Notice

Environmental Protection Act 1994

Information request

This information request is issued by the administering authority under section 140 of the Environmental Protection Act 1994 *to request further information needed to assess an amendment application for a site-specific environmental authority.*

To Coking Coal One Pty Limited
4/167 Eagle Street,
Brisbane City QLD 4000
Via email transmission only

ATTN: Bianca Voges-Haug

Email: Bianca.Voges-Haug@aurecongroup.com

Reference: EA0002465 (Broadmeadow East Coal Mine)

Further information is required to assess an amendment application for environmental authority

1. Application details

The amendment application for a site-specific environmental authority was received by the administering authority on 7 March 2024.

The application reference number is: A-EA-AMD-100609123

Land description: ML70257

2. Information request

The administering authority has considered the abovementioned application and is writing to inform you that further information is required to assess the application (an information request).

The information requested is provided below in **Appendix 1.**

3. Actions

The abovementioned application will lapse unless you respond by giving the administering authority -

(a) all of the information requested; or
(b) part of the information requested together with a written notice asking the authority to proceed with the assessment of the application; or

(c) a written notice –
   i. stating that you do not intend to supply any of the information requested; and
   ii. asking the administering authority to proceed with the assessment of the application.

Should the information request require an EIS process or applicant to submit a progressive rehabilitation and closure (PRC) plan then it must be completed and submitted.

A response to the information requested must be provided by **4 November 2024** (the information response period). If you wish to extend the information response period, a request to extend the period must be made at least **10 business days** before the last day of the information response period.

The response to this information request or a request to extend the information response period can be submitted to the administering authority by email to CRMining@des.qld.gov.au.

If the information provided in response to this information request is still not adequate for the administering authority to make a decision, your application may be refused as a result of section 176 of the *Environmental Protection Act 1994,* where the administering authority must have regard to any response given for an information request.

4. Human rights

A human rights assessment was carried out in relation to this decision and it was determined that no human rights are engaged by the decision.

If you require more information, please contact the department using the details below.

eburgess	2/05/2024
Signature	Date

Dr Emma Burgess
Department of Environment, Science and Innovation
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
Business Centre Coal
PO Box 3028, Emerald QLD 4720
Phone: 07 4987 9320
Email: CRMining@des.qld.gov.au

Appendix 1

No.	Matters of Interest	DESI Comment	Requested Action/s
1	Current operations	*Section 2.2 Current operations* (Supporting Document) states: *"The targeted coal resource within the ML is located within the Leichhardt seam of the **Rangal Coal Measures (RCM)** formation in the Bowen Basin. Other coal seams exist within the RCM, but these are not targeted because they are too thin or discontinuous to recover economically. The RCM is stratigraphically located above the high-ash, non-economic Girrah seam of the Fort Cooper Coal Measures".* This indicates that mining will target the Leichhardt coal seam only. *Section 3.1 Final Void Water Balance Model Development* (Appendix B Groundwater Report of the Supporting Document) states: *"The **Permian Rangal Coal Measures** comprises the target coal seams for this Project, which include the Leichhardt, Vermont and Girrah Seams".* There should be clarity and consistency in regard to what coal seam/s are being targeted and which formation they are located in. This is important in understanding pit depths and whether the modelling accurately simulates the mining that is to occur.	An updated supporting document that provides clear consistent advice as to which coal seams, in which geological formations will be targeted at Broadmeadow East.
2	Geologic unit thicknesses	*Table 4.2 Summary of Statigraphy in BME* This table identifies the local geological units.. In relation to the Rangal Coal measures, it states: *Carbonaceous mudstone, siltstone, sandstone. Coal seams:* • *Burton Seam (splitting to the Leichhardt and Vermont Seam).* • *Girrah Seam.* However, there is no indication of the average thickness of the coal seams and the interburden layers. This information should be provided to support the numerical groundwater modelling.	Provide information on average geologic unit thicknesses at the project including seam and interburden thicknesses.

3	Groundwater flow models	*Section 4.2.5 Permian Coal Measures* (Appendix B Groundwater Report of the Supporting Document) states: *"Individual coal seams form the principal water bearing strata within the coal measures and are therefore typically saturated throughout their full thickness".* And *"Groundwater storage and movement occurs within the coal seam cleats and fissures and within open fractures that intersect the seams".* *Section 3.2 Model Domain and Hydrogeological Study Area* (Appendix B Groundwater Report Appendix IV – Numerical Groundwater Modelling) states: *The development of the groundwater flow model was based on the conceptualisation of the hydrogeological system.* And *The closer the numerical model represents the conceptual understanding, and the site conditions, the better the performance of the model in making predictions.* However, *Section 3.6 Model Layers* (Appendix B Groundwater Report Appendix IV – Numerical Groundwater Modelling) identifies that only one model layer is used to represent the Rangal Coal Measures when typically, there would be multiple layers in the model to represent the coal seams and interburden separately in line with the conceptualisation of the coal seams being the principal water bearing strata within the Rangal Coal Measures. There is no discussion as to why the model layering has been structured this way. There is concern that the adoption of such model layers limits the model predictive capacity.	Provide advice – (a) as to the reasoning for using only one layer in the model to represent the Rangal Coal Measures. (b) as to the limitations caused by this approach and how the predictive ability of the model may be impacted.
4	Groundwater level and flow.	*Section 4.3.5 Rangal Coal Measures* (Appendix B Groundwater Report of the Supporting Document) *"Conceptually, the interpreted groundwater flow direction in the Permian coal measures is towards west-southwest, which is a subdue reflection of the surface topography. However, historical coal mining activities in the vicinity of the Project area has resulted in zones of*	Provide evidence including conceptual models and figures that clearly demonstrate the groundwater flow direction.

