

Notice

Environmental Protection Act 1994

Information request

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

To: Magnetic South Pty Ltd
Suite 302, Level 3
102 Adelaide Street
BRISBANE CITY QLD 4000

Attention: Gareth Bramston
Email: gbramston@aacrc.net.au

Reference: APP0043095

Further information is required to assess an application for a site-specific environmental authority

1. Application details

The application for a site-specific environmental authority was received by the administering authority on 23 October 2019.

The application reference number is: APP0043095

Land description: MLA 700056

2. Information request

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

The information requested is in Appendix A attached.

3. Actions

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

- (a) all of the information requested; or
- (b) part of the information requested together with a written notice asking the authority to proceed with the assessment of the application; or
- (c) a written notice –
 - i. stating that you do not intend to supply any of the information requested; and


- ii. asking the administering authority to proceed with the assessment of the application.

A response to the information requested must be provided by **31 January 2022** (the information response period). If you wish to extend the information response period, a request to extend the period must be made at least 10 business days before the last day of the information response period.

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

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

If you require more information, please contact Melissa Brunner on the telephone number listed below.



Signature

31 January 2020

Date

Gillian Naylor
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
(07) 4987 9386
Coal Business Centre
PO Box 3028, Emerald QLD 4720
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Attachments

Appendix A – Information request

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Infrastructure		
Section	Comment	Requirement
Supporting information Section 3.3 Construction	It has been stated that site preparation will include the clearance of vegetation. Address the requirement for protected plant clearing permits under the <i>Nature Conservation Act 1992</i> .	Provide further detail regarding vegetation clearing and the potential additional requirements under the <i>Nature Conservation Act 1992</i> .
Supporting information Section 3.3.1 Mine Access Road – Figure 9 Conceptual design - Mine access road intersection	Within Figure 9, it has been stated that there is an “area to be cleared to ensure SISD (Safe Intersection Sights Distance) is achieved.” It has also been stated that the existing culvert is to be extended. There is no detail regarding the vegetation type proposed to be cleared in this area. The potential impacts of extending the existing culvert have not been addressed.	Provide further information as to the vegetation type and potential impact as a result of the proposed clearing works to allow for SISD and extending the culvert.
Supporting information Section 3.3.3 CHPP, Stockpiles and overland Conveyor and Figure 13 Conceptual design - Conveyor crossing (Capricorn Highway)	It has been stated that “The conveyor will be constructed to pass over both the Capricorn Highway and the Blackwater Railway.” The impacts of the conveyor over the highway (specifically visual amenity) have not been addressed. Visual amenity impacts of the conveyor on a nearby residential dwelling have been marginally addressed.	Address the potential impacts of the overland conveyor crossing over the Capricorn Highway and the impacts on sensitive receptors.
Supporting information Section 3.4.3.1 Temporary Flood Protection Levee	In section 3.4.3.1 it has been stated that the temporary levee will be constructed to provide protection from a 0.1% AEP flood event, and that the levee will be from 1.21 to 2.37 metres high. Section 4.3.4 has stated that “Perimeter drainage will be provided to limit the volume of surface water runoff, including modelled 1:1000 storm events, from entering the (final) voids”.	Provide further information as to the levee design and function in accordance with Departmental Guidelines, including the structure requirements at closure and after relinquishment. Ensure sufficient details are provided for mass (slope) stability, erosional potential, scouring potential, settlement, safety and future land use suitability once decommissioned.

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<p>Section 4.3.4 Final voids</p>	<p>It is not clear from Sections 3.4.3.1 and 4.3.4 of the whether the 1:000 AEP Flood Protection Levee around Pit AB is only a temporary structure or is also part of the perimeter drainage plan for final closure, providing flood immunity for the final void up to the level of a 1:1000 AEP flood.</p> <p>Regulated structures (including diversions) are required to be designed, constructed and decommissioned in accordance with the Departmental Guidelines, 'Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)' and 'Structures which are dams or levees constructed as part of environmentally relevant activities (ESR/2016/1934)'.</p>	
<p>Supporting information Section 3.4.3.2 Clean water drains</p>	<p>The engineered 'drainage features' do not meet the definition of a drainage feature under the <i>Water Act 2000</i>. How will mine affected water (MAW) or contaminated water be prevented from entering into the unaffected water system? Are the proposed structures temporary or permanent?</p> <p>Regulated structures (including diversions) are required to be designed, constructed and decommissioned in accordance with the Departmental Guidelines, 'Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)' and 'Structures which are dams or levees constructed as part of environmentally relevant activities (ESR/2016/1934)'.</p>	<p>Provide further information and a conceptual design of any proposed drainage feature diversions.</p> <p>Provide further information as to the design and function of the 'drainage features' in accordance with Departmental Guidelines, including the structure requirements at closure and after relinquishment.</p> <p>Provide further information on whether the proposed infrastructure is temporary or permanent. If permanent discuss residual risks and relinquishment upon surrender.</p>
<p>Supporting information Section 3.4.3.3 Water storages</p>	<p>Risk of water storages (regulated structures) overtopping or failing, as well as the potential impacts and mitigation have not been discussed.</p>	<p>Provide information regarding the risk of regulated structures failing or having inadequate freeboard to contain site waters, MAW and the potential impacts on environmental values.</p>
<p>Supporting information Section 3.5.3 Sewerage</p>	<p>In relation to the release of treated effluent to land, the application states that the design of the system will ensure no runoff from the disposal area occurs.</p>	<p>Further information is to be provided on the following:</p> <ul style="list-style-type: none"> • Any predicted overflows to the environment from any storage needs to be justified in terms of environmental impact. • The assessments should be carried out for the proposed and future effluent disposal rates. • Description of management measures to be implemented to ensure the irrigation of effluent does not exceed water holding capacity of the soil or the uptake capacity of the crop (that may,

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		<p>as a consequence, result in water logging, surface runoff or excessive deep drainage).</p> <ul style="list-style-type: none"> • Description of the capacity of the vegetation and soils in the irrigation area(s) to assimilate these salts on a long-term sustainable basis. • Description of irrigation application method and scheduling (triggered). • Description of risks of human exposure from irrigation of effluent or aerosol drift. • Description of risks aerosol drift to off-site locations and cause odour nuisance. • Description of buffer zones from all sensitive receptors to the irrigation area and sewage treatment plant.
	<p>It has been stated that the proponent will operate a sewage treatment plant (STP) located at the accommodation facility. This STP will have a maximum capacity of 140 equivalent person (EP). The expected workforce at the site accommodation is about 140 persons in “normal” conditions, the accommodation facility will be constructed to accommodate up to 280 persons (see page 54 of the Supporting Information report).</p>	<p>Justify the proposed capacity of 140 EP given the accommodation capacity. Consideration to contingencies following a STP failure event and maintenance issues in line with risks noted in the above requirement should be provided.</p>
<p>Additional information - Requirements for effluent release to land</p>	<p>As the proposed activity involves the release of treated effluent to land, the following should be submitted in relation to effluent sources and type:</p> <ul style="list-style-type: none"> • Type of treatment applied – include description of treatment process, design details including size/volumes, peak design capacity of the sewage treatment system. • Quantity, description of average and maximum wastewater flows. Also include dry versus wet weather period over time. • Quality (key contaminants of concern), describe and quantify the concentrations of key contaminants including total nitrogen, total phosphorous, electrical conductivity/total dissolved salts and sodium/sodium absorption ratio. Include average and maximum concentrations of treated effluent generated at the site. • Quality (other contaminants) – provide a risk assessment of other contaminants including Heavy metals, Pharmaceuticals, Toxins, Pathogens including E.coli and quantify of treated effluent generated at the site. 	<p>Address the effluent sources and type in relation to the releases of treated effluent releases.</p>

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	<p>No standard conditions apply to STPs of more than 100 EP.</p> <p>As the proposed activity involves the release of treated effluent to land, identify the location of effluent discharge (irrigation scheme) and include a layout plan showing:</p> <ul style="list-style-type: none"> • Property boundaries • Proposed irrigation area boundary, location of any wet weather storage infrastructure, sampling and discharge points including GPS Co-ordinates (Latitude, Longitude) and Elevation • Topography including drainage lines, water courses or any 'waters' • Any sensitive receiving environments such as sensitive / high ecological value areas in close vicinity of the irrigation scheme • Any buffer distances to any sensitive receivers. <p>As the proposed activity involves the release of treated effluent to land, the following should be submitted in relation to historic climate data for area used for designing the scheme:</p> <ul style="list-style-type: none"> • Provide a description of most locally relevant climate data, weather patterns which can be obtained from Silo DataDrill (web link) data • Provide a description of the frequency of inundation in the area and assess if this is a risk. The location of the sewage treatment plant and any other high-risk areas of the activity should be located above the Q100 floodplain. 	<p>Additional information such as disposal area and size, wet weather storage capacity is required along with an appropriate risk assessment of the potential impact of this activity to the relevant environmental values. The STP capacity, disposal area location and size as well as the wet weather storage capacity should be included in the proposed conditions.</p> <p>Address historic climate data to support the proposed irrigation scheme.</p>
	<p>As the proposed activity involves the release of treated effluent to land, the following should be submitted in relation to the soil characteristics of the proposed effluent irrigation area and the site suitability. Based on site investigation and available data, provide the following:</p> <ul style="list-style-type: none"> • Description of soil profile including erodibility, texture, structure, impermeable layers and any evidence of rising water table <ul style="list-style-type: none"> ○ Hydraulic properties: ○ Moisture content at field capacity, permanent wilting point and saturation ○ Saturated hydraulic conductivity • Chemical properties: <ul style="list-style-type: none"> ○ Nitrogen content, especially organic nitrogen ○ Phosphorus content ○ Phosphorus sorption capacity 	<p>Describe the soil characteristics of the proposed effluent irrigation area.</p>

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	<ul style="list-style-type: none"> ○ Exchange sodium percentage ○ Background concentration of any contaminants. ● Proposed vegetation for effluent irrigation area <ul style="list-style-type: none"> ○ Species of plant cover ● Management of plant biomass. It is department's expectation the plant biomass be cut and removed from the irrigation/ disposal area. 	
	<p>As the proposed activity involves the release of treated effluent to land, the following should be submitted in relation to groundwater:</p> <ul style="list-style-type: none"> ● Presence of groundwater or temporary perched water tables, levels over time and background water quality. ● Any risk of effluent reaching groundwater. 	Describe the impacts to groundwater of the proposed treated effluent release.
	<p>As the proposed activity involves the release of treated effluent to land, the following should be submitted in relation to the irrigation management area:</p> <ul style="list-style-type: none"> ● Irrigation regime proposed (how irrigation is triggered and applied) ● Irrigation method and infrastructure required ● Management of any potential aerosol drift generated from above ground irrigation 	Describe the proposed irrigation management area.
	<p>As the proposed activity involves the release of treated effluent to land, the following should be submitted in relation to wet weather storage management:</p> <ul style="list-style-type: none"> ● Type and volume ● How any overflows will be managed ● Algae management if proposing open lagoon or pond ● If open storage, design of the wet weather storage including lining to ensure any potential of effluent leaching to groundwater is prevented ● Contingency plans 	Describe wet weather storage management.
	<p>As the proposed activity involves the release of treated effluent to land, address the predicted environmental impacts of the proposed effluent irrigation scheme. The preferred model is MEDLI. This model assesses the hydraulic load applied to the irrigation areas, the fate of nitrogen, phosphorus and salts, and required wet weather storage volume. The results of the MEDLI assessment is to be provided and include the following:</p> <ul style="list-style-type: none"> ● the proposed size of the irrigation area(s) ● the proposed wet weather storage volumes ● irrigation rates ● frequency of overtopping 	The department requires a "water balance method" (typically "MEDLI") to determine the suitable wet weather storage volume and size and locations of effluent irrigation areas based on the volume of wastewater generated at a facility, taking into account climatic conditions, vegetation being irrigated, effluent quality with regard to TN, TP, TDS, EC and soil properties to ensure no runoff from the effluent irrigation disposal area(s) and wet weather storage, with minimal "irrigation-induced deep drainage".

