Table 1: Vulcan Complex Project - Request for Information Responses

Section	ID #	Comment	Requirement	Proponent Response
Supporting Information Document General Comments	1.	Under Schedule 8, Part 3, Division 1 and 2 of the Environmental Protection Regulation 2019 (EP Reg), the administering authority is required to decide the extent to which the application achieves each relevant environmental objectives. A demonstration of how the proposal meets the environmental objectives and performance outcomes has not been provided.	It would be helpful if details are provided for how environmental objectives and performance outcomes will be achieved or not achieved.	An Environmental Objectives and Performance Outcomes Cross Reference table has been developed (**Table 4**, **Section 5.14** of the Site-Specific **EA Application Supporting Information** document) which provides an explanation of how the project will address the objectives and outcomes identified in the Environmental Protection Regulation 2019 (EP Reg), where relevant.
	2.	Providing the necessary plans can help to demonstrate how the applicant can perform their due diligence and meet their environmental obligations, otherwise conditions might be imposed to require the implementation of a system to manage risks to the environment. The supporting information document does not discuss in detail management plans, monitoring programs or mitigation measures mentioned in various appendices.	Develop and provide (if available) the relevant mitigation and management plans to demonstrate how risks will be managed and how the applicant will meet their environmental objectives as part of the information request response, otherwise demonstrate that a plan is not required at this stage.	The Water Management Plan, Erosion and Sediment Control Plan, Waste Rock Disposal Plan and other Environmental Management documentation which has been prepared for the Bulk Sample Project will be updated to address the Vulcan Complex Project. Vitrinite would be open to the Department conditioning updates to these plans. The Environmental Objectives and Performance Outcomes cross reference table outlines the applicable management and mitigation measures for each element of the VCP.
Supporting Information and Appendices General Comments	3.	Ensure all details updated through this information request in the assessments (appendices) are also updated in the information within the supporting information document.	Update both supporting information and appendices to avoid inconsistencies between the documents.	Relevant updates have been made to several individual technical assessment reports in response to the information requests in this table. Updated technical assessments have been re-appended to an updated version of the **EA Application Supporting information** document, and an updated **PRC Plan,** where relevant**.** It should be noted that the **EA Supporting Information** D**ocument** serves as a summary document for the information within the technical appendices, and is not intended as the overriding direct source for the information within the technical documents. The updates made to individual technical studies and assessment reports in response to requests for information have been brought across into the body of the **PRC Plan** and the **EA supporting Information** document**,** where relevant, for consistency, and are also cross referenced in the associated information request responses within this document.

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				In addition, the information requests in this document have been allocated an individual identification number for ease of navigation. Where responses in this document are relevant to more than one information request, a cross reference has been made to the identifier(s) for all responses that are relevant to an information request, for completeness.
	4.	There are photographs taken onsite through all documents that do not have coordinates or maps identifying where the photographs have been taken.	Provide coordinates or maps of photograph locations featured throughout the Supporting Document and all appendices.	The **EA Application Supporting Information** document, technical appendices have been updated with either coordinates or maps of photograph locations, where available.
Supporting Information Document Section 5.1.4 Flood Assessment	5.	Information within this section is not referenced to the assessment appendix. Statements and data are made with no information provided to justify conclusions of the flood assessment. Unclear what existing and post-closure conditions the potential flood impacts were assessed for.	Provide clarification on what "conditions" are being referred to when discussing the existing and post-closure conditions used for the flood assessment.	The **EA Application Supporting Information** document **Section 5.1** has been amended to provide further detail from the **Surface Water Assessment (Appendix A**) with regard to both the existing and post-closure conditions that the potential flood impacts were assessed against.
Appendix A Surface Water Assessment General Comment relating to sections: 5.2, 5.3, 7.1, 7.3.3 and 9.4.2. *Clarity around the need for release of mine-effected water during operations*	6.	There are some potential inconstancies in the risk assessment of mine-affected waters and understanding the need for a controlled release to the environment. For instance, in the beginning sections of the assessment there are no plans for the mine-affected waters to be released under 'normal operating conditions' (see Section 5.3 bullet points). This position is also reflected in the water balance model results where a negligible '0 ML/year' outflow is anticipated (see Table 7.1 - Average annual water balance – all realisations). However, in the middle Section (7.3.3) of the assessment (see below quote), the likelihood of release of mine-affected water during wet conditions to the environment has been discussed. *"If there is a 5%ile or wetter climatic condition then the on-site water storages would be filled to capacity and the Jupiter pit would have to store excess water for many months potentially disrupting mining activities*	The requirement for release of mine-affected water to the Boomerang Creek over the life of the activity should be determined and if required, conditions should be proposed based on the Department's Model mining conditions (DES, 2017).	Under the current strategy, Vitrinite does not plan any controlled releases of mine affected water from the Project. As identified by DES, model results indicate that mine affected water storages could fill to maximum operating volume during very wet (5 th %ile exceedance probability) years in modelled Stage 2 of operations (a 2 year operating period). Given the short operating period of the mine, this is considered a very low risk to the project. Full storage volume of mine water dams are not predicted to overflow under any of the modelled climate sequences, however releases of mine affected water may be required as an option under very wet conditions in order to allow dewatering of pits (in the 5 th %ile exceedance probability), and avoid long term disruptions to mining. **Section 9.3** of the **Surface Water Assessment** has been updated to include preliminary mine affected water release limits. These release criteria are consistent with the model mining conditions and conditions for similar mines in the surrounding area. The release criteria will be updated and completed progressively as part of the Water Management Plan once sufficient baseline monitoring has been collected (described further in the responses below).

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		for extended periods. To prevent this happening, additional water storage and/or water disposal methods such as controlled discharges would be required to recover the Jupiter pit sooner." In a later section, discussion around modelling indicates the potential need to release from mine-affected water dams. For example, it is stated that Jupiter pit (main mining pit) may begin to accumulate water during Stage 2 during wet weather conditions; owing to insufficient storage capacity of five mine water storage dams (see Section 7.3.3.1 — In pit storage) and might result in controlled release of mine-affected water to the near-by receiving environment of the Boomerang Creek catchment. In order to determine the appropriate approval conditions for the activity, the need for controlled release of mine-affected water should be determined. If not, the activity is likely to be conditioned as a no release site.		
Appendix A Surface Water Assessment General Comment relating to sections 5.2, 5.3, 9.6 and 9.7	*7.*	*Proposed investigation approach in the case of exceedances to the water quality objectives in the downstream environments.* The current proposed approach for investigations of wastewater releases is to compare monitoring point results to water quality objectives of the receiving environment. We (the department) support this approach in principle, but further information is required as to how this will be done - the indicators used, the values applied along with the methodology that will be used. The reality is that water quality objectives may need to be assessed against data over long periods of time for physical chemical indicators and this may be less suitable for assessing the impact of short term mine releases. Furthermore, water quality during rain events, when releases typically occurs, may not comply with water	Further details are needed on the proposed investigation approach for investigating releases from the site along with specific information around which monitoring points will be used to assess each release point.	**Section 9** of the **Surface Water Assessment** has been updated to include further detail regarding the proposed monitoring strategy including indicators used, timing of sampling, release values applied, and methodology used. In addition, further clarification has been added to designate monitoring points as upstream/ downstream points, as well as which monitoring points correspond to which dam.

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		quality objective. This is why having suitable upstream or control sites is important and needs to be part of the assessment. The timing of the sampling and the location of the sampling is also critical. Without clarifying these approaches, it will be difficult to know whether the investigation approach is suitable. It is not exactly clear at this stage as to which dams and release points relate to which receiving environment monitoring points. This should be clarified.		
Appendix A Surface Water Assessment Section 4.2 Local Drainage Network	8.	Figures 4.6 show drainage line 2 is constructed from gravel and earth. Will erosion control measures be installed (vegetation etc.) to prevent erosion of all similar drainage structures?	Provide information as to the measures to control erosion and maintain all diversions and drainage lines.	Erosion control measures for drainage structures are intended to be included in an update to the existing **Erosion and Sediment Control Plan** (ESCP) along with updates to the **Water Management Plan** (WMP).
Appendix A Surface Water Assessment Section 4.5 Figure 4.14	9.	Figure 4.14 is hard to interpret meaningfully. Could this data be displayed in a different way? Separate plots?	Clarify the importance of this information in the preceding sections and reconsider the method of displaying this data.	The relevance of the information in **Figure 4.14** of the **Surface Water Assessment** (Electrical conductivity [EC] and Flow in the Isaac River at the Deverill Gauge) has been outlined in **Section 4.5.1**: *The Deverill gauge is located upstream of the point where Boomerang Creek drains into the Isaac River. The gauge would therefore be representative of water quality in the receiving waters of the Isaac River from the Project.* **Figure 4.14** is intended as an accompaniment to **Figure 4.15**. The same data which is shown in **Figure 4.14** is displayed in a different way in **Figure 4.15**. **Figure 4.14** shows in detail the recorded discharge and EC versus time as well as where there are periods of available data. **Figure 4.15** shows the same information as a relationship of EC versus discharge.
Appendix A Surface Water Assessment Section 4.5.2 Local Water Quality	10.	Section 4.5.2 explains that local data is insufficient to establish water quality objectives (WQOs) and regional WQOs will be relied upon until sufficient data is collected.	Please clarify if WQOs will transition to, based upon local data once sufficient data is available. Which WQOs are proposed to be used? Will they be used as interim release limits/trigger limits? And, please clarify what criteria will be used to decide when local data will be used for WQOs?	The WQOs for the regional environment are outlined in **Table 3.1** of the **Surface Water Assessment**. These WQOs will be compared with the receiving water quality laboratory analysis parameters outlined in **Table 9.2** as well as the field testing parameters outlined in **Section 9.2** of the **Surface Water Assessment**. Preliminary receiving water contaminant trigger levels and mine affected water release limits have been added to **Section 9** of the **Surface Water Assessment**. It is noted that some of the limits for these are still to be confirmed (TBC) and will be developed as part of a **Water Management Plan** (WMP) once sufficient baseline data has been collected. ANZECC & ARMCANZ (2018) recommends at least 2 years of monthly sampling to set

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				guideline values. Therefore, the local data will be used once 2 years of sampling data is available. For all parameters which are TBC, regional WQO's will be used as interim release limits/trigger limits.
Appendix A Surface Water Assessment Section 4.6.2 Sodic and dispersive soils	11.	Section 4.6.2 does not specify the sodicity of the soil types in any absolute or numerical terms.	Please provide added detail as to the measure of exchangeable sodium percentage and Emerson class of surveyed soils.	This information is provided in **Section 4** of the **Soil and Land Suitability Report** (**Appendix I** of the **EA Supporting Information** document) prepared by AARC.
Appendix A Surface Water Assessment Section 5.3 Diverted runoff water management, Table 5.1	12.	Surface water collected in the sediment dams appears to include mine-affected water. Water coming in contact with waste rock spoil can have higher contaminant concentrations and should therefore be considered as mine-affected. Table 5.1 of Appendix A indicates that the surface water runoff from areas that are disturbed by mining operations (including out-of-pit waste rock emplacements) could report to the sediment dams and could be discharged with sediment related stormwater. Such wastewater, generated during the mining operations, should be classified as mine-affected water and be managed accordingly. Water management for the project is conceptualised in Table 6.4. The majority of mine-affected water from the main Jupiter pit reports to the dam MWD1 which is further received by the sediment dam - SD6. Sediment dam SD6 overflows to the Drainage Line 1 in Stage 1 and DD1 in Stage 2 of the project and finally reports to Boomerang Creek. Therefore, there is a possibility of mixing of mine-affected water generated from the operations with the surface water collected in the sediment dams (see Table 5.1). Sediment dams usually consist of sediment-laden water from stormwater run-off. The risk of mixing	Mine-affected water and dams should be categorised separately to the sediment dams that just deal with sediment and erosion control. Water in contact with waste rock spoil should be categorised as mine-affected water and sediment dams should not receive water from mine affected dams. The report should be amended to clarify water management and dam classification considering these comments.	Water coming in contact with waste rock has been classified as surface water in this assessment rather than mine-affected water. This is consistent with the definition provided in the DES *Model Mining Conditions* (2017), which states that mine-affected water is (bolding added for emphasis): *iii) rainfall runoff which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated,* ***excluding rainfall runoff discharging through release points associated with erosion and sediment control structures that have been installed in accordance with the standards and requirements of an Erosion and Sediment Control Plan to manage such runoff,*** *provided that this water has not been mixed with pit water, tailings dam water, processing plant water or workshop water;* Water coming into contact with waste rock is managed within sediment dams that have been designed in accordance with IECA (2008). These sediment dams and associated drains will be included in an updated ESCP for the Project. Furthermore, samples of the VCP overburden material analysed by RGS (2019) confirms it is Non-Acid Forming (Barren) with a negligible risk of generating acid mine drainage and there are no elements (metals/ metalloids) enriched in the sample materials. Initial static and kinetic test results indicate that surface runoff and seepage from the sample materials are likely to be pH neutral with moderate excess alkalinity, and low levels of salinity. Based upon this data, runoff reporting to the sediment dams from the waste rock is expected to be of significantly higher quality than water draining from the MIA, workshop and stockpile areas to the mine water dams, which has likely been in direct contact with coal. It is therefore considered beneficial to classify runoff from the waste rock spoil separately to the mine affected water onsite and treat this runoff through the sediment water system, rather than group it with the poorer quality coal affected water. The interaction between the mine affected water system and

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		of surface water from the sediment dams and mine-affected water from the storage facilities has not been sufficiency addressed in the assessment.		sediment water system (through the possibility of overflows of MWD1 to SD6) is addressed in the response below.
Appendix A Surface Water Assessment Section 5.6.1 Mine Affected Water Dams	13.	Section 5.6.1 does not discuss the environmental risk if Mine Water Dam (MWD) 1 is full. Where does water in MWD1 go if it overtops? Can water in MWD1 be dewatered back into MWDs 2-5?	Please provide details as the risk of uncontrolled discharges from MWD1 if it becomes full and overtops. And, please provide details as to where releases are made if MWD reaches capacity.	An appropriate operating volume and capacity has been designated for MWD1 (as outlined in **Section 5.6.1** of the **Surface Water Assessment**) to minimise the risk of overflows. As discussed in **Section 7.3.5** of the **Surface Water Assessment**, MWD1 is not predicted to overflow under any of the modelled climatic sequences and therefore this overflow is considered a very low risk. In the rare event that MWD1 did overtop, the runoff would likely drain to SD6. If the MWD1 is at risk of overtopping, the mine water could be dewatered to the other mine water dams (MWDs 2-5) or to the open cut pit to avoid an overflow. Additionally, assuming the Environmental Authority includes a mechanism to release mine affected water, controlled releases to the environment could be undertaken to further reduce the risk of uncontrolled overflows.
	14.	Where does water in MWDs 2-5 go if MWD1 is full? Can water be pumped between MWDs 2-5?	Please provide details as to the risk of an uncontrolled release from any MWD if MWD1 is full when MWDs 2-5 are also full. If the risk is negligible please justify.	If MWD1 is full, water is stored in MWDs 2-5. These mine water dams have been designed to have sufficient capacity to minimise the risk of uncontrolled releases. The mine water dams (MWD1 to 5) are not predicted to overflow under any of the modelled climate sequences, as discussed in **Section 7.3.5**. These overflows are therefore considered very low risk. Notwithstanding this, overflows from these mine water dams would drain into Drainage Line 2 before entering the Peak Downs water management system.
Appendix A Surface Water Assessment Section 9.2 Surface Water Monitoring locations	15.	There are issues around the Status of dissolved metals/metalloid monitoring in the mine-affected water dam and releases. Monitoring of a number of water quality indicators at mine-affected water storage facilities has been proposed in Table 9.3. However, it is unclear whether dissolved and total metals would be monitored in the tailing facilities, but both are recommended.	Clarify whether dissolved metals/metalloids would be monitored at the mine-affected water storage facilities. Where there is a potential for release to surface waters, both should be monitored.	No tailing storage facilities are proposed as part of the Project and therefore monitoring of tailings has not been considered. Additional discussion has been added to **Section 9.3** of the **Surface Water Assessment** to indicate that both dissolved and total metals will be collected during monitoring of mine-affected water storages.
Appendix A Surface Water Assessment Section 9.7 Receiving Environmental	16.	There are uncertainties around the suitability of proposed monitoring points for the receiving environment monitoring program. Even though four receiving environment monitoring points (VSW1,	The classification of monitoring points in terms of upstream and downstream should be clearly stated for any receiving environment monitoring point. Downstream monitoring points should be designed to assess the potential future impacts of all mine release points including from mine-	**Section 9** of the **Surface Water Assessment** has been updated to include more information on the strategy for compliance monitoring and regulation of discharge waters, including preliminary end of pipe release limits. Monitoring points have also been designated as upstream or downstream monitoring sites in **Table 9.1**. Additional clarification has been added to **Table 9.1** to clearly define which dams the downstream monitoring points are intended to assess.

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Monitoring Program (REMP)		VSW2, VSW3 and VSW8) are nominated to study receiving water quality during releases, as these are not classified in terms of upstream, off-stream or downstream monitoring points. In addition, no downstream monitoring points are proposed that that assesses the water quality of Boomerang Creek. Would such monitoring be covered under a Receiving Environment Monitoring Program (REMP)? From the diagrams provided, it is assumed that VSW8 and VSW2 are downstream to the activity. VSW3 appears to be an off-stream site. Only downstream sites would be used to assess potential impact. Upstream and off-stream sites would assist with developing site-specific triggers for comparison. Even though the information states that which channel the dams are to release to, it is not exactly clear whether all releases would be assessed by the current downstream monitoring points. For example, will any of the dams' release to Chanel 1 below VSW8? It appears that SD4 would overflow in an easterly direction. It should be clearly stated as to which potential release sites (or dams) would be associated with which downstream locations. This information should be provided as part of the assessment and Appendix A and will help assess if the monitoring points are adequate.	affected and sediment dams. Furthermore, a strategy for compliance monitoring and regulation of discharged waters should be clearly presented in the assessment. Ideally end-of-pipe limits for the water quality of dam releases should be proposed and should be the primary basis for regulation.	
Supporting Information Document And Appendix B Groundwater Assessment General Comment	17.	There is inconsistent information throughout the supporting document and the assessment when analysed together that identify drawdown to be an issue but not issue enough to establish management plans.	Ensure that all information is accurately corresponding with each other within the documents, and all references to drawdown are consistent between not only Appendix B and the groundwater section within the supporting document but also when referred to in other appendices such as stygofauna etc.	Both the **PRC Plan** and the **Stygofauna Assessment** (**Appendix E** of the **EA Supporting Information** document) have now been amended to be consistent with the description of potential drawdown as outlined in the **Groundwater Assessment** (**Appendix B** of the **EA Supporting Information** document).

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Appendix B Groundwater Assessment General Comment	18.	Throughout the assessment there are references to water management strategies however they do not provide in depth discussion into the components of said strategies.	Adequately demonstrate that the proposed water management strategies will perform adequately in terms of maintaining the capability of reducing mine affected water inventories and compliance with any proposed release criteria. The water management system performance must demonstrate that it is able to manage excess water during and after very high rainfall wet season conditions.	The **EA Supporting Information** has been updated to provide more detailed information in the **Surface Water Assessment** (**Appendix A** of the **EA Supporting Information** document) regarding compliance with proposed release criteria and the performance of the proposed: **Surface Water Management Strategy (**outlined in **Section 5)**; and the **Receiving Environment Management Plan (REMP)**, (outlined in **Section 9).** The **Groundwater Assessment** (**Appendix B** of the **EA Supporting Information** document); also has detailed information in the in **Section 7.2** regarding the performance of the proposed **Groundwater Management Strategy** and **Ground Water Management Plan** as outlined**.**
Supporting Information Document Section 5.2 Groundwater	19.	The document states that to determine the local environmental values and water quality objectives of the groundwater resource are in accordance with relevant legislative requirements, the following acts were referred to: • the Environmental Protection (Water) Policy 2009 (EPP Water) (Department of Environment and Heritage Protection, 2011), • the Queensland Water Quality Guidelines (Department of Environment and Heritage Protection, 2009), and • the ANZECC Water Quality Guidelines (AWQG, 2018).	There has been no reference to whether the following guidelines and manuals have also been utilised: • Queensland Monitoring and Sampling Manual (2018). • Guideline by Queensland Government: Using monitoring data to assess groundwater quality and potential environmental impacts Provide clarification whether the above has been utilised within the groundwater assessment.	Reference to the monitoring and sampling manual has now been provided in the **Groundwater Assessment** (**Appendix B** of the **EA Supporting Information** document) in **Section 1.1**, **Section 5.3**, **Section 5.8.1** and included in the references (**Section 9**). The guideline (DSITI, 2017) is currently mentioned in **Section 5.8.4** and **Section 7.2**. Further context has been provided in **Section 7.2**.
Appendix B Groundwater Assessment Section 5.1 Budgets	20.	Within budgets (water balances) there is minimal reference to modelling being undertaken to assess the extent of groundwater level impacts from the proposed project and the rate of groundwater inflow to the pits.	Provide further information.	**Section 6.1.1** of the **Groundwater Assessment** (**Appendix B** of the **EA Supporting Information** document) states the objective of the modelling is to quantify impacts of the Project both in terms of drawdown and groundwater fluxes. Further to this, **Section 6.2.1** provides the predicted inflows to the VCP pit and **Section 6.2.2** provides a summary and discussion of modelled water budgets or fluxes. Predicted drawdown resulting from the project is discussed in **Section 6.2.3** and a calibration constrained, null space Monte Carlo stochastic method for uncertainty has been used to assess the uncertainty in both drawdown and groundwater fluxes. The cumulative impacts of predicted inflow rates are discussed and presented in **Section 6.7**.

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				In addition to this **Appendix C** of the **Groundwater Assessment** also provides a series of graphs showing the overall boundary conditions water budgets or fluxes. **Table 22** has been amended in **Appendix C** of the **Groundwater Assessment** and included in the main report (see **Section 6.2.2** in main **Groundwater Assessment** report) to provide annual volumes of predicted inflow to the VCP pit.
Appendix B Groundwater Assessment Section 5.3 Groundwater monitoring network *Baseline Monitoring* Monitoring Network	21.	The groundwater monitoring network (sites MB01 – MB12) to establish the baseline are not considered to be representative of the project area and should be spread out across the site and strategically located to assess any potential source of contamination. The monitoring bores should not be located where there is a high probability to be directly impacted or destroyed by the activity, unless replaced by other bores. It is noted that the monitoring network does include 12 sites over a period of 6months however, this is not in accordance with the guideline *Using monitoring data to assess groundwater quality and potential environmental impacts. Version 1.* (DSITI, 2017) Minimal justification provided to understand the groundwater measurements obtained are adequate for the spatial representation of the site. The DSITI guidelines (Using monitoring data to assess groundwater quality and potential environmental impacts) (2017) recommend at least 8 to 12 groundwater samples be taken over a 12-month period to establish a robust baseline in order to derive site-specific triggers or limits for groundwater quality.	Provide the following information: a) Data justification that the data (water level and quality) is spatially representative of the ML area (i.e. in addition to collection of data at sites 1 to 6) which was not collected for at least 12 months including end of dry and end of wet season data (i.e. should reflect seasonality). b) Justification how the water quality data collected is able to be used as baseline water quality data, for determining and assessing natural variability and to derive appropriate site-specific triggers for the EA (refer to *Using monitoring data to assess groundwater quality and potential environmental impacts. Version 1.* c) Provide information whether any of the bores will be with a data logger.	a) A rationale section (**Section 5.3.1**) has been added to discuss the reasoning behind the bore locations and acknowledgment that some of the bores will be disturbed by mining and will need replacement. The bore network was installed in June 2019 and the network will soon be able to demonstrate continuous groundwater level monitoring for over a 12 month period. Furthermore, monthly sampling of the bores was completed for the 1st six the months, after which sampling frequency has dropped back to quarterly (primarily to facilitate stygofauna sampling). This will provide at least 8 samples within the first 12 months on which to base the interim groundwater trigger values in the EA. b) The guideline (DSITI, 2017) is mentioned currently in **Section 5.8.4** and **Section 7.2**. Further context is provided in **Section 5.3.2** and **Section 7.2**. **Section 5.3.2** describes the current monitoring plan and ties this into the groundwater management strategy described in **Section 7.2**. c) Data loggers are currently referred to in **Section 1.1** and **Section 5.3.2**. Further text is provided in **Section 7.2** confirming loggers will remain as part of the monitoring strategy.