		depressurisation in the groundwater, particular in the vicinity of adjacent residual open pit voids where pit lakes, in connection with the groundwater system, are present. These pit lakes have caused a reduction in the potentiometric surface creating a hydraulic gradient towards the pit lake. Therefore, the current groundwater flow direction in the vicinity of the Project area is a reflection of this hydraulic gradient, with groundwater flowing towards these pit lakes (i.e., towards the northwest)". Evidence/conceptual model/figures to support the above statement is not clearly demonstrated.	
		Section 4.3 Groundwater levels and flows There are hydrographs in section 4.3 showing historical groundwater trends in the monitoring bores. There is also some discussion in this section of the direction of groundwater flow in some formations. However, there are no groundwater contours using observed groundwater levels. Where data exists, as in the Rewan Formation and the Rangal Coal Measures groundwater contours based on observed data should be presented to demonstrate groundwater flow direction and to provide a basis for the numerical groundwater model.	Provide separate groundwater elevation contours for the Rewan Formation and the Rangal Coal Measures based on observed groundwater levels.
5	Groundwater Quality	*Section 4.4 Groundwater Quality* (Appendix B Groundwater Report of the Supporting Document) of the supporting document states: *"A review of groundwater quality data from the current Project groundwater monitoring network (as per EA0002465) indicates that the water quality in the Project area remains relatively stable, and the key parameters noted in the EA are within baseline levels".* Piper and Durov plots and time series plots for pH, EC and sulfate show stable trends and are discussed. Time series plots of the other key parameters noted in *Table D2 – Groundwater quality limits* of the current EA are presented in Appendix III Groundwater Chemistry Graphs (Appendix B Groundwater Report Groundwater Report of the Supporting Document).	Provide – (a) raw groundwater monitoring data in excel templates provided (attached in email). (b) updated graphs to replace Figures 4.12, 4.13 and 4.14 where water quality data for individual formations are plotted.

		To further validate the groundwater chemistry graphs, raw chemical data of groundwater monitoring needs to be provided for validation. Additionally, Figures 4.12, 4.13 and 4.14 in section *4.4 Groundwater Quality* (Appendix B Groundwater Report of the Supporting Document) provides graphs of water quality data for multiple formations. These graphs should be for individual formations to allow an understanding of water quality from each formation.	
6	Cross section diagrams	Whilst *Figure 4.5 Cross-section of Project area* in section 4.2 Hydrostratigraphic Units demonstrates the cross-section area of the project, there are no detailed cross sections that show the relationship between the full proposed pit depth, backfill level and adjacent coal seams. Cross sections should be provided (North, Central and South) which show the relationship between full proposed pit depth, backfill level and adjacent coal seams.	Provide cross sections for North void, Central backfilled pit, and South void which show the relationship between full proposed pit depth, backfill level and adjacent coal seams.
7	Groundwater level triggers	*Section 5.4 Groundwater Level Triggers* (Appendix B Groundwater Report of the Supporting Document) The supporting document lacks detail as to how the numerical groundwater model was used to determine predicted drawdown levels for both the existing bores in the EA and the newly proposed bores to go in the EA. For example, the predicted drawdown levels for those older bores in the EA, proposed to go in the amended EA, don't seem to have changed. No predicted drawdown contours, with monitoring bores marked on, are presented to demonstrate how these drawdown contours compare with the drawdown triggers determined for the individual EA bores. The 4 new bores in *Table 5-5 Predicted groundwater levels with proposed trigger levels* (Appendix D Update to Groundwater Quality Triggers Memorandum (KCB March 2024)) memo	Provide - (a) more information about how the updated numerical groundwater model was used to determine predicted drawdown triggers in all bores in the proposed EA. (b) predicted maximum drawdown contours in those geologic units relevant to the proposed EA bores with

		that states, in relation to trigger elevation levels, '*within 5 m of model predictions'*. An explanation is required as to what this means and how it has been applied.	the EA bores marked on those contour maps. (c) explanation as to how the comment in Table 5.5 '*within 5 m of model prediction*' applies to the predicted drawdown triggers.
8	Maximum extent of drawdown	The bore groundwater and drawdown levels reported in the supporting documents refer to EA conditions previously approved for 5m and 2m per annum and this was based on the Water Act. However, the department has moved away from this approach to conditioning groundwater level triggers given it is not fit for purpose and does not reflect the approved level of drawdown for the project. To ensure that the drawdown authorised in the EA for each hydrogeological unit is not exceeded, in order to protect groundwater values associated with each hydrogeological unit it is best practice to include bore specific groundwater level trigger thresholds. Most commonly, the groundwater level trigger thresholds are based on the 'maximum extent of drawdown' modelled and approved for the project.	Provide groundwater level trigger thresholds for each compliance bore; and baseline water level for each bore against which the drawdown is measured. The Level Trigger Threshold may be set based on yearly drawdowns or modelling on mounding, point in time drawdown or maximum drawdown.
9	Additional drawdown contours	*Figure 5.1 Post-Closure Drawdown and Elevation for Rangal coal measures – 10-, 50-, 100- and 500-Years Post-Closure* and *Figure 5.2 Post-Closure Drawdown and Elevation for Rewan – 10-, 50-, 100- and 500-Years Post-Closure* (Appendix B Groundwater Report of the Supporting Document) provide predicted Post – Closure drawdown and elevation for the Rangal Coal Measures for 10, 50, 100 and 500 years post closure.	Provide – (a) separate predicted drawdown contours for the Rangal Coal Measures for 10, 50, 100 and 500 years post closure with contour