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	<ul style="list-style-type: none"> • irrigation rates • soil water balance • soil nutrients balance • any risk of contamination to groundwater and measures to be implemented to protect groundwater • crop performances • predicted irrigation-induced annual deep drainage rate (mm/year) • predicted average deep drainage Nitrate and Phosphorus annual concentrations (mg/L) • interpretation of output details <p>For assessments using MEDLI model <u>Version 1.3</u>, the following model input and output files are to be provided:</p> <ul style="list-style-type: none"> • those files that end with “IPT.SUM” (Input Summary); and • those files that end with “SUMM.STA” (Summary Output) <p>Each file name begins with a 4-digit reference number and neither file contents nor the format is to be altered or changed.</p> <p>For assessments using MEDLI model <u>Version 2.0</u>, the following model input and output files are to be provided:</p> <ul style="list-style-type: none"> • *.medr (Output file) • *.med (Scenario file) 	<p>Where MEDLI is not used, a justification for the validity and calibration for the model is required.</p>
<p>Supporting information Section 3.6.2 Mine schedule Figure 19 Mine stage plan - Year 06</p>	<p>The temporary levee is proposed to be positioned along the south-eastern side of Pit AB. The diverted drain is located at the southern end of Pit AB. As the pit is proposed to progress toward the mining lease area (MLA) boundary, the applicant has proposed that the levee would extend the length of the drain to prevent possible in-pit flooding from the drain.</p>	<p>Demonstrate that the active mining pit will not be impacted during flood events given that this area has a high probability of flooding.</p>
<p>Supporting information Section 3.6.2 Mine schedule Figure 20 Mine stage plan - Year 08</p>	<p>Figure 20 shows that the active spoil dumps extend to be in close proximity to the diverted drainage feature. Risk of the dump slopes failing and impacting the drain has not been discussed.</p>	<p>Provide further information on the proximity of dumps to the drain and the potential impacts to environmental values.</p>

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<p>Supporting information Section 3.6.2 Mine schedule Figure 22 Mine stage plan - Year 12</p>	<p>Figure 22 shows that Pit AB is in close proximity to the MLA eastern boundary. Limited information has been provided as to whether there is going to be adequate space to complete rehabilitation works. If the pit is on the MLA boundary, how will pushing or fencing occur? Figure 26 Mine stage plan - Final landform shows no established vegetation at the location where the pit abuts the MLA boundary.</p> <p>There could be a risk of pit or dump failure, which may result in environmental impacts off-lease.</p>	<p>Provide further information regarding the rehabilitation of land surrounding Pit AB.</p>
<p>Supporting information Section 3.8 Road Transport</p>	<p>It has been stated that “These local roads and tracks will be temporarily closed to the public for the Project...to maintain the connection of Cooina Road to the Capricorn Highway (via Sanders Road and Namoi Road), the access track extending from Sanders Road is proposed to be diverted. This diversion will be approximately 2km in length and will connect onto Cooina Road approximately 1.0-1.2km south of its current connection. The diversion works are located outside of the MLA and will be subject to a separate approval from the Central Highlands Regional Council (CHRC) (i.e. approval is not being sought by this EA application).”</p> <p>Information has not been provided regarding the road diversion construction timing and how this coincides with the temporary closure. Will the diversion be constructed in advance of the road closure, so the public are minimally affected?</p> <p>If approval of the diversion (off-lease) is subject to council approvals, it is assumed that the diversion and road closure will not go ahead if approvals are not received. Alternatives will need to be considered.</p>	<p>Provide further information regarding the timing of the road closure and diversion construction.</p> <p>Provide alternatives if the road diversion is not approved.</p>
Rehabilitation		
Section	Comment	Requirement
<p>Supporting Information 4.2.4 Topsoil Resources Table 12 Estimated topsoil volumes available for rehabilitation</p>	<p>The table states that the Normanby soil management unit (SMU) will not be disturbed, but there will be a stripping depth of 0.9m. Topsoil stripping is considered surface disturbance.</p> <p>Are topsoil seedbank and topsoil subsoils calculated separately?</p>	<p>Ensure Table 12 values are accurate.</p> <p>Identify depth of topsoil seedbank and topsoil sub-soil and volumes</p>

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<p>Supporting Information Section 4.3.1 Post-Mining Land Use</p>	<p>It has been stated that the rehabilitated low wall slopes will be capable of supporting a grazing land use. However, in Table 14 – Nominated post-mining land use (PMLUs) show that residual low walls are planned for native vegetation supporting fauna habitat – this is inconsistent information.</p> <p>The void low wall will be rehabilitated to a final gradual slope for safe access and grazing by cattle. What is the gradient/ degree of the low wall in voids? This should also be included in Table 18 as a performance criterion.</p>	<p>Provide clarification on the rehabilitation outcome for the low walls as there is conflicting information throughout the rehabilitation section.</p> <p>Demonstrate that the low walls can sustain the PMLU of native vegetation and identify what additional stabilisation methods are required.</p>
<p>Supporting information Section 4.3.2 Waste rock emplacements</p>	<p>It has been stated that it is preferable to internally drain the upper surfaces of waste rock emplacements rather than increase flows down rehabilitated slopes. What structures are required for this? Are these going to remain post-mining? Is there a risk of failure?</p>	<p>Provide further information on the internally draining infrastructure required to reduce flows down rehabilitated slopes</p>
<p>Supporting Information Section 4.3.2 Figure 29 Conceptual Layout – Nominated PMLUs</p>	<p>Figure 29 identifies the PMLUs. The map demonstrates that there is grazing adjacent to the native vegetation. Has consideration been given to a corridor or link for fauna.</p> <p>Is there a barrier between the grazing land and the native vegetation to ensure cattle don't impact the native vegetation growth?</p> <p>Consider the spread of exotic pasture species into native vegetation habitats.</p>	<p>Address the connectivity between varying PMLUs and undisturbed areas.</p> <p>Discuss how the PMLUs will function as an integrated ecosystem in the long-term.</p>
<p>Supporting Information 4.3.4 Final Voids</p>	<p>It has been stated that “A key rehabilitation objective for this domain is to reduce the rate of predicted water salinity present in the void primarily to allow the ecology of the residual void waterbody sufficient time to adapt to salinity changes.” No method of how this will be achieved has been elaborated on. Are there other contaminants of concern that flora and fauna will have to ‘adapt’ to?</p> <p>Page 97 of the supporting document states that, “...the void will contain a fresh to brackish pit lake that is expected to provide suitable habitat for fauna species, particularly migratory and marine bird species.” No evidence has been provided to support this statement. How are flora and fauna species expected to transition from freshwater to a brackish water ecosystem?</p>	<p>Provide additional information regarding how the rate of predicted water salinity in the void is proposed to be reduced.</p> <p>Demonstrate how the ecological ecosystems will adapt to changes in salinity. Demonstrate that there are no other contaminants of concern that may impact the success of flora and fauna to function within the proposed ecosystem.</p> <p>Provide justification as to how the pit lake at both the freshwater and brackish timelines will be considered suitable habitat for specified fauna species.</p>
<p>Supporting Information Section</p>	<p>Refer to Table 17 Indicative progressive rehabilitation schedule.</p>	<p>Provide a clear explanation of the rehabilitation plans and methods for each of the domains.</p> <p>Provide justification as to why the area of land available for rehabilitation isn't being fully rehabilitated in Year 8 and Year 12.</p>

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<p>4.3.7 Progressive rehabilitation</p>		<p>Clarify where the values in column 5 for 'Total area rehabilitated (ha)' have been derived from.</p> <p>After mining activities have ceased, identify the expected timeframes to complete rehabilitation.</p> <p>For Pit C, provide further information on the areas available for rehabilitation and the total area reshaped and topsoiled.</p> <p>Identify proposed methods for failed rehabilitation and the impacts and management of this beyond Year 20.</p>
<p>Supporting Information Section 4.4.2 Reshaping/landform development</p>	<p>It was stated that there is a 'master waste rock emplacement surface drainage plan'.</p> <p>Graded banks and rock-protected spine drains are proposed to be installed to allow drainage from long rehabilitated slopes to be conveyed to natural ground level. All surface runoff from newly rehabilitated slopes will be directed into sediment dams until revegetation uptake is stable and adequate to control soil erosion.</p> <p>Is this temporary infrastructure? If it is permanent, what is the long-term management? How is this proposed to function? Will the drainage structures be removed?</p> <p>What capacity or design will sediment basins take and how were they calculated? How will sediment basins feed into the wider MAW Management?</p>	<p>Provide the aforementioned plan.</p> <p>Provide further information about structures to address the concerns raised.</p>
<p>Supporting Information Section 4.4.4 Revegetation</p>	<p>It has been stated that "Initial revegetation efforts will be aimed at stabilising and establishing the building blocks for a self-sustaining system, in accordance with the defined land use". Unsure how this will be achieved as it is not explained further. How will self-sustaining be defined? What analogue / representative vegetation type will be adopted?</p>	<p>Provide further information into "building blocks" and their correlation to the defined land use.</p>
<p>Supporting Information Section 4.4.7 Water Management Infrastructure</p>	<p>Included revegetation activities are: weed and pest management, ensuring revegetated areas are protected from the impacts of livestock grazing, monitoring diversion stability and revegetation success until a trajectory of achieving completion criteria can be demonstrated. The methods for achieving this have not been demonstrated.</p>	<p>Provide information in relation to planned strategies and the demonstration of achieving rehabilitation completion criteria.</p>

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Supporting Information Section 4.5.2 Erosion and Sediment Control	Erosion and Sediment Control has been proposed to be developed to address the construction, operational and rehabilitation/ closure phase of the Project.	Provide further information on erosion and sediment control methods, and management process' such as adopting ESC Plans developed by a CPESC or suitably qualified person during the life of mine operation and the relevant locations if known.
Supporting Information Section 4.5.2 Erosion and Sediment Control	It has been stated that erosion and sediment control structures would not be removed until disturbed areas have been stabilised and the risk of erosion of sedimentation impacts have reached pre-disturbance levels. What are the criteria for pre-disturbance levels? Will these structures remain post surrender or will rehabilitation not be achieved until erosion and sedimentation has stabilised?	Provide further information on how this will be achieved. Demonstrate that it is possible to achieve pre-disturbance levels of erosion and sedimentation.
Supporting Information Section 4.5.3 Contaminated Land	It has been stated that the risk of land contamination will be similar to existing mining operations and is likely to be confined to instances of small diesel spills, and/or spills of chemicals likely to be onsite. What are the relevant potential spill incidences and impacts of spills on the relevant environmental values at the proposed site. What are the proposed remediation methods prior to disturbance or ongoing management strategies?	Address the relevant impacts from contaminated land on site-specific environmental values.
Supporting Information Section 4.6 Rehabilitation indicators and completion criteria Table 18 Rehabilitation objective, performance indicators and completion criteria by domain	Table 18 identifies rehabilitation goals, objectives, performance indicators and completion criteria for mine domains. For the rehabilitation goals column performance indicators need to be specific. Performance indicators (something that can be measured i.e. water pH) and the subsequent rehabilitation criteria (quantifiable target i.e. water in Miners Creek must measure between 6 and 8 pH) are the benchmarks that would allow the proposed post-mining land use to occur without unacceptable ongoing management costs. Include, but not limited to the following examples; percentage of vegetation cover, vegetation dynamics, rates of erosion, volume of sediment loss, geotechnical stability factor. Baseline data is essential for evaluating rehabilitation performance as it describes the mine site's biophysical properties prior to disturbance. It is critical in setting performance targets for site rehabilitation, for understanding the long-term properties/ performance of the sites and to inform rehabilitation planning (especially with the PRC plan). This should be collected and decided prior to disturbance by mining to ensure that closure objectives have been fully considered and	Include a comprehensive suite of SMART performance indicators and rehabilitation/ completion criteria. In deriving the performance indicators (as mentioned above), demonstrate/ justify where the indicators were derived from as supported by baseline data. To support the future PRC plan requirement, considering including a timeframe in the rehabilitation criteria to demonstrate progression of rehabilitation. (Note that this can be changed when a PRC plan is submitted but will be used to support it.) Address the steps the site will need to take in order to achieve the objectives and criteria. Address risk avoidance steps. Identify and describe the post mining land use for each domain in Table 18 – link to criteria and objectives.

