

DOC16/471501, EF13/5640

Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001
Attention: Colin Phillips

Dear Mr Phillips

Environmental Impact Statement- Rocky Hill Coal Project (SSD-5156)

Reference is made to correspondence received on 12 August 2016 from the Department of Planning and Environment (DP&E) requesting written comments from the Environment Protection Authority (EPA) for SSD 5156 (the amended Rocky Hill Coal Project). Attached to the correspondence was the document titled: *"Amended Rocky Hill Coal Project Environmental Impact Statement Development Application No SSD-5156 (August 2016)"* (the EIS) prepared by R.W Corkery and Co Pty. Ltd.

The EPA has reviewed the EIS, and understands that the proponent is seeking approval for a new open cut coal mine close to the township of Gloucester. The EPA understands that the EIS describes an amended proposal by Gloucester Resource Limited (GRL) from the EIS it submitted in 2013.

Key details of the proposal are as follows:

- a mine area entrance off Mckinleys Lane;
- an administration area, including site offices, amenities, workshop, water treatment plant and ancillary facilities;
- extraction of coal from three open cut pits occurring between 7:00 am and 10:00 pm six days per week (from year 4 onwards);
- long term amenity barrier and two interim barriers to visually screen areas of activity and provide noise mitigation;
- a consolidated in-pit and permanent out of pit overburden emplacement, the materials would be used to backfill the final void;
- a run of mine pad and associated breaker station, a feed conveyor and a 500t oversized coal bin (to load the haul trucks), which would not be operated past 6:00 pm to limit noise impacts;
- approximately 4.4 km of sealed private haul road between the coal bin and the northern extent of the Stratford Mining Complex, which would not be operated past 6:00 pm to limit noise impacts; and
- a 5km section of relocated 132KV, and a new 11 KV power line.

A review of the EIS has been completed and EPA provides comments as shown in **Attachment 1**. As is normal practice the EPA has also attached a draft set of recommended conditions for future consideration by DP&E, should the Department consider that approval might be appropriate. However the EPA highlights in relation to noise that:

- DP&E needs to consider in its assessment of this application that if approved many residents and visitors to Gloucester will experience a changed noise environment (hearing mining noise for the first time).
- The Gloucester Valley experiences weather conditions like temperature inversions and southerly breezes reasonably regularly. Those conditions will increase noise from the mine, if approved, within Gloucester and its southern rural-residential estates.
- To achieve the noise contours predicted and shown in the EIS multiple layers of controls will be necessary. The required controls may not be practical to implement, due to the frequency of noise enhancing weather conditions like inversions and southerly breezes.
- Based on the frequency of temperature inversions in the Gloucester Valley, the modelling may have under-predicted noise levels from the mine at residential sensitive receivers.

This means that noise impacts from the mine, if approved, may be greater than suggested by the EIS. This issue, along with some technical noise issues are expanded upon in **Attachment 1**.

In relation to air, the EPA is concerned about the omission of information in the EIS and specialist studies regarding potential air quality impacts from blast fume. The EIS should have highlighted the importance of ensuring blasting does not occur in the stable atmospheric conditions experienced in the Gloucester Valley in the morning and evening so as to avoid exceedance of air quality criteria.

The proximity of the proposed mine to Gloucester township, combined with the strong and frequent temperature inversions experienced in the Gloucester valley, combined with a predominance of southerly winds in the Valley (towards Gloucester township) means that potential effects from spontaneous combustion, should it occur, is an important consideration for DP&E when considering this development application.

In relation to water, the EPA needs further information prior to being able to complete our assessment of this application. Further information is needed in the following areas: preventing seepage from salty minewater storages; better characterisation of "dirty" (sediment laden) water; proposed increased monitoring for "dirty" (sediment laden) water; clear information on the unit operations that are proposed in the water treatment plant; details on how/where brine will be managed/disposed; an assessment of the ephemeral watercourse that is proposed to receive discharges from the water treatment plant; discussion as to whether the treated water needs to be "conditioned" prior to reuse or discharge, better exploration as to whether the proposed reuse of some saline water onsite is appropriate or not, and an appropriate assessment of discharge limits for the water treatment plant.

Please contact Cameron Perry on (02) 4908 6808 if you require any further information regarding this matter.

Yours sincerely



PETER JAMIESON
Head Operations Unit - Hunter
ENVIRONMENT PROTECTION AUTHORITY

Contact officer: CAMERON PERRY
02 4908 6808

ATTACHMENT 1

Noise

The proposal, if approved, will likely change the noise environment

- Though noise modelling predicts the majority of residents will experience noise less than the proposed noise limits (discussed more below), it is important for DP&E to understand that many residents and visitors to Gloucester will experience a changed noise environment if the proposal is approved.
- If this project is approved, mining noise will be audible in Gloucester for the first time. Given the quiet nature of Gloucester and surrounding areas, the changed noise environment should be an important consideration for DP&E in its assessment of this application.
- The EPA has included blasting limits for the proposal, however even when those limits are met DP&E needs to understand for its assessment of this proposal that blasts are likely to be audible in Gloucester and surrounding areas and the noise environment is likely to be affected by the semi-regular blasts that are required throughout the life of the mine.

The noise modelling likely under-predicts the actual noise impacts

- Figure 1 shows the noise contours predicted in the EIS for Year 7 of the project.
- The EPA notes from the noise modelling conducted that despite the changes made to the project since 2013 the predicted noise contour representing the intrusive noise criterion ($L_{eq(15min)} 35$ dBA) just skirts around the Avon River and Thunderbolt Estates for two of the modelled scenarios.
- There is always some uncertainty in noise modelling. The EPA highlights to DP&E that the number of residences receiving noise above the intrusive noise criterion could be significantly greater than predicted if:
 - noise levels were slightly under-predicted, or
 - not all necessary mitigation measures are implemented to meet the noise limits.



Figure 1 - Contours predicted for year 7 of the project (adapted from Appendix O3 of SLR 2016).

- Temperature inversions are expected to occur about 20% of evenings in winter (one evening in every five), and this means that noise levels may have been under-predicted:
 - Strong temperature inversions are a feature of the Gloucester Valley. Temperature inversions have the effect of increasing noise levels at receivers compared to “normal” conditions.
 - The *Industrial Noise Policy* states that where inversion conditions are predicted to occur for at least 30% of the time on winter nights, the inversion effects on noise are significant.
 - The previous EIS noted that temperature inversion conditions were predicted to occur on about 60% of nights in winter in the local area, and about 40% of nights over the entire year. This is a significant percentage of time for inversions to occur.
 - As noted in the current EIS, the *Industrial Noise Policy* only requires inversions to be considered when night-time operation is proposed, and because mining operations were assumed to finish at 10:00 pm inversions were not included in any modelled noise scenarios.
 - The 2013 EIS suggested that inversions would occur in the evening period (6:00 pm to 10:00 pm) in Gloucester about 20% of the time in winter.
 - The EPA highlights that although the noise assessment has been conducted in line with the *Industrial Noise Policy*, due to the expected strength and frequency of inversion conditions in the Gloucester Valley, the modelling may have under-predicted noise levels at residential sensitive receivers up to about 20% of the time, or for one winter evening in every five.
- Proposed mitigation measures for noise may not be practical to implement for the likely times required (one evening in five in winter for inversions and also during the predominant southerly

breezes which are predicted to occur about 29 % of the time during winter evenings, although some of these occurrences might coincide):

- To ensure the proposal can meet the noise criteria the proponents have said they will implement multiple layers of operational noise mitigation measures.
- The EPA previously raised concern about the practicality of regularly limiting mining activities in an operational mine, and is concerned the modelling for this project is optimistic about the available noise mitigation measures.
- The noise impact assessment in the EIS describes a range of possible measures such as equipment shutdowns, “switching off the coal fleet and associated mobile equipment”, restricting some dozers to 1st gear “dependent on the time and location of operation”, and not operating “out-of-pit” in certain noise enhancing conditions.
- It is not entirely clear which mitigation measures were adopted for each noise model scenario, but certain scenarios seem to include a minimum of “switching off the coal fleet and associated mobile equipment” and restricting some dozers to 1st gear operation.
- As temperature inversion conditions are likely to be experienced in one evening out of every five in winter, combined with the need for additional controls during the predominant southerly breezes in the Gloucester Valley, the EPA questions whether the assumed and restrictive operational controls would be regularly put into practice on a large mine with a workforce of in excess of 100 employees.
- DP&E, when weighing up all relevant considerations, needs to consider the risk of additional residences being adversely impacted by noise if all proposed measures are not practical to implement at a real life operational mine.

