



DOC19/27616-09

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Dear Mr Rode

Tahmoor South Coal Project (SSD 8445)
Comments on the Environmental Impact Statement

I am writing in reply to your email dated 9 January 2019 notifying the Environment Protection Authority (EPA) of the public exhibition of the Environmental Impact Statement (EIS) for the proposed Tahmoor South Coal project.

The EPA has reviewed the EIS and provides detailed comment in the attachments to this letter (**Attachment A, B, C & D**). The comments highlight areas where the EPA recommends the proponent provide more information and clarification to assist the Department of Planning and Environment (DPE) in the assessment and determination of this proposal.

The EPA recommends that further information be sought from the proponent in following areas:

- Noise Emission – the EIS does not adequately address the Secretary's Environmental Assessment Requirements (SEARS) and EPA's specific requirements including low frequency noise and application of the VLAMP.
- Water Pollution - the EIS does not include contemporary assessment of the potential impact of the ongoing saline discharge from the proposed development on the Bargo River and other receiving waters.
- Reject Emplacement Area – the EIS does not provide a contemporary assessment of underground emplacement of coal wash reject material.
- Air Pollution – the EPA supports the development of an air quality management plan with a focus on real time monitoring near sensitive receptors.

Should you require any further information please contact Andrew Couldridge on (02) 4224 4100.

Yours sincerely

 12.3.19

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Attachment A

EPA Comments on the Noise Impact Assessment for the Tahmoor Coal South Project

Key issues

The EPA considers that the Noise Impact Assessment (NIA) does not adequately address the Secretary's Environmental Assessment Requirements (SEARs) and the EPA's input to the SEARs.

The NIA is inadequate because of significant technical deficiencies to allow the EPA to evaluate the extent of potential noise and vibration impacts from the project and the adequacy of the proposed mitigation measures.

- **Low frequency noise** - The NIA has not assessed Low Frequency Noise (LFN) in accordance with the Noise Policy for Industry (NPfI).
- **Modelling and predicted impacts** – The predicted noise model does not provide sufficient information to determine the full extent of potential operational noise impacts.
- **Mitigation and Voluntary Land Acquisition and Mitigation Policy (VLAMP)** – The proposed application of the VLAMP is not considered appropriate. Note that the VLAMP is applied by the consent authority (the DPE) under the *Environmental Planning and Assessment Act 1979*.
- **Existing mine noise** – The reported level of noise from existing operations is not consistent throughout the NIA. Reported existing noise levels vary by up to 13 dBA, without sufficient context to explain the discrepancy.
- **Sleep disturbance** – The maximum noise level assessment has not adequately addressed sleep disturbance in accordance with the INP.
- **Background noise levels** - The validity of the background noise measurements from 2012 referenced in the NIA is not justified, and there is no explanation for how existing mine noise has been excluded.
- **Vibration** – Potential sources of vibration, such as the drill and vent shafts, have not been adequately assessed.

To address the EPA's concerns, the proponent should provide further details on the following matters.

Low frequency noise

- 1) The NIA has not fully applied the Noise Policy for Industry (NPfI) Fact Sheet C method for analysis of LFN. The NIA should assess if LFN corrections are applicable at all receivers.
- 2) Details on proposed mitigation and management of LFN is required. The NIA states that mitigation of the coal handling and processing plant (CHPP) will achieve up to 10 dBA overall reduction. The NIA should state what C-weighted noise level reduction will be achieved.
- 3) LFN and other modifying factors should be assessed at all receivers. For example, more evidence should be provided for not applying the LFN adjustment at measurement location M8. The noise source identified at 40 and 50 Hz should be identified as either existing mine noise or extraneous noise.

Modelling and predicted impacts

- 4) The NIA has only considered one assessment scenario over the proposed 11-year project lifetime. The NIA should provide a worst-case analysis for different stages or modes of operations, including but not limited to:

- a. The initial 3 years of Tahmoor South Project (TSP) where it has assumed that no mitigation will be implemented.
 - b. The total noise levels from mine operation, existing vent operation and proposed vent fan construction.
 - c. Progressive development of the Rejects Emplacement Area (REA).
 - d. Use of haul trucks instead of conveyors to move product and run-of mine (ROM) coal.
 - e. Operation of the existing upcast vent fan (T2) as part of the TSP.
- 5) Construction of vent fans should be assessed as an operational noise source in accordance with the Industrial Noise Policy (INP). EPA considers that the vent site establishment works will utilise similar equipment to that used on the REA and is sufficiently close enough to the REA that the character of the noise will be similar to operational noise from the REA at receivers to the south.
 - 6) An accurate representation of the locations of equipment on the extended REA should be included in the modelling. The use of a single modelled location of equipment on the REA does not represent operations across the area of the extended REA and there is significant potential for noise levels to be higher at receivers than reported.
 - 7) Appendix B noise source modelling maps should be accurately labelled to identify equipment and the dozers and on-site haul trucks moving on and between the stockpiles (product and ROM). This should be included in the revised model to derive a worst-case scenario at receivers.
 - 8) All new equipment, buildings and processes should be included in the TSP noise prediction scenario, such as additional plant and new belt filter press building. This includes the:
 - a. Additional mobile plant required for coal handling;
 - b. Upgrades to the onsite and offsite service infrastructure (such as belt filter press building, vacuum pumps and gas plant);
 - c. Mine closure and rehabilitation activities.

The NIA does not indicate if the additional mobile plant, rehabilitation or service infrastructure upgrades have been considered. The NIA should confirm and if appropriate, include these sources in the model.
 - 9) The lists of plant and equipment (Tables 7.1 and 7.3) should indicate how many of each item were included in the model. The model should include water carts that are likely to be used on the site (at stockpiles and REA).
 - 10) The proponent should provide clarification on the following matters:
 - a. source heights used in the modelling;
 - b. how the conveyor sound power levels were reported (e.g. per metre or total);
 - c. how directionality of noise sources was accounted for in the noise modelling;
 - d. the modelled truck and train speeds;
 - e. how wagons were accounted for in the model;
 - f. why the noise source for rail loop only covers less than half of loop and
 - g. references to validate the sound power level of plant and equipment (for example, if they are derived from on-site measurements or from other sources).
 - 11) The assessment of the Church and College receivers should:
 - a. include passive or active recreation areas as required by the INP;
 - b. provide justification for the assumed 25 dB outside to inside correction for the Church and College buildings;
 - c. indicate if the predicted noise levels at the assessment point, 50 m to the south of the Church is representative and
 - d. identify and, if appropriate, assess the other buildings on the College grounds.
 - 12) The assessment location maps (Figure 5.1) should have the assessment location defined as per the INP; i.e. the most-affected point on or within the residential property boundary - or, if that is more than 30 m from the residence, at the most-affected point within 30 m of the residence and not closer than 3 m.
 - 13) A description of the modelling calculation method used in the NIA should be provided. A validation of the model's performance should be provided by comparing the predicted levels against measured existing levels (broadband and low frequency noise). Any calibration factors applied to the model should be stated and fully justified.
 - 14) The NIA should demonstrate the impacts for each day, evening and night period. Because predicted noise levels are significantly greater than the project specific noise levels (PSNL) and

the mitigation differs depending on the time period, the impacts need to be described for each period.

- 15) Noise contour maps in Appendix D should show the extent of the TSP areas of activity – not only the existing footprint.

Mitigation and VLAMP

- 16) Justification should be provided for the 3-year timeframe to implement all mitigation during which time substantially higher impacts were predicted.
- 17) The definition of residual impacts, mitigation and application of VLAMP rely on the predicted difference between noise from the existing mine and the predicted impact of the proposed development. The noise contribution from the operation of the existing mine should be provided.
- 18) The VLAMP states that at-receiver mitigation should be considered where impacts are greater than negligible. There are 131 receivers predicted to have a greater than negligible impact, but the NIA proposes mitigation at only two residential receivers. The proponent should provide justification for not considering more than two receivers for at-receiver mitigation.
- 19) The proposed mitigation scenario is contingent on ceasing REA operations during the night. A residual impact analysis should be provided for other time periods. In addition, the proponent needs to clarify why the source location map in Appendix B for the mitigated scenario (Figure B.3) includes sources in the REA, which is intended to be operated during daytime period only. Figure B.3 should also illustrate the proposed extent of the TSP REA.
- 20) The barrier mitigation (increased height of the northern bund and a proposed barrier adjacent to the stockpiles) described in Table 7.2 should indicate the assumed attenuation provided by the barriers. In addition, the proponent should review and, if appropriate, amend the source location maps (Appendix B), which indicate the northern bund running parallel to the rail line. Satellite maps of the surface infrastructure (Figure 3.3 in the EIS) indicate that the bund runs behind the water recycling plant and vent shaft 3, not parallel to the rail line, which will impact the effectiveness of the assumed barrier attenuation.
- 21) Additional compliance/achievable noise levels for the purposes of VLAMP should be nominated for receivers immediately south of the mine in the vicinity of Coolah Road and for receivers located adjacent to the proposed new vent shafts. The NIA states that negotiation is ongoing with two properties near to the new vent shafts, however these negotiations have not been completed. The NIA should state the residual impact and achievable noise level.

