



<b>Licence Number</b>	L9124/2018/1
<b>Licence Holder</b>	Golden Mile Milling Pty Ltd
<b>ACN</b>	602 161 008
<b>File Number:</b>	DER2018/000472-1
<b>Premises</b>	Lakewood Gold Processing Facility Mining leases M26/242 and M26/367 Mount Monger Road, LAKEWOOD WA 6431
<b>Date of Amendment</b>	22/03/2019

## Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Licence in accordance with section 59 of the *Environmental Protection Act 1986* (EP Act) as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B(9) of the EP Act.

**Tim Gentle**

**MANAGER – RESOURCE INDUSTRIES  
REGULATORY SERVICES**

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

# Definitions and interpretation

## Definitions

In this Amendment Notice, the terms in Table 1 have the meanings defined.

**Table 1: Definitions**

Term	Definition
ACN	Australian Company Number
AER	Annual Environment Report
Amendment Notice	refers to this document
ANZECC	Australian and New Zealand Guidelines for Fresh and Marine Water Quality
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer. CEO for the purposes of notification means:  Director General Department Administering the <i>Environmental Protection Act 1986</i> Locked Bag 33 Cloisters Square PERTH WA 6850 <a href="mailto:info@dwer.wa.gov.au">info@dwer.wa.gov.au</a>
CSC	carbon stripping circuit
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of and during this Review
Licence Holder	Golden Mile Milling Pty Ltd
m <sup>3</sup>	cubic metres
mtpa	million tonnes per annum

Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report.
Risk Event	as described in <i>Guidance Statement: Risk Assessment</i>

## Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

This notice is limited only to an amendment for Category 5. No changes to the aspects of the original Licence relating to Category 61 have been requested by the Licence Holder.

The following guidance statements have informed the decision made on this amendment  
*Guidance Statement: Regulatory Principles (July 2015)*

- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Decision Making (February 2017)*
- *Guidance Statement: Risk Assessment (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

## Amendment description

On 21 August 2018, the Licence Holder submitted an application to amend Licence L9124/2018/1 for the Lakewood Gold Processing Operations. The Licence Holder has applied to install a carbon stripping circuit (CSC) within the Lakewood Processing Facility. The CSC will allow Golden Mile Milling (GMM) to recover gold on site.

The CSC process generates an acid wash waste stream that will be discharged into the TSF. Lakewood Mill is a toll treatment facility; as such the ore types and their metal and metalloid contents of are highly variable. During operation of the CSC (4 – 7 times a week), the total maximum volume of acid wash waste from the proposed CSC, over one (1) year (7 strips per week), is approximately 2,738m<sup>3</sup> or 0.2% of the total tailings and waste flow directed to the TSF. The low pH of the acid wash waste from the CSC going to the TSF will be neutralised by the bulk tailings stream (pH 8.65). The applicant states that it is unlikely that further metal dissolution at the TSF and potential effects on seepage will occur.

Lakewood Mill is licensed to receive and dispose of controlled wastes in a liquid form from Bureau Veritas, Kalgoorlie and Carbon Management Solutions, Kalgoorlie. The waste is directed from the truck to a sump. The liquid is pumped from the sump into the carbon in leach circuit via the cyclone feed hopper. The bulk of this waste, from Carbon Management Solutions, is GMM's own acid wash and barren eluate waste from off-site carbon treatment. The total maximum volume of acid wash waste from the proposed CSC, over one (1) year (7 strips per week), is approximately 2,738m<sup>3</sup>. This volume corresponds to 2,997 tonnes per year.

It was stated in the application that the current volume of waste being received is approximately 70 – 100m<sup>3</sup> per week, which is introduced through the Carbon in Leach circuit and directed out to the TSF after the residual reagents are consumed.

The introduction of a CSC at Lakewood Mill will mean that off-site carbon treatment is no longer required, thus the volume of controlled waste received by the site is reduced and then offset accordingly by on-site carbon treatment. The applicant states that there will be no net change to the amount of waste discharged to the TSF, metal balance or water balance.

Carbon regeneration will be conducted off site.

## Carbon Stripping Circuit (CSC)

The proposed CSC consists of:

- Acid Wash Column (3.7m<sup>3</sup>)
- Elution Column (3.7m<sup>3</sup>)
- Eluate Tank (10m<sup>3</sup>)
- Pre-mixing Tank (3m<sup>3</sup>)
- Recycle Eluate Tank (3m<sup>3</sup>)

The carbon regeneration process consists of:

- The Acid Wash and Elution Columns which will be located in a new CSC concrete bunded area, inside the mill area concrete bund, with a spill containment capacity of approximately 10m<sup>3</sup>.
- The Eluate Tank which will be located in the new gravity concrete bunded area, with a spill containment capacity of approximately 27m<sup>3</sup>.
- The smaller Pre-Mixing and Recycle Eluate Tanks which will be located in the Mill 1 and Mill 2 concrete bunded area, with a spill containment capacity of approximately 560m<sup>3</sup>.

