



Application for Licence Amendment

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

Licence Number	L8912/2015/1
Licence Holder	Halls Creek Mining Pty Ltd
ACN	168 093 347
File Number	DER2015/001934-1
Premises	Lamboo Gold Project M80/343, M80/355, M80/359, M80/362, M80/503, M80/471, L80/70, L80/71, L80/94 and L80/97 MUELLER RANGES WA 6770
Date of Report	10 August 2021
Proposed Decision	Revised licence granted

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MANAGER RESOURCE INDUSTRIES

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

Table of Contents

1. Decision summary	1
2. Scope of assessment	1
2.1 Regulatory framework	1
2.2 Amendment summary	1
3. Risk assessment	3
3.1 Source-pathways and receptors	3
3.1.1 Emissions and controls	3
3.1.2 Receptors	3
3.2 Risk ratings	2
3.3 Detailed risk assessment- tailings seepage	3
3.3.1 Potential pathway	3
3.3.2 Regulatory controls	5
3.3.3 Rating of this risk event	5
4. Consultation	5
5. Conclusion	6
5.1 Summary of amendments	6
References	7
Appendix 1: Summary of licence holder’s comments on risk assessment and draft conditions	8
Appendix 2: Application validation summary	9
Table 1 Licence holder controls	3
Table 2: Sensitive human and environmental receptors and distance from prescribed activity	4
Table 3. Risk assessment of potential emissions and discharges from the premises during construction and operation	2
Table 4: Consultation	5
Table 5: Summary of licence amendments	6
Figure 1 Proposed new premises boundary	2
Figure 2 Distance to sensitive receptors	1
Figure 3 Current groundwater monitoring bores for TSF1 and TSF2 (GW1- GW9)	4

1. Decision summary

Licence L8912/2015/1 is held by Halls Creek Mining Pty Ltd (licence holder) for the Lamboo Gold Project (the premises), located at Mueller Ranges, WA within the Town of Halls Creek.

This amendment report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of the premises. As a result of this assessment, Revised Licence L8912/2015/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

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

2.2 Amendment summary

On 27 April 2021 the licence holder submitted an application to the department to amend licence L8912/2015/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Embankment raise of existing TSF1 and TSF2 (RL408m to RL411m)
- Change of the prescribed premises boundary to include mining tenements L80/94 and L80/97 (Figure 1)

This amendment is limited only to changes to Category 5 activities from the existing licence. No changes to the aspects of the existing licence relating to Category 64 have been requested by the licence holder. No increase of the currently approved Category 5 throughput of 250 000 tonnes per annum is proposed.

