola Coal will continue to engage with stakeholders and with its existing community engagement processes. As described in Section 10 of the SIOA, a key aspect of social impact assessment is the development of a framework to monitor an operation's impact over time. This will include collection of social data over time to monitor and evaluate commitments made in the SIOA.

Mangoola Coal has an existing Social Involvement Plan, which will be regularly updated with the collected social data and mitigation strategies of the SIOA to inform future management of social impacts and ongoing operational planning. The company also has a current community support program that provides contributions to local community groups and organisations. This program, at the operational level, is complemented by Glencore's broader Corporate Social Involvement Program which takes a more regional focus to social involvement and investment.

3.5 Environment Protection Authority

EPA raised matters regarding noise impacts, air quality impacts and surface water discharges.

3.5.1 Noise

EPA raised concerns regarding noise and vibration impacts. Responses to these matters (summarised and indented below), are provided.

The EA does not appear to include justification that the residual level of impact at receivers expected to be impacted above the project specific noise level (PSNL) is acceptable in accordance with Chapters 8 and 9 of the INP.

Chapter 8 in the INP states that:

The section below [Section 8.2.1] outlines a checklist that can be used as a guide by EPA officers to determine an acceptable level of residual noise impacts when setting statutory noise conditions, based on the consideration of social and economic benefits.

Residual noise impacts are described in the INP as predicted noise levels above the PSNLs. The noise and vibration study identified noise levels over the PSNLs (or residual noise impacts) at 17 properties, and a further four properties are predicted to experience levels above acquisition limits as shown in Section 8.3.2 of the EA. This number of properties is a marked reduction on the Modification 4 outcomes

An evaluation of the proposed modification against Section 8.2.1 of the INP based on residual noise impacts is provided below.

1. Characteristics of the area and receivers likely to be affected

Mangoola Coal is in the Upper Hunter Valley in NSW, 20 km west of Muswellbrook and 10 km north of the township of Denman. The relevant local government area (LGA) is Muswellbrook Shire. The nearest major roads are the Golden Highway, approximately 3.5 km from the site, and the New England Highway, approximately 15 km east of the site.

Site topography ranges from lower slopes to hills and rocky outcrops, with the highest point being Anvil Hill, which is at approximately 285 m above Australian height datum (AHD). The site is within the catchments of Anvil Creek, Sandy Creek, Big Flat Creek and Clarks Gully. Surrounding lands are used for grazing, vineyards, intensive cultivation, rural residential, and mining.

The proponent owns a substantial area of land surrounding the project area. Outside of the project disturbance boundary, the predominant land use is grazing land. The majority of privately owned lots are more than 3 km from the disturbance boundary.

There is a relatively low number of dwellings likely to be affected by noise with 17 assessment locations above PSNLs (ie within the management zone where minor to moderate impacts are expected, and four assessment locations predicted to be in the acquisition zone). These assessment locations equate to approximately 8% of the total considered (266 properties, private and mine-owned) in the assessment. All 21 locations are similarly impacted under current operations.

2. Characteristics of the proposal and its noise or vibrations

Key elements of the proposed modification are detailed in Section 1.3 of this report.

There are no construction activities associated with the proposed modification. Further, no changes are proposed to the daily average or maximum train movements approved under the current operations.

The operational noise assessment of the optimised mine plans predicted that during adverse weather conditions for all assessment periods, all stages of the mine life, and with all reasonable and feasible mitigation included the majority of assessment locations will experience noise levels below project approval noise impact assessment criteria.

Seventeen assessment locations are, however, predicted to experience noise levels between 1 and 5 dB(A) above the PSNL, which place these assessment locations in a potential noise management zone. Four assessment locations were identified in the acquisition zone.

The assessment found that seven lots (four landowners) are identified to experience greater than 40 dB(A) across more than 25% of their land area. These land owners were also identified earlier as affected under the single point calculations at their respective residences. No other privately owned land parcels were identified to exceed 40 dB(A) at over 25% of their land area.

All other noise and blasting criteria relevant to the proposed modification are predicted to be met.

3. Feasibility of additional mitigation or management measures

Noise management and monitoring at the site is carried out in accordance with the following existing documents prepared in consultation with the EPA and to the satisfaction of DP&I:

- Mangoola Coal Blast Monitoring Program; and
- Mangoola Coal Noise Management Plan (NMP).

The NMP requires the implementation of the several operational and engineering controls which were included in the noise model where relevant and will continue under the proposed modification. These are listed in Section 5.1.1 of the Noise and Vibration Impact Assessment (Appendix E of the EA).

4. Equity issues

Potential environmental noise impacts from the proposed modification will be managed by the proponent to acceptable levels and are therefore unlikely to result in potential property acquisition of private residences above current levels. Therefore, the potential for adverse social impacts is considered low. However, the proposed modification will enable the proponent to continue to support the local community as a local employer, economic contributor and community partner.

Further to the above, a detailed summary of the social and economic benefit that the proposed modification will bring to the surrounding area is outlined in Chapters 12 and 13 of the EA.

Based on the information provided above and in Chapters 12 and 13 of the EA, it is considered that the residual impacts from noise are minor when compared to the social and economic benefit from the proposed modification. The proponent is also committed to managing noise impacts at the properties identified to have potential noise levels over prescribed noise limits. Furthermore, given the conservative nature of the assessment, it is likely actual average operating noise levels would be less than those predicted, for the majority of the time.

Notwithstanding the above, it is anticipated regulatory authorities would also provide an evaluation of the proposed modification based on guidance provided in Section 8.2.1 of the INP.

Cannot find evidence in the EA that there are no other reasonable and feasible measures available, other than those proposed, as required in the DGRs. EPA requests justification that all reasonable and feasible noise mitigation controls have been considered, and provide details of how this was determined.

Section 3.3 of the Noise and Vibration Impact Assessment (Appendix E of the EA) states that the existing noise mitigation measures used at Mangoola Coal have been described in previous assessments and listed in the Statement of Commitments contained in PA 06_0014. These and other measures as outlined in the Mangoola Coal's noise management plan (NMP) include:

- restriction of night time operations - trucks and other plant to operate below maximum elevations during adverse weather;
- infrastructure plant - positioned in topographically shielded areas, cladding on coal handling plant, rejects bin, crushing stations and rail load out, and conveyors include shielding;
- rail spur and loop - parts thereof located in cutting and exposed areas include a 3.5 m high noise barrier to the south/east side;
- noise suppressed mining fleet;
- maintaining mining equipment to high standards;
- all new equipment is procured against a noise specification;
- unattended real time noise monitoring with automatic alarms to allow mine operators to take immediate proactive action (ie alarms are set below criteria and therefore allow for changes to take effect);
- use of silent horns on loading units;
- broadband reverse alarms;

- rubber tyred dozers used on dumps at night where possible;
- use of wheel lubrication on the rail loop around the Sandy Creek Bend;
- conducting noise management training with relevant personnel to enforce the importance of noise mitigation;
- undertaking the process of change management when operations change, including mining in new areas or when mining equipment changes; and
- meteorological monitoring and distribution via email of forecast conditions used by mining supervisors and mine planners including rainfall, wind speed, temperature, relative humidity and the probability of temperature inversions.

As part of the design of the proposed modification, other noise mitigation measures were considered and ruled out due to analysis of their reasonable and feasibility. This included construction of bunding on dumps and haul roads, additional restriction of operations at night time under adverse weather, and trolley assist systems. Further discussion on these aspects was also provided in Section 4.12 of the EA.

3.5.2 Air quality

EPA raised a number of concerns regarding air quality impacts. Responses to these matters, summarised and indented below, are provided.

Not all mitigation measures proposed to control emissions are quantifiable, measurable, auditable and enforceable.

This statement is inherent in striving to deliver for best management practice dust control. The best practice management and mitigation measures required to achieve and maintain emissions at low levels require significant human judgement in response to evolving and forecast situations. Whilst these actions cannot be reasonably quantified, audited or enforced, their outcomes generally can be. These outcomes are generally reflected in the air quality monitoring data, or in the quantifiable emissions reduction measures outlined in the current PRP requirements on NSW open-cut coal mines.

The emissions inventory adopted for the proposal and used in the dispersion modelling is not explicitly linked to the current air quality management plan. Control factors in the emissions inventory are not paired with specific auditable actions from the air quality management plan.

The emissions inventory adopted for the air quality impact assessment was primarily based on generic emission factors developed for estimating the typical, likely emissions from Mangoola Coal operating as a whole, including the proposed modification, into the future. The emission factors at best only represent typical, industry averages for specific activities, and in some cases allow some site specific data to be applied, for example, the results of Mangoola Coal's PRP commitments are applied in the emissions inventory assumptions for wheel generated dust. However, it does not follow that the emission factors would be sufficiently correct for any one activity considered in isolation to form a reasonable basis upon which to audit that activity when in operation.

If the inventory were to be developed for the purpose of auditing the individual activities that contribute to the total dust emissions from a coal mining project, only the upper bound of emissions that may ever arise for each and every activity (including many activities that are ignored in the modelling as they are too insignificant to affect the quantifiable outcome), would need to be applied in modelling assessment. This would lead to large overestimations in the total emissions, such that the assessment would become too unreliable to use in an approval context.

Pollution reduction programs included in Mangoola Coal's environment protection licence (EPL) will apply to this project.

Mangoola Coal's PRP and associated levels of dust control have been considered in the air quality impact assessment for the proposed modification. It is acknowledged that these would apply to Mangoola Coal's operations under the proposed modification.

The proponent should prepare an updated air quality management plan for the modified operations.

The existing air quality management plan for Mangoola Coal would be updated in accordance with the proposed modification as detailed in Section 17.2 of the EA and as required in Condition 7, Schedule 5 of PA 06_0014.

3.5.3 Surface water

EPA raised matters regarding the surface water impact assessment. Responses to these matters, summarised and indented below, are provided.

Recommended conditions for the EPL were provided relating to water quality and surface water discharges.

Mangoola Coal acknowledges the proposed draft EPL conditions, and will lodge an application with the EPA to vary the EPL to include the proposed HRSTS discharges to the Hunter River, should the proposed modification be approved. Mangoola Coal will liaise with the EPA during this process.

The surface water assessment makes no mention that water with an electrical conductivity of more than 400 $\mu\text{S}/\text{cm}$ is defined as saline water and can only be discharged via an authorised discharge point. This should be a key design criterion for the development of the water management system as it is possible that waters within the dirty water zone may also be saline. The proponent should note that conformance with the requirements of the 'Blue Book' for run-off from disturbed areas may still result in non-compliance with the HRSTS and the EPL.

The water management system has been designed so that there are no discharges of water from the saline water management system. Runoff from active overburden emplacement areas and rehabilitated areas not yet excluded from the dirty water zone system, but outside the saline water zone, are captured in sediment dams. Sediment dams are designed and constructed in accordance with Blue Book requirements (Landcom 2004; DECC 2008). Water from sediment dams is either recycled within the site water management system (eg for dust suppression) or discharged off site in accordance with Blue Book requirements.

Mangoola Coal's surface water monitoring plan details existing water quality in the creek systems surrounding Mangoola Coal. It is noted that background water quality monitoring results show exceedances of the ANZECC (2000) default impact assessment criteria for pH, EC and TSS. Baseline monitoring results also indicate that the ephemeral creeks record significantly higher EC and TSS levels than those recorded in flowing creeks. Consequently, the impact assessment criteria for electrical conductivity adopted for the Surface Water Monitoring Plan for Mangoola Coal exceeds 400 µS/cm for all surface water monitoring points.

Notwithstanding the above, water levels in sediment dams are managed to maintain stormwater capacity and minimise spills from stormwater events. There is capacity in the system to pump and transfer water in pipes between the sediment dams, and to the saline water zone, in order to manage sediment dam levels and minimise the risk of discharge. If a discharge is predicted to occur, the Site Water Management Plan includes discharge procedures to be implemented, including water quality sampling prior to discharge. Sediment dam structures only discharge once the design rainfall event has been exceeded and hence there will be a dilution effect if this occurs.

3.6 Roads and Maritime Services

RMS's submission raised no objections to, or requirements, for the proposed modification as it considers that the vehicular traffic generated by the proposed modification will not result in any significant impact on the classified road network.

The RMS submission noted that the intersection of Denman Road and Thomas Mitchell Drive is required to be upgraded by BHP Billiton under Mt Arthur Coal Mine's project approval by the end of December 2019. RMS notes that, while it is not the responsibility of Mangoola Coal to upgrade this intersection, the traffic report indicated that the upgrade works would significantly improve the performance of the intersection and that bringing forward these works would improve safety and efficiency for all users of the intersection.

RMS submission also requested a copy of the project approval and that Muswellbrook Shire Council should be consulted regarding the adequacy of the traffic and transport assessment. MSC's submission similarly raised no concerns with the adequacy of the traffic and transport assessment and existing project approval conditions as described in Chapter 4.

RMS did not recommend any conditions or changes to project approval conditions as a result of the proposed modification.

4 Local government submissions

4.1 Introduction

One submission was received from local government, namely MSC. In its submission MSC raised matters regarding social impacts on sense of community, biodiversity impacts, amenity impacts including noise and dust and the appropriateness of affectation zone boundaries, final landform and rehabilitation, surface water discharges and planning contributions. Each of these matters is addressed separately below.

4.2 Social impacts

MSC asserts that Mangoola Coal “has had an unacceptable impact ... on the Wybong community. The Wybong community has been left so short of critical mass that it now rarely gathers as a community and runs the real risk of further dislocation”.

The social impacts of the proposed modification were assessed in the SIOA. This included an assessment of population change which involved modelling potential operational workforce change scenarios associated with the proposed modification, an additional 150 employees and 90 contractors. For each scenario, the analysis estimated the increase in population and subsequent demand on local and regional community service sectors such as housing and accommodation, health and education services, likely to occur at a local community level as a result of increasing Mangoola Coal’s workforce.

The introduction of new groups of people to an area can have the effect of altering existing values and sense of community. The SIOA predicted that the proposed modification could result in a minor population increase (between 1.3 and 3%) in the Muswellbrook LGA through the increase in the Mangoola Coal operational workforce. No additional property acquisitions will occur due to the proposed modification and, therefore, the modification will not result in a reduction in the local community.

The SIOA determined that the risk of the proposed modification resulting in an impact on sense of community would be low. This is attributable to the minor population change in the Muswellbrook LGA as a direct result of the modification, and no additional property acquisitions.

Further, for these reasons, the proposed modification does not pose a real risk of further dislocation.

As described in Section 3.4.3, Mangoola Coal has an existing Social Involvement Plan which will be updated with the outcomes and mitigation strategies of the SIOA to inform future management of social impacts and ongoing operational planning. The company also has a current community support program that provides contributions to local community groups and organisations, which has included support for the Wybong Hall.

4.3 Biodiversity impacts

MSC’s submission noted that “the mine sits in a critical and irreplaceable biodiversity link between the largest National park in NSW – Wollemi National Park – and the largest continuous terrestrial biodiversity corridor in Australia – the Great Eastern Ranges”.

The proposed modification does not propose any further disturbance beyond that approved for current operations, and therefore will not have any additional impacts on biodiversity.

The Mangoola Coal operation manages 1,904 hectares (ha) of land as Biodiversity Offset Areas for conservation, habitat enhancement and sustainable agricultural. In addition, 1,164 ha of corridors are protected and managed to increase vegetated connectivity and habitat value. Mangoola Coal's current voluntary planning contributions include financial contributions to MSC for the Wybong Uplands Management Strategy. The Wybong Uplands Management Strategy was developed by Mangoola Coal in conjunction with MSC and the Hunter-Central Rivers Catchment Management Authority, and relates to sustainable land management and environmental and conservation works in the Wybong catchment area in the vicinity of the Mangoola Coal. Additionally, Glencore participates in the Great Eastern Ranges Initiative, and participated in the Upper Hunter Strategic Assessment with the Commonwealth government.

4.4 Amenity impacts

MSC noted that it had received an "unusually large number of representations from adjoining land holders concerned about amenity impacts and the Department [DP&I] is encouraged to carefully consider an appropriate affectation boundary that considers the particular pre-existing noise and dust levels in the Wybong valleys rather than more generic pre-existing levels used to inform other approval processes".

Community concerns about noise and dust impacts are addressed in Sections 5.1 and 5.2, respectively.

Mangoola Coal's affectation zones for noise and dust are specified in PA 06_0014, which are determined by relevant government policy and guidance documents, including the INP (EPA 2000) and the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (EPA 2005). The development of the affectation zones for the proposed modification was based on measured background noise and dust levels in accordance with these policies.

4.5 Final landform and rehabilitation

MSC noted that it is "concerned about the micro-relief of the final landform and encourages the Department to require conditions that will make the effect of any final landform as transparent and enforceable as possible. It is not clear from the material whether the final void is reduced in volumes, but it is Council's policy that subsequent mine modifications have that outcome. Council is unlikely to support a modified mine plan which increases the number or volume of final landform voids."

The proposed modification would not increase the size of the final void which is currently conceptual in its design. As required in PA 06_0014, at least five years out from mine closure, a detailed mine closure plan will be developed including a review of the opportunities for final void use in consultation with the appropriate stakeholders. The main objectives of the final void will be to minimise the area of disturbance and maximise the area of land restored to its former land capability, provide a landform which is stable and able to be maintained long term and provide minimal risk to public safety.

The proposed modification does not result in an overall increase in the number of final landform voids. It should be noted that the original landform comprised of two final voids and was reduced to one under Modification 4.

In relation to rehabilitation, MSC states that the project disturbance area should be returned to heavy wooded vegetation post-mining. The conceptual rehabilitation strategy for the approved project disturbance boundary aims to increase the extent of regionally significant woodland vegetation communities with an overall increase of approximately 146 ha in treed vegetation compared to before mining commenced. The ROMP identifies that the post-mining landform will include self-sustaining endemic vegetation communities consisting of native and naturalised species, which aims to emulate the pre-mining environment, enhance local and regional ecological linkages and provide for a sustainable final land use option.

The final landform of Mangoola Coal will be a natural landform design which achieves sustainability outcomes, improve habitat values and restore ecological function. As described in Section 16.8 of the EA, a sustainable landform design is currently being investigated to ensure that the design is able to effectively manage runoff events, minimise erosion, sustain plant growth and maximise use of natural resources for growth medium and habitat restoration.

4.6 Surface water discharges

MSC noted that it does not support that part of the application which would permit the discharge of salt or sediment laden water.

The HRSTS is a licensing scheme administered by EPA and guided by an operations committee that includes representatives from the NSW government, industry and community. The scheme allows discharges of saline water, in the Hunter River catchment above Singleton, from industries such as agriculture, mines and electricity generators while maintaining an appropriate level of water quality and freshness (EPA, 2013). Under the HRSTS, licence holders are notified by the operations committee of an opportunity to discharge saline water to the Hunter River in a controlled manner which is limited to times of high flow or flood when there is a large amount of low salt, fresh water in the river.

The HRSTS has established salinity goals to be maintained in the upper, middle and lower sectors of the Hunter River. Mangoola Coal is in the upper sector (upstream of Denman). During the 2011-12 period (1 July 2011 to 30 June 2012), HRSTS participants had up to 11 opportunities to discharge saline water, depending on which sector participants are in (EPA 2013). Participants in the upper sector generally have fewer opportunities to discharge.

Mangoola Coal's addition of the ability to discharge to the Hunter River under the HRSTS reduces the risk of uncontrolled releases from the operations and will be used as a contingency measure. Mangoola Coal is an overall net water user, and therefore normally does not need to discharge water off site. Recycling of water on site occurs as part of the water management system, and during dry periods, water is obtained from existing Hunter River water access licences. The water management system was designed to have sufficient capacity to store water during most climatic conditions. Only during prolonged wet periods would there be a lack of storage space for excess water, meaning that there is a risk of uncontrolled spills if water storages reach capacity.

Sediment in surface runoff is currently managed through sediment control structures as shown in Figure 2.9 of the Surface Water Impact Assessment (Appendix H of the EA). The proposed modification includes the construction of additional sediment dams, as shown in Figure 3.7 of the Surface Water Impact Assessment, which will ensure that surface water is appropriately managed. Further, under its EPL, Mangoola Coal will be required to monitor the concentration of TSS for HRSTS discharges at the proposed discharge point.

Further discussion on the reasons for the discharge of water under the HRSTS and the predicted surface water impacts are provided in Section 5.5.

4.7 Voluntary planning contributions

MSC commented that “the Applicant has proposed a planning contribution to Council, which Council considers adequately offsets the broader economic and infrastructure impacts of the proposal. There may be some aspects of Wybong Road and its intersections, which require further augmentation arising out of the proposal. Council will endeavour to achieve any such augmentations as a result of the work required under the conditions of its present approval.”

Further, the traffic and transport impact assessment in the EA did not identify any significant traffic impacts on the road network due the proposed modification, and did not recommend any additional management or mitigation measures. In Mangoola Coal’s discussions with MSC to date, no additional contributions or changes to voluntary planning contributions specifically relating to traffic have been requested by MSC. Mangoola Coal’s current voluntary planning contributions included substantial funding to be provided to MSC annually for road management and maintenance, including \$55,000 for the maintenance of Wybong Road, \$220,000 for general mine affected road maintenance. Mangoola Coal is also undertaking a range of remedial works to Wybong Road in consultation with MSC.

Mangoola Coal acknowledges that discussions with MSC to finalise an agreement on voluntary planning contributions are ongoing and notes that mutually agreeable outcomes that have been achieved so far are likely to continue.

5 Individual and community/special interest group submissions

5.1 Noise and vibration

Matters raised in relation to noise and vibration include the assessment approach, cumulative impacts, noise impacts, road and rail noise impacts, cumulative noise impacts, structural damage from blasting, and changes to the noise management and acquisition zones. Responses to each of these matters are provided below.

The number of submissions received from individuals and community/special interest groups which raised these matters are shown in Figure 5.1.

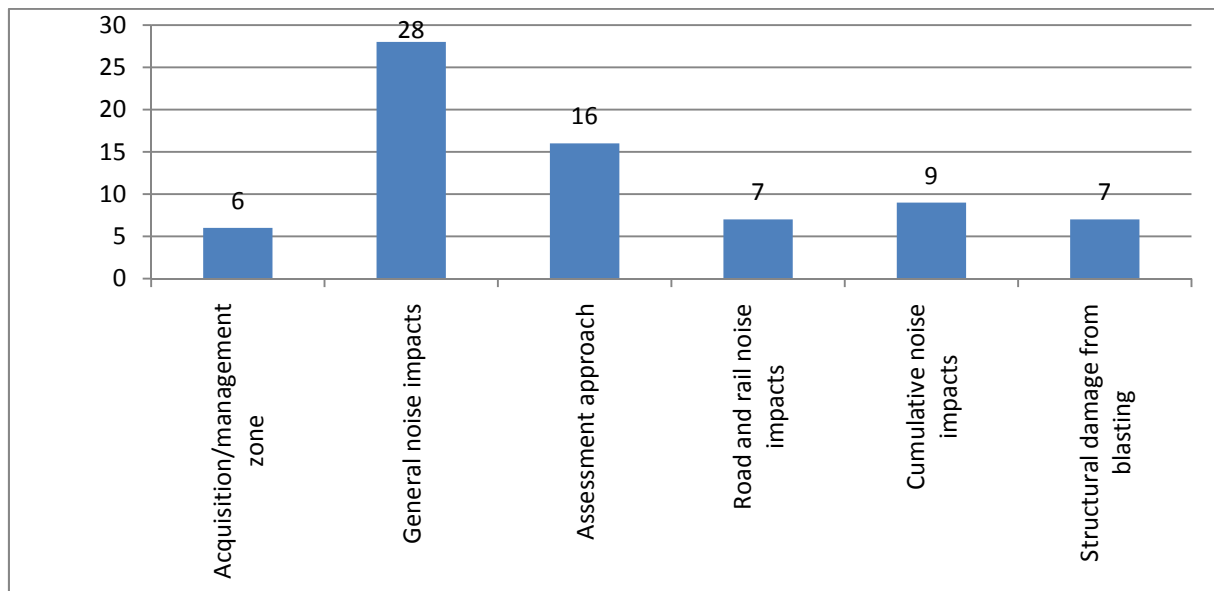


Figure 5.1 Noise and vibration matters raised

5.1.1 Assessment approach – noise

Submissions – I-5, I-10, I-12, I-15, I-18, I-20, I-32, I-33, I-34, I-47, I-48, I-50, I-53, C-11

Individual and community group submissions raised matters relating to the assessment approach for noise impacts, summarised and indented, and are addressed below.

Noise predictions under the proposed modification were understated, with a general view that intensification of mining operations under the modification could not result in a reduction in noise levels at receptors.

Noise modelling was based on three-dimensional digitised ground contours for the surrounding land, mine pits and overburden emplacement areas for three mine plan stages: Years 2, 5 and 10. Predicted noise levels are considered to be representative of a 'worst case' operating scenario. The mine plan stages represent the years in which maximum noise emissions are likely to occur and, therefore, the range of potential impacts over the life of the mine under the proposed modification. The mine plans contain plant and equipment placed at various locations and heights, representing realistic operating conditions. The model assumed all plant and equipment operating simultaneously and at full power (which, in practice, is unlikely to occur or would occur infrequently). Therefore, noise predictions are considered to be a 'worst case' operating scenario.

As described in Section 8.3.1.v of the EA, the previous noise assessment for Mangoola Coal's operations was completed for Modification 4 by Wilkinson Murray (2011). The differences in the predicted noise levels for the proposed modification compared to Modification 4 are due to:

- sound power levels adopted in the assessment for the proposed modification are different for some plant and equipment compared to Modification 4. The adopted sound power levels reflect actual measured levels from plant at Mangoola Coal through on-site monitoring, whereas the sound power levels adopted in the Modification 4 assessment, which was completed prior to site-specific data being available, were estimates. This is expected to be the primary factor for differences between the current and previous noise assessments;
- changes to mine plans, which has resulted in different shielding and barrier effects, and allows for changes in site topography to be considered in the predicted noise levels;
- equipment quantities modelled are different to equipment modelled in the previous noise assessment for Modification 4, due to:
 - changes in the mine plans and different economic requirements under the proposed modification compared to Modification 4;
 - the equipment type and quantity adopted for Modification 4 was estimated (as Mangoola Coal was not operational when the Modification 4 noise assessment was undertaken), while the type and number of equipment adopted for the assessment for the proposed modification are based on actual operating equipment, plus expected changes under the proposed modification. Therefore the proposed modification more accurately reflects the type and number of equipment; and
- adopting different meteorological data sets. The assessment for the proposed modification used data captured on-site between 2010 to 2012 (ie three years) compared to one year in Modification 4 (2010, being the only site specific data set available at that time).

Qualified and experienced acoustic consultants prepared the noise and vibration impact assessment for the proposed modification, in accordance with relevant guidelines and criteria required by EPA and DP&I. This included comprehensive modelling and assessment of a range of operating scenarios using conservative worst case assumptions and monitoring results for existing operations.

Based on the outcomes of the initial environmental risk assessment undertaken for the proposed modification, the noise and vibration study was peer reviewed by Dr Rob Bullen, Director of Wilkinson Murray and a qualified and experienced acoustic expert. All peer review comments were addressed in the noise and vibration study for the proposed modification.

Quantitative modelling of operating noise used proprietary noise modelling software Predictor (by Bruel & Kjaer). The selected software algorithms are recognised by environmental regulatory authorities and acoustic consultants as being one of the most reliable predictive methodologies currently available. The three dimensional model included surrounding topography, mine plans, sound power levels from plant and machinery derived from measurements at site or similar sites and effects of prevailing weather conditions (gathered from nearby meteorological stations). The proposed modification mining sequences were modelled and predicted impacts assessed for representative stages of the proposed modification.

The approach described above is a contemporary and industry accepted method for completing noise assessments. It is worth noting that at Mangoola Coal's community information session held at Wybong Hall regarding the proposed modification, Marion Burgess, a research officer at UNSW Canberra and expert in the area of community noise management and control, gave presentations to attendees on noise, in general; principally on how it's emitted and managed; and its assessment for development applications.

Concerns that land owners were advised that operational noise levels were expected to increase but assessment shows a significant reduction in noise levels, leading questions over the accuracy of the noise modelling.

Differences in the methodology used for the proposed modification and that used in the previous noise assessment (for Modification 4) are discussed above. Adopting sound power levels which reflect actual measured emissions captured from plant at Mangoola Coal is considered to be the primary reason for differences between the two studies. Actual sound power levels for many plant were lower than what was previously adopted and, therefore, past predicted noise levels are considered conservative. Therefore, the current model better represents operations at Mangoola Coal than the previous assessment for this reason.

Further, whilst production throughput is increasing, this does not necessarily translate to more noise unless a significant number of additional plant is used. For example, deploying twice as many plant items across the site generally would translate into a marginal 3 dB increase in noise levels at receivers.

As discussed above, Mangoola Coal engaged an independent acoustic specialist in the area of community noise management and control, Marion Burgess, to provide presentations and information on the general aspects of noise in the community information session held at Wybong Hall regarding the proposed modification.

A different noise model was used to that used in earlier assessment, prevents an objective assessment. The noise model used wasn't calibrated. The Predictor model is accepted by regulatory authorities only after it has been calibrated for the site.

The noise modelling software used for the proposed modification was different; however, the algorithms (calculations) are consistent with the previous Modification 4 noise assessment. The differences between the previous noise assessment and the assessment for the proposed modification are described in the section above, and were described in the EA and sections 3.1 and 4.6 of the Noise and Vibration Impact Assessment report. As discussed above, on-site noise emissions of individual plant and equipment have been measured and included in the modelling.

While site specific calibration of any modelling is encouraged by EPA, it is not a requirement. In EMM's experience, modelling software rarely under-predicts noise off site, particularly for adverse weather conditions. This is based on comprehensive software algorithm validations conducted over the years by EMM.

Appropriateness of sound power levels adopted for the proposed modification.

As annotated in the EA, and discussed above, the sound power levels used for modelling were derived from measurement data obtained at site or at similar operations.

The frequency of temperature inversion events and the level of noise impact occurring cannot be accurately predicted using any known model, and therefore require verification through a noise monitoring program.

The frequency of temperature inversions is analysed directly using historic weather data collected by site and is unrelated to the model. Approximately three years of data from 2010 were analysed and the occurrence of temperature inversions was determined through EPA recommended techniques in the INP. Verification through regular compliance monitoring is part of the site's current and future operating procedures and conditions of approval.

Expectation that noise generated by road and rail traffic would increase due to the proposed modification, and that such impacts would be unacceptable.

The noise assessment provides an assessment of road traffic noise. Where predictions are identified to be above relevant criteria, dwellings are provided with entitlement to mitigation as per the current project approval. Mangoola Coal undertakes compliance monitoring for road traffic noise. For example, the most recent road traffic compliance monitoring reports (available on the proponent's website) for noise monitoring undertaken in March and June 2013 indicates compliance with road traffic noise criteria at receptors on Wybong Road (Global Acoustics 2013a; 2013b).

The proposed modification will not result in an increase in the maximum daily train movements compared to current operations, and therefore a rail traffic noise assessment was not undertaken.

Concerns regarding adherence to the NSW Industrial Noise Policy, including assessment of low frequency noise.

An assessment of low frequency noise was completed in accordance with the INP, as well as more contemporary practice (Broner 2011), as detailed in Section 8.3.2.iv of the EA.

One submission (I-10) identified receptor points which had not been assessed.

An analysis of the properties identified in the submission was undertaken. Of those identified, four were considered valid for further review (identified as receptors 1, 4, 5 and 6 in the submission). These have been re-numbered as 106C, 257A, 257B and 257C, respectively, and are shown on Figure 5.2. The remaining two receptors identified in the submission (2 and 3) were proposed dwellings for which development approval from MSC has not yet been granted; however, based on the noise contours presented in the EA, noise criteria would not be exceeded at these locations.

Noise modelling was completed to determine the predicted noise levels for these receivers under the proposed modification and for the worst case year:

- Receptor 106C – 35 dB(A) and 36 dB(A) $L_{eq,15minute}$ daytime and night time respectively;
- Receptor 257A – 25 dB(A) and 26 dB(A) $L_{eq,15minute}$ daytime and night time respectively;
- Receptor 257B – 22 dB(A) and 23 dB(A) $L_{eq,15minute}$ daytime and night time respectively; and
- Receptor 257C – 25 dB(A) and 26 dB(A) $L_{eq,15minute}$ daytime and night time respectively.

Predicted noise levels are well below the PSNLs for receptors 257A, 257B and 257C. Receptor 106C would be entitled to mitigation measures under the proposed modification.

Published noise monitoring data shows no exceedances of noise criteria, despite high levels of noise complaints, leading to questions over the accuracy of the noise assessment.

Published noise monitoring data has been obtained in accordance with relevant NSW government policy (ie the INP). A review of the most recent noise monitoring report available on the proponent's website (Quarter 2, 2013 dated May 2013) provides a quantification of noise levels from site. The report notes audible mining noise at some monitoring locations and confirms criteria are met. At most of the selected monitoring locations, the mine is noted as inaudible. It should be noted that complaints do not necessarily imply exceedances, as criteria are not based on audibility; rather, section 1.4.4 of the INP states that criteria in the INP are aimed at protecting 90% of the population for 90% of the time.

