



Application for Works Approval

Part V Division 3 of the *Environmental Protection Act 1986*

Works Approval Number	W6443/2020/1
Applicant	Pilgangoora Operations Pty Ltd
ACN	616 560 395
File Number	DER2018/001042-3~60
Premises	Pilgangoora Operations Wodgina East Road MARBLE BAR WA 6760 Part of Mining Tenements: M45/1256 and L45/417 As defined by the premises maps attached to the issued works approval
Date of Report	04 02 2021
Decision	Works approval granted

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An officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and operation of the premises. As a result of this assessment, works approval W6443/2020/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this decision report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at <https://www.der.wa.gov.au>.

2.2 Application summary and overview of premises

Pilgangoora Operations Pty Ltd currently holds licence L9056/2017/1 for categories 5, 52, 54, 64 and 73 under Part V of the *Environmental Protection Act 1986* (EP Act).

On 1 July 2020, the applicant submitted an application for a works approval to the department under section 54 of the EP Act.

The application is to undertake construction works relating to Category 6: Mine dewatering activities within the licensed premises; to install dewatering infrastructure to allow the discharge of excess mine dewater associated with uncontrollable events (cyclones or significant rainfall events) to the environment to maintain safe operating conditions. The premises is approximately 75 km south of South Hedland.

The premises relates to the categories and assessed production capacities under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations); which are defined in works approval W6443/2020/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guidance Statement: Risk Assessments* (DER 2017) are outlined in works approval W6443/2020/1.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guidance Statement: Risk Assessments* (DER 2017).

To establish a risk event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this decision report are detailed in Table 1 below. Table 1 also details the proposed control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 1: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed applicant controls
General activities			
Hydrocarbons and chemicals	Mobile equipment (e.g. light vehicles, heavy equipment, generators and dewatering pumps)	Spills or leaks to ground, overflow during filling and/or breach of containment	<ul style="list-style-type: none"> No additional diesel storage is proposed under the works approval. The proposed works are not expected to change from the assessment under the current L9056/2017/1 decision report and therefore no proposed changes to current controls.
Sediment (e.g. sand) and hydrocarbon (e.g. diesel) laden stormwater	Stormwater migrating through construction areas	Overland runoff	The proposed works are not expected to change from the assessment under the current L9056/2017/1 decision report and therefore no proposed changes to current controls.
Construction			
Dust	Mobile equipment (e.g. heavy equipment)	Air/Wind dispersion	<ul style="list-style-type: none"> No additional clearing is required to implement the proposed activities. The proposed works are not expected to change from the assessment under the current L9056/2017/1 decision report and therefore no proposed changes to current controls.
Operations			
Mine dewater: <ul style="list-style-type: none"> Elevated metals and metalloids (e.g. Arsenic, Boron, Chromium Cr III, Nickel and Vanadium) Elevated nutrients (e.g. Nitrate) Elevated radioactive contaminants (e.g. Gross 	Mine dewatering from Central Pit	Mine dewater discharged to environment: <ul style="list-style-type: none"> Direct discharge to Pilgangoora Creek 	Management of mine dewater prior to disposal to Pilgangoora Creek: <ul style="list-style-type: none"> If water levels in the open pit (Central Pit) exceed safe operating conditions, options will be investigated to preferentially pump mine dewater to the site processing ponds for utilisation in the processing plant or transfer to the Iron Stirrup Pit (open pit). Note: The Iron Stirrup Pit routinely fills up during high rainfall events and has reduced storage capacity as a result. <ul style="list-style-type: none"> Controlled discharge to the environment will only be

Emission	Sources	Potential pathways	Proposed applicant controls
<p>alpha and Uranium)</p> <p>Note: The applicant only proposes to discharge mine dewater to Pilgangoora Creek following cyclones or significant rainfall events.</p>			<p>undertaken once the above preferential mine dewater management options have been assessed.</p> <p>Administrative controls:</p> <ul style="list-style-type: none"> • Mine dewater discharge processes will be incorporated into the existing operation Environmental Management Plan and Surface Water Management Plan. These procedures and processes will be developed in line with regulatory approvals and requirements and relevant personnel will be trained accordingly. Procedures will cover roles and responsibilities, key tasks, risks and controls, incident management and document review. <p>Collection of mine dewater in Central Pit prior to disposal to Pilgangoora Creek:</p> <ul style="list-style-type: none"> • Collection of run-off in Central Pit sumps (Figure 2) will allow settling of sediment prior to discharge to the environment. <p>Mine dewatering:</p> <ul style="list-style-type: none"> • Dewatering pump will be fitted with a flow meter to measure discharge volumes. • The proposed maximum flow rate for mine dewater being discharged to Pilgangoora Creek is controlled by pump capacity and is expected to be 50 L/s. • Mine dewater discharge to the Pilgangoora Creek will follow high rainfall events as opposed to be added to peak flows as they are occurring. <p>Pilgangoora Creek outfall:</p> <ul style="list-style-type: none"> • Controlled surface water discharge points will be constructed in a manner to minimise the discharge impact so that erosion and scouring is minimised. The applicant notes that the initial discharge location is naturally rocky and as a result not prone to erosion or scouring. • A diffuser arrangement will be utilised at the discharge point