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	<p>rehabilitation planning is an accurate representation of the site's characteristics. Baseline data is a requirement for a PRC plan.</p>	<p>This information requirement is also applicable to the respective sections 4.3 – 4.3.7 for each domain.</p>
<p>Supporting Information Section 4.7 Rehabilitation monitoring and measurement</p>	<p>It has been stated that “The assessment recommended additional testing of materials and field trials to assist in determining the most appropriate management options to ensure effective rehabilitation.”</p> <p>How have transects been determined to be the best site-specific option for monitoring rehabilitation? What other methods have been assessed as options?</p> <p>Have these field trials commenced? If not, is there a tentative timeframe as to when these might commence? The results of the trials will influence the rehabilitation methods on site (closure). Identify other studies that address options for rehabilitation that have been undertaken for similar land areas.</p> <p>The rehabilitation monitoring program should be designed in accordance with the performance indicators that can be compared against the rehabilitation criteria for the relevant domains.</p> <p>What rehabilitation trials are planned for the life of mine and after closure? The trials may focus on a single aspect of rehabilitation such as erosion control, oxidation rates, seed germination, plant growth rates or uptake of metals, faunal recolonisation or resilience to climatic variation. They may also address the overall success of the developing ecosystem through studies of nutrient recycling, microbial bio indicators, self-seeding or other measures of sustainability. The trials may be directed at filling gaps in the knowledge of local ecological processes and enable refinement of rehabilitation objectives and rehabilitation criteria that have been proposed for the milestones. Monitoring data from baseline studies may assist in designing the trials and monitoring programs, especially if analogue sites have been proposed to allow more realistic consideration of local conditions and the climatic effects on rehabilitation. Monitoring data from the trials can be useful in progressive certification or final surrender applications.</p>	<p>Identify and describe the monitoring regimes which would be undertaken in order to assess the trajectory of success of mine rehabilitation.</p> <p>Describe what field-based assessments and application of remote sensing, GIS and other relevant emerging technologies where appropriate might be applied.</p> <p>Identify plans for rehabilitation trials that can improve the success of the site's rehabilitation strategies.</p>

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Additional information – Relinquishment	With respect to the rehabilitation objectives, what are the anticipated ongoing vegetation management requirements and restrictions that may be imposed on future landholders after relinquishment?	Address final land use for landholders and the management requirements.
Additional information – Community consultation	Community consultation gives weight to the selection of the proposed final landforms. Consideration of the public interest is also a 'standard criteria' for a decision relating to an application and must be addressed. Demonstrate community consultation has been undertaken and that the community are supportive of the proposed final land uses.	Address what community consultation has been undertaken to address the proposed final land forms and what were the results of the consultation. As a standard criteria consideration, demonstrate that 'public interest' has been sufficiently considered.
Soil and Land suitability		
Section	Comment	Requirement
Supporting information Section 5.2.5 Soils Table 19 SMUs within the study area	The table has several references to ' <i>Cassia spinarum</i> '. This is a potential typographical error. Might be meant to read ' <i>Carissa spinarum</i> '.	Confirm whether ' <i>Cassia spinarum</i> ' is correct or not.
Supporting information Section 5.2.5 Soils Figure 32 Distribution of SMUs	Figure 32, supported by information provided in Table 19, suggests that the project site is dominated by strongly sodic soils. Impacts of strongly sodic soils can include surface crusting, reduced seedling emergence, reduced soil aeration, waterlogging, increased run-off and erosion risk, less groundcover and organic matter, less microbial activity. The aforementioned impacts have not been discussed in the supporting document or Appendix F Soil and Land Suitability.	Provide further information regarding the impact of strongly sodic soils on site, which may impact rehabilitation outcomes and proposed mitigation measures.
Supporting information Section 5.3 Potential Impacts, 5.3.1 Landform	The post-mining landform is proposed to be at a maximum height of 190m. The current height of the pre-mining landscape is from 120 – 150m. Can a landform of 190m in height be considered a significant change?	Provide further information about the change in final landform.
Supporting information Section 5.3.2 Visual Amenity	Dingo township is located approximately 2.3km east of the Project, in addition to other sensitive receptors within a 10 km radius that could be potentially impacted by visual disturbances. It has been stated that "views of Project infrastructure and elevated landforms are not expected to be significant from local roads and residential dwellings due to the local topography and large separation distances	Provide further information regarding the impacts of the Project on visual amenity and the mitigation measures.

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	between dwellings and mining activities.” Insufficient information has been provided regarding visual amenity impacts. Potential mitigation measures are not provided.	
Supporting information Section 5.4 Mitigation measures, management and monitoring - Landform	It has been stated that “Waste rock emplacement will be constructed to a maximum slope of 1V:10H (approximately 5.7%) and a maximum height of 190mAHD.” Based on percentage and degree conversions it is assumed that ‘5.7%’ should read ‘5.7°’ (i.e. 10% or 1/10). Other sections of the supporting information document (refer to section 4.3.2) have stated that the maximum slope is 6 degrees.	Confirm the maximum slope.
Supporting information Section 5.4 Mitigation measures, management and monitoring – Soils	It has been stated that “Mitigation strategies for soil include: carrying out routine testing of soil properties prior to use in rehabilitation. If required, fertilizers, soil ameliorants, and application of a seed mix will be used to increase the likelihood of rehabilitation success.” The use of the phrase 'routine testing' suggests the testing will be carried out at regular intervals in advance of rehabilitation activities. No further detail has been provided to confirm this. If the results of routine testing determine that the soil is not suitable for use in rehabilitation and that ameliorants etc. will not be adequate in improving soil properties, what is the next step in mitigation?	Provide further information regarding routine testing of soil and possible mitigation and management measures.
Supporting information Section 5.4 Mitigation measures, management and monitoring – Erosion Protection Measures	It has been stated that topsoil stockpiles will be seeded to prevent unnecessary erosion of soil. No further detail has been provided about which seed mixes would be used on topsoil stockpiles. An appropriate seed mix is required to be used to ensure that if seeds remain in the seed bank when topsoil is spread for rehabilitation that there is growth of appropriate species for that area/post-mining land use.	Provide further information regarding the proposed seed mix for use in rehabilitation.
Supporting information Section 5.4 Mitigation	Table 22 states that the Normanby SMU has a topsoil stripping depth of 0.9m. The table note relating to the Anderson, Charlevue, Ellesmere, Nigel and Normanby SMUs states “topsoil stripping not recommended.” Normanby SMU is the only SMU	Further justification is required as to why the Normanby SMU has a topsoil stripping depth of 0.9m when topsoil stripping is not recommended.

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<p>measures, management and monitoring – Table 22 Potential topsoil volume within disturbance footprint</p> <p>Appendix F Soil and Land Suitability – Table 62 Maximum Topsoil Stripping Depths for all Soil Management Units</p>	<p>out of the aforementioned SMUs that has a proposed topsoil stripping depth above 0m.</p> <p>Table 62 on page 76 of Appendix F states that the stripping depths with an asterisk (*) may require nutrient supplements or soil ameliorants for successful use in rehabilitation.</p>	<p>The note in Table 62 of Appendix F has not been reflected in the note of Table 22 in the supporting document. Account for any required ameliorants necessary for successful rehabilitation.</p>
<p>Supporting information Section 5.4 Mitigation measures, management and monitoring – Topsoil Handling Procedures</p>	<p>It has been stated that “If available, subsoils that have been identified as having a high clay content with low erosivity risk will be returned first at a depth of up to 0.5m, prior to the addition of sandier topsoil.”</p> <p>Is the expectation that subsoils with high clay content will be readily available? It has not been discussed about what would occur to ensure the sandier soils can provide a suitable growth medium if the high clay subsoils are not available.</p>	<p>Provide further information in regards to availability of high clay content soils and measures to be taken if they are not available.</p>
<p>Appendix F Figure 3, 4 and 6</p>	<p>Figures 3, 4 and 6 of Appendix F Soil and Land Suitability identify that the study area does not align with the MLA boundary. An explanation for the variation of the study area has not been provided in Appendix F.</p>	<p>Clarify the reasoning for the variation of the study area.</p>
<p>Appendix F Section 6.2 Topsoil</p>	<p>Table 63 indicates that 25,283,553m³ of topsoil will be stripped during the life of mine.</p>	<p>Provide detail of the approximate volume required to achieve the proposed final land use and rehabilitation outcomes.</p>

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stockpiling Table 63 Estimated Soil Volumes	Appendix F does not identify the volume of topsoil required to undertake rehabilitation to achieve the proposed final land use and rehabilitation outcomes.	Should a topsoil deficit be identified, provide detail of alternative methods to mitigate any deficit over the Life of Mine.
Appendix F Section 7.1 Land suitability	<p>It has been stated that “Other areas, such as steeper outer slopes of spoil (e.g. slopes of greater than 10%) may be subject to erosion and as such may be less suited to cattle grazing than the pre-mining landscape. A reduced land suitability score is expected on these landforms”.</p> <p>It was stated in section 4.3.2 Waste rock emplacements (in the supporting information) that the maximum slope for the proposed final landform is 6 degrees (with 10% = 5.7 degrees). How much greater than 10% are the slopes proposed to be?</p> <p>Section 4 of Appendix F indicated that many of the soils, from which topsoil will be sourced, are moderately to highly dispersive. No further information has been provided to describe how such topsoils will be applied to prevent erosion on steep slopes within the final landform.</p>	<p>Demonstrate how topsoil will be applied and maintained on steep slopes (slopes >10%).</p> <p>Demonstrate how slopes >10% are appropriate for a post-mining land use of grazing.</p>
Appendix F Section 7.4 Soil degradation	Section 7.4 recommends that saline or sodic soils will be segregated and stockpiles will be clearly demarcated to ensure appropriate use of the resource. No further information has been provided relating to the management of saline or sodic soils.	Provide further detail relating to the management of saline and/or sodic soils.
Biodiversity		
Section	Comment	Requirement
Additional information	<p>In reference to section 7 Environmental offsets in the EA application form, you must detail the magnitude and duration of the likely significant residual impact on each prescribed environmental matter for each activity and demonstrate that all reasonable measures to avoid and minimise impacts on each of the matters will be undertaken.</p> <p>In reference to section 7.2 Staged environmental offsets of the EA application form, you must include supporting information that details how the activities are proposed to be staged.</p> <p>Include any relevant biodiversity offset requirements including:</p>	Ensure the application requirements are sufficiently addressed.

