Your reference :
Our reference : SF17/46118;
Contact : Ms Sheridan Ledger; (02) 6332 7608

Mr Paul Freeman
NSW Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

11 December 2017

Dear Mr Freeman

MOOLARBEN COAL COMPLEX – OPEN CUT OPTIMISATION MODIFICATION

I refer to your email of 6 November 2017 requesting the Environment Protection Authority (EPA) provide comment on the publicly exhibited Environmental Assessment (EA) for the proposed Moolarben Coal Complex Open Cut Optimisation Modification (the Proposal).

As requested, the EPA has considered the EA for the Proposal in terms of the potential impact to air quality, noise emissions, surface water and waste management. The EPA's response is contained in Attachment A.

The EPA recommends the Department of Planning and Environment (DPE) seek further information and clarification in respect of the matters raised in Attachment A prior to finalising its assessment of the potential impacts of the Proposal.

Should you have any further enquiries in relation to this matter please contact me at the Central West (Bathurst) Office of the EPA by telephoning (02) 6332 7602.

Yours sincerely

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MOOLARBEN COAL COMPLEX – OPEN CUT OPTIMISATION MODIFICATION EPA COMMENT

The EPA understands that the modification proposes an increase in run-of-mine (ROM) coal production from the Stage 1 and Stage 2 open cuts (OC1 to OC4) which will involve installation of water treatment facilities and associated water storages adjacent to the existing rail loop area to provide water for on-site use and support the controlled release of water under Environment Protection Licence (EPL) release conditions. There is also proposed construction of pipelines from the water treatment facilities to a relocated EPL discharge point at the confluence of Bora Creek and the Goulburn River Diversion.

AIR

Background

In providing comment regarding the Air Quality impacts of the proposal, the EPA has reviewed the following documents:

1. *'Moolarben Coal Complex Open Cut Optimisation Modification Environmental Assessment'*, Moolarben Coal, November 2017 (Moolarben 2017);
2. *'Air Quality Assessment Moolarben Coal Project OC Optimisation Modification'*, Todoroski Air Sciences, 25th October 2017, Appendix B to Moolarben (2017), (TAS 2017); and
3. *'Air Quality Management Plan'*, Moolarben Coal 03 August 2015 (Moolarben 2015).

The following also refers to:

1. *'Wilpinjong Extension Project – Response to Submissions'*, Peabody Energy, May 2016 (Peabody 2016);
2. *'Moolarben Coal Project Stage 1 Optimisation Modification Air Quality and Greenhouse Gas Assessment'*, Todoroski Air Sciences, 7th May 2013, (TAS 2013);
3. *'Approved Methods of the Modelling and Assessment of Air Pollutants in NSW (2017)'* (*Approved Methods Modelling*) available at http://www.epa.nsw.gov.au/resources/epa/approved-methods-for-modelling-and-assessment-of-air-pollutants-in-NSW-160666.pdf ;
4. *'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, 2010, (Katestone 2010);
5. *'Emission Estimation Technique Manual for Mining Version 3.1'*, National Pollutant Inventory, January 2012, (NPI 2012); and
6. *'Compilation of Air Pollutant Emission Factors'*, AP-42, Fourth Edition United States Environmental Protection Agency, Office of Air and Radiation Office of Air Quality Planning and Standards, Research Triangle Park, North Caroline 27711, 1985 and updates, (USEPA 1985).

TAS (2017, p2-3) describes the proposal as:

- no change to mining fleet
- change in sequencing of open-cut mining
- increase in the size of the ROM coal stockpile and of the product coal stockpile
- minor change to the road from OC2 to OC3
- additional road from OC2 to OC4.

Moolarben (2017, p26) notes the proposal includes a (new) bypass conveyor system to transfer ROM coal from both stage 1 and stage 2 directly to the ROM coal stockpile.