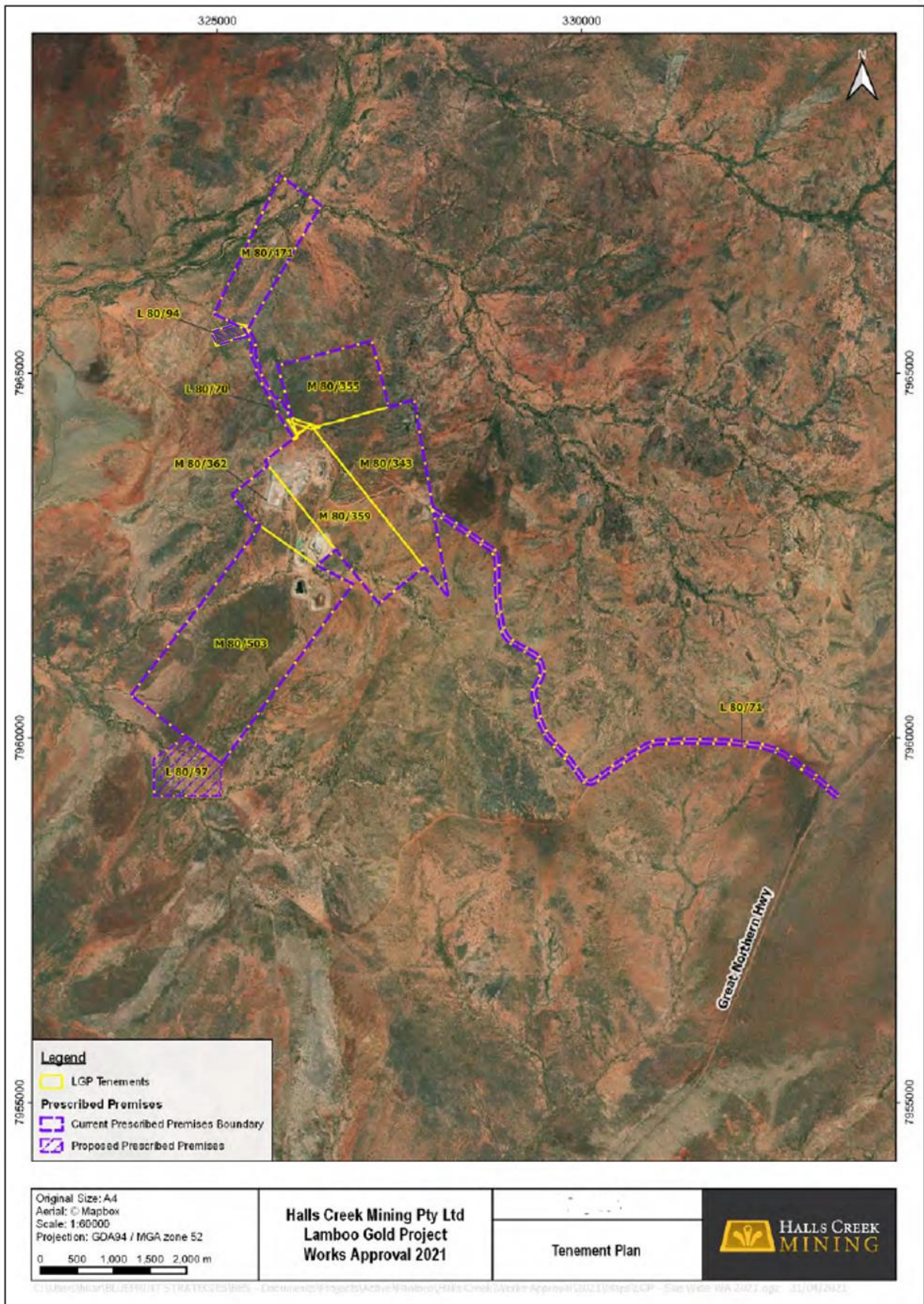


Figure 1 Proposed new premises boundary

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 *Guideline: Risk assessments* (DWER 2020).

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 amendment report are detailed in

Table 1 below.

Table 1 also details the proposed control measures the licence holder has proposed to assist in controlling these emissions, where necessary.

Table 1 Licence holder controls

Emission	Sources	Potential pathways	Proposed controls
Dust	Deposition of additional tailings into TSF1 and TSF2.	Air/windborne pathway	Due to the distance to the closest receptor, being 5 km from TSF1 and TSF2, no pathway is considered for dust or noise occurring during construction and operations. These emissions are therefore not further considered in the risk assessment.
Noise	Construction works, embankment raises	Air/windborne pathway	
Tailings seepage	Deposition of additional tailings into TSF1 and TSF2	Seepage to soils and groundwater	

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the licence holder'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 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 (*Guideline: Environmental siting* (DWER 2020)).

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

Human receptors	Distance from prescribed activity
Lamboos Pastoral Station	Approx. 5 km south of TSF1 and TSF2. The Delegated Officer considers that no pathway exists this receptor and therefore human receptors are not assessed in this report.
Environmental receptors	Distance from prescribed activity
Groundwater	Within Canning-Kimberley groundwater area Proclaimed under <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act) According to supporting documents, groundwater depth is approximately 40 – 55 mbgl
Laura River tributaries (Figure 2)	Multiple (minor) tributaries within the premises boundary. No permanent surface water within the premises, ephemeral flow.