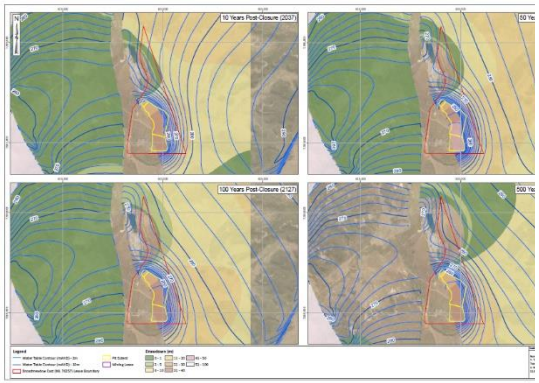


Figure 5.1 Post-Closure Drawdown and Elevation for Rangal coal measures – 10-, 50-, 100- and 500-Years Post-C

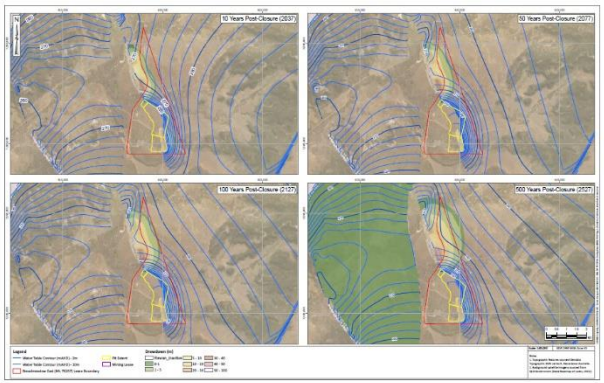


Figure 5.2 Post-Closure Drawdown and Elevation for Rewan – 10-, 50-, 100- and 500-Years Post-Closure

The colour coding for the drawdown is difficult to interpret. It would be more informative if separate drawdown contour maps were provided with contour lines marked and labelled.

It is also noted that this document is to support the determination and validation of water level triggers. Predicted drawdown contours at the end of mining should be provided and for any other time period, where maximum drawdown is predicted to occur at the location of water level trigger bores. The predicted drawdown contours should be for the layers which the trigger water level bores are monitoring and have the location of the water level trigger bores marked clearly on the drawdown contour figures.

Additionally, it is noted in Figures 5.1 and 5.2 that the groundwater levels in the area of the Central and Northern pit are very slow to recover post mining.

Discussion of the processes assumed to be occurring that result in this outcome of slow post mining recovery of the Central and Northern Pits is required.

lines marked and labelled.

(b) predicted drawdown contours for the end of mining and for any other time period, where maximum drawdown is predicted to occur at the location of groundwater level trigger bores. The predicted drawdown contours should be for the layers which the groundwater trigger level bores are monitoring and have the location of the groundwater level trigger bores marked clearly on the drawdown contour figures.

(c) discussion of the processes assumed to be occurring that result in this outcome of slow post mining recovery of the Central and Northern Pits.

10	Recharge zone description	*Section 3.7 Model boundary conditions – Recharge* (Appendix B Groundwater Report of the Supporting Document) states: *"The four recharge zones defined for this model are the extents/outcrop of: Quaternary alluvium, Tertiary sediments, Tertiary basalt, and Permian units".* It appears that the Triassic (Rewan) have been omitted from this description. In contrast *Figure 3.6 Recharge Zones* (Appendix IV – Numerical Groundwater Modelling) is a map of the recharge zones used in the model. It shows alluvium, Tertiary Sediments, Tertiary Basalt and Rewan Group. Therefore, Figure 3.6 includes the Rewan Group, but it does not mention the Permian's. Alternatively, *Table 3.4 Summary calibrated recharge rates* (Appendix IV – Numerical Groundwater Modelling) provides calibrated recharge rates for Quaternary alluvium, Tertiary Sediments, Tertiary Basalt and Triassic and Permian units. As such, there are three descriptions of the recharge zones all of which are different.	Review the references to the various recharge zones and update to reflect an accurate consistent description of what geologic units the recharge zones represent.
11	Comments on individual Bores	**MBBE0001** This bore is screened between 63m and 66m below ground level (mbgl) (*Table 4.5 Updated Monitoring Bore Network Details and Monitoring Requirements Q1 2024* in Appendix D Update to Groundwater Quality Triggers Memorandum, KCB March 2024). Based on a ground level elevation of 305m AHD (Appendix B Groundwater Report Table 3.2 Groundwater Monitoring Network (KCB, Sept 2023)) the bottom of the screened interval is 239m AHD. However, the trigger level in the existing EA *Table D1 Groundwater Monitoring Locations and Frequency* and the proposed *Table D1* in Section 8.1.1 of the supporting document (*Table 8-1 Proposed new wording of Table D1*) is 206.01m AHD. The trigger level is therefore 33m below the bottom of the screened section of the bore and 32m below the bottom of the hole. Additionally, there is an issue with the baseline standing water level.	For bore MBBE0001, review and update were relevant: (a) the baseline standing water level. (b) the trigger water level.

