



DOC16/552871-01; EF13/3519

Department of Planning and Environment  
GPO Box 39  
SYDNEY NSW 2001

Attention: Mr Thomas Watt

Dear Mr Watt

**RIX'S CREEK COAL MINE EXTENSION PROJECT (SSD 6300)  
RESPONSE TO SUBMISSIONS REPORT**

I refer to your email to the Environment Protection Authority (EPA) dated 31 October 2016, seeking comments on the Response to Submissions (RTS) report titled *"Rixs Creek Mine – Continuation of mining project Environmental Impact Statement Response to Submissions"*, prepared by AECOM and dated 20 October 2016, in relation to the Rix's Creek Coal Mine Extension Project, SSD 6300.

On 10 December 2015 the EPA provided our review submission of the Environmental Impact Statement for this project. Recommended conditions of approval were provided in that submission, however there was also a number of issues identified in relation to the air quality impact assessment undertaken for the proposal.

The EPA has reviewed the RTS and advises the Department of Planning and Environment (DPE) that the proposal is assessed as impacting non-mine owned property. These are summarised in Attachment A. Further, the extent of this impact is not presented in the assessment reports as not all the residences potentially experiencing additional days exceeding the 24-hour PM<sub>10</sub> cumulative impact assessment criterion are listed. As the assessment shows exceedances of impact assessment criteria, the proponent should evaluate the feasibility of additional mitigation measures to eliminate predicted exceedances and to minimise impacts. EPA also recommends that while diesel emissions and controls have not been comprehensively assessed, this can be addressed from further information obtained post-approval should approval be granted.

Further assessment of the RTS is provided in Attachment A. If you require any further information regarding this matter please contact Michael Howat on 4908 6819 or by email to [hunter.region@epa.nsw.gov.au](mailto:hunter.region@epa.nsw.gov.au)

Yours sincerely

*Natasha Ryan 15.11.16*

**NATASHA RYAN**  
**A/Head Regional Operations Unit - Hunter**  
**Environment Protection Authority**

**ATTACHMENT A:****Environment Protection Authority's Air Quality Assessment Review RTS**

The Environment Protection Authority (EPA) has undertaken a review of the Response to Submissions (RTS) report titled "*Rixs Creek Mine – Continuation of mining project Environmental Impact Statement Response to Submissions*", dated 20 October 2016, in relation to the Rix's Creek Coal Mine Extension Project, SSD 6300. The EPA has also reviewed the documents titled "*Air quality and greenhouse gas assessment, Rix's Creek continuation of mining project*" by Todoroski dated 26 August 2015 (Todoroski 2015) and the Environmental Impact Statement dated 26 October 2015. The EPA provides the following comments in relation to air quality matters.

**Estimated Impacts from the proposal**

The assessment predicts exceedances of the air quality impact assessment criteria at non-mine receptors as summarised in the table below, taken from Todoroski 2015.

Impacts greater than criteria – non-mine receptors

| Receptor ID | 24-hr              |                         |      |      |      | Annual                                     |  |                                |                                  |
|-------------|--------------------|-------------------------|------|------|------|--|--|--------------------------------|----------------------------------|
|             | PM <sub>10</sub>   |                         |      |      |      | PM <sub>10</sub>                           | PM <sub>2.5</sub>                        | TSP                            | dust deposition                  |
|             | 50                 | cumulative # extra days |      |      |      | 30   | 8  | 90                             | 4                                |
| critereon   | year max           | 2017                    | 2020 | 2023 | 2026 | year max                                   | year max                                 | year max                       | year max                         |
| 1           | 2020 71<br>2023 77 | 2                       | 21   | 32   | 4    | 2020 34<br>2023 36                         |  |                                |                                  |
| 19          |                    | 1                       | 1    | 3    | 1    |  |  |                                |                                  |
| 61          |                    | 2                       | 5    | 5    | 4    |  |  |                                |                                  |
| 140         |                    | 3                       | 2    | 4    | 1    |  |  |                                |                                  |
| 151         |                    | 1                       | 1    | 2    | 1    |  |  |                                |                                  |
| 163         |                    | 3                       | 3    | 1    |      |  |  |                                |                                  |
| 164         |                    | 1                       | 1    | 1    | 1    |  |  |                                |                                  |
| 170         |                    |                         |      |      |      | 2017 79<br>2020 100<br>2023 103<br>2026 99 | 2017 14<br>2020 16<br>2023 17<br>2026 16 |                                | 2020 5.3<br>2023 5.4<br>2026 5.3 |
| 171         |                    |                         |      |      |      | 2023 36                                    |  |                                |                                  |
| 172         |                    |                         |      |      |      | 2017 41<br>2020 47<br>2023 46<br>2026 43   | 2017 9<br>2020 10<br>2023 10<br>2026 9   | 2020 101<br>2023 99<br>2026 95 |                                  |
| 173         |                    |                         |      |      |      | 2017 43<br>2020 39<br>2023 39<br>2026 34   | 2017 9<br>2020 9<br>2023 9               | 2017 92                        |                                  |
| 174         |                    |                         |      |      |      | 2017 37<br>2020 37<br>2023 36<br>2026 33   | 2017 9<br>2020 9                         |                                |                                  |
| 175         |                    |                         |      |      |      | 2017 36<br>2020 36<br>2023 36<br>2026 39   |  |                                |                                  |
| 176         |                    |                         |      |      |      | 2017 38<br>2020 39<br>2023 38<br>2026 36   | 2017 9<br>2020 9<br>2023 9               |                                |                                  |