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		The sites MB01 – MB12 mapping in figure 5.1 identify that there was no sampling completed north or directly adjacent to the project area in the west/east. The sites that are within the study area are not immediately south of the proposed project site. This information questions whether the conceptual model and groundwater monitoring network provided in the submitted application is not supported by sufficient fit for purpose baseline monitoring.		
Appendix B Groundwater Assessment Section 7 Management and Mitigation	22.	An adaptive management program is anticipated and discussed within section 7 (groundwater monitoring network) which will form the basis for ongoing monitoring through the life of the project, however an ongoing adaptive management strategy for the collection of data, review and recalibration of the underground water model and review of the monitoring program in order to ensure that impacts on Environmental values are avoided and mitigated has not been detailed. Sufficient data is required in order to identify natural variability within the different aquifers, as per the *Using monitoring data to assess groundwater quality and potential environmental impacts* guidelines (2017). The proponent should provide details of the proposed monitoring plan to assess the groundwater quality baseline at each bore or group of bores. The proponent has not mentioned nominating compliance bores and propose limits for relevant indicators.	Review the proposed monitoring bores and justify the consolidated bore network based on factors such as the represented aquifers, the groundwater flow directions, the environmental values and the impacting activities on site. The proposed operational phase monitoring network demonstrating that consideration has been given to the revised conceptual model and groundwater flow model, the location of the mining operations, potential sources of contaminants (seepage from dams and overburden dumps). Demonstrate that there is adequate spatial coverage and representation of aquifers both up and down gradient in relation to potential contamination sources. Include a documented rationale for the spatial distribution of the sampling design / network and the monitoring frequency. Demonstrate clearly that the monitoring network is fit for purpose with bores classified as reference/control and test/compliance and the target aquifer is identified.	**Section 5.3.1** of the **Groundwater Assessment** has been updated to discuss the rationale behind locating the monitoring bores and some of the constraints present. **Section 5.3.2** of the **Groundwater Assessment** has been updated to discuss the current monitoring plan of the network. **Section 7.2** of the **Groundwater Assessment** has been updated to include an adaptive groundwater management strategy. The strategy includes consideration of both drawdown impacts and groundwater quality impacts. Key aspects include: • Acceptance of the groundwater monitoring network, recognizing that this may change from time to time to ensure it remains suitable and fit for purpose. • Development of interim trigger values or guidelines using current data and to be documented in the EA. • Ongoing quarterly monitoring and sampling. • Development of trigger levels and contaminant limits once 12 to 24 months of data is available. • Development of a WMP which includes groundwater. • Annual assessment of the data. • Consideration of the need to redevelop or recalibrate the numerical model. Whilst the impact assessment doesn't provide a detailed monitoring plan, or adaptive management strategy, there is a commitment in place which would see these components being regulated through the EA. Furthermore, there will be significant overlap between the monitoring requirements of the existing bulk sample Project and the VCP pit which is easier completed separate to the impact assessment.

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			Provide a detailed monitoring plan to assess the groundwater quality baseline at each bore or group of bores Provide a detailed adaptive management strategy proposed for the mitigation and management of drawdown and potential water quality impacts; and Detail any proposed strategies for the review and recalibration of the underground water model and review of the monitoring program in order to ensure that impacts on environmental values are avoided and mitigated.	
Appendix B Groundwater Assessment Section 6.2.3 Drawdown and Section 7 'Management and Mitigation'	23.	Page 82 of Appendix B states, "The nearest third party bore (to any of the mine pits) is RN162506, at a distance of 700 m from the 1 m predicted drawdown contour line. The uncertainty analysis also shows that the maximum probable drawdown (Figure 6.10) does not extend to RN162506 and that impact to the bore is very unlikely. This is a substantial buffer, and together with the proposed monitoring program (Section 7) will ensure that third-party bores are not put at undue risk by the Project." Section 7 does not include a detailed monitoring program. Further detail is required as to how the groundwater bore RN162506 will be monitored and managed during all stages of mining.	Provide further detail about the monitoring program for groundwater bores and the management strategies.	**Section 7.2** of the **Groundwater Assessment** has been amended and **Section 7.2.1** now includes specific reference to RN162506.
Supporting Information section 5.3 Terrestrial Ecology and Appendix C Terrestrial Ecology General Comment	24.	The magnitude of terrestrial flora and fauna environmental values and potential and actual impacts are not clearly identified and discussed. Ecological values are not limited to the tenure area.	Recommend including a risk analysis/matrix to address all impacts of terrestrial ecology from the proposed mining operations at all stages: construction, operation, rehabilitation, decommission.	**Section 5** of the **Terrestrial Ecology Assessment** (25 pages) is devoted to identifying and discussing the potential and actual impacts of the project on ecological values. A risk analysis has been prepared that summarises this information, and has been included as **Appendix E** of the updated **Terrestrial Ecology Assessment**.
Appendix C Terrestrial	25.	Lack of discussion surrounding density of vegetation within the	Further discussion into the density of vegetation within the various regional ecosystems identified through field surveys.	Vegetation density (basal area of woody vegetation cover, percentage cover of each stratum) has been reported for each secondary sampling site

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Ecology Assessment Section 4.1.2 Vegetation Communities		regional ecosystems identified through field surveys.	Also, identify how such densities have impacted the ability of fauna surveying.	surveyed, spanning every regional ecosystem present in the survey area (see **Appendix B** of the **Terrestrial Ecology Assessment**). Vegetation density is never mentioned with respect to limiting fauna surveys, as no limitations are considered to have existed. A network of small tracks across the site meant that access to trap sites was never prevented by vegetation density. Furthermore, all pitfall traps were hand-dug, so access for machinery was not required. Only two habitats present within the survey area were not surveyed by a minimum of three trap sites. Neither was due to vegetation density. Broad vegetation group 34d is a wetland community not amenable to trapping. 7a is a vine thicket community confined to a single small patch in a very rocky gorge. The abundant boulders prevented installation of drift fences or pitfall traps. Both habitat types were surveyed using other methods instead. Contrary to the assertion that vegetation may have inhibited fauna surveys, surveys prioritised remnant vegetation (containing the highest plant densities) over regrowth or non-remnant versions of the same plant communities (see **Section 3.2.2.2** of the **Terrestrial Ecology Assessment**). The principal constraint on trap site location was rock outcropping, not vegetation density, as the former prevented the installation of drift fences and pitfall traps. Where sites had to be relocated, traps were installed as close as possible to outcrops, and targeted surveys focused on such rocky habitats.
Appendix C Terrestrial Ecology Assessment Section 4.1.3.4 Water Quality	26.	How does the ground water sampling (results) vary throughout the different identified ecosystems within the survey area? Are there environmental or anthropogenic influences for the variances? This is inclusive of electrical conductivity, pH and quality (e.g. brackish). What does this data identify about the range of ecosystems or plant distribution/density across the survey site? This section only specifically targets RE 11.3.25 and RE 11.5.9. What about the others?	Provide further details into the water quality data and its importance to the relevant plant species inhabiting the ecosystems within the survey area.	The groundwater-quality requirements for most Australian plants are not known. All published information on local species is reviewed in **Section 4.1.3.4** of the **Terrestrial Ecology Assessment**. Note that this discussion focuses on salinity (electrical conductivity), as this is likely to be the principal limitation to plant growth of local groundwater. As pH was generally close to neutral, this was not considered a limitation to plant growth. Groundwater on site originates in the sandstone ranges to the west, which have minimal anthropogenic influences. Groundwater tends to flow east. Salinity varies by which coal seam (=aquifer) is the uppermost and how far east the water has travelled, over which it has accumulated salts. Groundwater quality is unlikely to vary over the scale that REs vary (the latter are primarily driven by soil/geology). Furthermore, the density of bores is insufficient to determine the quality of groundwater beneath every individual RE polygon. For the GDE assessment, the tolerance of plant species to groundwater quality is discussed in the context of the range of values detected locally, rather than specific values at specific bores. For further information regarding the groundwater sampling, refer to the Groundwater Assessment Report, on which the ecological assessment was based.

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				The reasons RE 11.3.25 and 11.5.9 are the focus of this section, are (i) the other local REs are not dominated by species known to utilise groundwater and/or (ii) the groundwater depths where the other REs occur are beyond the reach of roots. This is based on the assessment presented in **Table 4-2** of the **Terrestrial Ecology Assessment**.
Appendix C Terrestrial Ecology Assessment Section 4.1.3.5 Potentially Groundwater-dependent Ecosystems	27.	Figure 4-5 identifies the location of the Groundwater Dependent Ecosystems (GDEs) within the site area, however, provides no further information into how these GDEs aid in the function of the ecosystems and the flora species identified in these areas. No further details into the importance of identifying these GDEs onsite have been discussed.	Provide further details into the GDEs identified within the project area and how this links to the flora and fauna within the GDEs. This also includes if potential or actual impacts have been adequately considered, including post-mining landform on GDEs.	Areas mapped as "likely groundwater-dependent" in **Figure 4-5** of the **Terrestrial Ecology Assessment** represent RE 11.3.25. As discussed in **Table 4-2**, most tree species within this RE are probably reliant on groundwater as a source of water for at least part of the year. Areas mapped as "partially groundwater-dependent" represent RE 11.5.9 (high-value regrowth) where the water table is within 20 m of the ground surface. Here, some species (e.g., *Corymbia clarksoniana*) but not all (e.g., *Eucalyptus crebra*) may utilise groundwater (see **Table 4-2** of the **Terrestrial Ecology Assessment**). The degree of dependence on groundwater of particular species, and their role in the ecosystem as a whole, is only relevant if the project was to have an effect on groundwater level or quality. As this is not the case (there is no anticipated groundwater drawdown in the vicinity of mapped GDEs: see **Section 5.3.2** of the **Terrestrial Ecology Assessment**), further discussion of the potential impact in a hypothetical scenario of drawdown is irrelevant.
Appendix C Terrestrial Ecology Assessment Section 4.1.4 Biodiversity	28.	This section identifies that the surveying completed within the survey area are thorough enough to detect 100% of reptiles, birds and bats present within the area. Whilst the information discusses this, it only factors species that could be detected and does not allow for variables within the surveying completed which could have detected other species not found in the surveys. How certain does the data allow for the justification of 100% detection from the surveys. Within the amphibians the information provides allowances (97%) for influencing factors such as weather and distribution population.	Identify the statistical chance of there being undetected species due to influencing factors during the time of the surveys completed e.g. weather, drought, water availability, etc. Or discuss how the statistical analysis has accounted for these factors.	Species accumulation curves are the standard statistical tool for inferring survey thoroughness. They tell us when further survey effort is unlikely to reveal additional species (i.e., when 100% of species that can be detected have been detected). However, they offer no insight into the percentage of species present that cannot potentially be detected using the methodology implemented. There is no way for us to incorporate "percentage of species that are undetectable" into our estimates, simply because this percentage is unknown. This is why a paragraph in **Section 4.1.4.1** of the **Terrestrial Ecology Assessment** has been specifically devoted to explaining what species accumulation curves mean and how they should be interpreted with respect to the data presented. Note that the limitations of species accumulation curves apply equally to the groups with 83-97% detection as to the groups with 100% detection. It is actually unusual for ecology surveys to produce species accumulation curves that predict 100% detection, and this result is testament to the large scale of sampling that was implemented. To avoid similar misunderstandings of how species accumulation curves should be interpreted the text of the executive summary and **Section 4.1.4.1** of the **Terrestrial Ecology Assessment** has been updated to read "100% of the species that could have been detected" instead of "100% of the species that were present".
Appendix C Terrestrial	29.	This section identifies that 145.7ha of the ecosystems within the project site is an endangered regional ecosystem.	Discuss the mining operations proposed within the endangered regional ecosystem (ERE), including the actual and potential	As stated in **Section 4.2** of the **Terrestrial Ecology Assessment**, 145.7 ha of ERE are contained within the survey area (much broader than the project area). As clearly shown on **Figure 4-6**, all of these EREs are

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Ecology Assessment Section 4.2 Environmentally Sensitive Areas		Comparing mapping of the mine project plan, the endangered regional ecosystem is located where the proposed mining activity is located.	impacts from the proposed mining operations. Provide justification on how the ERE's will be avoided or impacts minimised or mitigated during mining.	located well south of the project area (bright red dashed boundary). As stated in the last paragraph of Section 4.2, no category B environmentally sensitive areas are contained in or within 500 m of the project area.
Appendix C Terrestrial Ecology Assessment Section 4.3.7 Threatened and Special Least Concern Wildlife	30.	Figure 4-9 has photographs with no coordinates nor is there a location map identifying where the photographs were taken, and in which RE.	Provide coordinates or map locations identifying which RE the fauna were found.	These photos are included as evidence for the species detected on site, to counter potential arguments by critics that species may have been misidentified. Of these photographs, only one (Squatter Pigeon) was taken within the project area. The remainder were taken in the broader survey area. Coordinates of all records, not only those shown in the photographs, are shown in **Figure 4-10**, **Figure 4-11** and **Figure 4-13** of the **Terrestrial Ecology Assessment**. These maps also show the extent of the habitat blocks present.
Appendix C Terrestrial Ecology Assessment Section 4.3.7.1 Koala	31.	No definition of "moderate density" when referring to large trees.	Define the scale of "moderate density" of the remnant vegetation listed in Table 4-5.	These REs with "moderate density of large trees" fall into the Specht vegetation categories of "woodland", "open woodland" "low open woodland" or "open forest" (see secondary site descriptions in Appendix B of the Terrestrial Ecology Assessment). In contrast, RE11.3.25 (the main RE in Primary habitat) typically falls into the category "closed forest", due to its high tree density. Note that large-tree density is not used in the Koala habitat classification process (all classification is by regional ecosystem and vegetation age category). This is why "moderate" is not defined. It is merely mentioned to further descriptively distinguish secondary habitat from primary habitat (i.e., not only are primary food trees absent, but overall tree density is lower and subsoil moisture is lower).
	32.	Figure 4-10 identify the primary, secondary, marginal and non-habitat areas of Koalas. When comparing mapping between Figure 4-10 and the proposed mine site project areas identified in figures within the Supporting Document, it is identified that a large portion of the primary and secondary habitat areas is located where the proposed mining operations are to be.	Provide discussion in relation to this. Ensure detail into the impact of the proposed mining on the koala distribution is included (it is noted 13 koalas were recorded in the surveys). Further, provide further detail on how the application proposes to manage impacts to Koalas during mining.	**Figure 4-10** of the **Terrestrial Ecology Assessment,** in fact shows no primary Koala habitat within the project footprint, and very little secondary habitat. **Figure 4-10** is best interpreted in conjunction with **Figure 5-2**, which zooms in on the project area and overlays the proposed footprint. Section 4 of the report is dedicated to discussing the ecological values of the project area and the broader survey area. Section 5 contains the detailed assessment of the impacts of the project on each of those values, including the Koala.
Appendix C Terrestrial Ecology Assessment Section 4.3.7.2 Greater Glider	33.	The information discusses that the Greater Gliders that were found during surveys were found in riparian habitat and highlights the importance of these areas. There is minimal discussion into the proposed mining operations and their impacts upon the habitats identified within Figure 4-11.	Discuss the importance of these riparian habitats in the preparation/discussions into the location of proposed mining operations and how these habitats have been considered in the proposed activities.	**Section 4** of the **Terrestrial Ecology Assessment** is dedicated to discussing the ecological values of the project area and the broader survey area. Section 5 contains the detailed assessment of the impacts of the project on each of those values, including the Greater Glider. As described in **Section 5.3.3.2** and shown in **Figure 5-3**, the project completely avoids removal of habitat for the Greater Glider.
Appendix C Terrestrial	34.	In this section it is made clear that within the project site for proposed mining operations there is primary	Provide further information into such considerations if such have been made. If	All discussion about how the project will impact the Squatter Pigeon is contained within **Section 5.3.3.3** and **Figure 5-4** of the **Terrestrial Ecology Assessment**. As can be seen from **Figure 4-13**, much of the

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Ecology Assessment Section 4.3.7.3 Squatter Pigeon		and secondary habitat, with identified sightings of the Squatter Pigeon within the project area. There is minimal discussion similarly to the Greater Glider around how this information found in the surveying and accumulation of results have been considered in the mining proposal.	not, provide discussion into reasoning for this decision.	survey area (with the exception of sandstone ridges, heavy clay soils and very open paddocks) constituted habitat for Squatter Pigeons. While attempts were made to position infrastructure away from habitat, completely avoiding this habitat was not possible given its scale. The project footprint was designed to avoid disturbing a dam that the species uses for drinking. The main way that the project has minimised impacts on the species is by utilising in-pit dumping for overburden. This (a) minimises the total footprint of the project by removing the need for large out-of-pit waste rock dumps and (b) allows a final landform and land use that is conducive to restoring Squatter Pigeon habitat (avoids the creation of large waste rock hills and voids). Squatter Pigeon habitat values have also been incorporated into completion criteria within the Progressive Rehabilitation and Closure Plan. **Section 5.3.3.3** has been amended to incorporate this further information about impact avoidance and minimisation.
Appendix C Terrestrial Ecology Assessment Section 4.3.7.5 Rufous Fantail	35.	This section discusses the marginal significance of the Rufous Fantail in inland areas of Australia, however there were confirmed sightings within the survey area, along with identified suitable habitat located within the project area. There is no discussion within this section into the revised map (Figure 4-14) of data from the completed surveying and how the information about this fauna species will be impacted by the proposed mining operations.	Provide further information to clarify the likely impact of the project on this species.	An assessment of the impacts of the project on the Rufous Fantail is provided in **Section 5.3.3.5** of the **Terrestrial Ecology Assessment**. Further information is provided in **Section 5.3.4.4**, as it is a migratory species listed under the EPBC Act.
Appendix C Terrestrial Ecology Section 4.3.7.7 Ornamental Snake	36.	There is contradictory information within this section. Within this section there is a map identifying suitable habitat within not only the survey area but also the project site. Whilst it states that suitable habitat was found, and it is likely that the Ornamental snake would utilise the area for habitation. Minimal reference to the difference between state-based mapping and ground-truth data found through surveying.	Clarification into the habitat existing onsite both within the study area and the project area itself. Edit the inconsistencies within this section so that information is not contradictory; and describe and justify the differences between state-based mapping and ground-truth data found through surveying.	The sentence that previously stated that there was no potential habitat within the project area, has been removed to avoid this contradiction. As stated in **Section 4.3.7.7** of the **Terrestrial Ecology Assessment**, the state-based mapping does not include dams in non-remnant areas as habitat for Ornamental Snakes, but does include creeks and areas thought to be brigalow from aerial imagery. This mapping therefore includes habitat within the project area that is incorrectly mapped as brigalow (field surveys revealed that this was instead *Acacia shirleyi* on sandstone), as well as creeks with sandy beds and no surface pooling, which are unsuitable for Ornamental Snakes. The dam on site was not mapped as habitat, but based on field surveys it has some potential, albeit minor, as habitat for Ornamental Snakes. Further discussion of these differences has been added to **Section 4.3.7.7**.
Appendix C Terrestrial Ecology Section 5 Ecological Impacts of Proposed Activities.	37.	Within section 5.1.1 it is identified that despite a majority of the land to be cleared is non-remnant there is high-value regrowth that will be cleared for mining operations in particular RE11.5.29.	Provide further discussion regarding the list of impacts on these high-value regrowth areas and the non-remnant areas, and what this means for versatility of flora and survivability and distribution of fauna who reside within these ecosystems.	How this habitat loss affects matters of state and national environmental significance are assessed in **Section 5.3** of the **Terrestrial Ecology Assessment**. All the vegetation types to be cleared constitute Least Concern REs. All of these are widespread as remnant vegetation across the broader survey area (see **Figure 4-3** and **Table 4-1**).

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				Importantly, of 4,317 ha of remnant vegetation within the survey area, 99.9% will not be cleared. Given that the habitat values of remnant vegetation typically exceeds that of regrowth or cleared pastures, important refuges for wildlife are being retained in the local landscape despite the project. A paragraph has been added to **Section 5.1.1** discussing the ecological uniqueness (in a local context) of the vegetation/habitat to be removed.
Appendix C Terrestrial Ecology Section 5.4 Offset Requirement	38.	Minimal information provided into requirements under the Environmental Offsets Act 2014, as per section 7 of EA application form. State mapping online identifies particular areas within the project site, that have minimal discussions within the assessment. These areas include: • MSES – Wildlife Habitat endangered or vulnerable adjacent to site, • MSES – Wildlife Habitat (special least concern animal) within project site, • MSES – regulated vegetation Category B and Category C within site, • MSES – regulated vegetation Category R within site, and • MSES – Regulated Vegetation intersecting a watercourse within project site. The applicant must detail the magnitud residual impact on each prescribed en and demonstrate that all reasonable m impacts on each of the matters will be Include any relevant biodiversity offset • Details of whether suitable offsets exist for impacts to prescribed environmental matters;	Ensure the application requirements are sufficiently addressed.	The magnitude and duration of residual impacts on each prescribed matter are discussed in detail within **Section 5.3** of the **Terrestrial Ecology Assessment**. This includes all five of the MSES listed within this comment. For ease of interpretation, the information for threatened and special least concern fauna has been duplicated within **Section 5.4** (the impacts on regulated vegetation were already duplicated there). Vitrinite is committed to providing any offsets for MSES that DES deems necessary prior to the commencement of any disturbance. As the values requiring offsets and the nature of these offsets (land-based or payment) is contingent upon the decisions of both the Department of Environment and Science and the Department of Agriculture, Water and the Environment (the latter does not allow for payment only), the offset strategy will be developed as soon as this information is received.