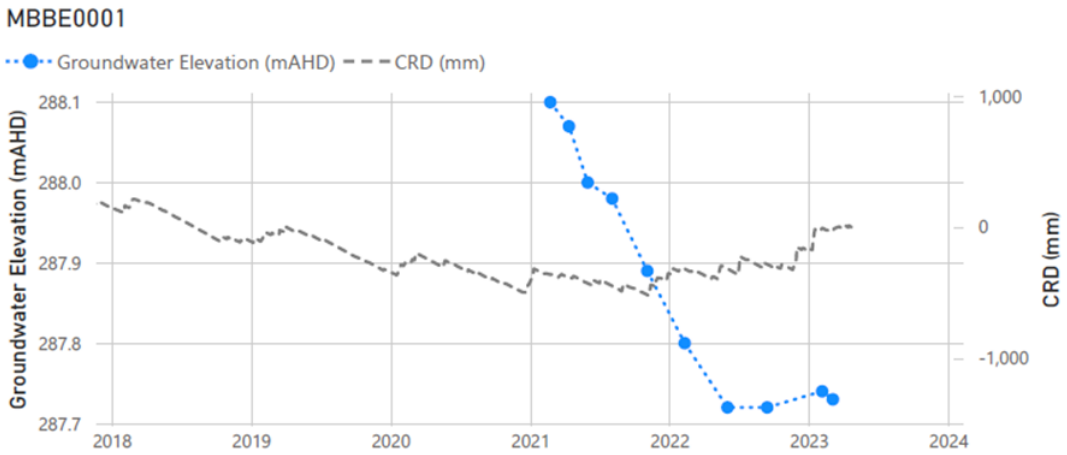
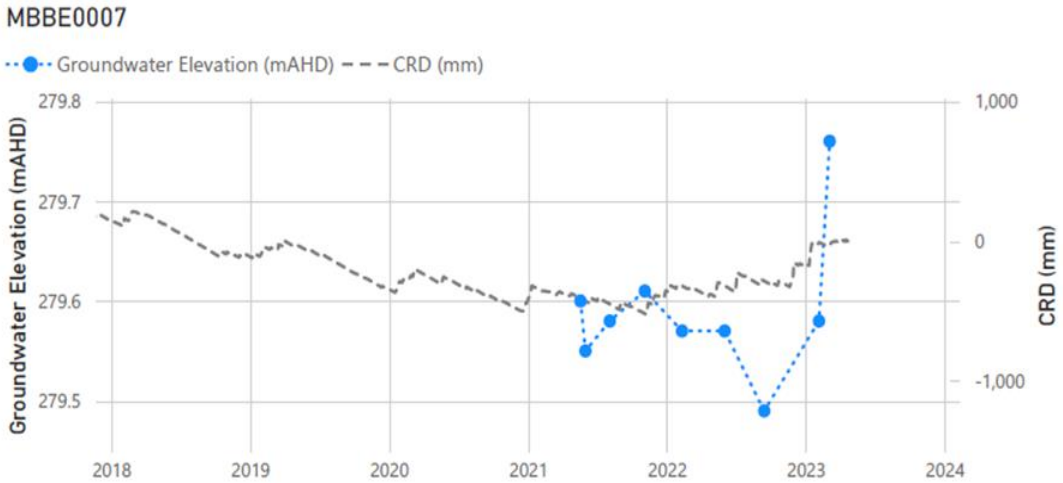
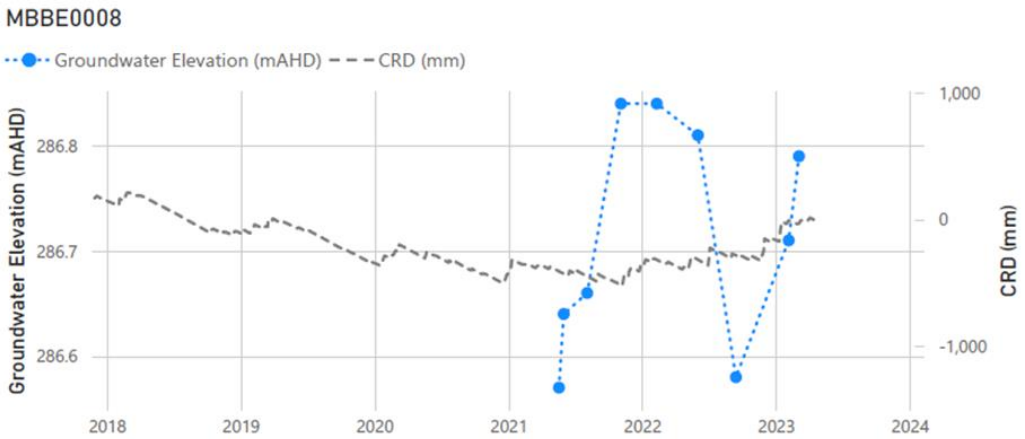
		A water plot for this bore was provided in *Appendix B Groundwater Report*, *Appendix II Groundwater Elevations Hydrographs* (page 205). A copy is provided below.  The baseline water level in *Appendix B Groundwater Report*, *Appendix I Monitoring Program*, *Table I-1 Groundwater Monitoring Bores at BME* is 42.2m below top of casing (mbtoc). Based on top of casing (TOC) elevation (EL) of 305.2m AHD (Appendix D Update to Groundwater Quality Triggers Memorandum (KCB March 2024)) this converts to a baseline water level elevation of 263m AHD. This does not seem to agree with the data above. It is unclear how the baseline water level of 42.2m was determined.	
		MBBE0004 This bore is screened between 2 and 5 mbgl AHD (Appendix D Update to Groundwater Quality Triggers Memorandum (KCB March 2024)) and reported to be mostly dry. A water level plot (hydrograph) is not provided for this bore in *Appendix B Groundwater Report*, *Appendix II Groundwater Elevations Hydrographs*, presumably because it is always dry. The existing EA has a drawdown trigger level of 2m for this bore. It is proposed to have a 2m drawdown trigger level in the updated EA Table D1 (Section 8.1.1 of the supporting document,	Provide further justification for the appropriateness of the proposed 2m drawdown level to a dry bore.