|             | 24-hr            |                         |      |      |      | Annual           |                   |          |                 |
|-------------|------------------|-------------------------|------|------|------|------------------|-------------------|----------|-----------------|
| Receptor ID | PM <sub>10</sub> |                         |      |      |      | PM <sub>10</sub> | PM <sub>2.5</sub> | TSP      | dust deposition |
| criterion   | 50               | cumulative # extra days |      |      |      | 30               | 8                 | 90       | 4               |
|             | year max         | 2017                    | 2020 | 2023 | 2026 | year max         | year max          | year max | year max        |
| 177         |                  |                         |      |      |      | 2017 80          | 2017 14           | 2017 185 |                 |
|             |                  |                         |      |      |      | 2020 43          | 2020 9            | 2020 99  |                 |
|             |                  |                         |      |      |      | 2023 43          | 2023 9            | 2023 99  |                 |
|             |                  |                         |      |      |      | 2026 42          | 2026 9            | 2026 98  |                 |

Impacts above criteria were found for 15 receptors not owned by the mine. Nine of these are assessed as having project only impacts greater than air quality impact assessment criteria. The other six are assessed to experience additional exceedances of the 24-hour criterion for PM<sub>10</sub> on a cumulative basis. Receptor 1 is assessed as exceeding impact assessment criteria from both project-only emissions, and on a cumulative basis when the project-only contribution is less than the criterion.

The Executive Summary states that all nine receptors assessed to have project only impacts greater than impact assessment criteria qualify for acquisition. One has an existing negotiated agreement with the project, while the other eight are included in the acquisition zone of other existing approved projects.

There is no comment regarding the six receptors assessed as experiencing additional exceedances on a cumulative basis but not exceeding due to project-only emissions.

### Diesel Engine Emissions

The EPA requested additional information on the estimation of emissions from diesel powered equipment used by the proposal. Todoroski 2015 estimated diesel exhaust as a component of emissions from haul roads. Emissions estimates from haul roads have an 85% control factor (reduction) representing management options including watering. The EPA requested explicit estimation of emissions from the use of diesel as the control factor does not apply to diesel exhaust.

In response the RTS provides specific estimates of emissions from diesel engines used for haul trucks by applying the emission factors set out in the US EPA Federal Tier II standards to the haul road vehicles listed in table D-3 of Appendix D of the RTS air quality assessment, and using the load factor and average operational hours in the NSW Emissions Inventory. This estimates haul road vehicle exhaust (year 2023) to be 18,108 kg/year total PM emissions.

The RTS then calculates the emissions removed by application of the control factor in Todoroski 2015 and finds that removing this control increases haul road diesel emissions by 15,392 kg/yr ( $0.85 \times 18,108$ ). This represents 0.5% of the TSP emissions, 1.3% of PM<sub>10</sub> emissions, and 11.1% of PM<sub>2.5</sub> emissions. The RTS states that this is a small change to the estimated PM<sub>10</sub> emissions, within the uncertainty of the modelling, and therefore unlikely to change the estimated impacts.

The EPA advise DPE that the change to estimated emissions of PM<sub>2.5</sub> is considerably greater than that of PM<sub>10</sub> but has not been discussed. Additionally that:

- The RTS has estimated emissions from diesel engines used on haul roads. This is only a part of the diesel engines that will be used for the proposal. Estimation of emissions from the use of diesel engines is incomplete as it does not include equipment such as loaders and dozers; and
- The gap in estimated emissions can be resolved by further information obtained should the proposal be approved. This includes information on:
  - baseline diesel emissions based on as sold original engine manufacturer configuration;

- in-service diesel emissions based on in-service operating configuration, incorporating the impact of any fuel efficiency or emission reduction measures or other engine modifications or changes implemented relative to the baseline engine condition; and
- best practice emission controls, considering all reasonable and feasible control and management strategies.

As a minimum, estimation and evaluation of diesel emissions should have regard for factors such as mine design and staging; activity rates; fuel consumption; engine type, capacity and load; and emissions performance.