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		• If already determined, the proposed offset delivery mechanism i.e. land-based, financial payment or a combination of both for impacts to prescribed environmental matters. Where financial payment is proposed, the values to which the financial payment relates and the quantity (as determined by the offset financial calculator). Where land-based offsets are proposed, provide an assessment of 'habitat quality' of the impact and offset area; and, • Details of whether the proposed offsets/ impacts will be undertaken in full prior to the impacts occurring, or whether they will be staged over the life of the project. If staged impacts/ offsets are proposed, identify what those stages are, which impacts are proposed for each stage and the anticipated timeframe for each stage.		
Appendix D Aquatic Ecology Assessment General Comment	39.	The assessment is lacking detail into important components of aquatic ecology that have been considered in the risk assessment and assessment of impacts upon aquatic environmental values.	Ensure that adequate information has been provided throughout the assessment to ensure all aspects of understanding fundamentals and assessing criteria of aquatic ecology have been considered in the investigation of impacts.	Further discussion of the assessment of values of the waterways of the site and in the broader area has been added in **Section 5.1** of the **Aquatic Ecology Assessment** (**Appendix D of the EA Supporting Information** document). It is considered however that generally the assessment of baseline aquatic ecological values presented in the **Aquatic Ecology Assessment** was scoped and executed via a proven survey approach. The methodology employed is considered fit for purpose, and the survey results yielded a characteristic representation of the aquatic ecology values known for the area. The aquatic ecological values of the area and region are well studied, and are typically not known for high legislative conservation significance.

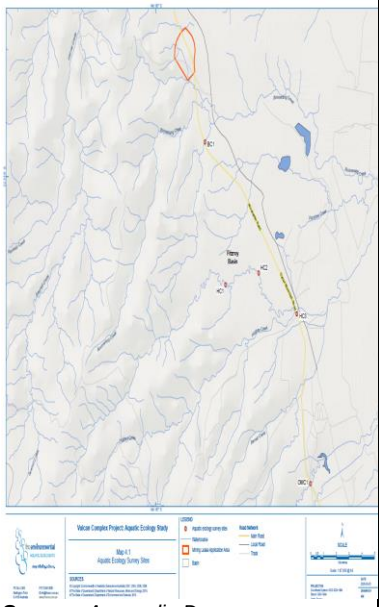
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				The methodology employed has been utilised for many EIS level Impact assessment studies within the locality and larger bioregion of the study site, and is outlined in detail below. An initial desktop assessment methodology was used to provide a description of the aquatic ecological values of the broader study area. This included review of: • aquatic MNES under the Commonwealth's EPBC Act; • aquatic matters protected under Queensland legislation, including: – threatened freshwater species under the NC Act; – features that support fisheries resources (e.g. waterway barrier risk layer), pursuant to the Fisheries Act 1994; – wetland protection areas as shown on the map of Referable Wetlands under the Environmental Protection Regulation 2008; – High Ecological Value waters as defined under the EPP (Water); – freshwater-dependent regulated vegetation, listed under the VM Act; • mapped aquatic ecological features, including floodplains, wetlands and surface-expression ground-water dependent ecosystems; • hydrological data recorded at DNRME gauging station 130410A (Isaac River at Deverill); • relevant literature, including published and unpublished technical reports, scientific papers, and conservation advice statements for any MNES identified; and • data contained in frc environmental's in-house bio-physical database. Subsequent to the desktop assessment, a **field survey** was designed and undertaken in the post-wet season, in April 2019, Rainfall recorded in early April 2019, shortly prior to the field survey, was the highest rainfall recorded since the 2018 wet season. The field survey timing reflected typical wet season conditions, and was considered to be at maximum representative hydrological condition and biological productivity. Survey sites were selected across the broader study area for the Vulcan Complex (**Section 4.2**) and are considered representative of waterways throughout the full extent of the Broader Study area, the specific Project Area and its associated receiving waters. The breadth of sampling is considered to provide a conservative assessment of the ecological values characteristic of the specific Project site, and the broader study area, which is understood well and has been studied considerably over the course of multiple projects. The following aquatic ecological components were assessed at five representative sites: • water quality measured in situ; • aquatic habitat; • aquatic plants; • macroinvertebrates; • fish; and

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				• turtles. The methodology undertaken to assess **potential impacts** to aquatic conservation significant values is a proven approach. The methodology employed is considered fit for purpose, and has been utilised for EIS level impact assessment studies within the locality and bioregion of the study site. This methodology employed was also guided by the standards detailed in the document Significant Impact Guidelines 1.1 (DotEE 2013). Given the above, it is considered that habitats representative of the site were adequately assessed, the values of the site have been adequately characterised during a post rain period, the methodology employed for the impact assessment was fit for purpose, and that there is sufficient detail on components of aquatic ecology and aquatic environmental values, provided as inputs into the aquatic ecology impact assessment to draw conclusions and make recommendations with regard to the objectives of the study, in assessing potential impacts, and required mitigation measures for conservation significant aquatic values. (Also see response # 40, # 41, # 42 & # 43)
	40.	There is sparse discussion into the waterways that surround the project area, this includes the water systems that run through or adjacent to site. Information discussing the nearby floodplain that certain surveying sites are in close proximity to should also be considered.	Whilst there are discussions of this in Appendix C Terrestrial Ecology, this information and further discussion needs to be included into this assessment or referenced. Further literature review should be considered discussing waterways surrounding the project area.	Further discussion of the assessment of the waterways values adjacent to the site and in the broader area has been provided in **Section 5.1** of the **Aquatic Ecology Assessment** (**Appendix D of the EA Supporting Information** document). Aquatic ecology survey sites were selected across the broader study area for the Vulcan Complex (**Section 4.2**) and are considered representative of waterways throughout the full extent of the Broader Study area, the specific Project Area and its associated receiving waters. The breadth of sampling is considered to provide a conservative assessment of the ecological values characteristic of the specific Project site, and the broader study area, which is understood well and has been studied considerably over the course of multiple projects. **Section 4.2** of the **Surface Water Assessment** has also been amended to include further discussion of the water quality sampling sites undertaken within the broader study area. (Also see response # 39, # 41, # 42 & # 43)
Appendix D Aquatic Ecology Assessment Section 4.2 Field Survey	41.	Minimal reasoning into selected survey sites. In Map 4.1 Aquatic Ecology Survey Sites it can be seen that all survey sites are a far distance downstream to the main project site area.	Provide reasoning into the aquatic ecology survey sites that have been chosen for the collection of field data. Justification into these sites suitability for testing is required to understand why more testing was unwarranted and why field data was not collated in sites closer to the project site.	It is considered that the waterways closer to the project site are not materially different from those that were assessed further downstream. The aquatic ecology of the region and broader study area has been previously studied in depth, is well understood, and has been included in the desktop literature review for this survey. The desktop survey suggests the aquatic biota of the region are ubiquitous on much larger spatial scales, than that undertaken for this study.

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		Any potential sites closer to the project area would aid in forming a baseline of water quality testing that can be compared with if testing throughout the life of mine to ensure downstream aquatic ecological impacts are regulated.		Survey sites were chosen because they are representative of the broader study area, and considered suitable to capture the variation of expected aquatic biological values in the broader region, and also reflect the conditions within the project area. **Section 4.2** of the **Aquatic Ecology Assessment** (**Appendix D** of the **EA Supporting Information** document) has been amended to include discussion of the approach for the sampling sites undertaken. Further discussion of the assessment of values of the waterways adjacent the site and in the broader area has also been provided in **Section 5.1** of the **Aquatic Ecology Assessment**. Aquatic ecology survey sites were selected across the broader study area for the Vulcan Complex (**Section 4.2** of the **Aquatic Ecology Assessment**) and are considered representative of waterways throughout the full extent of the Broader Study area, the specific Project Area and its associated receiving waters. The breadth of sampling is considered to provide a conservative assessment of the ecological values characteristic of the specific Project site, and the broader study area, which is understood well and has been studied considerably over the course of multiple projects. Forming the basis of a water quality monitoring program was not within the scope of the aquatic ecology study. An extensive water quality sampling assessment was undertaken in detail in the **Surface Water Assessment** (**Appendix A** of the **EA Supporting Information** document), including sampling the study site and values in the receiving environment and broader area. (Also see response # 39, # 40, # 42 &# 43)
	42.	It is stated that the only field surveying was completed in a 2-day post wet season time in 2019. The Department does not feel that sufficient survey effort has been made, further justification is required. There was no other surveying completed. In comparison with the surveying completed for terrestrial ecology, there is minimal reasoning behind the lack in surveying or why further surveying in different seasons was not undertaken. Has enough study been completed to determine the nature of aquatic ecology and the potential impact from mining operations?	Justification on whether the surveying is enough to determine the aquatic ecology statements made from the results discussed in section 5 of the assessment. Further, include detail on methodology used both desktop and field work.	The assessment of baseline aquatic ecological values presented in the **Aquatic Ecology Assessment** was scoped and executed via a proven survey approach. The methodology employed is considered fit for purpose, and the survey results yielded a typical representation of the aquatic ecology values known for the area. This methodology has been utilised for many EIS level Impact assessment studies within the locality and larger bioregion of the study site and is outlined in detail below. An initial desktop assessment methodology was used to provide a description of the aquatic ecological values of the broader study area. This included review of: • aquatic MNES under the Commonwealth's EPBC Act; • aquatic matters protected under Queensland legislation, including: – threatened freshwater species under the NC Act;

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				– features that support fisheries resources (e.g. waterway barrier risk layer), pursuant to the Fisheries Act 1994; – wetland protection areas as shown on the map of Referable Wetlands under the Environmental Protection Regulation 2008; – High Ecological Value waters as defined under the EPP (Water); – freshwater-dependent regulated vegetation, listed under the VM Act; • mapped aquatic ecological features, including floodplains, wetlands and surface-expression ground-water dependent ecosystems; • hydrological data recorded at DNRME gauging station 130410A (Isaac River at Deverill); • relevant literature, including published and unpublished technical reports, scientific papers, and conservation advice statements for any MNES identified; and • data contained in frc environmental's in-house bio-physical database. Subsequent to the desktop assessment, a **field survey** was designed and undertaken in the post-wet season, in April 2019, Rainfall recorded in early April 2019, shortly prior to the field survey, was the highest rainfall recorded since the 2018 wet season. The field survey timing reflected typical wet season conditions, and was considered to be at maximum representative hydrological condition and biological productivity. Survey sites were selected across the broader study area for the Vulcan Complex (**Section 4.2** of the **Aquatic Ecology Assessment**) and are considered representative of waterways throughout the full extent of the Broader Study area, the specific Project Area and its associated receiving waters. The breadth of sampling is considered to provide a conservative assessment of the ecological values characteristic of the specific Project site, and the broader study area, which is understood well and has been studied considerably over the course of multiple projects. The following aquatic ecological components were assessed at five representative sites: • water quality measured in situ; • aquatic habitat; • aquatic plants; • macroinvertebrates; • fish; and • turtles. The methodology undertaken to assess **potential impacts** to aquatic conservation significant values is a proven approach. The methodology employed is considered fit for purpose, and has been utilised for EIS level Impact assessment studies within the locality and bioregion of the study site. This methodology employed was also guided by the standards detailed in the document Significant Impact Guidelines 1.1 (DotEE 2013). Given the above it is considered that habitats representative of the site were adequately assessed, the values of the site have been adequately

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				characterised during a post rain period, the methodology employed for the impact assessment was fit for purpose, and that there is sufficient detail on components of aquatic ecology and aquatic environmental values, provided as inputs into the Aquatic ecology impact assessment to draw conclusions and make recommendations with regard to the objectives of the study, in assessing potential impacts, and required mitigation measures for conservation significant aquatic values. (Also see response # 39, # 40, # 41 & # 43)
Appendix D Aquatic Ecology Assessment Section 5.1 Aquatic Matters of National Environmental Significance	43.	There are limitations of aquatic ecology study based on broader study area to the mining operations. The ecology study provides valuable information about the current status of the aquatic ecology in the broader region to the project. However, Section 5.1 states that, "*No sensitive aquatic environmental receptors are likely to occur in waterways in the Project area*". Although this may be true, the study is limited to the sites used for the assessment. Regardless, it should be stated that the receiving waters of the drainage channels and Boomerang Creek that may be affected by discharge of mine-affected water have aquatic ecosystem values that need to be protected, even though they may be ephemeral. Three sites from Hughes Creek, one from Boomerang Creek and one at the One Mile Creek were used for the study (see snapshot below). Most of the chosen sites are far away from the waterways likely to be impacted from release of mine affected water and might not be representative of the receiving environment of the local receiving waters of Boomerang Creek. Some key water quality indicators at the site BC1, Boomerang Creek are consistent with the regional water quality objectives (see Table 5.1, Appendix D) and suggests reasonable water quality, although the data collected is limited.	It should be clearly stated that the local waterways adjacent to the site have aquatic ecosystem values that would be classified as moderately disturbed that should be protected. The lack of local assessment should be acknowledged as a limitation in the report and in regard to conclusion around aquatic ecology adjacent to the Project Area. Existing aquatic environmental values in Boomerang Creek and other surrounding creeks need to be further discussed along with the potential impact on aquatic ecological values associated with the project.	It is considered that the waterways closer to the project site will not be materially different from those that were assessed. The aquatic ecology of the region and broader study area has been previously studied in depth, is well understood, and has been included in the desktop literature review for this survey. The desktop survey suggests the aquatic biota of the region are ubiquitous on much larger spatial scales, than that undertaken for this study. Survey sites were chosen because they are representative of the broader study area, and considered suitable to capture the variation of expected aquatic biological values in the broader area, and also reflect the conditions within the project area. **Section 4.2** of the **Aquatic Ecology Assessment** has been amended to include discussion of the approach for the sampling sites undertaken. Further discussion of the assessment of values of the waterways adjacent the site and in the broader area has also been provided in **Section 5.1** of the **Aquatic Ecology Assessment.** An extensive water quality sampling assessment was also undertaken in detail in the **Surface Water Assessment** (**Appendix A**), including sampling the study site and values in the receiving environment and broader area. (Also see response # 39, # 40, # 41 & # 42).

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		 ***Source:*** *Appendix D*		
Section 5.8 Aquatic (Surface Expression) Groundwater-dependent Ecosystems	44.	There is minimal discussion into the importance of factoring groundwater dependent ecosystems into this assessment.	Provide further details into groundwater dependent ecosystems present in or surrounding the project site, and how these have been accounted for in potential and actual impacts due to mining operations.	A discussion of aquatic (surface expression) groundwater dependant ecosystems (GDEs) is provided in **Section 5.6** of the **Aquatic Ecological Assessment**. There are no mapped potential surface expression GDEs in the specific Project Area, although based on a national-scale desktop assessment there are potential surface expression GDEs in the Broader Study Area (**Map 5.4**). Hydrogeological studies completed for the Project indicate areas in the Broader Study Area where depth to the groundwater table is low, including small areas in the northern-most and southern-most parts of the Project Area (**Figure 5.4**). However, satellite imagery (Error! Reference source not found.**Figure 5.5**), coupled with the aquatic habitat survey and flow data described above, confirms an absence of sustained surface water flows or other groundwater influences on surface water aquatic ecology in the Project Area. Indeed, key criteria presented in Doody et al. (2019), that indicate the potential for surface expression GDEs were not met in the Broader Study Area or specific Project Area, Further discussion on terrestrial GDEs is also provided in **Section 4**, of the **Terrestrial Ecological Assessment** (**Appendix C** of the **Supporting Information** document . Areas mapped as “likely groundwater-dependent” in **Figure 4-5** represent RE 11.3.25. As discussed in **Table 4-2**, most tree species within this RE are probably reliant on groundwater as a source of water for at least part of the year.

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				Areas mapped as "partially groundwater-dependent" represent RE 11.5.9 (high-value regrowth) where the water table is within 20 m of the ground surface. Here, some species (e.g., *Corymbia clarksoniana*) but not all (e.g., *Eucalyptus crebra*) may utilise groundwater (see **Table 4-2**). The degree of dependence on groundwater of particular species, and their role in the ecosystem as a whole, is only relevant if the project was to have an effect on groundwater level or quality. As this is not the case (there is no anticipated groundwater drawdown in the vicinity of mapped GDEs: see **Section 5.3.2** of the **Aquatic Ecological Assessment**), further discussion of the potential impact in a hypothetical scenario of drawdown is irrelevant. (Also see response # 26 & # 27).
Section 5.9 Aquatic Biota of the Project Site	45.	Results of the field survey are discussed within this section. Whilst the data has been input into a table of assessment and scored, the information is projected as conclusive to the accurate aquatic ecology of the survey sites. For example, Table 5.3 identifies the results of the macroinvertebrate survey and concludes that within the data for taxonomic richness, PET richness and the SIGNAL-2 Score there are results lower than the guideline average. The results do not discuss variables of the surveying nor does it account for possible changes to the data had the surveying been completed in a wet season month.	Provide further discussion into all of the results concluded to within the entire section identifying the coverage and determinations made for aquatic ecology.	The field survey was completed in the post-wet season, 10 – 12 April 2019, with notable rainfall recorded in the region in late March 2019, shortly prior to the survey (**Figure 4-1** of the **Aquatic Ecological Assessment**). The rainfall recorded in early April 2019, prior to the field survey, was the highest rainfall recorded since the 2018 wet season. Thus, the field survey timing reflected typical wet season conditions. A dry season survey was not implemented because these waterways are highly ephemeral and at maximum hydrological condition and biological productivity during the wet season. A detailed discussion of results from both the desktop and field surveys are discussed with relevance to the project site in the Aquatic Ecology Assessment in a number of sections including: • Section 5.1- Aquatic Maters of National Environmental Significance; • Section 5.2 State Protected Matters relevant to Aquatic Ecology; • Section 5.3 Water Quality; • Section 5.4 Aquatic Habitat; • Section 5.5 Flow Regime; • Section 5.6 Aquatic (surface expression) Groundwater Dependent Ecosystems; • Section 5.7 Aquatic Biota of the Project Area; and • Section 5.8 Assessment of Environmental Value. Based on the discussion of ecological values within each of these sections and a detailed impact assessment undertaken within Section 6 The conclusions of the assessment were summarised as follows: Waterways of the specific Project Area have low to moderate aquatic ecological values, based on: • low to moderate aquatic and catchment naturalness • low diversity of common aquatic species (with no threatened or priority aquatic species) • no threatened, priority or special habitat or geomorphic features present

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				• limited and temporary hydrological connectivity, and • an absence of unique or representative aquatic ecosystems. • threatened aquatic fauna highly unlikely to occur, are no HEV waters, declared fish habitat areas, or threatened wetland Regional Ecosystems or category B or C regulated vegetation classes in the riparian zone; • suitable habitat for common species of turtle, fish and macroinvertebrate possibly occurring in some wet seasons; and • waterways unlikely to provide important corridors for fish passage because hydrological connectivity is very limited (several days a year, with no hydrological connectivity on some years) and these systems do not contain or link key breeding, foraging or refugial habitat for fish. No sensitive aquatic environmental receptors are likely to occur in waterways in the Project area. The following potential sources of impact on aquatic ecological values associated with the Project were identified: • discharge of mine-affected water to waterways; • localised sedimentation of waterways; • localised increases in turbidity and total suspended solids; • localised contamination of waterways; • waterway crossings; • cumulative impacts with other nearby mining projects; and • introduction of aquatic weeds to waterways. All sources of impact were assessed as having a low risk of adverse impact to aquatic ecological values. The two aquatic MNES species known from the broader Fitzroy River Basin are highly unlikely to occur in waterways of the Broader Study Area or the Project Area, with the nearest suitable habitat for both species (i.e. white throated snapping turtle and Fitzroy River turtle) some 115 km downstream from the Project Area. Thus, populations of these MNES species are sufficiently displaced from the Project Area to have no risk of direct or indirect impact from the Project. (Also see response # 39, # 40, # 41, # 42 & # 43)
Appendix E Stygofauna Assessment General Comment	46.	No clarity around the importance of identifying the potential stygofauna communities within the project site and surrounding areas. There is also minimal understanding in the link of stygofauna and the importance of its function within the literature review on aquatic and terrestrial ecology of the environment being impacted.	Provide further details within the literature of the assessment on the importance of the role of stygofauna within the ecology of the environment being site-specific to the project area.	Further discussion on the relevance of Stygofauna within the project site has been updated and provided in the **Stygofauna Assessment, Section 4.3 -** Results of field Surveys, and **Section 4.4 -** Environmental Values of Stygofauna of the Project Area. The discussion of results and assessment of potential impacts found that the stygofauna community of the Project Area was assessed as having low environmental value based on: • absence of any listed stygofauna taxon • absence of any stygobitic (i.e. obligate groundwater dependent) taxon • the occurrence of only a single, widely distributed stygoxene (i.e. not groundwater dependent) taxon

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				• the depth to water table in the Project Area is deeper than the typical depth from which stygofauna have been reported in Queensland (i.e. <15 m, Glanville *et al.* 2016), and • the concentration of total dissolved solids and electrical conductivity of groundwater of in the Broader Study Area commonly higher than the range reported for groundwater from which stygofauna are typically found. Further discussion of the potential impacts to Stygofauna values with specific reference to the study site has been updated and provided in the amended **Stygofauna Assessment, Section 5.1 - Potential Sources of Impacts to Stygofauna**. (Also see response # 47, # 48, #49 & # 50).
Appendix E Stygofauna Assessment Section 4.3 Results of the Pilot Study	47.	Further discussion on the reasoning behind the possible findings within the two cores V-MB5 and V-MB12 in relation to the hydrological data and the location of the bore site.	Further clarity is sought on the findings from the Pilot Study. Further discussion into the results and any information from the other chapters (the applicant refers to hydrological appendix throughout the document) that would identify correlations into why the same stygofauna species was found at these sites and not the others. For example: was the water hydrology similar or the geology? In understanding this, correlating features can be identified which can then be used to examine the project site to see if these features exist in other areas within the project site area and whether if this is the case, further field investigation bores should be considered to see distribution of the stygofauna. V-MB5 is located within the project site--highlight the importance of this and the potential and actual impacts from mining operations on stygofauna populations within the project site area.	Further discussion on the relevance of Stygofauna within the project site has been updated and provided in the updated **Stygofauna Assessment, Section 4.3- Results of field surveys**, and **Section 4.4- Environmental Values of Stygofauna of the Project Area**. The pilot study for the assessment of Stygofauna was undertaken in keeping with the methodology detailed in the Commonwealth Guideline for the Environmental Assessment of Subterranean Aquatic Fauna (DoSITIA 2014). In total, 16 bores were sampled across the site in two separate survey efforts for the pilot study, and the sampling effort and results are considered to be adequate to meet the objectives and purpose of the investigation. The survey results found that of the six bores that had groundwater present in December 2019, two bores (i.e. V-MB5 and V-MB12) contained stygofauna (see Table 4.3): a single ostracod species. This same taxon was found in the March 2020 survey at two additional bores (i.e. V-MB3 and V-MB7). This taxon is a stygoxene (i.e. not an obligate inhabitant of groundwater ecosystems; that is, it is not a taxon that is dependent on groundwater). Bores V-BM5, V-MB12, V-MB3 and V-MB7 are widely spaced, indicating this species occurs widely through the Broader Study Area, and likely beyond as ostracods are ubiquitous throughout Australian inland waters. The geologies targeted by the bores from which this taxon was found were DLL Coal Seams, MAT Coal seams, Weather Permian and Permian Underburden, indicating that this taxon does not have specific habitat requirements with respect to geological unit. Bore V-MB12, from which the ostracod was found, had the highest electrical conductivity and TDS of all the bores of the Broader Study Area with available water quality data, indicating that this taxon is tolerant of the full

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				range of groundwater quality conditions reported throughout the Broader Study Area. The depth to the water table at the bores from which the ostracod was found ranged from 14.5 m at bore V-MB5 (possibly within the root zone of terrestrial vegetation) to >20 m at bores V-MB12, V.MB3 and V-MB7 (deeper than the likely root zone of terrestrial vegetation; see Eamus *et al.* 2006). Therefore, the root zone of terrestrial vegetation in the Broader Study Area does not provide key habitat for the ostracod taxon. Further discussion of the potential impacts to Stygofauna values with specific reference to the study site has been updated and provided in the **Stygofauna Assessment, Section 5.1-**Potential Sources of Impacts to Stygofauna. Discussion of impacts concluded that the depth to water table through the Broader Study Area was typically below the root zone of terrestrial vegetation; thus, the water table does not intersect the root zone in the Project Study Area. Furthermore, most of the bores from which the ostracod taxon was caught have a depth to water table well-below the likely root zone of terrestrial vegetation, indicating that roots of terrestrial vegetation does not provided a key habitat for this taxon. (Also see response # 46, # 48, #49 & # 50).