		Table 8-1 Proposed new wording of Table D1). No baseline water level or groundwater trigger elevation is provided for this bore in either the existing EA *Table D1 Groundwater Monitoring Locations and Frequency* or the proposed *Table D1*. It appears inappropriate to indicate a 2m drawdown level in the EA for a bore which is apparently predominantly dry.	
		MBBE0007 A water plot for this bore was provided in *Appendix B Groundwater Report*, *Appendix II Groundwater Elevations Hydrographs* (page 205). A copy is provided below.  There appears to be a problem with the baseline water level used for this bore. The baseline water level in *Table I-1 Groundwater Monitoring Bores at BME* (*Appendix B Groundwater Report*, *Appendix I Monitoring Program*, page 203) and in proposed *Table D1 Groundwater Monitoring Locations and Frequency* (Section 8.1.1 of the supporting document, *Table 8-1 Proposed new wording of Table D1*), is 24.9 mbtoc. Based on TOC EL of 297.9 m AHD (*Table 4.5 Updated Monitoring Bore Network Details and Monitoring Requirements Q1 2024* in *Appendix D Update to Groundwater Quality Triggers Memorandum* (KCB March 2024)) this converts to a baseline	(a) Review how the baseline water level of 24.9m below top of casing was determined. (b) Provide a drilling log for bore MBBE00007. Where required, provide an updated supporting document based on the above reviews.

		water level elevation of 273m AHD. This does not seem to agree with the data above, with the lowest water level at about 279.5m AHD. It is unclear how the baseline water level of 24.9m was determined. It is also noted that there is no drilling log available for this bore on the groundwater database. A drilling log is required for this bore.	
		MBBE0008 A water level plot for this bore was provided in *Appendix B Groundwater Report*, *Appendix II Groundwater Elevations Hydrographs* (page 205). A copy is provided below.  There appears to be an inconsistency with the baseline water level in this bore. *Table I-1 Groundwater Monitoring Bores at BME* provides a baseline water level of 19.59 mbtoc. Based on TOC EL of 305.2 m AHD (Table 4.5), this converts to a baseline water level elevation of 285.61 m AHD. Additionally, the drawdown trigger level for this bore in the existing EA and Section 8.1.1 of the supporting document, *Table 8-1 Proposed new wording of Table D1*, is 5 m. It is assumed that the groundwater trigger elevation level should equal:	(a) Review the baseline water level and trigger elevation level for bore MBBE0008. (b) Provide a drilling log for bore MBBE0008. (c) Review the ground level and top of casing elevations for both MBBE0008 and MBBE0001. Where required, provide an updated supporting document based on the above reviews.

		TOC elevation – baseline standing water level – drawdown trigger level. In this case that would be: 305.2 – 19.59 – 5 = **280.61 m AHD** However, the groundwater trigger elevation level in the existing EA and in section 8.1.1 of the supporting document *Table 8-1 Proposed new wording of Table D1* is **282.62 m AHD**. This issue requires further investigation. It is also noted that there is no drilling log available for this bore on the groundwater database. A drilling log is required for MBBE0008. It is noted that the ground level elevation and TOC EL for bore MBBE0008 and MBBE0001 are identical in the reports. Perhaps there may be a problem with one of these.	
		MBBE0009 *Table 5.5 Predicted groundwater levels with proposed trigger levels* (*Appendix D Update to Groundwater Quality Triggers Memorandum* (KCB March 2024)) provides a baseline standing water level of 22.3 mbtoc for this bore. No water level plot is provided to support this baseline standing water level. A water level plot should be provided. Additionally, a groundwater trigger level elevation of 267.48 m is provided in *Table 5.5 Predicted groundwater levels with proposed trigger levels*, with a comment that drawdown trigger levels are within 5 m of model predictions. It is not clear what this comment means. Section 8.1.1 of the supporting document, *Table 8-1 Proposed new wording of Table D1* provides a groundwater trigger elevation of 291.65 m which is also the ground level elevation provided for this bore in the supporting document, Table 4-1 Replacement Groundwater Bore Locations. The groundwater trigger elevation in *Table 8-1 Proposed new wording of Table D1* for this bore therefore appears to be an error.	Provide – (a) a water level plot for MBBE0009 to support the identified baseline standing water level in Table 5.5. (b) an explanation of the comment '*within 5 m of model predictions*' in the KCB Table 5-5 as to what it refers to and how it is applied. (c) a review of the groundwater trigger elevation in supporting