The Quarter 2, 2013 noise monitoring report demonstrates good agreement between noise predictions for Modification 4 and measured data. For example, 35 dB(A) L_{eq} is the measured site contribution at monitoring location A4 (ie receptor 130 - see Figure 5.2). The Modification 4 predictions show a range of levels between 33 and 38 dB(A) for this location depending on the operating mine year and time of day.

5.1.2 Assessment approach – blast vibration and overpressure

Submissions – I-10, I-47, I-49, I-56

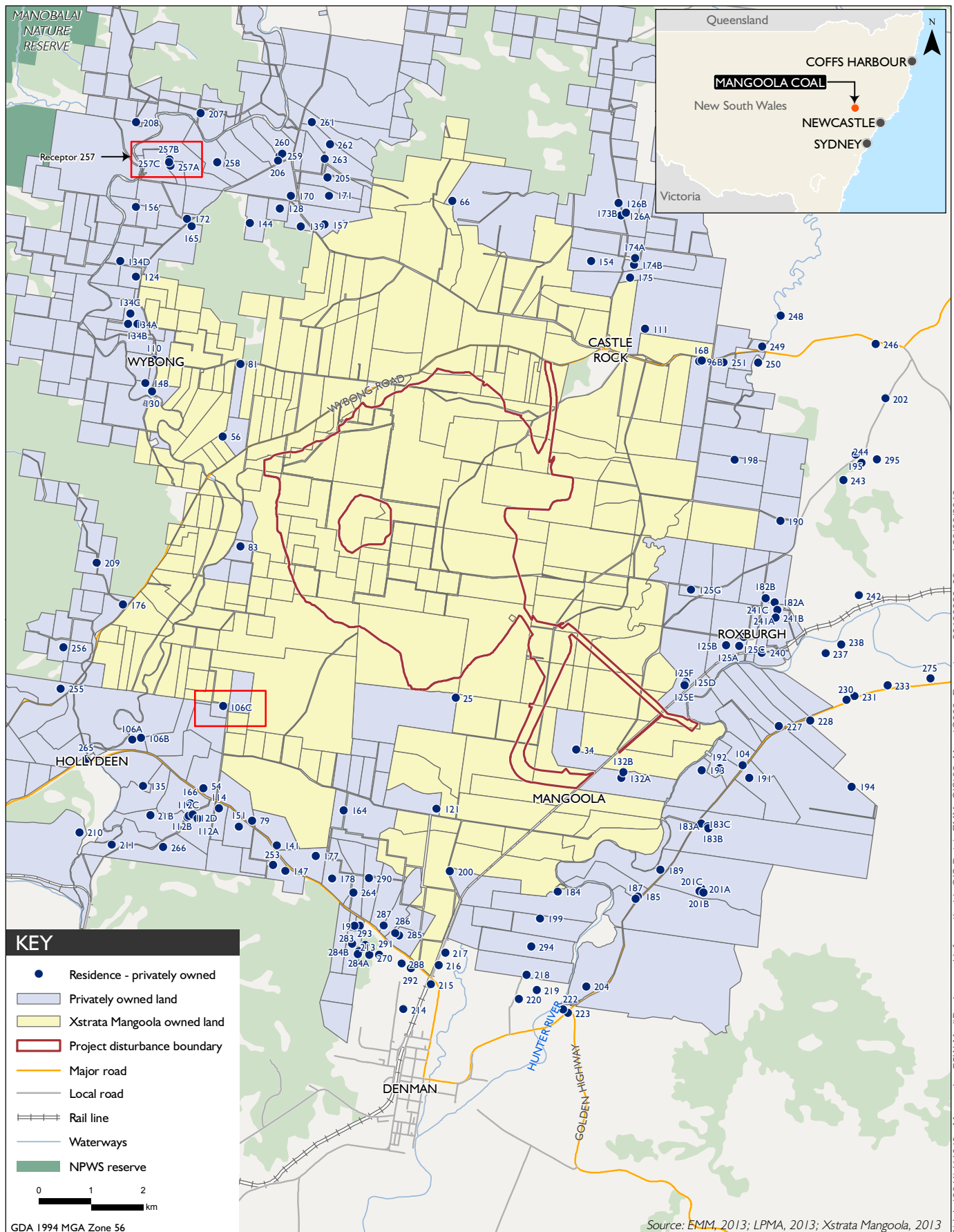
One submission included a more detailed review of the assessment approach for blast vibration and overpressure, and raised a number of matters, summarised and indented, which are addressed below.

Vibration impacts on historical buildings on old winery properties are not addressed.

The historical buildings referred to are north-west of the mine near receptor 257. As required by conditions 12 and 13 in Schedule 3 of the current project approval, Mangoola Coal will design blasts to meet criteria at residential buildings and heritage items. Therefore, no exceedances of the blasting criteria are expected to occur at the properties identified in the submission.

No assessment of blasting impacts on livestock and property has been undertaken as required by DGRs.

There is limited literature or evidence of the impacts of noise from blasting on livestock. Observations of the impact of mining activities, in particular blasting, on cattle were made in a 2011 study (Neil Nelson Agvice 2011). The study included observations of cattle on a feedlot site in the Hunter Valley during a number of blast events. The observations made in the study indicated that blasts did not appear to disturb cattle, which continued to feed, rest or graze apparently undisturbed by blasting. Where blasting is within 1 km (arbitrary) of known commercial livestock properties, notification would be provided to such livestock operators prior to blasting.



The potential for blasting impacts on property has been addressed in the Noise and Vibration Impact Assessment report. Section 4.9.2 of the Noise and Vibration Impact Assessment report describes expected ground vibration levels from blasting for 1,500 kg and 3,000 kg maximum instantaneous charge (MIC). For example, from the curves in Appendix G of the Noise and Vibration Impact Assessment report, the residential building criteria of 5 mm/s is estimated to be met at receptors for a 3,000 kg MIC when the separation distance is greater than 2,100 m. Aside from the receptors identified in PA 06_0014 as affected by blast vibration and overpressure, no other privately owned residences exist within 2,100 m of any proposed blasts.

The Noise and Vibration Impact Assessment report concluded that with appropriate blast design parameters, the current ground vibration and overpressure criteria specified in PA 06_0014 would be achieved for nearby private residences and sensitive structures.

No confirmation is provided demonstrating that the prediction graphs have been calibrated. Sensitivity analysis of the variations in predicted overpressure and ground vibration is required.

The calculation method adopts current contemporary methods for determining impacts and is accepted by the relevant agencies. The sensitivity analysis of variations in predictions is inherent in the adopted method of 95 percentile of data being below present levels.

The minimum offset required to achieve blast criteria would vary depending on face orientation and other factors, are not considered in the assessment.

A conservative approach was adopted whereby the worst case levels have been used to quantify impacts. The management of blasts and blast design is a key element in minimising impacts and blast designers can influence off site impacts significantly, hence reducing levels on the presented worst case. Mangoola Coal's Drill and Blast Engineer develops specific site laws for use in the on-going drill and blast design process based on updated data as the operation approaches sensitive receivers. In the absence of any relevant historical data, new areas are assessed with test programs (generally in the form of 'seed holes') to define suitable blasting parameters.

From the range of distances and blast levels provided, blast ground vibration and noise overpressure at residential locations can be interpolated from Appendix G of the Noise and Vibration Impact Assessment report. Further, conditions 12 and 13 of PA 06_0014 stipulate criteria for airblast overpressure and vibration impact assessment criteria that blasting activities must adhere to.

No results are provided showing the predicted vibration and overpressure levels at residences.

Predicted vibration and overpressure levels at residences can be determined from Appendix G of the EA (Noise and Vibration Impact Assessment report). For example, as described earlier, the residential building criteria of 5 mm/s is estimated to be reached for a 3,000 kg MIC when the separation distance is less than 2,100 m. Vibration and overpressure levels are dependent on the MIC, specific blast design and distance. The Noise and Vibration Impact Assessment report for the proposed modification demonstrated that the PA 06_0014 impact assessment criteria for airblast overpressure and ground vibration can be met for a MIC of greater than 1,500 kg at specified distances. Blasts will continue to be managed and designed to achieve criteria in PA 06_0014, and adopting Mangoola Coal's Blast Monitoring Program which will be reviewed and updated, where necessary, to reflect the changes from the proposed modification.

5.1.3 Noise impacts

Submissions – I-2, I-3, I-4, I-5, I-8, I-9, I-12, I-13, I-15, I-16, I-29, I-32, I-33, I-34, I-39, I-40, I-42, I-43, I-46, I-47, I-48, I-49, I-50, I-51, I-53, I-54, I-56, C-1

Submissions raised concerns that noise impacts experienced under current operations would increase under the proposed modification. Matters raised, summarised and indented, are addressed below.

Concerns that attended noise monitoring for compliance purposes under current operations does not reflect the actual noise impact at receptors, that current operations do not meet predictions approved in original EA, and that this will be perpetuated under the proposed modification. Active ongoing noise monitoring to verify noise predictions from current operations has not been undertaken.

Schedule 3, Condition 11 of PA 06_0014 requires Xstrata Mangoola to prepare and implement an NMP, which includes a monitoring program. Mangoola Coal's compliance monitoring program has recently been enhanced to include traffic noise, low frequency noise and use of more sophisticated equipment. The program now includes real time noise monitoring used to manage emissions on a permanent basis by relaying information back to site continuously.

The principal tool for ensuring compliance with noise criteria is real time noise monitoring (part of the NMP) that relays data back to site on an ongoing basis. This system incorporates automatic notifications where noise criteria are approached or exceeded that will enable mine operators to take a proactive approach to minimising noise impacts by modifying operations when monitoring indicates that potential impacts may occur. This informs operators of received noise levels and through a set of systematic procedures the site is able to pre-empt the potential for exceedances and can act accordingly. In the event that such notification is received, Mangoola Coal undertakes a review of the current mining operation (e.g. machinery locations and activities, meteorological conditions) and determines whether any modification to the operation is required to reduce the potential for noise related impacts.

The NMP describes such measures and has been prepared in consultation with EPA and to the satisfaction of DP&I. The plan will continue to apply to ensure compliance with model predictions and noise limits. As described above, a review of the most recent noise monitoring report (Global Acoustics 2013c) available on the proponent's website (Quarter 2 2013 dated May 2013) provides a quantification of noise levels from site. The report notes audible mining noise at some monitoring locations, however confirms criteria are met.

The proposed extraction rate of 13.5 Mtpa is able to be achieved with a relatively minor increase in the existing plant and equipment on site. The type and quantity of plant and equipment modelled in the noise and vibration impact assessment is presented in Section 3.5 of the Noise and Vibration Impact Assessment report. The intensification in mining is reflected in equipment numbers and their positioning in the modelling.

Unresolved matters remain between Mangoola Coal, DP&I and several stakeholders to agree on adequate mitigation measures for impacts associated with current operations.

There is an existing process under Schedule 3 Condition 8 of PA 06_0014 for landowners who are affected by noise levels in excess of 35 dB(A) to have reasonable and feasible mitigation measures implemented at their dwellings. This condition includes a process for dispute resolution where parties cannot agree on appropriate mitigation measures, or for residences not identified in PA 06_0014 as being entitled to mitigation measures, but where operational noise monitoring shows noise levels exceed 35 dB(A). The dispute resolution process involves referral (by either party involved) of an unresolved matter to the Director-General, who will decide an outcome. This referral process has been triggered twice since commencement of Mangoola Coal's operations; on one of these occasions, Mangoola Coal referred the matter to the DP&I; on the other occasion the matter was referred by a landowner. DP&I has only provided a determination on one of these matters, with the second matter pending a decision by DP&I.

Where residents believe they are affected above criteria, they are entitled to request an independent review in accordance with Schedule 4 of the project approval. This entitlement was taken up by two property owners in late 2011 and a thorough independent investigation undertaken.

Mitigation measures which have been implemented by Mangoola Coal such as restricting dump trucks and dozers below the maximum elevation of the overburden emplacement area at night has limited success due to uneven heights and mass of the overburden emplacement areas.

Restricting the height of equipment below the maximum elevation of the overburden emplacement is one of a number of measures used by site to mitigate noise levels. Overburden emplacement areas will continue to be developed to improve their performance for abating noise. This measure will assist in the reduction of noise for receivers within the 'shadow zone' of the noise barrier created by the emplacement bund. Noise from plant operating in this manner will be less audible off-site.

5.1.4 Blast vibration and overpressure impacts

Submissions – I-1, I-3, I-5, I-10, I-47, I-49, I-56

Several submissions raised concerns that current operations were resulting in structural impacts on properties close to Mangoola Coal, and that this would be exacerbated by the proposed modification including increased frequency of blasts and removal of the MIC from the project approval conditions.

A review of the most recent monitoring data as available on the proponent's website for May 2013 shows a total of 15 blasts in that month. All blasts satisfied ground vibration and noise overpressure limits at all monitoring locations. These locations are considered representative or worst case locations when compared to any residences.

Structural issues arising from ground vibration due to blasting are considered highly unlikely due to the distances between blasts and dwellings or other sensitive structures. Assessments were undertaken in 2011 and 2013 at three residences approximately 4 km or greater from blasting, to assess whether structural impacts due to blasting at Mangoola Coal had occurred. The assessments found no evidence of exceedance of blast criteria or structural damage due to blasting.

Blast management and mitigation practices developed to minimise the impact of Mangoola Coal's operations are contained within the relevant blasting procedures used on site. Specifically, the procedures aim to minimise the impacts to human safety, property and public infrastructure. Blasting impacts upon Aboriginal and cultural heritage items are addressed in the Mangoola Coal Aboriginal Cultural Heritage Management Plan and the Mangoola Coal Historical Conservation Management Strategy respectively. These procedures will be continually revised based on the outcomes of the blast monitoring program.

One submission claimed that proposed modifications to blasting conditions to increase frequency of blasting and removal of the MIC was not referenced in any of the published stakeholder engagement materials or discussed during consultation. Proposed amendments to blasting conditions were described in the fact sheets distributed to neighbouring properties (November 2012), discussed with stakeholders during face-to-face meetings and on printed material at the community information session held at Wybong Hall in December 2012.

5.1.5 Traffic noise (road and rail)

Submissions – I-1, I-6, I-14, I-17, I-29, I-33, I-47, I-49

Several submissions raised general concerns that noise impact associated with road and rail traffic would increase under the proposed modification, due to the increase in traffic associated with the workforce on the local road network, and increased coal product output. Other matters included:

- expectation that noise generated by road and rail traffic would increase due to the proposed modification, and that such impacts would be unacceptable;
- one submissions stated that there has been no assessment of compliance with road or rail noise impacts resulting from the proposed modification;
- Condition 7 of PA 06_0014 is based on the superseded Environmental Criteria for Road Traffic Noise (ECRTN) criteria;
- current road traffic noise levels were based on previous calculations and not on actual measurements;
- no results were provided for private properties on Bengalla Link Road, which were included in the previous assessment (Wilkinson Murray 2011).

The road traffic noise assessment results show that approved operations traffic noise levels due to shift changes under current operations are currently above the daytime criteria at four of the six private properties assessed. The additional traffic volumes associated with the proposed modification will increase these levels by up to 2.9 dB(A). The additional traffic volumes associated with the proposed modification will result in an exceedance of criterion at one additional location (receptor 251), and is therefore entitled to noise mitigation measures under PA 06_0014. It is noted, however, that this receptor already has noise mitigation rights under PA 06_0014 associated with current operational noise from Mangoola.

The increase in road traffic noise at locations 168, 246, 249 and 96B is above the NSW Road Noise Policy (RNP) (OEN 2011) allowable increase threshold of 2 dB where existing traffic noise is already above the relevant criteria. These assessment locations were identified to be within the management zone under the current operations and entitled to mitigation measures as per the project approval.

It should be noted that Schedule 3 Condition 7 of PA 06_0014 contains road traffic noise criteria that is as strict, or stricter, than relevant parts of either the ECRTN or RNP.

There is no change to predicted road traffic noise impacts under the proposed modification for the private properties on Bengalla Link Road within the management zone for the current operations (ie 203F and 203G).

The proposed modification will not result in an increase in the maximum daily train movements compared to current operations, and therefore a rail traffic noise assessment was not undertaken.

5.1.6 Cumulative impacts

Submissions – I-1, I-6, I-8, I-22, I-36, I-47, C-3, C-4, C-9

Submissions raised the matter of cumulative impacts with other existing industrial sources, suggesting that cumulative noise impacts should be assessed with noise measurements from other noise sources.

Existing industrial noise sources near Mangoola Coal with potential to contribute to cumulative noise are limited. The nearest significant noise source is Bengalla Mine approximately 14 km to the east. While noise from Bengalla Mine may at times influence received noise at residences east of Mangoola Coal, this source is not expected to generate noise levels that would add cumulatively to Mangoola Coal. Further, noise enhancing winds from the east which would increase Bengalla Mine associated noise at assessment locations east of the site would, in turn, reduce Mangoola Coal associated noise at these assessment locations. Similarly, westerly winds will have the opposite effect. Under still conditions, which are relatively uncommon for the area, there could be noise from both mines, albeit at much lower levels, for example during adverse winds.

5.1.7 Changes to the noise management zone

Submissions – I-11, I-12, I-18, I-53, I-56, C-11

Submissions raised objections to changes (reduction) of the noise management zone due to a reduction in the predicted maximum noise levels compared to previous noise impact assessments for Mangoola Coal, and the affect on landholders' mitigation measure entitlements. The revised statement of commitments in the EA proposes the following change to the management zone to reflect the revised noise (and air quality) modelling undertaken for the proposed modification:

- Noise mitigation and management – only those residences identified as having predicted noise impacts under the proposed modification greater than 35 dB(A) will be afforded noise mitigation and management.

Mangoola Coal proposes that landholders in the current management zone where noise levels are predicted to be below 35 dB(A) (ie below the PSNL) under the proposed modification be removed from Table 1 of the project approval automatically entitling them to mitigation measures.

However, it should be noted that under the proposed modification there would be two options available under PA 06_0014 for landholders no longer predicted to be within the management zone (ie not impacted by noise levels exceeding 35 dB(A)) to request noise mitigation measures:

- Schedule 3 Condition 8 - the owner of any residence where subsequent operational noise monitoring shows the noise generated by the project is greater than, or equal to, LAeq(15 minute) 35 dB(A); and
- Schedule 4 Condition 4 - if a landowner considers the project to be exceeding the impact assessment criteria in schedule 3, except where this is predicted in the EA, then he/she may ask the Director-General in writing for an independent review of the impacts of the project on his/her land.

Therefore, if a landholder who is not in the management zone believes they are affected by noise levels exceeding 35 dB(A), there are processes available to require Mangoola Coal to investigate noise impacts and, if noise levels exceed 35 dB(A), provide reasonable and feasible mitigation measures.

It is noted that over half of the properties with dwellings in the management zone for current operations (29 of a total of 53) have requested and had, or are in the process of having, noise mitigation measures installed.

5.1.8 Changes to the acquisition zone

Submissions – I-11, I-12, I-18, I-53, I-56, C-11

Submissions raised objections to changes (reduction) of the acquisition zone due to a reduction in the predicted maximum noise levels compared to previous noise impact assessments for Mangoola Coal, and the effect on landholders' acquisition entitlements.

The Noise and Vibration Impact Assessment report predicts that two receptors (121 and 132, currently within the acquisition zone), will not experience maximum noise levels greater than 40 dB(A) under the proposed modification that would entitle them to acquisition.

The revised statement of commitments in the EA proposes the following change to the acquisition zone to reflect the revised noise modelling undertaken for the proposed modification:

Xstrata Mangoola proposes to modify the management and acquisition zones to reflect the revised noise and air modelling undertaken for Modification 6:

- those residences identified in Appendix 5 of PA 06_0014 predicted to move out of the acquisition zone as a result of the proposed modification (ie noise/air quality predictions meet the relevant criteria) will be offered a 12 month period from the date of the modified project approval to request acquisition in accordance with Schedule 3 of PA 06_0014.

Mangoola Coal has proposed a 12 month transition period, from the date of a modified project approval being granted, to the two landholders who would no longer be in the acquisition zone under the proposed modification. During this transitional period these landholders may trigger the process established in the project approval (Schedule 4 Condition 10) and be acquired by Mangoola Coal.

After the 12 month transitional period, these landholders will move into the management zone. If these or any other receptor outside the acquisition zone believe that they are experiencing noise levels that exceed project approval criteria, they can request an independent review be undertaken which is outlined in Schedule 4 Condition 4 of PA 06_0014.

5.2 Air quality

Matters raised in relation to air quality include the assessment approach, cumulative impacts, dust pollution, health impacts from dust and rainwater tank water quality, changes to the affectation zones and climate change. Responses to each of these matters are provided below.

The number of submissions received from individuals and community groups which raised these matters are shown in Figure 5.2.

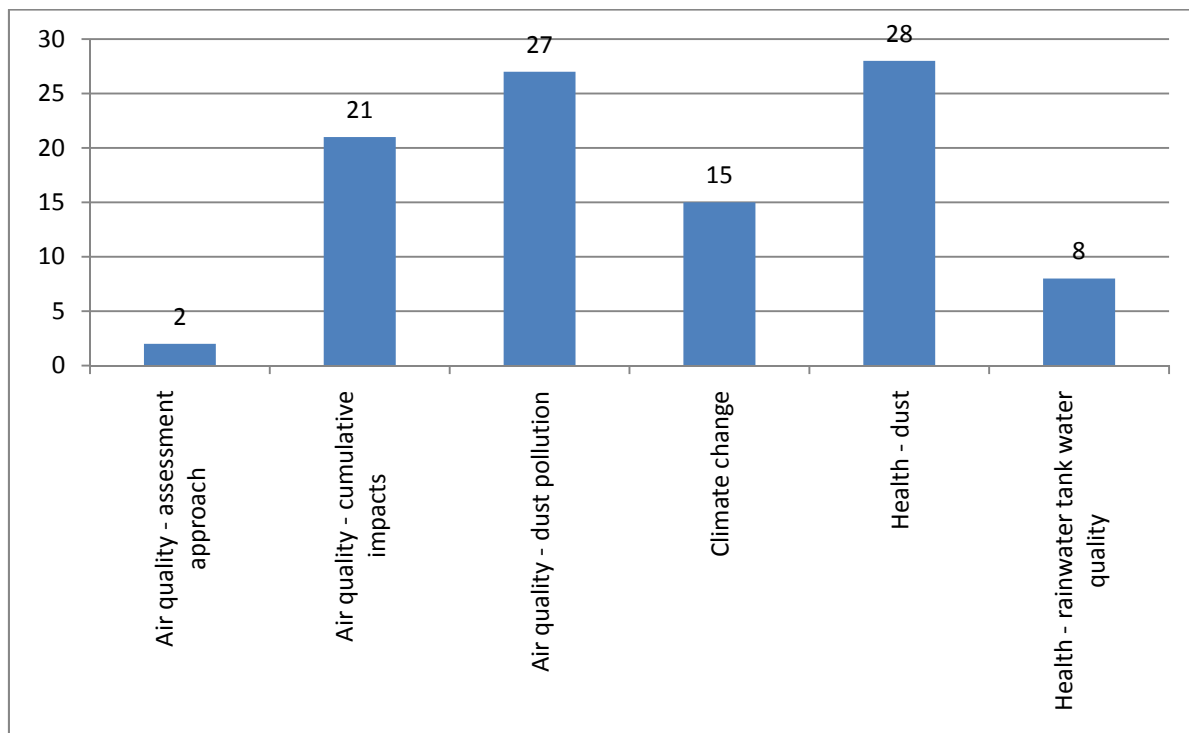


Figure 5.3 Air quality matters raised

5.2.1 Assessment approach – dust impacts

Submissions – I-10, I-20

Two submissions included a more detailed review of the assessment approach and method. Matters raised in these submissions, summarised and indented, are addressed below.

The Air Quality and Greenhouse Assessment report (Section 7.1) includes total suspended particulate (TSP) emissions only and not PM₁₀ and PM_{2.5} as required by the DGRs, and that PM₁₀ and PM_{2.5} and gaseous emissions from onsite mobile equipment are not quantified and appear to be not included in the modelling. The DGRs require an assessment of potential operational impacts, with focus on dust emissions including PM_{2.5} and PM₁₀.

Section 7.1 of the Air Quality and Greenhouse Assessment report (Appendix F of the EA) describes the calculation of emissions. The calculated TSP emissions include all PM₁₀ and PM_{2.5} emissions as these are a subset of TSP. An assessment of PM₁₀ and PM_{2.5} impacts is provided, per the DGR's, and is the focus of the report. PM₁₀ and PM_{2.5} and gaseous emissions from onsite mobile equipment are clearly presented in the assessment and results sections of the report. These are part of the overall emissions from mining activities, and are included in the modelling.

One submission stated that winter PM_{2.5} concentrations from the Muswellbrook EPA monitoring station were not included in the baseline assessment. Winter PM_{2.5} emissions were considered in the assessment, and are discussed in Section 11.7 of the Air Quality and Greenhouse Assessment report. These emissions comprise 75% to 85% of PM₁₀ emissions in winter in Muswellbrook and arise from a large number of closely spaced wood heaters in an urban area. It was concluded that winter PM_{2.5} emissions in urban area were unrepresentative of the area surrounding Mangoola Coal, and therefore winter peaks were excluded as they would lead to unrepresentative results. Further discussion is provided in Section 5.3 of this report.

It is deliberately misleading to compare incremental concentrations of TSP, PM₁₀ and PM_{2.5} against the NEPM criteria for total impact (incremental plus baseline).

The assessment applied EPA impact assessment criteria to make an assessment of potential impacts. However as there are no criteria or methodology for assessing PM_{2.5} impacts in NSW which can be applied, only a relative comparison (rather than an assessment of impacts) can be made between the predicted effects of the mine and the NEPM advisory reporting standards.

No explanation is provided for why only one year of generated meteorological data was used, and why no validation of this data against on site stations or long term data for demonstrating representativeness has been undertaken.

An explanation of the meteorological data used is described in Section 9 of the Air Quality and Greenhouse Assessment report. No long term meteorological data are available for Mangoola Coal. All available weather monitoring data from Mangoola Coal's on-site meteorological station, where there was also corresponding dust monitoring data, were used in the assessment. The data were incorporated into a three dimensional, spatially varying wind field for each hour of the year for which data were available. This data file for this wind field contains several billion data points, and it is impractical to present this in a printable document. To illustrate the content of the meteorological data file used in the modelling, the data at a representative location was used to present wind roses for the area, and a snapshot of the three dimensionally varying wind field over the modelled area was also presented in the Air Quality and Greenhouse Assessment report.

All of the available site-specific data were thus used explicitly in the modelling assessment; therefore, no validation is necessary.

Emissions to air quality from nearby mines were not included in the assessment.

Air quality emissions and potential impacts from nearby mines were included in the Air Quality and Greenhouse Assessment report. The method and assumptions for assessing cumulative impacts are described in Section 7.1.1 and Section 11 of the Air Quality and Greenhouse Assessment report, respectively.

One submission asserted that cumulative 24 hour PM₁₀ emissions are assessed only at the four monitoring stations, and that this is an inadequate assessment approach. In addition it was stated that cumulative PM_{2.5} was not included in the assessment despite being in the DGRs. The assessment approach used is in accordance with the approach for assessing impacts from coal mines detailed in the NSW EPA *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (2005). Cumulative PM_{2.5} impacts are assessed in Section 11.7 of the Air Quality and Greenhouse Assessment report.

The EA does not demonstrate that 80% control efficiency is achieved on haul roads, and claims must be supported by quantitative analysis using a recognised measurement method covering results from all meteorological conditions.

The Air Quality and Greenhouse Assessment report has been carried out to assess potential impacts of the proposed modification. The control efficiency of the existing mine is demonstrated in Mangoola Coal's PRP (*Mangoola Coal – Coal Mine Particulate Matter Control Best Management Practice Determination*, available on Mangoola Coal's website). It is considered reasonable to assume that the existing levels of control will be maintained under the proposed modification, and where relevant, this has been considered in the control efficiencies adopted in the emissions inventory in the Air Quality and Greenhouse Assessment report.

Calibration of the predicted levels with measured results has not occurred; the sensitivity of the assumptions in the modelled predictions cannot be tested; the level of error in the assessment approach is not addressed.

Calibration of the predicted levels with measured results was undertaken, and is described in Section 10 of the Air Quality and Greenhouse Assessment report. The assessment approach uses the most advanced, approved NSW EPA regulatory model and methodology, as described in Section 9 of the Air Quality and Greenhouse Assessment report. Thus the inherent margin for error is well understood by determining authorities and is within the normal uncertainty in any such modelling.

5.2.2 Assessment approach - blast fume impacts

Submissions – I-10

One submission included a more detailed review of the impacts of blast fume emissions. Matters raised, summarised and indented, are addressed below.

The impacts of oxides of nitrogen within blast fume plumes and health implications for equine and vineyards industry has not been considered.

The impacts of NO₂ from blast fumes have been assessed using EPA criteria set out in EPA (2005) which are based on national air quality standards developed by the National Environment Protection Council. These criteria are set to 'reflect the environmental outcomes adopted by the EPA' (EPA 2005). It is noted that the criteria are met in relatively close proximity to the mine, as illustrated by the contours shown in Appendix F of the Air Quality and Greenhouse Assessment report, and would also be met at more distant locations, where equine and vineyard operations may occur.

It is noted that EPA (2005) also sets out specific criteria for 'specialised land use' (which would include vegetable, flower crops and potentially vineyards); however these criteria apply to hydrogen fluoride, which is not associated with mining.

The isopleths presented in the Air Quality and Greenhouse Assessment report do not show significant differences between blasting with and without permissions, and no analysis/explanation is provided. There is also no detail on the weather conditions that were applied in the model for these two conditions.

This issue is discussed in Section 13.3 and 13.4 of the Air Quality and Greenhouse Assessment report. The reason there is no significant difference is that blasting is restricted beyond normal regulatory requirements by Mangoola, and thus Mangoola only permits blasting during daytime hours (9.00 am to 3.00 pm), when it is rare for poor weather conditions that affect blast fume dispersion to occur. Every weather condition for a full year, for each hour in which it is possible to blast (ie 9.00 am to 3.00 pm) were modelled in the blast fume assessment.

The size of the blast fume was not indicated.

The modelling assumed a worst case blast (in terms of maximum emissions release) for each hour of a full year during which it is possible to blast.

Findings of the Air Quality and Greenhouse Assessment report differ from the expectation given from a CSIRO study [Attala et al 2008] of NO_x emissions from blasting operations from open cut mining in the Hunter.

The findings of the Air Quality and Greenhouse Assessment report are consistent with the CSIRO report (Attala *et al* 2008). It is important to consider that the worst case emissions, if they occur at times of the day when dispersion is good (9.00 am to 3.00 pm), will not lead to high blast fume concentrations off site. Blasting at other times when dispersion is poor is likely to result in higher off site impacts. This is prevented from occurring at Mangoola Coal due to blasting being undertaken during daytime only, as described above.

The sensitivity of the model to other dimensions of the plume needs to be assessed using AFTOX or other calibration of a model such as CALPUFF with real time NO_x measurements;

AFTOX is a simple, screening level Gaussian plume model, and is not approved for regulatory use in impact assessments. The CALPUFF model used in the Air Quality and Greenhouse Assessment report is an advanced, approved regulatory model and proven to provide appropriately accurate (overestimate impacts) for regulatory use. The CALPUFF approach used in this study has been calibrated and validated (at other mines); however, this work is unpublished at this time.

There are differences in literature that indicate that average emission flux of NO_x may exceed the 0.9 kg/tonne of explosive quoted in the CSIRO study [Attala *et al* 2008].

The CSIRO study is specific to the Hunter Valley, and actual emissions measured from blasts. It is also consistent with longer term (yet unpublished) studies that have measured every blast from a Hunter mine for approximately one year at two positions in the blast plume. A very conservative approach was adopted for the proposed modification whereby the highest results were used to estimate worst case emissions, occurring on every hour of a year on which a blast could occur. This approach modelled worst case emissions.

5.2.3 Predicted dust impacts

Submissions – I-1, I-3, I-4, I-9, I-11, I-12, I-13, I-15, I-16, I-22, I-31, I-33, I-34, I-36, I-39, I-42, I-43, I-45, I-46, I-47, I-48, I-49, I-51, I-54, I-55, I-56, C-1

Submissions raised concerns that the modification would increase dust pollution and impact air quality in the local area and broader Hunter Valley region, which would increase effects of dust deposition at properties surrounding the mine, resulting in requirement for increased frequency of household cleaning, impacts to drinking water quality for properties that rely on rainwater tanks and collection areas susceptible to increased dust deposition.