Note: The VLAMP is administered by the DPE. However, the NIA relies on the implementation of the VLAMP to manage potential noise impacts from the development.

Existing mine noise

- 22) Justification should be provided for the discrepancies of existing mine noise in the NIA. For example, at 7 Olive Lane:

- Table 7.6 (night) states the existing mine noise is $L_{Aeq(15minutes)}$ 58 dBA (including LFN modifying factor) under enhancing meteorological conditions, equivalent to 53 dBA without the modifying factor;
- Table 4.1 states that the existing L_{10} is between 40 to 48 dBA at M3 but no meteorological conditions or measurement period are provided;
- Table 5.2 states the existing $L_{Aeq(15minutes)}$ is 44 dBA with no meteorological conditions or measurement period provided and
- Chapter 4.1 states that the mine is generally in compliance with the existing consent limit of L_{10} 45 dBA.

These discrepancies indicate a difference of up to a 13 dB in the reported level of noise for existing operations. The predicted noise levels are at least 5 dB above measured levels for existing noise at most impacted receivers. The NIA relies on the predicted reduction in noise level based on the difference between existing noise levels from current operation and the predicted noise levels from the proposed development to support the proposal and mitigation strategy.

Based on the evidence in the NIA, the EPA considers that the proposed mitigation has been overestimated.

Sleep disturbance

- 23) The proponent should provide predicted L_{Amax} noise levels.
- 24) The NIA states that the existing L_{Amax} was measured as 53 dBA at Olive Lane, but the existing $L_{Aeq(15minutes)}$ at 6 Olive Lane in Appendix C is 57 dBA. This requires clarification.
- 25) The existing maximum noise level of L_{Amax} 53 dBA from dozers and coal loading into wagons exceeds the screening criteria at Olive Lane. The extent of exceedance of the screening criteria at other locations should be provided. The noise contours presented in Figure D.1 show that $L_{Aeq(15minutes)}$ noise levels are above 45 dBA at a number of receivers, therefore the extent of the screening criteria could be much larger.
- 26) Evidence should be provided to support the claim that the frequency and level of noise events will reduce under the TSP.
- 27) Further details are required on mitigation measures to reduce maximum noise level events, including the predicted reduction.

Background noise levels

- 28) Justification should be provided to demonstrate that measurements from 2012 used in the NIA are appropriate. The 2012 EIS was not submitted to the DPE and is not available for review. Monitoring graphs and summaries in Appendix A should be included for all measurements used to set rating background level (RBL).
- 29) Further details should be provided for how the mine noise was excluded from the long-term noise measurements presented in Table 5.1, and what contribution the "limited operations" had on the background noise measurements. Unattended measurements at risk of being influenced by the mine should be sufficiently supported by attended measurements or other methods during the day, evening and night periods to demonstrate the influence of the mine.
- 30) The monitoring data should be consistently reported. For example, M13 and M24 should be reported in Table 5.1, Locations M2 and M8 should be shown in Figure 5.1 and the reasons for using M2 to represent M8 and not M24, which appears to be further away from the road.
- 31) Justification should be provided as to why the existing meteorological stations on the site and at the Tahmoor South site were not used to monitor meteorological conditions during the noise monitoring and that the location used at L2 is suitable.

Vibration

- 32) Specification of what type of drill will be used for the drill sites should be provided and an assessment of vibration impact of this drill should be undertaken, or justification provided for why it is not necessary.
- 33) The EPA's input to the SEARs identifies that complaints have been issued relating to vibration from existing vents shafts. The vibration impact from existing vents should be included in the NIA as a worst-case scenario and the potential for vibration from the proposed vent shafts addressed.

Recommendations

EPA recommends that the Department of Planning and Environment:

- 1. Note that the EPA considers the NIA is inadequate because of significant technical deficiencies to allow the EPA to evaluate the extent of potential noise and vibration impacts from the project, and the adequacy of the proposed mitigation measures and
- 2. Request the proponent provide further assessment and details as described in this advice.