General comments

Assessment of potential impacts to the air environment are presented in TAS (2017). They summarise results as (section 11, p46)

> *"No exceedance of criteria for $PM_{2.5}$, PM_{10}, TSP, or dust deposition are predicted at any privately-owned receptor due to emissions from the Moolarben Coal Complex incorporating the Modification*
>
> *Short-term cumulative PM_{10} dust impacts may potentially arise at a small number of privately-owned receptor locations. However with the continued application of the predictive / reactive dust mitigation measures by MCO, it is predicted the short-term cumulative PM_{10} dust would be adequately managed to acceptable levels."*

The EPA considers that insufficient information has been supplied to establish these results.

Modelling approach

Assessment of air impacts from the proposed modification built on the assessment conducted for modification 9 to Moolarben Stage 1 (TAS 2013). CALMET was used to simulate meteorology for the 2011 calendar year incorporating local wind data and topography revised to represent landform changes from current mining. The meteorology fields generated by CALMET were used with emissions estimates as inputs to CALPUFF to predict resulting ground level concentrations for each hour of the year.

Modelling was conducted using calendar year 2011 conditions for three mine operation scenarios corresponding to planned operation in 2019, 2021, and 2026.

EPA comment

The CALMET-CALPUFF modelling suite is suitable for simulating dispersion of emissions from the proposal. The use of calendar year 2011 is indirectly justified by comparing wind roses for that year to those presented in Appendix B.

Emissions estimation

Emissions estimates for the proposal are summarised in section 6.2 and described in detail in Appendix C. Emissions were estimated for three scenarios corresponding to planned activity for the years 2019, 2021, and 2026. These years were chosen to "represent potential worst-case impacts in regard to the quantity of material extracted in each year, the location of the operations and the potential to generate dust impacts at the sensitive receptor locations".

Scenario 1 (2019) is described as having all four open cut pits in operation at the proposed maximum rate of 16 Mtpa. Coal is hauled to the CHPP by truck from OC1, OC2, OC3 and by conveyor from OC4. Total production for the complex is 22 Mtpa of which 19 Mtpa is product coal.

Scenario 2 (2021) has operation in OC1, OC3, and OC4 at the proposed maximum rate of 16 Mtpa. Total production is at the proposed maximum of 24 Mtpa with product coal of 21 Mtpa.

Scenario 3 (2026) has operation limited to OC4 and the underground mines. Production is at the proposed maximum open-cut rate of 16 Mtpa with total production of 22 Mtpa of which product coal is 20 Mtpa.

Emissions were estimated using methods and approaches set out in USEPA (1985), NPI (2012), and Katestone (2010). Control factors included 90% control for watering haul roads applied only to the mechanically generated emissions.

Emissions are grouped into four categories: overburden; coal loading; coal handling and preparation plant (CHPP); and wind erosion. The emissions estimates by category for total suspended particulate matter (TSP) are (summed from table 6-1):

	2019 (tonnes per year)	**2021** (tonnes per year)	**2026** (tonnes per year)
Overburden	2193	1979	2059
Coal Loading	1458	1624	1301
CHPP	953	916	807
Wind erosion	834	718	601
Total	**5439**	**5236**	**4768**
ROM production Open Cut (Mt)	*16*	*16*	*16*

EPA comment

Interpretation of predicted pollutant concentration makes use of a current case (2011) – simulation without the modification (TAS 2017, p29). The emission inventory for this case has not been provided. It is needed to understand the modification and its predicted impacts.

The EPA Dust Stop program sought to reduce emissions from coal mines. As part of the Dust Stop program, Moolarben prepared a best management practice emissions inventory which estimated watering haul roads would provide a 75% reduction in emissions. Emission estimation for the modification (TAS, 2017) uses 90% as the control factor for watering on roads. The EPA notes that 80% was used for modification 9 (TAS 2013). Detailed justification on the assumed control factors and how it will be achieved in practice should be provided to facilitate interpretation of the model predictions.

The proposal seeks to increase maximum production of coal from the open-cut mines by 23% (13 to 16 Mtpa). Broadly speaking, a commensurate increase in emissions is expected. The EPA notes the proposal uses a conveyor to haul coal from OC4 rather than trucks as previously assessed. TAS (2013) used a control factor of 80% for watering roads where 90% is used for the modification. Both of these result in lower estimated emissions.