The Air Quality and Greenhouse Assessment report presents the likely effects on air quality due to operations under the proposed modification in both the immediately surrounding area, and cumulatively in the wider area. The assessment identifies several locations that would experience increased impacts, which is demonstrated in Figure 9.4 of the EA, but also locations that would experience reduced impacts. The change in impact between current operations and the proposed modification predominately arises due to two key factors:

- a more accurate modelling approach (than was available previously) was used to consider low wind speeds and three-dimensionally varying wind fields. This means the results would more accurately predict dust blowing up and along valleys, but also dust being blocked by hilly terrain; and
- the change in the position of mining activity and the intensity of mining activity, due to the proposed modification.

The assessment shows that deposited dust levels would remain below relevant criteria at most privately owned receptors. Where relevant criteria are exceeded at residential receptors, landholders would be entitled to property acquisition if requested in accordance with the conditions of PA 06_0014. Air quality modelling predicts that a total of 23 currently tenanted mine-owned dwellings would be affected by air quality levels that exceed relevant criteria at some point during the mine life. Mangoola Coal will review the predicted impacts and results of real time air quality monitoring at mine-owned dwellings under the proposed modification to determine whether affected properties are suitable for habitation during these periods of the mine life. Existing tenants can make a written request to Mangoola Coal in the event of unacceptable effects from mining, including dust impacts; if a complaint is unable to be resolved, tenants have the option of terminating their tenancy without penalty.

One submission asserted that the process of removal of sludge from water tanks is not mentioned in assessment, and that the presence of sludge in rain water tanks (drinking water) suggests higher levels of dust deposition are occurring than what has been modelled for current operations. It was suggested in the submission that analyses of the dust deposited on the roofs and in gutters could be used to establish the proportion of dust that is due to coal mining.

Impacts to drinking water quality in rain water tanks are discussed in Section 3.4.2 of this report. While dust emissions remain within the relevant criteria, to address community concerns regarding dust impacts to drinking water quality, Mangoola Coal implements a program of installation of first flush systems on residential rainwater tanks (at the request of landowners) within 4 km of active mining (in the approved project disturbance boundary). Under the proposed modification, Mangoola Coal proposes to expand this zone to include landowners within 6 km of active mining.

This includes cleaning of rainwater tanks and replacing filters on rainwater filtration systems once per year within 4 km, and once every two years within 6 km. This has been communicated to stakeholders through the EA, and Mangoola Coal's community newsletter (July 2013).

5.2.4 Cumulative impacts

Submissions – I-1, I-3, I-6, I-7, I-8, I-14, I-17, I-19, I-22, I-24, I-26, I-29, I-36, I-47, I-52, C-1, C-3, C-4, C-5, C-7, C-9

Submissions raised concerns regarding cumulative air quality impacts both due to the mining industry generally in the Hunter Valley, and cumulative impacts with other nearby mining operations. Concerns were also raised regarding the absence of an air quality monitor at Denman as part of the Upper Hunter air quality monitoring network.

The Air Quality and Greenhouse Assessment report assesses cumulative dust levels from Mangoola Coal and nearby mining operations (Mt Arthur Mine, Bengalla Mine and Mount Pleasant Mine) that may arise in future years. This includes direct modelling of other nearby coal mines, and specifically the proposed future operations of these projects, which will develop in a westerly direction over their respective mine life towards Mangoola Coal. The Air Quality and Greenhouse Assessment report applied conservative assumptions about the operation of these mines, and utilised information from publically available air quality assessments.

Cumulative impacts are shown in the tables in Section 11 of the Air Quality and Greenhouse Assessment report, and in the applicable figures in Appendix D. Section 11.5 to Section 11.7 specifically focus on 24-hour PM₁₀ and PM_{2.5} cumulative effects.

Where cumulative effects arise, all receptors where there may be an impact are identified in the Air Quality and Greenhouse Assessment report. Potential impacts of the actual operation of the mine are managed through a comprehensive monitoring program implemented by Mangoola Coal which allows reactive management measures to be implemented in the event that dust levels exceed relevant air quality goals. Four real-time TEOM monitors are positioned around the mine in areas most likely to be affected by mining activity. These instruments warn the mine as dust levels increase and confirm the performance of the mine in regard to affects on local air quality. In addition, EPA operates the Upper Hunter Monitoring Network, which includes many real-time monitors including some in remote locations that warn of elevated natural dust events such as dust storms or bushfires. Further detail on Mangoola Coal's monitoring program and air quality management measures is provided in Section 9.2 of the EA, and is available on Mangoola Coal's website.

Mangoola Coal is also an active participant in the Upper Hunter Mining Dialogue, which aims to improve the environmental performance of mining.

5.2.5 Greenhouse gas impacts

Submissions – I-6, I-8, I-14, I-17, I-21, I-24, I-25, I-26, I-27, I-29, I-35, I-41, I-45, C-4, C-8

Submissions raised concerns with increases in greenhouse gases and climate change impacts due to the modification. An assessment to quantify the greenhouse gas emissions under the proposed modification is presented in Section 14 of the Air Quality and Greenhouse Assessment report. The assessment shows that, while greenhouse gas annual emissions would increase under the maximum extraction rate, the proposed modification would not result in additional greenhouse gas emissions over the life of the mine compared to current approved operations.

5.3 Health

Submissions – I-1, I-4, I-5, I-6, I-9, I-12, I-13, I-14, I-17, I-19, I-24, I-26, I-29, I-32, I-33, I-35, I-36, I-41, I-44, I-9, I-50, I-52, I-55, C-2, C-3, C-4, C-7, C-9

Some submissions raised concerns related to health impacts, primarily due to dust emissions from open cut mining, machinery exhaust and explosives, including:

- concerns that the modification would contribute to pollution and air quality impacts in the broader Hunter Valley region;
- increased dust emissions from both the proposed modification and dust emissions from mining in the Hunter Valley more broadly, including respiratory problems, asthma, pulmonary fibrosis, eye irritation, allergic conditions. One submission also indicated concern about the effect of blast fume emissions on existing health concerns;
- concerns that there is insufficient data to make a sensible determination regarding the health effects due to dust emissions from mining on residents in regions that are already exposed to high density coal mining;
- decreased drinking water quality on properties that rely on rain water collection surrounding the mine, with rain water tanks and collection areas susceptible to increased dust deposition; and
- one submission stated the Hunter New England Health as having reported that Singleton and Muswellbrook local government areas have a higher than average rate of respiratory illness and asthma.

A health assessment study on the effect of coal mining pollution on human and animal health should be required for all new mines and extensions. A study undertaken by the NSW Department for Health, *Respiratory and cardiovascular diseases and cancer among residents in the Hunter New England Area Health Service* (NSW Health 2010) reported as key points and findings that;

...The rates of presentation for all respiratory illnesses in Muswellbrook and Singleton postcodes ranked below those of Tamworth, Gunnedah and Cessnock in all age groups...

...The death rate from respiratory disease for HNEAHS [Hunter New England Area Health Service] is no different from that for NSW. However, there are parts of HNEAHS with higher rates, most evident among males in Mehi and McIntyre. Neither cluster is exposed to significant coal mine and power generation emissions, but both clusters have (not statistically significant) higher smoking rates...

...The drinking water supplies for the towns near extensive open-cut mining and power generation activities are of comparable quality to that of other rural town water supplies...

Compared with the rest of NSW, the geographical regions of Hunter New England Area Health Service (HNEAHS) most affected by open-cut coal mining and power generation activities, have higher than the state average rates of death from all causes and cardiovascular disease in the lower Hunter Valley and lower rates in the upper Hunter Valley. The (NSW Health 2010) study concluded that the data:

...may indicate an adverse health effect due to exposure to coal mining or coal-fired power generation activities in HNEAHS, or may be due to other factors (such as smoking, for example, which is higher in adults in Upper Hunter, although not statistically significantly higher). Thus they do not establish that these adverse health effects are attributable to air pollution or to any other specific exposure. Further investigation is required to determine the role of pollutant exposures.

Data available on health issues relating to air quality was reported in the SIOA (Section 8.2.6.1 of the SIOA) for the proposed modification. The data indicates that rates of respiratory system disease (including asthma and chronic obstructive pulmonary disease) are only slightly higher for adults across the Upper Hunter (26.7 per 100) than both NSW and country NSW averages (25 per 100), and in relation to the Muswellbrook LGA, these rates are lower (24.5 per 100) (PHIDU 2011).

PM_{2.5} levels are generally regarded as an indicator of potential health impacts. Fine particulate emissions from coal mines comprise approximately 4.7% PM_{2.5} particulate matter and any likely change in PM_{2.5} levels due to the proposed modification would be small. Therefore, it is unlikely that the air quality in the local area would be worse, in regard to health, than the air quality experienced by majority of the NSW population. This is discussed further in Section 3.4.2 of this report.

The effects of the proposed modification in isolation and cumulatively have been presented in the Air Quality and Greenhouse Assessment report. The results are shown for receptor locations potentially affected in the wider area around the site.

The incremental results presented show the effect of the entire mine, not just the change in the existing case due to the additional activity from the proposed modification. The predicted change in impacts relative to the current situation would be a small part of the incremental results shown in the assessment (approximately 22% overall, but varying depending on the exact location). The predicted effects are thus generally small at most receptor locations; however, for some locations the additional effect is sufficient to result in an exceedance of criteria.

The cumulative results show the effects of the entire mine and surrounding mines over a large area. Receptors at a significant distance from the site would experience only marginal effects, decreasing with distance from the site. The predicted effects of the modification where impacts (air quality levels above criteria) may arise have been identified.

The monitoring data show that the existing dust levels in the area are generally low, and that the effect of Mangoola Coal operations generally is also low. The overall assessment indicates that dust levels would remain below criteria at the majority of receptors, apart from some receptors very near the site.

A study to identify the various components of particulate in the Upper Hunter is due to be released late in 2013 or early 2014. The available studies in this regard (ACARP 2007 and 2008) are based on data collected in Muswellbrook, Singleton and two properties adjacent to mining activity at the Integra and Ashton mines. A longer term study is also available based on PM₁ data (PM₁ is a subpart of PM_{2.5} and is very fine particulate matter) collected for over a decade in Muswellbrook, and reported by MSC in its State of the Environment report.

The results of the study are shown in Table 5.1 and indicate that the majority of fine particulate matter is due to combustion, and only a small fraction is due to mineral particulate (dust) that may be released by mining, agriculture and natural sources.

Table 5.1 Contribution of different sources to coarse and fine particulate matter

Origin of dust	Element	Coarse (PM _{2.5-10})	Fine (PM _{2.5})
Combustion	BC, Cr, F, Ni and S	18.83%	66.87%
Industry	Co, Cu, Mn and Zn	0.32%	0.23%
Motor vehicles	Br and Pb	0.16%	0.26%
Seasalts	Cl and Na	39.90%	15.19%
Soils	Al, Ca, Fe, Si and Ti	38.48%	10.62%
Woodsmoke/biomass burning	K	1.97%	0.94%
Others	H, P and V	0.33%	5.88%

Source: ACARP (2007)

In contrast to Muswellbrook and Singleton, well, which has a much lower density of wood heaters due to a lower population and is closer to mining activity, shows lower levels of PM_{2.5} well below the state average. Figure 5.4 shows these results and demonstrates that Camberwell has no winter peak for PM_{2.5}.

PM_{2.5} levels in the vicinity of Mangoola Coal would be expected to be even lower than levels in Camberwell as receptors are generally further from mining, and wood heaters are generally more widely spaced.

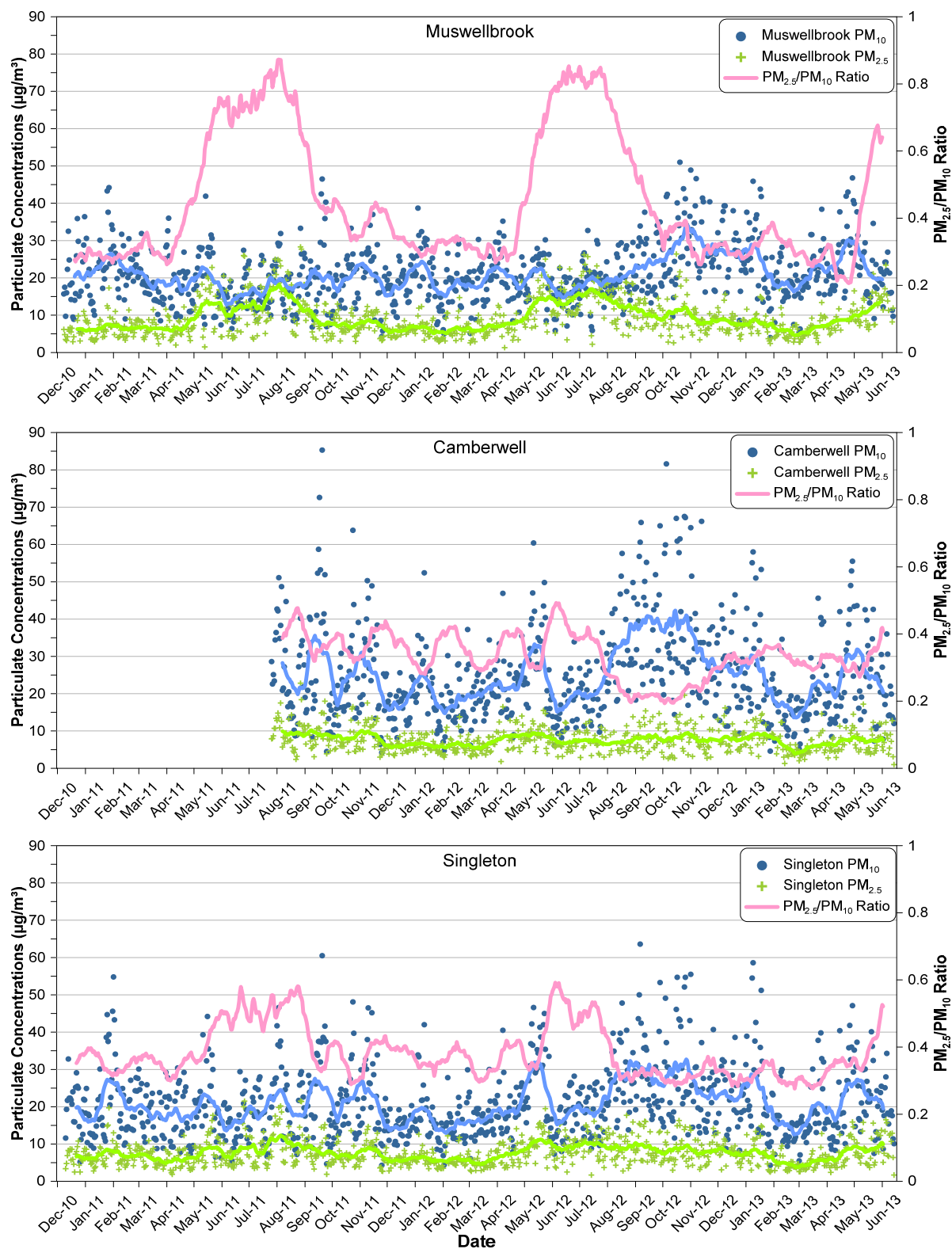


Figure 5.4 Particulate matter levels in Muswellbrook, Camberwell and Singleton (Source - OEH monitoring data, Upper Hunter Monitoring Network)

5.4 Traffic

Submissions – I-8, I-17, I-26, I-32, I-33, I-44, I-47, I-49, I-53, I-55, I-56, C-11

Submissions raised general concerns in relation to traffic impacts due to the proposed modification, including a perceived increase in strain/pressure on road infrastructure and impacts on road safety due to the proposed modification. It is noted (refer Section 4.7) that MSC commented that the planning contribution proposed by Mangoola Coal to MSC adequately offsets the broader economic and infrastructure impacts of the proposal, noting that “there may be some aspects of Wybong Road and its intersections, which require further augmentation arising out of the proposal. Council will endeavour to achieve any such augmentations as a result of the work required under the conditions of its present approval.”

A Traffic and Transport Assessment report for the proposed modification was prepared by Hyder Consulting Pty Ltd and peer-reviewed by GTA Consultants Pty Ltd. The increase in employee and contractor workforce numbers under the proposed modification will result in an increase in the traffic numbers generated by Mangoola Coal. The assessment found that Mangoola Coal’s predicted traffic generation, and the cumulative impacts of other traffic generating development in the area, is unlikely to have significant effects on the performance and capacities of the surrounding road network in part due to intersection upgrades required to be undertaken by BHP Billiton as part of Mt Arthur Coal Mine’s project approval.

Road traffic safety of the local road network is not expected to be significantly impacted by traffic generated by the proposed modification with only a minor increase in the risk of crashes occurring, which is a result of an increased number of vehicles on the road network, and a corresponding increase in the potential for accidents to occur. As part of Mangoola Coal’s current operations, substantial upgrades to the surrounding road network have been undertaken including safety upgrades to Wybong Road. As part of a previous modification to the operations, further upgrades to Wybong Road have been agreed in principle by Mangoola Coal in consultation with MSC.

After consultation with MSC in 2012 Mangoola Coal engaged testing of Wybong Road, including deflection testing to assess the structural performance of the road, roughness and rutting testing to understand current roughness and visual pavement inspection to identify signs of distress. Proposed remediation plans will be discussed with Council. In addition to the testing of Wybong Road, Mangoola Coal continues to monitor the road condition through inspections and maintenance such as:

- hot mix asphalt patching post rain events in various locations along the road;
- hot rock treatment near Spring Creek and Mangoola Road to treat blistering bitumen;
- minor pothole repairs post rain event in various locations along the road; and
- planning to conduct minor repairs to the section east of Sandy Creek.

Concerns were also raised in several submissions that intensification of operations would lead to an increase in train movements. Mangoola Coal’s current operations have approval for up to 10 trains (ie 20 rail movements) per day. The increase in the maximum extraction rate will not result in an increase in the approved daily maximum of 10 trains.

One submission suggested that they had been misled by Mangoola Coal to believe that trains are only received during the day, when trains arrive during both the day and night. The approved hours of operation for the rail load-out facilities since the inception of Mangoola Coal, and as approved under PA 06_0014, are 24 hours, seven days a week. This was originally described in the original EA for Mangoola Coal (then Anvil Hill Project) in 2006 and has not been modified since.

5.5 Surface water

5.5.1 Discharges under the Hunter River Salinity Trading Scheme

Submissions – I-2, I-3, I-4, I-6, I-7, I-8, I-14, I-18, I-19, I-23, I-25, I-26, I-29, I-33, I-35, I-41, I-44, I-45, C-11

One submission raised concerns regarding the introduction of discharge of ‘waste’ or saline water into the Hunter River. It was suggested that this is an entirely different approach to removal of waste water from the mine site.

An overview of the HRSTS and its objectives is provided in Section 4.6. The original EA (Umwelt 2006) predicted a lack of storage space for excess water during prolonged wet periods and identified discharges to the Hunter River as a potential risk management measure to avoid uncontrolled spills. However, this component did not form part of the approved project as further assessment on potential water impacts was required. This lack of water storage space was also identified in the EA for Modification 4 (Umwelt 2010).

Discharge of saline water to the Hunter River under the HRSTS would not be the primary means of water management on site. Mangoola Coal will continue to be a net water user, and would continue to manage water on site within the capacity of existing surface water management infrastructure. The ability to discharge saline water under the HRSTS would simply provide additional flexibility to the existing water management system during periods of prolonged or extreme rainfall. Although the mine is currently a net water user and normally does not need to discharge water off site, having this contingency will provide greater assurance during extreme or prolonged high rainfall periods in managing the risk of uncontrolled discharges or spills from the saline water zone.

Several submissions suggested that on site dam capacity should be increased to retain water. Construction of additional on-site water storage within the approved project disturbance boundary was considered as detailed in Section 4.13.3 of the EA. The construction of additional water storage within the approved project disturbance boundary would result in the sterilisation of some of the coal resource, which reduces the economic viability of the operation. Construction of additional water storage outside of the approved project disturbance boundary would involve disturbance of biodiversity offset areas and additional environmental impacts associated with this disturbance. For these reasons additional on site water storage was not considered desirable from a resource utilisation or environmental perspective.

5.5.2 Water quality impacts

Submissions – I-2, I-3, I-4, I-6, I-7, I-8, I-10, I-14, I-18, I-19, I-22, I-23, I-25, I-26, I-29, I-33, I-41, I-44, I-45, I-47, I-48, I-49, I-50, I-51, I-52, I-55, C-3, C-5, C-7, C-8, C-9, C-11

Submissions raised concerns that discharges of saline water to the Hunter River would have detrimental downstream impacts to water quality and salinity levels in the river, that there would be cumulative water quality impacts with other mines discharging to the Hunter River, and that agricultural and other land uses would be impacted.

The HRSTS was developed by the NSW government as an economic instrument to restore and protect the waters of the Hunter River. The intent of the HRSTS is to maintain an appropriate level of water quality and freshness in the Hunter River and reduce conflict between users of the Hunter River including agricultural land uses, mines and electricity generators through the allocation of credits to licence holders. As described in the previous section, the HRSTS is administered by EPA and guided by an operations committee that includes representatives from the NSW government, industry and community.

Under the HRSTS salinity levels are capped to meet water quality standards and protect the Hunter River against adverse impacts resulting from high saline discharges. There are 1,000 'salinity credits' issued under the scheme and this is a capped number. Each salt credit is worth 1/1000th of the total allowable discharge (tonnes of salt). Every two years, 200 credits are released for auction. Existing and potential participants are able to bid to buy credits. Participants may trade credits with each other, but the release of water is still subject to there being a defined event for the participant with the credits and they must comply with the discharge conditions for that location/event.

The HRSTS is heavily regulated by an operations committee with members representing irrigator and licence holders, NOW, catchment management authorities, and members representing environmental/catchment interests. Continuous monitoring of river flows and salinity levels are undertaken to advise the regulators of when there is a 'block' of water coming through the Hunter River that is able to tolerate water from HRSTS participants.

Each discharge location is required to have continuous water quality monitoring and a flow meter which feeds information back to the HRSTS system. Participants are also required to report any discharge events to the regulators.

The salinity goal for the upper sector, where Mangoola is located, is 600 $\mu\text{S}/\text{cm}$ during high flows and 900 $\mu\text{S}/\text{cm}$ during floods. EPA reported exceedances of these limits, however determined they were not related to any discharge from credit holders but due to natural salty groundwater seeping into the Hunter River (EPA, 2013). During 2011/2012 there were two industry discharge events in the upper sector of the Hunter River.

The predicted water quality impacts of discharging from Mangoola Coal were detailed in Section 11.3.4 of the EA. It was predicted that discharges to the Hunter River would be diluted at a minimum ratio of 1:46 which would result in an immaterial increase in Hunter River contaminant concentrations. Therefore, discharges to the Hunter River under the rules and regulations of the HRSTS were unlikely to impact downstream water users.

5.5.3 Water supply

Submissions – I-3, I-6, I-10, I-17, I-18, I-18, I-26, I-29, C-3, C-5, C-9

Submissions raised concerns that more water will be required in the short term (for the CHPP, dust suppression) under the proposed modification and changes to the site water management system would need to occur.

Schedule 3 Condition 29A of PA 06_0014 requires that Mangoola Coal must adjust the scale of mining operations to match its available water supply. The predicted water balance for the proposed modification was described in Section 11.3.2 of the EA. When necessary, water is pumped from the Hunter River for use on site in accordance with licences held by Mangoola Coal. Modelling of site water demand showed that the existing Hunter River allocation will be generally sufficient to meet site water requirements under the proposed modification. However, a combination of reduced Hunter River supply and long period of drought could result in shortfalls. Section 11.4.3 of the EA addressed water supply security, and included process to evaluate the potential for future water supply shortfalls on an annual basis. This includes undertaking an annual review of the site water balance to forecast supply availability well in advance, so operational responses could be implemented to manage potential shortfalls.

Uncertainties were raised in submissions regarding water supply in the event of a drought, suggesting that water used by Colinta Holdings Pty Ltd (Colinta) (a subsidiary of Glencore which operates pastoral activities on land owned by Mangoola Coal) would be transferred to mining activities, which would not be in keeping with the current and historical land use of the area. Submissions considered the diversion of water from agricultural systems to mining operations as unacceptable. No changes to water management and licensing in respect of water used by Colinta are proposed under the modification. Under current operations, water supply contingencies include the transfer of Hunter River extraction entitlements allocated to Colinta operations to the mining operations and operational responses (such as water saving measures). A certain volume of water from Mangoola Coal's water access licences is made available to Colinta; however the transfer of water from Colinta's operations as required is part of current operational water supply contingencies, and is described in Mangoola Coal's Water Management Plan. This contingency will not change under the proposed modification. Mangoola Coal will continue to maximise recycling of water as its preferential supply before use of licences attached to land used by Colinta. It is also important to note that the current stock and domestic allocations available to Colinta are not allowed to be transferred for use in mining or industrial purposes.

5.6 Social aspects

5.6.1 Community infrastructure and services

Submissions: I-6, I-17, I-18, I-26, I-29, I-55, C-8, C-11

Submissions raised concerns that the modification would place additional pressure and strain on public services and infrastructure. These concerns were expressed in relation to the mining industry in the Muswellbrook LGA and Hunter Valley more broadly. The SIOA for the proposed modification (Appendix I of the EA) considered social impacts and opportunities. The SIOA included identifying impacts to community infrastructure and services and assessing the significance of their impacts.

The SIOA (Section 8) considered potential impacts to the population of the Muswellbrook LGA, which would have the potential to affect community infrastructure and services. Three different population scenarios were considered in assessing the impacts of increased population due to the modification. Scenario A was considered the worst case scenario with 100% of the workforce relocating to the region, albeit the most unlikely scenario.

The worst case scenario (Scenario A) predicted that population change in the region would be 3% in the Muswellbrook LGA at peak employment, however the more likely Scenario C corresponded to a population change of 1.3%. This population change would occur over a period of several years as operations ramped up to the maximum extraction rate, which is anticipated to occur in approximately 2018. This was ranked as a moderate social impact; however, it was also considered a low social risk as this scenario is considered unlikely to occur. To put this predicted population impact in context, the population growth for the Muswellbrook LGA from 2006 to 2011 was approximately 4%, with a population increase of 18% in the Muswellbrook township in the same period.

Submissions also raised concerns regarding a lack of affordable housing, which is putting pressure on the housing market and forcing home buyers on normal incomes out of the area. The SIOA identified that the proposed modification could influence population change through relocation of additional workforce who could become permanent residents. Some new workers will be existing residents of communities in the region, while some may relocate to the area from other regions and live in a similar geographical distribution to the current operational workforce. The SIOA included an analysis of the housing market in the Muswellbrook LGA, and assessment of impacts to housing and accommodation. The SIOA predicted that, based on the potential population change due to the modification, there is a low risk of a significant impact on housing and accommodation.

With respect to potential pressure and strain on local road infrastructure, the traffic and transport impact assessment in the EA predicted that although there will be an increase in traffic generation as a result of the modification, the predicted traffic generation is unlikely to have significant effects on the performance, capacity and road safety of the surrounding road network.

The SIOA identified medium social risk for some community infrastructure and services due to the proposed modification. These included health care services in Denman, child-care and pre-school services in Muswellbrook and Denman, and utilities. Glencore has proposed to engage with relevant regulators, health care service providers and stakeholders to discuss recommendations to address social risks related to provision of these services.

One submission requested that funds from the Wybong Upland Management Strategy and Mangoola Coal Community Fund be directed solely to works in the immediate neighbourhood of Mangoola. Contributions in the immediate vicinity of Mangoola, as specified as part of the terms for Mangoola Coal's voluntary planning agreement under PA 06_0014, include contributions to the Wybong Upland Management Strategy (see Section 4.8), Wybong Road maintenance, and Denman recreational area enhancements. These funds are administered by MSC.

5.6.2 Sense of community and social amenity

Submissions – I-4, I-5, I-9, I-18, I-22, I-32, I-45, I-49, I-52, I-53, I-56, C-11

Submissions raised concerns regarding loss of a sense of community due to Mangoola Coal's operations as a result of a number of factors including property acquisitions, changing rural land uses, letting of mine-owned properties to multiple tenants resulting in loss of rural social fabric and community, and depopulation of the community resulting in increased criminal and nuisance activities (eg burglaries, incidence of fire and random discharge of firearms). The SIOA directly addresses impacts of Mangoola Coal's operations on sense of community, particularly as a result of population change, impacts on areas of community value and other land uses, and levels of conflict in the locality. Population change through the additional operational workforce for the modification is projected, at most, to make less than a 5% population change to the Muswellbrook LGA, which can be classified as a minor-moderate risk based on established population change impact criteria. As the modification will not result in further land acquisitions, the proposed modification is unlikely to have any depopulation impacts on the existing local community. In addition, the proposed modification will not result in any increase in land use conflict as there is no change to the approved project disturbance boundary.

More generally, submissions raised issues related to a perceived reduction in rural amenity and lifestyle as a result of noise and air quality impacts associated with the mining operations. The modification comprises detailed management and mitigation measures for noise and air quality and a process for acquisition/mitigation under PA 06_0014 where regulatory criteria are exceeded (refer to sections 5.1 and 5.2). However, there will be no additional land acquisitions as part of the proposed modification. In addition, Mangoola Coal has committed to undertaking an ongoing community information program for environmental issues to improve awareness of impact management practices and to engage with neighbouring mining operations in dealing with cumulative impacts.

It is important to also note the positive benefits to the community from Mangoola Coal's current operations including:

- employment (direct impact): the modification will result in increased employment, with the additional workforce expected to live locally reflecting the residential patterns of the current workforce - Muswellbrook (43%), Singleton (13%) and Denman (9%), with a median length of residence in the locality at 10 years;
- employees' household expenditure (indirect impact): the current workforce is estimated to spend approximately \$27 million in annual household expenditure, of which more than half (approximately \$15 million) is estimated to be spent in the Muswellbrook LGA;
- employees' participation in community groups and activities (indirect impact): approximately 58% of the current workforce indicated that at least one member of their household participated in community activities and groups, most often sport and recreation activities locally; and
- suppliers' employment impact (indirect impact) and business expenditure (direct impact): the most common locations of suppliers' offices are Singleton, Muswellbrook, Newcastle and Sydney, which correlates to where their spending occurs. On average, suppliers indicated that 57% of their income was dependent on the mining industry, and that 7% of their income was dependent on Mangoola Coal specifically.

It is expected that the current benefits associated with Mangoola Coal, workforce and supplier expenditure will continue and increase for the duration of the mine life as a result of the proposed modification.

5.7 Agriculture

5.7.1 Impacts to downstream agricultural users

Submissions – I-7, I-8, I-10, I-18, I-44, I-52, C-2, C-3, C-5, C-7, C-9

Submissions raised concerns that proposed discharges to the Hunter River would result in water quality impacts that would affect agricultural land uses downstream. The closest downstream water users were considered in the surface water assessment. Mangoola Coal proposes to discharge saline water to the Hunter River in accordance with the rules and regulations of the HRSTS and conditions to be enforced under the EPL. These discharges will be ‘planned’ or ‘controlled’ discharges through opportunities (ie limited periods) notified by the HRSTS operations committee. Under the HRSTS, discharges will only be during high flow conditions (defined as 1,000 to 4,000 ML/day). The HRSTS has a capped limit for acceptable salinity concentrations, which is managed through a total pool of credits, held by participants of the HRSTS. By using real-time monitoring at several points along the river, managers and trading scheme participants know the salinity levels of river water along the length of the river.

The water quality of proposed discharges under the HRSTS has been assessed based on the water quality data from the PWD and compared to the water quality of receiving waters (the Hunter River). The PWD water quality exceeded ANZECC trigger values for pH, salinity (TDS and EC), sodium, chloride, zinc, and total nitrogen. In the immediate vicinity of the discharge point, inside a mixing zone, contaminant concentrations will be elevated compared to adjacent areas. Outside of the mixing zone, the concentration of contaminants would depend on background concentrations and the level of dilution in Hunter River flows. Due to Mangoola Coal only being allowed to discharge during high flow conditions, mixing would be rapid and the resultant increase in Hunter River contaminant concentrations during HRSTS discharges will be immaterial.

Furthermore, the site water balance model was used to assess the likely increase in Hunter River salt load resulting from the proposed discharges. The predicted increase in average Hunter River salt load (at Denman) is likely to be less than 0.4%.

It is therefore unlikely that discharges to the Hunter River under the rules and regulations of the HRSTS will impact downstream water users through impacts to water quality. To ensure that potential impacts to water quality are minimised, Mangoola Coal will continue to implement its surface water monitoring plan, which will be updated to reflect the proposed modification. Further, should the proposed modification be approved Mangoola Coal’s EPL will be varied to include conditions related to the HRSTS.

5.7.2 Agricultural land uses

Submissions – I-7, I-8, I-10, I-18, I-26, I-44, I-51, I-52, C-2, C-3, C-5, C-7, C-9

Submissions raised concerns that proposed modification would impact on agricultural and farming land use. An agricultural impact assessment was undertaken in accordance with the NSW Strategic Regional Land Use Policy Guideline for agricultural impact statements to assess potential impacts of the proposed modification.