Attachment B

EPA Comments on the Water Impact Assessment for the Tahmoor Coal South Project

Key issues

Mine water discharges

Overall the EIS does not adequately assess the potential water quality impacts of discharges via Licence Discharge Point (LDP) 1.

Impact Assessment

The EPA's EIS Requirements for the Project (letter dated 24/04/17, DOC 17/269642-01), include the following:

- *In developing the Environmental Impact Statement (EIS) the proponent should describe the improvements achieved in water treatment and discharges at the site in recent years. This includes the performance of the new treatment plant constructed under PRP 22. The EIS should determine whether environmental values for the Bargo River are now being met downstream of the discharge or will be met following full commissioning of the plant. The EIS should assess whether additional treatment may be required to meet environmental values.*
- *The EIS should integrate the results of the aquatic health study in the Bargo River (PRP 23) as well as previous aquatic studies undertaken by the mine. An assessment should also be made of the possible increase in groundwater make and changes in quality from the new Tahmoor South area and whether additional treatment capacity will be needed.*

These two requirements have not been adequately addressed in the EIS.

An impact assessment for controlled surface water discharges of minewater (with potentially elevated levels of salinity, metals or other pollutant impacts) is not included in the EIS for LDP 1. The EIS discharge assessment is limited to referring to past and current PRPs related to the existing development and provision of water quality data and discussion for an ambient site downstream of the discharge. The status of PRP investigations and any further assessment related to the new proposal also should be integrated into the development assessment process.

Metals discharges via LDP1

The EIS refers to pollution reductions programs (PRP) 22 for metals that is currently in progress. PRP 22 aims to develop and commission a Waste Water Treatment Plant (WWTP) to reduce the concentrations of arsenic, nickel and zinc in mine water released from LDP1 based on the current operation. A WWTP was constructed in June 2015 to treat up to 6 ML/d of mine water to achieve the following metal concentration limits in the Bargo River:

- arsenic: 0.013 mg/L
- nickel: 0.011 mg/L
- zinc: 0.008 mg/L.

Based on a recent PRP report submitted to the EPA, the WWTP has not achieved the above water quality criteria and the current PRP suggests changes to the current WWTP to achieve the limits or, if unsuccessful, consider a reverse osmosis treatment plant, accounting for any constraints of brine or crystallised salt management at the site.

The EIS states that two sites downstream of the Tahmoor Mine licensed discharge point LDP 1 (SW-22 Tea Tree Hollow and SW-14 Bargo River Rockford Bridge) indicated elevated barium levels not

identified at other locations. At this site there has also been 26 exceedances of the aquatic ecosystem guideline for selenium. No further impact assessment of selenium or barium is provided.

Salinity concentrations and loads

The EIS refers to PRP 23 that did not recommend any changes to existing discharge licence limits to electrical conductivity/salinity. This assessment is not incorporated in the EIS. The additional tonnes of salt that will be discharged to the river system over the life of the new proposal and its fate downstream were not assessed in PRP 23.

Reference to the findings of a prior PRP does not provide a contemporary assessment of the potential impact of the ongoing saline discharge related to the proposed development and does not consider:

- any current or emerging issues with salinity, including new research
- additional salinity loads from extending the mining period and increasing discharge volumes
- any potential changes to the salinity or related impacts.

The information provided does not justify the statement in the EIS that the existing salinity limit of 2600 $\mu\text{S}/\text{cm}$ is acceptable for the new development.

It is unclear if a limit of 2600 $\mu\text{S}/\text{cm}$ would achieve the NSW Water Quality Objectives (WQO) for salinity of 350 $\mu\text{S}/\text{cm}$ at the edge of a near-field mixing zone (it is also noted that a site-specific trigger value of 193 $\mu\text{S}/\text{cm}$ was calculated for Site SW1). The EIS indicates that PRP 23 found localised effects to aquatic ecology at Tea Tree Hollow and Bargo River, downstream of the licensed discharge point, comprising a reduction in pollution sensitive invertebrates and an increase in pollution tolerant invertebrates. The study found the effects of the discharge to be localised within a few kilometres downstream of the discharge point. A few kilometres downstream is unlikely to relate to near-field mixing.