Figure 1 shows the flowchart for the CSC.

## Other approvals

No other approvals are required for this amendment.

## Amendment history

Table 4 provides the amendment history for L9124/2018/1

**Table 2:** Licence amendments

Instrument	Issued	Description
L8298/2008/1	06/11/2008	New application
L8298/2008/2	03/11/2011	Licence reissue
L8298/2008/3	30/10/2014	Licence reissue in new format with addition of category 61
L8298/2008/3	22/10/2015	Transfer of licence to Golden Mile Milling Pty Ltd
L8298/2008/3	2018	Licence ceased to have effect on non-payment
L9129/2018/1	21/05/2018	Replacement licence issued for ceased licence L8298/2008/3.
L9129/2018/1	22/03/2019	Amendment Notice 1 Licence amendment to install a carbon stripping circuit; Commissioning and improvement condition

## Location and receptors

Table 5 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

**Table 3: Receptors and distance from activity boundary**

Residential and sensitive premises	Distance from Prescribed Premises
City of Kalgoorlie- Boulder	Located at approximately 4km north-west from the ore processing area



## Risk assessment

Tables 6 and 7 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

**Table 6: Risk assessment for proposed amendments during construction**

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning	
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts					
<b>Cat 5</b> Processing or beneficiation of metallic or non-metallic ore	Construction of the CSC	<b>Dust:</b> associated with construction activities	City of Kalgoorlie-Boulder to the west of the	Air	Health and amenity impacts	Slight	Unlikely	Low	The CSC circuit will be constructed within the existing plant footprint.  No further assessment required

**Table 7: Risk assessment for proposed amendments during operation**

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning	
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts					
<b>Cat 5</b> Processing or beneficiation of metallic or non-metallic ore	Carbon Stripping Circuit	Leaks, spills and stormwater from CSC area	Soil and groundwater	Surface runoff	Soil and groundwater contamination	Minor	Unlikely	Low	The proposed locations of the CSC tanks, columns and supporting structures are within the existing plant footprint, do not impede any spillage or stormwater flow paths, and do not add to the existing plant catchment area. There will be no overall change in the risk of leaks, spill and stormwater within the plant area. Existing Licence Condition 1.3.1 apply and require pipelines containing environmentally hazardous substances to be fitted with telemetry and pressure sensors, automatic cut off systems and secondary containment. Existing Licence condition 1.3.3 requires daily inspection of all delivery and return water infrastructure.  No further assessment required.



Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning	
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts					
<b>Cat 5</b> Processing or beneficiation of metallic or non-metallic ore	Carbon Stripping Circuit	Acid wash solution disposed into tailings	Surrounding native vegetation	Acidic groundwater mounding in vicinity of the TSF inundating rootzones of vegetation surrounding the TSF	Poor vegetation health	Minor	Possible	Medium	<p>The site already receives acid wash from other premises. The total volume of acid wash discharged into the TSF will remain the same.</p> <p>There will be no change in the risk of discharge acid wash solution into the TSF.</p> <p>No further assessment required.</p>

## Decision

The Delegated Officer notes that should not be any increased risk to the overall operation from the proposed carbon stripping circuit.

Prescribed premises category table has been amended to reflect the reduction of liquid waste accepted on site.

Commissioning of the Carbon Stripping Circuit has been included in the Licence.

A drawing depicting the processing plant area and the Carbon Stripping Circuit has been included in the Licence, Schedule 1 Maps.

## Additional Amendments initiated by DWER

For the purpose of this amendment, a probabilistic water balance for the Lakewood Gold operations was prepared by Coffee (2018). The report indicated that the typical operating parameters for the TSF are:

- Tailings slurry discharge rate: 3,400m<sup>3</sup>/day;
- Tailings water discharge rate: 2,600m<sup>3</sup>/day
- TSF water return rate: 1,257m<sup>3</sup>/day

The TSF return rate corresponds to approximately 46% of the daily discharge. The other 54% daily losses from Tailings Dam are described below:

- 11.5% Evapotranspiration
- 13.5% Seepage
- 29% Water retained in the Tailings

For the purpose of this amendment, a review of the historical groundwater monitoring data from annual environmental reports - AERs (2013 to 2017) was conducted to understand the impact of seepage from the TSF to the surrounding environment. The reports document groundwater levels around the TSF since 2010. Figure 1 shows the location of the groundwater monitoring bores at Lakewood.

The standing water level (SWL) for all monitoring bores are very close to the surface. Monitoring bore TSF2 fluctuates from less than 50 cm below ground level, but has gone down to 2m bgl in 2017. However, groundwater level at TSF1 has gone up to 0.3m bgl in 2017 (Figures 2 and 3).

Figures 4 to 6 show zinc, copper and lead concentrations in groundwater around the TSF. The values were compared against ANZECC guidelines to marine water, given the hyper saline nature of groundwater. The variability in concentration is related to the nature of the operation – toll treatment facility, where the ore to be treated comes from different mine sites.

