NSW EPA
ENVIRONMENT PROTECTION AUTHORITY

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Our reference: DOC12/8543 & LIC08/1056-04
Date: 29 February 2012

Mr Stephen O'Donoghue
Senior Planner – Mining Projects
Major Projects Assessment
NSW Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Mr O'Donoghue

**Tarrawonga Mine Extension Project (11_0047) – Exhibition of Environmental Assessment**

I refer to the Environmental Assessment provided for the proposed Tarrawonga Mine Extension Project received by the NSW Environment Protection Authority (the EPA) on 18 January 2012.

The EPA has reviewed the information provided (Tarrawonga Coal Project Environmental Assessment by Resource Strategies and its associated documents). **Attachment 1** provides detailed comments and recommendations on the proposal. **Attachment 2** provides recommended conditions of approval.

It is noted that some of the key issues raised in the EPA submission (letter dated 5 December 2011) for the adequacy check stage of the proposal have not been addressed by the proponent. Despite this, the revised Environmental Assessment has been allowed to progress to public exhibition and the Department now finds itself in a position where it must raise many of the same issues.

It is noted that the project will require a variation to the existing environment protection licence under the Protection of the Environment and Operations (POEO) Act 1997. The proponent will need to make a separate application to the EPA to vary this licence if development project approval is granted.

Where relevant, the EPA would also appreciate receiving a copy of the submissions received by the Department of Planning and Infrastructure (or a report summarising these submissions) in response to the exhibition of the Environmental Assessment as this will assist the EPA in determining whether it needs to consider making a submission to the Planning Assessment Commission (PAC).

The EPA would also like to request a copy of the draft project approval once the PAC review report has been delivered and the Department of Planning and Infrastructure (DoP&I) has considered its recommendations and prepared draft conditions of consent for the second PAC panel's consideration.

In summary, from the information presented in the EA, the EPA is of the opinion that the most significant environmental issues are:

- Air Quality – Errors (significant potential underestimations) identified in the Air Quality Impact Assessment by EPA in the adequacy review phase have not all been addressed by the proponent and despite this several receivers are identified as being at risk of project-only and cumulative impacts;
- Noise – Predicted project-only and cumulative noise impacts and management of infrastructure shared with the Boggabri Coal Mine; and

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- Water – Contingency measures and revision frequency for the mine water balance to address its reliance on the success of the proposed low permeability barrier, the diversion of Goonbri Creek and a number of assumptions about operations at the mine and other environmental factors.

The EPA also notes that a number of elements of this proposal may need to be revisited in the context of the positions taken for the adjacent Boggabri Coal Mine in the NSW Planning Assessment Commission Review Report (February 2012).

If you have any questions, or wish to discuss this matter further please contact Mr Lindsay Fulloon in the Armidale office on 6773 7000.

Yours sincerely

**SIMON SMITH**
**Manager Armidale Region**
**Environment Protection Authority**

Encl: Attachment 1 – Key Issues Identified in EPA Review of the Publicly Exhibited Environmental Assessment for Tarrawonga Coal Project

Attachment 2 – Recommended Conditions of Approval

## ATTACHMENT 1 – KEY ISSUES IDENTIFIED IN EPA REVIEW OF PUBLICLY EXHIBITED ENVIRONMENTAL ASSESSMENT FOR TARRAWONGA COAL PROJECT

## A. AIR QUALITY IMPACT ASSESSMENT (AQIA)

### *ISSUE 1 – REVIEW OF AQIA*

#### *a) Error in the estimation of wheel generated dust emissions has not been rectified*

There are various sources of underestimation of total project TSP emissions that collectively have potential to underestimate project emissions by up to 60%. These issues were elaborated in the EPA's Adequacy Review (summarised in Table 1). The Proponent, in the exhibited AQIA, has addressed the *scraper emissions* related comment only. *Wheel generated dust*, which alone accounts for 57% underestimation in the total project TSP emissions, has not been addressed to provide a more credible assessment of project impacts.

The emissions inventory (Table 8.1, AQIA) is considered conservative because modelled domestic coal production rate (450,000 tpa) is inflated relative to the proposed rate (150,000 tpa). Similarly, gravel production rate is based on current approved rate which is about three times the proposed rate. It is also noted that the AQIA has modelled all ROM coal processing activities as part of the Tarrawonga Coal Mine (TCM) project, when there is likelihood of this activity occurring off-site, subject to upgrade of infrastructure at Boggabri Coal Mine and appropriate approvals. While these assumptions do make for a conservative assessment overall, the underestimation of a key emission source for an open cut coal mine (i.e., *wheel generated dust*) eludes a realistic and conservative emissions estimate of project impacts. This issue must be addressed when the Proponent conducts a *site-specific Best Management Practice* assessment.

Recommendation
The AQIA in the current form is considered sufficient for decision making. However, when conducting a site-specific Best Management Practice (BMP) assessment, calculations of wheel generated dust emissions must address related comments raised during the EPA Adequacy Review.

***Table 1: Summary of issues identified during EPA Adequacy Review.***

| Activity | Error in emission estimation |
|---|---|
| **Wheel-generated dust (WGD)** | ▪ Uncontrolled emission factor not based on a referenced emission estimation technique.<br>▪ EPA estimates show 57% underestimation in total project TSP emissions owing to this source alone. |
| **Wind erosion** | ▪ Incorrect treatment of rain correction factors for short term (24 h $PM_{10}$) source emission estimates; impacts have been reduced due to use of annual rainfall data.<br>▪ 3% underestimation in total project TSP emissions. |
| **Scraper emissions** | ▪ Transcription error only. |

#### *b) Approval for off-site ROM coal processing should be supported with a more realistic assessment of project impacts*

EPA understands that a large part of the project's ROM coal processing will be undertaken off-site, but at this stage approval of the off-site ROM coal processing operations is pending. In the context of this future development, an air quality impact assessment must be made which models the emission scenario that excludes any activities bound to occur off-site. If the current AQIA is intended for this futuristic scenario, it

does not appear appropriate to include potential off-site activities as part of this assessment, as these activities would be Boggabri Coal Mine's (or any other potential licensee's) responsibility.

Recommendation

An additional Air Quality Impact Assessment must be prepared if off-site ROM coal processing is to be undertaken as part of the TCM project.