Jacks Road and Waukivory Road should have been assessed as local roads

The assessment states that Jacks Road and Waukivory Road are local roads but will be upgraded, and modelled those roads as “principal haulage routes”. As stated in the *NSW Road Noise Policy* (DECCW 2011), principal haulage routes are identified by local authorities rather than by proponents.

The EPA recommends that DP&E, prior to approval, require the proponent demonstrate either:

- The local authority has identified Jacks Road and Waukivory Road as principal haulage routes, or
- The project will meet the road noise policy criteria for local roads at receivers affected by noise from Jacks Road and Waukivory Road.

Activities in the “night time” period should comply with $L_{eq(15min)}$ 35 dBA and $L_{max(15min)}$ 45 dBA

Table 4 of Section 2.1 of the Noise Impact Assessment indicates that maintenance activities will be carried out Monday to Sunday, at ‘all other hours’ (10pm-8am) on the condition that the activities are not audible at privately owned residences.

The EPA acknowledges this approach as a simple way of controlling noise in the night-time period. However, audibility varies among the population and the EPA would also prefer numeric limits to remove some of the subjectivity of an “audibility” limit.

The EPA, in its suggested conditions, proposes a night time $L_{eq(15min)}$ limit of 35dBA, and sleep disturbance limit of $L_{max(15min)}$ 45 dBA.

Any approval for the project should adopt DEFRA-based criteria for low frequency noise, and corrections to measured noise levels

The assessment states that the $L_{Ceq} - L_{Aeq}$ was modelled at the project’s closest sensitive receivers and was less than 15 dB. It also states that the Broner criteria should be used to guard against a “perverse outcome” where a correction applies at farther receivers but not at closer receivers.

The EPA agrees that the approach in the INP is not consistent with current science, but do not support the Broner criteria.

The EPA recommends that any project approval, require the proponent to apply a correction to any measured noise level, before comparison to limits, where the $L_{Ceq} - L_{Aeq}$ exceeds 15 dB and:

- where any of the 1/3 octave noise levels in Table A are exceeded by up to 5dB, a 2 dBA positive adjustment to measured A weighted levels applies in the evening and night periods.
- where any of the 1/3 octave noise levels in Table A are exceeded by more than 5dB, a 5 dBA positive adjustment to measured A weighted levels applies for the evening and night periods, and a 2 dBA positive adjustment applies for the daytime period.

Table A : One-third octave low frequency noise thresholds

Centre frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
One-third octave $L_{Zeq(15min)}$ threshold level (dB)	92	89	86	77	69	61	54	50	50	48	48	46	44

This requirement is consistent with the approach proposed in the draft industrial noise guideline, and is included in the attached recommended conditions.

The EPA recommends that any approval for the project require the proponent to develop and implement a construction noise management plan, and limit construction to standard hours

The assessment states that construction noise levels will be more than 5 dBA above noise management levels at 56 privately owned residences in the vicinity of the Jacks Road upgrade for up to one week.

The expected level of construction noise can be dealt with by any approval requiring the proponent to develop and implement a construction noise management plan including all feasible and reasonable measures to minimise construction noise impacts on residents. This condition is included the EPA's draft conditions of approval.

The assessment also stated that construction activities would occur during standard hours, except for some activities between 6pm and 10pm "under limited circumstances". The EPA recommends that any approval for the project includes conditions limiting construction to standard hours. The EPA has included a condition in this regard as part of the EPA's draft conditions of approval.

One residence is predicted to receive operational noise from the project up to 5 dBA above project specific noise levels, and three residences will receive operational noise from the project up to 2 dBA above project specific noise levels

The assessment proposed operational noise mitigation measures, including attenuated plant and equipment, using overburden to construct noise barriers, equipment scheduling and shutdown strategies, continuous noise monitoring and predictive weather.

The assessment stated that it was not reasonable for operational noise levels from the project to be reduced further. It also stated that an operational noise management plan would be prepared and implemented to minimise operational noise impacts.

Including all identified feasible and reasonable mitigation measures, three privately owned residences are predicted to receive operational noise above the project specific noise level, by:

- up to 5 dBA at "Receiver 6 Campbell" (up to $L_{eq(15min)}$ 40 dBA)
- up to 1 dBA at "Receivers 7 Ansell and Murray" and "19A Boorer" (up to $L_{eq(15min)}$ 36 dBA).

The EPA would expect that "Receiver 6 Campbell" will receive architectural treatment rights at the minimum in any approval for the project, in line with the *Voluntary Land Acquisition and Mitigation Policy*. In addition, if DP&E considers consent appropriate, given the potential for under-prediction of noise levels from the mine, the EPA suggests to DP&E that any condition referring to *Voluntary Land Acquisition and Mitigation Policy* be non-prescriptive relating to properties and actions in the event that actual noise impacts are greater than predicted. For example, if "Receiver 6 Campbell" is subject to noise greater than 5 dBA above the Project Specific Noise Levels then any condition

should note that under *Voluntary Land Acquisition and Mitigation Policy* the resident should be able to apply for voluntary acquisition by the proponent.

Air Quality

The omission of information on potential impacts from blast fume is a deficiency in the EIS

The EPA is concerned about the omission of information in the EIS and specialist studies regarding potential impacts from blast fume. The EPA is aware that because of the very stable meteorological conditions in the Gloucester Valley, that previous modelling (in 2013 for this proposal) had found that if blasting occurred between 9:00 am to 10:00 am or between 4:00 to 5:00 pm that there was a risk of NO₂ criteria exceedances for nearby residents. The EPA is concerned that the current EIS/specialist studies have made no mention of this risk. The only mention made is in section 11.4 of the air specialist studies where a statement is made that modelling was based on blasting occurring between the hours of 10:00 am to 4:00 pm in line with Rocky Hill's blast management measures. No further statements were found in the EIS or the specialist studies on the importance of restricting blasting to 10:00 am to 4:00 pm. The management measures identified in Section 5 of the EIS make no mention of the need to restrict times of blasting to prevent blast fume impacts. The EPA considers this lack of transparency a major deficiency in the EIS and specialist studies, particularly given the potential importance of the issue.

The assessment has found that impacts on air quality will be acceptable

The approaches used to assess expected impacts to the air environment from the amended Rocky Hill proposal have broadly followed guidance provided in *'Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales'*.

Pacific Environment Limited (2016a) estimate impacts from the amended proposal are less than those from the original proposal, which had met the air quality assessment criteria. This arises from revised emissions estimates and the overall lesser fraction of the estimated Total Suspended Particulates (TSP) emissions being PM₁₀ and PM_{2.5}. The estimated impacts from the proposed amendment comply with EPA impact assessment criteria.

Estimated changes to emissions

Estimated emissions from the amended project differ significantly from the original project with consequent changes to the assessed impact on sensitive receptors. Reduction in coal processing reduces emissions from this component of the processing.