Appendix E Stygofauna Assessment
 	
Section 5 Impact Assessment and Mitigation
	48.	Further detail is recommended for the potential sources of impact from the project on stygofauna. The information within the assessment is minimal and does not fully address/explain the scope of all the potential impact on stygofauna.
		
		For example, does the mapped proposed area for vegetation clearing correlate with the results from the stygofauna field data? What would extensive vegetation clearing within the project site mean for the survivability and reproduction rates of stygofauna within the immediate area that could be impacted due to their suitability in shallow groundwater ecosystems.
			Provide further details regarding the impact of mining operations on the stygofauna within the project site and in the downstream/immediate areas.
			
			How do the impacts cumulatively impact on the stygofauna community? Provide further details regarding the vegetation clearing potential impacts.
				Further discussion of the potential impacts to Stygofauna values with specific reference to the study site has been updated and provided in the **Stygofauna Assessment, Section 5.1 Potential Sources of Impacts to Stygofauna.**
				
				The following sources of potential Project impacts on stygofauna were identified:
				• vegetation clearing;
				• contamination of groundwater;
				• physical disturbance of groundwater ecosystems by:
				  • removal of topsoil and overburden from development areas;
				  • open cut coal mining;
				  • drawdown of water tables;
				  • compaction of shallow aquifers below haul roads; and
				  • cumulative impacts of the Project interacting with other nearby existing and proposed mines.
				
				However, a risk-based assessment determined that the mitigated risk of impact was low for each of these potential sources of impact. Discussion of impacts concluded that the depth to water table through the Broader Study Area was typically below the root zone of terrestrial vegetation; thus, the water table does not intersect the root zone in the Project Study Area. Furthermore, most of the bores from which the ostracod taxon was caught have a depth to water table well-below the likely root zone of terrestrial

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				vegetation, indicating that roots of terrestrial vegetation does not provided a key habitat for this taxon. (Also see response # 46, # 47, #49 & # 50).
Appendix E Stygofauna Assessment Table 5.4 Risk-based Impact Assessment	49.	With the moderate potential impact on stygofauna from vegetation clearing and physical disturbance of groundwater ecosystems, how do the proposed mitigation strategies grade in suitability in minimising the impact upon stygofauna. There is minimal discussion on the suitability of mitigation strategies.	Provide further details regarding the mitigation strategies proposed.	Further discussion of the potential impacts to Stygofauna values with specific reference to the study site has been updated and provided in the **Stygofauna Assessment**, **Section 5.1- Potential Sources of Impacts to Stygofauna**. A risk-based assessment determined that the mitigated risk of impact was low for each of the potential sources of impact. Discussion of impacts concluded that the depth to water table through the Broader Study Area was typically below the root zone of terrestrial vegetation; thus, the water table does not intersect the root zone in the Project Study Area. Furthermore, most of the bores from which the ostracod taxon was caught have a depth to water table well-below the likely root zone of terrestrial vegetation, indicating that roots of terrestrial vegetation does not provided a key habitat for this taxon. A number of mitigation strategies for identified potential impacts to stygofauna are detailed in **Section 5.2** and **Table 5.4**. Given that potential impacts identified were negligible, mitigation strategies are not discussed in any further detail greater than that provided in the Impact assessment (see **Section 5.2**, **Table 5.4**). (Also see response #46, # 47, # 48 & # 50).
Appendix E Stygofauna Assessment Section 6 Conclusions	50.	The section discusses that with the field survey data, despite identified stygofauna within the project area, a conclusion that the environmental value is low can be stated. Is there a possibility that further studies on stygofauna could be warranted to accurately reach this determination? Need to justify the extent and amount of survey sites reflecting the conclusions made.	Provide further justification into the conclusions made within this section and what this means for mining operations, particularly for the stygofauna community once operations have ceased and the rehabilitation complete.	The pilot study for the assessment of Stygofauna was undertaken in keeping with the methodology detailed in the Commonwealth Guideline for the Environmental Assessment of Subterranean Aquatic Fauna (DoSITIA 2014). In total, 16 bores were sampled across the site in two separate survey efforts for the pilot study, and the sampling effort and results are considered to be wholly adequate to meet the objectives and purpose of the investigation. The stygofauna community of the Project Area and Broader Study Area was assessed as having low environmental value based on: • absence of any listed stygofauna taxon; • absence of any stygobitic (i.e. obligate groundwater dependent) taxon; • the occurrence of only a single, widely distributed stygoxene (i.e. not groundwater dependent) taxon; • the depth to water table in the Project Area is deeper than the typical depth from which stygofauna have been reported in Queensland (i.e. <15 m, Glanville et al. 2016); • and the concentration of total dissolved solids and electrical conductivity of groundwater of in the Broader Study Area

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				commonly higher than the range reported for groundwater from which stygofauna are typically found Further discussion on the relevance of Stygofauna within the project site has been updated and provided in the **Stygofauna Assessment Section 4.3 Results of Field Surveys**, and **Section 4.4 Environmental Values of Stygofauna of the Project Area.** The pilot study is considered conclusive in identifying low potential habitat values and low potential impacts for stygofauna on site. It is difficult to foresee how any further study of these same low potential habitat values would possibly yield a different result, particularly, when the baseline groundwater conditions, and stygofauna habitat based on the existing groundwater conditions are found to be low in every instance where investigated across the site. (Also see response #46, # 47, # 48 & # 49).
Appendix F 'Air Quality Impact Assessment" Section 5.4 and Section 4.5.3	51.	Information provided in section 5.4 Cumulative Impacts is not complete. In section 4.5.3 Summary of background dust levels, Table 6 presents information on the background dust levels, however, data from the surrounding sites is not considered in the assessment.	Provide more data from surrounding sites and consider them in the assessment of background dust levels. Consider at least one year of data before adopting a background level.	The background dust levels presented in **Section 4.5.2** and **Section 4.5.3** of the **Air Quality Assessment** were based on DES's Moranbah air monitoring station located approximately 35 km from site and historical monitoring conducted by BMA and Anglo American in Moranbah. In determining background levels of dust the following data was considered (as reported in **Section 4.5.2** of the Air Quality Assessment): - PM_{10} – based on six years of DES monitoring data - TSP – derived from six years of DES monitoring data - $PM_{2.5}$ – based on nine months of BMA data due to only available data set at the time of the assessment - Dust deposition rate – based on three years of Anglo American monitoring data. There is no known publicly available data from the project area. The mining operations in the region are not owned by Vitrinite Pty Ltd, and any dust monitoring data conducted by these mine sites has not been made publicly available. Moranbah monitoring station is the closest DES air quality monitoring station to the Project site (~ 35 km) and is considered the most representative of levels at the site. The other closest sites are Emerald (~134 km) and Blackwater (~ 158 km). Due to their distance from site operations, these sites are considered less likely to be representative of dust levels at the Project site and were subsequently not included in the analysis. **Section 4.5.1** of the **Air Quality Assessment** summarises mining operations in the Moranbah area and quantifies PM_{10} and $PM_{2.5}$ emissions as reported to the NPI in FY17/FY18. The nearest mine to Project is Peak Downs Mine, located 1.6 km to the north east of the Project boundary. The nearest mines to the residential receptors (12 km south of the project) is

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				also the Peak Downs Mine which runs in a north south direction. All other mines are located more than 17 km from the Project boundary and more than 15 km from the residential receptors. A review of the Caval Ridge EIS shows that it is 18 km from the project and over 20 km from the project's residential receptors. Moranbah is located 10 km from Caval Ridge operations so using Moranbah dust data is likely to include the influence of Caval Ridge. Further to this, the Caval Ridge EIS modelling domain didn't extend to the south to cover the projects modelling area. Investigation of Caval Ridge model results at a receptor in the south of its domain (R23) show levels of dust to be: • 0 g/m^2/month for dust dep; • 0 ug/m^3 for annual $PM_{2.5}$; • 1 ug/m^3 for 24-hour $PM_{2.5}$; and • 6 ug/m^3 for PM_{10}. Overall, the background dust levels used in the air quality assessment are based on Moranbah data which provides a good indication of the dust levels from mining and are appropriate based on the level of currently available information. Further to this, the project contributes less than 10% when compared with the relevant air quality objectives. (Also see response # 52 & # 53).
Appendix F 'Air Quality Impact Assessment" Section 4.5.2.3 Dust deposition rate	52.	Monthly dust deposition monitoring is taken from monitoring done between April 2009 to October 2012. This data cannot accurately reflect the current dust deposition being over 7 years old.	Provide more recent information from other nearby sources to retrieve dust deposition monitoring data. This information could be sourced from (to west/east/north/south of the site): Peak Downs mine, South Walker creek operations, Caval Ridge mine. Consider at least one year before adopting levels.	As stated in **Section 4.5.2.3** of the **Air Quality Assessment** report, dust deposition monitoring is not undertaken by DES in the Project region. Therefore dust deposition rates were determined from publicly available data at the time of the assessment. The mining operations in the region are not owned by Vitrinite Pty Ltd, and any dust deposition monitoring data conducted by these mine sites has not been made publicly available. See previous comment above (# 51) on the suitability of Caval Ridge data. Overall, the dust deposition levels used in the air quality assessment are appropriate based on the level of currently available information. All available data sources have been utilised, and there is no known other publicly available meteorological data from the project area other than the BoM data utilised in the air quality assessment. The dust levels and meteorological data used in the air quality assessment are appropriate and satisfactory for achieving the objectives of the assessment. (Also see response # 51 & # 53).
Appendix F 'Air Quality Impact Assessment"	53.	In the dispersion model the CALPUFF method has been utilised. The weather station data from nearby sites has not been utilised to get more precise air quality model.	Re-run the dispersion model after gathering more (and more recent) data from surrounding sites and adjusting the background levels of TSP, PM10, PM2.5 and dust deposition.	The **Air Quality Assessment** utilised background levels based on publicly available information, as detailed above in item # 51 and # 52. The generation of a meteorological windfield for the project area is described in **Section 5.2** and **Appendix B** of the **Air Quality Assessment**.

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		Background levels of TSP, PM10, PM2.5 and dust deposition have been added to the dispersion modelling results of each scenario to provide a cumulative impact.	Weather station data from third party meteorological information is to be used to decrease the uncertainty of predictions.	The meteorological modelling was conducted in accordance with standard industry practice. The meteorological models are initialised with synoptic data for the region. As part of the assessment, meteorological monitoring data from the Bureau of Meteorology (BoM) station at Moranbah was used to validate the hourly TAPM predicted meteorology at this location. The validation process demonstrated a satisfactory level of accuracy between the observed data and the model predictions. Thereby providing confidence in the windfield generated for the project area. All available data sources have been utilised, and there is no known other publicly available meteorological data from the project area other than the BoM data utilised in the air quality assessment. The dust levels and meteorological data used in the air quality assessment are appropriate and satisfactory for achieving the objectives of the assessment. (Also see response # 51 & # 52).
Appendix F Air Quality Impact Assessment	54.	The assessment included control factors for dust mitigation. If operated without those control factors, dust emissions and subsequent impacts from the proposed mine may vary from those assessed.	Information confirming the proponent's intent to implement the modelled dust mitigation measures should be sought.	It is the proponent's intent to operate to the best practicable environmental standard and implement the recommended dust mitigation measures as commitments wherever deemed applicable during operations. These commitments will be incorporated as part of the site Environmental Management Plan (EMP).
Appendix F 'Air Quality Impact Assessment"	55.	Vulnerability of the landforms to climate change (extreme weather events, prolonged drought periods, etc.) is not considered.	Include a separate chapter to address a vulnerability of different landforms to climate change and adaptation strategies.	Vulnerability to climate change or adaptation measures are not considered relevant to air quality associated with the mine due to the short timescale of operations, that is three years.
Appendix F 'Air Quality Impact Assessment" Section 6.2 Mitigation Measures	56.	Section 6.2 Mitigation Measures needs to contain measures for GHG emissions from all activities at the site, across the project stages.	Provide and discuss any site-specific mitigation scenarios, along with estimated of possible CO_2-eq reduction (and associated costs) from different scenarios. Include land-use, construction waste sector emissions as well. Include a discussion on the Adaptation strategies for emissions that cannot be mitigated.	A greenhouse assessment was not conducted as part of this assessment, as it is typically seen as outside of the scope of this level of study. Non-the less a number of mitigation measures have been recommended to be employed for the reduction of any potential greenhouse gas emissions including: • The mine will be designed and operated to reduce mine equipment diesel consumption through equipment selection • load optimisation • route optimisation and production scheduling as well as • reduced idle time • Maintaining equipment based on manufacturer/supplier guidelines and recommendations.
Supporting information document; and	57.	Page 17 of the supporting information document states that, "The transport of coal will be from the Project MLA to an existing coal wash and load out facility along the Peak Downs Highway."	Discuss the potential for noise impacts offsite due to transportation.	An assessment of potential noise impacts from haul trucks has been undertaken and is now provided in **Section 6.7**, of the **Noise Impact Assessment** (**Appendix G** of the **Supporting Information** document). The resulting noise levels are considered compliant.

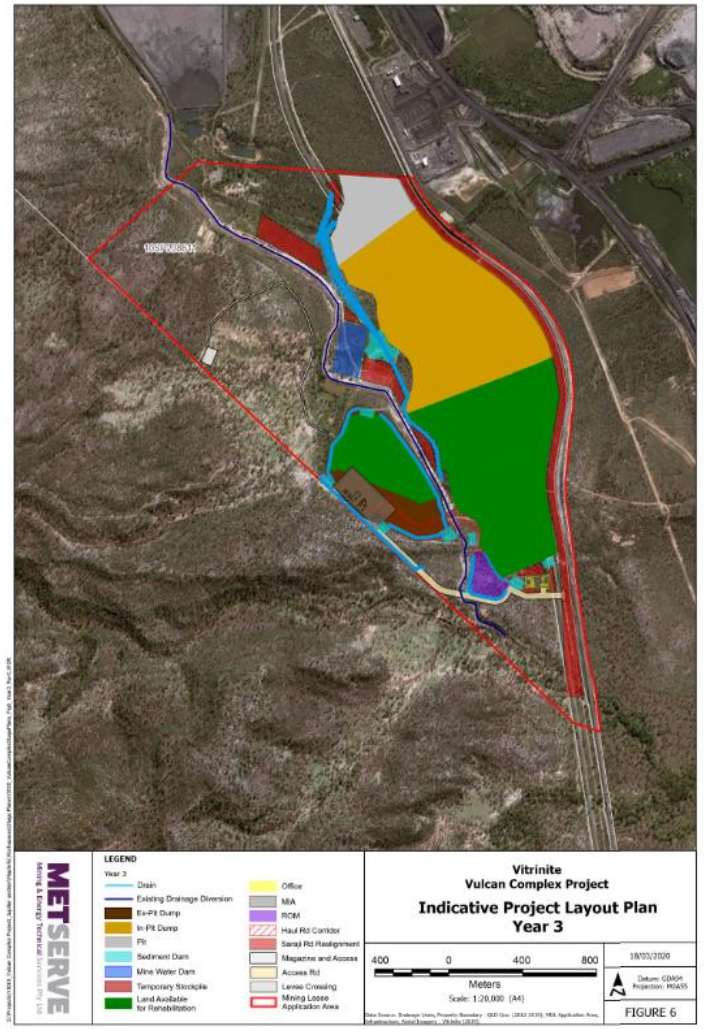
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Appendix G 'Noise Impact Assessment'		Page 6 of Appendix G states, "Note that assessment of offsite impacts (e.g. trucks) is excluded from the scope of this assessment." The potential for noise impacts offsite, due to truck movements to the coal washing and load facility, should be assessed.		The transport of coal will be from the Project MLA to an existing coal wash and load out facility along the Peak Downs Highway is depicted in **Figure 6.1**. Each truck will transport approximately 70 t of coal, with an anticipated average of 80 truck movements per 24 hours each way (i.e. 3.3 trucks per hour). The proposed haul truck route is on an existing public road (Peak Downs Mine Road, Dysart Road, Saraji Road) and a Queensland Globe review indicates the majority of the route (from the existing mine to the Highway) is classified 'PBS 3A (Up to type 1 road trains) RT1' and therefore has been designed for road trains, such as proposed for this project. Noise levels from trucks on public roads are not assessed against the criteria and noise limits proposed for assessment of noise from mining operations. There is no specific Queensland noise limit for such a scenario, and so instead reference is made to the noise criteria from the Department of Transport and Main Roads (DTMR) Transport Noise Management Code of Practice, November 2013. This document proposes a noise criterion of 68 dBA LA10,18hour for an existing residence adjacent an existing road. Note: The LA10,18hour noise level is the arithmetic average of the LA10,1hour noise levels between 6 am and midnight (i.e. 18 hours). Overall, based on the proposed haul truck route and truck numbers, the noise impacts are considered compliant.
Appendix G 'Noise Impact Assessment' Table 6.3 and Table 6.4	58.	The mobile equipment numbers and locations for Year 2 are presented in Table 6.3. The expected A-weighted levels data is missing, making it difficult to assess the levels at sensitive receptors presented in Table 6.4 Predicted A-weighted Noise Levels. The SoundPLAN program was used with CONCAWE algorithm for the noise modelling. Noise modelling is not considering all sources of environmental noise. Both "neutral" and "adverse" scenarios have been considered. It is not clear which meteorological conditions have been considered in the model.	Provide data on the noise levels (A-weighted-maximum and eq.) from ALL sources or equipment (both stationary and mobile) to be used at the site in the noise model and the duration of their use (continuous or discontinuous noise). Recommend to re-do the noise model to include more sources and considering the preparation (years 0 and 1) and post-mining/closure phases in the modelling and noise contours and present the trend analysis. Provide more information on meteorological conditions, meteorological station used for the data, etc.	Overall sound power levels are provided in the new **Table 6.4** of the **Nosie Impact Assessment**. The noise model includes all the noise sources which are understood to be included in the project. Modelling includes the highest production year, and given the sensitive receptors (residences) are over 10 kms from mine, modelling of other years would have negligible effect on outcomes at those residents. Meteorological conditions are nominated in **Section 6.2**. For adverse conditions, SoundPLAN assumes wind direction is from the source to each receptor as noted in **Section 6.2**. The stability class and wind speed for adverse conditions are from the Planning for Noise Control default inversion parameters for Non-Arid areas (annual average rainfall greater than 500 mm).
Appendix G 'Noise Impact Assessment'	59.	Within section 5 the Existing Noise Environment states that attended noise measurements and noise logging were undertaken at the 4	Include data relevant to the sensitive receptor to the north from Table 3.1 to get a more complete coverage of the area and	From **Table 5.2** and **Table 5.3** of the **Nosie Impact Assessment** it can be seen that background noise levels at Locations A and D, within several km of the existing mine, are relatively similar and consistently around 30 dBA L90 in the day, evening and night.

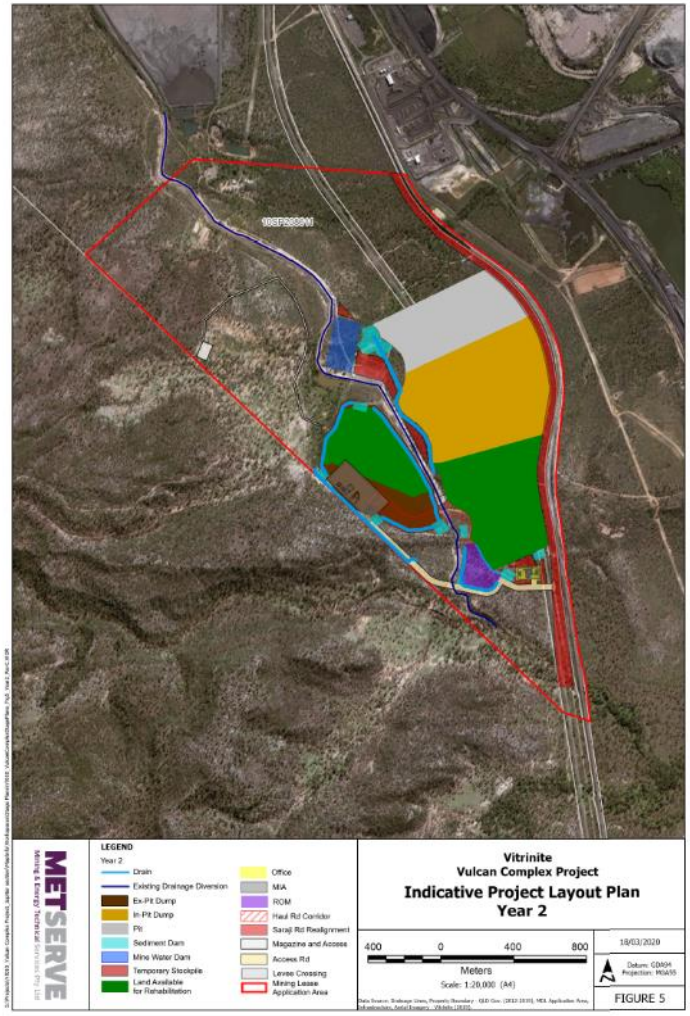
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Section 5		sensitive receptor locations (A, B, C and D). the measurements were taken over 7-day period with both selected noise logging receptor locations A and D, are to the east of the project. Northern sensitive receptor data has not been included.	better understanding on the background noise levels.	Background noise levels at Locations B and C are notably quieter, and this is considered to be due to the greater distance (> 20 km) of Locations B and C from existing mining operations to the east. The commercial receptors near the subject mine site (i.e. receptors 1 to 7 in **Table 3.1**) would likely experience similar background noise levels to Locations A and D (receptors 9 and 11 from Table 3.1) given their proximity to the mine, though this would obviously be dependent on local activities at the mine and at the commercial receptors themselves.
Supporting information document; and Appendix H Waste Geochemistry Assessment	60.	Page 7 of the supporting information document states that, "The current Project plan proposes the disposal and long-term storage of Coal Handling and Preparation Plant (CHPP) reject material within a facility at the operation selected to provide toll washing and product coal handling services for the Project. Should such storage not be available, Vitrinite will maintain the option to back-load the ROM coal haul trucks to bring reject material back to the Vulcan Project site for co-disposal in-pit with the Project waste rock material." The impacts and disturbance associated with the co-disposal option have not been discussed.	Discuss the impacts of in-pit co-disposal of rejects and tailings on site should this option be selected.	The existing **Waste Geochemistry Assessment** (**Appendix H** of the **Supporting Information** document) states in the last paragraph of **Section 4.1** that "As a bulk mixed material, it is expected that coal reject will have a relatively low risk of generating acidic drainage. If the Project progresses beyond the current approval and it is planned to wash coal on site, future co-disposal of coarse and fine reject materials and subsequent disposal within cells in waste rock materials is likely to be beneficial and eliminate any residual risk". Further explanation of the merits of co-disposal are also provided in the **Waste Geochemistry Assessment**, **Section 5.1.** the **Waste Geochemistry Assessment**, has been updated in **Section 2.2.3** (**Page 5/6**), **Section 4.1** (**Page 22**), **Sections 4.4** (**Page 27**) and **Section 4.5** (**Page 27-29**) to discuss the potential impacts of any in-pit co-disposal of coal reject (coarse rejects and tailings) on site should this option be selected. There is no additional disturbance associated with the co-disposal option. In addition, the amount of coal rejects generated from coal washing will be a small fraction of the total waste rock to be stored in-pit.
Appendix H Waste Geochemistry Assessment Section 3.1.1 Waste Rock	61.	From the information provided, it is not clear if samples were taken from different lithology seams.	Information needs to be included to demonstrate that the sample regime meets best practice standard (*Global Acid Rock Drainage (GARD) Guide, International Network for Acid Prevention: Chapter 4 Defining the Problem – Characterisation, Assessment and Management of Acid Drainage* (DME, 1995), AMIRA (2002). ARD Test Handbook: Project 387A Prediction and Kinetic Control of Acid Mine Drainage), is partially representative of all material being mined (i.e. the ore body, exposed pit walls and overburden etc.) and results are representative of all lithologies. Present information on the lithology at the site.	Information on the lithology and stratigraphy at the Project is already provided in the **Waste Geochemistry Assessment**, in several places including **Section 2.1**, **Figure 3**, **Table 3-1, Table 3-2, Graphs 4-1** to **4-10**, coupled to **Tables B1** and **B2** in **Attachment B**. Best practice guidelines technical AMIRA, 2002; DME, 1995; the GARD Guide (INAP, 2009) and COA (2016c) have already been used and referenced in the **Waste Geochemistry Assessment**, (although it is noted that the DME (1995) reference no longer exists on the DES website. The Vulcan Project is a coal deposit not an ore body and the geochemistry and stratigraphy of overburden and interburden in a lateral direction in this part of the Bowen Basin is relatively uniform, predictable and well understood.
	62.	There is not enough information regarding the geochemical	Provide more information on Geochemical Characteristics of ROM coal and	The geochemical characteristics of ROM coal can be extrapolated from the geochemical characteristics of coal reject coupled to coal quality (total