5.2 0 2.59 5.2 Kilometers

WGS_1984_Web_Mercator_Auxiliary_Sphere
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This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes

Author:
Recipient:

Figure 2 Distance to sensitive receptors

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the licence holder 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 licence holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

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

The Revised Licence L8912/2015/1 that accompanies this amendment report authorises emissions associated with the operation of the Premises i.e. additional deposition of tailings into TSF1 and TSF2 after the approved embankment raises.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 3. Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
<i>Operation (including time-limited-operations operations)</i>								
Deposition of additional tailings into TSF1 and TSF2	Tailings seepage	Seepage to soils and groundwater	Groundwater, surrounding soil	Refer to Section 3.1.1	C = Moderate L = Possible Medium Risk	N	<u>Condition 1.2.1 (Table 1.2.1)</u> <u>Condition 1.2.2 & 1.2.3</u> <u>Condition 3.4.1</u>	Refer to Section 3.3

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

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

3.3 Detailed risk assessment- tailings seepage

The deposition of tailings into of TSF1 and TSF2 is regulated under licence L8912/2015/1. Approximately 216,703 tonnes of tailings were deposited predominately into TSF2 during the 2018-2019 reporting period, and approximately 229,714 tonnes were deposited predominately into TSF1 during the 2019-2020 reporting period (Halls Creek Mining Pty Ltd, Annual Environmental Report (AER), 2019 & 2020).

The current licence requires quarterly groundwater monitoring in 9 bores to capture potential seepage impacts from TSF1 and TSF2 (Figure 3). However, the groundwater bores are slotted at depth about 18 – 24 metres below ground level (mbgl), and have been dry since their installation, and therefore no groundwater monitoring has been undertaken at the facilities. It is understood that the depth to groundwater is at approximately 40 – 45 mbgl. With the proposed embankment raises from RL:408 m to RL 411 m and additional tailings deposited, the adequacy of the groundwater monitoring to capture potential seepage has been considered.

Additionally, the current licence sets out a limit for Total Cyanide (TN) and Weak Acid dissociable cyanide (CN_{WAD}) of 80 mg/L and 50 mg/L respectively, for the decant water of TSF1 and TSF2. It is noted that these limits have been frequently exceeded as reported in recent AER's (Halls Creek Mining Pty Ltd, AER, 2019 & 2020). According to the licence holder, exceedances may be due to limited fresh water supply to the processing circuit increasing recirculated concentrations, variations of ore type and cyanide consumption or minimal residence periods for process water within the TSF. The additional tailings deposition associated with the embankment raise is not expected to increase the TN and CN_{WAD} concentrations.

In the AER for the reporting period of 2018-2019, the licence holder referred to ferrous sulphate trials undertaken to reduce TN and CN_{WAD} concentrations. The efficiency of the trials was not further discussed in the AER for reporting period 2019-2020 or in the licence amendment application assessed in this amendment report. As a result, the Delegated Officer is unable to consider the efficiency of these trials in reducing TN an CN_{WAD} concentrations in decant water.

3.3.1 Potential pathway

A review by DWER's internal technical experts of the geological setting at the premises and the relevance of groundwater occurrence has been undertaken. It was advised that the bedrock lithologies and overlying weathered profile at the premises generally have a low permeability, so occurrence of groundwater is generally limited in the region. However, due to the heavy monsoonal rainfall that seasonally takes place in the region, it is likely that ephemeral perched aquifers form in the weathered profile overlying bedrock. This ephemeral groundwater flow is likely to be a more significant pathway but would be much more difficult to monitor due to fluctuating flows and water levels.

While the deep groundwater flow from the site is unlikely to be a major pathway for the transport of chemical constituents, it is a pathway which requires monitoring. Additional information provided by the licence holder as part of the review of the draft licence conditions and amendment report, supports that deep monitoring bores (approximately 50 mbgl) may not be required for this amendment. Deep monitoring bores may be considered as part of the future TSF2 expansion works, as proposed by the licence holder (Appendix 1).