			document Section 8.1.1, Table 8-1 for MBBE0009.
		MBBE0010 *Table 5.5 Predicted groundwater levels with proposed trigger levels* (*Appendix D Update to Groundwater Quality Triggers Memorandum* (KCB March 2024)) provides a baseline standing water level of 22.3 mbtoc for this bore. No water level plot is provided to support this baseline standing water level. A water level plot should be provided. Additionally, a groundwater trigger level of 267.23 m is provided in *Table 5.5 Predicted groundwater levels with proposed trigger levels*, with a comment that drawdown trigger levels are within 5 m of model predictions. It is not clear what this comment means. The supporting document, Section 8.1.1, *Table 8-1 Proposed new wording of Table D1* provides a groundwater trigger elevation of 291.63 m which is also the ground level elevation provided for this bore in the supporting document Table 4-1. The groundwater trigger elevation in *Table 8-1 Proposed new wording of Table D1* for this bore therefore appears to be an error.	Provide: (a) a water level plot for MBBE0010 to support the identified baseline standing water level in Table 5.5. (b) an explanation of the comment '*within 5 m of model predictions*' in KCB Table 5-5, as to what it refers to and how it is applied. (c) a review of the groundwater trigger elevation in supporting document Section 8.1.1, Table 8-1 for MBBE0010.
		MBBE0011 *Section 5.4 Groundwater Level Triggers* (*Appendix D Update to Groundwater Quality Triggers Memorandum* (KCB March 2024)) states: *"No pre-mining baseline standing water level can be allocated to MBBE0011 since the bore was dry after construction and subsequent monitoring rounds confirmed that bore is dry".*	Provide further justification of the appropriateness of assigning a groundwater trigger elevation to bore MBBE0011.

		However, a groundwater trigger elevation of 271.13 m AHD has been assigned to this bore in *Table 5-5 Predicted groundwater levels with proposed trigger levels* in section 5.4. This appears inappropriate for two reasons: 1. The bore is only 6 m deep. The ground level elevation (supporting document *Table 4-1 Replacement Groundwater Bore Locations*) is 284.34 m AHD. The bottom of the bore is therefore at 278.34 m AHD which is about 7 m above the trigger level provided in *Table 5-5 Predicted groundwater levels with proposed trigger levels*. 2. The bore is reported as always dry, and a trigger level may be inappropriate to apply to a dry bore. Additionally, the supporting document, Section 8.1.1, *Table 8-1 Proposed new wording of Table D1* provides a groundwater trigger elevation of 284.34 m which is also the ground level elevation provided for this bore in the supporting document *Table 4-1 Replacement Groundwater Bore Locations*. The groundwater trigger elevation in *Table 8-1 Proposed new wording of Table D1* for this bore therefore appears incorrect and any trigger level appears inappropriate given it is a dry bore.	
		MBBE0012 *Table 5.5 Predicted groundwater levels with proposed trigger levels* (*Appendix D Update to Groundwater Quality Triggers Memorandum* (KCB March 2024)) provides a baseline standing water level of 46.91 mbtoc for this bore. No water level plot is provided to support this baseline standing water level. A water level plot should be provided. Additionally, a groundwater trigger level of 280.23 m is provided in *Table 5.5 Predicted groundwater levels with proposed trigger levels*, with a comment that drawdown trigger levels are within 5 m of model predictions. It is not clear what this comment means. The supporting document, Section 8.1.1, *Table 8-1 Proposed new wording of Table D1* provides a groundwater trigger elevation of 336.49 m which is also the ground level elevation provided for this bore in the supporting document *Table 4-1 Replacement Groundwater Bore Locations*. The	Provide – (a) a water level plot for MBBE0012 to support the identified baseline standing water level in Table 5.5. (b) explanation of the comment '*within 5 m of model predictions*' in KCB Table 5-5, as to what it refers to and how it is applied.

		groundwater trigger elevation in *Table 8-1 Proposed new wording of Table D1* for this bore therefore appears to be an error.	(c) Review of the groundwater trigger elevation in supporting document Section 8.1.1, Table 8-1 for this bore.
12	Calibration and numerical groundwater modelling	*Section 3.9.1 Calibration approach* (Appendix B *Groundwater Report* – Appendix IV – Numerical Groundwater Modelling) states: *Without an understanding of the historical mining activities and associated schedules, it is difficult to match modelled results with certain monitoring bores as part of the calibration process. Therefore, a review of the available monitoring bore network was undertaken to identify monitoring bores, and associated groundwater level records, that could be incorporated into the calibration process. Calibration focused on the more recent system conditions over the period March 2019 to January 2023.* *Section 3.1 Current and Planned Operations* (Appendix B Groundwater Report) states: *Mining commenced on the northern extent of the deposit in the last quarter of 2022 after sufficient overburden was removed.* Mining therefore was occurring at the end of the calibration period and through to 2028 in the predictive model period. There however appears to be no mining plan provided showing the details of the mining plan used in the numerical groundwater modelling. This information should be provided to provide confidence in what has been modelled.	Provide details of the mining plan used in the calibration and predictive numerical groundwater modelling.
13	Nearby mines	*Section 4 Model Predictions* (Appendix B Groundwater Report – Appendix IV – Numerical Groundwater Modelling). There appears to be no discussion of the assumptions in the numerical model as to the operations at nearby mines and how that might impact predictions in this model. These	Provide discussions as to what assumptions were made regarding the operation of nearby mines in