The proposed modification does not seek to extend the current approved project disturbance boundary or project footprint and is unlikely to change the land capability classes surrounding Mangoola Coal.

An assessment of the proposed modification against the strategic agricultural land (SAL) criteria identified in the Upper Hunter Strategic Regional Land Use Plan (SRLUP) for biophysical SAL and critical industry clusters (CIC) was completed. As the proposed modification will not impact land outside the approved project disturbance boundary no impacts to biophysical SAL and viticultural and equine CICs are expected.

Water discharges would be in accordance with an EPL and the HRSTS and, therefore, no significant impacts to downstream water quality and thus agricultural users are predicted.

Several submissions noted that they operated agricultural businesses and/or land uses such as thoroughbred operations and cropping activities (lucerne and hay) near Mangoola Coal, and expressed concern that their properties and agricultural land uses were not identified in the agricultural impact assessment in the EA. The agricultural impact assessment in Section 15.2 of the EA considered the impacts to land mapped as biophysical SAL and viticultural and equine CICs near Mangoola Coal, including biophysical SAL mapped to the south-east, east and west, equine CIC to the south-east, south and south-west, and viticultural CIC to the east and west of Mangoola Coal. Intensive agricultural land uses were described in Section 15.2.4 of the EA, including pastoral grazing on improved pasture that has been cultivated and maintained producing lucerne, and dairying operations, vineyards and thoroughbred operations. These land uses were also identified through reconnaissance in the area, and online searches, and were considered and assessed in the EA.

The modification is unlikely to have an impact on the land capability surrounding the site, access to markets or agricultural users downstream. It should also be noted that the Office of Agricultural Sustainability and Food Security determined that the proposed modification would not impact on agriculture.

5.8 Rehabilitation

Submissions – I-6, I-14, I-17, I-19, I-26, I-29, I-48, I-52, I-55, C-11

Submissions raised general concerns regarding a perception that rehabilitation is unable to return disturbed land to former agricultural land uses. General concerns were also raised regarding history of mining companies leaving their sites in a poor state at the completion of mining.

Mangoola Coal's rehabilitation strategy identified in the ROMP involves establishment of self-sustaining indigenous ecosystems which will link to remnant stands of native vegetation. This strategy has been developed in consultation with regulators including DP&I, DRE and OEH. It is also noted that MSC's preferred final land use is heavy wooded vegetation rather than agricultural land uses (see Section 4.5). Though the final land use of the project disturbance boundary will not include agriculture, Mangoola Coal's existing sustainable agriculture offset area protects valuable agricultural land adjacent to the project disturbance boundary, and is designed to protect valuable class I and II agricultural land, which is also mapped as viticulture CIC, and partially mapped as biophysical SAL.

As described in Section 3.1, Mangoola Coal is trialling sustainable landform designs under current operations and, if successful, this approach will be implemented across the site where feasible. Where required and requested by DRE, Mangoola Coal will update the MOP to reflect any changes to emplacement design, vertical relief and drainage resulting from successful sustainable landform trials.

Areas of the approved project disturbance boundary have been progressively rehabilitated in accordance with the MOP as described in Section 16.8.1 of the EA. Further, rehabilitation is regulated by DRE through the MOP and ROMP processes. A rehabilitation security deposit has been provided by Mangoola Coal to DRE to ensure successful rehabilitation of the land. Prior to the security deposit being released, DRE will undertake an assessment and determine whether rehabilitation obligations have been met.

One submission included comments on final void management, stating the need to set criteria for management of the final void (including void size, water quality, salinity leaching rate and cost analysis of void and rehabilitation post-mining). A detailed final void management plan will be developed within five years of mine closure which will identify management measures for the final void which will include detailed completion criteria. Further discussion of the final void, including final void water quality is provided in Section 5.13.

5.9 Visual

Submissions: I-3, I-4, I-13, I-45, I-47, I-49, I-51, C-8

Submissions raised concerns regarding visual impacts of the modification, including overburden emplacement areas and lighting associated with plant and equipment.

A Visual and Lighting Assessment report was completed for the proposed modification as part of the EA. The main alteration to the current approved mine plans sought under the proposed modification is an increase in the maximum rate of progression of mining operations. The progression of mining within the approved project disturbance boundary would remain generally in accordance with the current approved mine plan but would progress at a faster rate. No changes are proposed to the maximum height of emplacement.

If the proposed maximum extraction rate of 13.5 Mtpa is sustained, the modification would reduce the timeframe for active recovery of coal within the approved project disturbance boundary from approximately 15 years to 12 years. This would reduce the temporary effects of the mine elements which would have an overall positive impact on the visual landscape by completing rehabilitation of the disturbed area in a reduced timeframe.

The EA concluded that visual and lighting impacts will be reduced with a shorter mine life resulting from the increased proposed maximum extraction rate. However, a faster extraction rates will result in some viewers being exposed to mine activities sooner. Additionally, an increase in the total area to be rehabilitated at 240 m RL would occur under the proposed modification. These impacts are considered minor when compared to the benefits of potentially reduced visual impact period. A number of visual and lighting impact management measures are currently employed by Mangoola Coal and are considered sufficient to minimise the potential increases to visual and lighting impacts associated with the proposed modification. This includes a lighting plant procedure for the positioning of lighting plant and equipment. Mangoola Coal's Community Complaints Procedure also provides a process for immediate action to be undertaken in response to complaints received. PA 06_0014 requires a lighting audit to be undertaken, which was mostly recently completed in August 2013. Mangoola Coal has implemented further measures identified in the 2012 lighting audit. Mangoola Coal will continue to take all practicable measures to mitigate off-site lighting impacts from operations.

If successful, the sustainable landform designs currently being trialled (Section 3.1) will be implemented across the site where feasible, and will aid the establishment of a more natural looking final landform, which would have positive visual impacts.

Overall, the proposed modifications to Mangoola Coal are considered to have an overall positive impact on viewers in areas surrounding areas given the reduced timeframe which viewers from all viewpoints will be exposed to mining activity associated with the project.

5.10 Approval process and scale of modification

Submissions – I-2, I-5, I-17, I-18, I-30, I-56, C-3, C-7

Some community submissions raised concerns regarding the scale of the modification and frequency of modification applications, including:

- modifications to Mangoola Coal represent a significant change to mining operations from the original project;
- constancy and frequency of mining modifications is an inappropriate use of the approval process with the proposed modification being the sixth modification after only three years of operation. There is a need to protect the community from this level of uncertainty, so nearby communities/agricultural industries can have certainty regarding the future of the region;
- introduction of discharge of “waste” or saline water into the Hunter River through is an entirely different approach to removal of waste from the mine site, and is not a modification; and
- inadequate time to respond to the modification.

Mangoola Coal’s operations were approved under Part 3A of the EP&A Act. Part 3A projects may be modified under Section 75W of the EP&A Act if it involves an alteration but not a radical transformation of the approved project. The elements of the proposed modification are considered alterations and not a radical transformation given that they are minor in nature and will have minimal environmental consequences beyond current operations.

Mangoola Coal aims to continually improve the efficiency of its operations and resource utilisation. The proposed modification, and previous modifications, has resulted in improved operational performance and efficiencies. Mangoola Coal endeavours to notify stakeholders in a timely manner about proposed changes to the operations to provide certainty as is evident in the consultation process undertaken for the proposed modification.

The ability to discharge water under the HRSTS will not change the primary method for water management at Mangoola Coal. Further, the water management process approved for Mangoola Coal always (ie in the original EA in 2006 and Modification 4 in 2010) identified the requirement for discharges to the Hunter River during periods of high rainfall; however, this element was not approved previously as further assessment was required.

The EA and its supporting documents were placed on public exhibition for 30 days which is in accordance with the timeframe prescribed under NSW legislation, and which followed an extensive community consultation process as described in Section 5.11 below.

5.11 Consultation

Submissions – I-13, I-18, C-3, C-9

Several submissions identified that they had not been consulted regarding the proposed modification.

Mangoola Coal undertook an extensive consultation process over a period of seven months for the proposed modification. The consultation process included the distribution of a community information fact sheet (inclusive of a separate fact sheet explaining how the HRSTS works) which summarised the key elements of the proposed modification, face-to-face meetings with near neighbours, and a community information session. All of the stakeholder engagement activities associated with the proposed modification are described in Section 6 of the EA. In addition, Mangoola Coal engages with the community on an ongoing basis through its Community Consultative Committee which meets quarterly and has four community representatives as members, and regular newsletters and fact sheets, the Mangoola Coal website and a community hotline.

Since the public exhibition of the EA, Mangoola Coal has invited those community stakeholders who identified in their submissions that they had not been directly consulted with during the consultation process, to meet and discuss the proposed modification, and if necessary, address any further concerns as part of this response to submissions document. In addition, Mangoola Coal distributed a community newsletter in July 2013 (also available on Mangoola Coal's website) which included an update on the proposed modification and a further invitation for stakeholders to contact Mangoola Coal regarding the modification. No stakeholders requested meetings with Mangoola Coal, despite further efforts to engage directly with stakeholders (by letter) who expressed concerns with not being consulted.

One submission raised concerns that they were only consulted shortly before the public exhibition of the EA regarding changes to acquisition entitlements proposed under the modification, and stated that landholders should have been advised of this change well in advance of public exhibition. Mangoola Coal engaged directly with the affected landholders as soon as possible regarding the proposed change to acquisition entitlements. As discussed in Section 5.1.8 of this report, Mangoola Coal has proposed a 12 month transition period, from the date of a modified project approval being granted, to landholders who would no longer be in the acquisition zone under the proposed modification, during which time they may trigger the process established in the project approval (Schedule 4 Condition 10) to be acquired by Mangoola Coal.

After the 12 month transition period, these landholders will move into the management zone. If these or any other receptor outside the acquisition zone believe that they are experiencing noise levels that exceed project approval criteria, they can still request an independent review be undertaken which is outlined in Schedule 4 Condition 4 of PA 06_0014.

5.12 Property values

Submissions – I-5, I-9, I-10, I-16, I-31, I-54, I-56

Submissions raised concerns about perceived impacts on property values due to Mangoola Coal's operations, as well as general concerns about the impacts of mining more broadly on property values. In valuing land, the proximity to mining operations is only one consideration in a range of factors that may affect property and land values. NSW Land and Property Information (a division of Department of Finance and Services) identifies factors considered in land valuation such as:

- property market conditions in the year of valuation;

- most valuable use of the land;
- location of the land;
- constraints on use such as zoning and heritage restrictions;
- land size, shape and land features such as slope and soil type;
- nearby development and infrastructure; and
- views.

Most of these factors are not affected by proximity to mining operations. The proposed modification will not result in any changes to the approved project disturbance boundary and therefore will not change the proximity of the mine to privately owned land. The environmental impacts of the proposed modification are not significantly greater than those approved for current operations. In considering factors such as nearby development and infrastructure, and views, the EA has demonstrated that there is no significant change to the scale of the operations or significant visual impacts due to the modification. Therefore, the effect of Mangoola Coal's operations on property values is not predicted to be significantly affected by the modification.

Median house and unit sales price data for the nearby suburbs of Denman and Muswellbrook show a steady increase in values from 2004 to 2012, with some slowing in the rate of growth in recent years (Table 5.1). These trends in median property prices are unlikely to be affected by the additional operational workforce for this modification due to a predicted population change rate of between 1.3% and 3%. As noted in the SIOA, this small rate of population growth in the Muswellbrook LGA due to the modification should be seen in light of the 18% increase in the Muswellbrook township between 2006 and 2011.

Table 5.2 Median house and unit sales prices in Denman and Muswellbrook 2004-2012
(realestate.com.au)

Year	Muswellbrook				Denman			
	Median House Price	House Price % Change ¹	Median Unit Price	Unit Price % Change ¹	Median House Price	House Price % Change ¹	Median Unit Price	Unit Price % Change ¹
2004	\$198,000	25.3	\$115,000	25.0	\$179,500	32.5%	-	-
2005	\$226,500	14.4	\$142,000	23.5	\$218,500	21.7%	-	-
2006	\$235,000	3.8	\$176,000	23.9	\$222,000	1.6%	\$76,000	-
2007	\$255,000	8.5	\$163,750	-7.0	\$235,000	5.9%	\$105,000	38.2%
2008	\$268,000	5.1	\$160,000	-2.3	\$260,000	10.6%	\$535,000	409.5%
2009	\$260,000	-3.0	\$295,000	84.4	\$273,000	5.0%	\$116,000	-78.3%
2010	\$287,000	10.4	\$285,000	-3.4	\$290,000	6.2%	\$357,250	208.0%
2011	\$300,000	4.5	\$300,000	5.3	\$340,000	17.2%	\$425,000	19.0%
2012	\$330,000	10.0	\$300,000	0.0	\$314,000	-7.6%	\$246,000	-42.1%

Notes: 1. Year on year price change.

A review of property sales (houses and land) in suburbs surrounding Mangoola Coal indicates that there have been a number of property sales in the two years to August 2013, in the suburbs of Denman (59 sales), Sandy Hollow (15 sales), Castle Rock (five sales), Wybong (three sales), Manobalai (two sales), Hollydeen (one sale) and Mangoola (one sale). Of these, Mangoola Coal has purchased three properties, one each in Mangoola, Wybong and Castle Rock. As there are other mining operations and exploration leases in the area, it is likely that some purchases have been made by mining companies. However it indicates that there is a continuity of sales in the area.

5.13 Groundwater

5.13.1 Groundwater assessment

Submissions – C-3, C-9

Submissions raised concerns that a meaningful additional groundwater assessment had not been undertaken for any modifications since the original EA in 2006, and claimed that statements regarding potential impacts on groundwater quantity and quality are therefore inadequately justified.

A detailed groundwater assessment was undertaken by Mackie Environmental Research (MER) (2006) as part of the original EA. This assessment included an analysis of the potential impacts relating to groundwater quality and quantity.

The only approved project modification to Mangoola Coal's operations with the potential to affect groundwater is Modification 4. A review of the revised mine plan proposed under Modification 4 was undertaken by MER as part of the Modification 4 EA (Umwelt 2010). The groundwater review concluded that because the mine pit shells and disturbed areas were similar to the original EA, the rate of recovery of the water table will be similar and the groundwater impacts would also be similar to that predicted in MER (2006).

Mangoola Coal already has a number of existing commitments and approval conditions under PA 06_0014 relating to groundwater monitoring and management. Groundwater monitoring has continually been undertaken at Mangoola since the original EA, and since commencement of operations in 2010. Monitoring is undertaken in accordance with Mangoola Coal's approved Groundwater Monitoring Plan.

An assessment was undertaken by MER (2013) as part of the Groundwater Monitoring Plan to verify groundwater inflows predictions and validate predictions against monitoring data. The assessment by MER (2013) included remodelling of the approved mine plan (as modified under Modification 4) and recalibration of the original groundwater model using additional groundwater monitoring data collected since 2006. Results of the groundwater remodelling confirm that there is no significant change in impacts to groundwater due to the approved mine plan compared to modelling undertaken by MER in 2006. Results indicate that drawdown impacts are similar to those predicted by MER (2006), while the rate of groundwater inflow to the pit is predicted to be less than MER (2006), primarily due to updated model parameters and improved modelling algorithms.

The changes under the proposed modification compared to Modification 4 in relation to groundwater impacts are not considered significant due to the fact that the pit design and areas of disturbance not changing. From a groundwater perspective an increased rate of mining will mean that impacts occur earlier in time, but will be a similar magnitude, and recovery will also commence sooner. The Groundwater Monitoring Plan will continue to monitor the actual impacts to groundwater levels and quality as a result of mining and assessed against criteria as specified in the plan. This will provide data to assess the actual impacts to groundwater levels, quality and volumes extracted and will be further validated by remodelling as already undertaken in early 2013 by MER.

5.13.2 Final void water levels and quality

Submissions – C-3, C-9

Submissions raised concerns relating to water quality of the final void and potential downstream impacts. Responses to these matters, summarised and indented, are provided below.

EA documents refer to modelling that estimates a long-term water level within the final void to reach a maximum level that does not allow discharge to the environment and downstream watercourses, however sufficient assessment/modelling detail could not be identified to support conclusions.

Groundwater modelling undertaken in 2006 by MER included a simulation of recovery for groundwater levels in the coal measures. The modelling of the recovery considered the backfilled pit, the area of open voids and the runoff and rainfall infiltration with final void levels of 150 and 135 m AHD. Changes to the final landform under Modification 4 have resulted in a single final void. Remodelling of surface water was undertaken by Umwelt (2010) for Modification 4 and a review of the groundwater assessment was also undertaken by MER (2010). The surface water remodelling indicated a final void water level of 129 m AHD and the review of the groundwater assessment by MER (2010) for Modification 4 concurs that this new level is within the expected range and will not alter long term recovery predictions for groundwater.

Original 2006 assessment appears to have been based on an averaged approach to final void water balance with no assessment of the potentially significant short-to-medium term variability of climate and therefore water levels within the void.

Climatic variations were considered in the groundwater model with the use of long term average climatic conditions. The use of long term averages for climate will balance the short and medium term fluxes of above and below average rainfall events, and therefore the model is considered to be adequate with respect to climatic variations.

No discussion of effects of declining water quality in void. The estimated water quality (3,920 – 5,650 mg/L) does not appear consistent with what would effectively be the formation of a 'self contained system' that would in time create a hyper-saline water body. Suggests no accounting for evapo-concentration of non-draining water which will lead to hyper-saline water body, or there is some mechanism for movement of water from the pit to the environment (spill or groundwater movement) which is not adequately described.

The final landform (including a void) was assessed in the original EA and it was stated that final void water would be expected to remain largely isolated from the regional coal seams and alluvial systems. This is due to the inward hydraulic gradient and the formation of an 'evaporative sink in the long term' (MER 2006). This inward hydraulic gradient means that once the groundwater pressures recover they will continue to flow towards the pit over the long term and this hydraulic gradient will prevent saline water flowing into the surrounding aquifers. An analysis of the hydrochemistry for the water in the final void water was undertaken in Section 5.6 of MER (2006).

The final recovered water level of the void for Modification 4 is calculated at 129 m AHD, and the proposed edge of the final void is estimated at 150 m AHD, which is 21 m above the final recovered water level in the void. The void water is therefore not able to spill and the void will form a self contained system isolated from the surrounding environment and downstream alluvial groundwater users and surface water users.

The change to groundwater as a result of the proposed modification is timing of impacts, which will occur earlier due to the increased rate of mining. Although impacts (including the peak impact) will occur earlier than originally anticipated, the recovery of groundwater will also occur earlier than originally anticipated as rehabilitation is also undertaken ahead of the original schedule.

The groundwater model would continue to be verified annually in accordance with the groundwater management plan. Modelling and management of water quality in the final void will form part of the mine closure plan and final void management plan.

5.14 Economic

Submissions – I-5, I-18

Submissions raised concerns regarding the predicted workforce numbers were overstated in the EA, which would inflate the economic benefits of the proposed modification. The workforce numbers presented are based on peak production, and were conservative estimates to ensure that impacts associated with an increased workforce, such as traffic impacts and impacts to community services and infrastructure, were adequately assessed. Workforce requirements would change over the life of the mine, and this is accounted for in the estimate.

The economic assessment (Appendix J of the EA) included an assessment of the net benefits of the modification both with and without employment benefits, being \$266 M and \$261 M, respectively. Therefore even if the workforce estimate is not fully realised, the economic benefit of the modification would not be significantly affected.

5.15 Cumulative impacts

Submissions made statements regarding cumulative impacts generally due to the mining industry in the Hunter Valley including impacts to agricultural land uses, strain on public infrastructure and services, and diversity of the regional economy. These are addressed in the following sections.

5.15.1 Diversity of regional economy

Submissions – I-17, I-18, I-19, I-26, I-29, I-44, I-51, I-52, I-55, C-5, C-7, C-8

Submissions raised concerns regarding the regional economy due to mining more broadly, including:

- need for a secure and diverse economic base for the region. Mining is a threat to the economy as it drives out other sustainable industries and the long term employment they provide;
- mining has caused the loss of diversity of agricultural businesses such as thoroughbred studs, and wineries that contribute to diversity of industry;
- an economic impact assessment is required to assess the effect of the project on all other non-mining industries and businesses in the area; prospective rural businesses will not locate to areas threatened by coal mine expansion;
- the wine industry is affected by ongoing expansion of the mining industry – significant impacts have been experienced in recent years in the Upper Hunter Valley. The proposed modification will further damage the reputation of the Upper Hunter wine industry;

- tourism development proposals are constrained by levels of uncertainty due to mining; and
- general aesthetic impacts of mining on tourism in the Hunter Valley.

The concerns raised in the submissions are considered to be more related to the expansion of mining in general in the Hunter region, as opposed to the proposed modification, which only seeks to increase the intensity of mining at Mangoola Coal within the approved project disturbance boundary, rather than expand its mining footprint.

Economic impacts, including impacts to the regional and local economy were addressed in Section 13.3 and 12.3.6 of the EA and Section 5.5.4 of the SIOA.

Community concerns regarding the impact of mining on the diversity of the Hunter economy are understandable, particularly with the well publicised growth of mining outputs from Hunter mines. However, there is no evidence to suggest that mining, or an expansion of mining activity within the Hunter region, has an adverse impact on the diversity of its economy. To the contrary, data would suggest that the reverse is true, particularly in relation to agriculture and tourism.

Concerns raised in relation to mining and agriculture largely stem from concerns regarding conflicts in land use. However, there are many examples where mining, agriculture and other land uses have operated successfully together. Such outcomes are dependent on effective government regulation such as land use planning when it is based on sound biophysical and socio-economic data, and transparent evaluations using methods like cost benefit analysis.

Land use planning includes consideration of the economic outcomes of various use alternatives. As such, it is necessary to understand the comparative financial value of the NSW mining and other rural industries. In 2008/09, the gross operating surplus from mining was \$9,128 M and state royalty payments were \$1.28 B, with coal accounting for 95% of this (DP&I 2012). Comparatively, the gross operating surplus from agriculture, forestry and fishing was \$4,974 M and minimal state royalties (approximately \$140 M for forestry products) were paid.

Agricultural output is described as percentages of state or national output, for example, 80% of the value of stud horses and 5% of wine grapes. There are no economic or time series data that enable comparisons to be made between industry sectors or changes in output.

To assess the interaction between multiple land uses such as mining and agriculture, it is essential to examine time series data. If a conflict exists, agricultural output would have declined as mining has grown.

Between 1980 and 2011 there has been substantial growth in coal mining in the Hunter region where output has increased from 30.6 Mtpa to 159.5 Mtpa (HVRF 2011). The gross output value from the region's main agricultural activities over a comparable period is:

- grapes – \$4.7 M to \$21.1 M (peak \$27.2 M in 2000/01) (ABS Agstats Small Area Data 1979-2006);
- milk – \$24.5 M to \$33.8 M (peak \$68.6 M in 1995/96) (ABS Agstats 1979-2006); and
- beef – \$34.6 M to \$64.2 M (peak \$72.4 M in 2000/01) (ABS Agstats 1979-2006).

The change in value of total commodities is similar rising from \$97.9 M to \$195.2 M. Unfortunately, no reliable data are available for changes to stud horse production but it is probable, given the significant investments made in horse studs around Scone and Muswellbrook, that thoroughbred production would also have increased in value.

Another relevant perspective is whether 'food security' is under threat. Currently, Australia produces enough food for 60 million people, sufficient to feed approximately three times the present population (ABARES 2009). Despite this surplus, production of most agricultural commodities is increasing as the industry becomes more export orientated, with approximately 66% of recent production being exported either directly or indirectly following processing (Gillespie 2012). This applies particularly to the main industries in the region with about 70% of beef being exported, as well as 50-60% of wine and dairy production (Gillespie 2012).

In relation to tourism, statistics from Destination NSW (2013) show that tourism within the Hunter Tourism Region¹ has increased over the last 12 years. There were 7,296,200 total visitors (overnight and day trips) to the Hunter region in the year ending March 2013 compared to 6,723,600 total visitors in the year ending March 2001 (with a peak of 8,060,800 total visitors in the year ending March 2012). This is a growth of 8.5% compared to a decline in total visitors to NSW during the same period of approximately 1%. Total spend in the Hunter region for overnight and day trips in the year ending March 2013 was \$1,433 M compared to \$972 M in the year ending March 2001, which represents a 47% increase. At the same time, total spend in NSW for overnight and day trips increased by 23%.

Accordingly, similar to agriculture, while mining output from the Hunter region has grown, so too has tourism.

Another important consideration in the diversity of an economy is the location of investment. Nearly 50% of non-coastal local government areas in NSW are facing declining population due to a number of factors including loss of industries (eg abattoirs and timber mills), increased mechanisation of farming and aggregation of properties. In this context, the past and prospective contribution of mining investment, nearly all of which is in regions that would otherwise be in decline, needs to be recognised as a strong positive influence.

The conclusion from the above data is that agricultural and mining output value, as well as key tourism indicators, has grown concurrently over an extended period. At a regional level there is no evidence of exclusion or competition, rather a combination of effective land use planning and well regulated development which has allowed these industries to grow concurrently.

At a project specific level, an economic assessment of the proposed modification was undertaken. This included an assessment of its economic efficiency (consideration of the economic costs and benefits of the proposed modification) and its regional economic impacts (the stimulus that the proposed modification would provide to the regional and State economy). In terms of economic efficiency, overall the proposed modification is estimated to have net benefits of up to \$97 M, which includes \$64 M and \$28 M in tax revenue to the Commonwealth and State governments respectively. Regionally, the proposed modification will contribute \$193 M in annual direct and indirect regional output or business turnover, \$111 M in annual direct and indirect regional value-added and \$18 M in annual household income.

The economic assessment demonstrates that the proposed modification will have substantial direct benefits to the Hunter regional economy, and not solely to the mining sector.

¹ Destination NSW defines the Hunter Tourism Region as containing the Barrington Tops, Hunter Valley, Lake Macquarie, Newcastle and Singleton.

5.15.2 Strain on community infrastructure and services

Submissions – I-6, I-17, I-18, I-26, I-29, I-29, I-55, C-8, C-11

Submissions raised concerns that expansion of the mining industry is placing additional pressure and strain on community services and infrastructure in the Muswellbrook LGA and Hunter Valley more broadly. This issue was also raised by stakeholders during consultation and service capacity audit undertaken as part of the SIOA, and was addressed in detail in the SIOA.

As detailed in the SIOA, through this process, stakeholders raised issues in relation to the provision and capacity of services in Muswellbrook and surrounding areas, particularly resulting from the mining industry's impact on population growth and subsequent increase in demand for community services. Of most concern are housing shortages and lack of affordability, low access to specialist health services such as mental health, challenge to source skilled and trained workers across all services, critical lack of capacity in child-care facilities across the region and impacts of mining on perceived decreasing value placed on formal education.

Consultation with service providers also identified some key opportunities for the mining industry to address some of the issues including; investing in affordable housing, increasing their communication between property developers and Council in regards to future housing needs, supporting child-care facilities across the region and invest in additional infrastructure and facilities for the local youth.

Mangoola Coal already implements a range of existing strategies to address a number of these issues. Additionally, the EA and SIOA identified a range of other strategies that will be implemented to mitigate potential impacts due to the modification, including engaging with regulators, health, childcare and housing service providers and other relevant stakeholders to address these issues at a broader level.

Mangoola Coal has an existing Social Involvement Plan, which will be regularly updated with the outcomes and mitigation strategies of the SIOA to inform future management of social impacts and ongoing operational planning.

5.16 Project justification

Submissions – I-23, I-24, I-29

Mangoola Coal regularly reviews its mining operation to assess current performance and identify improvement opportunities. The proposed modification, as well as other modifications to Mangoola Coal operations to date, is the result of such reviews and aims to improve efficiency of the operations and resource utilisation. Following consideration of the matters raised in the submission to the proposed modification, justification for each of the separate elements is given below.

5.16.1 Extraction rate increase

It is proposed to increase Mangoola Coal's rate of extraction with an increase in the maximum rate from the approved 10.5 Mtpa to a maximum of 13.5 Mtpa. The proposed increase in the extraction rate is a result of efficiencies identified in the operation and capabilities of existing infrastructure. The CHPP is currently capable of operating at a higher throughput than currently approved. Allowing an increase in the throughput of the CHPP will allow Mangoola Coal to respond more quickly to shifting market demands for coal. Remaining at a maximum extraction rate of 10.5 Mtpa, when existing coal handling and processing infrastructure is capable of a higher throughput, would represent an inefficiency in the operation and a lost opportunity to operate the CHPP at its full potential.

Furthermore, these additional benefits are able to be realised within the approved project disturbance boundary with minimal environmental consequences beyond current operations.

The increased rate of extraction will also assist in facilitating coal exports to service global energy needs and, on balance, provide economic benefits to Muswellbrook LGA and the Hunter Region.

For the proposed increase in the extraction rate to occur some changes to elements of the current operations will be required, such as:

- increase in employee and contractor numbers;
- progression of rehabilitation and changes to final landform;
- changes to plant and equipment;
- ancillary water management infrastructure; and
- changes to footprint of the ROM stockpile.

Given that these are the result of the proposed increase in the extraction rate, the justification given above is considered to include these elements.

5.16.2 HRSTS discharges

The HRSTS was developed by the NSW government as an economic instrument to restore and protect the waters of the Hunter River. The intent of the scheme is to reduce conflict between users of the Hunter River including primary producers, mining operators and electricity generators through the allocation of credits to licence holders. Under the HRSTS discharges of saline water by licence holders to the Hunter River are limited to times of high flow or flood and salinity levels are capped to meet water quality standards and protect the Hunter River against adverse impacts resulting from high saline discharges.

Under the current operations, the capacity of existing surface water management infrastructure has the potential to limit operations under certain climatic conditions, as there is predicted to be a lack of storage space for excess water when operating at maximum capacity. The current contingency, should the water storages reach their capacity during periods of high, prolonged rainfall, is to pump water into the Tailings Dam or into the active pit. This lack of water storage was identified in previous surface water assessments for Mangoola Coal (Umwelt 2006; Umwelt 2010), which noted the possible requirement for discharges during prolonged wet periods. Mangoola Coal currently holds HRSTS credits; however, saline discharges to the Hunter River do not form part of current operations.

The ability to discharge to the Hunter River under the HRSTS would provide additional flexibility to the existing water management system at the site, particularly during periods of prolonged or extreme rainfall. Although the mine is currently a net water user (recycling the water that is available), and normally does not need to discharge water off site, having this contingency will provide greater assurance during extreme or prolonged high rainfall periods in managing the risk of uncontrolled discharges or spills from the saline water zone.

Mangoola Coal currently uses the existing Hunter River Pipeline and Hunter River Pump Station for licensed extraction of water from the Hunter River. The pump station and pipeline has two-way flow capabilities and is capable of both water extraction and discharge. Therefore, no additional construction of infrastructure will be required.

5.16.3 On site gravel production

Under the current operations waste rock is consumed in overburden dumps. While assessing the feasibility of the proposed modification, the utilisation of suitable mined waste rock for on site gravel production for use as blast stemming gravel and other on site activities was seen as an opportunity to maximise resource recovery and beneficial reuse of waste rock. On site gravel production would reduce the need to import gravel to site which would, as a result, reduce the heavy vehicles associated with gravel transport.

6 Updated statement of commitments

A review of the statement of commitments (Appendix 3 of PA 06_0014) has been undertaken as part of the proposed modification. The review identified that a number of these commitments were no longer required. These commitments can be put into three categories:

- commitments are duplicated by conditions of approval; or
- commitments are for particular actions that have now been completed; or
- commitments conflict with site requirements.

In addition, new commitments were made in the EA for the proposed modification. Table 6.1 presents a summary of the proposed changes to commitments based on the categories above, and includes the new commitments (shown in red). A general change will be made to amend 'Xstrata' to 'Mangoola Coal Operations Pty Ltd'.

In addition, each of the management and monitoring plans and strategies specified in Schedule 3 of PA 06_0014 will be reviewed to incorporate the elements of the proposed modification and updated statement of commitments, where required as stipulated in Condition 7 of Schedule 5.

Table 6.1 Proposed amendments to the statement of commitments

Reference	Proposed amendments	Rationale for amendment
6.2	Community Enhancement Program	
6.2.2	~~Xstrata will work with the local Council to facilitate local employment opportunities within the Muswellbrook Shire~~	This is addressed within the General Terms of the VPA in Appendix 4 of the Project approval. This commitment should be removed to avoid duplication.
6.4	Noise	
6.4.3	Noise Mitigation Measures The following noise control measures will be employed throughout the life of the Project unless otherwise agreed by the Department: ~~The CPP, coal stockpiles and associated infrastructure will be located near the eastern boundary of the Proposed Disturbance Area to take advantage of natural topographic shielding which will reduce noise impacts on surrounding areas.~~	Specifically relates to the design of the project and its construction which has now been completed.
6.4.4	~~The CPP and crushers will have noise enclosures, and shielding will be installed for conveyors.~~	Specifically relates to the design of the project and its construction which has now been completed.
6.4.5	~~The rail loop will be located to use natural topography for shielding as much as possible. In addition, a 4 metre high noise barrier will be constructed on parts of the track to meet the noise modelling in the EA.~~	Specifically relates to the design of the project and its construction which has now been completed.
6.4.9	~~If there are more than 20 privately owned properties in the acquisition zone that have not entered into a negotiated agreement, Xstrata will either: (a) carry out no night time mining operations; or (b) prepare and implement a noise management plan, in consultation with the EPA, and to the satisfaction of the Director General to reduce~~	A noise management plan has been prepared to the satisfaction of the Director-General.