This is particularly the case given that the risk of seepage increases with the proposed embankment raise. The current groundwater monitoring has therefore been found inadequate for capturing potential seepage impacts from the TSF1 and TSF2.

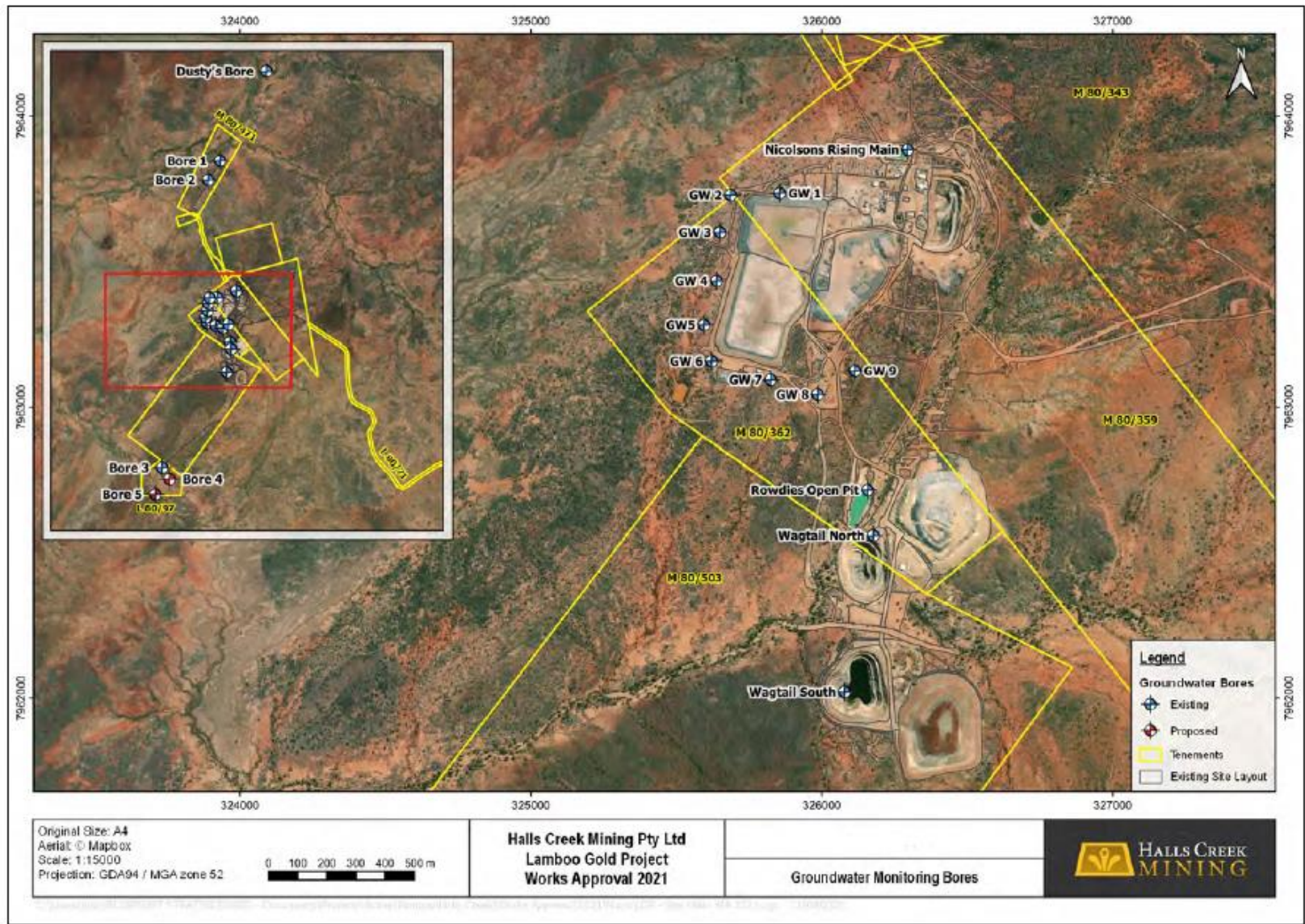


Figure 3 Current groundwater monitoring bores for TSF1 and TSF2 (GW1- GW9)