The EPA has constructed a table to compare emission estimates presented in TAS (2013) to those in TAS (2017), please see below:

Comparison of emissions (all in tonnes per year)

	Overburden	**Coal Loading**	**CHPP**	**Wind erosion**	**Total**
Year 6	2443	1631	593	1263	**5930**
2019	2193	1458	953	834	**5439**
difference (%)	*-10*	*-11*	*+60*	*-33*	***-8***
Year 11	2143	1679	601	1458	**5879**
2021	1979	1624	916	718	**5236**

difference (%)	*-8*	*-3*	*+53*	*-51*	*-11*
Year 16	2646	1808	665	1353	**6472**
2026	2059	1301	807	601	**4768**
difference (%)	*-22*	*-28*	*+21*	*-56*	*-26*

Total emissions for the proposal are estimated to be lower than those estimated for modification 9. Noting that model scenarios are chosen to represent maximum emissions for various combination of mining activity, the EPA uses years 6, 11, and 16 in TAS (2013) to compare to 2019, 2021, 2016 in TAS (2017).

Of note is the marked decrease in estimated emissions due to wind erosion. Stockpiles are stated to increase in size implying an increase from this part of total wind erosion emissions.

Information requested

Explanation and justification is needed for the lower estimated emissions, particularly:

- overburden handling;
- handling ROM coal in stage 2 – hauling and loading trucks;
- the use of bulldozers at the CHPP;
- handling coal rejects;
- wind erosion from both mining areas and stockpiles.

$PM_{2.5}$ assessment

24-hour background $PM_{2.5}$

There are no local observations of $PM_{2.5}$ for the chosen model year 2011. TAS (2017) refer to guidance from the Environment Protection Authority of Victoria to use a 70th percentile concentration as the background concentration for the contemporaneous assessment. Noting that Muswellbrook and Singleton are rural towns where the proposal is rural, TAS (2017) uses the average of the 70th percentile at each to be conservatively representative of Moolarben (section 7.3.1, p35). This is not NSW policy.

Annual average background $PM_{2.5}$

Assessment of annual $PM_{2.5}$ concentration used a non-modelled source background presented in the AQIA for the Wilpinjong mine, Peabody (2016). This estimate is 4.3 µg/m^3 and is based on data from monitoring sites in the Hunter Valley outside the major towns.

EPA comment

24-hour background $PM_{2.5}$

The method used to assess 24-hour $PM_{2.5}$ does not follow guidance in *Approved Methods Modelling* and is not sufficiently justified. Two levels of cumulative assessment are listed in *Approved Methods Modelling* – screening level dispersion modelling technique using worst-case input data; and refined dispersion modelling technique using site-specific input data. Section 5 sets out approaches to accounting for background concentrations. Refined dispersion modelling requires one year of continuous measurements contemporaneous with the meteorological data. This allows the simulation to capture any correlation between background concentration and emissions.

The use of a derived statistic based on annual concentration removes the description of day-to-day variability from the assessment. It then cannot represent any correlation between emissions and

background. Using maximum concentration can preclude the possibility of additional exceedences (this is the screening level approach), but any other statistic may fail to adequately capture the potential for additional exceedences of the 24-hour impact assessment criterion.

TAS (2017) does not show that use of the constructed 70th percentile can adequately capture the potential for exceedences of the impact assessment criterion for 24-hour $PM_{2.5}$ concentration. The EPA notes that increments from the proposal are up to 9 µg/m^3, 36% of the criterion value of 25 µg/m^3. When added to the constructed 70th percentile concentration, there is no exceedence of the impact assessment criterion. But this does not preclude the potential for additional exceedences on days reporting higher concentration. ATASU notes that both Singleton and Muswellbrook reported more than 10 days in 2011 on which $PM_{2.5}$ concentration was sufficiently high that should maximum impacts occur, an additional exceedence day would be predicted.