### **Impacts of proposal included in section 16 and Executive Summary**

The Executive Summary and section 16 of the EIS summarised information provided by Todoroski 2015. There was a potential contradiction between the two documents in that it is not clear that data tabulated in Appendix F of Todoroski 2015 represented maximum values as stated in the EIS. The EPA advise that the RTS has clarified that the annotation *'There are no days in the year assessed that have higher total levels than those shown in the tables'* applies to tabulated PM<sub>10</sub> concentrations.

### **Impacts at Maison Dieu, Country Acres Caravan Park, Maitland Diesel Service**

The EPA requested estimation of impacts at the locality known is Maison Dieu, at Country Acres Caravan Park, and at Maitland Diesel Service. The RTS notes that receptors closer to the mine than Maison Dieu have been assessed and provide a conservative estimate of impacts for these receptors. The RTS states that Maitland Diesel Service is receptor M20. It services and maintains equipment from the mine and is therefore considered to be part of mine operation. Assessment of cumulative impacts at Country Acres Caravan Park (receptor 45) shows additional days above the PM<sub>10</sub> impact assessment criterion in 2020 (1 day), 2023 (4 days) and 2026 (3 days).

The EPA agrees that a conservative estimate of impacts is available for residences at Maison Dieu (receptors 149, 150, 165, 167, 168, and 169) from receptors 151 and 164. Both these sites are assessed as experiencing additional days exceeding the 24-hour PM<sub>10</sub> assessment criterion concentration of 50 µg/m<sup>3</sup> on a cumulative basis. It is therefore possible for these other receptors to also experience impacts greater than the EPA's impact assessment criteria.

Similarly, the RTS provides a cumulative assessment for receptor 45 (table 6) which shows additional days exceeding the 24-hour PM<sub>10</sub> cumulative impact assessment criterion. Receptor 45 is in McDougalls Hill where at least eight other receptors are closer to the mine. It is likely that these eight receptors will also experience impacts greater than the EPA's impact assessment criteria. It is possible that other receptors in McDougalls Hill and Gowrie will experience impacts greater than the EPA's 24-hour PM<sub>10</sub> cumulative impact assessment criteria.

The EPA believe that cumulative assessment documentation is incomplete. Not all the receptors assessed as experiencing additional days exceeding the 24-hour PM<sub>10</sub> cumulative impact assessment criterion are identified in the assessment documents.

### **Estimation of emissions from all bare ground**

The EPA requested clarification on the method for estimating emissions due to wind erosion from exposed surfaces. The RTS provided further information on the method used to assess dust emission from exposed surfaces. The clarification compared the approach used with an alternative approach showing how they resulted in similar estimates of total emissions.

Todoroski 2015 estimated dust emissions from exposed areas using an emission factor of 0.4 kg/(ha·hour). This emission rate is applied to the active exposed area. The active exposed area was estimated based on the results of the pollution reduction program for Rix's Creek<sup>1</sup> and includes overburden emplacement and active open pits. Todoroski 2015 rely on the results of the pollution reduction program study to estimate total erosion for the proposal using this approach to estimating emissions from active areas.

<sup>1</sup> "Coal Mine Particulate Matter Control best Practice Final Licence Variation Notice – Exposed Area Assessment", Rix's Creek Mine, August 2015

The RTS notes that Katestone suggest an emission factor of  $0.1 \text{ kg}/(\text{ha} \cdot \text{hour})^2$ . This approach has been used in other assessments, and when used was applied to all bare ground rather than being restricted to actively worked areas.

The EPA advise DPE that the pollution reduction program study used a semi-quantitative method for estimating dust emission potential from a number of areas of the mine including active overburden, inactive crusted overburden, aerial seeded overburden, rehabilitated areas, and topsoil. From these measurements the study estimated that crusting provided an 80% reduction in emissions, aerial seeding an 85% reduction, and rehabilitation a 95% reduction in emissions.

The report used these results to compare estimates of total annual particle emissions from wind erosion using three methods: the 1994 environmental impact statement; the method used by Todoroski 2015; and detailed estimates totalling all disturbed areas using the derived emission control factors and area utilisation as at 31<sup>st</sup> December 2014.

The comparison showed that the method used by Todoroski 2015 was moderately conservative, estimating total emissions from the mine to be approximately 230 tonnes compared to 165 tonnes for the detailed estimate and as such the EPA acknowledge that the issue has been clarified.

#### **Information on derivation of the emission rate of nitrogen dioxide from blasting**

The EPA requested clarification on the derivation of emissions of nitrogen dioxide from blasting. The origin of the value used was not apparent. The RTS clarified that the value used was the maximum value listed by the CSIRO in their study of Hunter Valley blasts<sup>3</sup>. This was chosen because the study found no correlation between the amount of explosive used and the resulting production of nitrogen dioxide.

Environment Protection Authority  
15 November 2016

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<sup>2</sup> "NSW Coal Mine Benchmarking Study: International Best Practise Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining", Katestone 2011

<sup>3</sup> "NO<sub>x</sub> emissions from blasting operations in open-cut coal mining", *Atmospheric Environment*, 2008  
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