Emission	Sources	Potential pathways	Proposed applicant controls
			<p>to spread the flow.</p> <ul style="list-style-type: none"> • A layer of riprap will be installed to protect the receiving Pilgangoora Creek bank from erosion. • Only benign, non-acid forming (NAF) mine waste material will be used for rock armouring at the proposed discharge sites to prevent erosion. The total amount of waste rock utilised for the rock armouring will not be in excess of 30 tonnes. • The diversion channel is conceptualised as a rock-cut channel capable of conveying 1:100 year rainfall event. At these flood levels, the water flow will be approximately 2 m deep with velocities of 3-4 m/s. Natural velocities in the stream at the diversion outlet are around 1.2-1.6 m/s. • Scour protection at the outlet to dissipate mine dewater flow is expected to return to natural velocities within 200 m from the outlet. <p>Pilgangoora Creek monitoring:</p> <ul style="list-style-type: none"> • Continue the monitoring regime under the existing Surface Water Management Plan, which includes: <ul style="list-style-type: none"> ○ Pilgangoora Creek upstream and downstream samples taken during flow events, with samples analysed at an accredited National Association of Testing Authorities (NATA) laboratory; ○ Fixed point monitoring of the creek banks and beds is undertaken annually at each monitoring location (this includes photographs and observations of changes to the creek, recording of sediment deposition and/or erosion); and ○ Recording the maximum annual creek depth at each monitoring point.

Emission	Sources	Potential pathways	Proposed applicant controls
		<p>Mine dewater discharged to environment:</p> <ul style="list-style-type: none"> • Surplus mine dewater discharged • More frequent discharges of mine dewater to Pilgangoora Creek (e.g. discharges outside of cyclones or significant rainfall events) 	<ul style="list-style-type: none"> • Mine dewater only proposed to be discharged following uncontrollable events (e.g. cyclones or significant rainfall events). • Mine dewater quantities of less than 256,000 kL per year proposed to be discharged to Pilgangoora Creek.
		<p>Mine dewater discharged to environment:</p> <ul style="list-style-type: none"> • Pipeline leak/rupture 	<p>Pipeline:</p> <ul style="list-style-type: none"> • Constructed of HDPE. • The proposed works are not expected to change from the assessment under the current L9056/2017/1 decision report and therefore no proposed changes to current controls.
		<p>Mine dewater discharged to environment:</p> <ul style="list-style-type: none"> • Formation of algal blooms (containing algal toxins) • Native fauna/livestock gaining access to discharge location and ingesting discharged mine dewater 	<p>No applicant controls provided.</p>

3.1.2 Receptors

In accordance with the *Guidance Statement: Risk Assessment* (DER 2017), the Delegated Officer has excluded employees, visitors and contractors of the applicant's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies and is provided for under other state legislation.

Table 2 and Figure 1 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guidance Statement: Environmental Siting* (DER 2016)).

Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Sensitive receptors	Distance from prescribed activity
Human receptors	
South Hedland	<p>Located more than 70 km north of the premises.</p> <p>Distance of premises to closest sensitive land use is sufficient to inform that project activity impacts are not foreseeable. This receptor is not considered to be impacted during construction or operations and therefore not further considered in the risk assessment.</p>
Residential premises	<p>Wallareenya Homestead located more than 30 km north of the premises.</p> <p>Indee Station located more than 30 km northwest of the premises.</p> <p>Distance of premises to residential premises is sufficient to inform that project activity impacts are not foreseeable. These receptors are not considered to be impacted during construction or operations and therefore not further considered in the risk assessment.</p>
Environmental receptors	
Pilgangoora Creek	<p>Located within vicinity of Category 6 (mine dewatering) activities, cutting through the southern end of the Central Pit.</p> <p>Pilgangoora Creek is the proposed final discharge point for mine dewater stored within the Central Pit.</p> <p>Primary drainage line (the larger of the two drainage lines) that flows from east to west near the southern boundary of M45/1256 (Pilbara 2020a and DWER Geocortex).</p> <p>The creek is ephemeral and only flows following periods of significant rainfall. It is understood that the majority of annual streamflow occurs from January to March after which they usually recede and dry up by June or July. A few small, disconnected pools may remain throughout the year if recharged by groundwater and the level remains above the creek bed (Pilbara 2020b).</p>