Table 6.1 Proposed amendments to the statement of commitments

Reference	Proposed amendments	Rationale for amendment
	~~the noise impact of mining operations on the properties in the acquisition zone.~~ <i>Notes:</i> <i>1. This plan may include measures to reduce the intensity of mining operations, or restrict night time mining operations.</i> <i>2. In this commitment, negotiated agreement means a written agreement between Xstrata and the landowner in which the landowner agrees not to be counted as a number in the acquisition zone</i>	
6.4.10	Mangoola Coal proposes to modify the management and acquisition zones to reflect the revised noise and air modelling undertaken for Modification 6: - Noise mitigation and management – only those residences identified as having predicted noise impacts under the proposed modification greater than 35 dB(A) will be afforded noise mitigation and management. - Acquisition – those residences identified in Appendix 5 of PA 06_0014 predicted to move out of the acquisition zone as a result of the proposed modification (ie noise/air quality predictions meet the relevant criteria) will be offered a 12 month period from the date of the modified project approval to request acquisition in accordance with Schedule 3 of PA 06_0014.	This is an updated commitment. The predictions in the EA for this modification have utilised measured and recorded data to improve the predictions previously made for the original approval and Modification 4. The EA proposes a new wording for inclusion in the statement of commitments. However, should DP&I insert this into the project approval conditions, it will be removed from the statement of commitments to avoid duplication.
6.4.11	Infrastructure and bypass coal conveyors will consist of partial acoustic enclosures.	This is a new commitment.
6.4.12	The NMP will consider pro-active and predictive modelling and management, and protocols for managing noise during adverse meteorological conditions.	This is a new commitment.
6.5	Blasting and vibration	
6.5.6	Blast Controls ~~Xstrata will design and undertake blasts to ensure the relevant vibration and blast overpressure criteria are met at the 500 kV transmission line.~~	This is addressed in Schedule 3, Condition 13 of the Project approval. This commitment should be removed to avoid duplication.
6.5.7	~~Xstrata will refine and manage its blasting practices or undertake ameliorative measures so as not to significantly increase the risk of instability or affect the structural integrity of the rock shelter sites that are considered to be of significant Aboriginal cultural value in the Wallaby Rocks, Western Rocks and Limb of Addy Hill plateaus. This will include an ongoing monitoring program and review of blast design parameters.~~	This is addressed within the Blast Monitoring Plan; as required by Schedule 3, Condition 23 of the Project approval as well as Schedule 3, Conditions 13, 17 and 18. This commitment should be removed to avoid duplication.
6.5.8	~~Techniques to minimise blast impacts will be employed as necessary to ensure compliance with relevant criteria. This may include blast initiation using electronic detonation techniques, limiting blast MIC, consideration of wind speed and direction prior to blasting, use of adequate stemming, implementing a delay detonation system, and careful drilling and hole loading to ensure that the required blast design is implemented.~~	This is addressed within the Blast Monitoring Plan; as required by Schedule 3, Condition 23 of the Project approval as well as Schedule 3, Conditions 13, 17 and 18. This commitment should be removed to avoid duplication.

Table 6.1 Proposed amendments to the statement of commitments

Reference	Proposed amendments	Rationale for amendment
6.5.9	~~The Mine Manager or delegate will undertake a pre-blasting review of weather conditions to identify any conditions which may significantly increase blasting impact or dust impacts. When weather conditions are suitable or if safety requirements dictate at other times, the Mine Manager or delegate will issue a blast clearance prior to each blast proceeding.~~	This is addressed within the Blast Monitoring Plan; as required by Schedule 3, Condition 23 of the Project approval as well as Schedule 3, Conditions 13, 17 and 18. This commitment should be removed to avoid duplication.
6.5.10	~~Wybong Road will be temporarily closed during blast events within 500 metres of the road.~~	This is addressed within the Blast Monitoring Plan; as required by Schedule 3, Condition 23 of the Project approval as well as specifically in Schedule 3, Condition 19. This commitment should be removed to avoid duplication.
6.5.12	~~All relevant personnel will be trained on environmental obligations in relation to blasting controls.~~	This is addressed within the Blast Monitoring Plan; as required by Schedule 3, Condition 23 of the Project approval as well as Schedule 3, Conditions 13, 17 and 18. This commitment should be removed to avoid duplication.
6.5.13	~~The date, location of blast holes and quantity of explosive detonated each day will be documented.~~	This is addressed within the Blast Monitoring Plan; as required by Schedule 3, Condition 23 of the Project approval as well as Schedule 3, Conditions 13, 17 and 18. This commitment should be removed to avoid duplication.
6.5.14	~~Monitoring will be undertaken at locations representative of surrounding nearest private residences and other sensitive locations to verify compliance with relevant vibration and blast overpressure criteria, and identify appropriate further blast refinement or management.~~	This is addressed within the Blast Monitoring Plan; as required by Schedule 3, Condition 23 of the Project approval as well as Schedule 3, Conditions 13, 17 and 18. This commitment should be removed to avoid duplication.
6.5.15	~~Blast management procedures will be periodically reviewed to evaluate performance and identify corrective action, if required.~~	This is addressed within the Blast Monitoring Plan; as required by Schedule 3, Condition 23 of the Project approval as well as Schedule 3, Conditions 13, 17 and 18. This commitment should be removed to avoid duplication.
6.5.16	Blast monitoring results will be reported in the AEMR.	This is a new commitment.
6.5.17	The blast monitoring program will be updated where necessary in accordance with Modification 6.	This is a new commitment.

Table 6.1 Proposed amendments to the statement of commitments

Reference	Proposed amendments	Rationale for amendment
6.6	Air quality	
6.6.2	~~Air Quality Controls~~ ~~Water sprays will be used at coal handling transfer points and on stockpile areas that are capable of generating dust.~~	This commitment can be rolled into the requirements stated in Schedule 3, Condition 29 for the preparation of an Air Quality Management Plan (AQMP). The AQMP is approved by the Director-General and then made publicly available on Mangoola Coal's website.
6.6.3	~~All active roads will be clearly defined and the development of minor roads will be limited. Minor roads used regularly for access will be constructed so as to minimise dust generation (for example, by using well compacted select material) and will be watered as required.~~	This commitment can be rolled into the requirements stated in Schedule 3, Condition 29 for the preparation of an Air Quality Management Plan (AQMP). The AQMP is approved by the Director-General and then made publicly available on Mangoola Coal's website.
6.6.4	~~Speed limits will apply and be enforced on all roads on the mine site.~~	This commitment can be rolled into the requirements stated in Schedule 3, Condition 29 for the preparation of an AQMP. The AQMP is approved by the Director-General and then made publicly available on Mangoola Coal's website.
6.6.5	~~Water carts will be used on active haul roads and unsealed working areas. Surface moisture levels on all haul roads will be maintained at suitably elevated levels and/or chemical treatments will be applied to achieve 90% dust suppression.~~	The NSW Coal Mining Benchmarking Study prepared by Katestone for OEH (now EPA) states that best practice is 80% dust control. The current PRP which forms part of the EPL being implemented by Mangoola requires a target of 80% for haul road dust suppression. Further, the dust controls applied in the emissions inventory for the Modification 6 project has assumed 80% in accordance with stated best management practice.
6.6.6	~~Only the minimum area necessary for mining operations will be disturbed at any time.~~	This commitment can be rolled into the requirements stated in Schedule 3, Condition 29 for the preparation of an AQMP. The AQMP is approved by the Director-General and then made publicly available on Mangoola Coal's website.
6.6.7	~~Reshaping and rehabilitation of mining and overburden emplacement areas, and obsolete roads, will be undertaken as soon as practicable.~~	This commitment can be rolled into the requirements stated in Schedule 3, Condition 29 for the preparation of an AQMP. The AQMP is approved by the Director-General and then made publicly available on Mangoola Coal's website.
6.6.8	~~Drills will be fitted with dust suppressant measures.~~	This commitment can be rolled into the requirements stated in Schedule 3, Condition 29 for the preparation of an AQMP. The AQMP is approved by the Director-General and then made publicly available on Mangoola Coal's website.

Table 6.1 Proposed amendments to the statement of commitments

Reference	Proposed amendments	Rationale for amendment
6.6.9	~~Blasting design and operation will be managed to achieve optimum material breakage and movement to facilitate efficient mining while minimising the explosives used to achieve this outcome. This includes consideration of material and explosives characteristics, excavating equipment specifications, hole spacing and stemming material specification, accurate placement and drilling of holes, accurate explosives loading and well-managed stemming of blast holes. These measures will assist with minimising dust generation in the blasting process.~~	This commitment can be rolled into the requirements stated in Schedule 3, Condition 29 for the preparation of an AQMP. The AQMP is approved by the Director-General and then made publicly available on Mangoola Coal's website.
6.6.10	~~Cover crops will be established on any topsoil and subsoil stockpiles that are not planned to be used in less than six months.~~	This commitment can be rolled into the requirements stated in Schedule 3, Condition 29 for the preparation of an AQMP. The AQMP is approved by the Director-General and then made publicly available on Mangoola Coal's website.
6.6.11	~~Meteorological conditions will be monitored and weather data will be considered in the timing of blasts to assist with minimising the impacts of blast-generated dust.~~	This commitment can be rolled into the requirements stated in Schedule 3, Condition 29 for the preparation of an AQMP. The AQMP is approved by the Director-General and then made publicly available on Mangoola Coal's website.
6.6.12	~~Dust control measures to be employed during construction will include use of water carts, defining of trafficked areas, imposition of vehicle speed limits and constraints on work under extreme unfavourable weather conditions.~~	Specifically relates to the design of the project and its construction which has now been completed.
6.6.13	~~A spontaneous combustion management strategy will be developed for the Project and will include coal stockpile and reject emplacement management measures, monitoring potential causes of spontaneous combustion events, and actions that can be implemented in the event of spontaneous combustion occurring.~~	A spontaneous combustion management strategy has been prepared and approved by the Director General. The strategy is publicly available on Mangoola Coal's website. It will be reviewed and revised in accordance with Schedule 5, Condition 7. This commitment should be removed as it is no longer required.
6.6.14	~~Mine personnel will be provided with training in dust controls during induction for mine operations.~~	This commitment can be rolled into the requirements stated in Schedule 3, Condition 29 for the preparation of an AQMP. The AQMP is approved by the Director-General and then made publicly available on Mangoola Coal's website.
6.6.15	Mangoola Coal will install first flush systems on residential rain water tanks, at the request of landowners located within 6 km of active mining within the approved project disturbance boundary. Xstrata Mangoola will clean residential rainwater tanks at privately-owned properties at the request of landowners; once per year up to a 4 km radius from active mining within the approved project disturbance boundary; once every two years up to a 6 km radius from active mining within the approved project disturbance boundary.	An amendment has been proposed in Modification 6 to provide cleaning of rainwater tanks for a 6km radius (previously 4 km).
6.6.16	The AQMP will be updated to include commissioning of two additional monitors; one to the west-south-west of the mine, between the approved project disturbance boundary and sensitive receptors, and one to the north-west of the mine, near the township of Wybong and receptor 110.	This is a new commitment.

Table 6.1 Proposed amendments to the statement of commitments

Reference	Proposed amendments	Rationale for amendment
6.7	Water Management	
6.7.1	~~Conceptual surface water controls have been designed to ensure that clean runoff is separated from runoff within disturbed mining and infrastructure areas. Conceptual sediment and erosion controls have been designed to ensure any runoff from disturbed areas is appropriately treated.~~	Specifically relates to the design of the project and is addressed in the requirements of Schedule 3, Conditions 31 and 33. This commitment should be removed to avoid duplication.
6.7.2	~~The drainage lines to be constructed as part of the final landform generally along the alignment of Anvil Creek as it existed prior to approval will be designed and constructed to provide a stable vegetated channel with a natural appearance that blends in with any adjoining riparian areas. Native trees and shrubs will be planted along the drainage alignment to enhance the long term stability of the drainage system and to provide suitable habitat for native fauna.~~	This commitment is addressed in the requirements of Schedule 3, Condition 42(e) for the Rehabilitation and Offset Management Plan. This commitment should be removed to avoid duplication.
6.7.3	~~A comprehensive water quality monitoring program will continue throughout the life of the Project to monitor the surrounding surface water quality.~~	This commitment is addressed in the requirements of Schedule 3, Condition 34 for the Surface Water Quality Monitoring Program as well as Schedule 5, Condition 2. This commitment should be removed to avoid duplication.
6.7.3a	~~Xstrata Manganese will submit to the NSW Office of Water, plans for isolation of the mining excavation from the Big Flat Creek at least 6 months prior to operations extending to within 150 metres of Big Flat Creek.~~	This commitment is addressed in the requirements of Schedule 3, Condition 35 for the Groundwater Monitoring Program. This commitment should be removed to avoid duplication.
6.7.4	Groundwater ~~The existing groundwater monitoring bore locations will be maintained and a number of additional bores will be constructed at new locations beyond the mine pit areas, and in spoils following reshaping. Locations for these piezometers will be subject to consultation with NOW. These bores will be monitored every two months for a range of parameters including water table level, pH, and EC and further analyses every six months for total dissolved solids (TDS), major ions, and heavy metals. Daily monitoring of water levels by automatic data loggers at existing piezometers and in selected new piezometers will continue. Analyses of this data will include comparison against model predictions, establishment of triggers for remedial action, expert review as required, and reporting to regulatory agencies at appropriate intervals.~~	This commitment is addressed in the requirements of Schedule 3, Condition 35 for the Groundwater Monitoring Program. This commitment should be removed to avoid duplication.
6.7.5	~~As discussed in Section 5.3.2.3, it is possible (but unlikely) that two existing groundwater wells not owned by Xstrata may be affected by the Project. If the data obtained from the groundwater monitoring program indicates that the Project is having an adverse affect on these groundwater bores (that is, reduced groundwater yield from existing wells), then an alternative water supply will be provided by Xstrata.~~	This commitment is addressed in the requirements of Schedule 3, Condition 35 for the Groundwater Monitoring Program. This commitment should be removed to avoid duplication.

Table 6.1 Proposed amendments to the statement of commitments

Reference	Proposed amendments	Rationale for amendment
6.7.6	~~If monitoring indicates it is required, a barrier cut off wall within the alluvium associated with Big Flat Creek will be constructed to limit groundwater seepage into the mine.~~	This commitment is addressed in the requirements of Schedule 3, Condition 36 for the Surface and Groundwater Response Plan. This commitment should be removed to avoid duplication.
6.7.8	~~Analyses of the monitoring data will include comparison against model predictions, establishment of triggers for remedial action, expert review as required, and reporting to regulatory agencies at appropriate intervals. The monitoring results and the analyses will be reported in the AEMR.~~	This commitment is addressed in the requirements of Schedule 3, Conditions 35 and 36 for both Groundwater Monitoring Plan and the Surface and Groundwater Response Plan. This commitment should be removed to avoid duplication.
6.7.9	~~Xstrata Mangoola will install piezometers in accordance with the Xstrata Mangoola Groundwater Monitoring Program by the end of 2011. Monitoring of piezometers will become part of the site's monitoring schedule for the ongoing collection of data and reported in accordance with current Mangoola Coal Mine Project Approval. In addition, based on further groundwater advice, additional piezometers will be installed.~~	This commitment relates to a specific action which has now been completed. This commitment should be removed.
6.7.10	The SWMP will be updated to include: - the rules, regulations and operating parameters of the HRSTS and Mangoola Coal's responsibilities; - include a requirement for notification of downstream water users within 1 km of the proposed discharge point when discharges to the Hunter River (dictated by the rules and regulations of the HRSTS) are scheduled; - regular monitoring of water quality in the saline water zone, including the PWD, and monitoring prior to discharge, to ensure that guideline trigger values are met; - monitoring of bank erosion at the discharge outlet on Hunter River during HRSTS discharges, and corrective actions if any unexpected erosion of the bank occurs; - monitoring of the Hunter River channel at the discharge outlet annually and during and following any HRSTS discharge to assess channel stability, and corrective actions if any unexpected impacts arise to channel stability as a result of discharges at the outlet; and - an annual review of the site water balance in order to forecast potential water supply shortages.	This is a new commitment. However, should this commitment be rolled into the requirements stated in Schedule 3, Condition 31 for the preparation of a SWMP, it would not be reproduced in the Statement of Commitments to avoid duplication. The SWMP is approved by the Director-General and then made publicly available on Mangoola Coal's website.
6.8	Ecological Management and Site Rehabilitation	
6.8.2	~~Xstrata is committed to long term protection of the Proposed Offset Areas and will finalise the appropriate tenure / conservation mechanism to achieve this, in consultation with the Department, OEH and DRE.~~	This commitment is addressed in Schedule 3, Condition 40 requiring the long term security of the offset. This commitment should be removed to avoid duplication.
6.8.3	Xstrata will seek to acquire all proposed components of the Proposed Offset Areas within one year of the date of project approval. If one or more proposed components of the Proposed Offset Areas have not been acquired within this time frame, Xstrata will consult with OEH and the Department to identify alternatives.	This is an existing commitment which is still considered to be relevant.

Table 6.1 Proposed amendments to the statement of commitments

Reference	Proposed amendments	Rationale for amendment
6.8.4	The land to be included in the conceptual corridors will include one external corridor to the north and one external corridor to the west, with the final location to be determined in consultation with OEH and the Department.	This is an existing commitment which is still considered to be relevant.
6.8.5	Xstrata will take all reasonable steps to acquire all proposed component(s) of the conceptual corridors within one year of the date of granting of project approval. If proposed component(s) of the conceptual corridors have not been acquired within this time frame, Xstrata will consult with OEH and the Department to identify alternatives.	This is an existing commitment which is still considered to be relevant.
6.8.6	Where tree hollows are lost by felling hollow-bearing trees (including stags), hollow fallen timber will be replaced by nest boxes set in appropriate locations at appropriate heights for the target fauna species, <u>as recommended by a suitably qualified ecologist</u> . This will be managed in accordance with procedures in Mangoola Coal's ROMP.	This commitment is proposed to be amended (in red) to include reference to a qualified ecologist.
6.8.7	~~The ongoing health of Diuris tricolor will be monitored in the Habitat Enhancement Area adjacent to Modification Area 1, and at least 2 reference populations elsewhere in the Habitat Enhancement Area for at least five years. This will be included in the revised Mangoola Coal ROMP with baseline monitoring established prior to mining in the modifications areas and annual monitoring for at least 5 years following mining in the modifications areas.~~	This commitment is addressed in the requirements of Schedule 3, Condition 42 for the preparation of a ROMP. This commitment should be removed to avoid duplication.
6.8.8	~~If there is significant and sustained decline in vigour of the Pine Donkey Orchids immediately adjacent to the open pit in Modification Area 1 then Xstrata Mangoola, over a three (3) year period, will engage a suitably qualified ecologist to recommend actions in relation to achieving the long term survival of this population. This will be included in the revised ROMP.~~	This commitment is addressed in the requirements of Schedule 3, Condition 42 for the preparation of a ROMP. This commitment should be removed to avoid duplication.
6.8.9	~~Prior to any vegetation clearing in any of the modifications areas, a pre-clearance survey for Acacia pendula plants will be done. In the event that any plants are found they are to be marked and managed in accordance with Mangoola Coal's ROMP.~~	This commitment is addressed in the requirements of Schedule 3, Condition 42 for the preparation of a ROMP. This commitment should be removed to avoid duplication.
6.8.10	~~Translocation of Diuris tricolor from the approved disturbance area into suitable known habitats within the Biodiversity Offset Areas will continue to occur, as per the Project Approval for the Mangoola Coal Mine, and defined further in the ROMP. This will be extended to include any records of this species identified (during seasonal surveys) in the proposed modification areas.~~	This commitment is addressed in the requirements of Schedule 3, Condition 42 for the preparation of a ROMP. This commitment should be removed to avoid duplication.
6.9	Aboriginal Cultural Management	
6.9.1	~~Surface collection and grader scrapes will be undertaken for sites identified in the EA, prior to works commencing in these areas. Manual excavation will be undertaken in areas where the grader scrapes reveal features such as hearths, heat treatment pits, knapping floors or significant artefact concentrations.~~	This commitment relates to a specific action which has now been completed. This commitment should be removed.
6.9.2	~~Site AC13 will be subject to a detailed geomorphic investigation, a sub-surface test pitting program, large area manual excavation and grader scrapes.~~	This commitment relates to a specific action which has now been completed. This commitment should be removed.
6.9.3	~~Site SC10 will be managed for use by the Aboriginal and wider communities for teaching and educational purposes.~~	This commitment relates to a specific action which has now been completed. This commitment should be removed.

Table 6.1 Proposed amendments to the statement of commitments

Reference	Proposed amendments	Rationale for amendment
6.9.6	The Proposed Offset Areas shown on Figure 5.8 provide for conservation of archaeological terrain units evaluated as having equal or greater overall significance than in the Proposed Disturbance Area. Xstrata is committed to conserving all 98 identified sites and the landscapes in which they occur, within the Proposed Offset Areas. The Proposed Offset Areas will conserve all the rockshelter sites within Wallaby Rocks, Limb of Addy Hill, Western Rocks and Anvil Hill. Anvil Hill rockshelter sites (four sites), however, may be affected by the indirect impacts of blasting. This impact will be mitigated and management strategies for the rockshelters on Anvil Hill are discussed in Appendix 13.	This commitment is duplicated with commitment 6.9.4 and should be removed.
6.9.7	Xstrata Mangoola will continue to operate in accordance with the approved Mangoola Coal Aboriginal Cultural Heritage Management Plan (ACHMP) for the ongoing management of the Aboriginal heritage items within the approved project disturbance boundary. The ACHMP will continue to be implemented in consultation with the registered local Aboriginal stakeholders and will be revised within the next 12 months. The revision will include: — additional information on all newly identified sites on land owned or managed by Xstrata Mangoola, including sites identified within the areas affected by the modifications; — a requirement to ensure that if Aboriginal objects are salvaged or uncovered due to development activities, any custodial arrangements will comply with the provision of Section 85 of the NPW Act and that every opportunity will be afforded to Registered Aboriginal Parties to provide input into decisions regarding short and long term and/or final custodial arrangements for salvaged artefacts; — amendments to the NPW Act; and • details of further consultation with the Aboriginal community.	The Aboriginal Cultural Heritage Management Plan (ACHMP) was submitted to DP&I on 21 June 2013 to include the stated requirements. Therefore, this commitment has been satisfied and is no longer required.
6.9.8	In the event that surface disturbance identifies a new Aboriginal site, the site will be managed in accordance with the procedure in the existing ACHMP for previously unrecorded sites. This procedure will be updated during the revision of the ACHMP, consistent with the requirements of OEH.	This commitment is addressed in the requirements of Schedule 3, Condition 46(c) in the preparation of a ACHMP. This commitment should be removed to avoid duplication.
6.9.9	In the event that human remains are located following any surface disturbance, these will be managed in accordance with relevant procedures in the Mangoola Coal's ACHMP.	This commitment is addressed in the requirements of Schedule 3, Condition 46(c) in the preparation of a ACHMP. This commitment should be removed to avoid duplication.
6.9.13	Xstrata Mangoola will continue to consult with and involve all relevant registered local Aboriginal representatives for the project, in the ongoing management of the Aboriginal cultural heritage values. Evidence of this consultation will be collated and provided to the consent authority upon request.	This commitment is addressed in the requirements of Schedule 3, Condition 46(c) in the preparation of a ACHMP. This commitment should be removed to avoid duplication.
6.10	Heritage	
6.10.2	Archival recording will be undertaken for all heritage items identified within the Proposed Disturbance Area, prior to disturbance of such sites, to the standards of local heritage significance as specified by the guidelines of the NSW Heritage Office.	This commitment is addressed in the requirements of Schedule 3, Condition 47(b) for archival recording of heritage items. This commitment should be removed to avoid duplication.

Table 6.1 Proposed amendments to the statement of commitments

Reference	Proposed amendments	Rationale for amendment
6.10.4	~~Xstrata will complete a detailed archival recording of the Castle Hill homestead to the standard of local heritage significance.~~	This commitment is addressed in the requirements of Schedule 3, Condition 47(b) for archival recording of heritage items. This commitment should be removed to avoid duplication.
6.10.5	~~Potential further sites of local heritage value located within the area at which the relevant vibration criteria are predicted to be exceeded will be inspected, subject to landowner permission for access, and appropriately recorded prior to blasting. This will include assessing the structural status and identifying appropriate ameliorative measures, where relevant.~~	This commitment is addressed in the requirements of Schedule 3, Condition 48(c) for conservation management of heritage items that may be affected by blasting. This commitment should be removed to avoid duplication.
6.10.6	In the unlikely event that significant historical archaeological remains not identified as part of this study are discovered at the site, all works in the immediate area will cease and the Heritage Branch, Department of Planning and Infrastructure will be notified, in accordance with Section 146 of the <i>Heritage Act 1977</i> (NSW).	This is an existing commitment which is still considered to be relevant.
6.10.7	~~The location of site/items 20 and 21 will be included in a revision of the Heritage Management Plan.~~	The Heritage Management Plan has been revised to include these items. Therefore, this commitment has been satisfied and is no longer required.
6.11	Traffic and transport	
6.11.2	~~Wybong Road will be upgraded in association with Council, from the intersection with Bengalla Link Road to the proposed mine road. This includes an upgrade to a sealed carriageway minimum 6.5 metres wide, road marked centreline to relevant standards, enhancement of safety and advisory signage, and upgrade of sections to ensure safe operation of school bus zones and stops. All works will be undertaken in consultation~~	These commitments are addressed in the road upgrade requirements of Schedule 3, Conditions 50 and 50A and should be removed to avoid duplication.
6.11.3	~~The intersection of Wybong Road and the mine access road will be a Type B rural layout with a left turn auxiliary lane from Wybong Road into the proposed access road.~~	
6.12	Greenhouse gas	
6.12.3	~~Xstrata Mangoola will continue to monitor and seek to improve its energy and greenhouse gas performance against performance targets.~~	These commitments are addressed in the requirements of Schedule 3, Condition 59. These commitments should be removed to avoid duplication.
6.12.4	~~Xstrata Mangoola will report its greenhouse gas and energy performance via legislative reporting requirements.~~	
6.12.5	~~Xstrata Mangoola will continue to monitor and seek to improve its energy and greenhouse gas performance against performance targets.~~	
6.12.6	~~Xstrata Mangoola will report its greenhouse gas and energy performance via legislative reporting requirements.~~	
6.13	Visual controls	
6.13.1	~~Where access allows, vegetative screens will be planted along the lower sections of Mangoola Road from Roxburgh Road to the new rail loop intersection and along the ridge extending west from Limb of Addy Hill.~~	The vegetative screens were planted in 2010 and 2011. Therefore, this commitment has been satisfied and is no longer required.

Table 6.1 Proposed amendments to the statement of commitments

Reference	Proposed amendments	Rationale for amendment
6.13.2	~~Final revegetation of disturbed areas will consider the reduction of visual impacts.~~	This commitment is addressed in the requirements of Schedule 3, Condition 42(e). This commitment should be removed to avoid duplication.
6.13.4	~~The link road from the CPP to the Tailings Dam will be relocated to avoid the knoll 500 metres east of the product stockpile. This will ensure existing vegetation on the knoll shields views of the CPP and stockpile from VP 2.~~	The link road was relocated during the project construction in 2010. Therefore, this commitment has been satisfied and is no longer required.
6.13.6	The spur on the north-east of Anvil Hill at RL 220 will be recreated during rehabilitation of this area as part of the overburden emplacement areas to assist screening of the CPP ~~from Years 10 to 20~~ when viewed from the north around VP 10.	This commitment is proposed to remove the reference to 'from Years 10 to 20' and replace with 'during rehabilitation of this area' (in red). Given the proposed modification requests an increase in extraction rate which may result in a reduction in the timeframe for mining the resource, it is appropriate to remove the timing references in the commitment.
6.13.7	~~The north, east and south sides of the workshop and CPP will be clad to meet the noise modelling in the EA.~~	The cladding has been completed. Therefore this commitment has been satisfied and is no longer required.
6.13.9	~~Workshop doors will oriented south or south west, where possible, to reduce light spill.~~	This commitment is to be removed as the proposed orientation of the workshop was not possible due to identified site constraints.
6.13.10	~~Where safe to do so, trucks on access roads will make use of portable visual edge markers to increase drivers' visibility of road edges when driving with dipped headlights.~~	This commitment is to be removed as this is not practical given the safety requirements.
6.13.11	At night, work will be restricted to lower levels on the overburden emplacement areas to reduce noise impacts which will also reduce potential direct lighting effects from random elements such as truck headlights and flashing beacons.	This is an existing commitment which is still considered to be relevant.
6.14	Social	
6.14.1	Engage with relevant regulators, health care service providers and stakeholders to discuss recommendations to address social risks related to provision of health care services. This may include: - Discussions with MSC and DP&I regarding distribution of VPA funding for local traineeships in health service sectors. - Participate in the Second Doctor for Denman health care working group. - Investigate actions to facilitate provision of improved health services in Denman. Options include providing assistance with the use of other facilities such as the Denman multi-purpose centre, achieving the status of visiting medical officer and/or initial sponsorship of a relief doctor.	This is a new commitment.

Table 6.1 Proposed amendments to the statement of commitments

Reference	Proposed amendments	Rationale for amendment
6.14.2	Engage with relevant regulators, health care service providers and stakeholders to discuss recommendations to address predicted impacts on provision of child-care and pre-school services in Muswellbrook and Denman. This may include: - Focussing proportion of VPA funding on local traineeships in critical service sectors. - Allocation of a proportion of VPA funding to assist with increasing the capacity of pre-school services in Denman. Options include assisting the Denman Child-Care Centre (such as infrastructure, staffing or other needs that would be identified during further consultation).	This is a new commitment.
6.14.3	Noise effect on social amenity - Communicate operational measures with the community which are investigated and/or implemented to achieve ongoing management of noise levels. - Continue ongoing development of stockpile dozer track-noise mitigation. - Engage with neighbouring mining operations in dealing with cumulative impacts.	This is a new commitment.
6.14.4	Dust effect on social amenity - Expansion of zone for installation of the first flush system on residential rainwater tanks to include landowners within 6 km of the approved project disturbance boundary. - Rainwater tanks to be cleaned at privately-owned properties; once per year up to 4 km radius from the approved project disturbance boundary; once every 2 years up to 6 km radius. - Engage with neighbouring mining operations in dealing with cumulative impacts. - Development of an ongoing community information program for environmental issues to improve awareness of impact management practices.	This is a new commitment.
6.14.5	~~Proportion of VPA funding to be directed to MSC to assist with the upgrade of Muswellbrook Sewerage Treatment Plant – contribution to be based on proposed population increase (Scenario C) shown in the SIOA. Consideration will be given to long-term historical capacity issues and additional development pressure within the Muswellbrook urban area from other sources in determining the extent of contributions required to address potential impacts arising from the proposed modification.~~	Whilst this was a new commitment stipulated in the EA, MSC noted in its submission that Mangoola Coal has proposed a planning contribution to MSC that adequately offsets the broader economic and infrastructure impacts of the proposal. This did not include funding for the upgrade of the Muswellbrook Sewerage Treatment Plant. Therefore, this commitment is no longer proposed as part of this modification.

Table 6.1 **Proposed amendments to the statement of commitments**

Reference	Proposed amendments	Rationale for amendment
6.14.6	Local workforce opportunities: • Continue to implement local recruitment drive for the proposed modification operational workforce and expand to Sandy Hollow and Merriwa. • Facilitate a workshop to bring together government and industry stakeholders with an interest in providing housing in the Upper Hunter, and discuss issues such as affordability, diversity, availability, within the Muswellbrook LGA. • Continue to participate in Upper Hunter Mining Dialogue Housing and Social Infrastructure forums.	This is a new commitment.