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		characteristics of ROM coal and the proposed management of ROM stockpiles	management of ROM stockpiles to minimise environmental impacts.	sulfur and forms of sulfur) information. The **Waste Geochemistry Assessment**, has been updated to include an additional sub-section (**Section 4.1.3**) to describe the basis, and supporting data, for this approach.
Appendix H Waste Geochemistry Assessment	63.	The information provided in Figures 4 and 5 shows that good representative sampling was undertaken. However, the information is not linked to the previous information as provided in Table 3-1 and doesn't present quantifiable information.	Provide more detailed information on how many samples were taken from each sampling location as shown in Figures. For example, how many samples out of 115 provided in Table 3-1 were collected at location VSW104_C, how many out of 5 coal reject samples were taken at location VSW069_C., etc.	The requested additional information for waste rock is already provided in the **Waste Geochemistry Assessment**, in **Attachment B** (**Table B1** and **Table B2**). **Table B3** (**Attachment B**) (for rejects) has been updated with the relevant drill hole names shown in Figure 4 for clarification.
Appendix H Waste Geochemistry Assessment Section 3.2.1	64.	The section states that: "Two size fractions (coarse: wash 2, -50+2mm; and fine: wash 3 & fines, -2+0.25 & -0.25+0mm) of coal reject materials were selected to best represent the two coal reject streams that will be produced from coal washing off site." Clarity is required how the applicant plans to manage fine rejects.	Justify how the information determined that only these two fractions are representative of the lithology at the site. Ensure that reference is made to the lithology at the site. Further information on the management of fine rejects is required.	The two coal reject size fractions were selected by Chris McMahon (Coal Quality Consultant) to best represent the coarse and fine reject streams that will be produced from washing of coal off-site. There are only two coal reject streams (coarse and fine reject) that will be produced from coal washing. The coal reject samples were prepared at the coal quality laboratory by subjecting a working seam comprising multiple coal plys from large diameter drill core to washing tests and the resultant coal reject materials therefore represent a mixture of lithologies and coal. Fine rejects (tailings) will be managed at the off-site toll washing facility.
	65.	Information for the static geochemical test program is provided. Acid Base Account (ABA) test was used. Why was the net acid generation (NAG) test not performed as it is considered as a supplement to another static test such as the ABA test and describes the best net acid generation.	Justify why the net acid generation (NAG) test was not performed as it is considered as a supplement to another static test such as the ABA test and describes the best net acid generation. Further information also required on: - the total inorganic carbon determination including hydrochloric acid pre-treatment to be presented. - The difference between the total carbon content and the carbon content from the pre-treated samples.	It is already stated in the **Waste Geochemistry Assessment** (**Attachment A**) that "the standard NAG test is generally unsuitable for coal mining projects as the high organic content of some materials can cause erroneous results". Therefore, information on the carbon content of the samples is not required as the NAG test is not required. Essentially, the NAG test can produce a false positive result. The report text and reference list has been updated to include relevant references (Stewart *et al.*, 2003; ACARP, 2008). The standard NAG test is therefore not appropriate for coal mine samples especially as the waste rock contains negligible sulfide sulfur, excess ANC and is Non-Acid Forming (NAF). Coal reject materials can contain slightly elevated sulfide sulfur concentrations compared to background concentrations in soils, however KLC tests were completed for coal reject materials, which demonstrate that bulk/mixed coarse reject and tailings materials are classified as NAF (**Attachment B of** the **Waste Geochemistry Assessment** has been updated to include the six months' of KLC data for coal reject material which is now available).
	66.	Kinetic tests: The KLC tests for waste rock were completed from June to December 2019 and are being completed from December 2019 to June 2020 for coal	Elaborate in more detail the reasoning behind the justification that the 6 KLC tests are representative of the whole mine site.	The KLC tests were completed on composite samples for particularly prevalent waste rock lithologies (sandstone, claystone and siltstone) as well as coal rejects from coal washing and coupled to the 10 composite samples used in static water extract tests, provides good coverage of the range of materials that could potentially be generated and managed at the

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		reject materials. It is stated that 6 KLC test were conducted, but it is not clear from which location?		Project (apart from coal). **Appendix H** (**Table B7, Attachment B**) has been updated in the report to provide the identity of the specific individual samples included in the composite KLC sample suite. All KLC data for coal reject is now included in **Appendix H** (**Attachment B**).
Appendix H Waste Geochemistry Assessment Section 4 Geochemical and Physical Characterisation Results	67.	Management of assessed potential overburden and interburden (collectively called spoil), ROM stockpiles and potential coal reject materials needs to be addressed during all stages of the life of mine.	Present information how the applicant plans to manage this through different phases of mining: Construction, Operations, Rehabilitation and Decommissioning. Provide potential mitigation measures (if any).	A new **Section 5.4** has been added to the **Waste Geochemistry Assessment** to address this comment.
	68.	Additional confirmatory sampling and testing should be completed on bulk mine waste materials when available during the operational phase of the Project to determine the best management option for progressive rehabilitation of these materials during operations and at mine closure.	Present information on the sampling that is proposed/planned in the operational phase.	**Section 5.3** of the **Waste Geochemistry Assessment** has been updated to include information on the sampling and testing that is proposed/ planned in the operational phase.
Section 5.8.3 of Supporting Information document; and, Appendix I Soil and Land Use Assessment	69.	Section 5.8.3 of the supporting information states, “It (Crocodile SMU) is the dominant soil management unit immediately west of The MLA area, but occupies less than 1 ha of the MLA area.” Table 16 ‘Soil Management Units – Project Area’ of Appendix I does not list the Crocodile SMU as being in the project area. The Crocodile SMU has not been discussed in Appendix I as an SMU within the project area that could have impact on the proposed post mining land use of cattle grazing. As per Table 54 ‘Summary of Land Suitability Limitations for Cattle Grazing’, the Crocodile SMU has an overall suitability rating of 5. Section 6.1.13 states, “all land within the project area comprises Class 4 land.”	Include the Crocodile SMU as an SMU present within the project area when discussing land use suitability and proposed post mining land use of cattle grazing.	To clarify, the Crocodile Soil Management Unit (SMU) is not found within the VCP MLA, however it abuts the western boundary. Reference to it has been removed from the PRCP. The Limpopo and Zambezi SMU’s are found within the MLA, however the Zambezi SMU will not be disturbed by mining activities. Therefore all discussion of soil and subsoil management focusses on the Limpopo SMU. **Section 5.8.3** of the **EA Supporting Information** document and **Sections 1.2.6** and **1.2.7** of the **PRC Plan**, have been amended to remove the Crocodile SMU, provide information on the management of the Limpopo SMU,,and reflect the results in **Section 4** and **Table 16** of the **Soils and Land Suitability Assessment**.
Appendix I Soil and Land Use Assessment	70.	Section 4.5 of Appendix I states, “The particle size distribution reveals the A11 horizon of this SMU is strongly dominated by sand (79%) with silt and clay size particles comprising 8% and	Discuss the potential impacts of slumping on the proposed post mining land use of cattle grazing. Propose management measures for mitigating slumping.	The potential impacts from the proposed use of sandy topsoil material from the Limpopo SMU should be considered in terms of ‘erosion potential’ where used as the top 250 mm of the proposed post mine landform is unlikely to be prone to “slumping”, which is a mechanical process generally involved across a greater depth in the soil profile.

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Section 4.5 'Limpopo Management Unit'		10% of this horizon respectively. Organic matter content is regarded as moderate, contributing to average structural stability. This information along with the high sand content suggests this soil unit may be at risk of slumping." The potential impacts of slumping and proposed management measures have not been discussed in Appendix I.		An assessment of the potential for "slumping" of the final landform has been undertaken in a separate study that involved a geotechnical analysis of the slope stability for the ex-pit and in-pit waste rock dumps (Blackrock 2020). It should also be noted in the context of potential topsoil erosion, that the landform design proposes moderate slopes up to 15% (8.5 deg) with a gently sloping plateau. Notwithstanding the above, **Soils and Land Suitability Assessment**, has been updated in **Section 8.3** to include a number of recommendations for the appropriate management of sandy topsoils in the Limpopo SMU to ameliorate the potential for erosion, including addition of organic materials, contour ripping and keying, rock armouring, nutrient addition and hydro-mulching. The **PRC Plan**, has been amended in **Section 6.2.4** to incorporate the updated topsoil management recommendations.
Appendix I Soil and Land Use Assessment Section 8.1 Topsoil Suitability and stripping of Assessment'	71.	Section 8.1 of Appendix I states, "Importantly, the topsoil associated with this SMU (Limpopo) is predominantly composed of sand (79%) and should therefore not be placed on slopes exceeding 3% without appropriate measures to manage stability." A similar statement is provided for the Zambezi SMU. The Limpopo SMU is the majority SMU on site (96% of project area). As such, consideration should be given to the placement of topsoil from this SMU to ensure stable stockpiles. Proposed topsoil stockpile locations have not been discussed in Appendix I.	Provide information (e.g. maps) regarding the proposed locations of topsoil stockpiles.	Where practicable soils will be directly placed in prepared rehabilitation areas rather than stockpiled (**PRC Plan Section 6.2.4**). Where stockpiling is required, specific locations of topsoil stockpiles will be considered in the detailed mine planning phase, The management of topsoil stockpiles will consider limiting any potential disturbance from operations and the ongoing viability of the stockpiled soil and soil seedbank. Current planning for temporary topsoil stockpile locations are indicated below in the Mine year 3 stage plan (**Figure 6** from the **EA Supporting Information** document). Importantly, wherever final stockpile locations are determined, the stripping and stockpiling of topsoils from the Limpopo SMU will be undertaken in accordance with the topsoil management recommendation in the **PRC Plan** (**Section 6.2.4**) and **Soils and Land Suitability Assessment**, (**Section 8.3**). This includes a number of recommendations for the appropriate management of sandy topsoils in the Limpopo SMU to ameliorate the potential for topsoil erosion.

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Appendix I Soil and Land Use Assessment	72.	Section 8.2. of Appendix I states, "Stockpiling of topsoil for extended periods can lead to physiochemical and biological changes in the soil and thus affect the viability of the soil seed bank. Therefore, where possible,	Provide information pertaining to the feasibility of rehabilitating disturbed areas as soon as these areas become available with direct topsoil placement.	Opportunities for direct placement of topsoil and subsoil will be maximised during detailed mine planning and during ongoing operations, as a matter of best practice and limiting the cost of double handling soil resources. Given the relatively short lifespan of the mine operation, it is anticipated that such opportunities will be prevalent. Current mine planning indicates

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Section 8.2 Topsoil Stockpiling		topsoil should be directly placed in prepared rehabilitation areas rather than stockpiled." It has not been discussed whether areas will become available for rehabilitation within a feasible timeframe to allow the direct placement of topsoil rather than stockpiling.		that a significant area of ex-pit fill will be available for revegetation in the second year of mine life, as indicated below in the Mine year 2 stage plan (**Figure 5** from the **EA Supporting Information** document). A detailed schedule indicating the land availability (ha) for rehabilitation in each rehabilitation area, for every year of the mine life, is also provided in **Table 10-1 Section 10** of the **PRC Plan**. 

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Appendix I Soil and Land Use Assessment Section 8.2 Topsoil Stockpiling; and Section 8.3 Topsoil Placement	73.	Table 70 'Estimated Soil Volumes – Project Area' in section 8.2 of Appendix I states that the total topsoil on site is 1,224,000m3. Section 8.3 states Where possible, placement of topsoil at a minimum thickness of 0.2 m is recommended for rehabilitation areas to create a growth medium of sufficient depth to hold water and support revegetation." An estimated amount of topsoil required for proposed rehabilitation works has not been provided. Is 1,224,000m3 of topsoil going to be sufficient for rehabilitation?	Provide an estimate of the amount of topsoil required for proposed rehabilitation works. Provide detail of alternative methods to mitigate any deficit over the Life of Mine, Also, provide justification why 0.2m would be sufficient depth to hold water and support plant growth.	**Section 1.6.4** of the **PRC Plan** describes the materials (topsoil, subsoil and waste rock) that will be available for use in formation of the proposed final landform and provides a detailed estimate of the Volume of available material required for rehabilitation (**Table 6-2**). A deficit of material is considered unlikely with an estimated excess balance of +85,729 m^3 of topsoil, and +43,372 m^3 of Subsoil left unused after rehabilitation requirements, as detailed in **Table 6-2**. The **Soil and Land Use Assessment** also details the estimated topsoil resource available for each SMU within the project disturbance area (**Table 70, Section 8.3**) based on the recommended stripping depths for each SMU identified. Topsoil will be stripped from areas to be disturbed to a depth of 0.3 m, with between 0.2 m and 0.25 m being recommended for replacement where required on post mined landforms (**PRCP Plan Section 6.2.4**). The **Soil and Land Use Assessment**, **Section 8.3**, has been updated, and details a number of detailed recommendations for topsoil treatment and amelioration. Placement of 0.25 m is the recommendation for the thickness of topsoil to create a growth medium of sufficient depth for retention of water, provided that rainfall is present and sufficient during the rehabilitation period. Any less than the recommended 0.2 m depth and the process of evapo-transpitration may leave insufficient retention of available soil moisture to support vegetative growth. Additionally, the soil management recommendation for the addition of organic matter for the amelioration of sandy topsoils will benefit further retention of soil moisture to support vegetative growth.
Appendix I Soil and Land Use Assessment Section 9.1 Land Suitability	74.	Section 9.1 of Appendix I states, "Based on the pre-mining land use and the results of the soil and land suitability assessment, it is anticipated that most rehabilitated landforms will be able to support a post-mining land use of cattle grazing." The above states "most rehabilitated landforms", but not all. What about the other rehabilitated landforms? What are these proposed to support as a post mining land use?	Provide information regarding the proposed post mining land uses for all rehabilitated landforms on site.	Not all post mine land uses (PMLUs) will be suitable for grazing, such as Saraji Road, which will be maintained as an active transport corridor. Information regarding all of the PLMUs on site is provided in detail in the **PRC Plan, Section 4**, and also outlined in **Section 10.1.1** and illustrated in **Figure 10-1** including: • low-intensity cattle grazing; • public road; • railway used for coal transport; and • existing flood levee constructed to protect neighbouring coal mines. (Also see response # 75)
	75.	Section 9.1. of Appendix I states, "Other areas, such as steeper outer slopes of spoil (e.g. slopes of > 10%)	Provide information regarding the "agreed post mining land use".	Information regarding the proposed post mining land uses for all rehabilitated landforms on site is provided in detail in the **PRC Plan, Section 10.1.1.** Further information regarding all of the PLMUs on site is

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		may be subject to increased risk of limitations such as erosion. These areas will require management to ensure they remain safe, non-polluting, stable, and able to sustain an agreed post-mining land use." What is the "agreed post mining land use" intended to be?		provided in detail in the PRC Plan in **Section 4**, and is illustrated in **Figure 10-1** including: • low-intensity cattle grazing; • public road; • railway used for coal transport; and • existing flood levee constructed to protect neighbouring coal mines. (Also see response # 74)
Appendix J Transport Assessment Section 5.3 Impacted Road Links on Council Controlled Roads	76.	It is identified that the percentage increase in the road link assessment (Table 5.2) exceeds 5%. There is no discussion into the impacts of this on both the durability of the road and the existing use of these road links.	Provide further details on the impacts of the percentage increase identified in Table 5.2.	Impacts to the "durability" of the road is expected to be mitigated through the proposed pavement impact contribution for Council Controlled Roads. Discussion on the proposed pavement impact contribution is provided in **Section 7.7** of the **Transport Assessment** (**Appendix J** of the **EA Supporting Information** document).
	77.	It is stated that "the Project impact on council-controlled roads warrants further analysis". Details on this further analysis need to be discussed including when this analysis will be undertaken and how. What outcomes does this analysis propose to identify or discuss the importance of this further analysis.	Provide details into what will be included in the "further analysis" and when this will be completed.	This analysis has been undertaken with results provided in the last paragraph of **Section 5.3** of the **Transport Assessment** (**Appendix J** of the **EA Supporting Information** document). Even though an impact of greater than 5% is expected for Year 2 of operations, the forecast traffic volumes are well below the midblock capacity as derived using the Austroads Guide to Traffic Management. As such the increased vehicle demand as a result of the Project during the Construction and Operations phases is expected to be accommodated by existing capacity provided on Peak Downs Mine Road. No further analysis beyond that provided in the Transport Impact Assessment report is proposed.
Appendix J Transport Assessment Section 6.3.3 Intersection Form	78.	No details whether the project access from Saraji Road intersection designs within this section have been approved by the relevant Council or if these design are currently being discussed.	Include details into discussions with Council regarding the road designs.	Road designs have been discussed with Isaac Region Council, and as per **Section 10.1** of the **Transport Assessment** (**Appendix J** of the **EA Supporting Information** document)**,** a monetary compensation agreement has been delivered. Detailed discussions of the proposed Saraji Road realignment have also been undertaken with the landholder during delivery of the Opening and Closure of a Road process under the State Land Act, 1994.
Appendix J Transport Assessment Section 7	79.	Within section 7.5 it is identified in Table 7.8 Pavement Impact Assessment Results Summary (Impact Comparison to Existing SAR4), that in year 2, year 3 and year 4 have percentages that exceed the 5% baseline. There is no discussion into the impact of these identified exceedances or what this means for	Provide details discussing the impacts identified in the relevant table and what this means in particular to Saraji Road that is the main road to be used by the mine.	Pavement impacts are typically mitigated through a monetary contribution towards pavement degradation. The calculated contribution for State Controlled Roads has been assessed on the basis of the methodology prescribed in the Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment (December 2018). Council does not have a prescribed methodological approach to Pavement Impact Assessment set out within its Planning Scheme, and as such, the monetary contribution has been negotiated between the Proponent and

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		the durability of the road and maintenance required.		Council. It is understood that the contribution has been based on a modified approach based on TMR's methodology and was the agreed rate as negotiated as part of the Bulk Sample Project.
Supporting Information document.	80.	The supporting information does not include an assessment of potential commercial places in the vicinity of the project.	Provide an assessment of the commercial places and the potential impact of the project on these commercial places.	A summary of local businesses is provided in **Section 4.3.2** of the **Social Impact Assessment** (Appendix L **of the Supporting Information** document). At the time of assessment, there were 442 registered businesses within the statistical area of Moranbah, with approximately 27% of these (122 businesses) employing one to four employees. 9.3% of businesses generate a turnover of $2 million or more, which is higher than the Queensland average of 6.5% (QGSO, 2018d). Data on Dysart businesses is less accessible due to the size of the town and the fact that it is located within the statistical area of Broadsound-Nebo, which incorporates areas as far north as Collinsville and as far east as the coast. Searches of community directories and on-line business websites for Dysart indicate that approximately 50 businesses and services are located in the immediate area. Dyno Nobel and Kalari currently undertake commercial activities in close proximity to the VCP. Vitrinite is in commercial negotiations with the Kalari and Dyno Nobel to facilitate the relocation of both Kalari and the Dyno Nobel facilities prior to the commencement of VCP mining activities. Both commercial operations are anticipated to continue following relocation. The impact of the project on local businesses was assessed as low, due to the relatively small size of the project compared to other mines, and 'positive' (**Table 6-3**, **Transport Assessment**) due to the increased opportunities for these businesses. The region is already geared towards mining and the community is largely supportive of the local mining industry. Vitrinite encourages the use of local business where they are technically capable and commercially competitive, and has already engaged with local businesses for their services and products. Vitrinite will ensure that local businesses are aware of expectations and requirements for accreditation.
Appendix L Social Impact Assessment General Comment	81.	The assessment does not discuss social impacts on the workforce of the mine. For example, fatigue management.	Provide details on how the operations will impact on the workforce that live within the local communities and their families.	Workforce health and wellbeing issues, including those that occur off-site and off-duty, are regarded as Project health and safety matters and will be addressed by forthcoming management plans and policies. These policies will address off-site and out-of-hours issues including but not limited to: fatigue, due to day/night shift transitions, travel to and from site, and shift and stint length; mental health issues that are associated with FIFO or DIDO workforces such as isolation in mining camp accommodation and separation from family units; and general encouragement of healthy practices related to sleep, diet, and responsible alcohol consumption.
	82.	No discussion on whether the mine has plans to interact with the	Provide details on factors to be considered to ensure positive community relationships and methods to retain local community	Vitrinite will maintain communication with the community through its website, and will be receptive to feedback from the community, and all stakeholders, by telephone, face-to-face, email or regular mail