Licence: L8912/2015/1

IR-T15 Amendment report template v3.0 (May 2021)

3.3.2 Regulatory controls

Currently, no groundwater monitoring has been undertaken at the premises due to bores being installed approximately 20 m above the groundwater table, which results in dry bores.

Investigation of potential pathway via shallow aquifer

To capture the seasonal flow of perched groundwater near the TSF1 and TSF2, shallow bores may be required. Internal technical experts advise to undertake downhole geophysical logging using a natural gamma probe inside the PVC casing of all the existing dry monitoring bores around the toes of the TSF (GW1 – GW9, as set out in Figure 3). This identifies potential sandy layers which can be a pathway of seepage via a seasonally perched aquifer during wet season, resulting in saline porewater extending beyond the edges of the TSF.

A Hydrogeology Report (Rockwater, 2015) provided by the licence holder, shows groundwater in the project area is freshwater, with low salinity and of domestic and stock quality. The report included groundwater measurements in two bores (Bore 1 and Bore 2) located north of the TSF (on mining tenement M80/471), as well as six near-pit holes not further identified. Bore 1 and 2 had a TDS of 590 mg/L and 600 mg/L, respectively. The TDS in near-pit holes ranged from 370 – 530 mg/L. Findings of the downhole geophysical investigations are required to be reported to the department, which will determine if shallow monitoring bores are required.

3.3.3 Rating of this risk event

Taking into consideration that additional tailings will be deposited after the embankment raises, the Delegated Officer considered the consequence to be **Moderate**.

Seepage occurring from TSF1 and TSF2 is currently not monitored and remains unknown. The Delegated Officer has considered the likelihood **Possible**.

The Delegated Officer has compared the consequence and likelihood of this risk event and determined the overall rating as **Medium**. Based on this rating, the risk event is subject to regulatory controls.

4. Consultation

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

Table 4: Consultation

Consultation method	Comments received	Department response
Shire of Halls Creek advised of proposal (18/6/21)	N/A	N/A
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal (18/6/21)	N/A	N/A
Licence Holder was provided with first copy of draft amendment on 27/07/21	Refer to Appendix 1	Refer to Appendix 1
Licence Holder was provided with second copy of draft amendment on 9/08/21	Comment period waived	N/A

5. Conclusion

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

5.1 Summary of amendments

Table 5 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Table 5: Summary of licence amendments

Condition no.	Proposed amendments
Cover page	Inclusion of mining tenements L80/94 and L80/97 under premises address
1.1.2 Definitions	Inclusion of 'Suitably Qualified Geotechnical Engineer' definition
1.2.1 (Table 1.2.1)	Inclusion of TSF1 and TSF2 (Stages 3 and 4) to reflect embankment raise to RL411 m
1.2.1 (Table 1.2.1)	Removal of construction requirements for completed TSF embankment raise stages.
1.2.1 (Table 1.2.1)	Inclusion of shallow groundwater monitoring investigation in TSF1 and TSF2 proximity
1.2.3 & 1.2.4	Condition to provide Environmental Compliance Report to the department once infrastructure has been constructed. Requirements of content for the Environmental Compliance Report.
1.4.1	Requirement to undertake further investigation to identify sandy horizon in the weathered profile which may act as pathway for seepage from the TSF1 and TSF2 during wet season.
2.2.1	Correction of Figure reference.
Figure 1, Schedule 1	Figure replaced to represent new premises boundary
Figure 4 & Figure 5, Schedule 1	Figures added setting out the layout for the embankment raise for TSF1 and TSF2 (RL 411 m)
Figure 6, Schedule1	Figure number updated (previous Figure 4).