***c) Cumulative exceedance of the DoP&I Acquisition Criterion at Receiver 44a appears possible due to TCM and BCM contributions***

Maximum TCM project increment of 62 $\mu g/m^3$ was previously determined during the EPA Adequacy Review, indicative of the DoP&I Acquisition Criterion being triggered at 44a, due to TCM contribution alone exceeding 50 $\mu g/m^3$.

Further, assuming the following *worst-case* 24 hour $PM_{10}$ concentrations at 44a, the total impact may also exceed the DoP&I Acquisition Criterion (150 $\mu g/m^3$ including background concentration and contributions of all mines):

- *TCM maximum increment of 62 $\mu g/m^3$;*
- *TCM background concentration of 48 $\mu g/m^3$, from ambient monitoring data (Fig. 5-2, AQIA);*
- *Boggabri Coal Mine contribution of 40 $\mu g/m^3$ (AQIA p56); and,*
- *Maules Creek Coal Mine contribution of 3–5 $\mu g/m^3$ (AQIA p55).*

Referencing either of the criteria, it appears that 44a will be significantly impacted by both, TCM and BCM contributions. However, a *Best Management Practice* assessment must be made for the TCM project to determine if sufficient controls have been proposed, and to minimize its contribution to the cumulative impacts.

Recommendation

Following an assessment of Best Management Practice for the TCM project, additional management practices must be identified to minimize TCM contribution to cumulative impacts with Boggabri Coal Mine at receivers such as 44a. Only following such an assessment should the DoP&I Acquisition Criterion be applied for property acquisition.

## *ISSUE 2 - ASSESSMENT OF AMBIENT MONITORING REQUIREMENTS*

***a) Ambient monitoring site(s) should be established by TCM at receivers vulnerable to exceedances exclusively due to project emissions***

The Proponent must identify and establish ambient monitoring capable of assisting with the reactive management of particulate impacts at receivers vulnerable to exceedances of the OEH 24 hour $PM_{10}$ criterion owing to TCM emissions alone. For example, it would appear that due to its location relative to these receptors, TCM would be a major contributor to, and the most likely cause of any exceedances at private receivers 65a and 65b.

*Project-specific* ambient monitoring site(s) must be established through the analysis of the mine development plan (i.e., based on "active mining" locations during life of mine), and following a *Best Management Practice* assessment. Any monitoring site(s) established should be linked to *Reactive Management Strategies* and *Cumulative Air Quality Management Protocol.*

The EPA also notes that the recent NSW Planning Assessment Commission Review Report for the adjacent Boggabri Coal Project recommends the application of any (when this is finalised) ambient $PM_{2.5}$ criteria at any occupied residential property, regardless of land tenure (i.e. including mine owned properties). Furthermore the report also recommends that, mining operations must cease, or be scaled when any air quality standards are exceeded.

Recommendation
Project-specific ambient monitoring site(s) should be identified and established with reference to the mine development plan and the outcomes of a project-specific Best Management Practice assessment. Based on currently available information, one such site must be to the east of the project boundary.

***b) Monitoring at receivers at risk of cumulative exceedances of the OEH 24 hour $PM_{10}$ criterion should be prioritized in the Cumulative Air Quality Management Protocol***

Based on the AQIA predictions and EPA analysis (Table 2), 24 hour $PM_{10}$ concentrations (total including background and various coal mine contributions[1]) may exceed 50 µg/m$^3$ at private receivers *43, 44b, 65a, 65b, 79a, 83a, 83b, 88* and *89.* Most of these receivers are clustered along the east, south, south west and west boundary of TCM project. Most, if not all are shared/in common with Boggabri Coal Mine and are therefore vulnerable to cumulative impacts.

The identified receivers should receive priority in the *Cumulative Air Quality Management Protocol* and ambient monitoring program must be established within these sectors to assist in the reactive management of the various mines' day-to-day operations. Particular emphasis should be on receivers immediately west and south of TCM project; this would include 43 and 44b, and any others that may be identified. Also, even if not in the immediate vicinity of the project, monitoring capability must be established for receivers 79a and 83a and 83b.

Recommendation
Monitoring sites must be established for receivers that are in common between TCM, Boggabri Coal Mine and the proposed Maules Creek Coal Mine. Based on the available information, monitoring sites must be distributed in close proximity to and along the western to southern boundary of the TCM project. The Cumulative Air Quality Management Protocol must prioritise ambient air and meteorological monitoring in these sectors.

***Table 2: Indicative air quality impacts of the TCM project based on EPA Adequacy Review analysis.***

| Receiver ID | Location with respect to TCM | Indicative maximum due to TCM emissions (EPA Adequacy Review analysis) | | | | 24 hour $PM_{10}$ criterion likely to exceed |
|---|---|---|---|---|---|---|
| | | Yr 2 | Yr 4 | Yr 6 | Yr 16 | |
| 43 | West | 24 | 22 | 22 | 21 | OEH Criterion* |
| 44b | South west | 19 | 18 | 18 | 16 | |
| 79a | South west | 13 | 13 | 11 | 14 | |
| 83a | | 18 | 16 | 16 | 14 | |
| 83b | | 16 | 16 | 16 | 14 | |
| 88 | South | 16 | 14 | 14 | 13 | |
| 89 | | 24 | 22 | 24 | 19 | |
| 65a | East | 11 | 13 | 13 | 16 | |
| 65b | | 13 | 13 | 13 | 16 | |
| 44a | Immediate south | 58 | 54 | 62 | 56 | Possible DoP&I Acquisition Criterion due to TCM* |
| 45 | Immediate west | 42 | 37 | 34 | 30 | DoP&I Acquisition Criterion due to Boggabri |

** In all cases, assuming worst-case background concentration of 48 µg/m$^3$ based on TCM ambient monitoring data*

[1] In arriving at this conclusion, EPA also refers to the indicative maxima derived from the Adequacy Review analysis (summary in Table 2). The following have also been assumed:

- *a worst-case background concentration of 48 µg/m$^3$, based on 24 hour $PM_{10}$ monitoring at TCM (Fig.5-2, AQIA);*
- *Boggabri Coal Mine contribution of 40 µg/m$^3$ (AQIA p56); and,*
- Maules Creek Coal Mine contribution of 3–5 µg/m$^3$ (AQIA p55).