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		community to ensure good community connections and relationships. There is only minor reference to this within Table 6-7.	relationships for the duration of the mine from construction to decommission, particularly regarding possible interest in the mine actioning the PRCP schedule.	correspondence. Any directly affected stakeholders will continue to be communicated with directly about matters that pertain to them. During the consultation process, all relevant stakeholders have expressed support for the post mining land uses (PLMUs) in the planning of the **PRC Plan** and ongoing consultation will continue as necessitated throughout all phases of the project including closure decommissioning and rehabilitation. Vitrinite is committed to, wherever possible, seeking services from local companies and to recruit from the local workforce (**Transport Assessment**, **Table 6-3**), and this applies though the activities of the **PRC Plan**, as well as construction and operations.
Appendix M Stakeholder Engagement Section 3.1.3 Local Council	83.	No reference to whether conversations with the local Council has begun, particularly in reference to the Saraji Road re-alignment.	Provide clarification on all communication with the local Council on mining operations associated with the Saraji Road under the jurisdiction of the Council.	Vitrinite met with Isaac Regional Council (IRC) on 10 July 2019 to present the project overview and discuss IRC approvals and notifications, Pavement Impact Assessment (PIA) and Transport Impact Assessment (TIA) requirements, and the suitability of a Road Use Management Plan. Ongoing consultation was agreed to. On 20 November 2019 Vitrinite met again with council to update them on the project status and discuss road relocation/realignment and the associated approval process. It was agreed that IRC would draft a compensation agreement for road relocation. On 20 February 2020 Vitrinite met whir IRC regarding project updates and the Saraji Road realignment. Discussed were compensation agreements, a Road Use Management Plan, and approval mechanisms under the Land Act. Commitment to ongoing consultation was reaffirmed. On 25 February Vitrinite met with IRC to discuss use of recycled water in dust suppression. These consultations are included in the Stakeholder Register (**Appendix A** of the **Stakeholder Engagement Plan**).
Appendix M Stakeholder Engagement Section 3.1.6 State and Federal Regulators	84.	No discussion into which components of the application, construction, operation and decommission will involve particular regulators.	Provide further information on the relevant State and Federal Regulators involved in all steps of the mining operations from application to decommission.	**Table 2** of the **Stakeholder Engagement Plan** breaks down the involvement of State and Commonwealth stakeholders and the relevant project components. These can be summarised as follows: Queensland Department of Environment and Science (DES): • EA application and PRCP • Environmental assessments and mitigation measures • Environmental management plans • Mine rehabilitation Queensland Department of Natural Resources, Mines and Energy (DNRME) • Mining Lease application • Water supply and water infrastructure • Compliance with operational plans and safety

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				• Mine closure Queensland Department of Transport and Main Roads (DTMR) • Transport and road impacts • Transport Impact Assessment (TIA) • Pavement Impact Assessment (PIA) • Associated contributions • Road Use Management Plan Commonwealth Department of the Agriculture, Water and the Environment (DAWE) • Assessment EPBC Act referral and Preliminary documentation • Assessment of MNES, values, impacts and mitigation measures
Appendix M Stakeholder Engagement Section 3.2 Communicatio n Channels	85.	No reference to how the mine will address community concerns or complaints with available communication channels.	Provide further information on how the mine will address possible community complaints and concerns involving mining operations.	A complaint process is currently in place for the Bulk Sample Project (BSP) as conditioned by the environmental authority (EA). This system will be applied to the full VCP, of which the BSP is smaller component. It will document criticism or concern over perceived environmental issues and will be available for consultation by the relevant stakeholders. The complaints register will record: 1. name, address and contact number of the complainants; 2. time and date of the complaint; 3. reasons for the complaint; 4. investigations undertaken; 5. conclusions formed; 6. actions taken to resolve the complaint; 7. any abatement measures implemented; and 8. person responsible for resolving the complaint. Should the VCP be required to have any further or different complaint procedures through conditions from an administering authority, they will of course take precedence to ensure compliance of the project.
Appendix M Stakeholder Engagement Section 4 Ongoing Engagement	86.	The section does not address who in particular will require ongoing engagement. For example, who would be involved in discussions about possible change in operations.	Provide further information on the main stakeholders involved in ongoing engagement.	Stakeholders will receive ongoing engagement for as long as they are affected by the project. Assessment of this status will be a matter for the review for the Stakeholder Engagement Plan on an annual basis to identify which stakeholders require continuing engagement and on which matters. In general ongoing engagement is expected to include owners of underlying and adjacent tenures, and entities which operate within the project area and its immediate vicinity for as long as they meet those criteria; and the administering authority and other regulatory bodies until such time as full relinquishment is achieved. Given the small scale and short duration of the Project (all rehabilitation works to be completed within 5 years), and the proposal to return the land to its pre-mine land use, it is considered unlikely that stakeholder perspectives on post mining land uses (PMLUs) will change significantly during the course of progressive rehabilitation.

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PRC Plan General Comment	87.	The Department acknowledges the applicant's use of relevant Reference Milestones in the PRCP guideline. The PRCP guideline highlights that this list is not exhaustive and where appropriate site-specific milestone (and supporting descriptions and criteria) will also need to be developed. Consider if additional site-specific milestones need to be added to the PRCP schedule. In particular, ensure that descriptions of each milestone adequately capture all the actions associated with the milestone and that Milestone Criteria reflect these steps.	The following additional information is required to ensure the completion criteria for this site is sufficient to adequately measure success: • **RM1** – include a criteria that waste will be transported, disposed of, handled in accordance with the relevant waste legislation. • **RM2** – include criteria that contamination removed from site is done so in accordance with the relevant regulations and that the site is placed on EMR/CLR where necessary • **RM3** – there is a slight difference in soil capping layer for PMLUs. For example – in pit and ex pit WRDs. These differences need to be captured in the criteria for RM3. Include criteria signalling that the landform is geotechnically or erosionally stable. The criteria for landform development needs to specifically refer to landform rules, for example - the final landform is constructed as per design plans, max slope gradient on batters is 15%, drainage systems installed, backfilled pit is assessed as geotechnically stable by suitably qualified person. • **RM4** – Include mention of rock mulch application and application/incorporation of ameliorants and fertilisers. Include a criteria demonstrating that the use of rock mulch on slopes would still be safe for cattle. • **RM6** – Include a milestone to address corrective actions for failed revegetation. • **RM7** – Include a milestone to address corrective actions arising from monitoring to fix areas of erosion, bare soil, failed rehab. Need additional criteria to demonstrate geotechnical	The milestone criteria have been amended in accordance with the suggested requirements (see **Table 10-3**), with the following exceptions: • RM1 – no exceptions • RM2 – it is the intention of Vitrinite that there is to be no contamination at the conclusion of the project, so the criterion for "placing on the EMR/CLR" was not included. • RM3 – no exceptions • RM4 – no exceptions • RM6 – no exceptions • RM7 – an additional criterion for erosion monitoring has been added. However, it should be noted that three of the existing criteria (soil stability index, percentage groundcover and surface water quality) were specifically chosen to assess this. Additional criteria pertaining to (a) natural recruitment/self-sustainability, and (b) recovery from drought have also been added to RM7. No specific criterion for self-sustainability of open pastures was considered appropriate, given that, if these pastures meet the general criteria for pasture mass, stability against erosion, ground cover, natural recruitment and drought tolerance, there is no reason they would be less self-sustainable than wooded sites. On the contrary, grasses are far more likely than trees to recover quickly after fire or drought. They are also more likely to commence natural recruitment earlier than trees due to their rapid maturity. It is acknowledged that such concerns about pasture stability are valid if milestone criteria were to be tested only 1-2 years after planting, when there is still potential for pastures (and trees) to deteriorate over time if growing conditions are unfavourable. However, the monitoring program commits to ten years of monitoring following planting. Any pastures that are not self-sustainable are unlikely to continue to fulfil the milestone criteria over such time.

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			and erosional stability has been achieved. Include additional criteria demonstrating the vegetation is self-sustaining. It is noted that no trees are proposed to be planted on the out of pit dump due to lack of topsoil. How will this meet self-sustaining after fire or drought?	
	88.	There are many key recommendations and conclusions discussed in the attached specialist reports which were not adequately reflected or referred to in the PRC planning part. Please ensure that any conclusions/recommendations that have come from supporting technical studies are clearly introduced and explained in order to justify the conclusions taken forward into the Schedule.	Where supporting technical studies are appended to the PRCP – please ensure these are referred to where appropriate.	Relevant updates have been made to several individual technical assessment reports in response to the information requests in this table. Updated technical assessments have been re-appended to an updated version of the **EA Application Supporting information** document, and an updated **PRC Plan,** where relevant**.** The updates made to individual technical studies and assessment reports have been brought across into the body of the **EA supporting information** document and **PRC Plan,** where relevant, for consistency, and are also cross referenced in the associated information request responses within this document.
	89.	Many of the concerns previously raised during the pre-lodgement reading of the landform design portion of the PRC planning part have not been addressed in the planning part of the submitted PRCP. This includes topics regarding to waste material characterisation, rock mulch, and vegetative cover, surface of the landforms, surface water interactions, monitoring and adaptive management. For further explanation, refer to email from Emma Burgess to Dave Moss on 26 March 2020.	Include all relevant information that has been previously discussed into the PRCP to addressing landform design and PRC planning.	Issues outlined as per DES email **Subject; Vitrinite Vulcan Complex Project PRCP – information requirement discussion** (dated Thu 26/03/2020 2:39 PM): *"..please find below the department's response to your particular questions as to whether the supplied information (the site slope analysis, literature review and geotechnical evaluation of the proposed final landform slopes for the Vulcan Complex project) is sufficient to meet the PRCP requirements that –* • *the final landform design includes modelling predicting the long-term stability of the final landform design; and* • *trial methodology to verify the predicted success of the final landform design.* *For all applications that involve the construction of landforms which will form part of the post mining landscape, the Department requires a level of detail necessary to conduct the required impact assessment. This would typically involve waste material characterisation studies (which may include erodibility trials etc.), geotechnical investigations, landform design studies, supporting literature reviews and proposed trials necessary to prove up rehabilitation strategies and/or landform designs.* *With regards to the information submitted –* *The **Geotechnical Assessment** identified that landforms will exceed a Factor Of Safety of 2, which demonstrates the potential for long term geotechnical stability and safety of the landforms.* *As a matter of interest - there was a material identified in the geotechnical assessment described as Cat 2.5 (Unsaturated and Saturated). It would be informative to identify the geochemical and physical characteristics of*

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				this material. I note that the assessment assumed a basal saturated spoil layer of approximately 5m, and again, it would be informative to provide some discussion around the implications of this assumption to the overall assessment. **See Response # 104** ***The Literature Review of slope stability*** *identifies reliable information regarding the relationships between cover, slope gradient and erosion. The report also cites research regarding the stability of landforms when grazed.* *However, for the purpose of demonstrating/predicting that the final landform will be stable in the long term, there remain some missing links:* ***Waste material characterisation -*** *What are the characteristics of the waste material that will be used to construct the ex-pit landform and be used to backfill the in-pit landform? While the landform is apparently low risk in that it is 15m high and has low gradient slopes – are the materials used to construct the landform dispersive/sodic/saline? How do they relate to the Oaky Creek materials which are referred to in Figure 5 and the Bowen Basin soil materials in Figure 4. The PRCP should demonstrate the excavated materials at Jupiter are similar to those cited from the literature.* **See Response # 105 and #107** ***Rock Mulch -*** *While it is reasonable to accept the information, which discusses the benefits of rock mulch in providing protection against erosion, this system relies on an underlying material that is not prone to gully/ tunnel erosion and further discussion about this is necessary. It is also recommended that some specifications regarding the competency and grading of the rocky material are provided, as well as detail to demonstrate that the soil/rock mix is a suitable growth medium to ensure successful establishment of vegetation.* **See Response # 104 and # 106** ***Vegetative ground cover –*** *The additional target of 10-20% veg cover is low and does not reflect what the department considers as acceptable leading practice. Based on the literature review and also common understanding, the total groundcover target of 40 -50% is sufficient to inhibit high rates of erosion but a preferable minimum target would be 60 – 70% ground cover in total. This strategy also relies on the erosional stability of the underlying material which is used to construct the landform. Also of note is the comment that soils on site are sandy and originate from colluvial deposits. This infers soils of low fertility and poor structural stability. Sustainable pasture production will be key to long term stability as well as the rock mulch cover and these matters should be discussed.*

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				See Response # 106, # 107, # 112, # 117, # 118, #119 and # 120. ***Surface of the landform -*** *It is assumed that the literature review only relates to the batters of these landforms – please confirm. Some information around how the top surface of these landforms will remain stable is needed. For example - a capping layer of soil will be spread across the landform to provide a growth media suitable to sustain pasture; and the final profile of the landform top will shed water evenly, avoiding concentrated flows onto the batters (which cause erosion). Will the rock mulch inhibit the PMLU of light intensity grazing?* *Please clarify if there will be any benches or lifts on the batters or any engineered structures such as cross-slope structures or drains?* **See Response # 96, # 103, # 108, # 117,** ***Surface water interactions –*** *A discussion regarding interactions with drainage lines and whether the landform will impede surface water movement is recommended. Are there any flooding considerations – will the in-pit placement areas be inundated by flood waters? This may impact on the long term stability and should be considered.* **See Response # 96, # 103, # 108, # 117,** ***Groundwater interactions -*** *Is groundwater predicted to accumulate in the base of the in-pit spoil? If so, how stable will the saturated waste material be in the long term?* **See Response # 20, # 91** ***Monitoring and adaptive management –*** *It will be necessary for the EA applicant to make a commitment that landforms will be monitored for stability for an acceptable period of time post construction. Gathering of this key information will be necessary to demonstrate successful completion of rehabilitation milestones (as per the requirements of a PRCP schedule). While the project is planned to be of short duration with full rehabilitation works completed within 5 years, it will be a number of years before the site can be surrendered and in the intervening time, it is expected that the EA holder will commit to collecting data that assesses the final landform behaviour. This will also allow the opportunity to address any shortcomings, improve water drainage, repair eroded areas etc. Also, there remains considerable opportunity for short term trials to be undertaken (for example a trial that investigates erodibility characteristics of the materials used to construct the landform), and this is encouraged. In providing this advice, it is noted that there are varied purposes for undertaking trials related to progressive rehabilitation. For example, there is a distinction between trials related to landform design*

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				prior to finalisation of the specific design, and those necessary to prove a rehabilitation strategy prior to finalising a rehabilitation method. **<u>See Response # 70, # 72, #104, # 106, #107, # 112, # 120 and #128</u>** *In **summary** - for low risk/consequence landforms, it is feasible that an applicant could demonstrate a prediction of long term stability for the landform design through a description of how the landform has been appropriately designed to manage/mitigate waste material characteristics and achieve stable condition (as per S111A definition). The information submitted (and in conjunction with the full application which will include other supporting information) is informative and useful, however as identified above, there is additional information that should be submitted to more fully demonstrate a prediction of long-term stability.*
	90.	The PRCP schedule has not been completed in the correct form/template - in the xls. format. It is important to note that the content of this spreadsheet will be used to generate the final approved version of the PRCP Schedule	Please provide a completed PRCP Schedule in.xls format (using the approved PRCP Schedule template ESR/2019/5103).	The **PRC Plan Schedule** (**Section 10**) has been transposed into the PRC Plan Schedule excel spreadsheet template (ESR/2019/5103) and will provided with the supporting information to the amended final PRC Plan.
	91.	Limited discussion throughout the PRC plan regarding information contained within the Hydrological report (Appendix A: Surface Water Assessment) and Groundwater Assessment Report (Appendix B: Groundwater Assessment).	Information from the hydrogeological report and Groundwater assessment report in the appendix needs to be reflected in the body of the PRCP Plan.	The PRC Plan has now been updated to include more detail from **Appendix A - Surface Water** and **Appendix B – Hydrogeology** technical reports, in **Section 6.1.6** and **Section 6.1.7** respectively.
	92.	There is minimal discussion within the PRCP on residual contamination.	Please discuss the management of residual contamination in the body of the PRCP Plan.	**PRC Plan, Section 5, Table 5-1** (Rehabilitation objective A2) details that: Prior to the commencement of topsoil placement, a site suitability statement is to be prepared by an approved auditor to assess that that land is not contaminated and is suitable for any use. Including: Levels of contamination present following remediation efforts that take place after infrastructure decommissioning and removal. **PRC Plan, Section 8, Table 8-2** (Risk Assessment for Rehabilitation of the project) details a number of proposed actions in the event that previously unidentified contamination source discovered, including: • Records are to be kept of all spills, leaks and other incidents occurring at the Project that might result in contamination. These incidents are to be recorded in an Incident Register, and information about relevant incidents are to be provided to an approved auditor prior to their site visit/testing. • Employees and contractors are to be made aware of their reporting obligations through a Site Induction.

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				• Initial consultation with an approved auditor to identify contamination targets for remediation or removal. **PRC Plan, Section 9.1.2 – Rehabilitation Milestone 2: Remediation of Contaminated Land** provides details on the preparation of a contaminated land investigation document to be prepared by an approved auditor, which is to contain the following components: • a site investigation report, scientifically assessing whether contamination exists; • a validation report, describing works undertaken to remediate any contamination; and • a site suitability statement, stating that land is not contaminated and is suitable for any use. **PRC Plan Section 10.3.1, Table 10-3** (Milestone Criteria), details that to meet the Milestone for Remediation of contaminated land (RM2) a number of specific milestone criteria will be met including: • **All contamination** is remediated or removed from site; • Any contamination removed from site is done so in accordance with relevant regulations; and • A contaminated land investigation document is prepared by an approved auditor, which is to contain a site suitability statement stating that land is not contaminated and is suitable for any use. The above prescriptions will manage all contamination, "residual" or otherwise.
Section 1.2 Site Description	93.	Limited information regarding the site details. Ensure that all information within the Supporting Document for the EA application is also included within the PRCP application.	Information needs to be included in the PRC planning part regarding the size (area) of the tenure.	Further detailed information regarding the site tenure, as well as a broader site description has been introduced into **Section 1.2.1** of the **PRC Plan**. An additional table has been inserted outlining the size of area (Ha) for each of the site tenure(s). (**Table 1-1**) This has been derived from **Section 3** of the **EA Supporting Information** document Other general description of the site in the PRC Plan **Section 1.2** is extensive, describing site topography, climate, geology, hydrology, soil, and ecological values in greater detail than in the body EA Supporting Information document.
	94.	Minimal reference to Matters of National Environmental Significance (MNES), Matters of State Environmental Significance (MSES) or the proximity to sensitive receptors.	Further information regarding how the design of the mine features/infrastructure has had regard to MNES, MSES and sensitive receptors.	**Section 1.2.9** of the **PRC Plan** was not intended to be a complete assessment of the impacts of the project on MNES and MSES, as the 194-page Terrestrial Ecological Assessment (TEA) accompanying the **EA application** has already dealt with this. Instead, this section focuses on the species for which the TEA concluded were likely to experience significant residual impacts as a result of the Project. In particular, we have focused on discussing key attributes of their ecology that are relevant to mine rehabilitation. As requested, **Section 1.2.9** has been revised to

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				incorporate details about how the project has been designed to limit impacts on MNES and MSES. Habitat maps for the Koala and Squatter Pigeon have also been added to illustrate the distribution of these sensitive receptors pre-mining.
	95.	Minimal information within section 1.2.2 surrounding climate projections in the long-term and evaporation on site.	Further information is required discussing these topics.	Information about evaporation rates and climate change predictions and implications for rehabilitation have been added to **Section 1.2.2**.
Section 1.2.4 Hydrology and Section 1.3.2 Water Management	96.	Both of these sections state a drainage corridor will be established through backfilled spoil. There is a lack of information discussing this drainage corridor.	Further information is required regarding how this structure will be designed/constructed to mitigate erosion risk.	The **PRC Plan Section 6.1.5** on **Drainage and Surface Water Management**, has been updated to include further information on the drainage corridor and management of surface waters. This includes a conceptual landform drainage plan and cross section schematics showing the relationship between the landform, proposed plateau and batter drainage structures and surrounding drainage network. The **PRC Plan** has now been updated to include more detail from **Appendix A - Surface Water** and **Appendix B – Hydrogeology** technical reports, in **Section 6.1.6** and **Section 6.1.7** respectively. As noted by DES, a drainage corridor is proposed to be implemented as part of the final landform design. The drainage corridor extends from the outlet of DD1, draining post-closure catchments through backfilled spoil on the northern side of the final landform to the Drainage line 1 Saraji Road rail culverts. The proposed drainage corridor is proposed to be approximately 1 km in length, as shown on the new **Figure 6-5, Section 6.1.5 of the PRC Plan**. The design of the proposed drainage corridor is detailed in **Section 5.9** and **Section 8.6** of the **Surface Water Assessment** (WRM,2020) and summarised below. The preliminary design of the corridor is 40 m wide with 15% batter slopes that grade up to existing ground levels. A low-flow channel that is consistent with the existing channel would be included within the corridor. A cross section of the drainage corridor (**XS1** on **Figure 6-5, PRCP Plan Section 6.1.5**) is shown in **Figure 6-6 of the PRC Plan**. This cross section was taken approximately 500 m upstream of the existing Norwich Park Branch Railway culvert and shows flooding results under post-closure conditions. Flooding results are shown both with and without the existing drainage diversion and levee within the Project boundary. The results assume a moderately vegetated channel. The results show that the proposed drainage corridor has sufficient capacity under both levee scenarios to convey flood events up to the 0.1% AEP. In addition, flooding results presented in WRM (2020) indicate that under 1% AEP conditions, peak velocities at the upstream end of the drainage corridor are up to 1.4 m/s (with levee) and 2.6 m/s (without levee). Under 0.1% AEP conditions, maximum velocities

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				in the drainage corridor are up to 1.9 m/s (with levee) and 2.8 m/s (without levee). Given the peak velocities referenced above, erosion and scour protection will be required along the proposed corridor structure and for the toe of the final landform if the existing drainage diversion is removed post closure. Erosion control measures will need to be carefully considered at the inlet and outlet of the drainage corridor, as well as the downstream culvert crossings. Suitable erosion and sediment control measures will be determined during design. Possible erosion controls include: • topsoiling and revegetating the drainage corridor; rock lining the corridor and landform toe; • operating DD1 until all erosion controls have been implemented in the channel and/or revegetation is established; • implementing seepage prevention measures (such as the addition of a clay liner along the base of the diversions) to prevent seepage from the corridor to the final landform; and • routine monitoring of erosion and sedimentation along the drainage corridor to ensure the diversion is stable during natural flow events. Vitrinite will undertake rehabilitation monitoring to assess the stability of the drainage corridor and assess the performance of ESC controls implemented. This monitoring will inform a number of parameters, including: • when to relinquish the upstream catchment controls (including DD1 and sediment dams) to allow the upstream catchment to flow through the drainage corridor; • the effectiveness of ESC controls and whether additional/modified ESC controls are required to limit erosion in the long term; • the stability of the drainage channel following flow events and whether the channel dimensions require modification; and • when to relinquish the drainage channel if routine monitoring over a suitable period indicates that the channel is stable and erosion is comparable to natural conditions.
Section 1.3 Relevant Activities	97.	Limited information regarding the relevant activities.	Further information is required in the PRC planning part regarding the location and type of ancillary ERAs	A new section has been introduced to **the PRC Plan** (**Section 1.3.1**) into the Relevant Activities section. This now outlines the ancillary ERAs and includes a table of ERA approvals required (**Table 1-2**). This has been derived from **Section 2.2 Approvals Required** in **EA Supporting Information** document.
Section 3 Stakeholder Engagement	98.	Minimal information regarding frequency of communication between applicant and stakeholders involved in the project.	Further clarity is required regarding the frequency of proposed ongoing consultation with identified parties.	**Section 3.1** of the **VCP Stakeholder Consultation Plan** has been amended to include detail of the annual PRC Plan monitoring return, which will be utilised as the mechanism to maintain ongoing consultation with all relevant identified parties.