	2013 project		Amended project	
TSP emissions (T / yr)	Year 2.5	928.6	Year 1	267.8
	Year 4.25	1,206.0	Year 4	740.5
	Year 7.75	990.5	Year 7	1,079.9
	Year 13	822.8	Year 10	807.8

Emissions estimation has been done to greater detail than in the original application. For both estimates, emissions of PM₁₀ and of PM_{2.5} are calculated as a fraction of estimated TSP. In the original application, a single value for each was used for all sources. Emission estimation for the amended proposal applies source-specific ratios. The resulting total emission estimate has lesser contributions from PM_{2.5} and PM₁₀ to TSP. The fraction of TSP that is PM₁₀ reduces from 0.39 to 0.29 and that of PM_{2.5} from 0.047 to 0.040.

The estimated total annual emissions for the amendment show PM₁₀ emissions are a smaller fraction of TSP emissions than in the original assessment. Emissions are also reduced as there is less coal handling and preparation.

In Attachment 2 to this letter the EPA provides a range of conditions to address air quality impacts.

Spontaneous Combustion

The EIS notes that an assessment was undertaken that concluded that “based on historical information gathered from existing open cut operations in the Gloucester Basin and coal quality parameter analysis, the expected propensity for spontaneous combustion is low.”

Until recently, the EPA has not been aware of spontaneous combustion issues in the Gloucester Coal Measures. In the last year there has been spontaneous combustion issues at the Duralie Coal Mine (located south of the proposal), along with community complaints regarding odours.

Spontaneous combustion from coal stockpiles, active mining areas and historical reject emplacement areas may lead to significant environmental impacts to local air quality. Spontaneous combustion of coal is a major community concern for residents located near coal mines in the Upper Hunter Valley. The EPA and the companies concerned receive many community complaints stating that very bad odours are being experienced as a result of spontaneous combustion. Dealing with spontaneous combustion issues are extremely difficult and frustrating for coal mining companies. There are a number of spontaneous combustion situations that have burnt/smouldered for periods of years. Since at least 1998 the EPA has spent significant resources working with a number of Hunter Valley coal companies through formalised Pollution Reduction Programs to reduce the occurrence and area's impacted by spontaneous combustion. These issues, while currently being managed, remain a concern for the EPA and local residents in the Hunter Valley.

The EPA notes the EIS has rated the risk of odours from spontaneous combustion impacting on residents and other sensitive receivers as low (s3.3.1 & App 6). Standard management methodologies have been proposed in the EIS to reduce the potential for spontaneous combustion.

The proximity of the proposed mine to Gloucester township, combined with the strong and frequent temperature inversions experienced in the Gloucester valley, combined with a predominance of southerly winds up the Valley (towards Gloucester township) means that potential effects from spontaneous combustion, should it occur, is an important consideration for DP&E when considering this development application.

Surface Water Quality

The EPA provides the following comments in regard to water quality. The EPA also notes issues that still need to be addressed by provision of further information/clarification to enable the EPA to adequately assess this proposal. This information will be necessary for the EPA to set appropriate water quality discharge criteria.

Information on preventing impacts from stored minewater is necessary

The proponent notes saline minewater would be managed in a closed water management system within an area referred to as the “Saline Water Zone”, an area comprising all open cut pits and three Environmental Dams. It will be necessary to prevent seepage from the Saline Water Zone storages into the surrounding aquifers or watercourses. The EIS proposes that *“detailed investigations into seepage potential from the Environmental Dams will be required to identify if prevention measures such as clay lining of the embankment and storages are necessary.”*

These investigations need to be provided as part of the EIS and/or a commitment provided regarding minimum permeability requirements for the Saline Water Zone storages to prevent pollution of waters.

Dirty (sediment laden) water needs to be better characterised and adequate monitoring proposed

The water balance modelling, sizing of basins, overburden geochemical characterisation investigations and proposed mitigation methods appear adequate for the dirty water zone.

Monitoring of sediment basins for a full range of potential pollutants should be conducted periodically to confirm the predictions in the EIS, e.g. selenium, aluminium and arsenic. This would be in addition to expected licence limits for pH, electrical conductivity (EC) and total suspended solids (TSS).

Reference to the "Blue Book" in the EIS might imply Volume 1 of *Managing urban stormwater: soils and construction*, which is not the appropriate reference. Based on the year of publication cited in the EIS, the EPA expects that the consultant is referring to *Managing urban stormwater: soils and construction Volume 2E: Mines and quarries* which contains management methods for sediment laden water on mine sites. This should be confirmed.

The proponent needs to better characterise the "dirty water", propose monitoring of sediment basins for a full range of potential pollutants to confirm the predictions in the EIS and confirm pollution controls will be based on the relevant guideline.

Greater clarity on the water treatment plant and the need for water management plans

The proponent needs to be clear on the unit operations that are proposed in the water treatment plant so that the EPA can make an assessment of the potential risks involved.

The EPA has proposed two draft conditions relating to water management plans. These conditions are likely to change upon the submission of details of the water treatment plant and an adequate assessment of the range of other relevant potential pollutants from coal seams that are not listed in the proposed licence limits. In proposing these conditions the EPA highlights that if a reverse osmosis plant is proposed it is expected that most potential pollutants will be at trivial levels and those pollutants may not require licence limits for discharge. Discharge limits will mostly relate to salinity levels (not too high or too low); indicators of treatment performance/amendment levels; and any indicators that are not handled well in a reverse osmosis plant that are identified as risk factors in the commissioning monitoring.

A brine management option needs to be identified

Salty minewater is proposed to be treated via a treatment plant (although not stated in the EIS it is expected by the EPA this will include a reverse osmosis treatment facility). Such a facility produces two products: a permeate with very much reduced salinity; and a concentrated (very salty) brine.

The EIS states that: "*The saline effluent (brine waste stream) will be converted to a solid salt product that will either be transported off site to a waste facility authorised to accept the material or to a reprocessing facility to recover the useful salt species.*"

The EIS predicts there will be large volumes of brine (~7 t/d) that need to be managed or disposed at an appropriate location. Not all waste depots will be suitable for these large volumes of brine. There needs to be a commitment by the proponent to develop a brine management/disposal option that provides certainty on a final approach to ensure appropriate management and disposal of this waste stream. This requirement is consistent with the EPA position at other reverse osmosis treatment systems.

The proponent needs to investigate the availability of waste or reprocessing facilities that could or will be used for this proposal and should detail a preferred management/disposal route.

Treated water reuse

The EIS notes that water balance modelling has shown that beyond about Year 4, increases in water generated are relatively high and a mechanism is needed to treat and dispose of excess water to prevent an unsustainable build-up. The EIS notes a water treatment plant capable of treating 2.5 ML/d is needed to balance excessive quantities of water from accumulating.

The EIS notes that about 900 ML/a of saline water in a wet year will need to be treated and disposed. The EIS notes this volume of water would be sufficient to irrigate about 200 ha of land and this area represents about 15 % of the land owned by the proponent in or adjacent to the mine area. It is stated that the applicant intends to reuse as much of the treated water as possible to irrigate pastures nearby and for rehabilitation purposes, with discharges offsite as a last resort in times of prolonged high rainfall. The EPA supports this approach, however the EPA notes the project is projected to result in slightly reduced streamflows particularly in drought times and so the consent should reflect that discharges in times of drought may be beneficial in maintaining river baseflows. Given there have been no firm commitments in the EIS to reuse as much water as possible, the EPA has proposed a condition of consent requiring this objective, as well as the possibility of increasing discharges in times of drought to supplement River baseflows (see Attachment 2).