### *ISSUE 3 – MANAGEMENT OF SHARED INFRASTRUCTURE*

The Tarrawonga Coal Project Environmental Assessment proposes that the Tarrawonga Coal Mine will share coal washery and rail facilities with the adjacent Boggabri Coal mine, subject to the approval of a consent modification lodged by Boggabri Coal. Tarrawonga mine and the Boggabri mine each have their own separate Environment Protection Licences (EPLs), as each is a separate legal entity, and the operation of each of these premises needs to directly attributable to the relevant discreet accountable party to ensure that the EPA can pursue appropriate regulatory intervention with respect to any non-compliance issues. The same will need to apply with respect to the operation of the shared infrastructure.

Recommendation
To ensure adequate accountability, if the two separate EPLs are retained to encompass the separate operation of the two coal mines, responsibility for any air emissions from the operation of the shared facilities will either need to be assigned to one of the two existing EPLs, or to a separate jointly owned legal entity via a separate and additional EPL that encompasses the operation of these shared facilities only.

## B. NOISE AND BLASTING ASSESSMENT (NBA)

### *ISSUE 4 – REVIEW OF NBA*

#### *a) Predicted exceedances at three receptor locations*

The EPA notes that no figure detailing modelled equipment locations appears to have been included in the NBA. This information is useful to EPA in reviewing and assessing the potential impact and should be included in any future noise impact assessments provided by the proponent.

The operational noise levels are predicted to exceed 35 dB(A) at three residences (43, 44a and 45) under adverse meteorology during the evening and night periods. The predicted tenth percentile noise levels at receiver 43 ("Jeralong") are up to $L_{Aeq,\ (15\ minute)}$ 42 dB(A), which exceeds the acquisition criterion nominated in the Project Approval for the 2010 modification. The predicted tenth percentile noise levels at receiver 44a ("Kyalla") are up to $L_{Aeq,\ (15\ minute)}$ 39 dB(A), which exceeds the 38 dB(A) architectural treatment criterion nominated in the 2010 TCM Project Approval. The predicted tenth percentile noise levels at receiver 45 ("Tarrawonga") are up to $L_{Aeq,\ (15\ minute)}$ 46 dB(A), which exceeds the acquisition criterion nominated in the 2010 Project Approval.

Recommendations
The NBA states that a TCM employee currently resides at "Tarrawonga" and that the owner of "Kyalla" is currently in negotiations with TCM. The NBA also states that operations will be modified during the evening and night periods under adverse meteorology to reduce noise levels to meet the criteria. EPA therefore recommends the application of noise limits of 35 dB(A) at all receivers.

EPA also recommends (as OEH previously recommended on the 2010 modification) that no evening or night time activities be undertaken on the southern emplacement unless the proponent has secured negotiated agreements/acquisition rights with affected receptors where noise levels exceed $L_{Aeq,\ (15\ minute)}$ 35 dB(A) and demonstrated that all feasible and reasonable noise mitigation strategies have been implemented.

EPA also recommends that any Project Approval issued for this proposed project include the same condition (see condition 5.1 in Attachment 2) as in the Project Approval for the 2010 modification, except that "sustained" would be more consistent with the Industrial Noise Policy (INP) than "systemic".

***b) Modelling methodology and meteorological monitoring***

The NBA relies on Wilkinson Murray's 10th percentile methodology for predicting noise impacts. The EPA has previously raised (i.e. during the 2010 modification application) the issue of using the 10th percentile method for predicting impacts and requested that the proponent undertake further analysis to compare the 10th percentile method with the method outlined in the Industrial Noise Policy (INP). This does not appear to have been undertaken and therefore the EPA considers this to be an outstanding issue affecting this proposed Project.

The conditions of consent for the 2010 modification state that the proponent shall prepare and implement a Noise Management Plan (to be submitted to DP&I by end March 2011) that "*includes a program for validating the accuracy of the tenth percentile methodology used to predict the potential noise impacts of the development*" and that the proponent shall ensure that there is a meteorological station in the vicinity of the site that is capable of continuous real-time measurement of temperature lapse rate in accordance with the NSW Industrial Noise Policy (INP). The EPA is not aware of the submission of a revised Noise Management Plan, and notes that the Statement of Commitments in the EA states that "The Noise Management Plan will be revised to include details of the mitigation and management measures for noise and methodology for measuring temperature inversions."

The TCM Annual Environmental Monitoring Report 2010-2011 states that the meteorological station is fitted with temperature sensors at 2m and 10m intervals, however as noted in EPA's previous comments on the issue, the INP requires 10m and 60m measurements. It appears that the determination of temperature inversions is also an outstanding item to be addressed by the proponent.

Recommendation
That the proponent's commitment to provide a revised Noise Management Plan is incorporated within the project consent conditions and the provision of this document is required as a matter of priority. The revised Noise Management Plan must contain the required validation of the 10th percentile methodology, in addition to the other contents nominated in the statement of commitments, in accordance with the requirements of the INP.

***c) Cumulative noise impacts***

The EPA notes that the EARs for the Tarrawonga Coal Project stated that a detailed cumulative assessment must be undertaken, to include other existing and proposed mines in the area. Attachment 3 to the EA includes a discussion of other mines operating in the area (proposed and existing), and the NBA includes predicted cumulative noise levels for Boggabri, Maules Creek and Tarrawonga. The NBA states that worst case scenarios have been assumed for the cumulative assessment and predicted levels do not exceed the Amenity Criteria at all receivers except 43 and 45 (using predicted noise levels from Tarrawonga mine under adverse met conditions during the evening and night).

As noted above, receivers 43 and 45 are impacted by Tarrawonga Coal Project and the NBA states that discussions with these receivers regarding operational noise impacts should also consider management of cumulative noise effects. The EPA notes that the Statement of Commitments in the EA states that "TCPL will work with the proponents of the Boggabri Coal Mine and Maules Creek Coal Project to develop and implement a joint network of real-time ... operational noise monitors ... in the vicinity of the Project. The details of the joint network will be provided in the revised ... Noise Management Plan".

The EPA also notes that the recent NSW Planning Assessment Commission Review Report for the adjacent Boggabri Coal Project recommends the application of cumulative impact noise limits at any privately owned residential property based on the amenity criteria from the INP.