Sensitive receptors	Distance from prescribed activity
	<p>Along the course of Pilgangoora Creek most soils have been stripped back to bedrock and the remaining soil is a cobbly, colluvial structure with high infiltration rates (Pilbara 2020a).</p> <p>2020 water quality results provided for Pilgangoora Creek demonstrate a pH between 7.1-7.9; 31-54 mg/L Total Dissolved Solids (TDS) (Pilbara 2020a.)</p> <p>The two primary drainage lines intersect approximately 4 km west of M45/1256, reporting to Chinnamon Creek about 11 km west of the premises before discharging into the Turner River some 13 km to the north-west.</p> <p>A Pilgangoora Creek diversion is approved under Mining Proposal Reg ID 85615 and is proposed to be constructed in two stages. Stage 1 to occur at works approval stage. Diversion channel is proposed to be rock-cut channel (i.e. the channel inverts and sides will comprise fresh, hard country rock requiring drilling and blasting to construct) capable of conveying 1:100 year rainfall event (Pilbara 2020a).</p>
Houston Creek	<p>Located approximately 3.6 km north-west of Category 6 (mine dewatering) activities.</p> <p>Primary drainage line (the smaller of the two drainage lines) that flows from east to west through the northern half of M45/1256(Pilbara 2020a and DWER Geocortex).</p> <p>The creek is ephemeral and only flows following periods of significant rainfall. It is understood that the majority of annual streamflow occurs from January to March after which they usually recede and dry up by June or July. A few small, disconnected pools may remain throughout the year if recharged by groundwater and the level remains above the creek bed (Pilbara 2020b).</p> <p>The two primary drainage lines intersect approximately 4 km west of M45/1256, reporting to Chinnamon Creek about 11 km west of the premises before discharging into the Turner River some 13 km to the north-west.</p> <p>Distance and flow direction of the Houston Creek is sufficient to inform that Category 6: Mine dewatering activities impacts are not foreseeable. This receptor is not considered to be impacted during construction or operations and therefore not further considered in the risk assessment.</p>
Two unnamed ephemeral creeks (north of Pilgangoora Creek)	<p>Two unnamed ephemeral creeks (branching off from Houston Creek) are located approximately 723 m and 681 m north and north-east of Category 6 (mine dewatering) activities and flow from east to west near the southern boundary of M45/1256 (DWER Geocortex).</p> <p>These creeks are ephemeral and only flow following periods of significant rainfall. It is understood that most of the annual streamflow occurs from January to March after which they usually recede and dry up by June or July. A few small, disconnected pools may remain throughout the year if recharged by groundwater and the level remains above the creek bed (Pilbara 2020b).</p> <p>Distances and flow directions of the ephemeral creeks are sufficient to inform that Category 6: Mine dewatering activities</p>

Sensitive receptors	Distance from prescribed activity
	impacts are not foreseeable. These receptors are not considered to be impacted during construction or operations and therefore not further considered in the risk assessment.
Two unnamed ephemeral creeks (south of Pilgangoora Creek)	<p>Two unnamed ephemeral creeks (branching off from Pilgangoora Creek) are located approximately 1.3 km and 2.6 km south and south-west of Category 6 (mine dewatering) activities and flow from east to west near the eastern and southern boundary of M45/1230 (DWER Geocortex).</p> <p>These creeks are ephemeral and only flow following periods of significant rainfall. It is understood that most of the annual streamflow occurs from January to March after which they usually recede and dry up by June or July. A few small, disconnected pools may remain throughout the year if recharged by groundwater and the level remains above the creek bed (Pilbara 2020b).</p> <p>Distances and flow directions of the ephemeral creeks are sufficient to inform that Category 6: Mine dewatering activities impacts are not foreseeable. These receptors are not considered to be impacted during construction or operations and therefore not further considered in the risk assessment.</p>
Groundwater	<p>Premises located within the Pilbara Groundwater Area proclaimed under <i>Rights in Water and Irrigation Act 1914</i>.</p> <p>Groundwater quality information supplied by the licence holder in 2017, stated that groundwater is approximately 9.5 metres below ground level (mbgl) (Pilbara 2017). Groundwater flow direction is towards the west, away from the groundwater divide and locally towards Pilgangoora Creek.</p> <p>The licence holder supplied an average standing water level (SWL) of 5.47 mbgl between January to August 2020 for the ground monitoring bore located immediately south of the central pit (PMB001) (Pilbara 2020c).</p> <p>Groundwater is considered fresh to brackish with 500-1,000 mg/L TDS (DWER Geocortex).</p> <p>Groundwater pH is neutral (pH 7.8 to 7.9) (Pilbara 2020).</p> <p>The main beneficial uses of the groundwater system in the vicinity of the project are mining and livestock drinking water. Groundwater is also used to produce potable water for the project by reverse osmosis treatment (Pilbara 2020a).</p>
Threatened and priority flora	<p>MMWC Environmental Pty Ltd was engaged in 2015 and 2016 to undertake level 2 flora and vegetation assessment, with the key findings provided below:</p> <ul style="list-style-type: none"> • Database searches indicate 16 species of Threatened and Priority listed flora occurring within the vicinity of the survey area; • <i>Pityrodia</i> sp. Marble Bar listed as Threatened Flora under the <i>Wildlife Conservation Act 1950 (WA)</i> is considered as Possible to occur in the survey area.