An assessment is needed as to whether the ephemeral creek receiving treated water can adequately receive the volumes of water from the treatment plant

In times of wet weather the proponent proposes to discharge treated water to an unnamed ephemeral watercourse that discharges to the Avon River south of Jacks Road. The EIS presents no assessment as to the capacity of the unnamed ephemeral watercourse to accept the volume of water likely without adverse effects. The EPA requests an assessment be undertaken in this regard. The EPA has also proposed a condition of consent (see Attachment 2) that requires a baseline and then an annual assessment of the watercourse to ascertain any erosion issues that might need to be addressed.

Discussion is needed as to whether certain minerals need to be re-added to the water post treatment to prevent environmental issues

Based on the discussion in the EIS it appears to the EPA that a reverse osmosis plant is being proposed as part of the treatment train. Reverse osmosis plants can be very effective in reducing minerals in the treated water to the extent that other environmental issues can eventuate when such "pure" water is reused or discharged.

The EPA notes from the EIS Appendix "Overburden and Reject Characterisation" by RGS Environmental that some of the overburden materials may be sodic and be susceptible to structural stability problems related to dispersion and erosion. These issues could be exacerbated if waters are irrigated with an inappropriate chemical characterisation.

It is on occasions necessary to "condition" reverse osmosis permeate to make it suitable for reuse or discharge (which could be important if discharging in low flow conditions). The EIS needs to discuss any mechanisms necessary to ensure the balance of minerals in the treated effluent will not cause disruption to receiving environments or soil structural decline. If conditioning of the treated water is deemed necessary after appropriate assessment, the EIS needs to stipulate if maximum limits for parameters like pH, bicarbonate alkalinity, dissolved ions, boron, and Sodium Adsorption Ratio might be necessary, to check that overdosing during conditioning is not occurring and/or that water quality is acceptable. Discussion should also occur as to the dissolved oxygen level likely in the discharged water and whether a limit (see discussion below) and/or active aeration is also necessary for this parameter.

The determination of discharge limits to waters needs to be correctly addressed

The EIS states that Environment Protection Licence limits (Table 4.55 in the EIS "Potential water quality discharge limits") have been proposed based on the 80th percentile of the receiving water

quality monitoring data when the guideline value exceeds the 80th percentile value (see also Table 4.15 in the specialist consultant report). The 80th percentile value of receiving waters can only be used when the data is from an agreed reference site that meets the definition of a reference site for the purposes of developing site specific trigger values as set out in the ANZECC (2000) guidelines. ANZECC (2000) states that: *"the reference condition should represent a substantial achievement in environmental protection that is agreeable to the majority of stakeholders"* and *"It is not acceptable to allow poor environmental performance or water pollution, simply because a waterway is degraded"*. In accordance with the ANZECC (2000) guidelines, the level of protection that should apply in this case is for a "slightly to moderately disturbed system". In the absence of appropriate reference conditions the ANZECC (2000) default trigger values should be used as a basis for developing discharge criteria.

There is a range of other relevant potential pollutants from coal seams that are not listed in the proposed licence limits shown in Table 4.55 that should be taken into account in the environmental assessment for the proposed discharges of treated minewater. For toxicants such as metals, the trigger values can be adjusted using the decision tree for toxicants in the ANZECC (2000) guidelines. The EIS should also consider and discuss whether BTEX chemicals need to be included as limits, and if so, propose appropriate limits. Similarly discussion should occur for dissolved oxygen. Where ANZECC (2000) Volume 1 does not provide an aquatic ecosystem trigger value for a particular analyte reference should be made to Volume 2 to determine if an interim trigger value is available as a basis for decision making, or international literature can be reviewed. The use of 99% species protection levels applies as a default value for some analytes for "slightly to moderately disturbed ecosystems" to account for potential bioaccumulation effects or other issues, e.g. the selenium trigger value proposed by the consultants in Table 4.55 is incorrect and should be 5 µg/L. The licence limits can be adjusted to take into account available initial dilution if discharges occur during times of adequate flows and available dilution can be demonstrated.

The proponent needs to propose Environment Protection Licence limits using approaches consistent with the ANZECC (2000) guidelines.

Untreated water reuse

The proponent notes that some untreated water reuse may occur throughout the premises. As noted above, the EIS Appendix "Overburden and Reject Characterisation" by RGS Environmental states that some of the overburden materials may be sodic and be susceptible to structural stability problems related to dispersion and erosion. These issues could be exacerbated if saline waters are irrigated.

Additionally if saline waters are irrigated to, for example, a road that drains to the "dirty water" or "clean water" area, saline discharges could potentially occur (although it is recognised that given the dilution likely during rainfall events, this issue may be minimal).

The above issues need to be adequately explored in the EIS process and appropriate controls imposed as is necessary. Given that a water treatment plant is proposed anyway, it is the EPA's preference that all reuse water be appropriately treated to remove salts and other substances that could cause biological disruption in receiving environments.

"Breaker reject" material will require specific handling and disposal

The proposal includes the use of a rotary breaker at the Run of Mine coal pad. This breaker will produce a coarse "reject". The Appendix "Overburden and Reject Characterisation" by RGS Environmental highlights the coarse reject from the breaker will often have a high sulphur content and some will be likely to generate acidic leachate, which the soils will not have sufficient capacity to neutralise. Additionally this "breaker reject" may on occasions have salinity issues and have concentrations of heavy metals that could cause environmental issues.

The EPA cannot find where this issue has been adequately addressed in the EIS and is not comfortable with the recommendation of the consultant in the Appendix "Overburden and Reject

Characterisation" by RGS Environmental. RGS Environmental has proposed "*Potentially Acid Forming (PAF) breaker reject materials should be disposed within the open cut pits (where possible) or randomly blended with other overburden materials....within the western and northern amenity barrier and permanent out-of-pit overburden emplacement area at least 5 metres from the final batters or upper surfaces*" (underlining added by the EPA). The EPA is not willing to take the risk that PAF material will be managed as described above.

The EPA has proposed two conditions of consent to address this issue, which require PAF materials to be disposed in locations below the water table. This will also help to minimise risks posed through spontaneous combustion of reject material.

If achieving below the water table disposal for PAF material is an issue for the proponent (particularly in the early years of the project), then the proponents should explore disposal of PAF materials at the Stratford Coal Mine, which already has systems in place to deal with such materials.

ATTACHMENT 2

'DRAFT' CONDITIONS OF APPROVAL TO BE CONSIDERED BY DP&E

ROCKY HILL COAL PROJECT (SSD-5156)

ADMINISTRATIVE CONDITIONS

Works to be undertaken in accordance with information supplied

1. Except as provided by these recommended conditions of approval, the works and activities shall be undertaken in accordance with the proposal contained in:

- (a) The document "*Amended Rocky Hill Coal Project Environmental Impact Statement Development Application No SSD-5156 (August 2016)*" prepared by RW Corkery and Co Pty Ltd and dated August 2016

unless otherwise specified in these conditions of approval.

OPERATING CONDITIONS

2. Activities at the premises must only occur during the times detailed in the table below:

Activity	Days *	Permitted Hours of Operation
Construction and site establishment	Monday to Saturday	In accord with condition 22 and 23 of this consent
Mining (Year 1 to 3)	Monday to Saturday	7:00 am – 6:00 pm
Mining (year 4 to end of mine life)	Monday to Saturday	7:00 am – 10:00 pm
Breaker station operations	Monday to Saturday	7:00 am – 6:00 pm
Coal haulage via private haul road	Monday to Saturday	7:00 am – 6:00 pm
Maintenance	Monday to Saturday	7:00 am – 10:00 pm
	Sunday	8:00 am – 10:00 pm
	Monday to Sunday	All other hours – in accord with condition 25 of this consent

3. Activities must be carried out in a competent manner. This includes:

- a) The processing, handling, movement and storage of materials and substances used to carry out the activity; and

- b) The treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

4. Maintenance of plant and equipment

All plant and equipment installed at the premises or used in connection with the activity:

- a) Must be maintained in a proper and efficient condition; and
- b) Must be operated in a proper and efficient manner.