		assumptions should be clearly stated so that it is understood what mining impacts the modelling relates to. For example, Appendix B Appendix IV Figures 4.1 and 4.3 appear to show significant groundwater recovery in the area around Broadmeadow West but there is little discussion of this.	the modelling for this project.
14	Evapotranspiration	*Table 3.5 Summary Water Balance at the End of Calibration* Period (Appendix B Groundwater Report – Appendix IV – Numerical Groundwater Modelling) indicates evapotranspiration in the calibration period of 0. There should be some discussion as to whether this is considered a realistic representation of the groundwater system in the model domain.	Provide discussion on the water balance summary for the calibration period and in particular the assessment of evapotranspiration being equal to 0.
15	Backfill and spoils	*Section 4.2.1 Model Set-Up* (Appendix B Groundwater Report – Appendix IV – Numerical Groundwater Modelling) There is no indication in the report as to how backfill or spoil has been dealt with in the modelling. Much of the mined area will be backfilled. It is known that spoil typically receives higher recharge and has a higher hydraulic conductivity and specific yield than the natural geology it replaces. It is therefore important that it is represented in the modelling for those periods where it is in place. If separate parameters have not been applied to the spoil areas, how has this impacted predicted groundwater levels and predicted groundwater inflows provided to the water balance model.	(a) Provide advice as to how spoil has been dealt with in the numerical groundwater modelling. (b) If separate parameters have not been applied to the spoil, provide details on how this has impacted predicted groundwater levels and void water levels.
16	Post Mining Land Use	*Table G1 Post Mine Land Use (PMLU) and Rehabilitation Methods* (Appendix A Draft Environmental Authority with Proposed Changes – Appendix 5) states the Post-Mining Land Suitability Class for the PMLU disturbance areas are Class 4. Please confirm whether this is referencing the previous land suitability class definitions from Regional Land Suitability Frameworks for Queensland which defines Class 4 as 'Marginal land'.	(a) Please confirm which land suitability class definition is being followed. (b) Pending response to item 16(a), provide

		"Marginal land, which is presently considered unsuitable due to severe limitations. The long term significance of these limitations on the proposed land use is unknown or not quantified. The use of this land is dependent upon undertaking additional studies to determine whether the effect of the limitation(s) can be reduced to achieve sustained economic production". Or Whether this is referencing the current Guidelines for Agricultural Land Evaluation in Queensland which defines Class 4 as 'Unsuitable with severe limitations'. "*Currently unsuitable land. The limitations are so severe that the sustainable use of the land in the proposed manner is precluded. In some circumstances, the limitations may be surmountable with changes to knowledge, economics or technology*". If the draft EA follows the latter definition, this land suitability will not be suitable to support a stable grazing PMLU without severe limitations and management requirements.	justification that the PMLU of land class suitability 4 will support a grazing outcome without severe limitations and management requirements.
17	Southern Void Numa	Section 5.3.7 Southern Void NUMA. Although *Table 5-4 Final Southern Void* dimensions and criteria is provided (refer to screenshot below), it is not reflected in the draft EA Appendix 5 *Table G1 PMLU and Rehabilitation Methods* (Appendix 2 of the supporting document and included below for reference). The proposed completion criteria in the EA lack sufficient geotechnical safety criterion for the residual voids (NUMAs) in the 'long-term safety' rehabilitation goals (e.g. factor of safety).	Provide updated SMART criteria for inclusion in the EA for the Southern Void as a NUMA demonstrating geotechnical stability, factor of safety that can be achieved, minimum set back distance if required and other specific criteria that can be transitioned to the PRCP as SMART management milestone criteria.

Table 5-4 Final Southern Void dimensions and criteria

Design Aspect	Final Landform Construction Criteria
Structure location	Southern portion of the mined deposit (refer *Appendix 4 Figure 4* of EA0002465)
Footprint	31 ha
Depth	105 m
Overall Slope	Overall slope: 15-30% [1] DVertical distance between berms: 20 m Berm width: 5 m Drainage outward away from void towards original topography drainage paths.
End wall length	700 m
Highwall length	1200 m
Highwall and end wall slope (final pit walls (competent material))	70 degrees
Highwall and end wall slope (final pit walls (incompetent material))	45 degrees
Low wall length	1050 m
Low wall (final pit wall (incompetent material))	45 degrees
Inpit spoil slope (unrehabilitated)	Angle of repose nominally 37 degrees
Maximum void lake equilibrium level	Will not reach 300 m AHD
Surface water catchment	167 ha

It is noted that the proposed completion criteria and rehabilitation requirements in the EA may be further amended during the draft EA negotiation process.