Further evidence is needed to establish that the assessed increments are not likely to result in additional days exceeding this impact assessment criterion. Data analysis offers a number of approaches, including reference to more recent data. ATASU prefers use of observations directly where possible and approaches that preserve day-to-day variability.

Annual average background $PM_{2.5}$

The EPA notes there are limited data available representing rural locations. The estimate used is reasonable.

Information requested

Assessment of 24-hour concentration of $PM_{2.5}$ using a clearly described and justified method shown to be equivalent to the contemporaneous assessment described in *Approved Methods Modelling*. The method must show it adequately assesses the potential for emissions to result in additional days exceeding the impact assessment criterion of 25 µg/m^3. The EPA recommends use of local observations in developing description of the background concentrations, including reference to recent data.

PM_{10} assessment

Concentration of 24-hour PM_{10} was predicted to result in additional days exceeding the impact assessment criterion at five receptors, TAS (2017, table 7-4). There were no more than 2 days at any receptor in any of the three emission scenarios (years).

Approved Methods Modelling requires that where modelling predicts concentrations exceed impact assessment criteria, '*dispersion modelling must be revised to include various pollution control strategies until compliance is achieved*' (p36). TAS (2017) conducted additional modelling in which emissions were amended to reflect a "pause" in activities in the pit and overburden dumps. The reduction in emissions was large enough to reduce predicted concentrations at the receptors to less than the impact assessment criterion.

EPA comment

Modelling of the proposal predicts additional exceedences of the 24-hour impact assessment criterion for PM_{10} at five receptors – 9, 26, 37, 40, and 70. The exceedences occurred for all three emission scenarios (years) and arose from the model year days 15th March, 02nd June, and 28th June. Increments contributing to these exceedences ranged from 5.2 to 29.6 µg/m^3, TAS (2017, table 7-4 and appendix F).

TAS (2017) does not provide information regarding the emissions inventory for the revised modelling. Reference is made to the air quality management plan, Moolarben 2015, but no details are provided regarding either which level of control was used in the emissions inventor for the additional modelling, nor

the outcome of applying the predictive/reactive scheme to the year modelled (2011). Results are summarised in table 7-5 but no detailed results have been provided.

Information needed

More detail is needed regarding assessment of the effectiveness of the predictive / reactive management scheme:

- statement of which level mitigation was simulated and the reduction in total emissions;
- number of occasions in the modelled year (2011) on which the simulated control would be implemented and for how long on each;
- demonstration that the management scheme requires action in sufficient time to reduce emissions on the days predicting concentrations greater than the impact assessment criterion; and
- tabulation of resulting increments and cumulative assessment for this simulation matching the results presented in appendix F for the standard simulations.

WATER

Background

At present, the Moolarben Coal Mine (Moolarben) is permitted to discharge 10ML/day. The Environment Protection Licence (EPL) includes discharge water quality limits for electrical conductivity (EC), pH, oil & grease, total suspended solids (TSS) and turbidity. It should be noted that while Moolarben is permitted via EPL conditions to discharge 10ML/day, no discharges have occurred since 2011. The discharges which occurred in 2011 were due only to a significant rainfall event which resulted in the Mudgee area being declared as a natural disaster area. The modification seeks to increase the permitted discharge volume to 20ML/day which will require a variation of the EPL.

Impact predictions and suitability of assessment to avoid and minimise impacts

The baseline information provided is generally suitable, however the EPA considers some issues have not been appropriately considered. These issues will be discussed in the following sections.

Site –specific trigger values for discharges

The EPA understands that the water treatment process is subject to final engineering design but would likely involve pre-treatment followed by the secondary treatment of water via reverse osmosis (RO).

The water treatment facility is proposed to be designed to control dissolved metal concentrations, particularly cadmium, manganese and nickel, which may be elevated in on-site storages, and are not naturally elevated in the Goulburn River (page 67 Executive Summary). The EPA notes that aluminium, copper and zinc levels are slightly elevated in some on-site waste storages when compared to the AZNECC default 95% species protection trigger levels.