Abbreviations

ACHMP	Aboriginal Cultural Heritage Management Plan
AEMR	Annual Environmental Management Report
AFTOX	Air Force Toxics Model
AHD	Australian height datum
ANZECC	Australia and New Zealand Environment Conservation Council
AQMP	Air Quality Management Plan
CHPP	Coal handling and preparation plant
DGR	Director-General's Requirements
DP&I	Department of Planning and Infrastructure
DPI	Department of Primary Industries
DRE	Division of Resources and Energy
EA	Environmental assessment
EC	Electrical conductivity
EMM	EMGA Mitchell McLennan Pty Limited
EPA	Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EPL	Environment protection licence
Ha	Hectares
HRSTS	Hunter River Salinity Trading Scheme
INP	NSW Industrial Noise Policy
km	Kilometres
LGA	Local government area
MIC	Maximum instantaneous charge
ML	Mining Lease
MOP	Mining Operations Plan
MSC	Muswellbrook Shire Council
Mtpa	Million tonnes per annum
NEPM	National Environmental Protection Measure
NMP	Noise Management Plan
NOW	Office of Water
OEH	Office of Environment and Heritage
PAC	Planning Assessment Commission
PRP	Pollution reduction program
PSNL	Project specific noise level
PWD	NSW Planning Assessment Commission
RL	Relative level
RMS	Roads and Maritime Services
RNP	Road Noise Policy
ROMP	Rehabilitation and Offset Management Plan
Run-of-mine	ROM
SAL	Strategic agricultural land
SIOA	Social Impact and Opportunities Assessment
SRLUP	Upper Hunter Strategic Regional Land Use Plan
SWMP	Surface Water Monitoring Plan
TDS	Total dissolved solids

Abbreviations

TEOM	Tapered element oscillating microbalance
tpa	Tonnes per annum
TSS	Total suspended solids
TSP	Total suspended particulate
VPA	Voluntary planning agreement

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Appendix A

Matters raised in submissions

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
I-1	Denman	Withheld	Objection	I-1.1	Cumulative impacts		Cumulative environmental and health impacts (dust, noise, visual pollution and dwelling damage) on the local community.	5.1.6, 5.2.4
				I-1.2	Air quality	Air quality - dust pollution	Atmospheric dust pollution.	5.2.3
				I-1.3	Health	Health - dust	Impacts related to air quality - respiratory problems, eye irritation, allergy conditions, and domestic tank water pollution.	5.3
				I-1.4	Noise	Noise - road/rail	24 hour noise from existing operations causing sleep disruption, increase in coal train movements.	5.1.5
				I-1.5	Blasting	Blasting - structural impacts	Structural damage to dwellings.	5.1.4
I-2	Denman	Amanda Feeney	Objection	I-2.1	Noise	Noise - general	Noise from CHPP infrastructure, stockpiles and gravel for use on roads, already excessive and it can only become worse.	5.1.3
				I-2.2	Water	Water quality - Hunter River	Discharge of waste into the Hunter River - cumulative water quality impacts with other mines discharging water to the Hunter River. Impacts on downstream users e.g. agricultural sector - Dairying, Beef Cattle Production, Viticulture, Thoroughbred Industry and the towns and settlements depending on water sources.	5.5.2
				I-2.3	Approval process		Application for discharge of waste into the Hunter River through the Hunter Salinity Trading Scheme this is not a modification this is the Company requesting an entirely different approach to how they remove their waste from the mine site - should increase dam sizes to retain water - previously committed water was going to stay on site.	5.10
				I-2.4	Agriculture		Discharge of waste into the Hunter River - cumulative water quality impacts with other mines discharging water to the Hunter River. Impacts on downstream users e.g. agricultural sector - Dairying, Beef Cattle Production, Viticulture, Thoroughbred Industry and the towns and settlements depending on water sources.	5.5.2
I-3	Muswellbrook	Mark Peel	Objection	I-3.1	Air quality	Air quality - dust pollution	Additional dust impacts due to large extension.	5.2.3
				I-3.2	Health	Health - rainwater tank water quality	Impact on rainwater tanks - drinking water has to be filtered.	5.2.3
				I-3.3	Visual	Visual - lighting	Lighting impacts.	5.9
				I-3.4	Noise	Noise - general	General noise impacts on property.	5.1.3
				I-3.5	Water	Water supply	Could cause loss of water to property's registered bore.	5.5.3
				I-3.6	Water	Water quality - Hunter River	Too many mines discharging saline water to the Hunter - 'river will die'.	5.5.2
				I-3.7	Air quality	Air quality - cumulative	Respondent has two properties on Roxburgh road - Mangoola EA only identified	5.2.4

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
						impacts	one of the two - the second property joins no 242 which has acquisition rights from Mt Arthur for dust. Our property would go over with the cumulative effect of Mangoola extension.	
				I-3.8	Blasting	Blasting - structural impacts	Blasting impacting on our infrastructure.	5.1.4
I-4	Denman	Jane Thrift	Objection	I-4.1	Air quality	Health - rainwater tank water quality	Dust impacts (and associated health impacts, impacts to rainwater tanks).	5.2.3
				I-4.2	Health	Health - dust	Impacts related to air quality - respiratory problems, asthma, pulmonary fibrosis, domestic tank water pollution.	5.3
				I-4.3	Noise	Noise - general	Noise impact from gravel crusher, extra trains on the rail loop continual noise night and day and noise inversion, CHPP modifications.	5.1.3
				I-4.4	Visual	Visual - lighting	Extra lighting impacts due to gravel crusher, additional trains, CHPP modifications.	5.9
				I-4.5	Social	Social - quality of living	Diminished lifestyle and quality of living.	5.6.2
				I-4.6	Water	Water quality - Hunter River	Waste through the pipeline to the Hunter River will add to already polluted river system - detrimental to industry relying on the Hunter River for their livelihoods.	5.5.2
				I-4.7	Agriculture		Waste through the pipeline to the Hunter River will add to already polluted river system - detrimental to industry relying on the Hunter River for their livelihoods.	5.5.2
I-5	Wybong	Margot and Michael White	Objection	I-5.1	Noise	Noise - general	Noise due to increased ROM rate, gravel crushing and blasting frequency. Inability of mine to mitigate noise impacts (mitigation methods such as air conditioning, double glazing not compatible with rural lifestyle and amenity). Baseline levels under the Industrial Noise Policy are assumed as 30db. We also understand that actual pre-mining noise levels in this area were actually measured to be around 20db. The Industrial Noise Policy is not a reliable or credible policy to use to protect the real impact on residents living in green field mining areas. We therefore believe that no increase in ROM coal extraction, no crushing of waste rock and no increase to the blasting schedule should be allowed.	5.1.1, 5.1.3
				I-5.2	Air quality	Health - dust	Dust - increase due ROM extraction, gravel crushing, blasting frequency, health impacts due breathing in, dust in domestic rainwater, and deposition of dust on/in house requiring cleaning. Dust deposition at our residence has significantly increased since Mangoola commenced operation. Veranda facing mine unusable. Requests for cleaning by Mangoola have been refused. No confidence Mangoola Coal can mitigate dust in a manner in keeping with our rural amenity and enjoyment of our home.	5.3

Table A.1 **Matters raised in submissions**

RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				I-5.3	Property value	Property value impacted	Property values - decreased asset value due to impacts from mine.	5.12
				I-5.4	Social	Social - sense of community	Sense of community / social impacts - impacted by acquisition of surrounding homes (loss of community), increased traffic, increase in theft, uncertainty regarding Mangoola's operations (sixth modification) creating anxiety, loss of place. The community of Wybong has already undergone decimation with Xstrata acquiring many households. Homes acquired by Xstrata are left to fall apart or let to multiple tenants. Each time there is another modification to operations asking for changes/increases in their operation it causes great stress, anxiety and feelings of a loss of place by the community. This social impact is not addressed in the EA. SIOA is not science as it is still a subjective analysis. The weighting they have given each consequence against the likelihood of it occurring is still just an opinion. In the SIOA there is reference to only a few stakeholders asking for acquisition, and only 1 written request. I know we have written requesting Xstrata Mangoola enter into good faith negotiations to purchase our property. This request has been refused. However I have been present on several occasions when at least 4 other parties have verbally requested acquisition - statements are misleading/inaccurate.	5.6.2
				I-5.5	Blasting		Amendment to blasting conditions to increase frequency of blasting per week was not in any of the published modification materials. It was not in the Director General's Requirements and was not discussed at any of the stakeholder consultations yet it appears in the EA. We also object to this as once again it will increase noise and dust.	5.1.4
				I-5.6	Approval process		They have been operating for just 3 years and already asking for their 6th modification. There is an absolute need to protect the community from this uncertainty, so those of us who live here can get on with our lives and make our own plans.	5.10
				I-5.7	Consultation		At a stakeholder consultation meeting at the mine site on 17th April 2013, the General Manager, Tony Israel was asked about this increase in the workforce and he stated, 'won't have that many, just put that in just for "in case". Is Xstrata inflating the numbers to increase the supposed economic benefit of the extra jobs?	5.14
I-6	Ashtonfield	Aina Ranke	Objection	I-6.1	Cumulative impacts		General statement regarding unacceptable cumulative effects of mining in the Hunter Valley. Upper Hunter Valley is already saturated with coal mines, further expansion should be halted.	5.1.6,5.2.4

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				I-6.2	Health	Health - dust	The Upper Hunter Valley is already saturated with coal mines, further expansion should be halted. Short and long term health effects. Insufficient data about impacts of open cut mining on residents that are exposed to high density coal mining.	5.3
				I-6.3	Air quality	Air quality - cumulative impacts	Increasing mine output will increase already high mine source air pollution and further decrease air quality locally and across Hunter Region. Denman does not have an air quality monitor that is part of the Upper Hunter Air Quality network.	5.2.4
				I-6.4	Noise	Noise - road/rail	Increase in noise pollution through an increase of rail traffic and rail noise. This is unacceptable given that current disputes between mine affected residents and Mangoola Coal remain unresolved.	5.1.5
				I-6.5	Water	Water quality - Hunter River	Discharges of saline water [from other operations] already increasing salinity levels in the Hunter River to the detriment of downstream agricultural operations. Discharge of saline water was not permitted under original application - discharge (if approved) should be strictly conditioned to occur only in extreme circumstances.	5.5.2
				I-6.6	Cumulative impacts	Social - strain on public infrastructure and services	Public infrastructure in the Upper Hunter and Muswellbrook Shire presently not coping with the pressures of mining activity. Lack of affordable housing, increasing employee levels forcing young home buyers on normal incomes out of the area. Threats to diversification of the regional economy as mining drives out other industries.	5.6.1, 5.15.2
				I-6.7	Rehabilitation		The application fails to address the issue of leaving post mining final voids, mining leaves irreversible scar on landscape and renders the land useless for agricultural production. The initial application for Mangoola Coal and this modification fail to address the issue of leaving post mining final voids.	5.8
				I-6.8	Agriculture		General statement regarding diversion of water from agricultural systems to mining operations being unacceptable.	5.5.3
				I-6.9	Air quality	Climate change	Increase in greenhouse gas emissions further increasing the threat of climate change.	5.2.5
I-7	Unknown	Anthony Lonergan	Objection	I-7.1	Air quality	Air quality - cumulative impacts	Modification will add to already unacceptable dust levels in Upper Hunter due to cumulative impacts of coal mining.	5.2.4
				I-7.2	Water	Water quality - Hunter River	HRSTS discharge - adding to salt load in Hunter River will have long term implications for the viability of irrigation farming in the valley.	5.5.2

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				I-7.3	Agriculture		HRSTS discharge - adding to salt load in Hunter River will have long term implications for the viability of irrigation farming in the valley.	5.5.2, 5.7.1, 5.7.2
I-8	East Maitland	Margaret Edwards	Objection	I-8.1	Air quality	Air quality - cumulative impacts	Unacceptable air quality impacts in the Upper Hunter due to a concentration of mines.	5.2.4
				I-8.2	Water	Agriculture - water quality impacts	Increase in background levels of salinity in Hunter River which is detrimental to river environment and downstream agriculture.	5.5.2, 5.7.1, 5.7.2
				I-8.3	Cumulative impacts		General statement regarding unacceptable cumulative effects of mining in the Hunter Valley. Irreversibility of damage cause by open cut mining, history of leaving land in poor state.	5.1.6, 5.2.4
				I-8.4	Traffic	Social - strain on public infrastructure and services	Increased production will place further pressure on road networks.	5.4
				I-8.5	Noise	Noise - general	Increased production will increase noise.	5.1.3
				I-8.6	Air quality	Climate change	Increased production will add to climate change.	5.2.5
				I-8.7	Agriculture		Increase in background levels of salinity in Hunter River which is detrimental to river environment and downstream agriculture.	5.5.2, 5.7.1, 5.7.2
I-9	Muswellbrook	Withheld	Objection	I-9.1	General		General statement regarding impact on environment and local community.	N/A
				I-9.2	Property value	Property value impacted	De-valuation of property due to increase in mining generally. Outside of area of compensation even though believes they are affected by the mining industry. concerned that being situated between mines, outside of their purchase line, will cause us to be unable to sell our property at a 'reasonable' & 'fair' price, if we wish to do so in the future, We are also concerned that we are out of the area of compensation, even though we are being affected by the mining industry.	5.12
				I-9.3	Air quality	Air quality - dust pollution	Increase in dust - impact drinking water and cause health issues.	5.2.3
				I-9.4	Health	Health - dust	Increase in dust - impact drinking water and cause health issues.	5.3
				I-9.5	Noise	Noise - general	The levels and periods of noise experienced will increase and impact our lives and our well-being.	5.1.3
				I-9.6	Social	Social - quality of living	Mining impacting on rural lifestyle, liveability and economic security. Local community has been diminished. Impact on the local community and local areas. Enjoyment of living in this rural area and the local community has been severely diminished.	5.6.2
I-10	Wybong	Upper Hunter	Objection	I-10.1	Noise	Noise - assessment approach	No details of the proposed increase in equipment numbers are provided.	5.1.1

Table A.1 **Matters raised in submissions**

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
		Holdings Pty Ltd						
				I-10.2	Noise	Noise - assessment approach	Inconsistencies between numbers of employees stated (Page 3, Section 4.8 and Table 4.8).	5.1.1
				I-10.3	Noise	Noise - assessment approach	Condition 7 of PA 06_0014 is based on the superseded ECRTN criteria.	5.1.1
				I-10.4	Noise	Noise - assessment approach	The INP low frequency criteria should apply. However, if the proposed Norm Broner criteria apply this should consider the frequency range from 10 Hz. If instantaneous SPL fluctuates by ± 5 dB then a penalty of 5dB applies.	5.1.1
				I-10.5	Noise	Noise - assessment approach	WHO states that levels up to 45dB (A) are acceptable for sleep disturbance but only if the number of events per night is less than 10-15.	5.1.1
				I-10.6	Noise	Noise - assessment approach	Recently approved land subdivision and new building site (tourism accommodation at Dolwendee, Hollydene and Wybong Estates) have not been considered the lists of receiver locations.	5.1.1
				I-10.7	Noise	Noise - assessment approach	Property owners were advised that operational noise levels were expected to increase but assessment shows a significant reduction in noise levels. Question the accuracy of the noise modelling.	5.1.1
				I-10.8	Noise	Noise - assessment approach	No assessment of compliance with road or rail noise impacts resulting from the increase production.	5.1.1
				I-10.9	Noise	Noise - assessment approach	Cumulative noise impacts should be assessed with noise measurements from other existing industrial sources undertaken.	5.1.1
				I-10.10	Noise	Noise - assessment approach	Assessment should present results for worst LAeq (15 minute) not 10th percentile.	5.1.1
				I-10.11	Noise	Noise - assessment approach	No details are provided on how the night time restriction of operations under adverse weather conditions is actually implemented.	5.1.1
				I-10.12	Noise	Noise - assessment approach	Analysis for determining the presence of tonal components has not been presented.	5.1.1
				I-10.13	Noise	Noise - assessment approach	Total dB (A) values in Table B.1 do not match with the A weighted frequency spectrum data provided.	5.1.1
				I-10.14	Noise	Noise - assessment approach	Inconsistency between number of privately owned receptors (Appendix D and page 19).	5.1.1
				I-10.15	Noise	Noise - assessment approach	Some noise sources (ie shovel gate banging) have been considered only when assessing the sleep disturbance and it is not clear if they are present in the	5.1.1

Table A.1 **Matters raised in submissions**

RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							modelled operational scenarios.	
				I-10.16	Noise	Noise - assessment approach	Typographical error in Table 4.1 (dB(A) = 333). Table should show results for both neutral and adverse weather conditions. Table does not specify under which adverse weather condition noise levels have been calculated.	5.1.1
				I-10.17	Noise	Noise - assessment approach	Noise levels should be assessed for evening time. Considering night time predicted noise levels to be the same as evening time is not always conservative.	5.1.1
				I-10.18	Noise	Noise - assessment approach	Disagrees that the CHPP wouldn't pass the DB(c) minus DB(A) test based on the data provided in Appendix B.	5.1.1
				I-10.19	Noise	Noise - assessment approach	No results are provided to confirm that noise levels satisfy the 60 dB(A) Broner criterion.	5.1.1
				I-10.20	Noise	Noise - assessment approach	Not clear if the 5dB penalty has been applied to overall predicted noise levels or to the CHPP noise contribution at the receivers only.	5.1.1
				I-10.21	Noise	Noise - assessment approach	Unclear if predictions in Table 4.7 were undertaken under prevailing or worst case meteorological conditions.	5.1.1
				I-10.22	Noise	Noise - assessment approach	A different noise model was used to that used in earlier assessment, prevents an objective assessment.	5.1.1
				I-10.23	Noise	Noise - assessment approach	Noise model used wasn't calibrated. Predictor model is accepted by regulatory authorities only after it has been calibrated for the site.	5.1.1
				I-10.24	Noise	Noise - assessment approach	Disagree with Section 3.2 as the INP considers default weather conditions and site specific weather conditions respectively. No details of the considered weather conditions are included.	5.1.1
				I-10.25	Noise	Noise - assessment approach	No precise reference to noise data is made, no details on methodology, and the result of recent measurement campaigns are provided.	5.1.1
				I-10.26	Noise	Noise - assessment approach	SPLs for the Coal rail load out and lighting plant are different to previous noise assessment (Wilkinson Murray 2010). No detail or explanation in regards to the differences is provided.	5.1.1
				I-10.27	Noise	Noise - assessment approach	SPL data in Appendix B are presented in 1 octave band centre frequency from 63 Hz to 8000 Hz. It is more appropriate to consider spectrum data in 1/3 octave band centre frequency from 20 Hz to 20,000 Hz.	5.1.1
				I-10.28	Noise	Noise - assessment approach	Conveyor drives noise data would result in an overall around 80 dB(A). The table shows a total dB(A) of 76.	5.1.1

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				I-10.29	Noise	Noise - assessment approach	Table 3.1 shows representative Leq,15 minutes SPLs. A 15 minute interval is not considered to be appropriate when describing moving vehicles (ie haul trucks).	5.1.1
				I-10.30	Noise	Noise - assessment approach	Current road traffic noise levels were based on previous calculations and not on actual measurements. Actual measurements should have been used.	5.1.1
				I-10.31	Noise	Noise - assessment approach	No results for private properties on Bengalla Link Road are provided which were included in the previous assessment (Wilkinson Murray 2010).	5.1.1
				I-10.32	Noise	Noise - assessment approach	The March 2013 version of the Bruel & Kjaer model corrected an overestimation of barrier effects. If previous model version was used then likely that noise levels are underestimated.	5.1.1
				I-10.33	Noise	Noise - assessment approach	The list of noise amelioration factors have no dB(A) noise reduction levels presented.	5.1.1
				I-10.34	Noise	Noise - assessment approach	Noise monitoring is inferred at a number of receivers, as attended monitoring is only undertaken at receivers as agreed with the EPA. Unacceptable to make an inference in these circumstances.	5.1.1
				I-10.35	Noise	Noise - assessment approach	Published noise monitoring data shows no exceedance despite high levels of noise complaints. Question the accuracy of the noise assessment.	5.1.1
				I-10.36	Blasting	Blasting - structural impacts	Very old winery's on properties. Blast impact assessment needs to address historical buildings.	5.1.2
				I-10.37	Blasting	Blasting - health impacts	No assessment of blasting impacts on livestock and property as required by DGRs.	5.1.2
				I-10.38	Blasting	Blasting - structural impacts	No results are provided showing the predicted vibration and overpressure levels at residences.	5.1.2
				I-10.39	Blasting	Blasting - structural impacts	There is no confirmation that the prediction graphs have been calibrated. No contours are provided showing residence potentially affected by blasting.	5.1.2
				I-10.40	Blasting	Blasting - structural impacts	A sensitivity analysis of the variations in predicted overpressure and ground vibration are needed.	5.1.2
				I-10.41	Blasting	Blasting - structural impacts	The minimum offset required to achieve blast criteria would vary depending on face orientation and other factors not considered in the assessment.	5.1.2
				I-10.42	Air quality	Air quality - assessment approach	The impacts of oxides of nitrogen within blast fume flumes and health implications for equine and vineyards industry has not been considered.	5.2.2
				I-10.43	Air quality	Air quality - assessment approach	The isopleths do not show significant differences between blasting with and without permissions. This is not explained or analysed. There is also not detail	5.2.2

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							provided on the weather conditions that were applied in the model for these two conditions.	
				I-10.44	Air quality	Air quality - assessment approach	Size of the blast fume was not indicated.	5.2.2
				I-10.45	Air quality	Air quality - assessment approach	The findings of the report differ from the expectation given from the CSIRO reference.	5.2.2
				I-10.46	Air quality	Air quality - assessment approach	The sensitivity of the model to other dimensions of the plume needs to be assessed using AFTOX or other calibration of a model such as CALPUFF with real time NOx measurements.	5.2.2
				I-10.47	Air quality	Air quality - assessment approach	There are differences in literature that indicates that average emission flux of Knox may exceed the 0.9 kg/tonne of explosive quoted in the CSIRO study.	5.2.2
				I-10.48	Air quality	Air quality - assessment approach	Needs to consider subdivisions on land holder's properties.	5.2.1
				I-10.49	Air quality	Air quality - assessment approach	Process of removal of sludge from water tanks is not mentioned in assessment. The levels of dust deposition measures at gauges and predicted in the model would not be expected to require desludging of drinking water tanks. Presence of sludge suggests higher levels of dust deposition than what was modelled.	5.2.1
				I-10.50	Air quality	Air quality - assessment approach	Calibration of the predicted levels with measures results has not occurred and the sensitivity of the assumptions in the modelled predictions in unable to be tested.	5.2.1
				I-10.51	Air quality	Air quality - assessment approach	Analyses of the dust deposited on the roofs and in gutters would be able to be used to establish the proportion that is due to coal mining.	5.2.1
				I-10.52	Air quality	Air quality - assessment approach	Sensitivity of predicted levels to error is not addressed.	5.2.1
				I-10.53	Property value		Impacts of mining on property values.	5.12
				I-10.54	Agriculture		Impacts of mining on agriculture.	5.5.2; 5.5.3, 5.7.1, 5.7.2
I-11	Mangoola	Michael Valentine	Objection	I-11.1	Noise	Acquisition/management zone	Object to being moved from the acquisition zone to the management zone. Claims that impacts will be less are based on areas where noise and dust monitoring is not undertaken. Impact of mining operations will increase with increased production. No monitoring sites close to the property which can be used to measure impacts.	5.1.7

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				I-11.2	Noise	Acquisition/management zone	Our property is in close proximity to the current mining operations, it is affected by noise and dust and we are currently within the acquisition area of Mangoola Coal and we object to being removed from this acquisition zone to the management zone. We believe this impact of mining operations will only increase with the increase of production. No monitoring sites close to the property which can be used to measure impacts.	5.2.3
I-12A	Wybong	Christine Phelps	Objection	I-12.1	Noise	Noise - general	Currently significantly impacted by noise, which the application will increase significantly. Have engaged the services of an independent noise expert at own cost which shows exceedance of worst case noise levels. Request that an independent peer review of the noise assessment be made public. Do not want to sell property. Note the Ashton Coal project approval requirement to provide alternative like accommodation for the duration of mining. Requests for noise, dust and visual mitigation have been refused.	5.1.1, 5.1.3
				I-12.2	Air quality	Air quality - dust pollution	Currently significantly impacted by dust - the application will increase significantly. Dust coats house, potable water catchment areas and olive trees. Dust is finer than PM10 and is not subject to criteria. Xstrata refuses to clean out water tanks. Increased fine black dust pollution inside and outside house since mine started operating. Xstrata has refused to clean water tanks so far.	5.2.3
				I-12.3	Noise	Acquisition/management zone	Negotiations with proponent and DP&I to resolve adequate mitigation are still not finalised - respondent refers to correspondence attached from past three years which they wish to be included as part of their submission.	5.1.7
				I-12.4	Health	Health - dust	Dust impacting health (which has improved with installation of air conditioning operated 24/7) and olive oil harvesting.	5.3
I-13	Denman	Timothy Castle	Objection	I-13.1	Air quality	Air quality - dust pollution	Dust impacts from current operations - dust sticks to surfaces, hard to clean. Concerned about health effects of dust.	5.2.3
				I-13.2	Noise	Noise - general	Noise impacts at night.	5.1.3
				I-13.3	Visual	Visual - lighting	Lights at night light up the area facing the house.	5.9
				I-13.4	Health	Blasting - health impacts	Health concerns from dust and gases from the explosions at the mine. Has been told that the gases from the explosions at the mine can affect health.	5.3
				I-13.5	Consultation		Have never been contacted by the mine regarding impacts experienced at the property [711 Merriwa Road, Denman].	5.11
I-14	East Maitland	White	Objection	I-14.1	Water	Water quality - Hunter River	HRSTS discharges will result in an increase in saline level in the river, already under	5.5.2

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							stress from cumulative effects of other mines. This is detrimental to the river environment and downstream agriculture which will also suffer from having water diverted to mine usage.	
				I-14.2	Air quality	Air quality - cumulative impacts	Until Denman has an air quality monitor as part of the Upper Hunter Air Quality Network and further mining should be halted.	5.2.4
				I-14.3	Health	Health - dust	Cumulative mining impact reducing air quality and resulting in adverse short and long term health effects.	5.3
				I-14.4	Noise	Noise - road/rail	Increase in noise levels at the mine due to the expansion and product level increase, so does rail traffic and noise.	5.1.5
				I-14.5	Rehabilitation		Damage of mining to arable land is irreversible. The issue of leaving post mining voids has not been addressed.	5.8
				I-14.6	Air quality	Climate change	Extra coal product adds to climate change.	5.2.5
I-15	Wybong	Colin Dudgeon	Objection	I-15.1	Noise	Noise - general	Concerned about the increase in noise pollution that will accompany an increase in activity. Measurements that have been carried out in the past have not covered a sufficient area of the surrounding country and a range of weather conditions that cover the normal annual variation. No expansion should be approved until the probable degree of contamination by noise, dust and gases is properly assessed over an appropriate period of time and surrounding area.	5.1.1, 5.1.3
				I-15.2	Air quality	Air quality - dust pollution	Concerned about the increase in dust pollution that will accompany an increase in activity. Measurements that have been carried out in the past have not covered a sufficient area of the surrounding country and a range of weather conditions that cover the normal annual variation. No expansion should be approved until the probable degree of contamination by noise, dust and gases is properly assessed over an appropriate period of time and surrounding area.	5.2.3
I-16	Denman	Noel Feeney	Objection	I-16.1	Noise	Noise - general	Property is closely located to the washery, coal loading and rail loop with constant noise concerns.	5.1.3
				I-16.2	Air quality	Air quality - dust pollution	Property is closely located to the washery, coal loading and rail loop with constant dust and air quality concerns.	5.2.3
				I-16.3	Property value		Mine and its operations will have a significant impact on the value of my property.	5.12
I-17	Singleton	Barrie Griffiths	Objection	I-17.1	Noise	Noise - road/rail	Increase in noise (including rail noise) due to increased production. Current noise disputes between residents and mine are unresolved.	5.1.5

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				I-17.2	Approval process		Discharge to the Hunter River was specifically not permitted in the original application and if approved strict conditions on water management should apply to ensure the discharge is not used unless in extreme circumstances. Discharges of saline water will increase background levels of salinity and affecting agriculture and river environment.	5.10
				I-17.3	Agriculture		Water is being taken from agricultural systems and diverted to mining operations.	5.5.3
				I-17.4	Rehabilitation		Post mining final voids- Not addressed in initial application and modification.	5.8
				I-17.5	Traffic		Additional pressure on the road network due to increased production. Additional rail traffic and rail noise.	5.1.5, 5.4
				I-17.6	Cumulative impacts	Social - strain on public infrastructure and services	Additional stress on public infrastructure due to cumulative impacts of mining operations generally. Demand for employment will place pressure on demand for community services and facilities. Lifestyle- lack of affordable housing from mine ownership of rateable land causing young home buyers to move out of the area. Threat to regional economy as the mine drives out sustainable industries and the long term employment they provide. Strain on services- increase in employment will cause pressure on supply and demand of community services and facilities.	5.6.1, 5.15.2
				I-17.7	Cumulative impacts	Social - diversity of regional economy	Threat to the diversity of the regional economy as mining drives out other sustainable industries and the long term employment they provide.	5.15.1
				I-17.8	Air quality	Air quality - cumulative impacts	Reduction in air quality and an increase in mine air pollution. Will cumulatively add to impacts of mine-sourced air pollution for the whole Hunter Valley. Denman does not have air quality monitor that is part of Upper Hunter Air Quality Network even though it is close to the mine. Establishment of mine expansions/new mines should be halted until Denman is included in regional air quality network.	5.2.4
				I-17.9	Air quality	Climate change	Increased coal production adds to climate change threat.	5.2.5
				I-17.10	Health	Health - dust	Insufficient data to make a sensible determination regarding the health effects upon the residents of the regions that are already exposed to high density coal mining.	5.3
I-18	Unknown	Richard Hordern	Objection	I-18.1	Economic		Employment increase will only occur under full production - believe the proposal is overstating its benefits.	5.14
				I-18.2	Agriculture		Impacts of mining on agricultural business. Size and scale of the encroaching mining activities in the area have made it very difficult to secure long term client contracts and to effectively produce family succession planning tools. The property	5.7.1, 5.7.2

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							(Lucerne and cereal hay production business) was not identified in surrounding land uses figure 2.2. Mangoola agricultural offset area provides little benefit to the local community.	
				I-18.3	Water	Water supply	Concerns of water quality management and risks to downstream water users. Concerned that water will be diverted from Colinta holdings to mine operations during periods of drought. Object to any further changes in the Hunter River water balance.	5.5.3
				I-18.4	Cumulative impacts	Social - strain on public infrastructure and services	Increased strain on services, lessening of quality of services.	5.6.1, 5.15.2
				I-18.5	Cumulative impacts	Social - diversity of regional economy	Long term repercussions of community's long-term reliance on mining industry. Difficult to find volunteers for organisations and social commitment in the area.	5.15.1
				I-18.6	Social	Social - sense of community	Obliteration of rural social fabric. Replaced with dedicated, affluent and socially irresponsible community that is enjoying short term productivity. Noted that this is a subjective and morally conflicting opinion but important for the area and its future.	5.6.2
				I-18.7	Noise	Noise - assessment approach	Hard to believe that there would be less of an impact associated with an expansion of mining activities.	5.1.1
				I-18.8	Approval process		Modification to employee numbers sought is a 'best case' scenario and is misleading, in order to sell benefits of the proposed modification. 150 employees not indicative of the actual number of employees that would be hired if the modification was approved.	5.10
				I-18.9	Consultation		Were only informed three days prior to exhibition that changes to acquisition rights were proposed under the modification. As only a few landholders are believed to be affected it would have been pertinent to advise landholders well in advance of exhibition.	5.11
				I-18.10	Noise	Acquisition/management zone	Object to removal of acquisition rights. Were not consulted about removal of rights. Landholder was guaranteed that property would have acquisition rights [for 132A and B] when Xstrata purchased Mangoola Coal. Family succession and financial planning has been nullified. Removal from the acquisition zone would undermine family plans based on acquisition rights.	5.1.7
				I-18.11	Water	Water quality - Hunter River	Concerned that HRSTS was not introduced as part of earlier modifications associated with the pipeline. There should be no risk to downstream water users, not just a reduced risk. Concerned that there appears to be risks associated with	5.5.2

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							uncontrolled releases and pit inundation in severe weather events even if the modification is denied.	
				I-18.12	Water	Water quality - Hunter River	Property is the first privately owned WAL downstream of the proposed discharge point. Business solely relies on water for irrigation - dubious about the extent of potential saline residues and water quality issues. Very little assurance of the integrity of Xstrata Mangoola water quality due to issues regarding water management following construction. Object to changes to the water balance in the Hunter River and on site.	5.5.2
				I-18.13	Water	Water supply	More water will be required short term at the CHPP, for dust suppression and changes to the site water management system would need to occur. Not certain what would happen in the event of a drought. Water used by Colinta would be transferred to mining activities; this is not in keeping with the current and historical land use for the area.	5.5.3
I-19	Denman	John Kaye	Objection	I-19.1	Cumulative impacts		Cumulative impacts of mining in the Hunter Valley on soils, water, land, air and agriculture. Mines own more than 50% of rateable land in Muswellbrook. Recommend refusal based on National Water Commission 2012 report.	5.2.4
				I-19.2	Water	Water quality - Hunter River	General statements regarding ecological and agricultural impact of discharging saline water. Saline water seeping from mine storage is raising background salinity levels in Hunter River. General impacts of coal mining on water sources, and the Hunter River.	5.5.2
				I-19.3	Air quality	Air quality - cumulative impacts	Mining significant contributor to air pollution. Cumulative impact of mines raising air pollutants to a level that is not acceptable and has human and animal health impacts. We do not yet fully understand the negative impacts of the air pollutants from mining. The smaller the particles, the further into the body they travel. Diesel combustion gases are known to be very small and to be carcinogenic. A toxicological analysis of mine sourced pollutants is presently being undertaken and will be released after the submission date for this modification proposal. The Upper Hunter Air Quality Monitoring Network regularly detects levels of dust that are too high and issues air quality alerts. The cumulative impact of many mines releasing pollutants amounts to a level of pollutants in the atmosphere that is not acceptable. Mines need to do a lot more to reduce air pollution. It has been reported by Hunter New England Health that Singleton and Muswellbrook local government areas have a higher than average rate of respiratory illness and asthma. The mitigation measures that the mines take to reduce air pollution are	5.2.4