5. All above ground tanks containing material that is likely to cause environmental harm must be bunded or have an alternative spill containment system in place.

6. Bunds must:

- a) have walls and floors constructed of impervious materials;
- b) be of sufficient capacity to contain 110% of the volume of the tank (or 110% volume of the largest tank where a group of tanks are installed);
- c) have floors graded to a collection sump; and
- d) not have a drain valve incorporated in the bund structure,

or be constructed and operated in a manner that achieves the same environmental outcome.

AIR

Air Quality Management Plan

7. For all emission sources at the site the proponent must prepare an air quality management plan that includes, but is not limited to:

- Key performance indicator(s);
- Monitoring method(s);
- Location, frequency and duration of monitoring;
- Record keeping;
- Response mechanisms; and
- Compliance reporting.

8. The air quality management plan must also include:

- Details of the predictive meteorological system;
- Details of the real-time dust monitoring system; and
- Specific actions that will be taken in response to meteorological or particulate matter triggers being reached, these actions must include stopping certain activities in identified weather conditions or when certain trigger levels are reached.

9. The air quality management plan must be implemented prior to the commencement of any dust generating activities associated with the project.

General Dust Conditions

10. All areas in or on the premises must be maintained in a condition that prevents or minimises the emission of dust to the air.

11. Any activity carried out in or on the premises must be carried out by such practical means as to prevent dust or minimise the emission of dust to the air.
12. Any plant operated in or on the premises must be operated by such practical means to prevent or minimise dust or other air pollutants.
13. All trafficable areas, coal storage areas and vehicle manoeuvring areas in or on the premises must be maintained, at all times, in a condition that will minimise the emission of dust to the air, or emission from the premises of wind-blown or traffic generated dust.

Air Quality Monitoring and Management

14. Real Time Dust Monitors

- a) The proponent must, prior to the commencement of dust generating activities at the site, install continuous real time air quality monitoring for PM₁₀ and PM_{2.5} at two locations representative of residences within the Forbesdale Estate and the Avon River estate

15. Requirement to monitor ambient particulate matter

- a) The licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns.

Point 1 to Point x

Parameter	Units of measure	Frequency	Averaging Period	Method
PM ₁₀	Micrograms per cubic metre	Continuous	1-hour	AS 3580.9.8 - 2008

Note: The number and location of PM₁₀ monitors must be approved by the EPA prior to the installation of the monitoring equipment.

Note: The method must be approved by the EPA prior to the installation of the monitoring equipment.

Note: The calibration, quality assurance, quality control and audit program must be approved by the EPA prior to the installation of the monitoring equipment.

- b) Monitoring of all parameters listed in Condition 15(a) Column 1 must commence prior to earth moving activities being undertaken at the site.

16. Contingency monitoring

- a) Prior to the commencement of dust generating activities at the site, the licensee must submit a report to Manager EPA Hunter Region that details:
 - (i) contingency actions, including monitoring, that will be implemented when the weather station is not operating in a proper manner ; and
 - (ii) contingency actions, including monitoring, that will be implemented when any of Points 1 - x (continuous PM₁₀ monitoring) are not operating in a proper manner.

Note: For the purpose of the above condition 'proper manner' means:

- (i) operation in accordance with manufacturers specifications and recommendations;
- (ii) operation in accordance with relevant Australian Standards:
 - i. AS 3580.14—2011 for Condition 1(a);
 - ii. AS 3580.9.8 -2008 for Condition 2(a); and

- (iii) operation in a manner that provides data required to satisfy condition(s) of the environment protection licence.
- b) Prior to the commencement of dust generating activities at the site, EPA must approve the proposed contingency methodology presented in the report required under condition 16(a).
- c) To remove any doubt, the licensee must not undertake dust generating activities at the site at any time when there is no way assess to real time site specific or representative ambient PM₁₀ and meteorological monitoring data which satisfies the requirements of Conditions 15 or 69.

17. Predictive Meteorological System

Prior to the commencement of dust or noise generating activities at the site, the licensee must install and operate a predictive meteorological system that will predict adverse weather conditions so that operations on the premises can be shut down or altered to adequately control air quality and noise impacts.

18. Dynamic dust management

- a) Prior to the commencement of dust generating activities at the site, the licensee must submit a report to Manager EPA Hunter Region that details:
 - (i) Action trigger levels based on measured real time PM₁₀ concentrations at representative receptor locations and other inputs such as predicted and prevailing meteorology;
 - (ii) Specify actions to be taken in response to the identified trigger levels which may include, but not be limited to, stopping certain activities, additional control measures or limitations on particular site activities during adverse meteorological conditions
- b) A minimum of 1 review of the effectiveness of the dust management plan must be conducted each twelve months.
- c) The plan and the management of all relevant activities on the site must be updated in accordance with the findings of any review of the plan.
- d) The plan must be posted on the proponent's website and be made available to the EPA upon request.

19. Coal Mine Particulate Matter Best Practice Implementation

Wheel generated dust

- a) The Licensee must achieve and maintain a dust control efficiency of 84% or more on all haul roads

Control efficiency is calculated as:

$$CE = \frac{E(\text{uncontrolled}) - E(\text{controlled})}{E(\text{uncontrolled})} \times 100$$

Where E = the emission rate of the activity

- b) The Proponent must prepare a Monitoring Program to assess its compliance with Condition 19(a) under varying meteorological conditions. The Monitoring Program must detail the following:
 - the parameters to be monitored;

- the methods to be used to monitor each parameter;
- the locations where each parameter will be monitored;
- the frequency at which each parameter will be monitored;
- the Key Performance Indicators that will be used to determine compliance with Condition 5(a); and
- a detailed justification for each Key Performance Indicator selected.

As a guide, the EPA anticipates that the following parameters will be monitored:

- moisture and silt contents of haul roads;
- frequency, duration, rate and quantity of water applied to haul roads;
- frequency, duration, rate and quantity of suppressant applied to haul roads in comparison to manufacturer's specifications;
- vehicle kilometres travelled;
- haul truck weight;
- haul truck speed; and
- dust levels on haul roads.

The Monitoring Program must be submitted by the Licensee to the Environment Protection Authority Regional Manager Hunter, at PO Box 488G, NEWCASTLE prior to any dust generating activity occurring on the site.

Note: The EPA intends to require the licensee to implement the Monitoring Program once it is approved by the EPA.

- c) The proponent must submit a written report to the EPA providing the results of the Monitoring Program. The report must include an assessment of the dust control effectiveness, dust levels and the proponent's compliance with Condition 19(a). The report must be submitted by the Licensee to the Environment Protection Authority Regional Manager Hunter, at PO Box 488G, NEWCASTLE.

ODOURS

20. Potentially Offensive Odour

The proponent must not cause or permit the emission of offensive odour beyond the boundary of the premises.

NOISE

21. The proponent must prepare and implement a detailed Construction Noise Management Plan (CNMP), prior to commencement of construction activities, that includes but is not necessarily limited to:

- identification of each work area, site compound and access route (both private and public)
- identification of the specific activities that will be carried out and associated noise sources at each site and access route
- identification of all potentially affected sensitive receivers
- the construction noise objectives identified in accordance with the *Interim Construction Noise Guideline* (ICNG, DECC 2009)
- assessment of potential noise and vibration from the proposed construction methods, including noise from construction traffic, against the objectives identified in (d)
- detailed description of the feasible and reasonable noise mitigation measures that will be implemented to reduce noise from the project in an effort to meet the objectives identified in (d), including at least all feasible and reasonable measures from section 6 of the ICNG
- procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity

- measures to monitor noise performance and respond to complaints.