Recommendation
That the project consent conditions incorporate a requirement for the proponent to develop and provide a revised noise management plan in consultation with the EPA that includes (in addition to the elements identified in b) above) the details of the joint noise management network to be established with the

proponents of the Boggabri Coal mine and the Maules Creek Coal Mine for monitoring project specific and cumulative noise impacts.

***d) Construction noise***

The EPA noted in its adequacy review that construction noise from the project should be assessed against the NSW Industrial Noise Policy (INP). The proponent has not modified this aspect of the NBA since the adequacy review and hence the NBA still contains an assessment of construction noise against the Interim Construction Noise Guideline. Nonetheless, the predicted noise levels from construction combined with year 16 operations appear to not exceed the operational noise criteria derived under the INP.

Recommendation

That construction noise emissions from the premises are to be monitored for compliance purposes against the relevant Industrial Noise Policy criterion (i.e. the recommended project specific noise limits).

***e) Road traffic noise***

The EPA also noted in the adequacy review that the NBA should clarify whether the Approved ROM Coal Road Transport Route has been formally identified as a 'principal haulage route' by the local authority (e.g. Council) to warrant it being classified as a collector road. This confirmation does not appear to have been included in this NBA.

Recommendation

As it is proposed that movements on the haul road will only occur until the approvals are in place to transfer coal to the Boggabri mine facilities, the EPA recommends that to minimise potential noise impacts of the haul road, the same condition as in the 2010 Project Approval be included in the project consent (see condition 6.1 in Attachment 2).

***f) Rail noise and blasting***

The EPA has no further comments on the blasting and rail noise assessment. The NBA states that these aspects will have minimal change and that relevant criteria can be met. It is worth noting, however, that the Project proposes to conduct blasting more than once per day (up to twice per day). This, however, is not in accordance with the ANZEC guidelines for blasting and is not considered appropriate by The EPA. The EPA therefore has included a recommendation that blasting occur up to once per day.

Recommendation

That condition 7.7 is incorporated in the project approval to limit the number of blasts that can occur at the site to a maximum of one per day.

## *ISSUE 5 – MANAGEMENT OF SHARED INFRASTRUCTURE*

The Tarrawonga Coal Project Environmental Assessment proposes that the Tarrawonga Coal Mine will share coal washery and rail facilities with the adjacent Boggabri Coal mine, subject to the approval of a consent modification lodged by Boggabri Coal. Tarrawonga mine and the Boggabri mine each have their own separate Environment Protection Licences (EPLs), as each is a separate legal entity, and the operation of each of these premises needs to directly attributable to the relevant discreet accountable party to ensure that the EPA can pursue appropriate regulatory intervention with respect to any non-compliance issues. The same will need to apply with respect to the operation of the shared infrastructure.

Recommendation

To ensure adequate accountability, if the two separate EPLs are retained to encompass the separate operation of the two coal mines, responsibility for the noise emissions from the operation of the shared facilities will either need to be assigned to one of the two existing EPLs, or to a separate jointly owned legal entity via a separate and additional EPL that encompasses the operation of these shared facilities only.

## C. SITE WATER MANAGEMENT

### *ISSUE 6 – PROPOSED LOW PERMEABILITY BUND AND GOONBRI CREEK REALIGNMENT*

The mine water balance calculations rely on the success and integrity of the proposed low permeability barrier and the diversion of Goonbri Creek. The EPA has some concerns about how well the proposed construction method will be able to achieve the proposed design criteria with regard to keying the low permeability barrier into the aquitard that underlies the alluvial aquifer. No contingencies are identified as a means of dealing with any additional groundwater make in the advancing mine pit if the performance of the low permeability barrier fails to meet that predicted by the groundwater modelling. The EA does not appear to incorporate any detail on how the integrity and performance of the barrier will be validated before mining intersects the alluvium in approximately year 12 of the project (e.g. perhaps by pumping/groundwater level recovery tests undertaken from bores constructed within the alluvium inside (i.e. west of) the proposed barrier, or other appropriate means).

The barrier's performance has been predicted on the basis of groundwater modelling incorporating a range of assumptions. This modelling suggests that seepage into the pit from the alluvium will be reduced from 3.3 ML/day to 0.1ML/day, and the mine water balance has been based on the finding s of this modelling. Any pit seepage from the alluvium in excess of 0.1 ML/day after the construction of the barrier is completed, therefore potentially presents a significant issue for the proponent. Any requests to discharge mine water in this eventuality will not be supported.

Recommendation
That an approval condition is applied that requires the proponent to validate the performance of the low permeability barrier before mining is permitted to intersect the alluvium.

### *ISSUE 7 – SITE WATER BALANCE*

The impacts of recent flooding events in the area have brought some assumptions within past water balance modelling efforts into question (e.g. the runoff generated within Leard State Forest). Furthermore, out of date or invalid assumptions in water balance models appear to have contributed to significant water management issues at some mine sites in the area.

Any mine water balance makes a range of assumptions about environmental conditions and operations in and around the mine site. In the course of any project, plans, methods and timeframes change. These changes can render the assumptions made in modelling and water balance calculations at a mine site invalid. As the proponent's ability to effectively manage water from a variety of sources and respond to the impact that any changes to the project might have on the water balance relies heavily on the predictive performance of such tools, it is vital that these are regularly reviewed and updated.

Recommendation
That the Project Approval is conditioned to require regular formal reviews of the mine site water balance, and all the assumptions within the modelling that underpins the water balance calculations. These review processes must assess existing water management infrastructure and methods against relevant best practice requirements and define whether any additional control measures or infrastructure is required at the site to effectively manage water that accumulates at the site in accordance with current regulatory requirements.

## D. BIODIVERSITY

### *ISSUE 8 – OFFSET PROPOSAL*

OEH is disappointed that most of the issues regarding biodiversity raised during the adequacy assessment, including the provision of a management plan for the offset site, have not been addressed.

Despite the provision of some spatial data, OEH has been unable to run a full biometric analysis of the offset proposal.

However, based on the information provided, OEH is generally satisfied with the offset proposal, provided that an adequate management program is undertaken for "Willeroi". The National Parks and Wildlife Service (NPWS) is willing to accept all or part "Willeroi" as an intended addition to Mount Kaputar National Park pending appropriate approvals and provided the following issues are addressed:

***a) Conservation and other management issues:***

- Control of the environmental weed Coolatai Grass
- Control of a number of noxious weeds, in particular Sweet Briar
- Control of erosion along the creek line and associated drainage lines
- Habitat restoration in key areas
- Development of essential management trails to a specified standard of construction
- Boundary fencing
- Provision of a legal access (if required)
- Management of artificial water points (including contours and decommissioning if required)
- Pest control programs
- Provision of management information such as vegetation and Aboriginal cultural heritage surveys.