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	99.	The community consultation register must include a record of how issues have been considered.	Further information is required regarding how this has been incorporated into the PRC Plan.	**Section 3.2 – Stakeholder Consultation Register**, has been amended to include more details outlining the stakeholder consultation process for the PRC Plan development. This includes a description of topics of consultation undertaken with the relevant identified stakeholders, including discussion of the proposed PRC Plan approach, the plan for the mine, PMLUs, areas of disturbance, rehabilitation and management methods, progressive rehabilitation and closure timeframes.
	100.	No reference to any discussions with relevant stakeholders regarding post mine land uses (PMLU).	Further clarity is required whether post mine land uses (PMLU) have been discussed with stakeholders other than the underlying landholder	**Section 3.2 – Stakeholder Consultation Register**, has been amended to include more details of the stakeholder consultation process, and topics of consultation including PMLUs, with the underlying landholder and relevant agencies. The PMLUs prescribed are to restore the pre-mine land use that is pervasive, and extensive across the Bowen Basin region. Additionally, the prescribed PMLUs will also provide for enhanced habitat values for conservation significant species and improvement of biodiversity values, which are seen as beneficial outcomes developed in consultation with stakeholders.
Section 3 Stakeholder Engagement and Section 4.1 Accordance with Stakeholders' Requests	101.	Minimal details are provided discussing the process of PRC plan and the determined PMLU appropriateness with relevant stakeholders.	Further information is required regarding how consultation was incorporated into developing the proposed PRC plan and determining the proposed PMLU to be most appropriate	**Section 3.2 – Stakeholder Consultation Register**, has been amended to include more details of the stakeholder consultation process, and topics of consultation including PMLUs, with a number of relevant identified stakeholders. The PMLUs that have been prescribed, were determined and have been discussed in the consultation process, as outlined in **Section 3.2**, and the Project **Stakeholder Engagement Plan Section 7.1** and **7.7** and **Appendix A** and **Appendix B**. Prescribed PMLUs are to restore the pre-mine land use of light grazing, that is pervasive, and extensive across the Bowen Basin region. Additionally, PMLUs will also provide for enhanced habitat values for conservation significant species and improvement of biodiversity values.
Section 4.3 Assessment of Options	102.	Minimal information on assessment of options. The assessment of options outlines a scoring system used to assess the relative merit of 4 PMLU options.	Further information is required regarding what descriptors were used to measure/assign scores to some of the 'considerations' listed in Table 4-1.	**Table 4-1** of the **PRC Plan** has been amended to include a new column that justifies the scores awarded for each consideration.
Section 5.1 Rehabilitation Objectives, Indicators and Completion Criteria, and Section 10.3 Rehabilitation Milestones	103.	Limited reference within the rehabilitation criteria in the PRCP schedule discussing surface and groundwater. (Refer to general comment regarding lack of information provided from Appendix A: Surface Water Assessment and Appendix B: Groundwater Assessment of the Environmental Authority application).	The information from the hydrological assessment must be translated into the rehabilitation criteria in the PRCP schedule that are suitable for closure. *For example:* regional groundwater quality could be used due to the limited site data to establish rehabilitation milestone for groundwater quality	The **PRC Plan** has now been updated to include more detail from **Appendix A - Surface Water** and **Appendix B – Hydrogeology** technical reports, in **Section 6.1.6** and **Section 6.1.7** respectively, **Rehabilitation Methodology Section 6.1.5 -Surface Water** has been expanded to include information from the updated **Surface Water Assessment** (**PRC Plan Appendix A**) regarding the establishment of Water Quality Objectives (WQOs) for the site.

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				A **Receiving Environment Monitoring Program** (**REMP**) document will also be developed that specifies the proposed monitoring program for the local receiving waters. The REMP will incorporate the historical and proposed monitoring as described in **PRC Plan Section 6.1.5** and The **Surface Water Assessment** (**PRC Plan Appendix A**). The main objective of the **REMP** will be to report against WQOs for local waterways potentially affected by discharge from the Project and will assist in assessing general aquatic ecosystem health. A set of initial proposed receiving water contaminant triggers levels have been developed, based on conditions at nearby operating coal mines and preliminary baseline results. These trigger levels (**Appendix A**) are proposed to be measured at the upstream and downstream water monitoring locations (i.e. VSW1, VSW2, VSW3 and VSW8). Monitoring at these locations will allow for an accurate evaluation of the impact of any releases from the Project and allow for identification of any upstream influences that are not associated with the Project. Further technical detail on this is also provided in **PRC Plan Section 6.1.5** and **PRC Plan Appendix A** and **Appendix B** The surface water WQOs for the Project (**Appendix A, Table 3-2**) will be used as release contaminant trigger investigation levels. Should surface water monitoring show that a release from the Project are above the WQOs, an investigation will be undertaken into the release. Reporting of the spill will be undertaken in accordance with the Project EA. **Rehabilitation Methodology Section 6.1.7 - Hydrogeology** has been expanded to include information on drawdown monitoring, water quality monitoring and the proposed ongoing groundwater Adaptive Management Strategy to monitor and manage any potential impacts for the Project. **Section 6.1.7** has also been expanded to include a rationale for the methodology used for determining the site specific groundwater quality monitoring parameters used in the rehabilitation milestone criteria in **Section 5.1**. The methodology and overall approach to determine site specific WQ parameters has been developed in accordance with the most relevant guidelines and model conditions for mine operations in the Bowen basin (DES 2018 and 2019). Site specific groundwater quality triggers will be established over time and present the most accurate measure of effect on water quality, particularly in the context of the relatively limited groundwater values of the VCP site. The Groundwater Assessment of baseline values and modelling of potential impacts for the project, concludes that there are minimal groundwater values within the site, with no contained aquifers, and very low to negligible potential impacts to groundwater quality parameters from the proposed mine activities, This context has been brought into the **PRC Plan** (**Section 6.1.6**) in this update, and as such the development of site

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				specific water quality parameters as proposed for ground water monitoring and rehabilitation milestones in the **PRC Plan** (**Table 5.1**), are deemed as the most relevant for use to monitor target signoff criteria. Use of monitoring ground water quality parameters downstream of the site in broader regional context may provide limited value for the purpose of PRC Plan rehabilitation monitoring criteria, both in the context of the short duration of the project, and minimal potential for groundwater impacts. It should also be considered that given the extent and influence on groundwater quality impacts in the regional context from the many surrounding established large scale, long term operations, monitoring for similar impacts from the relatively small and short lived VCP operation in the same regional context, would likely yield little measurable or meaningful result.
Section 6 Rehabilitation Methodology	104.	Minimal information in landform design discussion.	Further information is required regarding landform modelling, limitations and assumptions of the landform design and proposed QA/QC requirements.	Limit equilibrium analyses were performed by Blackrock Mining Solutions (2020) to determine the overall slope stability in terms of a Factor of Safety (FoS), which is a commonly employed measure in slope stability analysis to determine the likelihood of slope failure. The FoS is generally a measure of driving forces versus resisting forces in a system. FoS values > 1 are indicative that a system is likely to be stable, while generally an FoS value of 1.5 is considered to be the generally accepted value for long-term slope design. The following methodology and criterion were used for the assessment: • Circular failure analyses using the auto-refine search algorithm and the general limit equilibrium method for spoil failures; • A basal saturated spoil layer of approximately 5 m thickness was assumed for final landform slope stability assessment Limit equilibrium analyses were assessed in terms of a circular failure mechanism acting through the unsaturated, and saturated Category 2.5 spoil material, for in-pit and ex-pit dump final landforms, respectively. Analyses returned critical Factor of Safety (FoS) values of 3.88 and 5.10 for the in-pit and ex-pit final landforms, respectively. It was concluded from the limit equilibrium analyses that the proposed final landform design exceeds the minimum FoS of 1.5 for long-term stability, and is therefore acceptable from a geotechnical perspective. Monitoring across the final landform will be integral to the early detection of erosion and will allow for early intervention. The updated **Soil and Land Suitability Assessment** (**Appendix I**, of the **EA Application Supporting Information** document) provides a methodology for monitoring and measuring erosion which can be applied in addition to the landscape function analysis (LFA) proposed in the **PRC Plan**.

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Section 6.1 Landform Design	105.	The PRC plan does not demonstrate that the waste rock material excavated from the Jupiter pit is similar in characteristics to the materials referred to from previous trials.	Further information is required to clarify that the landform design is appropriate and demonstrates the predicted long-term stability of the landform.	Drilling conducted by Vitrinite has identified medium to high-strength sandstone resources both above and between coal seams that are likely to be suitable for use in rock mulching. Based on the geological modelling of Vitrinite's coal projects, which locally extends beyond the proposed disturbance footprint of the VCP, this resource is expected to be abundant far beyond the requirements for landform construction. The available waste rock material will be approximately 13,000,000 m^3. Based on geological drilling logs there is a high degree of confidence that a significant resource of competent sandstone is present in the waste rock material that will be excavated during mining activities. The geochemical and geophysical characteristics of waste rock will be assessed to identify the suitable strata for use in landform stabilisation. Once these strata are confirmed, mine scheduling and selective handling will be applied to ensure that adequate suitable material is available for the progressive rehabilitation of landforms. The **Geochemical Assessment of Waste Rock and Coal Reject Technical Report** (**Appendix H**, of the **EA Application Supporting Information** document) has been updated. While this report does conclude that the "overwhelming majority of the waste rock materials have low sulfide content, excess ANC, and are classified as NAF (Barren)" and that these materials "have a very low risk of acid generation and a high factor of safety with respect to potential for generation of acidity", it is a recommendation of the report that additional sampling be undertaken to confirm geochemistry and to aid in best management of materials during progressive rehabilitation: "Sampling should focus on collecting representative samples of any waste rock (i.e., spoil) materials planned to be used at the surface of final landforms to supplement any existing subsoil and topsoil salvaged re-used in revegetation and rehabilitation activities. Testing should include typical soil parameters including pH, EC, exchangeable cations, organic matter, total organic carbon, Emerson Aggregate, particle size distribution, and nutrients (including available K, P, S, as well as Nitrogen (N) species (TKN, TN, Nitrite and Nitrate)." Testing will also include a suite of suitable geophysical kinetic tests of sandstone waste rock, to assess long term weathering characteristics and competency of material that is identified to potentially be used as rock mulch. In the unlikely circumstance that the available sandstone material not be sufficient, either in available volume, or on the basis of its geophysical or geochemical characteristics, Vitrinite commits to obtaining a substitute material that meets suitable specifications, in order to achieve the landform stability requirements of the project.

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				Similarly, in the event that waste rock material is identified as having negative geophysical of geochemical characteristics, that is, is more susceptible to dispersion or instability, appropriate amelioration techniques and selective handing processes will be applied to maintain the integrity of the final landform.
	106.	Further information is required to demonstrate that the soils and capping methodology will result in a stable landform. This is particularly important as there is no landform modelling provided with the application and the Soil and Land Suitability Assessment states that "most waste rock materials may be susceptible to dispersion and erosion" and "may be improved to some extent by the addition of gypsum".	Provide further details and justification that the soils and capping methodology will result in a stable landform.	The stability of the soil capping methodology has been addressed in updated to the **Soil and Land Suitability Assessment** (**Appendix I**, of the **EA Application Supporting Information** document)**.** The erosion risk for the Limpopo SMU, the dominant SMU in the VCP area, and which has been assessed as having a susceptibility to erosion, has been conducted in the updated **Soil and Land Suitability Assessment** (**Section 9.3, Appendix I**, of the **EA Application Supporting Information** document). This analysis takes into consideration erodibility, erosivity, slope, and cover management. The results of this erosion analysis are present in **Table 73** of the **Soil and Land Suitability Assessment** (**Appendix I**, of the **EA Application Supporting Information** document). In summary, it was determined that the erosion on slopes of 15% is adequately controlled through the proposed management measures. The most effective erosion control was determined to be the establishment of grass cover, though a combination of controls provides further improvement.
	107.	The waste characterisation study identified that waste rock material will likely be dispersive and erosive. The PRC plan does not adequately demonstrate the suitability of waste rock material to achieve the final landform design. Further assessment of erosion rates (particular to the landform and materials from which it is constructed) demonstrating all gradients will be considered stable and slope profile design must be provided.	Provide an assessment of erosion rates demonstrating all gradients will be considered stable and slope profile design. This assessment can then be used to inform specific criteria in the PRCP Schedule around erosional stability.	The waste **Geochemical Assessment** (**EA Supporting Information document Appendix H**, **Section 4.3.**2) identified that the sampled waste rock material from the Permian subsoil overburden was "likely to be moderately to strongly sodic and consequently may be susceptible to dispersion and erosion and should be managed appropriately". This result was derived from static geochemical testing on 6 composite waste rock samples (EA Supporting Information document **Appendix H**, **Attachment B: Static Geochemical Test Results**). Vitrinite are currently undertaking a broader sampling and testing program, as part of the reactive ground sampling program for blasting product confirmation, and will utilise the broader sampling program to further characterise and identify the presence of suitable competent waste rock material, demonstrating less sodic characteristics and is non-dispersive, for use in final landform reformation. Based on the geological modelling of Vitrinite's coal projects, which locally extends beyond the proposed disturbance footprint of the VCP, this resource is expected to be abundant far beyond the requirements for landform construction. The available waste rock material will be approximately 13,000,000 m^3. Based on geological drilling logs there is a high degree of confidence that

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				a significant resource of competent sandstone is present in the waste rock material that will be excavated during mining activities. The materials balance undertaken for the design of final landform (**PRC Plan Section 6.1.4, Table 6-2**) shows that the overall volume of Permian waste rock material required for use in formation of the proposed final landform is approximately 47,000 m^3. The geochemical and geophysical characteristics of waste rock will be assessed to identify the suitable strata for use in landform stabilisation. Once these strata are confirmed, mine scheduling and selective handling will be applied to ensure that adequate suitable material is available for the progressive rehabilitation of landforms. Given that the volume of waste rock material available will be approximately 13,000,000 m^3, there is a high degree of confidence that suitably stable (non-dispersive) waste rock material, such as a targeted sandstone band, will be available. Once identified further, this material will be targeted for selective handling, and applied for the purpose of competent material in final landform reformation. In the unlikely circumstance that the available sandstone material not be sufficient, either in available volume, or on the basis of its geophysical or geochemical characteristics, Vitrinite commits to obtaining a substitute material that meets in order to achieve the landform stability requirements of the project. Similarly, in the event that waste rock material is identified as having negative geophysical of geochemical characteristics, that is, is more susceptible to dispersion or instability, appropriate amelioration techniques and selective handing processes will be applied to maintain the integrity of the final landform. The stability of the soil capping methodology has been addressed in updated to the **Soil and Land Suitability Assessment** (**Appendix I**, of the **EA Application Supporting Information** document). The erosion risk for the Limpopo SMU, the dominant SMU in the VCP area, and which has been assessed as having a susceptibility to erosion, has been conducted in the updated **Soil and Land Suitability Assessment** (**Section 9.3**). This analysis takes into consideration erodibility, erosivity, slope, and cover management. The results of this erosion analysis are presented in **Table 73** of the **Soil and Land Suitability Assessment**. In summary, it was determined that the erosion on slopes of 15% is adequately controlled through the proposed management measures. The most effective erosion control was determined to be the establishment of grass cover, though a combination of controls provides further improvement. Also see response #111.

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	108.	Further information is required regarding how the final profile of the landform top will shed water evenly, avoiding concentrated flows onto the batters, and treatment of the installed drainage features which will convey water off the landform	Provide further information.	**Section 6.1.5** of the **PRC Plan** on **Drainage and Surface Water Management** has been updated to include further information of the landform drainage and management of surface waters. This includes a conceptual landform drainage plan and cross section schematics showing the relationship between the landform, proposed plateau and batter drainage structures and surrounding drainage network. A conceptual drainage plan of the final landform is now shown in **Section 6.1.5, Figure 6-5** of the amended **PRC Plan**. The drainage controls shown in **Figure 6-5** and described below have been implemented to ensure that the final landform is free draining and to avoid concentrated flows (and erosion) along the landform batters. The conceptual design of the final landform plateau slopes to the west so that runoff drains to the west. This design is shown within the west-east cross sections of the final landform in **Figure 6-6**, **Figure 6-7** and **Figure 6-8** (cross sections locations are shown in **Figure 6-5**). Plateau drains are proposed along the top of the landform which will collect and direct runoff towards drop structures along the western landform batters. Contour banks have been proposed along the top of the final landform batters to limit erosion until vegetation has been established. Contour banks on the western side of the final landform will drain residual catchments to the drop structures if required. In addition, contour banks along the eastern slopes will collect and control runoff on the eastern batters as required. Batter slopes (and therefore drop structures) along the final landform will be graded at a maximum of up to 15%. Sediment dams will be retained surrounding the final landform and have been designed to collect runoff from all areas of the final landform. The sediment dams (and associated drainage structures) will be retained until the final landform catchments have been completely rehabilitated and water quality monitoring has established that runoff quality (i.e. TSS) is consistent with natural background conditions. The final landform design will be shaped so that the plateau directs runoff towards the plateau drains. **Figure 6-6** shows a cross section of the final landform plateau (labelled as 'Final landform finished level') and an indicative shaping of the plateau required to drain runoff to the plateau drains (labelled as 'Indicative landform design'). The cross section is taken north-south from the northern side of the final landform (location shown in **Figure 6-5**).
	109.	There are no calculations or modelling to identify the overburden swelling which is an intricate part of understanding the final dimensions of the in-pit waste rock dump.	Please provide calculations underpinning the overburden swelling as this will inform the final dimensions of the in-pit waste rock dump	The final dimensions of the in-pit and ex-pit waste rock dumps have been calculated using a number of assumptions, the most pertinent of which is the general assumptions applied in the calculation of overburden swell as a conservative factor of 18%, which is based on a most commonly used standard practice factor for this material.

<table>
<tr><th>Section</th><th>ID #</th><th>Comment</th><th>Requirement</th><th>Proponent Response</th></tr>
<tr><td></td><td></td><td></td><td></td><td>This figure cannot be validated until operations and blasting have commenced however, after bulk material has been observed to react in void placement. This being the case, a further conservative factor of 20% has been applied in the calculations initially, until verification is possible, to provide a margin of safety.</td></tr>
<tr><td>Section 6.1.2. Cover Design</td><td>110.</td><td>There is minimal information discussing water management onsite (both surface water and groundwater). Information discussing water quality needs to be included within the PRC plan.

Refer to the general comment on information inclusion from Appendix A: Surface Water Assessment and Appendix B: Groundwater Assessment.</td><td>Further information is required regarding the water quality criteria proposed for discharge of water from the cover, and to demonstrate there is enough suitable material to achieve the rehabilitation outcomes.</td><td>Section 9 of the Surface Water Assessment (PRC Plan Appendix A) (WRM, 2020) has been updated to include further detail regarding the proposed monitoring strategy including indicators used, timing of sampling, release values applied and methodology used.

Preliminary receiving water contaminant trigger levels have been proposed as part of the VCP EA, (also outlined in Table 1 below). These preliminary triggers have been based on baseline surface water quality results taken at the Project.

Table 1 Preliminary receiving water contaminant trigger levels

<table>
<tr><th>Quality Characteristic</th><th>Units</th><th>Trigger Level</th><th>Monitoring Locations</th><th>Monitoring Frequency</th></tr>
<tr><td>pH</td><td>-</td><td>6.5 - 8.0</td><td rowspan="4">VCW2 & VCW8</td><td rowspan="4">Monthly, following any rainfall event greater than 50 mm in a 24-hour period and following a release event.</td></tr>
<tr><td>Electrical conductivity</td><td>µS/cm</td><td>1.500</td></tr>
<tr><td>TSS or TDS</td><td>mg/L</td><td>TBC</td></tr>
<tr><td>Sulphate (SO_4^{2-})</td><td>mg/L</td><td>1,000</td></tr>
</table>

A number of triggers are to be confirmed (TBC) and will be developed as part of a Water Management Plan once sufficient baseline data has been collected. ANZECC & ARMCANZ (2018) recommends at least 2 years of monthly sampling to set guideline values. Therefore, the local data will be used once 2 years of sampling data is available. For all parameters which are TBC, regional WQO's (as outlined in Table 3.1 of the Surface Water Assessment [WRM, 2020]) will be used as interim release limits/trigger limits, if available.

The preliminary receiving water contaminant trigger levels will be reviewed and updated over the life of the project as required based on background natural surface water monitoring. The preliminary triggers have bene proposed for discharge from the final landform, however these triggers may change over the life of the mine to achieve more suitable outcomes by the time the final landform is established.</td></tr>
<tr><td></td><td>111.</td><td>Rock mulch is proposed for the batters of the final landform (instances where slopes are >10%). Further information is required regarding the competence and grade of rock material. Will the rock cover will be sourced from</td><td>Provide clarification if there will be sufficient volumes of the competent rock available on site. Describe the specifications, or similar information to demonstrate, the competence and grade of rock material used as rock mulch.</td><td>The materials balance undertaken for the design of final landform (PRC Plan Section 6.1.4) shows that the overall volume of Permian waste rock material required for use in formation of the proposed final landform is approximately 47,000 m^3.

The volume of waste rock material available will be approximately 13,000,000 m^3, and the geological model undertaken of the site potentially</td></tr>
</table>

Section	ID #	Comment	Requirement	Proponent Response
		overburden? Minimal information has been provided to indicate if there will be sufficient volumes of the competent rock available on site.		identifies ~5,000,000 m^3 of consolidated sandstone material. As such there is a high degree of confidence that suitably stable (non-dispersive) waste rock material, such as a targeted sandstone band, will be available. Once identified further, this material will be targeted for selective handling, and applied for the purpose of competent material in final landform reformation. The waste Geochemical Assessment (**EA Supporting Information** document **Appendix H, Section 4.3.2**) identified that the sampled waste rock material from the Permian subsoil overburden was "likely to be moderately to strongly sodic and consequently **may** be susceptible to dispersion and erosion and should be managed appropriately". This result was derived from static geochemical testing on 6 composite waste rock samples (**EA Application Supporting Information** document, **Appendix H, Attachment B** - Static Geochemical Test Results). Vitrinite are currently undertaking a broader sampling and testing program, as part of the reactive ground sampling program for blasting product confirmation, and will utilise the broader sampling program to further characterise and identify the presence of suitable competent waste rock material, demonstrating less sodic characteristics that is non-dispersive, for use in final landform reformation. The materials balance undertaken for the design of final landform (**PRC Plan Section 6.1.4**) shows that the overall volume of Permian waste rock material required for use in formation of the proposed final landform is approximately 47,000 m^3. Given that the volume of waste rock material available will be approximately 13,000,000 m^3, and that the geological model undertaken of the site potentially identifies potentially ~5,000,000 m^3 of consolidated sandstone material, the there is a high degree of confidence that suitably stable (non-dispersive) waste rock material, such as a targeted sandstone band, will be available. Once identified further, this material will be targeted for selective handling, and applied for the purpose of competent material in final landform reformation. In addition to the above, further geochemical work has also been undertaken to detail a number of specific ameliorative measures to be applied for the use of the identified sodic, potentially dispersive material, if it became apparent that this may be required for some material. This is not the preferred method, however these prescriptions have been developed to demonstrate that if given the absence of suitable amounts of competent material, then Vitrinite commits to obtaining a substitute material that meets in order to achieve the landform stability requirements of the project. Also see response # 107.