The high SWL and elevated metal concentration in groundwater around the TSF can be correlated to the reduced water recovery capacity, the high percentage of water retained in the tailings and the amount of seepage coming from the TSF.

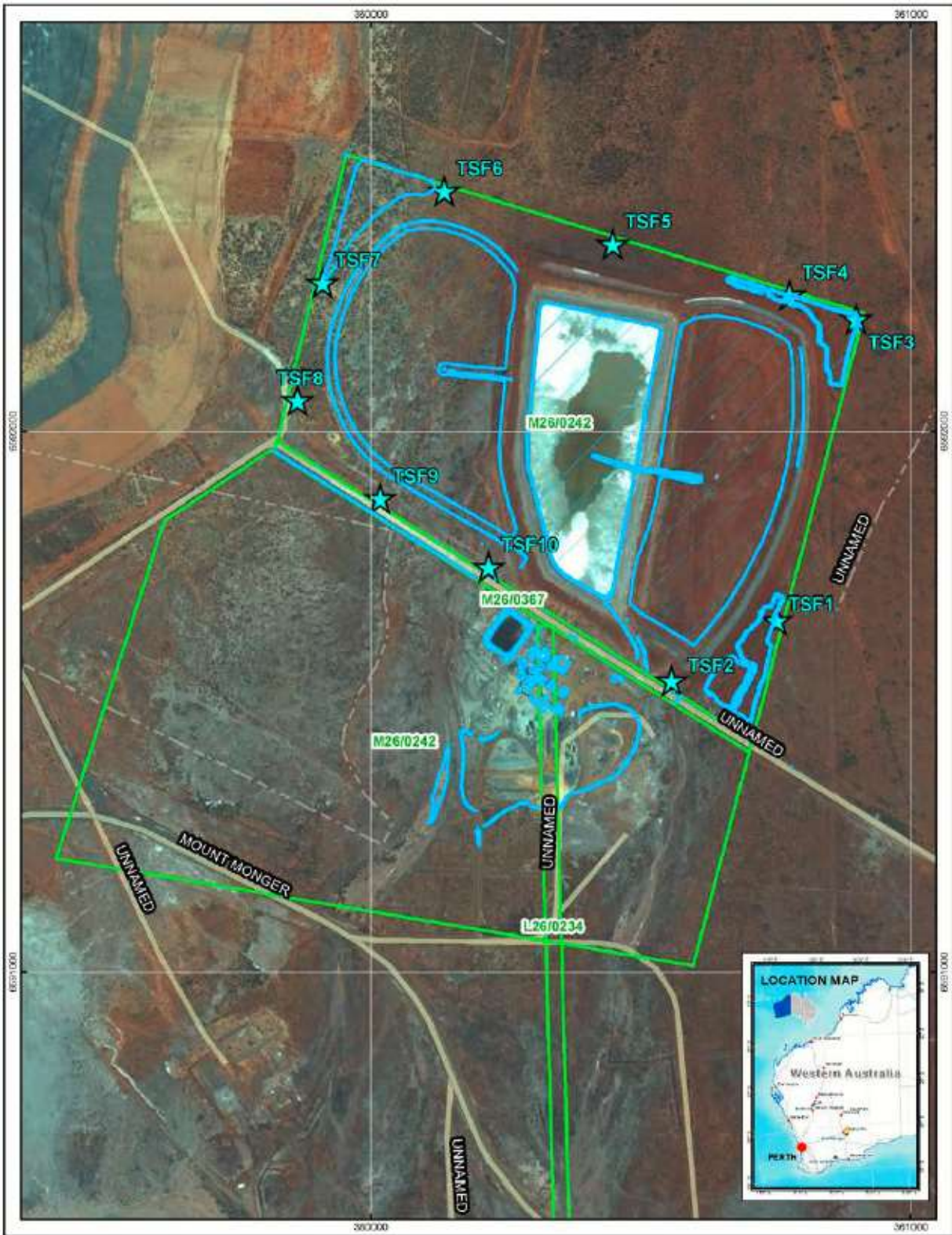


Figure 1: TSF monitoring bores location.