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. Halls Creek Mining Pty Ltd, Annual Environmental Report (2018-2019), (DWERDT206752)
5. Halls Creek Mining Pty Ltd, Annual Environmental Report (2019-2020) (A1937894)
6. Halls Creek Mining Pty Ltd, Licence amendment application (April 2021), (DWERDT444380)
7. Rockwater Pty Ltd 2015, Hydrogeology Report for Department of Environment Regulation Report for Halls Creek Mining Ltd (DWERDT484806)
8. Halls Creek Mining Pty Ltd, Response to draft instrument and additional supporting information (DWERDT484806)

Appendix 1: Summary of licence holder's comments on risk assessment and draft conditions

Condition	Summary of licence holder's comment	Department's response
Table 1.2.1	<p>Request to remove the requirement for deep and shallow bores.</p> <p>The licence holder provided additional documents, including a Hydrogeology report (Rockwater, 2015) to support the low risk of seepage and impacts to the groundwater. It was further advised that a TSF2 expansion is proposed in 2022, which will involve detailed geotechnical and hydrogeological investigations. The licence holder requests to address the deep and shallow bores within this subsequent works approval (TSF2 expansion).</p>	<p>The additional information provided was reviewed by internal technical experts. It was advised that the dewatering of fractured systems around the pits is a valid justification, and the requirement of deep monitoring bores can be reassessed in the subsequent works approval for TSF2 expansion works. The condition relating to deep monitoring bores has therefore been removed in this instance.</p> <p>However, the risk of perched groundwater flow during wet season still remains. Internal technical advice proposes to undertake the ground-based geophysical investigation around the toes of the TSF before sinking shallow bores, in order to identify whether saline porewater has extended beyond the edges of the TSF in the subsurface. The condition was amended to reflect the revised advice.</p>

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY				
Application type				
Amendment to licence	<input checked="" type="checkbox"/>	Current licence number:	L8912/2015/1 <i>The application was received as works approval, will be assessed as licence amendment application.</i>	
		Relevant works approval number:		N/A <input type="checkbox"/>
Date application received		27/4/2021		
Applicant and Premises details				
Applicant name/s (full legal name/s)		Halls Creek Mining Pty Ltd		
Premises name		Lamboo Gold Project		
Premises location		M80/343, M80/355, M80/359, M80/362, M80/471, M80/503, L80/70, L80/71, L80/94 and L80/97 MUELLER RANGES WA 6770		
Local Government Authority		Town of Halls Creek Shire of Halls Creek		
Application documents				
HPCM file reference number:		DER2015/001934-1 (L8912/2015/1); DER2021/000243 (new application folder)		
Key application documents (additional to application form):		<ul style="list-style-type: none"> • Works approval application form • Proof of occupier status • ASIC company extract • Cost of Works • Supporting document • Commissioning plan 		
Scope of application/assessment				
Summary of proposed activities or changes to existing operations.		<u>Licence amendment</u> <ul style="list-style-type: none"> • Embankment raise of TSF1 and TSF2 (RL408m to 411m) <u>Licence amendment-administrative</u> <ul style="list-style-type: none"> • Change of prescribed premises boundary 		

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity (amendments only)
Category 5: Processing or beneficiation of metallic or non-metallic ore	250 000 tonnes per annual period as approved; no change of throughput proposed	N/A

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: Managed under Part V <input 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: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Proof of occupier for all relevant mining tenements provided.
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	No clearing is proposed.
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"/>	No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Licence / permit not required.
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"/>	N/A

Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
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 type="checkbox"/>	<i>Mining Act 1978, Contaminated Sites Act 2003</i>
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Classification: contaminated – restricted use (C–RU) of Mining tenement M80/359 Date of classification: 5/6/2013