Page 67 of the Executive Summary states that the design criteria for metal concentrations in the water treatment facility would be to meet ANZECC trigger levels at the point of release (i.e. either 'default' 95% species protection trigger levels, or where metal concentrations in the Goulburn River naturally exceed the 95% species protection level, 'site specific' trigger levels would be developed based on the 80th percentile concentration of historic monitoring data). The EPA supports this commitment.

The EA states that surface water quality monitoring data shows aluminium, copper and zinc concentrations are naturally elevated in the Goulburn River (when compared to the ANZECC 95th percentile freshwater aquatic ecosystem guideline values) (Appendix F). Therefore, Moolarben propose to develop 'site specific' trigger levels based on the 80th percentile concentration of historic monitoring data for these analytes.

The ANZECC Guideline provides that a slightly to moderately disturbed system is the relevant level of protection for the receiving waters, in this case the Goulburn River, and while the comparison of water quality results to site-specific trigger values is a recognised approach in the ANZECC Guidelines, this is only appropriate if they are developed in accordance with the approach set out in the ANZECC Guidelines. The AZECC Guideline provides that 24 contiguous monthly samples from an appropriate reference site(s) are required to develop site specific trigger values for the receiving waters, being the Goulburn River. It should be noted that page 26 of Appendix F provides that the datasets for dissolved Aluminium concentrations are very limited and results therefore may not be adequate to characterise the water quality.

The EPA notes from section 2.5 of Appendix F that the surface water trigger levels used for water quality impact assessment purposes are combination of site-specific trigger values and the default trigger values for upland rivers in slightly to moderately disturbed ecosystems in south-east Australia. It is unclear to the EPA what monitoring location along the Goulburn River has been used as the basis for the development of the site-specific trigger levels nor whether it is based upon 24 contiguous monthly sample results from that location. Such information is requested.

The EPA notes from Table 2.9 in the Executive Summary that an EC water quality trigger level of 900 µs/cm has been established. Page 24 of Appendix F provides that the EC of the Goulburn River upstream of the proposed discharge point varies between 540µs/cm and 548 µs/cm. Justification of the use of 900 µs/cm as a trigger level for EC is requested.

It should also be noted that salinity is a surrogate measure of the range of specific salinity ions. Each ion and mix of ions can have different impacts on receiving waters and aquatic ecosystems. Surface waters, groundwaters and coal mine discharges can often have very different ionic compositions. Different ions (sodium, calcium, magnesium, potassium, chloride, bicarbonate, sulfate and the salts they form) can induce varying degrees of toxicity to aquatic life.

In developing licence conditions for metals, the EPA would consider any available near-field mixing at the point of discharge if there are no acute toxicity risks at the point of discharge. It is understood however, that the sites location high in the headwater catchments of rivers system is likely to be problematic for considering mixing zones due to low flows and the lack of dilution that can practically be achieved for such discharges.

The EPA would also consider application of the ANZECC (2000) toxicant decision-tree which provides a method to define the potential bioavailable fractions of the analytes to reduce the conservatism built into the guidelines, e.g. considering dissolved fractions for metals is a step in the decision-tree. Chemical speciation assessment and whole effluent toxicity testing are further steps.

Increase in discharge volume

Appendix F considers the potential impacts of the proposed increased volume of a licensed discharge on downstream flows and quality. The EA states that there would be negligible adverse change in downstream pH levels, EC or TSS concentrations (i.e. when compared to historic water quality, ANZECC trigger levels). As the EPA is unclear on the location along the Goulburn River where the trigger values have been established, the EPA cannot provide comment with respect to this statement.

The EPA understands from Appendix E that an increase in discharge volumes are required due to the outcomes of the revised site water balance and that this increase is mainly a result of predicted groundwater inflows being higher than previously modelled due to:

- Model revision and recalculation;
- The proposed increase in the rate of open cut mining from 13 to 16 Mtpa;
- Proposed increases in the footprints of OC2 and OC3;
- Changes to the sequencing if the approved underground mining areas (including the continued dewatering of UG1 t maintain access as UG4 is mined); and
- Differences in the timing of advanced dewatering of the UG4 area via the approved borefield.