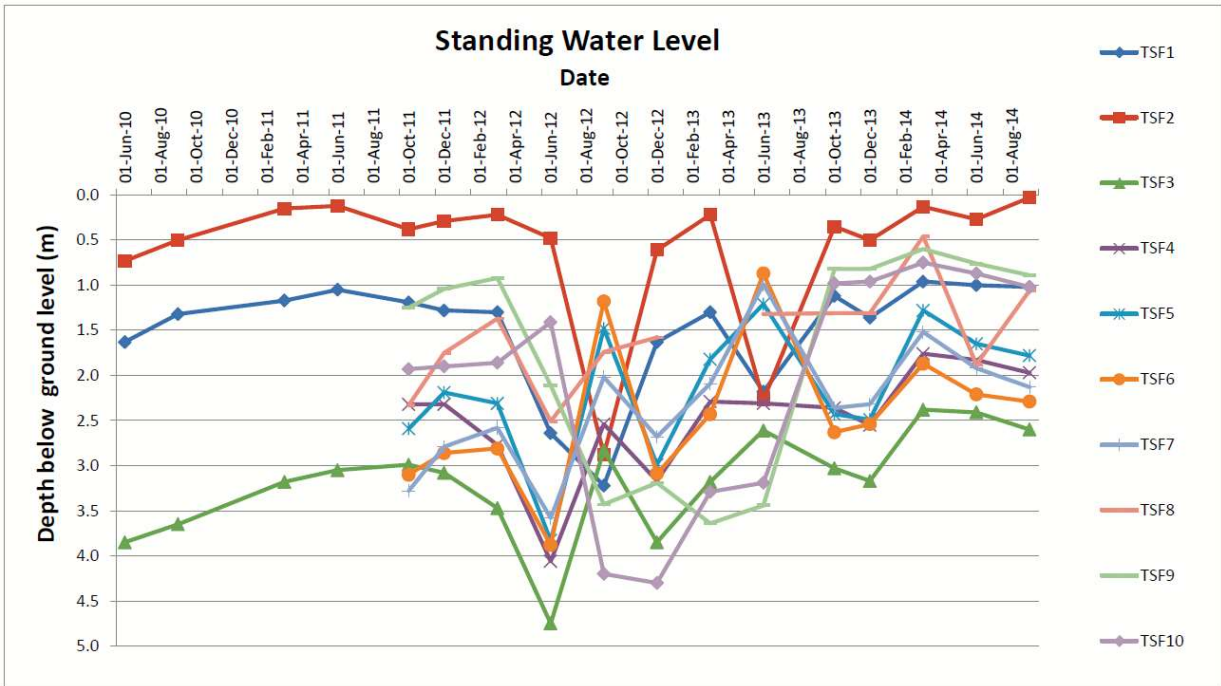


Figure 2: Standing water levels results around TSF1- Lakewood operations between 2010/2014.