	<ul style="list-style-type: none"> • Details of whether suitable offsets exist for impacts to prescribed environmental matters; • 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; • 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. 	
<p>Supporting information Section 6.2 Description of environmental values and section 6.3 Potential impacts</p>	<p>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. In addition, address the environmental values and impacts on surrounding flora and fauna, not limited to but including Taunton National Park, Walton State Forrest, Blackdown Tablelands and Arthurs Bluff State Forest.</p>	<p>Provide further information on the site-specific environmental values and potential and actual impacts on terrestrial ecology.</p>
<p>Appendix G Section 3.5.1 Groundwater Dependent Ecosystems</p>	<p>An explanation on what Figures 7, 8 and 9 identify in terms of GDEs was not provided.</p>	<p>Provide information on the figures and what the information presented in these figures identify about the site and the possible impacts on these areas that will be impacted by the mine.</p>
<p>Appendix G Section 4.0 Methodology Figure 11 Fauna Survey Figure 10 Flora Survey</p>	<p>Surveys have not been conducted on sites located around the mine (predominately conducted in areas that the mines themselves/pits are not located), instead of doing survey sites in the habitat that currently sits in the areas being planned for coal extraction. Why have studies not been conducted in the relevant areas? This is also applicable for the flora surveys (Figure 10).</p>	<p>Provide further justification on sites that were chosen for surveying and the importance of the site's locations.</p>

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Appendix G Section 4.5.4 Fauna Survey Effort - Table 9	An inconsistent method of trapping/monitoring/recording has been utilised for the different seasons. For mammal trapping, 4 sites in Autumn, 6 sites in spring and 5 sites in Autumn have been selected. Why was a survey not completed in Spring 2018? The results that have been formulated do not identify animal correlation between seasons and species in the MLA as they cannot be appropriately comparable.	Justification on the amount of surveying conducted in the two different seasons over the course of the surveying period.
Appendix G Section 5.4.1 Groundwater Dependent Ecosystems Figure 13	Figure 13 is not explained. Riverine wetlands are identified in the study areas including in areas where the pits are proposed to be.	Discuss the impact of mining on these groundwater dependent wetlands, and the impact from the proposed final land use.
Appendix G Section 7.2.1 Fauna Species of Conservation Significance and Habitat	In this section there are three identified fauna species of conservation significance. This does not correlate with information in other sections which state there are five fauna species of conservation significance with only four listed. The 3 fauna species that have been discussed in section 7.2.1 are the Squatter pigeon, the Greater Glider and the Short-beaked Echidna. In section 6.3.1 it is stated there are five species with only four listed – southern Squatter Pigeon, Greater Glider, Short-beaked Echidna and Rufous Fantail.	Ensure all information between sections are correct and correlating. All species of conservation significance need to be discussed in terms of their potential impacts from mining activities.
Appendix G Table 25 Summary of Assessment of Prescribed Matters	Table 26 identifies that an offset is required for 106.65 ha of essential habitat. This is not included in the supporting information and conflicts with Table 25 (page 99). Table 25 identifies the summary of assessment of prescribed environmental matters. Provide further detail and workings of how the impact assessment conclusions were reached and assessed against the Queensland Environmental Offsets Policy Significant residual impact guideline (December 2014).	Ensure all information correlates between tables and is correct. Provide further information.
Appendix H Section 5.0 Methodology	Two sampling events were completed at different times of the year of February in 2018 and April in 2019, which means data cannot be accurately correlated without externalities considered which has not been discussed.	Justification into why the two sampling projects (2018 and 2019) are enough to provide critical information in relation to the aquatic biodiversity in the site area.
Appendix H Section 5.2 Sampling Sites Table 5	Many of the assessments and surveys were completed at different times and not all at the different survey sites identified in Figure 6.	Discussion on why specific sites were chosen for the assessments completed compared to the sites that did not have assessments. Justification is needed on the sample sites survey patterns.
Appendix H	No survey sites were located downstream of the Springton Creek, only on its tributaries within the site area.	Provide justification as to why a survey site was not located for downstream Springton Creek and why the information that could

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Section 5.2 Location of Survey Sites Figure 6		have been provided from this survey site would not have been valuable.
Appendix H Section 6.7 Aquatic values	Stated that many of the biodiversity aspects of ecology have been found to be “low”.	Provide further justification of this determination based on the surveying completed (why the amount of surveying completed in 2019 justifies the determination).
Appendix H Section 7.0 Potential Impacts	Provide a discussion about the impact of the proposed mining activity on the aquatic ecology environment in times of flood and drought.	Provide further information.
Surface water		
Section	Comment	Requirement
Supporting information Section 7.2.3 Surface water quality	Background water quality does not meet the Water Quality Objective (WQO) guideline values for the protection of aquatic ecosystems at many sites including pH (lower pH in 2019), dissolved oxygen (low DO), turbidity, suspended solids, ammonia, and sulphate (as SO ₄ ²⁻) on a few occasions. Petroleum hydrocarbons were also found to exceed WQO guideline values at several sites, considered by the applicant likely due to the highway and agricultural practices.	Considering the absence of a specific industrial source, it is recommended that these hydrocarbon results are reviewed and confirmed.
	It has been stated that samples were taken following two flow events. However, there is no indication of the flow characteristics at the time of sampling.	Provide flow data in addition to water quality data.
	In accordance with Queensland WQOs guidelines, a minimum of 8 samples over a 12-month period are potentially sufficient to derive surface water quality trigger values (DEHP 2009). Only 2 sampling rounds data are provided within the report. This has implications for the development of locally relevant WQOs and mine water release criteria.	Additional data is required to establish a robust baseline and derive site-specific triggers for surface water quality. Provide all raw data for all monitoring locations in an excel format (including additional data obtained since the last sampling round presented in the report).
Supporting information Section 7.2.3 Surface water quality Table 28	WQOs are available for the Mackenzie River sub-basin and listed on page 129 of the Supporting Information report for the project. A mistake has been noted on the Total Nitrogen water quality objective (WQO) to be 7 µg/L (see Table 28 on page 129) instead of 775 µg/L proposed in the Environmental Protection (Water) Policy 2009 (EPP Water).	Ensure correct information is provided.
Supporting information Section 7.3.3	It has been stated that other runoff from disturbed areas, such spoil dumps, will be intercepted by sediment dams designed in accordance with the SWMS. Discharge from sediment dams directly into the receiving environment (after settlement of	Address total suspended solids in the Erosion and Sediment Control Plan and REMP. It is recommended Suspended Solids trigger level be included in Table F5 – receiving waters contaminant trigger levels

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Impacts on surface water quality	suspended sediments) would only occur during rainfall events. The discharge is expected to have insignificant impacts on water quality, as overburden runoff quality is expected to be relatively benign. As total suspended solids have the potential to be a major issue, the erosion and sediment controls including the sizing of the sediment ponds requires consideration.	of the EA conditions proposed by the applicant, as per the <i>Model water conditions for coal mines in the Fitzroy basin (2013)</i> (ESR/2015/1561).
Supporting information Section 7.4.2 Mine affected water release	<p>There are potential impacts of contamination of surface water caused by releases from mine water dams.</p> <p>The design and water balance do not assume any release from the mine water dams. However, it has been stated that if any controlled releases are to occur, it would be in accordance with the EA conditions. Release limits at the mine affected water release points as well as at a downstream monitoring point proposed in Charlevue Creek are proposed in the draft EA conditions provided by the applicant. Proposed limits and indicators for such release should be carefully considered. Demonstrate sulphate is not an issue before proposing to remove it from monitoring requirements.</p>	<p>Provide further detail of the potential and actual impacts including the magnitude and duration.</p> <p>Justify amendments to the <i>Model water conditions for coal mines in the Fitzroy basin (2013)</i> (ESR/2015/1561) in relation to the proposed EA conditions.</p>
Supporting information Section 7.4.4 Receiving water monitoring	It has been stated that site-specific reference/baseline values will be developed after a period of monitoring to assess future local water quality data.	Provide a detailed monitoring plan that would be used to assess the baseline water quality of the receiving environments (including locations, frequency, indicators and quality assurance/control methods). Data should be collected according the methods outlined in the Monitoring and Sampling Manual (DES, 2018). All available data should be provided in an excel format, including sampling conditions (rain, stream flow etc.).
Appendix B Section 5.1 Site water types Table 5.1	<p>Sediment water is defined as ‘surface water runoff from areas that are disturbed by mining operations (including out-of-pit waste rock emplacements)’.</p> <p>Although ‘sediment water’ may not come into contact with coal or other carbonaceous material, it has still come into contact with areas disturbed by mining operations and will contain an increased sediment load. On this basis, the department considers ‘sediment water’ to be mine affected water.</p> <p>Please note that the department considers runoff from areas which have had mine affected water applied as dust suppression to be mine affected water.</p>	<p>Amend Table 5.1 to remove the definition of ‘sediment water’.</p> <p>Describe the management of runoff from haul roads.</p> <p>Update the water balance to include runoff from haul roads as mine affected water.</p>
Appendix B Section 5.3 Water management	“Raw water Dam” is listed under Mine affected water dams (p 42).	Ensure correct information is provided.

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system components		
Appendix B Section 6.2 Groundwater inflows to mining pits Table 6.2	Insufficient detail is included explaining the marked changes to net annual inflows into AB pit. What changes during mine life years 11-14?	Provide further detail.
Appendix B Section 6.5.2 Catchment runoff rates	It has been stated that adopted rainfall runoff parameters are summarised in Table 6.4. In the absence of site-specific parameters, parameters typical for coal mines in the Bowen Basin were adopted. No further justification has been provided to demonstrate that the adopted parameters (rainfall and runoff volumes) are appropriate for use in the surface water balance.	Demonstrate that the adopted parameters are appropriate for use in the surface water balance.
Appendix B Section 6.9 Water balance model results	It was indicated that capacity of the mine water dam will be reached by Year 11, with increased potential of overtopping during wetter years. Table 6.8 summarises the overall annual site water balance, however no further explanation of the results is provided.	Provide an interpretation summary of the data displayed in Table 6.8. Discuss the cause for the increase in site inventory over time, in consideration of the modelled decrease in rainfall and runoff. Provide a description of the management and mitigation measures to be implemented for erosion and sediment control and the release of mine affected waters.
Appendix B Section 6.9.5 Overall site water balance	Discuss how the inventory will be managed in terms of ESC and MAW releases etc. The Mine Water Dam is at capacity at year 7. It is not desirable to have a mine that accumulates MAW without management controls being implemented	Provide some additional information and interpretation regarding the increasing site water inventory and the numbers for predicted rainfall and runoff.
Appendix B Section 8.2 Final void configuration Figure 8.1 and 8.2 Final landform and final void catchments	<p>The Figure "Predicted Flood Extents & Depths (Developed Condition), 0.1% AEP" shows the position of the Flood Levee as an orange coloured line in Appendix A8. Interpolation of the flood level contours at the northern end of the levee indicates that the level of the floodwater at the northern end of the levee is 113.3 metres AHD in the 0.1% AEP flood.</p> <p>Examination of the subsequent Flood Map for the PMF, on page 129, entitled "Predicted Flood Extents & Depths (Developed Condition), PMF" indicates that the level of the floodwater at the same point near the end of the levee is 114.8 metres AHD in the PMF flood. This is 1.5 metres higher than the flood at the same point in the 0.1% (1:1000 AEP) Flood.</p>	<p>Provide further certainty that the final void will not be in an undiverted floodplain, or a floodplain that has been redefined by a structure that is temporary or artificial.</p> <p>Provide further clarification whether the infrastructure required to prevent flooding inflows into the final void is temporary or permanent. If proposed to be permanent infrastructure, provide further information about the levee at relinquishment, including risks of failure and the required maintenance. How will the infrastructure be managed in perpetuity and by whom? If proposed to be temporary</p>