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							not effective, or we would not have such a high frequency of air quality alerts. An air quality monitor should be located in Denman that is part of the Upper Hunter Air quality network.	
				I-19.4	Cumulative impacts	Social - diversity of regional economy	General statements objecting to mining impacts upon agricultural land. Farming land is being underutilised or sterilised by mining, replaced with poor quality rehabilitated land not commercially viable for farming. Mining is a once only land use. Mining threatens thoroughbred industry through air and water pollution. Will have an impact on neighbouring farming industries and the community.	5.15.1
				I-19.5	Water	Water quality - Hunter River	Discussion on the report issued by the National Water Commission "Integrating the mining sector into water planning and entitlements regimes" March 2012 - recommendation 4 from that report	5.5.2
				I-19.6	Cumulative impacts	Social - diversity of regional economy	Economic assessment must be undertaken to assess the effect of the proposal on other industries and businesses. Employment impacts from mining pushing other industries out of the Hunter Valley. Diversity of economy must be encouraged. Increasing number of coal mines will result in supply exceeding demand, mines will fall into care and maintenance. Where will miners find work if other industries like agriculture have been pushed out of the valley.	5.15.1
				I-19.7	Rehabilitation		Low levels of copper in top soil of rehabilitated land which stunts cattle grazing. Rehabilitated land continues to subside especially after rain or irrigation. Crops grown on rehabilitated land can only be used for grazing as the uneven surface makes the use of harvester machinery impossible. After mining there is often no attempt to maintain any established rehabilitation or continue rehabilitation. Overburden is aerated and occupies 40% more volume than before. End up with considerable additional amounts of excavated material. The aerated spoil is unstable and very susceptible to erosion contributing to dust and silt. No certainty that mined land can be returned to viable agriculture use. Impacts of flooding on rehabilitated land. Mining voids depressurise aquifers which fill the void with saline groundwater and heavy metals.	5.8
				I-19.8	Health	Health - dust	A health assessment study on the effect of coal mining pollution on human and animal health has never been part of the mine application process. This must now be part of the application process prior to any consideration of a mine extension or new mine. Mangoola coal is close to the town of Denman. Denman does not have an air quality monitor that is part of the Upper Hunter Air Quality Network. Until Denman is part of the air quality network expansion of this mine and	5.3

Table A.1 **Matters raised in submissions**

RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							establishment of new mines near Denman should be halted.	
I-20	Denman	Pat Keegan	Objection	I-20.1	Noise	Noise - assessment approach	There are no contours of the total noise emissions due to both the current operations and the proposed modification, i.e. the cumulative noise emissions.	5.1.1
				I-20.2	Noise	Noise - assessment approach	No details are given in the EA as to design of the predictive meteorological forecasting system, the performance indicators and the planned changes to mining operations in prediction meteorological adverse conditions. An updated version of the NMP showing DGRs should be included with the EA.	5.1.1
				I-20.3	Noise	Noise - assessment approach	The EA does not appear to give consideration to the measures in Section 7.2 of the INP given that temperature inversions are a feature of the region - scheduling the use of noisy equipment at the least sensitive time of the day, and where there are several noisy pieces of equipment, scheduling operations so they are used separately rather than concurrently.	5.1.1
				I-20.4	Noise	Noise - assessment approach	Section 3.3 describes that 'other' noise mitigation measures were considered and ruled out due to 'analysis of their reasonable and feasibility. This analysis is not included in the EA for and should be provided to provide transparency in the decision making process. The mitigation measure of restriction of all operations at night time irrespective of elevation under adverse weather conditions has not been included in the EA.	5.1.1
				I-20.5	Noise	Noise - assessment approach	The cumulative operational noise impact of Bengalla and Mt Arthur Mines are not considered in the EA. This is not appropriate given the feature of temperature inversions in the region. An assessment of cumulative impact must be performed on all receivers including predicted emissions from planned expansions at neighbouring mines.	5.1.1
				I-20.6	Air quality	Air quality - assessment approach	Section 7.1 includes TSP emission only and not PM10 and PM2.5 as required by the DGRs.	5.2.1
				I-20.7	Air quality	Air quality - assessment approach	PM10 and PM2.5 and gaseous emissions from onsite mobile equipment are not quantified and appear to be not included in the modelling.	5.2.1
				I-20.8	Air quality	Air quality - assessment approach	Only one year of generated meteorological data was used. There is no validation of this data against onsite stations or long term data for demonstrating representativeness.	5.2.1
				I-20.9	Air quality	Air quality - assessment approach	Emissions to air from nearby mines were not included.	5.2.1

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				I-20.10	Air quality	Air quality - assessment approach	Winter PM2.5 concentrations from the Muswellbrook EPA monitoring station were not included in the baseline assessment.	5.2.1
				I-20.11	Air quality	Air quality - assessment approach	Cumulative 24 hour PM10 emissions are assessed only at the four monitoring stations. This assessment approach is inadequate.	5.2.1
				I-20.12	Air quality	Air quality - assessment approach	Cumulative PM2.5 was not included in the assessment despite being in the DGRs.	5.2.1
				I-20.13	Air quality	Air quality - assessment approach	Incremental TSP, PM10 and PM2.5 were compared against the NEPM criteria for total impact (Incremental + baseline). It is highly misleading to compare incremental concentrations against the NEPM and is a deliberate ploy to deceive the community.	5.2.1
				I-20.14	Air quality	Air quality - assessment approach	The EA does not demonstrate that 80% control efficiency is achieved on haul roads. Claims must be supported by quantitative analysis using a recognised measurement method covering results from all meteorological conditions.	5.2.1
I-21	Mosman	Karolina Kulczynska	Objection	I-21.1	Air quality	Climate change	Object to an increase in extraction rates on the grounds of the increasing danger of climate change. The consequences of increasing fossil fuel use, which will be aided by increasing the extraction rate of Mangoola Mine, are catastrophic on an economic, environmental and humanitarian level.	5.2.5
I-22	Baulkham Hills	Suzanne Le Breton	Objection	I-22.1	Social	Social - sense of community	Concerned about impact of expansion on few remaining residents in the area.	5.6.2
				I-22.2	Water	Water quality - Hunter River	Concerned about possible pollution of the Hunter River.	5.5.2
				I-22.3	Cumulative impacts		People who have chosen to stay in the area are already impacts by noise and air pollution which will increase. Residents of Wybong and the environment are not being protected or compensated.	5.1.6, 5.2.4
				I-22.4	Air quality	Air quality - dust pollution	Increase in dust impacts due to modification.	5.2.3
I-23	Maryland	Gerard Le Breton	Objection	I-23.1	Water	Water quality - Hunter River	Dumping toxic salt water into the Hunter River shows inadequate consideration for local waterways.	5.5.2
				I-23.2	Project justification		The proposed increase purely from a financial perspective shows inadequacies. Electricity from unsubsidised renewable energy is already cheaper than electricity from new build coal and gas fired power stations in Australia (Bloomberg New Energy Finance Feb 2013).	5.16
I-24	Singleton	Marg McLean	Objection	I-24.1	Air quality	Climate change	The expansion will produce an additional 2.4 million tonnes of greenhouse gas	5.2.5

Table A.1 **Matters raised in submissions**

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							emissions per year. It is not appropriate to allow this to occur.	
				I-24.2	Air quality	Health - dust	The modification should not be approved for many reasons, including the cumulative impact on air quality and the consequences for human health in the Hunter Valley. The air quality effect cannot be monitored as part of the Upper Hunter Air Quality Network and the noise impact of the mine is already a matter of contention within the immediate community and it would be increased under the modification.	5.3
				I-24.3	Project justification		It is not in the public interest for DP&I to provide for short term money making for overseas companies at a greater cost in the longer term.	5.16
				I-24.4	Air quality	Air quality - cumulative impacts	The modification should not be approved for many reasons, including the cumulative impact on air quality and the consequences for human health in the Hunter Valley. The air quality effect cannot be monitored as part of the Upper Hunter Air Quality Network and the noise impact of the mine is already a matter of contention within the immediate community and it would be increased under the modification. Cumulative impact of coal mining has a far greater environmental cost than it is worth.	5.2.4
I-25	Scone	Kaye Monro	Objection	I-25.1	Water	Water quality - Hunter River	When Xstrata purchased Mangoola it knew that there was no access to the HRSTS. The reason that there is no access is because in the Upper Hunter, due to "limited catchment and relatively short length of the rivers above the gauging stations ... a flow event in the river would pass the mine discharge point before it could be classified as a 'high flow' event, because the flow volume at Singleton could not be predicted (Coal Mining Potential in the Upper Hunter Valley - Strategic Assessment (DOP 2009)). The river hasn't changed and Xstrata should not be permitted to join the scheme. Presumptuous for Xstrata to place an exit pipe on the Hunter River bank.	5.5.2
				I-25.2	Water	Water quality - Hunter River	The current EPL and approval do not permit release of saline water from the site. The 2012 AEMR clearly shows saline water is seeping from the site, both ground water and surface water have high salinity at some monitoring sites.	5.5.2
				I-25.3	Water	Water quality - Hunter River	The pit water dam exceeds trigger values for a number of water quality parameters and yet this is designed to overflow into Anvil Creel.	5.5.2
				I-25.4	Water	Water quality - Hunter River	Don't mention what chemicals they use in the CHPP to wash coal.	5.5.2
				I-25.5	Water	Water quality - Hunter River	Clearly coal mining produces large amounts of toxic water waste which should be stored in lined dams to prevent it leaching into aquifers as is happening at	5.5.2

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RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							Mangoola. Should have to pay to have their waste remove like other community members instead of using waterways as a dump.	
				I-25.6	Air quality	Climate change	Cannot see why the environment or planning departments would permit any project with such high GHG emissions. Object to the extension further adding to the problem of climate change.	5.2.5
				I-25.7	Air quality	Climate change	Xstrata fail to explain that fugitive methane emissions increase in amounts with increasing depth, that coal will desorb methane for over two months, and that fugitive GHG emissions occur for years after mine closure (ACARP C90063).	5.2.5
I-26	Jerry's Plains	Ian and Robyn Moore	Objection	I-26.1	Water	Water quality - Hunter River	Have grave concerns for the health of the river system which is already at saturation point as far as salinity levels are concerned. Discharge to the Hunter River was not permitted in the original application and should not be allowed.	5.5.2
				I-26.2	Water	Water quality - Hunter River	Discharges of saline (contaminated) water into the Hunter River are resulting in an increase in the background levels of salinity in the river. This is detrimental to the river environment and properties downstream.	5.5.2
				I-26.3	Agriculture		Saline (contaminated) water is used to grow Lucerne to produce Lucerne Hay at respondents property with some sold to thoroughbred horse breeding studs and vealers.	5.5.2
				I-26.4	Water	Water supply	Water is being taken from agricultural systems and diverted to mining operations.	5.5.3
				I-26.5	Cumulative impacts	Social - strain on public infrastructure and services	The increasing operation in addition to other mines in the Upper Hunter, Muswellbrook, and Singleton Shires are putting additional stress on public infrastructure that is presently not coping with current levels of mining.	5.6.1, 5.15.2
				I-26.6	Air quality	Air quality - cumulative impacts	The concentration of mines in the Upper Hunter is resulting in an unacceptable reduction in air quality for residents of the Upper Hunter. Increasing mine output increase mine sourced air pollution and decrease air quality for Upper Hunter residents.	5.2.4
				I-26.7	Health	Health - dust	Precautionary principle regarding health effects short and long term should be applied, there is insufficient data to make a sensible determination regarding the health effects upon the residents of the regions that are already exposed to high density coal mining.	5.3
				I-26.8	Cumulative impacts	Social - diversity of regional economy	Mining companies already own more than 50% of rateable land in the Muswellbrook Shire. The Upper Hunter is saturated with coal mines and future expansion should be halted.	5.15.1

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				I-26.9	Traffic		Increased production will put additional pressure on the road network.	5.4
				I-26.10	Rehabilitation		The initial application and this modification do not address the issue of leaving post 5.8 mining final voids.	
				I-26.11	Air quality	Air quality - dust pollution	Denman does not have an air quality monitor that is part of the Upper Hunter Air Quality Network. Mining should be halted until this happens.	5.2.5
				I-26.12	Cumulative impacts	Social - diversity of regional economy	Threat to the diversity of the regional economy as mining drives out other sustainable industries and the long term employment they provide.	5.15.1
				I-26.13	Cumulative impacts		Mining is resulting in industrialisation of the region and associated air, dust and water pollution. The Hunter Valley was once known for its agricultural qualities. Farmers were here first, should be allowed to stay and produce food for the country and ever growing global population without the fear of pollution.	5.2.4
				I-26.14	Rehabilitation		Mining in the Upper Hunter has a bad history of leaving land in poor state. Instead of expansions in the Hunter why not take these mining companies out into unpopulated areas of the state and away from high quality land.	5.8
				I-26.15	Agriculture		The government is destroying one of the fineness agricultural valleys of the world.	5.7.2
I-27	Newtown	Daryl Morris	Objection	I-27.1	Air quality	Climate change	Burning fossil fuel is becoming increasingly dangerous to all life. Australia is the largest exporter of coal and is becoming known as a rogue state that does not care about the greater good only short term economic gain. Government should make healthy choices for the majority and not focus on a few increasing their pockets. Expansion of Mangoola will only lock us into our unhealthy dependency on fossil fuel further.	5.2.5
I-28	Denman	Sue and John Perfrement	Objection	I-28.1	General		Object due to potential impacts on our land. Have same concerns as the Upper Hunter Holdings submission (I-10).	See I-10
				I-28.2	Consultation		Would like to be advised if the application proceeds to an inquiry.	N/A
I-29	Hamilton	Steve Phillips	Objection	I-29.1	Project justification		The proponents have exaggerated the economic importance of the project while deliberately failing to address the impacts of the project on other industries, the public and the environment.	5.16
				I-29.2	Air quality	Climate change	The project would result in the release of approximately 232 million tonnes of carob dioxide equivalent over 10 years which is equivalent to a 4.2% increase in Australia's domestic greenhouse pollution (551.9 Mtpa).	5.2.5
				I-29.3	Air quality	Climate change	Global warming impacts are already claiming the livers of an estimate 300,000	5.2.5

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							people per year. The Commonwealth Government's Climate Change Commission recently found that 80% of fossil fuel reserves must remain in the ground, unburned or dangerous climate change will be unstoppable.	
				I-29.4	Water	Water quality - Hunter River	Discharge to the Hunter River was specifically not permitted in the original application, and must not be permitted now either. Discharges of saline water into the Hunter River are resulting in an increase in the background levels of salinity in the river which is detrimental to the river environment and downstream agriculture.	5.5.2
				I-29.5	Water	Water supply	Too much water is already being used by mining in the Muswellbrook Shire.	5.5.3
				I-29.6	Cumulative impacts	Social - strain on public infrastructure and services	The increasing operation in addition to other mines in the Upper Hunter and Muswellbrook Shire are putting additional stress on public infrastructure that is presently not coping with current levels of mining.	5.6.1, 5.15.2
				I-29.7	Air quality	Air quality - cumulative impacts	The mine will add to cumulative impacts of mine sourced air pollution for the whole Hunter Valley.	5.2.4
				I-29.8	Health	Health - dust	Precautionary principle regarding health effects short and long term should be applied, there is insufficient data to make a sensible determination regarding the health effects upon the residents of the regions that are already exposed to high density coal mining.	5.3
				I-29.9	Noise	Noise - general	Expansion will increase noise produced by the mine. Current disputes between mine affected residents and Mangoola are unresolved.	5.1.3
				I-29.10	Noise	Noise - road/rail	An increase in production will result in an increase in rail traffic and rail noise.	5.1.5
				I-29.11	Cumulative impacts	Social - diversity of regional economy	Mining companies already own more than 50% of rateable land in the Muswellbrook Shire. The Upper Hunter is saturated with coal mines and future expansion should be halted.	5.15.1
				I-29.12	Cumulative impacts	Social - strain on public infrastructure and services	Lack of affordable housing is putting extra pressure for housing forcing young home buyers on normal incomes out of the area.	5.6.1, 5.15.2
				I-29.13	Cumulative impacts	Social - strain on public infrastructure and services	Increase in mining employment will put pressure on the supply and demand for community services and facilities that are presently strained.	5.6.1, 5.15.2
				I-29.14	Rehabilitation		The initial application and this modification do not address the issue of leaving post 5.8 mining final voids.	
				I-29.15	Air quality	Air quality - cumulative impacts	Denman does not have an air quality monitor that is part of the Upper Hunter Air Quality Network. Mining should be halted until this happens.	5.2.4

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				I-29.16	Cumulative impacts	Social - diversity of regional economy	Threat to the diversity of the regional economy as mining drives out other sustainable industries and the long term employment they provide.	5.15.1
				I-29.17	Cumulative impacts	Social - diversity of regional economy	Industrialisation of the region.	5.15.1
				I-29.18	Rehabilitation		Mining in the Upper Hunter has a bad history of leaving land in poor state. Irreversibility of the damage caused.	5.8
I-30	Illawong	Anthony Shewan	Objection	I-30.1	General		Any proposal to increase extraction rates should be subject to wider public scrutiny and hearings.	5.10
I-31	Muswellbrook	Withheld	Objection	I-31.1	Air quality	Air quality - dust pollution	Increase in dust- deterioration of air quality.	5.2.3
				I-31.2	Noise	Noise - general	Increase in noise- increased rail movements, increased production of coal handling plant. Increased vibration- from increased production and rail movements.	5.1.3
				I-31.3	Property value		Impacts on property values.	5.12
I-32	Wybong	Withheld	Objection	I-32.1	Noise	Noise - general	Noise - Coal trucks and shovel/excavators operating between sleeping hours cause sleep disturbance and resident has to retreat inside during daylight hours but noise mitigation measures (8ml glass in most sleeping quarters) don't work; . Hotline regularly used during disturbance but alerted that noise is within limits. Inadequacy of EA- does not consider frequency of noise by coal trucks and shovel/excavators.	5.1.1, 5.1.3
				I-32.2	Health		Mine operations impacting health and wellbeing	5.3
				I-32.3	Traffic		Traffic- road repair and maintenance, safety (mine employee driver fatigue).	5.4
				I-32.4	Social	Social - sense of community	Sense of community- large number of property purchased, long term residents have moved out, impact on community cohesion ie less volunteers for RFS and Wybong Hall.	5.6.2
I-33	Wybong	Withheld	Objection	I-33.1	Health	Health - dust	Health and wellbeing from dust deposition which has resulted in respiratory problems.	5.3
				I-33.2	Air quality	Air quality - dust pollution		5.2.3
				I-33.3	Blasting	Blasting - health impacts	Blasting- causing migraine headaches.	5.3
				I-33.4	Noise	Noise - general	Noise impacts- sleep disturbance; have complained but do not believe mine is complying with acceptable noise levels.	5.1.1, 5.1.3
				I-33.5	Water	Water quality - Hunter River	Water- saline water discharge into the Hunter River; high rainfall in recent years	5.5.2

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							may make this semi-regular, resulting in effects to farming and environment.	
				I-33.6	Traffic		Traffic impacts- noise, safety, danger to wildlife.	5.1.5, 5.4
I-34	Castlerock	Withheld	Objection	I-34.1	Noise	Noise - general	Noise- from continuous machinery noise causing sleep disturbance (in contact with Ben Clibborn Env & Com Manager Man Coal); believe noise mitigation due to temperature inversion is required. Vibration- on days of extreme noise and is uncomfortable.	5.1.1, 5.1.3
				I-34.2	Health	Health - rainwater tank water quality	Dust- being washed into rainwater tank and drinking water supply; concern for health.	5.2.3
I-35	Hazelbrook	Withheld	Objection	I-35.1	Water		HRSTS discharge- river at risk of being irreparably polluted.	5.5.2
				I-35.2	Health	Health - dust	Dust- high health stress.	5.3
				I-35.3	Air quality	Climate change	Contradiction between scientists wanting to keep fossil fuels in the ground and the mine wanting to extract the resource.	5.2.5
I-36	Denman	Kathleen Oldman	Objection	I-36.1	Cumulative impacts		Cumulative impacts from the number and impact of existing coal mines in the hunter river and hunter valley.	5.1.6, 5.2.4
				I-36.2	Air quality	Air quality - dust pollution	Air- dust from mechanical excavation and gaseous emissions from open cut mines, machinery exhaust and explosives; causes dust deposition and	5.2.3
				I-36.3	Health	Health - dust	Health impacts due to dust and costs to health services.	5.3
I-37	Manobalai	Withheld	Objection	I-37.1	General	No response required	General objection. Detailed objection to follow.	N/A
I-38	Wybong	Withheld	Objection	I-38.1	General	No response required	General objection; 'Cannot live at their home'. Does not specify key themes.	N/A
I-39	Wybong	Withheld	Objection	I-39.1	Noise	Noise - general	Forced from home due to noise and dust. Destroyed family, property and family.	5.1.3
				I-39.2	Air quality	Air quality - dust pollution	Forced from home due to noise and dust. Destroyed family, property and family.	5.2.3
I-40	Wybong	John Shewan	Objection	I-40.1	General		Includes a summary of correspondence between the respondent, the proponent and government departments. This is being dealt with under a separate process in accordance with approval conditions.	N/A
I-41	Epping VIC	Withheld	Objection	I-41.1	Water	Water quality - Hunter River	Water- salt and chemical runoff destroying Hunter river, agriculture, nature reserves (environment),	5.5.2
				I-41.2	Air quality	Health - dust	Dust- ill health to community and expansion will exacerbate this and a lower standard of living.	5.3
				I-41.3	Air quality	Climate change	Contradiction between scientists wanting to keep fossil fuels and the mine wanting to take it.	5.2.5

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				I-41.4	Health	Health - dust	Dust- ill health to community and expansion will exacerbate this and a lower standard of living.	5.3
I-42	Unknown	Schroeder	Objection	I-42.1	Noise	Noise - general	Noise and dust levels risk their business of breeding and racing thoroughbred racehorses.	5.1.3
				I-42.2	Air quality	Air quality - dust pollution	Noise and dust levels risk their business of breeding and racing thoroughbred racehorses.	5.2.3
I-43	Muswellbrook	Withheld	Objection	I-43.1	Noise	Noise - general	Noise and dust levels risk their business of breeding and racing thoroughbred racehorses.	5.1.3
				I-43.2	Air quality	Air quality - dust pollution	Noise and dust levels risk their business of breeding and racing thoroughbred racehorses.	5.2.3
I-44	Aberdare	David Atwell	Objection	I-44.1	Water	Water quality - Hunter River	Discharge saline water into the Hunter River will have detrimental effects on agriculture and flora and fauna (environment). Discharges not permitted under current approval and would create a precedent.	5.5.2
				I-44.2	Air quality	Health - dust	Dust- studies still being completed and no research showing high dust levels are safe.	5.3
				I-44.3	Agriculture		Discharge of saline water into the Hunter River will have detrimental effects on agriculture and flora and fauna. Discharges not permitted under current approval and would create a precedent.	5.5.1, 5.5.2, 5.7.1, 5.7.2
				I-44.4	Traffic		Strain on services- roads are disintegrating and councils not being compensated to maintain them. Safety issues to drivers.	5.4
				I-44.5	Social	Social - diversity of regional economy	Sense of community- domination of the mines has left limited long term employment opportunities in other sectors.	5.15.1
				I-44.6	Health	Health - dust	Health and wellbeing- coal and diesel particles can give illnesses ranging from asthma to lung cancer (pers comm. Prof David Durrheim).	5.3
I-45	Muswellbrook	Wayne Blake	Objection	I-45.1	Air quality	Air quality - cumulative impacts	Air- pollution of Mangoola and other mines adjacent to property. Concerns raised at meetings with the mine.	5.2.5
				I-45.2	Air quality	Health - rainwater tank water quality	Drinking water- Will not drink tank water as pollution ends up on roof and into tank. Mangoola mine has refused to pay for drinking water.	5.2.3
				I-45.3	Noise	Noise - general	Noise pollution- sleep disturbance. Xstrata Mangoola Reports say that they can't open windows by more than 10% otherwise they will be affected by noise and air pollution. Requested the mine to air condition their home but have refused.	5.1.3

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RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				I-45.4	Visual	Visual - lighting	Visual- light pollution into house. Xstrata has done nothing.	5.9
				I-45.5	Water	Water quality - Hunter River	Impacts agriculture and Hunter farming, Industrial and Domestic Community.	5.5.2
				I-45.6	Social	Social - sense of community	Sense of community- farming land for 104 years so have a sense of entitlement.	5.6.2
I-46	Denman	James Fairweather	Objection	I-46.1	General		Concerns with increased extraction rate. Property already impacted by dust, noise and other disruptive activities.	5.1.3, 5.2.3
				I-46.2	Consultation		Within existing E.L zone, would like to be advised of any inquiries or outcomes that may impact on current situation.	N/A
I-47	Muswellbrook	Henry and June Brown	Objection	I-47.1	Cumulative impacts		Constantly under siege from the effects of the mine (noise, blasting, dust, lighting and trains) and object to any modification and intensification which will make impacts worse. Already impacted in ways that have not been modelled and disagree with current modelling which is understated and fraudulent. Changes were made to the site without changes to the impact modelling.	5.1.6, 5.2.4
				I-47.2	Noise	Noise - general	Subjected constantly to audible noise and infrasound emanating from the CHPP, impacting lives and health. Current modelling which is understated and fraudulent.	5.1.1, 5.1.3
				I-47.3	Blasting	Blasting - structural impacts	Already impacting on house due to distance from mine and strata.	5.1.2
				I-47.4	Air quality	Air quality - dust pollution	Dust constantly falls on property whenever wind comes from the west which pollutes drinking water and the amenity of property.	5.2.3
				I-47.5	Visual	Visual - lighting	Lighting an issue with lights from the CHPP and stockpiles illuminating property.	5.9
				I-47.6	Traffic	Noise - road/rail	Trains to and from the mine are part of the noise/vibration problems. Xstrata claims that trains are only received during the day, but this is a lie. Trains are dispatched by RailCorp and these often occur at night. More trains resulting in more impacts will occur with intensification of operations.	5.1.5, 5.4
				I-47.7	Water	Water quality - Hunter River	Object to mine dumping poisonous saline water into the already stressed river system. Should be made to keep on their own property.	5.5.2
I-48	Unknown	Deidre Olofsson	Objection	I-48.1	Noise	Noise - general	Noise monitoring does not reflect the true impact. Attended monitoring should not be used for compliance as it is done one day every three months.	5.1.1, 5.1.3
				I-48.2	Air quality	Air quality - dust pollution	Dust monitoring does not reflect the true impact. There is no monitoring that looks at cumulative. The HUAN is not used in compliance. Monitoring should be raw data only and the actual readings without manipulation.	5.2.3
				I-48.3	Rehabilitation		Rehabilitation must be classified to agriculture land format and must meet a sustainable industry. The mapping of all rehab land in the hunter and the	5.8

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							classification is required so the public can identify what land-use and value of the land will be.	
				I-48.4	Rehabilitation		Requests a set criteria for void size trending to no void, soil testing of the rehab to check for salinity leaching and the speed of leaching to the void, cost analysis report of the maintenance of the void and rehab post mining, timeframe of when aquifers will become sourcing on the salinity transfer to the water network, costs of the health of the water network system, assessment of cumulative impact within Upper Hunter when voids and aquifer become sourcing post mining. No assessment of the cumulative salinity impact on the water network post mining particularly after closure.	5.8
				I-48.5	Water	Water quality - Hunter River	Salinity control and purification of the water to returned back to the water network is mandatory.	5.5.2
I-49	Muswellbrook	Peter and Julie Brown	Objection	I-49.1	Traffic		Modification will exacerbate existing impacts - road and rail.	5.1.5, 5.4
				I-49.2	Noise	Noise - general	Impacted by existing audible noise and infrasound. Infrasound from CHPP is having health impacts. Noise/vibration from rail is an issue. Mine has said they only receive trains of a day - this is a lie - trains occur at night. Noise modelling is not accurate. Modification will exacerbate existing impacts.	5.1.3, 5.1.5, 5.3, 5.4
				I-49.3	Blasting	Blasting - structural impacts	Structural damage to houses due to close proximity and strata.	5.1.2
				I-49.4	Air quality	Air quality - dust pollution	Dust from current operations settles on property. Drinking water tanks polluted by dust. General amenity impacted by dust. Modification will exacerbate existing impacts.	5.2.3
				I-49.5	Visual		Lighting is an issue with current operations, from CHPP, stockpiles. Modification will exacerbate existing impacts.	5.9
				I-49.6	Social	Social - quality of living	Intensification of mining will degrade lives and lifestyle.	5.6.2
				I-49.7	Water	Water quality - Hunter River	Opposed to discharge of water in Hunter River - more water storage should be provided.	5.5.2
I-50	Scone	Dr. David Stevenson	Objection	I-50.1	Health	Health - dust	General statement that the Upper Hunter is already saturated with coal mines that impact on the health of the communities of Denman, Muswellbrook, Singleton and neighbouring townships.	5.3
				I-50.2	Health	Health - dust	Further expansion will exacerbate the mine-sourced air pollution for the whole Hunter Valley, as well as have an impact because of increased rail and road traffic.	5.3

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
I-51	Muswellbrook	Wendy Wales	Objection	I-50.3	Noise	Noise - general	Mangoola Mine already impacts adversely on the local community and noise and other issues are largely unresolved.	5.1.1, 5.1.3
				I-50.4	Water	Water quality - Hunter River	Dependent on water for agricultural production. Discharge to the Hunter River should not be permitted as it was not permitted in the original application and would certainly have a detrimental effect on the river environment and agriculture downstream.	5.5.2
				I-51.1	General		Increased production rate will increase dust and air pollution, noise and light pollution.	5.1.3, 5.2.3, 5.9
				I-51.2	Water	Water quality - Hunter River	Increased demand on water, destruction of water tables and the deposition of salt in a river whose salinity levels are rising have impacts on agricultural viability.	5.5.2
				I-51.3	Cumulative impacts	Social - diversity of regional economy	Mining is no longer seen as an industry compatible with wineries and vineyards, horse studs and dairy farms, human physical and social wellbeing.	5.15.1
				I-51.4	Agriculture		Mining is no longer seen as an industry compatible with wineries and vineyards, horse studs and dairy farms, human physical and social wellbeing.	5.7.2
				I-52.1	Cumulative impacts	Air quality - cumulative impacts	General statement regarding cumulative impacts of mining on the Hunter River and Hunter Valley - not yet quantified. Mining expansion adds to the total accumulation of air pollution in the Valley.	5.2.4
				I-52.2	Social	Social - sense of community	Acquisition in Denman results in loss of history and fabric of the community further isolating remaining residents.	5.6.2
I-52	Kayuga	Nerida Wales Brown	Objection	I-52.3	Agriculture		General comments regarding loss of productive land to mining. Mining industry threatens productive farming land and farming water supply. The project will override the objective of the Strategic Regional Land Use Plan to protect strategic agricultural land. The project will impact neighbouring farming industries through air and water pollution.	5.7.1, 5.7.2
				I-52.4	Water	Water quality - Hunter River	Discharge to Hunter River will raise background salinity levels in the river.	5.5.2
				I-52.5	Rehabilitation		General comments regarding inability of rehabilitation to return land to previous agricultural uses.	5.8
				I-52.6	Cumulative impacts	Social - diversity of regional economy	An economic impact assessment must be undertaken to assess the effect of the project on all other non-mining industries and businesses in the area. Prospective rural businesses will not locate to areas threatened by coal mine expansion.	5.15.1
				I-52.7	Water	Water quality - Hunter River	General comments regarding impacts on water and groundwater due to mining.	5.5.2