While the EPL currently permits a 10ML/day discharge from Moolarben, the mine has been a nil discharge site throughout its life, aside from one very significant rainfall event in late 2010 which resulted in emergency discharges being approved by the EPA. The site water balance for Moolarben has been reviewed and updated many times, the previous time being in 2015. The EPA is interested in a comparison between the site water balance discharge predictions provided with the 2015 modification and those provided in the EA to allow it to determine what the changes in discharge volumes are.

The request for a 20 ML/day, is based upon the water balance model for very wet climatic conditions (1%ile). It appears that the proponent has taken a conservative approach to the assessment and has a desire to have a level of flexibility built into the water management system. While the EPA appreciates the approach taken, justification for using the 1%ile volumes rather than the 50%ile volumes are requested, as it likely that 50%ile volumes may be a more accurate indicator of the discharge volume which are required in reality.

Site Water Balance

Page 52 of Appendix F provides discussion regarding assumptions made with regarding the water treatment plant and the likely volume of brine which will be produced. It is unclear to the EPA how brine has been accounted for in the site water balance.

Cumulative Impacts and Load

The EA does not propose changes to existing water quality concentration limits currently authorised by EPL 12932 for licensed discharges but proposes instead a change to discharge volumes. Associated with an increased volume of discharge is an increased load of pollutants to the environment.

While load considerations are included in the EA regarding the Hunter River Salinity Trading Scheme, the potential loading impacts of the proposed discharge on the receiving waters immediately downstream of the site are not considered, including the section of the Goulburn River that flows through the Goulburn River National Park.

To appropriately assess the cumulative impact of the proposed discharge an assessment would need to include consideration of both the load and ionic impacts described above.

It is noted that the SEARs require a cumulative assessment to be undertaken and previous planning consent requires the proponent to minimise cumulative water impacts with other mines in the region.

EPA Licensing

When considering an EPL variation, the EPA is required by section 45 of the *Protection of the Environment Operations Act 1997* (the POEO Act) to take into consideration the practical measures which could be taken to:

1. Prevent, control, abate to mitigate that pollution, and
2. Protect the environment for harm as a result of that pollution.

As such, the EPA needs to understand how the identified potential proposed increase in discharge volumes have been avoided or mitigated. The EPA requests further information regarding the potential for:

- Increased onsite re-use, for example, consideration of watering of rehabilitation areas, increased dust suppression, watering of coal stockpiles;
- offsite re-use/water sharing options; and
- discharges to an alternate catchment for example the Talbragar River.

Discharge Point

The EPA notes that a spreader/diffuser is proposed to be installed with the aim of minimising the impact of the volume of water being discharged via Bora Creek. The EA considers that this will alleviate the potential for scouring of the bed of the Goulburn River from the discharge. Given the height of the drop off from the bed of Bora Creek to the Goulburn River the EPA concurs that a method to reduce the impact is required. Ongoing monitoring of impacts is supported.

Water Treatment Plant

The EPA understands the water treatment is proposed to be located adjacent to the rail loop. The EA provides some indicative mapping regarding the location though detailed layout mapping has not been provided. It is likely that the proposed location of the water treatment plant may be in close proximity to Bora Creek or within its catchment. To understand the potential impacts of the siting of the water treatment plant including existing water management structures, further information is requested.

Section 3.7 of Appendix H discusses the pre-treatment requirements for the water treatment plant. The EPA notes that pre-treatment is proposed however the EA does not address how the sludge waste will be managed. Classification of the sludge waste will be required to inform any decisions regarding disposal.