Management programs and/or works would need to be put in place to improve the condition of the property to an agreed standard that is acceptable to NPWS.

***b) Funding***

NPWS would require funds to be made available covering management of lands transferred to the National Parks estate for the same time period as would be covered by a Biobanking agreement.

If any subdivision of "Willeroi" were required, the proponent would undertake and meet those costs, including the registration of plans necessary to create the area to be transferred to national park estate. The proponent would also need to agree to reimburse the NPWS for reasonable conveyancing costs associated with the land transfer.

***c) Interim conservation arrangement***

The proponent will need to discuss the most appropriate 'interim' conservation mechanism for the period prior to transfer (e.g. a Biobanking Agreement) with OEH and the NPWS.

Recommendation

That the proponent develop a management plan, funding plan and conservation arrangement for "Willeroi" in consultation with, and to the satisfaction of, NPWS. These arrangements must include defined and measurable outcomes and targets and appropriate programs to monitor progress.

## E. ABORIGINAL CULTURAL HERITAGE

### *ISSUE 9 – CULTURAL HERITAGE OFFSET*

Aboriginal stakeholders have raised the possibility of a Cultural Heritage Offset. There is no clear indication in the EA provided on whether the proponent is prepared to consider this and undertake negotiations with the community.

Recommendation

The proponent needs to provide a clear answer in relation to this question and detail how it has dealt with community aspirations

### *ISSUE 10 – CULTURAL SIGNIFICANCE ASSESSMENT*

There is no cultural significance assessment of each site only general statements. The submissions from Aboriginal people strongly raise the matter of the area's significance. In comparison, the archaeological

significance is argued as low for most of the 57 sites recorded. There is a clear conflict between these two positions that needs appropriate examination.

The archaeological criteria used to determine significance could be questioned. If you examine an Aboriginal site using current criteria for assessing significance the result 99% of the time will always be low because the site's contents (artefacts) are consistently common across south east Australia so seeking *rarity, representiveness, education, social* as categories incorrectly contextualises the spatial relationship between the archaeology (visible) and landscape.

Recommendation
The proponent needs to speak with the Registered Aboriginal stakeholders to obtain their view on the Cultural significant of each site as they are the only ones who can determine the cultural significant of sites. This should take the same format as the Archaeological Assessment on page 63.

### *ISSUE 11 – ABORIGINAL CULTURAL HERITAGE MANAGEMENT PLAN*
It is unclear whether a communication strategy will be part of the Aboriginal Cultural Heritage Management Plan.

Recommendation
There needs to be a communication strategy imbedded in the Aboriginal Cultural Heritage Management Plan due to the high number of registered Aboriginal stakeholders (this may already be part of the plan but this is not clear).

### *ISSUE 12 – CUMULATIVE IMPACTS*
The treatment of cumulative impact is superficial. The issue of accumulated impacts is of considerable concern given the number of mines being developed in the area .The report considers the cumulative impact of mine sites to be low because the area is located in an agricultural landscape. However it fails to consider the differences between the impacts associated with each of these difference land uses and the much greater potential impacts associated with mining.

Recommendation
The issue of cumulative impact and how it is dealt with should be addressed in more detail.

### *ISSUE 13 – REGISTRATION OF IDENTIFIED SITES IN AHIMS*
Site cards have still not been submitted to OEH's Aboriginal Heritage Information Management System (AHIMS) Unit. A check of the AHIMS show that these Site cards have not yet been entered into AHIMS even though the Aboriginal Cultural Heritage survey was completed in March 2011.

Recommendation
Site cards need to be forwarded to the AHIMS unit ASAP so that can be entered into AHIMS.

## F. FINAL LANDFORM

### *ISSUE 14 – FINAL VOID*
The EPA notes that the recent NSW Planning Assessment Commission Review Report (February 2012) for the adjacent Boggabri Coal Project, makes it clear that "*...the long term landform must not generate a pit (void) lake.*" The EPA does not support the generation of final water filled mine voids and believes that better environmental outcomes can be achieved by programming mining to avoid final voids that interact with groundwater.

Recommendation
That the project is conditioned to require the proponent to develop a final mine landform and closure plan that addresses the future stability of the proposed final landform, long term groundwater recovery and quality and avoids the generation of a pit (void) lake.

## ATTACHMENT 2 – RECOMMENDED CONDITIONS OF APPROVAL

### *AIR*

### 1. BEST MANAGEMENT PRACTICE DETERMINATION

Prior to construction, the Proponent must undertake a site-specific Best Management Practice (BMP) determination to identify the most practical, technically and economically feasible measures to minimise particulate emissions due to operations at Tarrawonga Coal Mine.

1.1. The Proponent must prepare a Coal Mine Particulate Matter Control Best Practice Assessment Report in consultation with the Department of Planning and Infrastructure, the Environmental Protection Agency, and the Office of Environment and Heritage which should include, but not necessarily be limited to, the following:

- identification, quantification and justification of best practice measures that could be used to minimise particle emissions during various stages of the Tarrawonga Coal Mine Plan; and,
- evaluation of the practicability of implementing these best practice measures.

1.2. The assessment must be guided by the document Guideline for Site-Specific Best Management Practice (BMP) Determination for Coal Mine Particulate Matter Control, included in TAB 1.

### 2. AMBIENT MONITORING FOR MANAGING PROJECT-SPECIFIC IMPACTS

Prior to construction the Proponent must undertake an assessment of Reactive Particulate Management Strategies for the Tarrawonga Coal Mine site and implement all practical measures for the purpose of real-time management of site-specific particulate emissions.

2.1. The assessment must be in accordance with conditions outlined in TAB 2.

2.2. Project-specific ambient monitoring site(s) should be identified and established with reference to the mine development plan and the outcomes of a project-specific Best Management Practice assessment. One such site must be to the east of the project boundary.

### 3. AMBIENT MONITORING FOR MANAGING CUMULATIVE IMPACTS

Prior to construction, the Proponent must develop a Cumulative Air Quality Management Protocol in cooperation with neighbouring mines (Boggabri Coal Mine and Maules Creek Coal Mine), and members of the local community for the purpose of real-time management of cumulative particulate impacts.