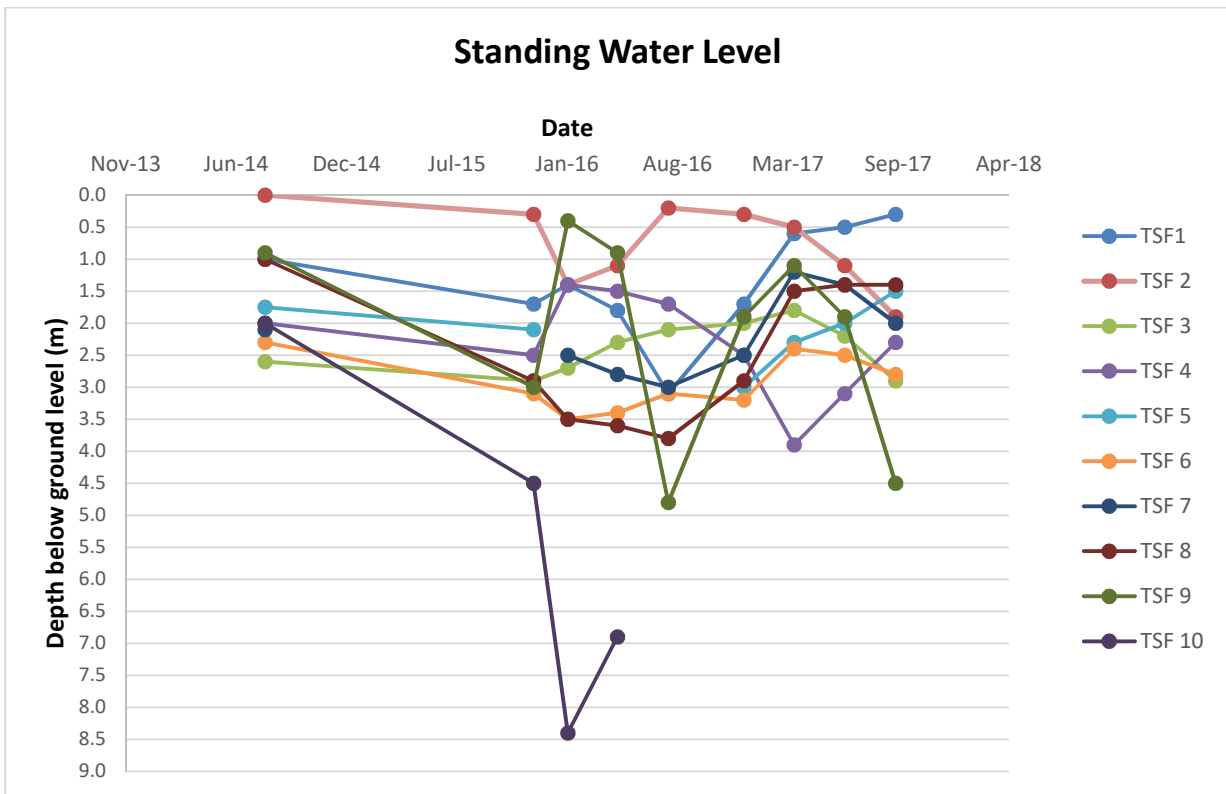
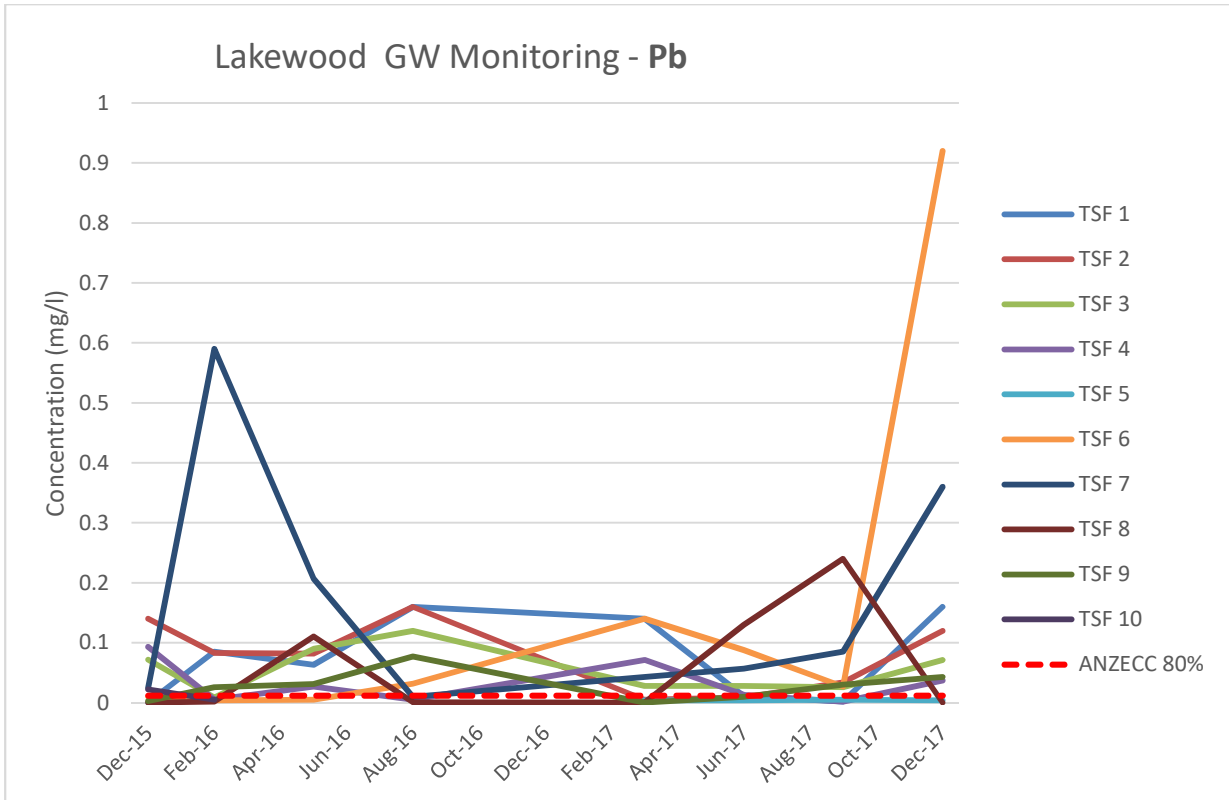
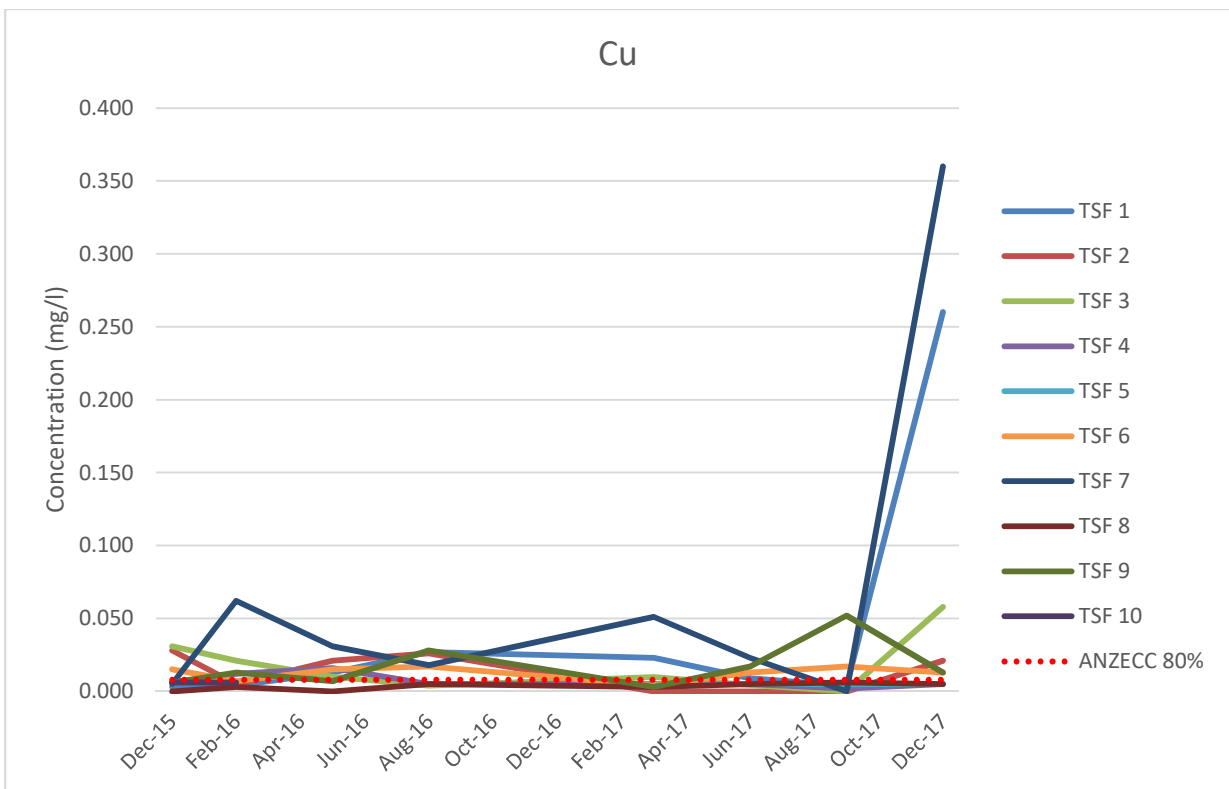