Sensitive receptors	Distance from prescribed activity
	<ul style="list-style-type: none"> • <i>Heliotropium muticum</i> – P1 recorded during the July 2016 survey in the north-west corner of the premises. <p>Surveyed <i>Heliotropium muticum</i> are located approximately 5 km north-east from the proposed Category 6: Mine dewatering activities (MMWC 2016). Distance of prescribed activity to P1 flora is sufficient to inform that activity impacts are not foreseeable. These receptors are not considered to be impacted during construction or operations and therefore not further considered in the risk assessment.</p> <p>Potential impacts to <i>Pityrodia</i> sp. Marble Bar are managed through Condition 8 of the granted clearing permit (CPS 8175/1) and therefore not further considered in the risk assessment.</p>
Threatened and priority fauna	<p>A level 1 fauna survey was conducted over the majority of the application area in June 2015 by MMWC Environmental Pty Ltd. The same area was again subject to a single-phase level 2 terrestrial vertebrate survey in February 2016 by 360 Environmental Pty Ltd. Areas within L 45/388, L 45/414 and L 45/413 were not included in fauna surveys. Given the size of areas surveyed in the vicinity (over 1,600 hectares), it is reasonable to suggest that areas not covered by the fauna survey will offer similar habitat types (DMIRS 2018).</p> <p>A total of 15 conservation significant species (including Priority species) were identified during the review of the database searches as potentially occurring in the survey area. Of these, one was recorded during the Level 2 survey, two were recorded during the Level 1 survey and eight species were considered Possible and four were considered Unlikely to occur in the survey area.</p> <p>The following conservation significant species were recorded in the survey area:</p> <ul style="list-style-type: none"> • Rainbow Bee-eater (<i>Merops ornatus</i>) listed under the <i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i> (EPBC Act); • Pilbara Leaf-nosed bat (<i>Rhinonictis aurantia</i> – VU) listed under the EPBC Act; and • Western Pebble-mouse (<i>Pseudomys chapmani</i> – P4) listed under the Wildlife Conservation Act 1950 (WA) (360 Env 2016). <p>Two Gane's blind snake (Pilbara), <i>Anilius ganei</i> (P1) located immediately south of the Central Pit were sighted in 2005 (DWER Geocortex).</p> <p>A level 1 Short Range Endemic (SRE) was conducted over most of the application area in 2016 by Bennelongia Environmental Consultants. At least 23 species belonging to eight SRE groups were recorded. No listed and no confirmed SRE species were collected (Bennelongia 2016).</p> <p>The proposed Category 6: Mine dewatering activities are to allow the discharge of excess mine dewater associated with uncontrollable events (cyclones or significant rainfall events) to the Pilgangoora Creek line. Given the relatively short and infrequent period of discharge, impacts to the listed threatened and priority fauna are likely to be minimal. These receptors</p>

Sensitive receptors	Distance from prescribed activity
	are therefore not further considered in the risk assessment.
Subterranean fauna	<p>Bennelongia Environmental Consultants completed a Level 1 subterranean fauna assessment in August 2016, followed by targeted stygofauna assessment for the Pilgangoora Creek dewatering drawdown impact area in September 2016. Results of this survey have confirmed that all species have been identified outside of the impact zone of the premises (Pilbara 2020a).</p> <p>The proposed Category 6: Mine dewatering activities are to allow the discharge of excess mine dewater associated with uncontrollable events (cyclones or significant rainfall events) to the Pilgangoora Creek line. Given the relatively short and infrequent period of discharge, impacts to subterranean fauna are likely to be minimal. These receptors are therefore not further considered in the risk assessment.</p>
Groundwater Dependent Ecosystems (GDE)	<p>The nearest significant GDE (i.e. a GDE with moderate or higher potential for interaction with subsurface groundwater) to the premises, as identified in the GDE Atlas, is the Chinnamon Creek system (GRM 2017).</p> <p>This ecosystem is located approximately 2 km south of the premises and 4.6 km south-south-west of the proposed Category 6: Mine dewatering activities (DWER Geocortex).</p> <p>The proposed Category 6: Mine dewatering activities are to allow the discharge of excess mine dewater associated with uncontrollable events (cyclones or significant rainfall events). Given the relatively short and infrequent period of discharge, impacts to the GDE are likely to be minimal. This receptor is therefore not further considered in the risk assessment.</p>
Native vegetation	The condition of vegetation located within the vicinity of proposed Category 6: Mine dewatering operations is Very Good: Vegetation structure altered; obvious signs of disturbance (MMWC 2016).
Riparian vegetation	<p>Riparian vegetation located along the Pilgangoora Creek line. Any localised impacts to existing riparian vegetation as a result of the excess mine dewater discharge are not considered material as the section of Pilgangoora Creek immediately downstream of the proposed discharge location A will be diverted and the original creek line subsumed by the expanding open pit (Pilbara 2020a).</p> <p>The Pilgangoora Creek diversion is proposed to be constructed in two stages. Stage 1 will occur early in the mine life and will allow initial development of the Central Pit. Stage 2 will be constructed between Years 10 and 15. It will extend the diversion to the east and allow for the ultimate footprint of the Central Pit. The Pilgangoora Creek diversion is approved under Mining Proposal Reg ID 85615.</p> <p>The area is also approved to be cleared under the granted clearing permit (CPS 8175/1). This receptor is therefore not further considered in the risk assessment.</p>
Native fauna	During the level 2 terrestrial vertebrate survey in February 2016 by 360 Environmental Pty Ltd, 57 species were recorded

Sensitive receptors	Distance from prescribed activity
	<p>from 26 families. These comprised 32 species of reptiles from nine families, 22 bird species from 14 families and 3 mammal species from three families.</p> <p>In total, four fauna habitats were identified in the survey area. These included rocky hill (70.26%), stony plain (14.74%), drainage line (6.34%) and sandy plain (5.84%). Habitat condition throughout the survey area ranged from Pristine to Very Good (Pilbara 2020a).</p>
Livestock (e.g. cattle)	The premises is located on Wallareenya Station pastoral lease, an active cattle grazing station and cattle are anticipated to occur within the mining operations area during the life of the project.