8.1.5 Appendix 5 Table G1 PMLU and Rehabilitation Methods

Legend:
Green text = new
~~Red text with strikethrough~~ = proposed to be removed

Table 8-3 Proposed new wording of Appendix 5 Table G1

Disturbance Area (DA)	Description	Pre-Mining Land Suitability Class		Rehabilitation Method	PMLU / NUMA	Post-Mining Land Suitability Class	
		Cattle Grazing	Rainfed Broadacre Cropping			Cattle Grazing	Rainfed Broadacre Cropping
4. Southern Void	The residual void remaining post mining at the southern pit extent. Borders the ~~central backfilled void~~ central in-pit spoil dump	4 &5	4	▪ Minimised void area and volume based on economic, engineering, geotechnical, geochemical, surface water and groundwater technical reporting outcomes (Condition G8). ▪ Design final slope angles of the high, low and end walls. ▪ Conduct long term water balance studies regarding void hydrology that includes surface water and groundwater assessments. ▪ ~~Create a final void design plan~~. Predict long term water quality through geochemical modelling. ▪ ~~Manage long term water quality for livestock consumption as per Australian and New Zealand Guidelines for Fresh and Marine Water Quality (the Guidelines).~~ ▪ Backfill to a minimum of 225 RL ~~above the regional groundwater level~~, treat or remove exposed coal seams. ▪ Develop specific rehabilitation strategies that includes monitoring, surveying, stability analysis and reporting.	~~Water storage~~ Residual Void (Non-Use Management Area)	~~4 (Low wall slopes)~~ N/A	N/A

8.1.6 Appendix 5 Table G2 PMLU and rehabilitation success criteria

Legend:
Green text = new
~~Red text with strikethrough~~ = proposed to be removed

Table 8-4 Proposed new wording of Appendix 5 Table G2

PMLU / NUMA	DA	Goals	Objectives/Indicators	Criteria	Validation Method
Southern Void					
~~Water storage~~ Residual Void (Non-Use Management Area)	Southern Void	Safe Stable	a. Safety hazards in rehabilitation are as low as reasonably practical. b. Minimise void area. c. Stabilise walls and slopes.	▪ Install slopes and batters as per the void closure plan: • Overall slope: 15-30% • Vertical distance between berms: 20 m • Berm width: 5 m • Final pit walls (Competent material): 70 degrees • Final pit walls (Incompetent material): 45 degrees • Underwater slopes: Angle of repose 37 degrees • Void maximum surface area (31 ha). • Void maximum depth (105 m). • Maximum void lake equilibrium level will not reach 300 m AHD. • Drainage direction: into the void • Backfill to a minimum of 225 RL. ~~above the groundwater level (water level based on conceptual modelling).~~ ▪ Safety bund constructed at 2 m high, base width of 5 m from unweathered, freely draining, end- dumped rockfill at a minimum 20 m offset from the pit perimeter as per the closure plan. ▪ Design the void as per the void closure plan. ▪ Final shape implemented as per rehabilitation and management strategies included in the void closure plan. ▪ Partial backfill to a minimum of 225 RL as per the latest void water balance modelling. ~~according to above the groundwater level and as per the baseline groundwater assessment.~~	▪ Geotechnical report and certification from an appropriately qualified and experienced person AQP that the area has achieved stable condition, including: ▪ Safety bund constructed in accordance with engineering requirements for height, based on crest width. ▪ No public access to high wall or end wall areas. ▪ Fence entire perimeter and bund to high wall areas. ▪ Absence of active rill/gully erosion ▪ Certification that drainage measures and structures have been appropriately established and are directing overland flow away from the highwall edge; and ▪ Certification that erosion and sediment control measures have been installed and are operating as designed ▪ Final void located outside of the Isaac River floodplain, as defined under the *Environmental Protection Act*. ▪ Evidence, which has been certified by an appropriately qualified person, based on up to date groundwater modelling, that any final void lakes will not overflow nor potentially contaminate any other surface water bodies and groundwater aquifers.

PMLU / NUMA	DA	Goals	Objectives/Indicators	Criteria	Validation Method
		Non-polluting	Pit waters are contained such that they do not impact or interact surface or groundwater.	▪ Coal seams to be treated, removed or covered in the backfilling process. ▪ The installation of certified contours and drains as per design by an AQP (CPESC). ▪ Surface water quality of the receiving environment as per the water management plan. ▪ Groundwater aquifers maintain their pre-mining or reference bore water quality. ▪ Prescribed environmental matters maintain their pre-mining condition ▪ Groundwater quality as per the closure water management plan. ▪ No exposed hazardous material. ▪ Conduct a water balance study to assess the void surface and groundwater interactions. ▪ Predict long term water quality for the overall final void system.	▪ Surface water and groundwater trigger limits assessed as per the frequencies noted in the closure water management plan. ▪ Certification by an AQP that the water level and quality will not cause harm to the surrounding environment. ▪ Groundwater monitoring demonstrates that the groundwater quality is within 95th percentile of the results of baseline pre-mining bore monitoring results, or when baseline is not available, reference bores which have not been impacted by mining activities.
		Self-sustaining	a. Adequate revegetation and aquatic species richness. b. Littoral zone increases and linkages with terrestrial vegetation.	~~▪ Battered slopes with 60% vegetation cover as per the closure and revegetation plans.~~ ▪ Structural, geotechnical and hydraulic factors based on the physical and chemical characteristics of the site. ▪ Spoil shaped to connect to the surrounding landscape where possible. ▪ No active erosion. ~~▪ Water quality suitable for stock watering as per Australian and New Zealand Guidelines for Fresh and Marine Water Quality (the Guidelines).~~	Post closure aquatic, flora and fauna ecological monitoring of the low wall area as per the monitoring plan.

Legend:
Green text = new
~~Red text with strikethrough~~ = proposed to be removed