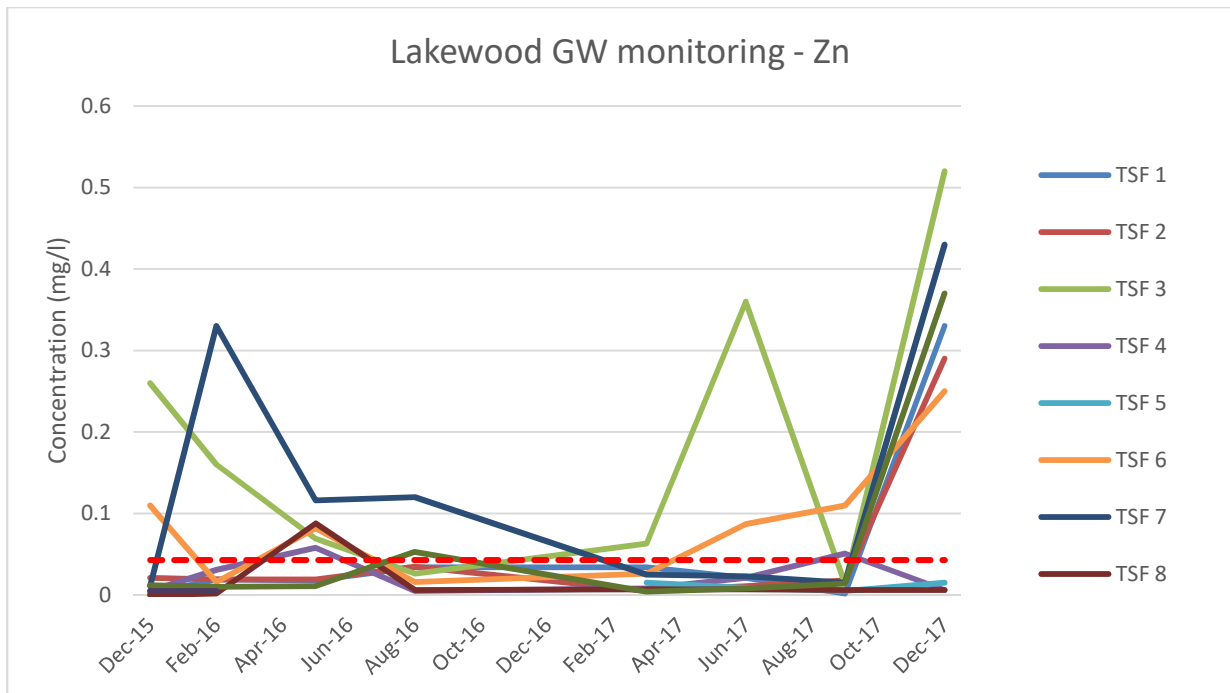
Figure 3: Standing water levels results around TSF1- Lakewood operations between 2013/2017.