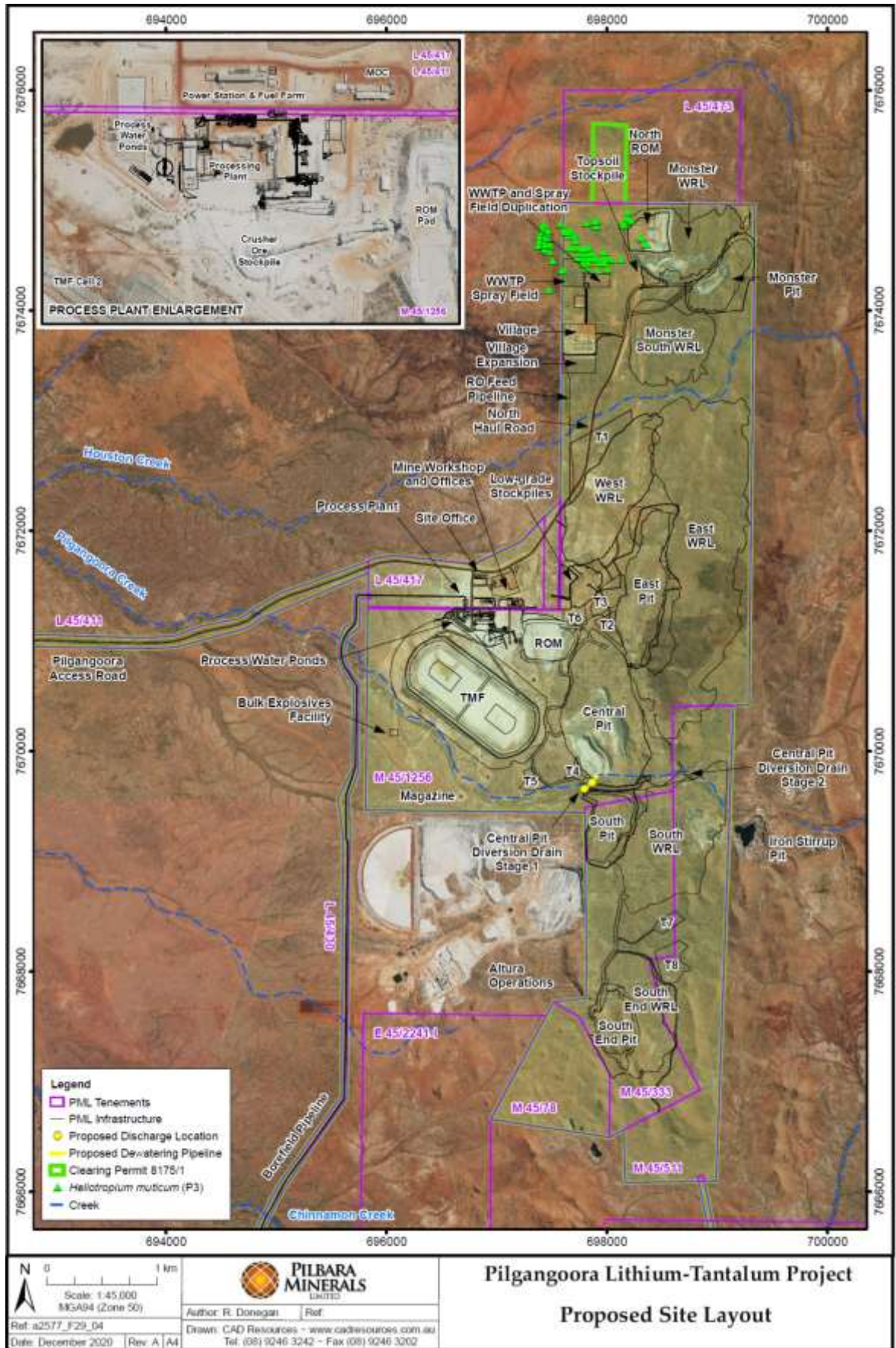


Figure 1: Distance to sensitive receptors

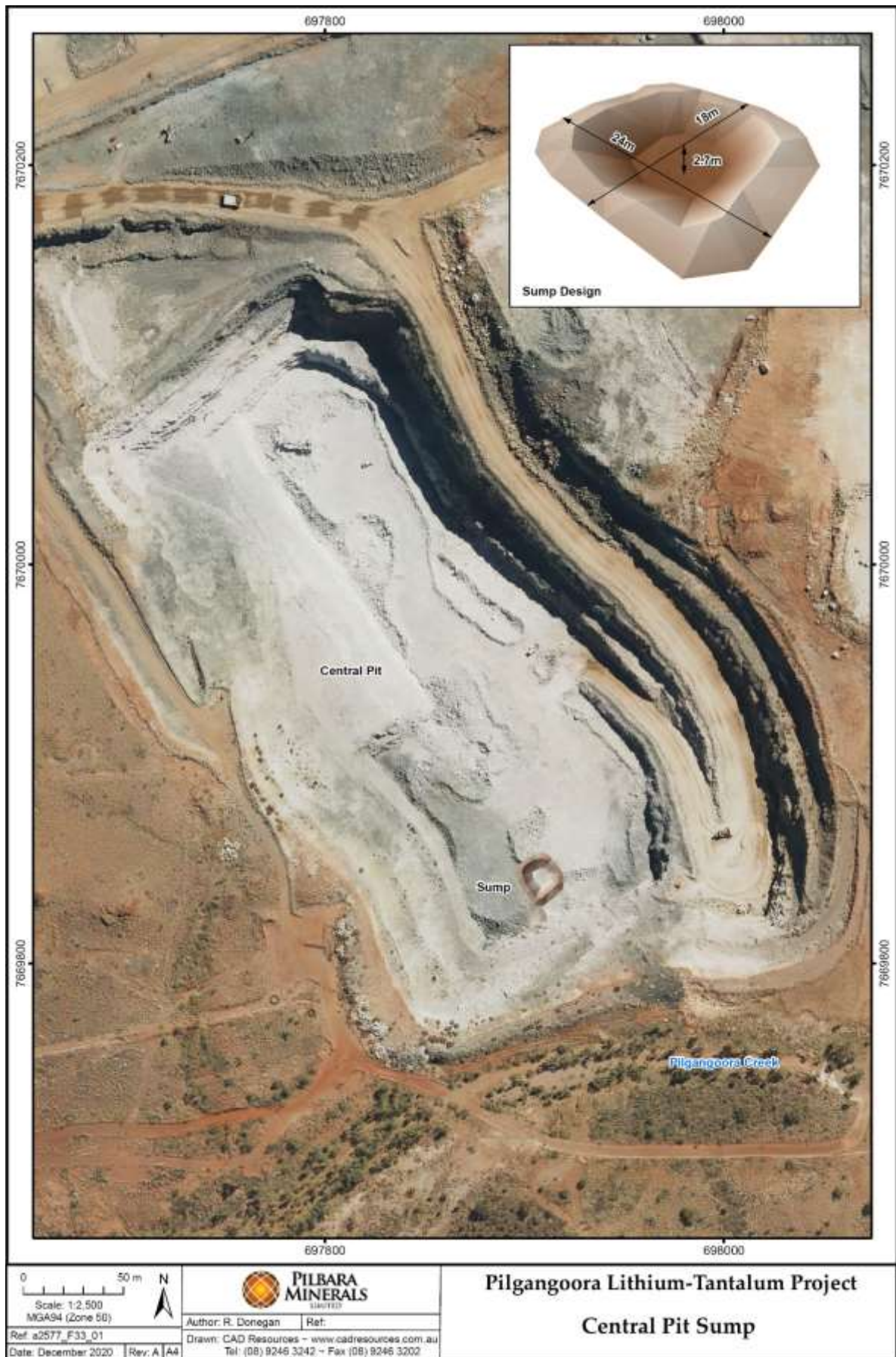


Figure 2: Central Pit sump design

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guidance Statement: Risk Assessments* (DER 2017) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 3.

Works approval W6443/2020/1 that accompanies this decision report authorises construction only. The conditions in the issued works approval, as outlined in Table 3 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

An amendment to licence L9056/2017/1 is required to authorise emissions associated with the operation of the premises i.e. Category 6 activities. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence amendment application.

Table 3: Risk assessment of potential emissions and discharges from the premises during general activities, construction and operations

Risk Event						Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory requirements
Source/Activities	Potential emission	Potential pathways	Potential adverse impacts	Receptors	Applicant controls				
General activities									
<p>Source:</p> <ul style="list-style-type: none"> Mobile equipment (e.g. light vehicles, heavy equipment, generators and dewatering pumps) <p>Activities:</p> <ul style="list-style-type: none"> Maintenance and servicing activities Storage and use of hydrocarbons and chemicals 	Hydrocarbons and chemicals	Spills or leaks to ground, overflow during filling and/or breach of containment	<p>Reduced quality or contamination of soil, sediment, groundwater and/or surface water</p> <p>Reduced native vegetation health</p>	<p>Surface water (Pilgangoora Creek)</p> <p>Groundwater</p> <p>Land/Soil</p> <p>Native vegetation</p>	Refer to Table 1, section 3.1.1	<p>C = Moderate</p> <p>L = Possible</p> <p>Medium Risk</p>	Yes	Condition 1	<p>Regulatory requirements applied to aid in the prevention of discharges to the environment.</p> <p>The Delegated Officer notes that the general provisions of the EP Act, <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> (UDRs), the <i>Dangerous Goods Safety Act 2004</i> and associated regulations assist to regulate hydrocarbon and chemical emissions during construction and operation.</p>