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	<p>The Flood Levee would have to be 1.5 metres higher to prevent the PMF flood from entering the Void. There is no indication in the text of the study, or on the Flood Maps, that the Flood Study has been undertaken with a higher levee to exclude the PMF flood from the Final AB Void. The levee is not shown on the Map as an orange coloured line, and not mentioned in the text but the PMF flood has been excluded along a neat straight line on the PMF flood Map as if there is a PMF Levee in position.</p> <p>It has been stated that “The final void will be located and designed such that it is not inundated by flooding in the probable maximum flood (refer Figure 8.2).” It is not clear what the function of the 1:100 AEP flood levee is.</p> <p>Will the structure later be raised higher than 1.21 and 2.37 metres at closure so as to definitely exclude the Probable Maximum Flood from the final void?</p> <p>Is the infrastructure proposed to be temporary or permanent?</p>	<p>infrastructure, is the levee going to be removed one the rehabilitation of the final void has been completed and approved? What is preventing mixing of the void water with floodwaters once the infrastructure is removed?</p> <p>Provide clarification about the height and function of the flood levee at mine closure and upon surrender and relinquishment.</p> <p>The department is unlikely to approve a void situated wholly or partially in a floodplain unless the void will be rehabilitated to a safe and stable landform that is able to sustain an approved post-mining land use that does not cause environmental harm.</p>
	<p>The proposed surface drain on Pit C has not been discussed in any of the information provided. What structures are required for this? Are these going to remain post-mining? Is there a risk of failure?</p>	<p>Provide further information about the proposed surface drain.</p>
<p>Appendix B Section 10.3 Final void lakes</p>	<p>It has been stated that salt will accumulate within both voids over time. The void lake salinity is expected to exceed a TDS of 30,000 mg/L after approximately 500 years. Final void modelling suggests that during the first 200 years after closure, apart from short periods when inflows are very low, and salt concentrations temporarily increase rapidly due to evaporation, lake salinities will be less than 10,000 mg/L.</p> <p>No further information has been provided relating to final land use and rehabilitation outcomes for the voids. I.e. will the voids be partially backfilled above the coal seam? Will the highwall be blasted and shaped to partially backfill the pit?</p> <p>Based on the information provided, it appears that the final voids will not be able to support a post-mining land use.</p> <p>Demonstrate that the final landform re-establishes a functional hydrologic system that prevents erosion, maximises connectivity, prevents upstream and downstream surface and groundwater contamination in the short and long term and is consistent</p>	<p>Provide further detail regarding the final land use and rehabilitation outcomes for the final voids.</p> <p>Provide the results from a residual void study to support the statements made.</p>

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	<p>with the surrounding natural topography and landscape. Include drawings, figures and maps to illustrate the final landform.</p> <p>For areas that do not have a post mining land use proposed –</p> <ul style="list-style-type: none"> ○ demonstrate that these areas are limited in number and size to the extent possible by, for example, demonstrating that the land, or any part of the land, cannot be used for any post-mining land use; and ○ are located to prevent or minimise environmental harm by having regard to all reasonably practical alternatives for the location, and the nature of the environmental harm that may be caused at the proposed location, and the sensitivity of the environment surrounding the proposed location; and ○ demonstrate that these areas are capable of being managed to achieve best practice management and minimise environmental harm. 	
Appendix B Section 10.5 Impacts on downstream flow regime	It has been stated that after mine closure, the water management system will be decommissioned but there will be some residual impact on streamflow due to drainage to the final voids.	Discuss the impacts on environmental values and outline the residual impacts.
Appendix B Section 10.6.1 Seepage	It has been stated that there is some potential for seepage of water from the Mine Water Dam to Charlevue Creek.	Provide additional detail on mine water dam design to reduce seepage to Charlevue Creek.
Appendix B Section 11.1 Receiving water monitoring	Address the lack of gauging station for flow rates on Springton and Charlevue Creeks.	Provide further information.
Post mining final void lakes	<p>The Supporting Information and Appendix B - Surface Water Assessment has indicated that the equilibrium water levels in the Final Voids will not seriously impact local aquifers. There are unexplained inconsistencies in the levels quoted.</p> <p>Section 4.3.4 of the Supporting Information stated an equilibrium level of 80m AHD. Section 7.3.5 of the Supporting Information states a maximum lake water level of 57.6 mAHD. In Appendix B - Surface Water Assessment, there are inconsistencies</p>	Address the inconsistencies around levels in the final pit configurations.

	<p>between the levels quoted in Section 8.11 and the levels shown in Figures 8.6 and 8.7.</p> <p>There is no one section in either the Information Document, or Appendix B, which is a single point of truth for:</p> <ul style="list-style-type: none"> • Maximum or proposed level of the waste rock backfill in the two voids. • Long term equilibrium water levels in the two voids (based on modelling). • Maximum and minimum long-term water levels in the two voids (modelled). • Final proposed floor level in the two voids. • Overflow level at natural surface for the two voids. <p>The problem of uncertainties about Levels is further exacerbated by the use of both mbgl (metres below ground level) and AHD (Australian Height Datum) as means of quoting different levels.</p>	
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Groundwater		
Section	Comment	Requirement
Baseline Monitoring	<p>The department is concerned that the water quality data accumulated to date are too localised and do not provide adequate spatial representation of the site.</p> <p>The data was obtained over 9 months. 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.</p>	<p>Provide the following information:</p> <ol style="list-style-type: none"> a) Data (water level and quality) that is spatially representative of the ML area (i.e. in addition to collection of data at sites 1 to 6) should be collected for at least 12 months including end of dry and end of wet season data (i.e. should reflect seasonality). b) The water quality data collected above should then 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 <i>Using monitoring data to assess groundwater quality and potential environmental impacts. Version 1.</i> (DSITI, 2017)) c) Data from the Stage 2 bore installation (bores installed May/June 2019) for which only field-testing data was provided should be updated and used in the derivation of appropriate site-specific triggers. d) All ground water level data for bores at sites 1 to 5 must be provided. e) Provide a date by which bore DW7292W1 be fitted with a data logger.

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		<p>f) Describe the streamflow gauging, including the locations of and timeframe for streamflow gauging that will take place in order to establish the relationship between creek flow and ground water levels that will take place.</p> <p>g) Provide all monitoring data from the data logger fitted to bore DW7076W and the date that it was fitted.</p> <p>h) Provide all monitoring data for bores at sites 6 to 17.</p>
<p>Monitoring Network</p>	<p>The groundwater monitoring network (sites 1 to 5) 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.</p> <p>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.</p> <p>It is noted that the monitoring network was expanded to include bores at sites 6 to 17 (i.e. the network has been augmented). The monitoring network has been described in terms of the location and screening of bores within the hydrostratigraphic units but the intended purpose of each bore and proposed long term frequency of monitoring of the bores is not described. The selected bore locations should reflect the current understanding of the hydrogeology with an aim to get a more detailed conceptual understanding of the hydrogeology, aquifers present, standing water levels and direction of groundwater flow. While the augmented network appears to provide adequate spatial coverage, very little information is provided to demonstrate that monitoring bores have been located giving consideration to the spatial representation of hydrostratigraphic units both up and down stream of the Gemini Project or in relation to proposed infrastructure. The bore locations should be justified through an explanation of their locations, and the application should include a figure showing the location of the monitoring bores relative to the proposed infrastructure.</p> <p>The conceptual model and groundwater monitoring network provided in the submitted application is not supported by sufficient fit for purpose baseline monitoring.</p>	<p>Once sufficient baseline data has been obtained the following is required:</p> <p>a) A review of the groundwater model using all the data collected.</p> <p>b) 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.</p> <p>c) A revised conceptual model of the hydrogeology of the mining lease including updates to the hydrogeology, aquifers present, standing water level and the direction of groundwater flow.</p> <p>d) 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 activities, potential sources of contaminants (seepage from dams and overburden dumps).</p> <p>e) Demonstrate that there is adequate spatial coverage and representation of aquifers both up and down gradient in relation to potential contamination sources.</p> <p>f) Include a documented rationale for the spatial distribution of the sampling design / network and the monitoring frequency.</p> <p>g) 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.</p> <p>h) A detailed monitoring plan to assess the groundwater quality baseline at each bore or group of bores</p>

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	<p>Falling head slug tests were undertaken on bores 6 to 17 to obtain site specific hydraulic conductivity data for groundwater modelling. Falling head slug tests were not undertaken on the bores at sites 1 to 6.</p> <p>An adaptive management program is anticipated 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.</p> <p>In order to derive site-specific limits for all bores listed by the applicant in Section 14 of the supporting document in Table E1, additional data should be provided for all the designated bores. Sufficient data are required in order to identify natural variability within the different aquifers, as per the DSITI guidelines (2017). The proponent should provide the proposed monitoring plan to assess the groundwater quality baseline at each bore or group of bores.</p> <p>Once sufficient data are obtained, the proponent is required to nominate compliance bores and propose limits for relevant indicators.</p>	<p>Provide a detailed adaptive management strategy proposed for the mitigation and management of drawdown and potential water quality impacts; and</p> <p>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.</p>
Trigger Values	<p>The proposed groundwater monitoring program should achieve the early detection of any potential impacts to groundwater resources at Gemini, to maintain groundwater at a suitable background quality.</p> <p>Trigger values should be assessed/proposed based on the guideline <i>Using monitoring data to assess groundwater quality and potential environmental impacts. Version 1.</i> (DSITI, 2017) guideline. The guideline details a process for data evaluation to calculate site specific trigger values for groundwater. It is recommended that this guideline is followed, both in the collection of baseline monitoring data, and ensuring that baseline monitoring ensures sufficient data for the statistical robustness of trigger values as per the guideline.</p> <p>Trigger values should be fit for purpose and conservative enough that when applied to the investigation bores they provide an early warning of emerging potential impacts to the quality of the groundwater. Applying triggers which are set too high may not be sensitive enough to identify current or emerging contamination issues.</p>	<p>Demonstrate that baseline groundwater monitoring data has been collected and that proposed trigger values are determined in accordance with the DSITI Guideline (March 2017).</p>