**Figure 4: Lead concentration in groundwater compared against ANZECC 2018 Marine water – 80% Level of species protection.**



**Figure 5: Copper concentration in groundwater compared against ANZECC 2018 Marine water – 80% Level of species protection.**



**Figure 6: Zinc concentration in groundwater compared against ANZECC 2018 Marine water – 80% Level of species protection.**

Improvement conditions IR1 and IR2 have therefore been added to the Licence which require the Licence Holder to improve the water recovery rate for TSF.

The expire date has been extended from 20 May 2019 to 20 May 2030.

### Licence Holder’s comments

The Licence Holder was provided with the draft Amendment Notice on 26 February 2019. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

### Amendment

- The Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:  
**Expiry date: 20 May ~~2019~~ 2030**
- The Prescribed premises category is amended by the insertion of the red text shown in underline below:

#### Prescribed premises category

Schedule 1 of the *Environmental Protection Regulations 1987*

Category number	Category description	Category production or design capacity	Approved premises production or design capacity
5	Processing or beneficiation of metallic or non-metallic ore: premises on which – (a) Metallic or non-metallic ore is crushed, ground, milled or otherwise processed; (b) Tailings from metallic or non-metallic ore are reprocessed; or (c) Tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.	50 000 tonnes or more per year	900 000 tonnes per annual period
61	Liquid waste facility: premises on which liquid waste produced on others premises (other than sewage waste) is stored, reprocessed, treated or irrigated.	100 tonnes or more per year	4-200 <del>1300</del> tonnes per annual period

2. The Licence is amended by the insertion of the following Condition 4.1 to 4.2:

#### **4 Improvements**

##### Improvement program

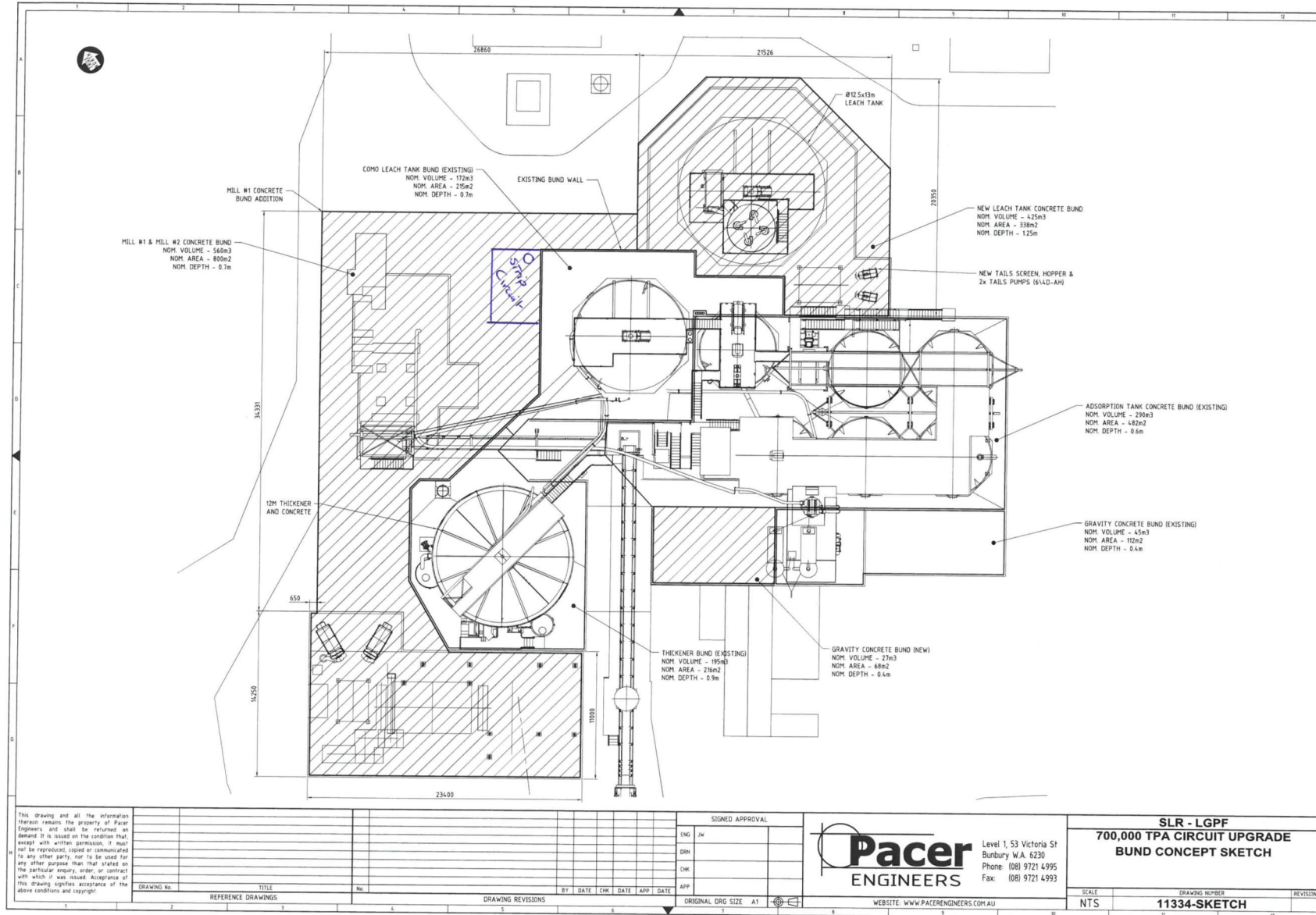
4.1 The Licensee shall complete the improvements in Table 4.1 by the date of completion in Table 4.1.