3.1. The assessment must be in accordance with conditions outlined in TAB 3.

3.2. Monitoring sites must be established for receivers in common between TCM and Boggabri Coal Mine, distributed in close proximity to and along the western to southern boundary of the TCM project. The Cumulative Air Quality Management Protocol must prioritise ambient air and meteorological monitoring in these sectors.

### *NOISE*

### 4. LIMIT CONDITIONS

4.1. Noise generated at the premises must not exceed the noise limits in the table below. The locations referred to in the table below are indicated by Figure 4-1 in Noise and Blasting

Assessment contained within the Environmental Assessment for the Tarrawonga Coal Project, Resource Strategies, (undated).

| Locality | NOISE LIMITS dB(A) | | | |
|---|---|---|---|---|
| | Day | Evening | Night | |
| | $L_{Aeq\ (15\ minute)}$ | $L_{Aeq\ (15\ minute)}$ | $L_{Aeq\ (15\ minute)}$ | $L_{A1\ (1\ minute)}$ |
| All residential receivers | 35 | 35 | 35 | 45 |

4.2. For the purpose of condition 4.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

4.3. To determine compliance:

a) with the $L_{Aeq(15\ minute)}$ noise limits in condition 4.1, the noise measurement equipment must be located:

- approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
- within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
- within approximately 50 metres of the boundary of a National Park or a Nature Reserve.

b) with the $L_{A1(1\ minute)}$ noise limits in condition 4.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) with the noise limits in condition 4.1, the noise measurement equipment must be located:

- at the most affected point at a location where there is no dwelling at the location; or
- at the most affected point within an area at a location prescribed by conditions 4.5(a) or 4.5(b).

4.4. A non-compliance of condition 4.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

- at a location other than an area prescribed by conditions 4.5(a) and 4.5(b); and/or
- at a point other than the most affected point at a location.

4.5. The noise limits set out in condition 4.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or

b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
c) Stability category G temperature inversion conditions.

4.6. For the purposes of condition 4.5:

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

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

## 5. ADDITIONAL NOISE MITIGATION MEASURES

5.1. Upon receiving a written request from the owner of any residence:

(a) on the land listed in Table A [table to list relevant non project related receptors where impacts exceed 35 dB(A) but are less than the acquisition criteria e.g. 44a "Kyalla"]; or

(b) on privately-owned land where subsequent noise monitoring shows that the noise generated by the project is greater than or equal to $L_{Aeq\ (15\ minute)}$ 38 dB(A), on a sustained basis,

The Applicant shall implement additional noise mitigation measures (such as double glazing, insulation, and/or air conditioning) at the residence in consultation with the owner. These measures must be reasonable and feasible.

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

## 6. ROAD TRAFFIC NOISE CRITERIA

6.1. Except for the land referred to in Table A [the same table referred to in condition 5.1(a) above] the Applicant shall ensure that the noise generated by the development on public roads does not exceed the criteria in Table B.

*Table B: Road Traffic Noise Criteria dB(A) LAeq (1 hour)*

| ***Location*** | ***Day*** | ***Evening*** | ***Night*** |
|---|---|---|---|
| *Any residence on privately-owned land* | *60* | *60* | *55* |

*Note: Road traffic noise generated on public roads by the development is to be measured in accordance with the relevant procedures and exemptions of the NSW Road Noise Policy.*

## 7. BLASTING

7.1. The overpressure level from blasting operations at the premises must not exceed 120dB (Lin Peak) at any time and at any point within 30 metres of any non project related residential building or other noise sensitive location. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

7.2. The overpressure level from blasting operations at the premises must not exceed 115dB (Lin Peak) for more than five per cent of the total number of blasts over each reporting period at any time and at any point within 30 metres of any non-project related residential

building or other noise sensitive location. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

7.3. Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 10mm/sec at any time and at any point within 3.5 metres of any non project related residential building or other noise sensitive location. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

7.4. Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 5mm/sec for more than five per cent of the total number of blasts over each reporting period at any point within 3.5 metres of any non project related residential building or other noise sensitive location. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

7.5. Blasting operations on the premises must only be carried out between the hours 9am to 5pm, Monday to Saturday, inclusive.

7.6. The hours of operation for blasting operations specified in condition 7.5 may be varied if the EPA, having regard to the effect that the proposed variation would have on the amenity of the residents in the locality, gives written consent to the variation.

7.7. Blasting at the premises is limited to 1 blast on each day on which blasting is permitted.

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

## TAB 1 SITE-SPECIFIC BEST MANAGEMENT PRACTICE (BMP) ASSSESSMENT

Guideline for Site-Specific Best Management Practice (BMP) determination for Coal Mine Particulate Matter Control

### PURPOSE OF THIS GUIDELINE

The purpose of this guideline is to provide details of the process to be followed in conducting a site-specific determination of best practice measures to reduce emissions of particulate matter from coal mining activities. This guideline also provides the required content and format of the Coal Mine Particulate Matter Control Best Practice – Assessment and Report (the Report).

### THE SITE-SPECIFIC DETERMINATION PROCESS

The following steps must be followed, as a minimum:

**1. Identify, quantify and justify best practice measures that could be used to minimise particle emissions for each stage of the Mine Plan**

1.1 Estimate baseline emissions of TSP, $PM_{10}$ and $PM_{2.5}$ (tonne per year) from each mining activity. This estimate must:

- utilise USEPA AP42 emission estimation techniques; and,
- calculate uncontrolled emissions (with no particulate matter controls in place).

(Note: these particulate matter controls must be clearly identified, quantified and justified with supporting information).

1.2 Using the results of the uncontrolled emissions estimates generated from Step 1.1, rank the mining activities from highest to lowest according to the mass of TSP, $PM_{10}$ and $PM_{2.5}$ expected to be emitted by each mining activity per year.

1.3 Identify the most significant mining activities (e.g. cumulative 95$^{th}$ percentile) from Step 1.2 that would contribute the highest emissions of TSP, $PM_{10}$ and $PM_{2.5}$ for each year.