Ionic impacts

Salinity is a surrogate measure for 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 meaning that salinity measurement alone is not an adequate basis for assessing all potential salinity-related impacts. Different ions (sodium, calcium, magnesium, potassium, chloride, bicarbonate, sulfate and the salts they form) can induce varying degrees of toxicity to aquatic life.

To appropriately assess the impact of the proposed discharge an assessment would need to include consideration of potential ionic mix impacts and any risk of concentrations of specific salinity ions such as bicarbonate. For example, the EIS states that two sites downstream of the Tahmoor Mine licensed discharge point LDP 1 (SW-22 Tea Tree Hollow and SW-14 Bargo River Rockford Bridge) indicated elevated levels of bicarbonate and sodium which was not identified at other locations. The potential impact and mitigation measures have not been assessed in the EIS.

Other pollutants

The EIS does not provide an adequate characterisation of the discharge or assessment of the potential for pollutants other than salinity and selected metals to be present in discharges, e.g. Coal seams.

The potential for increases in pH downstream of the discharge is not assessed.

Potential levels of methane in minewater discharges are also not assessed, however, the EIS states that methane is not likely to be a significant issue.

Mixing zone policy and principles

A lack of near-field dilution in Tea Tree Hollow and at the point of confluence with the Bargo River are likely to be relevant to the Tahmoor proposed discharge, however, this is not considered in the EIS.

Where a mixing zone is used, the EPA's policy is that the NSW WQOs should be met at the edge of the area where initial mixing occurs or "near-field" mixing. If the discharge volume from a licensed discharge point dominates flows in the system under most conditions the dilution effects within a near field mixing zone could be relatively minimal. The EPA would, therefore, examine the pollutant concentrations at the point of discharge relative to the appropriate water quality guideline values.

Recommendations

EPA recommends that the Department of Planning and Environment request the following be completed:

- a surface water quality discharge assessment for LDP1 be provided on contaminants and salinity and salinity-related risks based on current scientific knowledge, including pH, metals, salinity loads, toxicity of various specific ions and potential ionic mix related risks;
- relevant information from the PRP process that can inform the impact assessment is included and, where appropriate, updated in the EIS;
- the discharge impact assessment be based on:
 - comparison to either the relevant guideline values for aquatic ecosystem protection or numerical values derived from a suitable slightly-modified ecosystem reference site selected and sampled in accordance with the Australian Water Quality Guidelines
 - all potential pollutants that could cause non-trivial harm in discharges
 - available dilution from receiving water flows that occur when discharges will occur
- the full range of metal, salinity and other potential pollutants to be assessed should 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 concentrations and loads, major ions, alkalinity and hardness, including: 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, methane.
- all practical measures are assessed and implemented to achieve the NSW WQO by the edge of the near-field mixing zone consistent with the mixing zone policy and principles;
- the overall treatment system is reviewed based on an updated discharge water quality assessment provided as part of the EIS process which considers the full range of potential contaminant and salinity-related risks and the relevant mixing zone policy and principles;
- a target set of discharge criteria are established at this stage where the WWTP is under review and the new project is being proposed.

It is also recommended that any water quality assessment separates:

1. discharge trigger values or criteria (which should be based on guideline values in for slightly to moderately disturbed aquatic ecosystems or site-specific trigger values from slightly modified reference sites selected and sampled in accordance with the Australian Water Quality Guidelines); and
2. trigger values or criteria that may be used to assess ambient water quality differences upstream and downstream of the development. In this case site-specific trigger values from some sites (that are not based on Australian Water Quality Guideline reference site requirements) may be used to compare upstream water quality to downstream water quality

using appropriate statistical comparisons. These upstream waters, however, if degraded, do not provide a basis for deriving site-specific discharge criteria.

Note the assessment could consider literature on metals that can assist in defining the bioavailable fractions of metals as a basis for adjusting the conservative guideline values, for example, as a minimum, zinc and nickel have hardness-modified trigger values that could be calculated to refine the proposed limits (see Warne, et. al. 2018). There also is the potential for further assessment on zinc, nickel and arsenic that may reduce the conservative aspects of the default trigger values, e.g. arsenic III has a lower trigger value of 24 µg/L compared to the PRP limit of 13 µg/L.

Other Issues

Wastewater storage liners

Information on storage liners for minewater do not appear to be provided in the EIS. All practical measures to mitigate the risk of seepage of mine water from storages into the surrounding aquifers or watercourses should be considered. Wastewater storage ponds should be lined to a permeability equivalent to a 900mm clay liner with permeability not less than 10^{-9} ms^{-1} .