22. Construction work associated with the project must be undertaken:

- between 7:00 am and 6:00 pm, Mondays to Fridays;
- between 8:00 am and 1:00 pm on Saturdays; and
- at no time on Sundays or public holidays.

Note 1: for the purpose of this approval, “construction work” includes only: upgrading works for Jacks Road and Waukivory Road, construction of the mine access road and private haul road; construction of offices and amenities; construction of light vehicle carparks; construction of water management structures required prior to the commencement of construction; construction of workshop (including fuel bay, wash-down, store); construction of the ROM pad and breaker station earthworks; and installation of power generation equipment, reticulated power and communications infrastructure. All other activities are deemed operational noise.

Note 2: The EIS for the Project predicted a 10 month site establishment and construction phase.

23. Construction work associated with the project may be undertaken outside the hours specified in the standard hours if it is:

- construction that causes $L_{Aeq(15min)}$ noise levels that are:
 - no more than 5 dB above Rating Background Level at any residence in accordance with the *Interim Construction Noise Guideline* (DECC, 2009); and
 - no more than the Noise Management Levels specified in Table 3 of the *Interim Construction Noise Guideline* (DECC, 2009) at other noise sensitive land uses; and has been approved in writing by the Secretary, or
- for the delivery of materials required by the police or other authorities for safety reasons; or
- required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; or
- approved through the process outlined below.

24. The hours of construction specified may be varied with the prior written approval of the Secretary. Any request to alter the hours of construction shall:

- be considered on a case-by-case or activity-specific basis;
- be accompanied by details of the nature and justification for activities to be conducted during the varied construction hours;
- be accompanied by written evidence to the Secretary that appropriate consultation with potentially affected noise sensitive receivers and notification of relevant Council(s) and other relevant agencies has been and will be undertaken;
- demonstrate that all reasonable and feasible noise mitigation measures have been put in place; and,
- be accompanied by a noise impact assessment consistent with the requirements of the *Interim Construction Noise Guideline* (DECCW, 2009).

25. 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 Appendix C1 – Land ownership Plan of the *Noise, Vibration and Blasting Assessment* (SLR Consulting Australia Pty Ltd 2016).

Receiver	Location: MGA94 Zone 56 Easting and Northing	NOISE LIMITS dB(A)			
		Day L _{Aeq} (15 minute)	Evening L _{Aeq} (15 minute)	Night	
				L _{Aeq} (15 minute)	L _{Amax} (15 minutes)
6 Campbell	405555, 6453564	40	40	35	45
7 Ansell & Murray	403954, 6455192	36	36	35	45
19A Boorer	402107, 6452036	36	35	35	45
Any other residence	Any residence not identified above and not subject to a negotiated agreement	35	35	35	45

Note: In the EIS for the Project the proponent committed that any maintenance activities carried out during 'all other hours' (10pm-8am) will only occur on the condition that the activities are not audible at privately owned residences.

26. For the purpose of condition 25:

- 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.

27. The noise limits set out in condition 25 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) Temperature inversion conditions greater than 8°/100 m.

28. For the purposes of condition 27:

- a) Data recorded by the meteorological station identified as EPA Identification Point <?> must be used to determine meteorological conditions ; and
- b) Temperature inversion conditions (vertical temperature gradient in degrees C) are to be determined by direct measurement over a minimum 50m height interval as referred to in Part E2 of Appendix E to the NSW Industrial Noise Policy.

29. To determine compliance:

- a) with the L_{eq(15 minute)} noise limits specified above, 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_{Amax} noise limits in condition 25, the noise measurement equipment must be located within 1 metre of a dwelling façade.

- c) with the noise limits in condition 25, 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 (a) or (b).

30. A non-compliance of this Noise Limits condition 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 this Noise Limits condition; and/or
- at a point other than the most affected point at a location.

31. For the purpose of determining the noise generated at the premises: the modifying factors, except for low-frequency noise, in Section 4 of the NSW Industrial Noise Policy must be applied, where appropriate, to the noise levels measured by the noise monitoring equipment.

32. For the purpose of determining the noise generated at the premises, a correction must be applied to any measured noise level, before comparison to limits, where the $L_{Ceq} - L_{Aeq}$ exceeds 15 dB and:

- where any of the 1/3 octave noise levels in the table below are exceeded by up to 5dB, a 2 dBA positive adjustment to measured A weighted levels applies in the evening and night periods.
- where any of the 1/3 octave noise levels in Table A are exceeded by more than 5dB, a 5 dBA positive adjustment to measured A weighted levels applies for the evening and night periods, and a 2 dBA positive adjustment applies for the daytime period.

Centre frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
One-third octave $L_{Zeq}(15min)$ threshold level (dB)	92	89	86	77	69	61	54	50	50	48	48	46	44

33. To assess compliance with Condition 25, attended noise monitoring must be undertaken in accordance with Condition 29 and:

- at each one of residential receivers 6, 7, 19A and at a location representative of residences in the Avon River Estate;
- occur Quarterly, in a reporting period;
- occur during each day, evening and night period as defined in the NSW Industrial Noise Policy for a minimum of:
 - 1.5 hours during the day;
 - 30 minutes during the evening; and
 - 1 hour during the night.
- occur for three consecutive operating days.

The extent of monitoring required will be reviewed by the EPA, upon request, after the first two years of data.

34. A noise compliance assessment report must be submitted to the EPA within 30 days of the completion of the quarterly monitoring. The assessment must be prepared by a suitably qualified and experienced acoustical consultant and include:

- a) an assessment of compliance with noise limits presented in Condition 25; and
- b) an outline of any management actions taken within the monitoring period to address any exceedances of the limits contained in Condition 25.

35. Annually the noise compliance assessment report must also include an assessment of compliance with the plant and equipment sound power levels identified in Table 4.9 of the EIS. The compliance report must clearly identify the methodology used to determine the sound power levels of the plant and equipment. If plant or equipment individually exceeds the originally predicted sound power level, or if the overall mobile and fixed plant sound power level exceeds the originally predicted sound power level identified in tables 4.9 or 4.10, the proponent must stipulate actions that will be taken to ensure overall sound power levels do not exceed originally predicted levels.

36. Real Time Noise Monitor

The proponent must, prior to the commencement of noise generating activities at the site, install continuous real time noise level monitor at a location representative of residences within the Avon River Estate.

37. Dynamic noise management

- a) Prior to the commencement of noise generating activities at the site, the licensee must submit a report to Manager EPA Hunter Region that details:
 - i. Action trigger levels based on measured real time noise levels at a representative receptor location and other inputs such as predicted and prevailing meteorology;
 - ii. Specify actions to be taken in response to the identified trigger levels which may include, but not be limited to, stopping certain activities, additional control measures or limitations on particular site activities during adverse meteorological conditions.
- b) A minimum of 1 review of the effectiveness of the dust management plan must be conducted each twelve months.
- c) The plan and the management of all relevant activities on the site must be updated in accordance with the findings of any review of the plan.
- d) The plan must be posted on the proponent's website and be made available to the EPA upon request.

BLASTING

38. Blasting at the premises may only take place between 10:00am-4:00pm Monday to Saturday. Blasting is not permitted on public holidays.

Note: these time restrictions have been applied as modelling has shown there is a risk of nitrogen dioxide from blast fume exceeding relevant ground level criteria in stable meteorological conditions outside the above time period.