<p>Source:</p> <ul style="list-style-type: none"> Contaminated stormwater <p>Activities:</p> <ul style="list-style-type: none"> Stormwater migrating through construction areas 	Sediment (e.g. sand) and hydrocarbon (e.g. diesel) laden stormwater	Overland runoff	<p>Reduced quality or contamination of soil, sediment, groundwater and/or surface water</p> <p>Increased turbidity in surface water</p> <p>Reduced native/riparian vegetation health or native/riparian vegetation</p>	<p>Surface water (Pilgangoora Creek)</p> <p>Groundwater</p> <p>Land/Soil</p> <p>Native/Riparian vegetation</p>	Refer to Table 1, section 3.1.1	<p>C = Minor</p> <p>L = Possible</p> <p>Medium Risk</p>	Yes	Condition 2	<p>Condition 5 of granted licence L9056/2017/1 requires stormwater likely to be contaminated with hydrocarbons and other contaminants to be directed to an oil water separation system prior to discharge to the environment or re-use onsite.</p> <p>Regulatory requirements applied to aid in the prevention of discharges to the environment.</p> <p>The Delegated Officer notes that the general</p>

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Risk Event						Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory requirements
Source/Activities	Potential emission	Potential pathways	Potential adverse impacts	Receptors	Applicant controls				
			death						provisions of the EP Act, <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> (UDRs), the <i>Dangerous Goods Safety Act 2004</i> and associated regulations assist to regulate sediment and hydrocarbon emissions during construction and operation.
Construction									
Source: <ul style="list-style-type: none"> Earthworks and vehicle/mobile equipment movements Category 6 activities: <ul style="list-style-type: none"> Construction and installation of dewatering infrastructure (dewatering pipelines, energy dissipation infrastructure at Pilgangoora Creek discharge location) 	Dust	Air/Wind dispersion	Reduced quality or contamination of surface water Reduced native/riparian vegetation health or native/riparian vegetation death	Surface water (Pilgangoora Creek) Native/Riparian vegetation	Refer to Table 1, section 3.1.1	C = Minor L = Rare Low Risk	Yes	N/A	N/A