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<p>Water Balance modelling</p>	<p>Modelling has been undertaken to assess the extent of groundwater level impacts from the proposed project and the rate of groundwater inflow to the pits.</p>	<p>Provide an updated numerical model based on updates to the conceptual and groundwater flow direction models, incorporating groundwater monitoring data obtained to date.</p> <p>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.</p>
<p>Groundwater dependent ecosystems</p>	<p>It cannot be conclusively ruled out that the groundwater level is beyond the depth that is accessible to the root zone of some plants (vegetation adjacent to Charlevue Creek) or that there is not continuous saturation below the potential groundwater dependent ecosystem (GDE) that has been identified. Furthermore, the seasonal range of water level within the alluvium is not known, and the 2m drawdown contour at post-mining equilibrium extends under the area where the potential GDE is located. Ongoing monitoring has therefore been recommended, including monitoring within the alluvium via water level data loggers. It is noted that a data logger is already fitted to bore DW7076W and that it is planned to install a logger in bore DW7292W1.</p> <p>The GDEs that may be impacted by the activity and the expected drawdown includes Charlevue Creek, Springton Creek and an 88 ha HES wetland located approximately 4 km east of the MLA boundary. The applicant indicates that this wetland is located within a shallow depression on an elevated ridgeline. On page 48 of the Appendix B Groundwater Impact Assessment report, it is stated that, “based on modelling, professional experience and judgement, ... , It is interpreted that the risk posed by drawdown from the mining operation to the potential GDE is very low as:</p> <ul style="list-style-type: none"> • It is interpreted that the potential GDE exists in an area where the groundwater system is very localised and is perched above the regional groundwater system; and, • The groundwater lens that is interpreted to be located beneath the potential GDE is likely to be maintained by seasonal surface water runoff rather than the regional groundwater system.” 	<p>Describe a plan for the ongoing monitoring of groundwater levels within the Charlevue and Springton Creek Alluvium that is proposed to be undertaken, including the locations and frequency of monitoring.</p> <p>Include the derivation of indicators, thresholds and triggers relevant to the protection of GDE values.</p> <p>Demonstrate that the monitoring locations selected for monitoring the alluvium are adequately representative of the alluvium across the site.</p> <p>Provide a date by which the data logger will be installed in bore DW7292W1.</p> <p>Provide detail in relation to the streamflow monitoring that is or will be undertaken in order to allow the relationship between creek flow and water level to be established over time.</p> <p>Provide information relating to how the information collected from the monitoring of the Alluvium will be incorporated into the refinement of the conceptual and numerical groundwater models. This should include verification of specialist opinions relating to the probability that the potential GDE's are underlain by a perched groundwater system and that the riparian vegetation (within Charlevue and Springton Creeks) are reliant on moisture or perched groundwater existing for a period of time after a flow event rather than being reliant on groundwater.</p>

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	<p>These vague statements do not provide certainty that the wetland will not be impacted by the activity. The figure below shows that the drawdown extent is modelled to extend to the HES wetland.</p>	<p>Review monitoring bore locations to ensure the main potentially impacting activities on site are monitored, as well as any potential impact to the HES Wetland to ensure detection of any significant impacts. Provide and justify the consolidated monitoring bore network.</p>
Drawdown	<p>The results of drawdown modelling are described by a 5m and a 2m drawdown extent. This selection is based on the definition of bore trigger thresholds for the <i>Water Act 2000</i> and have been used to estimate the potential impact on existing groundwater users.</p> <p>The potential for impact on environmental values has been assessed as low risk and the likelihood dependency of the vegetation on groundwater for survival is assessed as unlikely. The assessment does however conclude that drawdown from mining may affect water levels in the alluvium at some locations and ongoing monitoring is recommended.</p> <p>Interim groundwater level triggers that instigate investigations into groundwater resource impacts, which are informed by modelling should be selected for the protection of environmental values. These are useful for assessing model predictions, evaluating drawdown impacts, instigating investigations and implementing mitigation measures.</p> <p>The association between stages of mining/time and drawdown within each aquifer has not been well described.</p> <p>It is suggested that the applicant undertake some preliminary work to model the rate of drawdown in order to assess the model and expected impacts during operation and potential measures to be taken to ensure the predicted drawdown is not exceeded.</p> <p>The model indicates an impact of the drawdown on registered bores outside the MLA boundary.</p>	<p>As per section 126A(2)(c)(iii) of the EP Act provide a description of the aquifer or aquifers where the water level in that aquifer is predicted to decline because of the exercise of underground water rights.</p> <p>Establish and provide drawdown triggers (including a rationale) based on the identified Environmental values. Once sufficient data is obtained, the proponent is required to nominate compliance bores and propose limits for relevant indicators.</p> <p>Undertake further modelling to determine the rate of drawdown to fully assess the expected impacts and include sufficient monitoring controls are in place to identify and manage any potential impacts</p> <p>Consider undertaking a bore survey to identify the potential impacts of drawdown on potentially impacted properties.</p>
Chapter 3 requirements (Water Act, 2000) -	<p>New projects within a regulated groundwater area have a statutory right to take underground water ('associated water') under section 334ZP of the <i>Mineral Resources Act 1989</i>. The project is therefore subject to the underground water obligations set out in Chapter 3 of the <i>Water Act 2000</i>, including the requirement to</p>	<p>Address and provide the information requirements in the guideline Requirements for site-specific and amendment applications – underground water rights, V1.01 (ESR/2016/3275).</p>

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Associated Water	<p>prepare Underground Water Impact Reports (UWIR) and Baseline Assessment Plans (BAP) before dewatering begins. Make good provisions under Chapter 3 of the <i>Water Act 2000</i> also apply.</p> <p>The application form indicated that the Gemini will be exercising their right to take or interfere with underground water. Section 126A of the EP Act outlines the information requirements which must accompany a site-specific application where a resource activity involves the exercise of underground water rights and ensures that upfront assessment of the impacts to environmental values from the exercise of these underground water rights has been undertaken.</p> <p>The information requirements detailed in the guideline <i>Requirements for site-specific and amendment applications – underground water rights, V1.01</i> (ESR/2016/3275) (the guideline), are required to be met for the Gemini application. The guideline suggests specific methods and information that the department believes to be appropriate to meet the requirements of 126A of the EP Act, and types of Environmental values that the department believes to potentially be affected by the exercise of underground water rights.</p> <p>As discussed under previous sections the limited sampling and representation of aquifers presents an underlying source of uncertainty and concern for the department, due to its limited ability to capture spatial and temporal variability. Any modelling (Numerical, Flow, Conceptual, Water balance) undertaken on the basis of limited sampling is thus potentially equally uncertain.</p> <p>Recalibration of the Numerical Model and testing the Conceptual Model by increasing the accuracy of field data once sufficient data is available is considered necessary to improve the certainty of the model outputs and the identification of potentially impacted environmental values.</p>	<p>Recalibrate the Numerical Model and test the Conceptual Model by increasing the accuracy of field data once sufficient data is available to improve the certainty of the model outputs and the identification of potentially impacted environmental values.</p>
Air Quality		
Section	Comment	Requirement
Appendix I Section 3.3.2 Sensitive receptors Figure 4 Location of	Figure 4 shows the locations of each of the sensitive receptors within close proximity to the Gemini Coal Project. However, the figure provided does not provide sufficient information to assist the department to make a decision.	Provide a map utilising satellite imagery and GPS co-ordinates of all sensitive receptors, including those which have compensation or purchase agreements to assist with the department's assessment.

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sensitive receptors		
Appendix I Section 3.3.3.1 Existing sources of emissions	<p>Insufficient consideration has been given to emissions from Bluff Coal Mine as an existing emissions source. Bluff Coal Mine is located approximately 25km west of Dingo.</p> <p>Potential cumulative impacts from Bluff Coal Mine must be considered as part of the overall assessment of the Gemini Coal Project.</p>	Amend the Air Quality and Greenhouse Gas Assessment to consider potential cumulative impacts of Bluff Coal Mine.
Appendix I 3.3.3.2.1 Existing ambient air quality	<p>It has been stated that “The nearest available monitoring site for PM₁₀ and PM_{2.5} is located at Blackwater Township, approximately 35 km west of the Project site’.</p> <p>Statements made in section 3.3.3.2.1 suggest that the applicant has not undertaken onsite ambient air quality monitoring to determine the background air quality for the Gemini Coal Project.</p>	<p>Describe in detail, what ambient air and dust monitoring was undertaken at the site to determine the background and/or current air quality for the Gemini Coal Project.</p> <p>Consider at least one year of data before adopting background levels.</p> <p>If onsite ambient air quality monitoring was not undertaken as part of the ambient air quality assessment, demonstrate how air quality data taken at Blackwater for a four-month period is sufficient to demonstrate the expected background air quality, with consideration of temporal and meteorological variation, at the Gemini Coal Project.</p>
	<p>It has been stated that “For the purposes of the cumulative impact assessment, the ambient background concentrations of PM₁₀ and PM_{2.5} were taken as the 70th percentile 24-hour average from the Blackwater monitoring site. Use of the 70th percentile value is based on the methodology published by Environmental Protection Agency Victoria (EPA Victoria, 2007) and is accepted in Queensland.”</p> <p>The use of the 70th percentile value does not adequately assess the maximum impact likely to occur as a result of the Project.</p>	<p>Provide the maximum background level 24-hour average PM₁₀ and PM_{2.5} concentrations for all sensitive receptor locations, consistent with the requirements of Departmental Guideline – Application requirements for activities with impacts to air (ESR/2015/1840).</p> <p>Provide a table showing the number of times that 24-hour average PM₁₀ and PM_{2.5} concentrations were predicted to exceed 50 micrograms during the monitoring period.</p>
Appendix I Section 3.4.2 Standard mitigation measures Table 5 Standard dust control	Published emission estimation calculations specifically for mining activities are included in the National Pollutant Inventory Emission estimation technique manual for Mining (NPI Manual). This guideline has been utilised by the applicant to estimate emissions from the mining operation. It is considered that this is a best practice approach to the emissions estimation process for mines proposed in Australia. This methodology is the generally adopted approach to emissions estimation and the referred documents are independent standards that are considered the best reference documents for emissions related information.	<p>Address why the reduction factor levels have been significantly underestimated or provide justification for the use of varied factors that deviate from the guideline.</p> <p>Demonstrate the feasibility of the options selected.</p>

<p>measures and relative reduction</p> <p>Table 6 Emissions inventory for year 2, year 8 and year 15</p>	<p>There are however some issues with Katestone’s approach that are not in accordance with the guideline and will have a discernible effect on the emission level estimates. There appears to be some issues with the emission reductions being claimed for the standard mitigation measures proposed by the applicant for the control of fugitive dust emissions from the mining related activities. Table 5 of the Air Quality and Greenhouse Gas assessment report lists “standard dust control measures”, which when applied, result in a percentage reduction in the overall calculated emissions from a particular mining related dust generating activity.</p> <p>The application of emission reduction factor is a standard approach in the process of calculating estimated dust emissions and is covered under the NPI Manual. The percentage reduction for some of the “standard dust control measures” are not however in line with the reduction factors that are listed in the NPI Manual.</p> <p>Of concern are the claimed percentage reductions for hauling of material. Katestone are claiming an 85% reduction factor for hauling of ROM coal and hauling of overburden. The NPI manual only allows 50% for level 1 watering (2 litres/m²/hr) and 75% for level 2 watering (>2 litres/m²/hr). The emissions from hauling activities are by far the most significant sources of dust for the mining activity (see emissions inventory in Table 6 of Katestone report).</p> <p>The variation of the two above mentioned reduction factors away from the accepted standard levels under the NPI Manual will have a dramatic effect on the levels of dust that are estimated to be emitted from the mining activities.</p> <p>It is not clear if the operation is predicted to be able to meet the water demand for the higher rate of watering required for the Level 2 rate of great than 2 litres/m²/hr, as again, these factors have not been considered by the applicant to the level of detail that is considered to be required to demonstrate the options are at least feasible.</p>	
<p>Appendix I Section 3.5 Air quality impact assessment</p>	<p>Section 3.5 discussed the results produced from the air quality modelling.</p> <p>Each of the subsections within section 3.5 stated that “using standard, and when necessary, additional mitigation measures predicted 24-hour average and annual average concentrations of PM₁₀ comply with relevant air quality objectives at all sensitive receptors. Additional mitigation measures may include restricting</p>	<p>Update the air quality model, and results, to reflect the NPI manual.</p> <p>Describe in detail the mitigation measures to be applied to mitigate impacts to air quality resultant from the Gemini Coal Project, including an assessment of the feasibility of the mitigation measures in application.</p>