39. Blasting outside of the hours specified in the condition above can only take place with the written approval of the EPA.

40. Offensive blast fume must not be emitted from the premises.

Definition:

Offensive blast fume means post-blast gases from the detonation of explosives at the premises that by reason of their nature, duration, character or quality, or the time at which they are emitted, or any other circumstances:

- i. are harmful to (or is likely to be harmful to) a person that is outside the premises from which it is emitted, or
- ii. interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premise from which it is emitted.

41. Blasts must be delayed during weather conditions that would transfer excessive dust and/or fume towards Forbesdale, Thunderbolt or Avon River estates.

42. All blasts conducted on the premises must be videoed in such a manner that the scale, direction and extent of any fume and dust produced by the blast is readily apparent. Such video must be provided to the EPA immediately upon request.

Blast Limits

43. The airblast overpressure level from blasting operations at the premises must not exceed 120dB (Lin Peak) at any time at any noise sensitive locations. 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.

44. The airblast overpressure level from blasting operations at the premises must not exceed 115dB (Lin Peak) at any noise sensitive locations for more than five per cent of the total number of blasts over each reporting period. 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.

45. Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 10mm/sec at any time at any noise sensitive locations. 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.

46. Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 5mm/sec at any noise sensitive locations for more than five per cent of the total number of blasts over each reporting period. 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.

47. A breach of the abovementioned limits will still occur where airblast overpressure or ground vibration levels from the blasting operations at the premises exceeds the limit specified at any "noise sensitive locations" other than any specific locations identified above.

48. The airblast overpressure and ground vibration levels in conditions 43 to 47 do not apply at noise sensitive locations that are owned by the licensee or subject to a private agreement, relating to airblast overpressure and ground vibration levels, between the licensee and land owner.

Blast Monitoring

49. To determine compliance with condition(s) 43-47:

- a) Airblast overpressure and ground vibration levels must be measured and electronically recorded at the nearest residences or noise sensitive locations for all the parameters in the first column of the table below.
- b) The licensee must use the units of measure, sampling method, and sampling frequency specified in the other columns.

Parameter	Units of Measure	Frequency	Sampling Method
Airblast overpressure	Decibels (linear peak)	Continuous during all blasts	Australian Standard AS2187.2-2006
Ground vibration peak particle velocity	Millimetres/second	Continuous during all blasts	Australian Standard AS2187.2-2006

- 50. The proponent must monitor all blasts carried out in or on the premises at or near the nearest residences or noise sensitive locations (such as a school or hospital) that is likely to be most affected by the blast and that is not owned by the licensee or subject of a private agreement between the owner of the residence or noise sensitive location and the licensee relating to alternative blasting limits. At the minimum monitoring must be conducted at residences generally north and west of the premises.
- 51. The proponent must report any exceedance of the blasting limits to the regional office of the EPA as soon as practicable after the exceedance becomes known to the proponent or to one of the proponent's employees or agents.
- 52. The proponent must report any impact on a person from offensive blast fume (as defined in the condition 40 above) to the regional office of the EPA as soon as practicable after the impact becomes known to the proponent or to one of the proponent's employees or agents.

WATER AND GROUNDWATER

- 53. Except as may be expressly provided by a licence issued under the *Protection of the Environment Operations Act 1997* in relation of the development, section 120 of the *Protection of the Environment Operations Act 1997* must be complied with in connection with the carrying out of the development.
- 54. There must be no discharge from the premises of waters contained within open cut pits, unless such waters have first been treated in the water treatment plant.
- 55. (EPA note: the EPA is likely to suggest condition restricting or prohibiting saline water reuse on the premises, following an adequate and thorough assessment during this EIS process as to whether saline water reuse is appropriate)
- 56. The proponent must sustainably reuse as much of the treated minewater as possible, with discharges of treated water to the ephemeral creek to the north of the premises considered a last resort option, unless in times of drought (and with EPA approval) discharges are needed to supplement Avon River baseflows.

Note 1: The EIS for the Project notes the proponent intends to reuse as much of the treated water as possible and the annual volume of water produced by the water treatment plant would be sufficient to irrigate about 200 ha of land, which represents about 15 % of the land owned by the proponent in or adjacent to the mine area.

Note 2: The EPA must be provided with evidence from an appropriate authority that drought discharges are needed to supplement Avon River baseflows prior to any discharge in low river-flow conditions.

57. The proponent must supply a report to the EPA, yearly with the Environment Protection Licence Annual Return documentation, that provides details of:
 - a) The volume of minewater treated annually in the water treatment plant;
 - b) The volume of treated minewater sustainably reused throughout the annual return reporting period, including a breakdown on the locations where the minewater was reused;
 - c) The volume of treated minewater discharged offsite throughout the annual return reporting period;
 - d) Rainfall recorded over the annual return period, including a comparison to historic 10 percentile, median and 90 percentile rainfall for the area; and
 - e) Where sustainable reuse of treated minewater represents less than ninety percent of the total minewater treated in the annual return period, commentary as to the reason for this level of reuse and actions proposed to be taken to sustainably reuse as much of the treated minewater as possible.
58. Following the cessation of mining activities there must be no discharge of minewater from the premises.
59. Waste rock must be assessed to determine if it is Potential Acid Forming (PAF). PAF waste rock must be segregated, handled and disposed so as to mitigate against acid formation and pollution of waters.
60. PAF material must not be disposed above groundwater level without EPA specifically approving in writing the location and design of the out-of-pit PAF waste cells.
61. Stormwater management measures must be prepared and implemented to mitigate the impacts of stormwater run-off from and within the premises in a manner that is consistent with the guidance contained in to *Managing Urban Stormwater: Soils and Construction Volume 1* and *Managing Urban Stormwater: Soils and Construction: Volume 2C Unsealed Roads and Volume 2E Mines and Quarries* (DECCW 2008).
62. The drainage from all areas at the premises which will liberate suspended solids when stormwater runs over these areas must be diverted into adequately sized sedimentation basins.
63. The sedimentation basins must be maintained (to remove both accumulated sediments and treated water) to ensure that their design capacity is available for the storage of all runoff from cleared areas.

Note: The EIS for the proposal has noted that sediment control basins will be operated such that the water that accumulates after rainfall will be treated as is necessary to achieve the necessary discharge limits and then discharged within five days of the rainfall event.

64. Water and irrigation management plan

(EPA note: it is the intention of the EPA to add a condition similar to that shown below. This draft condition might be varied upon submission of all relevant information as requested in this letter)

Prior to commencement of the operation the proponent must develop and implement a management plan (or series of plans) that cover the surface water (including the water treatment plant), irrigation and groundwater issues. The plan(s) must include:

- erosion and sediment control measures and bunding;
- maintenance and monitoring of the treatment plant, including reverse osmosis membrane performance, and distribution system for irrigation water and brine, including operational triggers to ensure that the treatment process is functioning in a proper and efficient manner for the entire operational period;
- further development of a detailed water balance that incorporates an annual review to update the balance based on actual rainfall and effluent irrigation data;
- specifications for the unamended and amended quality of irrigation water and the circumstances under which the amendment might be varied, linked to soil monitoring;
- a soil and water monitoring program for irrigation water, soils, groundwaters and crops based on risk factors that aim to detect when specific water quality, soil or crop sustainability trigger values are nearing, or have exceeded, trigger levels;
- clearly defined management actions that are implemented when approaching or exceeding sustainability trigger values. An example of trigger values used for soil sustainability management can be found in: McGahan, Eugene and Robyn Tucker (Principle Authors), 2003, *Resource Manual of Development of Indicators of Sustainability for Effluent Reuse in the Intensive Livestock Industries: Piggeries and Cattle Feedlots*. Project No. 1816. Australian Pork Limited, Canberra, Australia, May, 2003;
- use of 'control' or 'reference' sites which are unlikely to be impacted by irrigation water to allow comparison between impacted and non-impacted sites;
- contingency plans for incidents and emergencies including for water treatment, tank or bunding failure, chemicals spills, poor crop performance, and breakage of brine pipelines;
- a program for reporting on the treatment processes and irrigation operations.