1.4 For each of the most significant mining activities identified in Step 1.3 (e.g. cumulative 95$^{th}$ percentile), identify the best practice measures that could be implemented to reduce emissions taking into consideration:

- the findings of Katestone (2010), *NSW Coal Mining Benchmarking Study - International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining,* Katestone Environmental Pty Ltd, Terrace 5, 249 Coronation Drive, PO Box 2217, Milton 4064, Queensland, Australia. http://www.environment.nsw.gov.au/resources/air/KE1006953coalminebmpreport.pdf;
- any other relevant published information; and,
- any relevant industry experience from either Australia or overseas.

1.5 For each of the significant mining activities identified in Step 1.3 (e.g. cumulative 95$^{th}$ percentile), estimate emissions of TSP, $PM_{10}$ and $PM_{2.5}$ from each mining activity following the application of the best practice measures identified in Step 1.4.

1.6 This analysis must include each stage of the Mine Plan.

**2. Evaluate the practicability of implementing these best practice measures**

2.1 For each of the best practice measures identified in Step 1.4, assess the practicability associated with their implementation, by taking into consideration:

- implementation costs;
- regulatory requirements;
- environmental impacts;
- safety implications; and

- compatibility with current processes (if applicable) and proposed future developments.

2.2 Identify those best practice measures that will be implemented at the premises to reduce particle emissions for each stage of the Mine Plan.

## REPORT CONTENT

The report must clearly identify the methodologies utilised and all assumptions made.
The report must contain detailed information justifying and supporting all of the information used in each step of the process.

In evaluating practicability of best practice measures in Step 2, the Proponent must document the following specific information:

- Estimated capital, labour, materials and other costs for each best practice measure on an annual basis for every year in each stage of the Mine Plan. This information must be set out in the format provided in Appendix A;
- Quantification of any new environmental impacts that may arise from the application of a particular best practice measure, such as increased noise or fresh water use;
- The details of safety impacts that may result from the application of a particular best practice measure; and,
- The details of any incompatibility with current operational practices at the premises (if applicable); and or details of any incompatibility with future development proposals at the premises.

## REPORT FORMAT

The report must be structured according to the process outlined above and submitted in both electronic format as .PDF format and hard copy format in triplicate. All emission estimates, costs and supporting calculations must be submitted in electronic format as .XLS format.

## ABBREVIATIONS AND DEFINITIONS

***USEPA AP42 Emission Estimation Techniques*** – all of the following:

USEPA (1995), AP 42, Fifth Edition, *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources,* Technology Transfer Network - Clearinghouse for Inventories & Emissions Factors, United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711, USA. http://www.epa.gov/ttn/chief/ap42/index.html;

USEPA (1998), AP 42, Chapter 11.9 *Western Surface Coal Mining*, Technology Transfer Network - Clearinghouse for Inventories & Emissions Factors, United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711, USA. http://www.epa.gov/ttn/chief/ap42/ch11/final/c11s09.pdf;

USEPA (2006), AP 42, Chapter 13.2.2 *Unpaved Roads*, Technology Transfer Network - Clearinghouse for Inventories & Emissions Factors, United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711, USA. http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf;

USEPA (2006), AP 42, Chapter 13.2.4 *Aggregate Handling and Storage Piles*, Technology Transfer Network - Clearinghouse for Inventories & Emissions Factors, United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711, USA. http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0204.pdf; and,

USEPA (2006), AP 42, Chapter 13.2.5 *Industrial Wind Erosion*, Technology Transfer Network - Clearinghouse for Inventories & Emissions Factors, United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711, USA. http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0205.pdf.

**$PM_{10}$** – Particulate matter of 10 micrometres or less in diameter

**$PM_{2.5}$** – Particulate matter of 2.5 micrometres or less in diameter

**Mining Activities** – means:

- Wheel generated particulates on unpaved roads
- Wind erosion of overburden
- Blasting
- Bulldozing Coal
- Trucks unloading overburden
- Bulldozing overburden
- Front-end loaders on overburden
- Wind erosion of exposed areas
- Wind erosion of coal stockpiles
- Unloading from coal stockpiles
- Dragline
- Front-end loaders on overburden
- Trucks unloading coal
- Loading coal stockpiles
- Graders
- Drilling
- Coal crushing
- Material transfer of coal
- Scrapers on overburden
- Train loading
- Screening; or
- Material transfer of overburden

**TSP** - Total Suspended Particulate Matter

***Appendix A: Presentation of Information on Cost of Implementation***

The report should provide spreadsheets including estimates of the annual capital, labour and materials costs for each year over a ten year period for implementing each best practice measure identified in Step 2.

A template is given below for one best practice measure.

| **Mining Activity:** | **Example: Wheel-generated particulates on unpaved roads** | | | | | | |
|---|---|---|---|---|---|---|---|
| **Specific Best practice measure:** | **Example: Procurement of large trucks/vehicles** | | | | | | |
| **Year** | Yr1 | Yr2 | Yr3 | Yr4 | Yr5 | .... | **Total** |
| Cost of **specific** capital items (e.g. new vehicle)* | | | | | | | |
| **Total capital costs** | | | | | | | |
| Labour costs including directly related on-costs | | | | | | | |
| Cost of specific materials and other items (e.g. fuel)* | | | | | | | |
| **Total material and other costs** | | | | | | | |
| **Estimated additional cost per tonne of particulate matter suppressed for TSP, $PM_{10}$ and $PM_{2.5}$*** | | | | | | | |
| Cost savings from implementing each best practice measure* | | | | | | | |
| **Estimated** net **cost per tonne of particulate matter suppressed for TSP, $PM_{10}$ and $PM_{2.5}$*** | | | | | | | |

* each item must be specified – one item per row in spreadsheet.

## TAB 2 REACTIVE PARTICULATE MANAGEMENT STRATEGIES

**1** The *Reactive Particulate Management Strategies* is to be developed for the purpose of real-time management of short-term ambient particulate concentrations resulting from the Tarrawonga Coal Mine operations, at residences in the immediate and wider local community. To enable the effective reactive management of particulate emissions from facility-wide operations, the *Strategy* should incorporate the following elements:

**1.1** As outlined in condition 3.1, nominate and establish ambient particulate monitoring sites for management and compliance purposes.

**1.2** As outlined in condition 3.2, use weather data (e.g. wind speed and direction) from an on-site meteorological station to assist in selecting and implementing the most technically and economically feasible particulate mitigation strategies (as identified by the BMP determination).