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	<p>overburden and ROM haul to between 7am and 6pm on days when 24-hour averaged maximum PM₁₀ is predicted to exceed 50 µg/m³.”</p> <p>Table 5, section 3.4.2, stated that an 85% reduction factor for hauling of ROM coal and hauling of overburden has been applied. The National Pollutant Inventory Emission Estimation Technique Manual for Mining (NPI manual) only allows 50% for level 1 watering (2 litres/m²/hr) and 75% for level 2 watering (>2 litres/m²/hr). As such, the department considers that the modelled results are significantly underestimated.</p> <p>No further information has been provided in relation to which mitigation measures were applied in the model or in which instances that these mitigations are likely to be applied.</p>	<p>Provide information to confirm that adequate amounts of water will be available to meet the water demand for the higher rate of watering required for the Level 2 rate of greater than 2 litres/m²/hr.</p>
Appendix I Section 3.5 Air quality impact assessment	<p>Based on a review of the proposed mining schedule, annual production schedule and the relative location of the closest sensitive receptors, Year 2, Year 8, and Year 15 of the Project were identified as being likely to generate the worst-case potential for dust impacts over the life of the Project. Modelling of TSP, PM₁₀, and PM_{2.5} should be done across all stages of the project life (in years 1 and 20).</p>	<p>Include modelling of air quality in the pre-mining and post-mining phases as well.</p>
Appendix I Section 3.6 Mitigation	<p>The proposal to enter in discussion and as appropriate commercial agreements with surrounding landholders (such as property purchases and air conditioner/purifier installations) cannot be relied upon by the department as demonstrating the management of impacts of dust and particulate matter.</p> <p>No further information has been provided in relation to the proposed air quality monitoring network.</p>	<p>Commercial agreement discussions are not appropriate at this stage and further information is required demonstrating that the impacts of dust and particulates will be managed appropriately.</p> <p>Describe in detail the proposed air quality monitoring network for the Gemini Coal Project, including GPS locations, parameters to be monitored and monitoring equipment to be installed.</p>
Modelling results	<p>The standard mitigation measures include watering of haul roads, dust suppression sprays for drilling and loading and unloading operations, enclosure of conveyors and crushers, and a telescopic chute and sprays on the train unloader.</p> <p>Is there sufficient water of the right quality available for dust suppression uses as required?</p> <p>With only these above-mentioned standard dust mitigation measures implemented, it is predicted that the mining operation would cause exceedances of the ambient PM₁₀ 24h averaging period criterion of 50 µg/m³ that is specified under the <i>Environmental Protection (Air) Policy 2019</i> (EPP Air). The modelling output shows</p>	<p>Provide further detail on how the proposed standard mitigation measures will be implemented.</p> <p>Demonstrate that sufficient water volume of sufficient quality will be available during the course of the year for all dust suppression measures that they plan to implement as fugitive dust controls.</p> <p>Provide an Air Quality Management Plan (AQMP) which provides further detail and information on the mitigation measures and management controls that will ensure the required impact mitigation is achieved and must include the following:</p>

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	<p>this to occur at multiple sensitive receptors, and at multiple stages throughout the progression of the mining activities over the mines projected lifespan. The model also predicts exceedances of the ambient PM₁₀ annual averaging period criterion of 25 µg/m³ that is specified under the EPP Air.</p> <p>The exceedances of the EPP Air policy identifies the potential risk for unacceptable impacts from dust and particulates.</p> <p>To address the identified issue of excessive PM₁₀ at the surrounding receptors, the applicant has proposed additional mitigation measures to help the proposed operation achieve compliance with the ambient guideline values. The Katestone report only states the following in relation to these measures:</p> <p style="padding-left: 40px;"><i>Additional mitigation measures may include restricting overburden and ROM haul to between 7am and 6pm on days when 24-hour averaged maximum PM₁₀ is predicted to exceed µg/m³.</i></p> <p>It appears that Katestone have then applied a percentage reduction in the emission loadings from overburden and ROM hauling equal to the corresponding percentage reduction of time the activities are conducted through the day when the additional controls are being implemented. While such management options are in theory feasible, they might be quite difficult from an operational point of view to actually initiate this in time to be effective following the detection of high dust. It would also potentially be necessary to do this on a high number of days (in the order of 59 days based on the modelled predictions), which potentially would have a high operational impact on production. The applicant has not provided any detail on how this will be achieved, or if it is economically feasible for the mining operation to do so.</p>	<ul style="list-style-type: none"> • further detail in relation to the control measures that the applicant will implement to control fugitive dust sources, • the proposed monitoring program for dust and particulates, • detail of how the real time dust monitoring network will be used to predict when additional dust control measures are required, • detail in relation to the operational implementation of the additional dust control measures they will need to rely upon to ensure PM₁₀ is effectively controlled.
<p>Supporting information Section 14 Draft EA conditions</p>	<p>The Air EPP that commenced on 1 September 2019 no longer allows for 5 exceedances of the guideline level. It is recommended that the proposed condition B1 shown in section 14 of the AARC report be amended to remove the “for no more than five exceedances recorded each year” text from the point b) item. It is acknowledged that this is the wording of the model mining condition, and was included to accommodate a previous reference attached to the PM₁₀ 24h guideline level specified under the Air EPP, making allowance for up to five exceedances of the guideline level per year for bushfires etc. The recently remade EPP Air commenced on 1 September 2019. No exceedances are allowed for now, so the reference to allowing for exceedances of the criteria on five occasions for bushfires etc. should be removed.</p>	<p>Amend proposed condition B1 to remove the “for no more than five exceedances recorded each year” text from the point b) item.</p>

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	<p>It is recommended that the applicant consider an additional proposed environmental authority condition requiring that continuous monitoring of ambient PM₁₀ levels be conducted. This should be supplementary to the existing proposed condition B2 shown in section 14 of the AARC report, not replace it.</p> <p>The recommended form of continuous monitoring is a tapered element oscillating microbalance (TEOM), operated in accordance with AS 3580.9.16. These do however require a housing hut and access to 240V power, so there is a chance that a different form of monitoring more suited to remote location installation could be proposed by the applicant and considered by the department as required.</p> <p>Associated real time meteorological station monitoring would also need to be conducted by the applicant in accordance with the relevant Australian Standard (AS/NZS 3580.14), and it is recommended that this requirement is also locked into a site-specific condition.</p>	<p>Include additional EA condition(s) that implements real time, online meteorological monitoring in accordance with the relevant Australian Standard (AS/NZS 3580.14).</p>
	 <p>Figure 1 – Recommended continuous real time PM₁₀ monitoring locations (with red coloured sensitive receptors indicating they exceed the air quality guideline level for PM₁₀ 24h)</p>	<p>Include an additional EA condition(s) that implements real time, online PM₁₀ ambient monitoring, at the five recommended sites shown in Figure 1 above. This should be conducted in accordance with the relevant Australian Standard. It is recommended that TEOM type ambient dust monitors are utilised by the applicant and are operated in accordance AS 3580.9.16.</p>

	<p>The five locations shown in Figure 1, have been recommended to give a balance of coverage of the potentially impacted sensitive receptors that would need to be monitored and the most economic number of monitoring stations (as they are expensive to install and operate). The monitoring stations should all have telemetry to allow real time notification of excessive dust concentrations so that corrective actions can be implemented by the mine operators as required, which has been proposed as a control measure.</p>	
GHG Assessment		
Section	Comment	Requirement
<p>Appendix I Section 4.3.1 Emissions</p>	<p>Scope 1 and 2 greenhouse gas emissions were estimated on an annual basis for the Project, taking into account only diesel combustion, fugitive emissions of methane from mining and the electricity usage and explosives (presented in Table 14).</p> <p>No vulnerability to climate change or adaptation measures have been addressed in the application.</p> <p>Project doesn't consider all sources of GHG emissions, which can lead to possible underestimation of overall emissions. In particular, there are also emissions in the site preparation phase, like scope 1 and scope 3 emissions from vegetation clearing and preparation, spreading mulched vegetation; in the operational phase: from bitumen transport, road construction, drainage construction emissions, waste disposal emissions (landfilling), transport emissions, indirect emissions (NO_x, CO, NMVOCs, SO₂) and emissions in a closure phase (grassland/other rehabilitated land emissions/sinks, etc).</p> <p>Also, include a separate chapter to address a vulnerability of different landforms to climate change and adaptation strategies.</p>	<p>Provide further information.</p>
<p>Appendix I Section 4.3.1 Emissions Table 14</p>	<p>Modelling has been completed for year 1 – 19 only, despite the mine being identified to have a 20-year life span. Are there no emissions associated with rehabilitation?</p>	<p>Modelling for construction, operation and decommission (including rehabilitation) is required.</p>
<p>Appendix I 4.4.3 GHG mitigation and management</p>	<p>A range of options for Magnetic South Pty Ltd to manage Project related GHG emissions are presented in this chapter. However, it is very broad and doesn't include information about how much is expected in the reduction of GHGs and emissions strategies.</p>	<p>Provide and discuss any site-specific mitigation scenarios, along with estimated of possible CO₂-eq reduction (and associated costs) from different scenarios. Include land-use, construction, waste sector emissions as well.</p>

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Appendix I Section 4.4.3 GHG mitigation and management	In section General, it states “identifying opportunities” for GHG emissions.	Provide further information on the opportunities.
Noise		
Section	Comment	Requirement
Appendix J Section 4.4 Noise Logging	Monitoring of environmental noise to determine background levels L90 [dB] was conducted between 7 and 19 June 2019. However, this doesn't represent a complete seasonal spectrum of levels of environmental noise.	Monitoring in other seasons should be considered before establishing (adopting) background levels (at least two seasons).
Appendix J Section 5.3.3 Background creep	Background creep has been mentioned but no information has been provided. How will background creep be prevented or minimised? Give consideration to the requirement in the Noise Measurement Manual (EM1107)	Give consideration to the cumulative impacts on all affected environmental values.
Appendix J Section 6.4 Modelling Scenarios	Mining noise emissions from the Gemini Project have been predicted for the following three mine year scenarios: <ul style="list-style-type: none"> • Year 2 • Year 8 • Year 15 These years were selected to give a representation of mine noise levels near the beginning, middle and end of the project. However, project life is 20 years and there will be considerable noise emissions from transport in the mine closure period (same as in the clearing/pre-mining phase) that must be taken into consideration.	Include preparation (years 0 and 1) and post-mining/closure phases (year 20) in the modelling.
Appendix J Section 6.6.2 Cumulative Noise Impacts	It has been stated that the nearest existing mine is Bluff Mine which is 12km to the west. The sensitive receptors that have the most potential to be impacted by the Gemini Project to the west are SR22, SR31 and SR32. The Bluff Mine is over 10 km from these receptors. Given the significant distance and that adverse wind conditions cannot occur for both mines simultaneously at these receptors since they are in opposite directions, it is unlikely that cumulative noise impacts from both mines will be an issue. Further information is required to identify the potential cumulative impacts.	Present data/charts and present a scenario with noise levels under “No WIND” conditions, to support statements made.
Measurements	The noise criteria have not been based on the Model Mining conditions (ESR/2016/1936). For night time the noise criteria following the Model Mining condition would be 2dB more stringent than the derivation made using the Environmental Protection (Noise) Policy 2019 Planning for noise control.	Provide further information.