4.2 The Licensee, for improvements not specifically requiring a written submission, shall write to the CEO stating whether and how the Licensee is compliant with the improvement within one week of the completion date specified in Table 4.1.

<b>Table 4.1: Improvement program</b>		
<u>Improvement reference</u>	<u>Improvement</u>	<u>Date of completion</u>
<u>IR1</u>	<u>The Licensee shall improve the water recovery rate to 60% for TSF1.</u>	<u>12 months from amendment date</u>
<u>IR2</u>	<u>The Licensee shall record the water balance for the site and report to the CEO on a quarterly basis.</u>	<u>Ongoing from the amendment date</u>
<u>IR3</u>	<u>The Licensee shall submit a report prepared by a geotechnical engineer assessing the adequacy of seepage controls around TSF1</u>	<u>3 months from amendment date</u>

# Schedule 1: Maps

Schedule 1 Maps of the Licence is amended by the addition of the new map of depicting the location of the Carbon Stripping Circuit.





## Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L9124/2018/1- Lakewood Gold Processing Facility	L9124/2018/1	accessed at <a href="http://www.dwer.wa.gov.au">www.dwer.wa.gov.au</a>
2	Golden Mile Milling Pty Ltd - Licence amendment application 20/09/2018		DWER records (A1722042)
3	Coffey, October 2018. L9124/2018/1 – Amendment to Licence Application – Further Information Request Coffey Response on behalf of Golden Mile Milling	Coffey (2018)	DWER records (A1730768)
4	Silverlake Resources, November 2014. Lakewood Gold Processing Facility – Annual Environmental Report L8298/2008/2.		DWER records (A838342)
5	Silverlake Resources, December 2014. Lakewood Gold Processing Facility – Annual Monitoring Report & Operating Strategy Review GWL176895(1).		DWER records (REPORT14/1408)
6	Groundwater test results – V4 3 <sup>rd</sup> qtr 2017 (excel file)		DWER records (A1567386)
7	Water monitoring metal assays 2017 V3 (excel file)		DWER records (A1567386)
8	2018 Lakewood Mill Annual Environmental Report (Ecological, November 2018)	AER 2018	DWER records (A1757272)
9	Memo - L9124/2018/1 – Applicant Notification – Notice of Proposed Amendment to License Coffey Response on behalf of Golden Mile Milling (Coffey, February 2018)		DWER records (A1774430)
10	Guidance Statement: Setting conditions. DER, October 2015		accessed at <a href="http://www.dwer.wa.gov.au">www.dwer.wa.gov.au</a>
11	Guidance Statement: Environmental Siting. DER, November 2016		
12	Guidance Statement: Risk Assessments. DER, February 2017		

## Appendix 2: Summary of Licence Holder comments

The Licence Holder was provided with the draft Amendment Notice on 26 February 2019 for review and comment. The Licence Holder responded on 28 February 2019. The following comments were received on the draft Amendment Notice.

Condition	Summary of Licence Holder comment	DWER response
IR1	<p>A review of the water balance concludes that under normal operating conditions and average climatic conditions, water recovery rates may range from 45 - 50%, and thus a rate of 60% is likely not achievable. It is noted that the 45 - 50% range is consistent with similar type paddock facilities in the Goldfields Region.</p>	<p>In the 2018 Tailings Storage Audit and Management Review report (Coffey, November 2018) it was observed that minimal free board was observed along the perimeter embankment. Also that Milled tailings slurry water movements were not recorded for the audit period. GMM advised that a recovery of between 30 and 40% was achieved from TSF1.</p> <p>The report concluded that water management on the facility should be improved.</p> <p>IR 1 remains in the Licence Amendment. However, DWER has extended the completion date from 6 to 12 months.</p>
IR3	<p>A review by Coffey concludes that there is currently insufficient data available to allow proper professional assessment and interpretation of TSF1 seepage (i.e. drivers and receptors), and the adequacy of seepage interception and recovery control measures.</p> <p>It is noted that there is currently an extensive campaign of geotechnical and hydrogeological investigations and compliance monitoring underway at Lakewood to address this, which has included a recent CPTu investigation of TSF1 and installation of embankment vibrating wire piezometers (VWP's). On this basis, it is recommended that data acquisition continue for at least 6 months before a review of TSF1 seepage is conducted.</p>	<p>The AER 2018 indicates high ground water level at the site and unknowns about the phreatic surface within the embankments of the TSF.</p> <p>IR3 remains in the Licence Amendment.</p>