**1.3** As outlined in condition 3.3, identify specific mitigation measures for the effective reactive management of significant particulate-generating activities at the Project site in response to inputs such as wind speed and direction and trigger particulate concentration levels, including, but not limited to, cessation of activities under adverse conditions.

**2** The *Reactive Particulate Management Strategies* must aim to monitor local meteorology and particulate impacts of the mining operations within/at the project boundary and at receiver locations, by incorporating the following as a minimum:

### 2.1 Real-time ambient monitoring of particulates

#### 2.1.1 Establish reliable ambient particulate monitoring program as follows:

- Nominate and establish a network of real-time particulate monitoring sites within and beyond the Project boundary for the purpose of gauging project activity emissions on short time-scales (i.e., less than 1-hour). These monitoring sites shall be referred to as "management monitoring" sites and monitoring data used for informing day-to-day reactive management measures. The management monitors should be fit-for-purpose but need not comply with AM-22.

- Nominate and establish a suitable number of ambient $PM_{10}$ monitoring sites at relevant locations for the purpose of determining compliance with the OEH 24-hr average concentration criterion (50 $\mu g/m^3$). These shall be referred to as "compliance-monitoring sites". The compliance-monitoring program must be maintained so as to be capable of continuously monitoring the parameters specified in the following table.

| Parameter | Units of measure | Frequency | Averaging Period | Sampling Method |
|---|---|---|---|---|
| $PM_{10}$ | $\mu g/m^3$ | Continuous | 24-hour | AM-22 |
| Additional requirements | | | | |
| - Siting | | | | AM-1 & AM-4 |
| - Measurement | | | | AM-2 & AM-4 |

#### 2.1.2 *Establish trigger levels for reactive management of on-site emissions*

The particulate monitoring program should be designed to:

- Identify short-term (i.e., less than 1-hour) particulate concentration trigger level(s) at "management monitoring sites" consistent with achieving 24-hr averages of 50 $\mu g/m^3$ at "compliance-monitoring" site(s).

- Alert the mine manager when particulate levels exceed the nominated trigger level(s).

## 2.2 Real-time meteorological monitoring

### 2.2.1 *Establish a reliable meteorological monitoring station*

A real-time meteorological weather station must be established and maintained on-site so as to be capable of continuously monitoring the parameters specified in the following table.

| Parameter | Units of measure | Frequency | Averaging Period | Sampling Method |
|---|---|---|---|---|
| Rainfall | mm | Continuous | 1 hour | AM-4 |
| Wind speed @ 10 metres | m/s | Continuous | 15 minute | AM-2 & AM-4 |
| Wind direction @ 10 metres | ° | Continuous | 15 minute | AM-2 & AM-4 |
| Temperature @ 2 metres | °C | Continuous | 15 minute | AM-4 |
| Temperature @ 10 metres | °C | Continuous | 15 minute | AM-4 |
| Sigma theta @ 10 metres | ° | Continuous | 15 minute | AM-2 & AM-4 |
| Solar radiation | W/m2 | Continuous | 15 minute | AM-4 |
| Additional requirements<br>- Siting<br>- Measurement | | | | <br>AM-1 & AM-4<br>AM-2 & AM-4 |

### 2.2.2 *Establish trigger levels for reactive management of on-site emissions*

- Identify meteorological parameters, such as wind speed categories and wind direction (at specified averaging periods) that would form the trigger(s) for the operational management of specific particulate-generating mining activities.
- Alert the mine manager when the nominated trigger(s) are tipped.

## 2.3 Identify management strategies

Options to be adopted in response to meteorological and ambient particulate concentration triggers, for the reactive management of specific particulate-generating activities should be outlined, including the following as a minimum:

- All specific activities that are particulate-generating must be identified.
- Avoid high particulate-generating activities during adverse wind conditions, such as when winds are blowing directly towards the nearest sensitive receptors.
- Cease or reduce excavator and dozer operations when prevailing winds are in the direction of sensitive receptors.
- The mine manager must be provided with weather updates consistent with alerting to sudden onset of strong winds to enable timely application of water sprays necessary to reduce the potential for wind erosion.

**3** The *Reactive Particulate Management Strategies* must incorporate reporting provisions for the local community. A *Complaints Register* for the Project must be established and any complaints regarding the mining operations must be recorded. All complaints must be correlated with prevailing weather conditions and operational activities undertaken at the time of reporting. The *Complaints Register* must be available to external auditors upon request.

**4** Annual reviews of the effectiveness of the *Reactive Particulate Management Strategies* must be undertaken upon implementation (i.e. every 12 months). In accordance with the findings of the annual review, management practices implemented for controlling emissions from significant particulate-generating activities must be revised and the documentation updated. The outcome of the annual review must be included in the Maules Creek Mine's Annual Environmental Management Report (AEMR), and details made available to the OEH.

**5** The monitoring and air quality management program established through the *Reactive Particulate Management Strategies* should be incorporated into the *Cumulative Air Quality Management Protocol*.

## TAB 3 CUMULATIVE AIR QUALITY MANAGEMENT PROTOCOL

1 The Protocol must be developed with the objective of real-time management of cumulative impacts of all mining operations in the Gunnedah Coal Basin region, consistent with achieving 24-hr average $PM_{10}$ concentration of 50 $\mu g/m^3$ at receivers located within the Tarrawonga community and also the regional community impacted by other mines (Maules Creek and Boggabri).

2 The Protocol should enable the co-operative development, implementation and maintenance of a holistic regional network capable of providing:

- real-time ambient air quality monitoring; and,
- real-time meteorological monitoring.

3 The Protocol should incorporate predictive air quality modelling capability for the reactive management of particulate emissions from active mining in the region. A meteorological and air quality forecasting system must be developed to predict, one day in advance, what the meteorological conditions and air quality impact would be, to enable the control of intensity of activities for that day.

4 The Protocol must also incorporate all site-specific measures identified through the BMP determination (TAB 3) and the *Reactive Particulate Management Strategies* (TAB 4), and identify specific monitoring locations for management and compliance-monitoring purposes.

5 The Proponent must document the *Cumulative Air Quality Management Protocol* to include, but not limited to:

- an evaluation of the practicability of implementing the *Cumulative Air Quality Management Protocol*; and,

- the strategy for long-term management or maintenance of the holistic network.