	<p>The noise criteria should be derived using the Model Mining conditions. The night time criteria should be 35dBA instead of 37dBA and this worsens the noise exceedances during night time by 2dB with the worse exceedance going from 13dB to 15dB and add another 3 sensitive receptors in exceedance, raising the total number from 6 sensitive receptors exceeding night time noise criteria to 9 sensitive receptors exceeding the night time criteria. Further information is required about the mitigation of nuisances.</p> <p>In addition, LA1 (Model Mining Conditions) and LAmax for sleep disturbance (EPP Noise 2019) has not been assessed. Further information is required.</p>	
Modelling	The weather scenarios considered are for neutral and adverse meteorological conditions. South-easterly or westerly winds have not been measured and noise impacts would be considered worse under those conditions. Report the percentage of days under those conditions.	Provide modelling for south-easterly and westerly wind conditions.
Sound sources	The sound power levels reported for the machines modelled are appropriate. The sound power level of the Drill Caterpillar MD6420 is not listed specifically but is listed as drill which may differ. Sound power level of Cat MD6420 should be used for the model for accuracy and should be listed.	Provide further information.
Waste		
Section	Comment	Requirement
Supporting information Table 3 Applicable ERAs for the project (page 4)	Incorrect ERA category is referenced – the correct category should be ERA 63 1 (b)(i).	Update using Departmental Guideline for Model operating conditions ERA 63 – Sewage Treatment (ESR/2015/1668).
Supporting information Section 12 General	<p>It is a regulatory requirement for applicants to demonstrate that they have considered the waste and resource management hierarchy for any proposed ERA.</p> <p>A cleaner production program should identify and implement ways of improving a production process that:</p> <ul style="list-style-type: none"> • uses less energy, water or another input; • generates less waste; and 	To ensure the generation of waste is avoided and/or waste is re-used as much as practical, cleaner production philosophies and waste management strategies should be adopted and detailed in the application.

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	<ul style="list-style-type: none"> generates waste that is less environmentally harmful. <p>Applicants must identify any:</p> <ul style="list-style-type: none"> cleaner production and waste management strategies to be implemented; and <p>cleaner production and waste management strategies which were considered but are not going to be implemented and the reasons for not implementing them (if applicable).</p>	
Supporting information Section 12.5 Waste management	Sewage will be treated in an STP. Treated effluent will be released for irrigation. More information is needed to determine the conditions required to manage risk.	Describe any waste treatment processes proposed and the anticipated end products of these processes including the quality of the irrigation water quality. Include details of any waste residues from the process including sludge.
	Paints and miscellaneous chemicals will be transported offsite by a licensed regulated waste contractor and treated at a licensed waste facility before disposal.	Provide details about how waste will be treated and disposed of.
	Disposal of waste is to be considered when no other economically feasible option is available. How was it determined that waste that is proposed to be disposed of is not economically viable to be managed under a more preferred management option (i.e. avoid, reduce, re-use, recycle, recover, and treat)? In particular, how was it determined that the only viable option for scrap tyres is to dispose of in pit?	Applicants must describe how they have addressed the waste and resource management hierarchy. Outline why other, more desirable, waste management strategies were unsuitable. Provide information to support their selected mitigation and disposal strategies.
	The applicant must investigate options for reusing all wastes generated onsite, including recycling options for the wastes. This includes seeking an end of waste approval to enable reuse of any regulated wastes generated onsite. Reuse options should consider both reusing wastes onsite and offsite, or between industries. For example, reuse of sewage sludge obtained from a sewage treatment plant may be appropriate for land application to support improved pastures.	Identify waste streams (types) and provide details of any potential final reuse of the wastes. Refer to https://environment.des.qld.gov.au/management/waste/business/end-of-waste-classification for further information.
Supporting information Section 12.6 Regulated waste management	All non-mobile activities must provide a drawing or site-plan showing waste storage areas, processing areas, recycling or re-processing areas, and disposal locations. This must include details for wastes generated onsite, as well as raw and treated wastes. This should be used to identify potential risks.	Include a site plan of the storage, handling and disposal locations.
	Due to differences in the descriptions of waste disposal for regulated wastes and waste disposal for general wastes in permissible waste types, it is important that the applicant understands the definitions and significance of the waste types used in the ERA description. The waste disposal ERA description includes the waste	Provide a description of all types of waste with regard to the EP Regulation definitions.

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	<p>descriptors; general; regulated; limited regulated; and clinical waste. Definitions of these waste types are included in the EP Regulation (Schedule 19).</p> <p>Describe the method of transport for the regulated wastes and details of the transport.</p> <p>Where regulated wastes are to leave the site, provide details of the transporter or company receiving the wastes.</p>	<p>Provide information on the machinery and proposed method of transport for waste.</p>
<p>Supporting information Section 13.1 Environmental Objectives and performance outcomes</p>	<p>Identify the risk of migration of contaminants from the waste material to surface water. Also the potential for flood waters to interact with waste rock placements. Sediment is a regulated waste and the impacts of sediment run off on the adjacent waterways should be addressed considering their proximity to the waste rock emplacements.</p>	<p>Discuss the management of sediment run off and mitigation measures especially for potential impacts to Charlevue Creek.</p>
<p>Supporting information 13.3.3 Potential impacts on surface and groundwater resources Appendix D – Table B4</p>	<p>The concentration of most trace metals/ metalloids tested for water in contact with coal reject and mining waste materials is typically below the LOR and below the applied water quality guideline criteria.</p>	<p>Address why the LOR is greater than the water quality guideline recommended limits and address how results were achieved that were less than this limit i.e. the LOR for Selenium was 0.1 mg/L, the Aquatic Ecosystem water quality maximum is 0.011 mg/L and results of 0.02 mg/L were found.</p>
<p>Supporting information 13.4 Mitigation measures, management and monitoring</p>	<p>It was stated that most mining materials appear to be susceptible to dispersion and erosion, additional testing including field trials, may be needed when the mine is operational and bulk materials are being generated. Such tests would help to determine the most appropriate management option for progressive rehabilitation of these materials during operations at mine closure.</p> <p>There are a number of studies that have been completed on the optimum rehabilitation practices for resource activities in the Bowen Basin and best practice has been established.</p>	<p>Provide detail on the proposed management options for rehabilitation of waste rock during operations. Address other management options that were considered.</p>
	<p>The waste rock emplacement surface, during construction and at completion of the final landform, should be sloped to direct excess surface drainage towards collection points such as sediment dam(s) or the final void.</p>	<p>Describe and illustrate the location, design and methods for constructing dumps for waste rock and any subsoil that should not be replaced in rehabilitation. Also discuss the inputs and processes for collection in sediment dams.</p>

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	Potentially reactive rocks can be clay rich, saline waste rock typically occurring in coal overburden, that, when exposed by mining and used for construction of waste rock emplacements, stockpiles, roadways etc. becomes dispersive and will readily erode. A major issue for mine sites is the generation of high sediment loads in storm runoff.	Describe the chemical and physical properties of the waste rock and subsoil, and assess the properties that affect their erosion potential.
	Tailings is a waste product.	Describe the processes for storage and handling and include the management plans and mitigation measures for preventing environmental harm.
	The likelihood of spontaneous combustion has not been addressed.	Assess the risk of spontaneous combustion for the proposed coal mine and provide the following information: <ul style="list-style-type: none"> describe the quality and quantity of carbonaceous material in the waste stream discuss the potential of spontaneous combustion for coal waste stockpile areas discuss the prevention and control measures adopted for spontaneous combustion describe the likely impacts of spontaneous combustion incidents on the receiving environment.
	The water balance would assess each of the major water fluxes into and out of the final void. These include surface runoff, groundwater movement, interactions with waste rock and evaporation.	Conduct a water balance assessment for the pit lakes in the final landform.
General		
Section	Comment	Requirement
Regulatory requirements - Environmental Objectives	Under Schedule 8, Part 3, Division 1 and 2 of the Environmental Protection Regulation 2019 (EP Reg), the relevant environmental objectives for operational assessment have been stated in the application. A demonstration of how the proposal meets the environmental objectives and performance outcomes has not been provided.	At this stage, insufficient information has been provided to demonstrate that the environmental objectives can be met. Detail how environmental objectives and performance outcomes will be achieved or not achieved.
Regulatory requirements - Environmental impacts	Provide further details of the potential or actual impacts on environmental values including: <ul style="list-style-type: none"> the associated likelihood, magnitude and duration of risk; 	At this stage, insufficient information has been provided to demonstrate the potential or actual impacts on environmental values. Address the risks and impacts of each relevant activity during the construction, operation and decommissioning stages of the Project.

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	<ul style="list-style-type: none"> • whether any of those impacts might cause serious environmental harm, and what is the likelihood of that harm; • what an acceptable level of impact on the environmental values is, taking into account any management objectives for those values; • any existing control measures that are implemented to minimise impacts on environmental values; and • whether any conditions need to be imposed to prescribe how impacts that carry a risk of causing serious environmental harm must be managed. <p>The following technical guidelines explain how to provide the necessary information:</p> <ul style="list-style-type: none"> • application requirements for activities with impacts to air (ESR/2015/1840) (PDF, 528KB) • application requirements for activities with impacts to land (ESR/2015/1839) (PDF, 177KB) • application requirements for activities with noise impacts (ESR/2015/1838) (PDF, 399KB) • application requirements for activities with impacts to water (ESR/2015/1837) (PDF, 214KB) • application requirements for activities with waste impacts – (ESR/2015/1836) (PDF, 167KB)* • requirements for site-specific and amendment applications – underground water rights (ESR/2016/3275) (PDF, 505KB). <p>*The Operational Policy – Disposal and storage of scrap tyres at mine sites – ESR/2016/2380 (PDF, 95KB) may also be relevant.</p> <p>In addition, use the guidelines relevant to your proposed environmentally relevant activities.</p>	<p>Provide a risk assessment that identifies the likelihood of an impact occurring, the management/mitigation measures proposed, the consequence of the managed impact and the overall risk matrix.</p> <p>Address the following:</p> <ul style="list-style-type: none"> • Account for potential level of residual impact on environmental and community values. • Consider the cumulative impacts of environmental values that would be generated.
Management Plans	<p>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.</p>	<p>At this stage, insufficient information has been provided to demonstrate that proposed mitigation strategies will prevent the occurrence of environmental harm or nuisance.</p>

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	<p>Management plans or mitigation measures mentioned in the Supporting information report include:</p> <ul style="list-style-type: none"> • Sediment and erosion control management plan; • Receiving Environment Monitoring Program (in accordance with the Departmental Guideline <i>Receiving Environment Monitoring Program guideline</i> (ESR/2016/2399) and Schedule F – Water in the Departmental Guideline <i>Model Mining Conditions</i> (ESR/2016/1936)); • Site Water Management Plan (in accordance with condition F27 in the Departmental Guideline <i>Model Mining Conditions</i> (ESR/2016/1936)); • Land disturbance permit system; • Weed and Pest Management Plan; • Emergency Response and Spill Management Plan; • Fuel and hazardous liquids storage and management plan; • Crossing design for fish passage during low and high flow events; • Noise and Blast Management Plan; • Topsoil Management Plan; • Cultural Heritage Management Plan; • Air Quality Management Plan; and • Generated Waste Management Plan. 	<p>Develop and provide 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.</p>
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