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							Runoff from mining operations is changing the nature of the Hunter River. Extracts of the National Water Commission are presented regarding impacts to significant water sources - due to previous experience with negative effects on Hunter Valley water systems caused by a mining and the regular failure of initial modelling and assessment to predict these problems, risks should not be taken of potentially harming the Hunter River water source. The project will permanently damage the Hunter River and permanently remove productively used water from the regional economy.	
				I-52.8	Air quality	Air quality - cumulative impacts	Cumulative impact of many mines releasing pollutants amounts to a level of pollutants in the atmosphere is unacceptable. Denman does not have an air quality monitor that is part of the Upper Hunter Air Quality Network. Until Denman is part of the air quality network expansion of this mine and establishment of new mines near Denman should be halted.	5.2.4
				I-52.9	Health	Health - dust	Negative impacts of air pollutants from mining not fully understood. A toxicological analysis of mine sourced pollutants is presently being undertaken and will be released after the submission date for this modification proposal. Hunter New England Health has reported that Singleton and Muswellbrook local government areas have a higher than average rate of respiratory illness and asthma. A health assessment study on the effect of coal mining pollution on human and animal health should be required for all new mines and extensions.	5.3
				I-52.10	Cumulative impacts	Social - diversity of regional economy	Need to have a secure and diverse economic base for the region.	5.15.1
I-53	Wybong	Withheld	Objection	I-53.1	Noise	Noise - general	Believe that the proposed increase in extraction and increase in equipment numbers will increase the level and frequency of noise generated by Mangoola Coal and will impact on their health and wellbeing.	5.1.3
				I-53.2	Noise	Current operations - impacts	Majority of noise occurs at night and they have trouble sleeping. Also impacts on daily life to the point where they cannot be outside.	5.1.3
				I-53.3	Noise	Current operations - impacts	Objects to the frequency of noise levels generated with exposure for days on end. Believe that this isn't been considered in the EA.	5.1.2
				I-53.4	Noise	Acquisition/management zone	Objects to the redefining of the noise mitigation zone which will expose residents to additional electricity costs, meter reading and ongoing maintenance of air conditioner units, contradicting what was agreed to by Mangoola Coal.	5.1.7
				I-53.5	Noise	Acquisition/management	Noise from trucks and shovel/excavators regularly disturbing them, though	5.1.7

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
						zone	Mangoola reports that noise is within limits. Believe that they are being substantially impacted and that the current mitigation area should remain.	
				I-53.6	Traffic		Concerned by projected increase in employee numbers due to repair and maintenance costs and safety. Claims that accidents on the southern end of Wybong Road due to driver fatigue are not reported to the Police and not included in accident counts.	5.4
				I-53.7	Traffic		Colinta stock wandering along the road unattended creates traffic hazards.	5.4
				I-53.8	Social	Social - sense of community	Community of Wybong has effectively been halved by the presence of Mangoola Coal through land acquisitions and residents moving out of the community which impacts on community cohesion and the number and availability of community members to volunteer for community building activities such as RFS and Wybong Hall.	5.6.2
				I-53.9	Social	Social - sense of community	Have witnessed an increase in the crime rate (break and enters) within Wybong over the last 2 years, which has occurred with the introduction of Mangoola Coal and loss of residents which has led to defragmentation.	5.6.2
I-54	Wybong	Carol and David Burton	Objection	I-54.1	Noise	Noise - general	Since Xstrata commenced mining we are constantly annoyed by dust and noise. Concerned that this will get worse with the increase in output.	5.1.3
				I-54.2	Noise	Noise - general	Concerned about the installation and operation of rock crushing plant and that this will create more dust and noise.	5.1.3
				I-54.3	Air quality	Air quality - dust pollution	Constantly clearing and washing house exterior and paved areas. Slurry ends up in water supply after rain. Mine has installed first flush system but yet to see if it is working.	5.2.3
				I-54.4	Property value		Have had difficulties selling due to closeness of mine. Have no confirmation on future direction of mining.	5.12
				I-54.5	Consultation		Would welcome someone from DP&I to visit property and see impacts of mining.	N/A
I-55	Wybong	Keith and Deborah Campbell	Objection	I-55.1	Health		Health impacts	5.3
				I-55.2	Water	Water quality - Hunter River	Water quality impacts on surface aquifer and potable supply to households. Changes to salt levels on floodplains of the Hunter Catchment.	5.5.2
				I-55.3	Air quality	Air quality - dust pollution	Dust pollution.	5.2.3

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				I-55.4	Traffic		Increase in traffic and maintenance of Wybong Road.	5.4
				I-55.5	Rehabilitation		Overburden placement and proponents need to stabilise and rehabilitate much quicker.	5.8
				I-55.6	Social	Social - strain on public infrastructure and services	Great burden on the community from increase need for local services e.g. Medical, schools, local infrastructure etc.	5.6.1, 5.15.2
				I-55.7	Cumulative impacts	Social - diversity of regional economy	Market competition for labour and wages.	5.15.1
I-56	Wybong	David and Edna Clay	Objection	I-56.1	Noise	Noise - general	Increase in production will create more noise.	5.1.3
				I-56.2	Traffic		Increase in production will result in 50% more traffic on Wybong Road.	5.4
				I-56.3	Consultation		Don't feel that Xstrata has dealt with them honourably and doubt they will in the future. Had a verbal agreement to subsidise power bills for the air conditioner installed but have refused to put this in writing. Will no longer pay if Mod 6 goes through.	5.1.7
				I-56.4	Approval process		Discharge water into Hunter River is another example of them constantly moving the gold posts. Continuous modifications make the future even more uncertain.	5.10
				I-56.5	Blasting		Object to increasing the frequency of blasts which they already feel.	5.1.2
				I-56.6	Air quality	Air quality - dust pollution	Increase in production and crushing gravel will increase dust levels. Since Mangoola commenced operation the ridge capping and gutters on home are rusting. Has been brought to Mangoola's attention without resolution.	5.2.3
				I-56.7	Social	Social - sense of community	Since Mangoola commenced the community has been ruined and the rural lifestyle changed dramatically.	5.6.2
				I-56.8	Property value		Concerned about the decrease in value of their property.	5.12
				I-56.9	Consultation		Would welcome someone from DP&I to visit property and see impacts of mining.	N/A
C-1	Singleton	Hunter Communities Network - Bev Smiles	Object	C-1.1	Cumulative impacts		Cumulative impacts not adequately addressed - air quality, water quality and water resources, HRSTS, capacity of road/rail infrastructure, viability of local community (social impacts), impacts on diversity of industry in the Shire, health impacts. Cumulative impacts with surrounding mines not adequately addressed.	5.2.4
				C-1.2	General		Current operations do not meet predictions approved in original proposal.	5.1.3, 5.2.3
C-2	Denman	Hunter Equine	Object	C-2.1	Agriculture		Impacts on agricultural-related business due to current mining/planned	5.7.1, 5.7.2

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
		- Melanie Sunderland					expansions, and loss of income.	
				C-2.2	Health	Health - dust	Health and wellbeing impacts due to air pollution and traffic (safety issues due to mine shift workers speeding on roads).	5.3
C-3A + 3B	Scone	Hunter Thoroughbred breeders association	Object	C-3.1	Consultation		No direct consultation by Mangoola Coal.	5.11
				C-3.2	Cumulative impacts		Cumulative impacts of mining on thoroughbred industry, air quality and associated health impacts, impacts on watercourses (Hunter River), blasting, noise, visual, transport safety.	5.1.6, 5.2.4
				C-3.3	Approval process		Modifications to Mangoola Coal represent a significant change to mining operations from original proposal. Constancy and frequency of mining modifications is abuse of the approval process and provides no certainty to community/agricultural industries regarding the future of their regions. Mining companies must have early visibility of the size, structure and duration of their operations early in the mine life. Inadequate time to respond to the modification.	5.10
				C-3.4	Social	No response required	Statement that advice is being sought regarding the accuracy of the assessment.	N/A
				C-3.5	Economic	No response required	Statement that advice is being sought regarding the accuracy of the assessment.	N/A
				C-3.6	Agriculture	No response required	Statement that advice is being sought regarding the accuracy of the assessment.	N/A
				C-3.7	Water	Groundwater	No meaningful additional groundwater assessment has been undertaken for any of the proposed modifications since the original 2006 study. Therefore statements regarding potential impacts on groundwater and quality are inadequately justified particularly as they relate to final void water levels and quality.	5.13.1
				C-3.8	Water	Groundwater	EA documents refer to “modelling” which estimates a long-term water level within the final void to reach a maximum level that does not allow discharge to the environment and downstream watercourses - can't find sufficient assessment/modelling detail to support conclusions - previous assessments do not provide sufficient detail of no risk of discharge in the long-term. Original assessment appears to have been based on an averaged approach to final void water balance with no assessment of the potentially significant short-to-medium term variability of climate and therefore water levels within the void. Final void water management approach - is no discussion of effects of declining water quality	5.13.2

Table A.1 **Matters raised in submissions**

RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							in void and legacy for the State, sensitivity of estimated likelihood of void spill to underlying model assumptions (reducing evaporative losses with increasing salinity, uncertainty in rainfall/runoff assumption, etc), and the impact of the void on the long-term suitability of water for downstream users and the environment.	
				C-3.9	Water	Groundwater	Quoted range of final void water quality suggests significant flaws in the assessment and/or conclusions - suggests no accounting for evapo-concentration of non-draining water which will lead to hyper-saline water body, or there is some mechanism for movement of water from the pit to the environment (spill or groundwater movement) which is not adequately described. On the basis of their reviews of the original proposal EA documents (2006), Modification 4 documents (2010) and those associated with the current proposed modification they have found no detailed description of the modelling or results thereof to support these statements. In particular the estimated water quality (3,920 – 5,650 mg/L) does not appear consistent with what would effectively be the formation of a 'self contained system' that would in time create a hyper-saline water body. As such the final void strategy has potential risks to all downstream users and has not been adequately addressed.	5.13.2
				C-3.10	Water	Water quality - Hunter River	Downstream impacts not well understood. Proposed discharge has the greatest potential to impact thoroughbred industries downstream of Mangoola. Under current approach, the mine holds no discharge licence - underlying risk of uncontrolled discharge of saline water. Actual risks of uncontrolled discharge are not well understood due to the modelling approach used. A more formalised plan that links with a managed scheme and controls releases to periods of elevated flow conditions represents an improvement in overall site and downstream water management.	5.5.2
				C-3.11	Agriculture		Disagree that the proposed modification will not have an impact on land capability and productivity surrounding and downstream of the site. Disappointed that this EA fails to recognise and address the wider and cumulative impacts on agricultural industries downstream of Mangoola Coal as a result of their modifications. EA does not acknowledge that other thoroughbred breeding operations downstream from the mine could be seriously affected by adverse impacts on the Hunter River	5.5.2, 5.5.3, 5.7.1, 5.7.2
				C-3.12	Air quality	Air quality - cumulative impacts	Air Quality is a significant issue for the Hunter Valley thoroughbred breeding industry and the Hunter Valley community. Assessment of cumulative impacts of open cut coal mining on air quality and health is overdue.	5.2.4

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				C-3.13	Cumulative impacts		Noise and blasting will have significant impacts on adjacent landholders - cumulative impacts will impact the reputation of thoroughbred industry as a whole. Concerned about the nature, extent, frequency and fall out associated with this and other mining activities in the area.	5.1.6
				C-3.14	Health		Serious concerns over the critical lack of studies into the effects of coal mining on Australian communities. Agree with the study Health and Social Harms of Coal Mining in Local Communities, Spotlight on the Hunter Region, University of Sydney, October 2012 - Australia needs to re-evaluate whether the overall health and social costs of Australia's reliance on a coal economy will ultimately outweigh its economic benefits.	5.3
C-4	East Maitland	Hunter Environmental Lobby Inc.- Jan Davis	Objection	C-4.1	General		Original issues raised in relation to Anvil Hill EA still of concern - compliance with planning objectives; biodiversity issues; water issues; cumulative impacts and Greenhouse and energy issues.	N/A
				C-4.2	Air quality	Health - dust	Effects of human health generally in the Upper Hunter from breaches in air quality standards.	5.3
				C-4.3	Air quality	Climate change	General statement regarding effects of climate change and need for development of renewable energy.	5.2.5
				C-4.4	Cumulative impacts		General statement regarding the need for examination of true cumulative impacts on communities, employment, biodiversity, water and greenhouse issues by the Government.	5.1.6, 5.2.4
C-5		Redman Park Pty Ltd- Amanda and Stuart Thomas	Objection	C-5.1	Agriculture		Water is a critical resource for the Redman Park business (thoroughbred horse stud and Lucerne farm). Quantity and quality of Hunter River water critical for farmers, other agricultural pursuits and residents of the Hunter Valley.	5.5.2, 5.5.3, 5.7.1, 5.7.2
				C-5.2	Water	Water quality - Hunter River	Discharge of saline water into Hunter River not approved in original application - it is a threat to future viability of business.	5.5.2
				C-5.3	Air quality	Air quality - cumulative impacts	General statement about mining contributions to poor air quality in the Hunter Valley. Denman does not have air quality monitor that is part of Upper Hunter Air Quality Network even though it is close to the mine. Establishment of mine expansions/new mines should be halted until Denman is included in regional air quality network.	5.2.4

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				C-5.4	Cumulative impacts	Social - diversity of regional economy	General statement regarding need to have a secure and diverse economic base for the region. Supply will exceed demand, prices drop, and unemployment.	5.15.1
C-6		Rivers SOS	Objection	C-6.1			Interim submission – objection.	N/A
C-7	Denman	Inglewood Vineyards-Brett Keeping	Objection	C-7.1	Tourism		Impacts on the wine industry - ongoing expansion of the mining industry in recent years has had a significant impact of the wine industry in the Upper Hunter Valley and the proposed modification will further damage the reputation of the Upper Hunter Wine Industry as a whole. Tourism development proposals are constrained by levels of uncertainty due to mining.	5.15.1
				C-7.2	Health	Health - dust	Cumulative impacts of mining in the Upper Hunter have not been fully considered. This modification proposal will further impact on the areas dust and noise pollution, leading to further deterioration of the local environment. These impacts will also affect the health and wellbeing of the local communities.	5.3
				C-7.3	Approval process		Ongoing modifications - incremental creep of mining projects. Size and scale of mine is vastly different to what was proposed. General statement that more scrutiny of all mining proposals is required to ensure that landholders and local communities are fully informed from the outset of the likely impacts from these developments.	5.10
				C-7.4	Agriculture		Loss of diversity of agricultural businesses like thoroughbred studs, wineries etc. that contribute to diversity of industry.	5.7.1, 5.7.2
				C-7.5	Air quality	Air quality - cumulative impacts	Request that a cumulative air quality and health impact assessment of this project and other mining operations. Denman does not have an air quality monitor that is part of the Upper Hunter Air Quality Network. Until Denman is part of the air quality network expansion of this mine and establishment of new mines near Denman should be halted.	5.2.4
				C-7.6	Water	Water quality - Hunter River	Industries that threaten/pollute/ damages water supply will threatened viability and reputation of agricultural industry - not appropriately considered in the EA.	5.5.2
				C-7.7	Cumulative impacts	Social - diversity of regional economy	No balance between co-existence of mines and other businesses - if expansion of mining continues generally, there will be a loss of agricultural industries in the Upper Hunter.	5.15.1
C-8		Upper Hunter Tours- Craig Benjamin	Objection	C-8.1	Water		Saline water should not be discharged into the Hunter River. River is already under pressure from existing mining operations. Water quality for human consumption and agriculture is critical.	5.5.2

Table A.1 Matters raised in submissions

RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				C-8.2	Cumulative impacts	Social - strain on public infrastructure and services	Strain on current infrastructure in and around Denman due to mining in general is unacceptable.	5.6.1, 5.15.2
				C-8.3	Tourism		General comment regarding aesthetic impacts of mining generally impacts on tourism.	5.15.1
				C-8.4	Visual		Visual (lighting) impacts at residential receptors on Golden Hwy.	5.9
				C-8.5	Noise	Noise - road/rail	Noise impacts at residential receptors on Golden Highway.	5.1.3
				C-8.6	Air quality	Air quality - dust pollution	Denman does not have an air quality monitor that is part of the Upper Hunter Air Quality Network. Until Denman is part of the air quality network expansion of mines in general should not proceed.	5.2.5
C-9		Darley	Objection	C-9.1	Consultation		Darley is a key stakeholder directly downstream from the Mangoola mine, and dependent on the Hunter River for our livelihood. Disappointed that we were not directly consulted by Xstrata regarding the modification.	5.11
				C-9.2	Water	Water quality - Hunter River	Potential risks to the health of the Hunter River, are of significant concern to our business and our future. Advice we have received suggests significant shortcomings in the Mangoola EA which if not satisfactorily addressed could adversely impact on our operations.	5.5.2
				C-9.3	Water	Groundwater	Water risks associated with the proposed Mangoola Modification have not been properly assessed, or updated since 2006 despite a numbers of modifications and changes to the mine plan, and could pose serious and irreparable problems for both surface and groundwater systems of the Hunter River and downstream industries. Modelling and assessment of ground and surface water impacts which do not provide sufficient information to understand and assess the likely impacts. Risks of uncontrolled mine water discharge understated due to the modelling approach adopted.	5.13.2
				C-9.4	Water		Concerns regarding the final void, its management, the potentially adverse risks to and impacts on downstream landholders and the legacy for both future generations and the State - lacks any discussion on likelihood of void spills; and the impact of the void on the long term suitability of water for downstream users. Inadequately accounts or justifies the final void quality and consequent salinity impacts of this proposal with the possible result of salinity far in excess of that quoted in the EA.	5.13.2
				C-9.5	Water	Water quality - Hunter River	Lacks any discussion of the downstream impacts of this proposal including the	5.5.2

Table A.1 Matters raised in submissions

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							effects of declining water quality on downstream water user including thoroughbred breeding operations.	
				C-9.6	Agriculture		EA has failed to adequately assess the impact of the modification proposal on the Hunter Valley's thoroughbred breeding industry and community downstream of the current mining operation. Agricultural Impact Assessment lacking in credibility and accuracy.	5.5.2, 5.5.3, 5.7.1, 5.7.2
				C-9.7	Health		EA has failed to account for the cumulative health impacts of this proposal on the Hunter Valley community	5.3
				C-9.8	Cumulative impacts		EA does not adequately acknowledge and assess the cumulative impacts of existing mines together with this proposal on the local community, sustainable business operations, air quality, noise, and traffic and road safety.	5.1.6, 5.2.4
C-10		CFMEU	Support					N/A
C-11		Wybong Action Group	Objection	C-11.1	General		Believes that the expansion should not be approved until all outstanding obligations and commitments under the existing consent are met.	N/A
				C-11.2	Social	Social - sense of community	Unacceptable social impact of local residents that Mangoola have failed to make good on their obligations and commitments under existing consent.	5.6.2
				C-11.3	Rehabilitation		The OEA is more than 50% incomplete, meant to contain noise and dust.	5.8
				C-11.4	Social	Social - sense of community	Mangoola has reduced the Wybong community by more than 50% from some 700 persons to less than 300.	5.6.2
				C-11.5	Social	Social - sense of community	Reduction in community activities provided by Wybong Hall.	5.6.2
				C-11.6	Noise	Noise - general	Hordern subdivision is being exposed to unmitigated and unlawful emissions of mine noise, lighting, fumes and dusts for extended night periods.	5.1.3
				C-11.7	Social	Social - sense of community	Xstrata have engaged in a deliberate process to destroy community friendships through secret negotiations and offering substandard treatments not commensurate with noise impacts or treatments on other homes.	5.6.2
				C-11.8	Noise	Noise - general	Xstrata have refused to undertaken compliance noise monitoring at the Hordern subdivision or to verify/deny the accuracy of their noise models.	5.1.1, 5.1.3
				C-11.9	Noise	Noise - general	Xstrata seeks to avoid their obligations to treat dwellings without verification of the noise levels experiences or proving of the model.	5.1.1, 5.1.3
				C-11.10	Traffic		Road safety issues (particularly Ridgeland Road/Wybong Road intersection).	5.4
				C-11.11	Social	Social - strain on public	Direction of funds from the Wybong Upland Management Strategy and Mangoola	5.6.1,

Table A.1 **Matters raised in submissions**

RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
						infrastructure and services	Coal Community Fund solely to works in the immediate neighbourhood of Mangoola.	5.15.2
				C-11.12	Noise	Noise - general	Noise complaint statistics clearly identify the existing of excessive noise from Mangoola which Mangoola have refused to measure for compliance.	5.1.1, 5.1.3
				C-11.13	Noise	Noise - general	The noise contours in the original EA understated the intrusion of significant noise.	5.1.1, 5.1.3
				C-11.14	Noise	Noise - general	Modification 4 exacerbated the noise problem to the north-east while ameliorating to some degree the noise issues to the north-west. Other aspects of the mine which have noise impacts, height and mass of OEA, absence of any noise controls to the north-east, reorientation of haul roads under Mod 4, use of large drilling rigs, shovels and operations at night. Reflection of noise waves on surrounding topography.	5.1.1, 5.1.3
				C-11.15	Noise	Noise - assessment approach	Do not believe that the noise models are representative of noise experienced at Hordern, or are in any way consistent with the mine operating plans, or the topography, geology and acoustic characteristics of the area.	5.1.1
				C-11.16	Noise	Noise - general	Jet stream chute created by the mine redesign of Mod 4 which carries fine particulates and noise. Sound resembles 'jet engine'.	5.1.1, 5.1.3
				C-11.17	Noise	Noise - general	Working at high elevations at night despite consent condition.	5.1.3
				C-11.18	Traffic		Ridgeland Road and Wybong Road intersection is unacceptable for public use at 100 km/hr including school bus and mine vehicles. Deceleration land to Ridgeland Road is grossly unsafe. 50% increased traffic flows represent an unacceptable risk to our community. Requests reduction of speed limit on Wybong Road to 80 km/hr, that safety barriers, culverts, edges, signage and line-marking be improved and over-width and heavy vehicles prohibited. Ridgeland Road intersection should be rendered safe to use and Wybong Road West improved	5.4
				C-11.19	Social	Social - sense of community	Burglary, fire and discharge of firearms from vehicles have become a commonplace menace to our community following commencement of Mangoola and depopulation of the district. Request that the DG inform the NSW Police, NSW Rural Fire Brigade and NSW Fire Service of these concerns.	5.6.2
				C-11.20	Health	Health - dust	Emissions from Mangoola have rendered rain water supplies unfit for human consumption despite first flush systems. Request that all diversion, filtering and treatment to all domestic rain water supplies on the Hordern subdivision be undertaken.	5.3

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RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
				C-11.21	Noise	Noise - general	Request a variation to EPL for additional real time noise monitoring to north-east and at the Hordern subdivision and real time reporting on Xstrata's website. Current noise monitoring network is inadequate. Noise modelling has utilised unproved and unverified calculated noise levels.	5.1.1, 5.1.3
				C-11.22	Noise	Noise - assessment approach	Mangoola and its surrounds are often affected by strong night and early morning temperature inversions which dramatically and predictably elevate noise from Mangoola to obtrusive levels. The frequency of these events and the level of noise augmentation occurring cannot be accurately predicted using ENM or any other known model. Noise predictions can only be regarded as a guide that the Independent Hearing and Assessment Panel determined required verification through an active and ongoing program of noise monitoring at receiver locations and which has not been undertaken	5.1.1
				C-11.23	Noise	Noise - assessment approach	Restricting dump trucks and dozers below the maximum elevation of the OEAs at night has limited success due to uneven heights and mass of OEA and Xstrata not working below the maximum elevation.	5.1.1
				C-11.24	Noise		Recommends that conditions 3 and 8 of Schedule 3 of the approval be retained in full as per the original consent and that all residences ought to be removed from Table 1 be retained and restored, that the night operating conditions be amended to read 'will operate below the lowest topographical point of the OEA and surrounding topography at night', real time dust and noise monitor at the Hordern subdivision, and all noise treatments and ameliorations be concluded by Xstrata prior to commencement of Mod 6.	5.1.7
				C-11.25	Water	Water quality - Hunter River	No discharges should be permitted.	5.5.2
LG-1		Muswellbrook Shire Council		LG-1	Social	Social - sense of community	Project has had unacceptable land acquisitions since 2004 resulting on Wybong community. Wybong community has been left short of critical mass - now rarely meets as a community and is at risk of further dislocation.	5.6.2
				LG-2	Noise / Air quality		Council encourages DP&I to consider an appropriate affectation boundary that considers the particular pre-existing noise and dust levels in Wybong Valleys rather than more generic pre-existing levels.	4.4
				LG-3	Final landform		Council is concerned about the micro-relief of the final landform and encourages conditions that will make the effect of any final land form as transparent and enforceable as possible.	4.5
				LG-4	Final landform		Not clear whether the final void is reduced in volume. Council's policy is that	4.5

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RTS ID#	Location (if provided)	Name	Object/ support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							subsequent mine modifications have that outcome. Council unlikely to support modified mine plan which increase number of volume of final void.	
				LG-5	Rehabilitation		The mine should be returned to heavily wooded vegetation.	4.5
				LG-6	Water		Council does not support the discharge of salt or sediment laden water.	4.6
				LG-7			Council considers the planning contribution proposed by Mangoola adequately offsets the broader economic and infrastructure impacts of the proposal. There may be some aspects of Wybong Road and its intersections which require further augmentation arising from the proposal. Council will endeavour to achieve any such augmentations as a result of the work required under the conditions of its present approval.	4.7
A-1	n/a	Division of Resources and Energy	n/a	A-1.1	Rehabilitation		EA has not addressed the impact to rehabilitation as a result of increased coal extraction and changes to the landform, or stockpiling of ROM coal.	3.1.1
				A-1.2	Rehabilitation		Assess the impact of the final landform on surface water management to reduce the potential for soil erosion and reliance on infrastructure such as drop structures.	3.1.1
				A-1.3	Rehabilitation		Assess the impact to rehabilitation as a result of changes to the rehabilitation schedule.	3.1.1
				A-1.4	Rehabilitation		Revise the final landform to make the final landform more consistent with the surrounding landscape.	3.1.1
				A-1.5	Rehabilitation		Assess the potential for spontaneous combustion related to stockpiling of ROM coal and identify management actions to minimise the risk and how this would be monitored.	3.1.1
				A-1.6	Rehabilitation		Provide an adequate description of the project's functional domains including tailings dams, waste emplacements, final voids, infrastructure areas.	3.1.2
				A-1.7	Rehabilitation		Describe whether the specific performance objectives and standards of each domain have changed as a result of the changes to the final landform.	3.1.2
				A-1.8	Rehabilitation		Domain Specific Objectives: Identify the functional domains of the project and describe the rehabilitation objectives for each domain in light of final landform changes.	3.1.2
				A-1.9	Rehabilitation		Completion Criteria: Propose strategic completion criteria for each domain having regard to the various phases of rehabilitation (ie. Decommissioning, Landform	3.1.2

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RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							Establishment, Growth Medium Development, Ecosystem Establishment, Ecosystem Development) and outline the proponent's commitment to progressive rehabilitation.	
				A-1.10	Rehabilitation		Emplacement design to be sympathetic with the surrounding topography. ORE accepts the conceptual landform design outlined in the EA, however the Proponent should be aware that as part of the MOP, ORE will require further detail regarding emplacement design, with specific reference to vertical relief and drainage	3.1.2
				A-1.11	Rehabilitation		Prepare a rehabilitation plan which addresses all aspects of rehabilitation and mine closure, including post mining land use assessment, rehabilitation objectives, completion criteria and rehabilitation monitoring; include a final landform design that is sympathetic with the surrounding topography of the area and considers natural drainage design and relief patterns and principles; and include a Life of Mine Tailings Strategy prepared by a team of suitably qualified and experienced persons which addresses all aspects of life of mine tailings incorporating design, operation, water balance and decommissioning including rehabilitation and closure.	3.1.3
A-2	n/a	Department of Primary Industries Office of Agricultural Sustainability and Food Security	n/a	A-2.1	Agriculture		No additional impacts to agriculture are predicted to result from the proposed modification.	3.2.2
		Department of Primary Industries Office of Water		A-2.2	Water		The existing commitments and conditions under PA 06_0014 relating to groundwater management are considered appropriate for the management of the proposed modification, and that the proposed modification does not alter Mangoola Coal's existing licensing requirements under the Water Act 1912 and Water Management Act 2000.	3.2.1
				A-2.3	Water		The proponent holds high security and general security category access licences from the Hunter Regulated River Water Source and aquifer category access licences from the Wybong Creek Water Source, however it has no records of the	3.2.1

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RTS ID#	Location (if provided)	Name	Object/support	Matter reference	Theme	Sub-theme	Matters raised	Report reference
							proponent holding any unregulated category access licences from the Wybong Creek Water Source.	
				A-2.4	Water		A number of recommended conditions were proposed by NOW.	3.2.1
		Department of Primary Industries Fisheries NSW		A-2.5	Water		Fisheries NSW recommended approval conditions to ensure Mangoola Coal complies with the HRSTS, and require Mangoola Coal to implement a suitable monitoring program (including reporting requirements) to determine any significant impacts on the aquatic biota in the Hunter River associated with the increased discharge of the saline water. The design of this program should be in consultation with and subject to approval of Fisheries NSW prior to implementation.	3.2.3
A-3	n/a	Environment Protection Authority	n/a	A-3.1	Noise	Noise - assessment approach	The EA does not appear to include justification that the residual level of impact at receivers expected to be impacted above the PSNL is acceptable in accordance with Chapters 8 and 9 of the INP.	3.5.1
				A-3.2	Noise	Noise - assessment approach	Cannot find evidence in the EA that there are no other reasonable and feasible measures available, other than those proposed, as required in the DGRs. EPA requests justification that all reasonable and feasible noise mitigation controls have been considered, and provide details of how this was determined.	3.5.1
				A-3.3	Air quality	Air quality - assessment approach	EPA notes that not all mitigation measures proposed to control emissions are quantifiable, measurable, auditable and enforceable.	5.2.1
				A-3.4	Air quality	Air quality - assessment approach	The emissions inventory adopted for the proposal and used in the dispersion modelling is not explicitly linked to the current air quality management plan. Control factors in the emissions inventory are not paired with specific auditable actions from the air quality management plan.	5.2.1
				A-3.5	Air quality	Air quality - assessment approach	Pollution Reduction Programs included in the EPL for Mangoola will apply to this project also.	5.2.1
				A-3.6	Air quality	Air quality - assessment approach	EPA recommends that the proponent prepare an updated air quality management plan for the modified operations.	5.2.1
				A-3.7	Water	Water quality - Hunter River	The surface water assessment makes no mention that water with an EC of more than 400 µS/cm is defined as saline water and can only be discharged via an authorised discharge point. This should be a key design criteria for the development of the water management system as it is possible that waters within the dirty water zone may also be saline. The proponent should note that conformance with the requirements of the 'Blue Book' for run-off from disturbed	3.5.3

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							areas may still result in non-compliance with the HRSTS and the EPL.	
A-4	n/a	NSW Health	n/a	A-4.1	Noise	Acquisition/management zone	It is unclear whether properties within the acquisition zone receive noise mitigation measures to protect current or future tenants.	5.1.7
				A-4.2	Noise	Acquisition/management zone	It is recommended that the proponent clearly demonstrate that the community residing within the noise impacted area have been consulted and that the predicted noise levels and proposed mitigation measures are acceptable to them. Furthermore, a complaints mechanism for residences should be incorporated into the proposed noise monitoring program which enables both rapid assessment and corrective measures (if required) to be implemented.	5.1.7
				A-4.3	Air quality	Air quality - assessment approach	Significant incremental impacts in PM10 are not highlighted and only focus on criteria exceedances.	5.2.1
				A-4.4	Social	Social - sense of community	Impacts on mine owned residences, resulting in abandonment, demolition or exclusion, could have significant impacts on the social character of the area	5.6.2
				A-4.5	Air quality	Health - dust	Residents of impacted mine owned housing should be warned of potential health risks and should provide informed consent demonstrating that they have been alerted to these.	5.3
				A-4.6	Air quality	Air quality - assessment approach	EIS assumes that PM10 level goals will remain static throughout duration of the project. Even if regulatory goals do not decrease, societal expectations of cleaner air will increase. Urban air in Sydney will continue to improve in quality while the air quality in the vicinity of the project will worsen and in many areas exceed the PM10 levels in Sydney.	5.2.1
				A-4.7	Air quality	Health - rainwater tank water quality	Through the community consultation process concerns were raised of possible impacts in drinking water. The EIS does not provide specific analysis of issues associated with water quality from rainwater tanks at residences without reticulated water supply.	5.3.1
				A-4.8	Air quality	Health - rainwater tank water quality	The installation of first flush systems and extending tank cleaning program are mentioned as proposed strategies. It would be appropriate to utilise the Hunter New England Population Health guidelines and apply its recommendations and standards to rainwater tanks within the vicinity of the mine in a proactive manner. A management system of taking complaints and rectifying issues identified would also be considered.	5.3.1

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				A-4.9	Social	Social - quality of living	It is recommended that the proponent demonstrate community satisfaction with the proposed mitigation strategies outlined in Appendix I of the EIS. The effectiveness of these measures should be monitored over time as part of the proposed social impact monitoring program and adjustments made as necessary.	5.6.2
A-5	n/a	Office of Environment and Heritage	n/a	A-5.1	General		Declined to make a submission as the project modification application will not impact biodiversity/threatened species, heritage, flooding and surface water management.	N/A
A-6		Roads and Maritime Services					Raised no objections.	3.6

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