Risk Event						Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory requirements
Source/Activities	Potential emission	Potential pathways	Potential adverse impacts	Receptors	Applicant controls				
Operations									
Source: <ul style="list-style-type: none"> Mine dewater Activities: <ul style="list-style-type: none"> Mine dewatering from Central Pit 	Mine dewater: <ul style="list-style-type: none"> Elevated metals and metalloids (e.g. Arsenic, Boron, Chromium Cr III, Nickel and Vanadium) Elevated nutrients (e.g. Nitrate) Elevated radioactive contaminants (e.g. Gross alpha and Uranium) 	Mine dewater discharged to environment: <ul style="list-style-type: none"> Direct discharge to Pilgangoora Creek 	Increased erosion, scouring, and sedimentation within creek bed. Reduced quality or contamination of creek bed, groundwater and/or surface water	Pilgangoora Creek (surface water, creek bed structure and sediment) Groundwater Riparian vegetation	Refer to Table 1, section 3.1.1	C = Moderate L = Rare Medium Risk	Yes	<u>Conditions 3-5</u>	Regulatory requirements applied to ensure that energy dissipation infrastructure is constructed/installed as per the applicant's proposal. The Delegated Officer notes that further operational requirements will be assessed at the licensing stage.
		Mine dewater discharged to environment: <ul style="list-style-type: none"> Surplus mine dewater discharged More frequent discharges of mine dewater (e.g. discharges outside of cyclones or significant rainfall events) 	Increased turbidity in surface water Reduced riparian vegetation health or riparian vegetation death		Refer to Table 1, section 3.1.1	C = Moderate L = Rare Medium Risk	Yes		Operational requirements to be assessed at licensing stage

Risk Event						Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory requirements
Source/Activities	Potential emission	Potential pathways	Potential adverse impacts	Receptors	Applicant controls				
		<p>Mine dewater discharged to environment:</p> <ul style="list-style-type: none"> Pipeline leak/rupture 	<p>Reduced quality or contamination of soil, sediment, groundwater and/or surface water</p> <p>Reduced native/riparian vegetation health or native/riparian vegetation death</p>	<p>Surface water (Pilgangoora Creek)</p> <p>Groundwater</p> <p>Land/Soil</p> <p>Native/Riparian vegetation</p>	<p>Refer to Table 1, section 3.1.1</p>	<p>C = Moderate</p> <p>L = Rare</p> <p>Medium Risk</p>	No	<p>Conditions 3-5</p>	<p>The following additional regulatory requirements have been applied for the construction/installation of dewatering infrastructure:</p> <ul style="list-style-type: none"> Dewatering pipelines to meet AS/NZS standards. Dewatering pipelines to be located within a bund to contain spills in the event of a pipeline rupture/leak. Dewatering pipelines to be anchored to restrict movement in the event of a cyclone or significant rainfall event. <p>The Delegated Officer notes that further operational requirements will be assessed at the licensing stage.</p>
		<p>Mine dewater discharged to environment:</p> <ul style="list-style-type: none"> Formation of algal blooms (containing algal toxins) Native fauna/livestock gaining access to discharge location and ingesting discharged 	<p>Reduced native fauna/livestock health or native fauna/livestock death</p>	<p>Native fauna</p> <p>Livestock</p>	<p>Refer to Table 1, section 3.1.1</p>	<p>C = Moderate</p> <p>L = Rare</p> <p>Medium Risk</p>	No	<p>Operational requirements to be assessed at licensing stage</p>	<p>Operational requirements to be assessed at licensing stage.</p>

Risk Event						Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory requirements
Source/Activities	Potential emission	Potential pathways	Potential adverse impacts	Receptors	Applicant controls				
		mine dewater							

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guidance Statement: Risk Assessments* (DER 2017).

Note 2: Proposed applicant controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website (05/10/2020)	None received.	N/A
Local Government Authority advised of proposal (08/10/2020)	None received.	N/A
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal (08/10/2020)	None received.	N/A
Njamal Traditional Owners advised of proposal (08/10/2020)	None received.	N/A
Days Pastoral Company advised of proposal (08/10/2020)	None received.	N/A
Applicant was provided with draft documents on (05/11/2020)	No comments were provided by the applicant in relation to the draft decision report or regulatory requirements within the draft works approval W6443/2020/1.	N/A

5. Conclusion

Based on the assessment in this decision report, the Delegated Officer has determined that a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

References

1. Bennelongia 2016, Bennelongia Environmental Consultants, 2016, *Pilgangoora Project: Level 1 Short-Range Endemic Fauna Assessment*, Jolimont, Western Australia
2. 360 Env 2016, 360 Environmental, 2016, *Baseline Vertebrate Fauna Survey*, West Leederville, Western Australia.
3. Department of Environment Regulation (DER) 2016, *Guidance Statement: Environmental Siting*, Perth, Western Australia.
4. DER 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
5. DER 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
6. DMIRS 2018, Department of Mines, Industry Regulation and Safety (DMIRS), 2018, *Clearing Permit Decision Report*, East Perth, Western Australia