Recommendations

EPA recommends that the Department of Planning and Environment request the following be completed:

- It is recommended that mine water storages are lined to a permeability equivalent to a 900mm clay liner with permeability not less than 10^{-9} ms^{-1} . A more permeable liner may be acceptable if a detailed justification is provided, including demonstration that the likely long-term fate of salt will not impact the beneficial use and environmental values of surrounding ground and surface waters.

Goaf storage

The EIS describes development of an underground storage within goafed areas of the Tahmoor North underground for storage of water pumped from sediment dam M3 at times when inflow to dam M3 is more than the WWTP capacity. At times of lower inflow, water could be recovered from the underground storage treated within the WWTP and released via LDP1. The underground storage would be formed within the void space of the mined longwall panels up to and including LW30. A storage capacity of 4,751 ML has been estimated within this area.

There may be potential risk to groundwater if these storages are near water courses or have a geology with cracking or low permeability. Relevant hydrogeology expertise would be required to assess any potential impacts.

Trigger values

Water quality data from various ambient sites have been assessed against ANZECC (2000) guideline trigger levels for the protection of Aquatic Ecosystems, however, a range of analytes have not been assigned guideline values (e.g. interim values from Volume 2 of ANZECC (2000) or by referencing international literature).

The purpose of site-specific trigger values in Tables 19 to Table 30 is also unclear. The ANZECC (2000) site specific trigger value methodology is used to modify the default trigger values based on high quality reference sites, e.g. use of slightly-disturbed site to derive trigger values for a slightly to moderately disturbed level of protection.

Recommendations

EPA recommends that the Department of Planning and Environment request the following be completed:

- where available, all analytes are assigned trigger values for aquatic ecosystem protection
- the purpose of the site-specific trigger values is clarified, noting that there are different uses of trigger values including:
 - as a basis for setting controlled discharge criteria; or
 - as a basis for measuring changes in existing water quality due to the development.

Sediment basin discharges

It is unclear if there are any managed overflows of minewater from licensed discharge point (LDP) 1, e.g. flows above pumping rates/timing of pumping to underground storage. This should be clarified and if necessary the frequency, volume and potential impacts assessed in the EIS.

The EIS indicates drainage from the product coal stockpile area into retention dams S2 and S3 where wastewater overflows from these storages and flows into the larger retention dam S4 from where water is automatically dosed with a flocculant prior to discharge to Tea Tree Hollow via licensed overflow point (LOP) 4. The potential impact of this discharge is not assessed in the EIS and its sizing and frequency of overflow is not clear. If pollutants other than clean sediments are present, then sizing and overflow frequency in accordance with the Managing Urban Stormwater (Blue Book) Volume 2E may not be adequate.

Controlled discharges from sediment basins

It appears that there are no controlled discharges from the Reject Emplacement Area (REA). It is unclear how storage capacity of basins in this area are restored in the required management period so that subsequent rainfall events are adequately captured and settled, e.g. it is noted that Dam S4 is pumped to Dam M3, however the management periods for these dams is unclear. This information may have been included in a PRP report, however, it is not available for assessment in the EIS.

Flocculants

The potential impact of sediment settling agents are not assessed in the EIS. It is the responsibility of licence holders to ensure their licence regulates the discharge of all pollutants that pose a risk of non-trivial harm.

Managed overflows

Managed overflows are assumed to be consistent with the requirements of the Blue Book Volume 2E, however a specific managed overflow assessment is not provided.

While overflows are likely to be diluted, the overflow frequency from the Blue Book relates to 'clean' sediment, i.e. that does not contain elevated levels of other pollutants.

Recommendations

EPA recommends that the Department of Planning and Environment request the following be completed:

- the potential for any managed overflows from LDP1 is clarified and if necessary the frequency, volume and potential impacts assessed in the EIS
- further information is provided on the methods for returning sediment basin capacities based on design management periods set out in Blue Book Volume 2E
- the potential impact of sediment settling agents in discharges from the site are assessed
- for site discharges, monitoring should occur initially for a full range of potential pollutants during controlled discharges and managed overflows. This discharge monitoring should include:

- A full suite of metals
- sulfate, total dissolved solids and electrical conductivity, major ions
- total suspended solids and turbidity
- any residual settling agent risks (flocculants or coagulants)
- volume and frequency of controlled discharges and frequency of managed overflows.