65. Water Treatment Plant Commissioning Stage Monitoring Plan

(EPA note: it is the intention of the EPA to add a condition similar to that shown below. This draft condition might be varied upon submission of all relevant information as requested in this letter)

The proponent must ensure that data is collected and collated as part of the water treatment plant commissioning stage monitoring program for amended and unamended effluent. The data must be submitted to the EPA for consideration. The data must include, at a minimum:

- organics (total recoverable hydrocarbons, including BTEX);
- radionuclides, including: combined radium-226/-228, gross alpha and gross beta;
- a full suite of metals;
- non-metallic inorganics: ammonia, nitrate, nitrite;
- salinity, major ions, alkalinity and hardness: total dissolved solids, sodium, chloride, potassium, magnesium, fluoride, sulfate, calcium, bromide, bicarbonate, carbonate, hydroxide, hardness;
- dissolved oxygen, electrical conductivity, pH, redox potential, turbidity, total suspended solids.

66. Concentration limits (consent condition)

The proponent must not discharge waters from the site, except in accordance with the conditions of any environment protection licence.

67. Concentration limits (Environment Protection Licence condition)

- a. For each monitoring/discharge point or utilisation area specified in the table\&s below (by a point number), the concentration of a pollutant must not exceed the concentration limits specified for that pollutant in the table.

POINT 1-x (each point where sediment laden water is discharged from the premises)

Pollutant	Units of measure	100 percentile limit
Total Suspended Solids	mg/L	50
pH	pH units	6.5-8.5
Oil and Grease	mg/L	5 mg/L and/or None visible

POINT Y (the discharge from the water treatment plant)

Pollutant	Units of measure	100 percentile limit
Total Suspended Solids	mg/L	50
pH	pH units	6.5-8.5
Oil and Grease	mg/L	5 mg/L and/or None visible
Other parameters and limits are yet to be determined and will be stipulated by the EPA after the submission of an appropriate EIS assessment, and prior to determination of the development application		

Note: the EPA will consider a turbidity limit in addition to (or as an alternative to) Total Suspended Solids (TSS) where it can be demonstrated there is a clear correlation between TSS and turbidity for the discharge(s) in question.

68. Water Monitoring (Environment Protection Licence condition)

For each monitoring/discharge point or utilisation area specified below (by a point number) the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns

POINT 1-x (each point where sediment laden water is discharged from the premises)

Pollutant	Units of measure	Frequency	Sampling Method
Total Suspended Solids	mg/L	Daily during any discharge	Grab Sample
Turbidity	ntu	Daily during any discharge	Probe
pH	pH units	Daily during any discharge	Probe
Oil and grease	visual	Daily during any discharge	Visual observation
Conductivity	uS/cm	Daily during any discharge	Grab Sample
Aluminium and other parameters – TBD after a more thorough assessment by the proponent			

POINT Y (the discharge from the water treatment plant)

Pollutant	Units of measure	Frequency	Sampling Method
Total Suspended Solids	mg/L	Daily during any discharge	Grab Sample
Turbidity	ntu	Daily during any discharge	Probe
pH	pH units	Daily during any discharge	Probe
Oil and grease	visual	Daily during any discharge	Visual observation
Conductivity	uS/cm	Daily during any discharge	Grab Sample
Other parameters and monitoring requirements/frequency are yet to be determined and will be stipulated by the EPA after the submission of an appropriate EIS assessment, and prior to determination of the development application			

POINT A (Waukivory Creek U/S 2), POINT B (Waukivory Creek D/S), POINT C (Avon River U/S) and POINT D (Avon River D/S) (sampling locations shown on Figure 4.50 of the EIS for the Amended Rocky Hill Coal Project dated 2016)

Pollutant	Units of measure	Frequency	Sampling Method
Total Suspended Solids	mg/L	Monthly	Grab Sample
Turbidity	ntu	Monthly	Probe
pH	pH units	Monthly	Probe
Oil and grease	visual	Monthly	Visual observation
Conductivity	uS/cm	Monthly	Grab Sample

69. Weather Monitoring

A meteorological weather station must be installed and maintained so as to be capable of continuously monitoring the parameters specified in the table below.

For each monitoring point specified in the table below the proponent must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The proponent must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns.

Point <z>

Parameter	Units of Measure	Frequency	Averaging Period	Sampling Method
Siting				AM-1
Air temperature at 2 metres	°C	Continuous	1 hour	AM-4
Air temperature at 10 metres	°C	Continuous	1 hour	AM-4
Wind direction at 10 metres	°	Continuous	15 minute	AM-2 & AM-4
Wind speed at 10 metres	m/s	Continuous	15 minute	AM-2 & AM-4
Temperature lapse rate	°C	Continuous	15 minute	Direct measurement over a minimum 50m height

				interval as referred to in Part E2 of Appendix E to the NSW Industrial Noise Policy
Rainfall	mm	Continuous	15 minute	AM-4
Relative humidity	%	Continuous	1 hour	AM-4

Monitoring for all parameters listed in Column 1 must commence prior to earth moving activities being undertaken on the premises.

Note: The location of the weather station must be approved in writing by the EPA prior to the installation of the monitoring equipment.

70. Receiving Environment Investigations

- (a) Prior to the commencement of construction the proponent must engage a suitably qualified person to conduct a baseline survey along the entire length of the ephemeral watercourse that is proposed to receive discharges from the water treatment plant to assess for impacts of erosion. The results of the survey must be compiled into a report and include photographs of any erosion issues and recommendations for actions that will be taken (including timelines) to address any erosion (or potential erosion) issues identified. The report must be provided to the EPA within two months of the person conducting the survey.
- (b) Annually the proponent must engage a suitably qualified person to conduct a survey along the entire length of the ephemeral watercourse that receives discharges from the water treatment plant to assess for impacts of erosion. The results of the survey must be compiled into a report which compares the results to the baseline survey and the previous survey. The report should include photographs, taken in approximately the same location each year, which compares any erosion issues from year to year. The report must include recommendations for actions that will be taken (including timelines) to address any erosion issues identified. The report must be provided to the EPA annually with the Environment Protection Licence Annual Return.

Note: the EPA will review the frequency of this requirement for the watercourse survey, upon request, after the first two years of surveys have been completed (noting that discharges from the water treatment plant are not predicted to occur until about Year 4).

71. Annual Report on Ambient Environmental Monitoring

Annually the proponent must engage a suitably qualified person review the results of ambient water quality monitoring conducted in the vicinity of the premises. The results of the review must be compiled into a report including graphs for key parameters at each site, showing results since monitoring began. The report must include expert commentary that discusses any trends observed, postulates the reasons for the trends and makes recommendations for any actions necessary to address any adverse trends or results (including timelines). The report must be provided to the EPA annually with the Environment Protection Licence Annual Return.

WASTE

72. The proponent must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by an environment protection licence.

73. This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require an environment protection licence.

EMERGENCY RESPONSE

74. The proponent must maintain, and implement as necessary, a current Pollution Incident Response Management Plan (PIRMP) for the premises in accordance with the requirements in Part 5.7A of the *Protection of the Environment Operations (POEO) Act 1997* and POEO regulations. The proponent must keep the incident response plan on the premises at all times. The incident response plan must document systems and procedures to deal with all types of incidents (e.g. spills, explosions or fire) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment.