7. GRM 2017, Groundwater Resource Management, 2017, *(Groundwater) Operating Strategy for Pilgangoora Project*, Beaconsfield, Western Australia
8. MMWC 2016, MMWC Environmental Pty Ltd, 2016, *Pilgangoora Project Area Flora, Vegetation and Fauna Assessment*, Subiaco, Western Australia.
9. Pilbara 2020a, Pilbara Minerals, 2020, Works Approval Application – Supporting Documentation, West Perth, Western Australia.
10. Pilbara 2020b, Pilbara Minerals, 2020, Surface Water Management, West Perth, Western Australia.
11. Pilbara 2020c, Pilbara Minerals, 2020, SWLs Ambient Groundwater, West Perth, Western Australia.
12. Pilbara 2017, Pilbara Minerals, 2017, Works Approval and Operating Licence Application – Supporting Documentation, West Perth, Western Australia.

Appendix 1: Application validation summary

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)				
Application type				
Works approval	<input checked="" type="checkbox"/>			
Licence	<input type="checkbox"/>	Relevant works approval number:		None <input type="checkbox"/>
		Has the works approval been complied with?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Has time limited operations under the works approval demonstrated acceptable operations?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
		Environmental Compliance Report / Critical Containment Infrastructure Report submitted?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Date Report received:		
Renewal	<input type="checkbox"/>	Current licence number:		
Amendment to works approval	<input type="checkbox"/>	Current works approval number:		
Amendment to licence	<input type="checkbox"/>	Current licence number:		
		Relevant works approval number:	N/A	<input type="checkbox"/>
Registration	<input type="checkbox"/>	Current works approval number:	None	<input type="checkbox"/>
Date application received	1 July 2020			
Applicant and Premises details				
Applicant name/s (full legal name/s)	Pilgangoora Operations Pty Ltd			
Premises name	Pilgangoora Operations			
Premises location	The premise boundary consistent with Prescribed Premise Licence L9056/2017/1, consists of mining tenements M45/1256 and L45/417.			
Local Government Authority	Shire of East Pilbara			
Application documents				
HPCM file reference number:	DER2018/001042-3-60			
Key application documents (additional to application form):	<ul style="list-style-type: none"> • 8A Surface Water Mangement Plan [A1908706] • 8B Revised Groundwater Modelling [A1908707] • 8C Level 2 Flora & Vegetation Assessment [A1908708] • 8D Level 1 Short Range Endemic Fauna Assessment [A1908709] • 8D Level 2 Vertebrate Fauna Assessment [A1908710] • 8E Pilgangoora soil characterization [A1908711] • Works Approval Supporting Information [A1908705] • Water Quality Results for Iron Stirrup [A1938952] • Response to DWER Request for Further Information (TMF 			

	Water Balance, Bloc Model, GCA Mine Waste Characterisation Report) [DWERTD331561]
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Scope of application/assessment

<p>Summary of proposed activities or changes to existing operations.</p>	<p>Works approval</p> <p>To install dewatering infrastructure to allow the discharge of excess mine dewater associated with uncontrollable events (cyclones or significant rainfall events) to the environment to maintain safe operating conditions.</p> <p><u>Construction:</u></p> <ul style="list-style-type: none"> Installation of dewatering pipeline (HDPE), flowmeter, diffuser and placement of riprap material to prevent erosion and scouring at the mine dewater pipeline outlet. <p>Note: The riprap material will be sourced on site from benign waste rock from open pit mining.</p> <p>Note: The Pilgangoora Creek diversion is proposed to be constructed in two stages. Stage 1 will occur early in the mine life and will allow initial development of the Central Pit. Stage 2 will be constructed between Years 10 and 15. It will extend the diversion to the east and allow for the ultimate footprint of the Central Pit. The Pilgangoora Creek diversion is approved under Mining Proposal Reg ID 85615.</p>
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Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Proposed production	Proposed changes to the production or design capacity (amendments only)
Category 6: Mine dewatering: premises on which water is extracted and discharged into the environment to allow mining of ore.	Maximum dewatering discharge is 256,000kL per annum	<i>Is there a proposed change to the previously assessed production or design capacity?</i>

Legislative context and other approvals

Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision No: N/A Managed under Part V <input checked="" type="checkbox"/> Assessed under Part IV <input type="checkbox"/>
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Ministerial statement No: N/A EPA Report No: N/A
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Reference No: N/A
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Certificate of title <input type="checkbox"/> General lease <input type="checkbox"/> Expiry: Mining lease / tenement <input checked="" type="checkbox"/>

		<ul style="list-style-type: none"> • M45/1256 - Expiry 15/12/2037 • L45/417 - Expiry 22/01/2038 Other evidence <input type="checkbox"/> Expiry:
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	Approval: N/A Expiry date: N/A If N/A explain why? Premises is managed under Mining Tenement.
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	CPS No: CPS [8175/1] Clearing Permit application submitted through DMIRS.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: N/A Licence/permit No: N/A
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Licence/permit No: GWL183354(5)
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Name: Pilbara Groundwater Area Type: Proclaimed Groundwater Area Has Regulatory Services (Water) been consulted? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Regional office: N/A
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Name: N/A Priority: N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Is the Premises subject to any other Acts or subsidiary regulations (e.g. <i>Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx</i>)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A

Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Classification: N/A Date of classification: N/A