This initial monitoring should occur until it is demonstrated that mitigation measures are effective (e.g. measures may include placement of inert material on the outer surfaces of the waste rock emplacement.) Subject to initial results, a reduced suite of key indicators may be able to be developed, however, periodic monitoring of a wider suite of analytes may be required.

Sewage Treatment

Section 4.5 of Appendix J states that *"a sewage water treatment plant upgrade is proposed at the pit top to treat sewage on site for additional proposed bathhouses. The discharged effluent would be treated by the upgrade plant and would flow into two maturation ponds, which flow through to and are discharged via LDP1. Water quality tests would be carried out periodically on the water discharging from LDP1 to test for any elevated levels of faecal coliforms."*

The potential impact of the proposed sewage discharge is not assessed in the EIS and details of the upgrade are not provided, including potential impacts on downstream aquatic ecosystems and water users, e.g. recognised swimming sites. The practical measures that could be taken to prevent, control, abate or mitigate that pollution are not considered, including reuse of effluent onsite.

Recommendation

EPA recommends that the Department of Planning and Environment request these issues be addressed as part of the EIS process.

References

Warne, MstJ, Batley, GE, van Dam, RA, Chapman, JC, Fox, DR, Hickey, CW & Stauber, JL (2018). *A revised method for deriving water quality guideline values for metal, nonmetallic inorganic and organic toxicants in Australia and New Zealand.* <http://waterquality.gov.au/anz-guidelines/guideline-values/derive/warne-method-derive>.

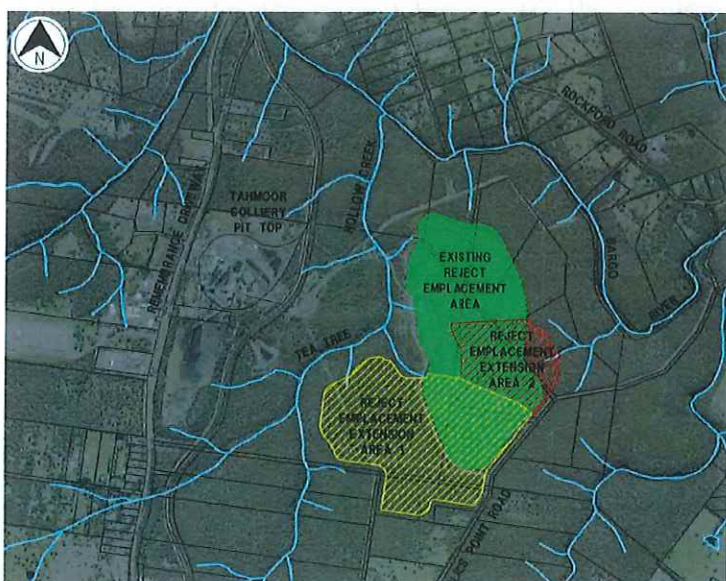
Attachment C

EPA Comments on the Reject Disposal Impact Assessment for the Tahmoor Coal South Project

Key issues

Rejects Disposal Options Study Technical Report (SKM 2018, Appendix U of the EIS)

SKM undertook an options study and cost benefit analysis for management of mine reject materials. SKM determined that surface disposal at an expanded Rejects Emplacement Area (REA) is the preferred strategy for disposing of reject material associated with the project. The proposed REA will expand upon the existing REA. The new areas (Areas 1 and 2) will measure a total of 803,666 m², to accommodate up to 9,900,990 m³ of fill, and with a total capacity of 20,000,000 tonnes.



REA Acid & Metalliferous Drainage and Spontaneous Combustion Assessment (Geoterra 2018, Appendix W of the EIS)

The assessment undertook analysis of Acid and Metalliferous Drainage (AMD) runoff from the existing REA. The assessment also analysed groundwater collected from piezometer network monitoring for impacts from the existing REA, which consists of one well upgradient and second down gradient. Leachate assessment was also conducted of material collected from exploration boreholes from the proposed development area.