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	112.	Minimal information regarding cover design for the batters.	Please clarify if the cover design specified in section 6.1.2 is applicable for the batters.	The cover design includes the application of rock mulch on slopes of 10% or greater to improve slope stability and resistance to erosion on the batters. The erosion risk for the Limpopo SMU, the dominant SMU in the VCP area, and which has been assessed as having a susceptibility to erosion, has been conducted in the updated **Soil and Land Suitability Assessment** (**Section 9.3, EA Application Supporting Information** document, **Appendix I**). This analysis takes into consideration erodibility, erosivity, slope, and cover management for the final cover design, including batters. The results of this erosion analysis are present in **Table 73** of the **Soil and Land Suitability Assessment** (**EA Application Supporting Information** document, **Appendix I**). In summary, it was determined that the erosion on slopes of 15% is adequately controlled through management measures. The most effective erosion control was determined to be the establishment of grass cover, though a combination of controls provides further improvement. The updated **Soil and Land Suitability Assessment** also includes recommendations for the expediting vegetation establishment as means of reducing potential erosion risk. These techniques include addition of organic matter to topsoil, use of fast-establishing cover crops hydro mulching and fertiliser application. These techniques are further detailed in **Section 8.3.**1 of the **Soil and Land Suitability Assessment.** See also response #106 and #107
	113.	The rationale provided for cover design deviations for RA1 is that insufficient sub-soil is available, yet the material balance indicated in section 6.1.4 indicates an estimated subsoil surplus of 43,372m^3. As the out-of-pit waste rock dump will continue for the life of the operation why will insufficient subsoil material be available at an appropriate stage of project development to apply to this out-of-pit dump? (section 1.3.1).	Provide further detail why insufficient subsoil material is available at an appropriate stage of project development to apply to this out-of-pit dump.	While there is a net surplus of subsoil for the entire VCP project, scheduling considerations and stockpiling limitations prevent the application of subsoil to the cover of the ex-pit dump. The rationale for RA1 is based upon expediting the successful rehabilitation of both the ex-pit dump and the in-pit dump and to reduce the need to stockpile and transport subsoil material that may be dispersive. The ex-pit dump differs from the in-pit dumps as it is constructed on an existing surface. While topsoil resources will be stockpiled from this surface, subsoil will remain in situ as there is no need to remove it, and therefore it will not yield a subsoil resource to be applied during rehabilitation. Construction of the ex-pit dump will include the co-placement of subsoil and waste rock from the open pit, rather than selective handling of these materials. This eliminates the need for a potentially dispersive subsoil stockpile being maintained for the purpose of the rehabilitating the ex-pit dump. It allows the ex-pit dump landform to be achieved sooner, expediting rehabilitation.

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				As the pit progresses it was determined that the best use of subsoil would be application to the final surface of the in-pit dump as it becomes available for rehabilitation. This further reduces the need to stockpile subsoil, reduces the transportation of dispersive material out of the pit, reducing the risk of dispersive material entering surface drainage features. This expedites the rehabilitation of the in-pit dump. The selected rehabilitation objectives for RA1 are consistent with the proposed post-mining land use of low intensity cattle grazing.
Section 6.1.3 Mine Waste Geochemistry	114.	Sufficient information has not been provided to demonstrate material disturbed by mining operations has been adequately characterised in accordance within best practice standards and modelling. Refer to the general comment regarding the inclusion of supporting information from technical studies.	Further information is required to demonstrate that the sampling meets best practice standards, is spatially representative of all material being mined and all lithologies. Block models showing the sampling locations relative to the material being removed needs to be developed	The **Geochemical Assessment of Waste Rock and Coal Reject Technical Report** (**EA Application Supporting Information** document, **Appendix H**) has been updated. While this report does conclude that the "overwhelming majority of the waste rock materials have low sulfide content, excess ANC, and are classified as NAF (Barren)" and that these materials "have a very low risk of acid generation and a high factor of safety with respect to potential for generation of acidity", it is a recommendation of the report that ongoing sampling be undertaken to confirm geochemistry and to aid in best management of materials during progressive rehabilitation: "Sampling should focus on collecting representative samples of any waste rock (i.e., spoil) materials planned to be used at the surface of final landforms to supplement any existing subsoil and topsoil salvaged re-used in revegetation and rehabilitation activities. Testing should include typical soil parameters including pH, EC, exchangeable cations, organic matter, total organic carbon, Emerson Aggregate, particle size distribution, and nutrients (including available K, P, S, as well as Nitrogen (N) species (TKN, TN, Nitrite and Nitrate)." Testing will also include a suite of suitable geophysical kinetic tests of sandstone waste rock, to assess long term weathering characteristics and competency of the material identified to potentially be used as rock mulch. Vitrinite is committed to this ongoing sampling process.
Section 6.1.5 Drainage and Surface Water Management	115.	The PRC plan does not fully address the requirement to describe the sources, pathways and fates of contaminates from the site.	Further details need to be included within the PRC plan to address this requirement.	**Section 6.1.5** of the **PRC Plan** has been updated to include a new section providing further detail on the source pathway and receptors of contaminants during and following rehabilitation of the site. As outlined in the **PRC Plan Section,** Error! Reference source not found. the waste rock dumps and final landforms will be relatively benign landforms, with no potential for acid mine drainage or seepage to groundwater. The overburden and interburden at the site was found to have a universally low sulphide content and high acid-neutralising capacity due to high pH. All material assessed was non-acid-forming and considered essentially barren for oxidisable sulphur. All carbonaceous interburden samples for the site were classified as non-acid-forming and, as a bulk material, carbonaceous interburden is considered to be non-acid-forming (RGS 2020).

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				As such, the primary source of contaminant during rehabilitation works and the post-rehabilitation period of the site, will be potential increases to sediment load and turbidity of surface water flows. The pathway of any potential elevated sediment load will be the surface water flows across the final landform design as outlined in **Section 6.1.5, Figures 6-5**. The potential receptor is the downstream catchments and receiving environment, as described in detail in **Section** Error! Reference source not found.. The controls for potential elevated sediment loads and turbidity include revegetation and rock mulch (**Section** Error! Reference source not found. of the **PRC Plan**), and water management structures such as contour banks, sediment dams, and plateau drains as detailed in **Section 6.1.5** of the **PRC Plan**. A Receiving Environment Monitoring Program (REMP) document will be developed that specifies the proposed monitoring program for the local receiving waters. The REMP will incorporate the historical and proposed monitoring as described in (**Appendix A** of the **PRC Plan**) and in the sections above. The main objective of the REMP will be to report against WQOs for local waterways potentially affected by discharge from the Project and will assist in assessing general aquatic ecosystem health. A set of initial proposed receiving water contaminant triggers levels have been developed, based on conditions at nearby operating coal mines and preliminary baseline results. These trigger levels (**Appendix A** of the **PRC Plan**) are proposed to be measured at the upstream and downstream water monitoring locations (i.e. VSW1, VSW2, VSW3 and VSW8). Monitoring at these locations will allow for an accurate evaluation of the impact of any releases from the Project and allow for identification of any upstream influences that are not associated with the Project. It is noted that only a single round of baseline water monitoring has been undertaken and therefore the receiving water contamination water levels may need to be refined following further monitoring.
	116.	States that final landform batter slopes will be a maximum of 1 vertical:6 horizontal, however Figure 1-15 suggests that a significantly steeper batter will exist on the eastern side of the structure adjacent to Saraji Road.	Please confirm if the batter slope gradient is intended to be uniform or if deviations in slope are proposed.	The batter slope gradient is proposed to be generally uniform with little no deviations. Batter slope gradients for the final landform will not be formed above the proposed maximum of 1 vertical, 6 horizontal (15%). Final landform slope will vary in some places at a shallower slope. For example the westward sloping face of the top surface of the ex-pit dump as represented in **Figure 6-2**). The presentation of **Figure 1-15** in the **PRC Plan** (now presented as **Figure 1-17** in the updated **PRC Plan**) is a representation of the proposed final landform for the purpose of presenting the water management infrastructure in place around the final landform. **Figures 6-1**, **Figure 6-2**, and **Figure 6-3**, as presented in **Section 6.1.1,** are provided to represent the final landform images in an easily interpreted

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				context. These images are generated from an aerial oblique perspective form different aspects around the MLA., providing a view of the landform to show the batter slope in a better context, It is assumed that the interpretation of potentially steeper slopes expressed in the information request comment may be leading from the observer interpreting **Figure 1-15,** where the south east face of the in-pit dump has a shorter fall. This is due to this batter meeting the higher topography at the east of the site, and it should be noted that the topographic lines for this slope are equal to those of the other slopes, they are just cut off short by the height of surrounding natural landform.
Section 6.2 Revegetation	117.	Further information is required to justify the choice of reference site and demonstrate sufficient growth media is available on site to sustain the PMLU.	Provide further information	The following information has been added to **Section 9.1.6** of the **PRC Plan** to explain how reference sites were selected: "*These reference sites were selected as (a) they meet the requirements for soil, slope and vegetation density, (b) they are evenly spaced, with at least 500 m between them, and (c) they are located within the MLA area, and therefore do not require special access permissions. To avoid biases in the placement of these reference sites, their coordinates have been selected based on GIS information rather than through site visits. The baseline condition of reference sites therefore represents a random sample of analogous, nearby, unmined vegetation communities*." A paragraph has also been added to **Section 6.1.2** of the **PRC Plan** presenting evidence for the adequacy of the topsoil depth for plant establishment.
	118.	Further information is required in the revegetation plan to address how the Crocodile and Limpopo soil characteristics will be managed to improve revegetation success. Important to consider physio-chemical characteristics in the root zone area.	Provide further information	To clarify, the Crocodile Soil Management Unit (SMU) is not found within the VCP MLA, however it abuts the western boundary. Reference to it has been removed from the PRCP. The Limpopo and Zambezi SMU's are found within the MLA, however the Zambezi SMU will not be disturbed by mining activities. Therefore all discussion of soil and subsoil management focusses on the Limpopo SMU. Further information on the management of the Limpopo SMU has been included in **Section 6.2.4 and 6.2.5** of the **PRC Plan**.
	119.	There is minimal information regarding chemicals, ameliorants and fertilisers being applied in the revegetation and the impact from these discussed methods.	Further information is required to describe any application of ameliorants and/or fertilisers.	As discussed in Response 118 above, the Limpopo SMU is the only SMU, to be disturbed and therefore utilised in rehabilitation activities. Further information on the management of the Limpopo SMU has been included in **Section 6** of the **PRC Plan**. This includes discussion of ameliorants and fertilisers and the anticipated benefits of their use. See also Response # 118
Section 6.2.4 Revegetation Approach	120.	Within this section it is states that subsoil and topsoil should not be placed on slopes greater than 3%. But the batter slopes will be 15%.	Further information is required to explain how erosion is going to be managed on the slopes.	The **Soil and Land Suitability Assessment** recommends that Limpopo soils are not placed on slopes of greater than 3% unless appropriate measures to manage stability are applied. Batter slopes will be subject to stability management measures including the application of rock mulch.

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		There is no further explanation into the details of this statement.		The erosion risk for the Limpopo SMU, the dominant SMU in the VCP area, and which has been assessed as having a susceptibility to erosion, has been conducted in the updated **Soil and Land Suitability Assessment** (**Section 9.3, Appendix I of the EA Application Supporting Information** Document). This analysis takes into consideration erodibility, erosivity, slope, and cover management. The results of this erosion analysis are present in **Table 73** of the **Soil and Land Suitability Assessment**. In summary, it was determined that the erosion on slopes of 15% is adequately controlled through management measures. The most effective erosion control was determined to be the establishment of grass cover, though a combination of controls provides further improvement.
Section 8 Risk Assessment	121.	The risk assessment hasn't addressed all requirements under s126C of the *Environmental Protection Act 1994* relating to identifying risk of stable condition for land not being achieved.	Please ensure the following risks are identified and addressed: ○ Risk that mining production is affected over the duration of the operations and that the final landform is not achieved ○ Risk that the predicted swelling of the waste rock final landform may not correlate with actual performance and that the final landform is not achieved ○ Loss of containment events from either the in-pit dump, out-of-pit dump or sediment ponds Risk arising from failed landform design.	The risk assessment presented in **Section 8** of the **PRC Plan** has been updated to provide further assessment of potential risks posed to achieving a stable final landform.
	122.	Risks associated with achieving a stable final landform are minimal and details that are provided are not comprehensive enough in the risk assessment.	Further information is required regarding the risks posed by the soil to achieving a stable final landform without recommended amelioration measures.	The risk assessment presented in **Section 8** of the **PRC Plan** has been updated to provide further assessment of potential risks posed to achieving a stable final landform.
	123.	Further clarity is required whether the requirement to set aside adequate waste rock is correct. Should this not refer to the competent rock which will be sourced from overburden (not waste rock material which is dispersive/prone to erosion)?	Provide further information	The terms waste rock and overburden have been used interchangeably in the PRC Plan and this will be clarified. For the purposes of this project waste rock is considered to be the material which will be disturbed to gain access to coal resources and is not coal, coal rejects, or soil. Waste rock will be subject to some degree of selective handling and stockpiling to provide a supply of competent material for use in final landform construction and cover stabilisation (rock mulch), see **Section 6.1.2. Cover Design** of the **PRC Plan**
	124.	There is no discussion on responsibility involving steps included in the development and implementation of a risk treatment plan.	Details must be provided regarding who is responsible for the approval and implementation of the risk treatment plan	The requirement for the appointment of the appropriate mine representative responsible for the approval and implementation of the Risk Treatment Plan, will be upheld by the appointment of a mine Safety, Health, Environment and Training (SHET) Superintendent.
Section 9.1.1 Rehabilitation	125.	Section 9.1.1 is the only section which refers to decommission	Please include a separate section in the PRCP plan that identifies which	Further detail on the milestone criteria set for the decommissioning and removal of infrastructure is provided in **Section** Error! Reference source

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Milestone 1: Infrastructure Decommissioning and Removal		infrastructure and details regarding infrastructure that will remain onsite in the final landform design. This information provided within this section does not provide full details discussing the intent and discussions involved on the built infrastructure.	infrastructure will be decommissioned and how; how remaining infrastructure will be maintained and evidence of agreement that it can remain.	not found. and Error! Reference source not found.. This includes a list identifying how infrastructure will be decommissioned. This includes: All services disconnected; • All road materials (bitumen, gravel) removed (with the exception of the Saraji Road reserve PMLU outlined in **PRC Plan**, **Section 4**); • All pipelines drained and removed; • All fencing that is not part of the PMLU removed All road materials (bitumen, gravel) removed • All buildings demolished and removed; • All machinery and equipment removed; • All surface water drainage infrastructure that is not required in the PMLU is removed; • All rubbish removed; and • All waste is to be transported, disposed of and handled in accordance with relevant waste legislature.
Section 10.3 Rehabilitation Milestones	126.	The following information is required regarding the proposed milestones. Noting that the milestones should follow the SMART principle: • Include a milestone regarding when seeded areas will be considered sufficiently established to commence the land use of grazing. Include a milestone regarding the installation of drainage structures or surface water management.	Provide this information within the proposed milestones. Also ensure that Section 8 Risk Assessment: Table 8-2 Risk assessment for rehabilitation of the Project and Section 9.1 Milestone Monitoring, is updated to reflect these changes. also show this throughout the risk assessment and PRCP Schedule.	As requested, a new rehabilitation milestone, RM6: Land is suitable for the commencement of grazing, has been added to **Table 10-2** of the **PRC Plan**. Milestone criteria relevant to this milestone have been added to **Table 10-3**. A new milestone for the installation of drainage structures has not been added, as this is already considered part of RM3. The reason for this is that, as a separate milestone, its timing would have to be before or after the existing RM3 (landform development). While most components of surface water management will be in place prior to landform development, additional components are added during landform development. Given how intricately tied the installation of these final drainage features are to other aspects of landform development, it is logical to treat the completion of these works as a single milestone.
Section 10.3 Rehabilitation Milestones and Section 10.4 Draft PRCP Schedule	127.	PRC plan states that rehabilitation Area 4 covers dams, sediment control drains and ponds. Rehabilitation milestone 3 (landform development and reshaping/reprofiling) includes installation of erosion and sediment control systems.	Further information is required indicating how the final landforms which are predicted to rise above the previously flood impacted areas will be managed to maintain structural integrity.	Inundation maps within **Appendix B** of the **Surface Water Assessment** (WRM, 2020) (**Appendix A** of the **PRC Plan**) indicate the areas of the final landform which will be inundated during flood events. **Figure B.1**, **Figure B.2**, **Figure B.7** and **Figure B.8** of **Appendix B** the **Surface Water Assessment** indicate: • Under both 1% and 10% AEP conditions the proposed drainage corridor will convey flows within its footprint and therefore there will be inundation against the final landform toe. With the flood levee, flood results indicate peak inundation for the 10% AEP and 1% AEP events will be approximately 0.8 m and 2.2 m respectively against the final landform toe. Without the flood levee, flood results indicate peak inundation for the 10% AEP and 1% AEP events will be approximately 2.6 and 3.5 m respectively against the final landform toe. • Under both 1% and 10% AEP conditions the proposed drainage channel draining to the inlet of DD1 will inundate the toe of the final

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				landform. With the flood levee, results indicate peak inundation for the 10% AEP and 1% AEP events will be approximately 2.2 and 2.6 m respectively. Without the flood levee, the final landform toe will be inundated to a depth of 2.6 and 3.2 m respectively. These areas are shown as 'was dry, now wet' in **Figure B.1**, **Figure B.2**, **Figure B.7** and **Figure B.8** of **Appendix B** the **Surface Water Assessment** (WRM, 2020). • No other areas of the final landform toe are predicted to experience significant inundation under 1% and 10% AEP conditions. It is recommended the geotechnical stability of the toe of the dump on its western side adjacent the drainage channel is considered in locations where the toe is predicted to inundate. It is noted that the final landform batters are at a maximum slope 15% and therefore will be well below the angle of repose. In addition, as outlined above, detailed design of the drains will incorporate suitable erosion control measures along the final landform toe. If it is found that the inundation at the landform toe is undesirable, it could be mitigated by filling the area between the drain and the landform to prevent inundation of the landform toe (shown as 'Indicative fill design' in **Figure 7**).
10.4 Draft PRCP Schedule	128.	A1 - Land is to be stable ○ Landscape function analysis (LFA) is not a suitable determination to be used for the sole purpose of assessing stability. LFA is an ecological process focused method and is primarily used to measure ecosystem function. Additionally, the methodology is field based and uses visual indicators only, however for a structure that is proposed to extend 15m above surrounding ground level at a maximum slope of 15%, quantitative data collection is required. In addition to LFA please include a quantitative data collection methodology to assess stability.	Provide details to the department in the identified areas that need further clarification and review in Table 5-1 Rehabilitation Goals.	Monitoring across the final landform will be integral to the early detection of erosion and will allow for early intervention. The updated **Soil and Land Suitability Assessment** (**Section 9.6**, **Appendix I** of the **EA Application Supporting Information** document) provides a methodology for monitoring and measuring erosion which can be applied in addition to the landscape function analysis proposed in the **PRC Plan**. A brief description of monitoring methodologies is provided below. **Landscape Function Analysis** Landscape Function Analysis (LFA), as outlined in the PRC Plan is considered an effective monitoring tool for rehabilitated land. It offers detailed insight into how the landscape function at the rehabilitation site changes over time, and facilitates numerical comparison of restored/rehabilitated sites against reference sites. It uses 11 indicators of soil biogeochemical properties and processes, and generates three indices of soil function: soil stability, nutrient cycling and infiltration. These indices are strongly associated with the provision and regulation of ecosystem services such as soil retention, cycling of water and nutrients, carbon storage and biomass production. The LFA method quantifies changes in soil function response to natural and anthropogenic disturbances, as well as the effectiveness of management practices.

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		The rationale provided for the assessment timing isn't provided, which has implications for the milestone completion dates nominated in Table 10-4. The timeframes nominated are not considered adequate to allow for the collection of intervention into the rehabilitation process, nor to facilitate collection of performance data that can inform that stability is appropriately measured.		**Field Erosion Monitoring** In-field erosion monitoring is based on field-based assessments taken over time. Permanent monitoring transects, 50 m in length will be established across the landform to provide a basis for quantifiable temporal assessments. Observations will be taken along the 50 m transects, recording the number and average depth of erosion features, rill lines or gullies. It should be noted that the placement of the permanent transects may not be a true reflection of erosion across the rehabilitated landforms. General observations should therefore also be undertaken during the monitoring event. This assessment will identify evidence sediment movement, including the formation of rills, removal of soil around the base of plants and accumulation of loose sediment at the base of slopes. In-field erosion monitoring will also include an assessment of the water quality of run-off water released from the catchment of a given rehabilitation area. **Remote Sensing Methodologies** Various remote sensing technologies are available for the assessment of rehabilitated areas. They can be used for assessing the same area over time which can be useful to assess sheet erosion and or the development of rill and gully erosion over time, as well as detection of existing rill and gully erosion, however they will require calibration with field observations.
	129.	A2- Land is to be non-polluting This milestone has not considered the potential pollution resulting from discharge of sediment from the site. There is acknowledgement that some erosion control infrastructure is to remain in place until sufficient vegetative cover has been developed, however a data gap exists relating to the quantifiable maximum rate of erosion, as determined from a landform design investigation and subsequent sedimentation loss. Please ensure this is addressed.	Provide details to the department in the identified areas that need further clarification and review in Table 5-1 Rehabilitation Goals	Detailed landform stability and erosion monitoring is now proposed to be undertaken as outlined in the updated **PRC Plan Section 9** and **Table 5.1** and the updated **Soils and Land Suitability Assessment Section 9.2 (Appendix I** of the **EA Supporting Information** document. In addition, a water management and monitoring program is proposed will be developed to monitor sediment loads (amongst many parameters) at sedimentation dams and other water management structures, against water quality objectives, as outlined in **Section 6.1.5 of the PRCP**. Also see response #129
Spatial Information: Shapefiles	130.	Potential sensitive receptors (e.g. habitat) have not been adequately mapped. Section 1.2.9 of the PRC plan discusses MNES/MSES species within the project area, which are also mapped on QLD Globe. However, these areas are not	Provide this information within the spatial data.	A number of figures were produced that provide detailed site mapping for the habitat of identified MNES and MSES in the **Section 5** of the **Terrestrial Ecology Assessment** (**Appendix C** of the **EA Supporting Information** document), including: **Figure 5-2 Koala Habitat Map**; **Figure 5-4 Squatter Pigeon habitat map**; and **Figure 5-3. Greater Glider habitat map**.

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		adequately identified on the spatial data		Habitat mapping was based on a number of factors including, but not limited to: likelihood of presence based on proximity and recentness of records, availability of potential habitat, presence of food sources, soil types, vegetation density, land use, and distance to water. A detailed methodology of the development of site habitat mapping is described in **Section 5** of the **Terrestrial Ecology Assessment** (**Appendix C** of the **EA Supporting Information** document), Relevant spatial data files for the EA and PRC Plan have been re-submitted to the Department in accordance with the Spatial Information Submission Guideline Version 3.01 (DES 2019) Also see Response #131
	131.	No area data has been provided as part of the spatial data – while a field type of SHAPE_Area has been included, for all polygon files this is 0.0ha.	Ensure the spatial data contains area data.	Relevant spatial data files for the EA and PRC Plan have been re-submitted to the Department in accordance with the Spatial Information Submission Guideline Version 3.01 (DES 2019)