Management of brine/treatment by products

Additional water storages would be required as part of the water treatment facilities to hold feed water, blend water and treated water, and to store by-products of the treatment process (e.g. brine). Page 31 of Executive Summary states that "*the majority of by-products generated from the treatment process would be diluted with mine water and used for dust suppression on haul roads, active mining areas and coal stockpile areas. Any runoff from dust suppression would be recaptured in the water management system.*"

And further that by-products would be:

- temporarily stored in dedicated by-product storage dams, or other mine water storages (e.g. OC2 and OC3 mine water dams following the completion of mining in these areas);
- reticulated to mining or waste emplacement areas draining to internal catchments with any runoff recaptured in the water management system;

- evaporated in dams or via other evaporative techniques (e.g. evaporation cannons);
- permanently stored in underground workings (i.e. down gradient of longwall mining), once void space is available.

The EPA does not support the proposal to dispose of in underground mining areas following mining. Dams used for the storage of brine will be required by the EPA to be lined and achieve a permeability standard of at least 1 x 10^{-9} m/s. Further dams may be required for the blending of brine with mine water for use for dust suppression, though no details regarding this are provided.
Any areas reporting to storages that are sized based on *Managing Urban Stormwater: Soils and Construction – Volume 1* and *Volume 2E* (e.g. overburden emplacement areas or haul roads in sediment basin areas) or rehabilitation areas should not receive by-products or blended by-products. Risks include:

- potential salinisation and sodicity impacts on haul roads, active mining areas and coal stockpile areas. There are potential impacts associated with soil degradation and dispersion and increased erosion and sediment discharge. Salinity and sodicity levels in proposed irrigation waters is not provided in the EA.
- Increased salinity loads and concentrations in discharges.

It is recommended that the Response to Submissions should clarify and provide appropriate mitigation options where necessary for the following issues:

- Water management systems and storages that will receive or recapture by-product or blended by-product runoff from use or reuse should be designed to capture a 100 year ARI 72 hour storm event.
- For soils within 1 in 100 year 72 hour capture areas, management of any salt affected soils, e.g. waste management, rehabilitation and mine closure.
- The potential impact of by-products on the integrity of liners and the suitability of storages for holding brine, including reactivity of the liners with by-product.
- Evaporative processes and management of potential impacts of residual and increasing concertation of salts in storages and on liners.
- Potential impacts on groundwater from disposal of by-products in underground mining areas following completion of mining.

At the current time there is insufficient information to enable the EPA to provide comment regarding the suitability of the proposed options for the management of the brine. While the EPA notes that brine would diluted with mine water and used for dust suppression, it is unclear how this would be achieved in practice i.e. what is the likely quality of water being applied, is it anticipated that all brine could be utilised for dust suppression etc.

<u>Dam sizing</u>

Appendix E, page 70 states that: "*The modelled spill risk of dam 107 is consistent with the approved design standard for this dam (50 year Annual Recurrence Interval [ARI], 72 hour event as per Condition 32, Schedule 3 of Project Approval 05_0117)*". It appears that the project approval (08_0135) was updated to a 1 in 100 year ARI, 72 hour event at Phase 2. If this new ARI applies to dam 107 then the risk should be assessed and mitigated.

Noise

The EPA notes there are two landholder locations (location 30 and 63) which appear early in Moolarben's Environment Protection Licence; appear in a recent consolidated approval for Moolarben, and; are listed in Appendix C2 of the Noise Assessment. However, there do not appear to be predicted noise levels for these two locations, or an explanation as to why there are none in the Noise Assessment. Figure 3 of the EIS indicates that location 30 is mine owned and location 63 is under contract/purchase agreement. However, it's not clear in the Noise Assessment if this is the reason why noise impacts were not assessed at these two landholder locations.

Having reviewed the information provided, the EPA also does not accept the findings in Section 5.2 of the Noise Assessment, which are based on mean differences. The EPA would like clarification on these two points.

In summary, the noise assessment includes additional feasible and reasonable mitigation to achieve the predicted noise levels (and to not exceed the existing EPL noise limits). The EPA can support the modification with no changes to the existing noise limits in Moolarben's Environment Protection Licence.

It should be noted that the EPA requires that any approval includes a requirement for the proponent to implement their feasible and reasonable noise mitigation to minimise the impacts of the project and to not exceed the current EPL noise limits.