The assessment found elevated levels of contaminants and water quality indicators in AMD runoff, with elevated pH, salinity (as measured by TDS) Cu, Pb, Zn, Ni and total nitrogen. However, the assessment noted that *'the REA runoff water, including water reporting to the culvert, S7A, S7 and S9, is discharged from the existing LDP1 EPA licenced discharge point, with runoff water pumped via the existing water management system to LDP1. It is also noted that Tahmoor Mine is implementing a new water treatment plant designed to remove heavy metals from the mine water discharge at LDP1, as required by the existing PRP22 conditioned in Tahmoor Mine's EPA Licence EPL1389...'*

The assessment concluded that the REA is not anticipated to generate AMD, assuming typical residence times and reaction rates. Therefore, the assessment provision for capture of runoff/leachate, monitoring and lime treatment associated with the REA 'is not anticipated'.

Notwithstanding, the report recommended that ongoing monitoring should still be required of the REA materials, and a program of routine water quality sampling and testing of runoff (as is reported to be currently conducted by Tahmoor Mine) should be continued during active placement at the REA to monitor any variation in AMD. The report recommended that site water quality monitoring programmes should test for pH, EC, acidity/alkalinity, sulphate, Al, As, Co, Cu, Fe, Mn, Ni and Zn to monitor for any effects of pyrite oxidation and AMD generation.

The report also noted that no specific waste management handling, storage or testing procedures were considered necessary regarding spontaneous combustion management, although Adiabatic Self Heating test work could be conducted, if required, during the REA construction process. The report recommended the REA should undergo regular visual inspections for the presence of spontaneous combustion, with the inspections observing the stockpiles for any visible signs of smoke or any other obvious signs of heat production.

The EPA notes the Geoterra assessment did not provide specific details on how the REA material and leachate would be monitored for AMD and contaminants of concern or specify what contingency measures would be adopted if monitoring parameters are exceeded. Similarly, the assessment did not include specific details on how potential impacts to the surrounding environment around the emplacement area, would be monitored.

Recommendations

EPA recommends that the Department of Planning and Environment request the following:

- The assessment of options for underground emplacement of coal wash reject was undertaken with information and costings obtained prior to 2013. The EPA recommends that to properly assess the feasibility of the underground emplacement, the EIS be updated using knowledge acquired from currently operating underground emplacement paste plants. One such plant that has moved from a trial to a fully operational and permanent plant is at Metropolitan Colliery. The plant now emplaces up to 20% of reject principally consisting of fine material in the goaf. The EIS should examine the technology and costs of production, and an assessment should be done of the reduction in the area of the proposed REA footprint with various amount of material emplaced underground.
- The EPA generally agrees with the recommendations presented in the EIS Appendix W, that any REA fill materials brought onto the site, along with AMD runoff, should be required to be monitored, and tested for contaminant compounds, acid potential, and spontaneous combustion.
- It is recommended groundwater should also be continued to be monitored for water quality parameters and contaminant compounds. The existing well network is considered to be limited, and consideration needs to be given to expanding this network to account for the expansion of the REA, so to adequately monitor groundwater down hydraulic gradient of the REA.
- All monitoring of the proposed REA expansion, AMD runoff and groundwater in vicinity of the expanded REA, should be ensured under an ongoing monitoring plan for the site, to include contingencies to be adopted if monitoring parameters are exceeded. This plan should be developed in consultation with the EPA in consideration of the Environmental Protection Licence requirements.

Attachment D

EPA Comments on the Air Quality Impact Assessment for the Tahmoor Coal South Project

Key issues

The EPA acknowledges that the air quality impact assessment was undertaken in accordance with EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (EPA, 2016) (Approved Methods). The air quality impact assessment predicts minimal exceedances of project specific air quality criteria. Operation of the proposed development is not predicted to result in exceedances of air quality criteria for annual average PM_{2.5}, annual average PM₁₀, annual average TSP or annual average deposited dust under the worst case scenario, when considering project only contributions or when including cumulative (background) contributions.

Recommendations

- The EPA recommends that any approval if given incorporate conditions requiring a construction Air Quality Management Plan and an updated operational Air Quality and Greenhouse Gas Management Plan.
- Tahmoor Coal should develop and implement its proposed trigger action response plan relating to meteorological triggers for dust generation for receptors in close proximity to the Surface Facilities Area
- The EPA recommends additional real-time PM₁₀ monitors be installed to monitor impacts and enable adaptive real-time management of air quality impacts. The network should target the most sensitive receptors likely to be affected by dust and specifically those on Remembrance Driveway such as the Anglican school and nearby residences. It is recommended that the monitoring network also be able to reasonably differentiate and quantify particulate emissions from the Surface Facilities Area sources in order to prioritise dust control measures.