Government of Western Australia
Department of Environment Regulation

Amendment Notice 1

Licence Number	L8698/2012/1
Licensee	Doray Minerals Limited
ACN	138 978 631
Registered business address	Level 1, 1292 Hay Street WEST PERTH WA 6005
Date of amendment	27 January 2017
Prescribed Premises	Category 5: Processing or beneficiation of metallic or non-metallic ore Category 6: Mine dewatering discharge Category 64: Class ll putrescible landfill site
Premises	Andy Well Gold Project Mining Tenement M51/870 MEEKATHARRA WA 6642

Amendment

The Department of Environment Regulation (DER) has amended the above licence in accordance with section 59 of the *Environmental Protection Act 1986* as set out in this Amendment Notice.

Date signed 27 January 2017

Alana Kidd

Manager Licensing – Resource Industries

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

Amendment Notice

This Notice is issued under 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.

Amendment Description

This Amendment Notice is the result of an applicant initiated amendment and relates to a lift at the Tailings Storage Facility (TSF). The existing TSF at Andy Well is an above ground paddock storage comprising of two cells; Cell A and Cell B. The embankments at Cell A and Cell B will be raised by 2m from Reduced Level (RL) 1489m to RL1491m. Cell A is currently inactive, while Cell B is active.

The works will comprise upstream raising of the perimeter embankment and internal embankment, and centreline raising of the decant access ways. The decant structure will also be raised to RL 1491 m.

There is no artificial liner for the TSF. The existing underdrainage system is no longer functioning due to consolidation around the slotted pipework and the system has been decommissioned. There are no seepage control methods in place.

The TSF has been inspected annually by external consultants (Coffey Consulting) and been deemed to be well managed, with tailings deposition and water management conducted in accordance with operating procedures.

The Department of Minerals and Petroleum (DMP) granted approval for the TSF raise on the 18 November 2016 (Registration ID 60833).

Location, environmental siting and potential receptors

Table 1 below lists the relevant human receptors in the vicinity of the prescribed premises.

Residential and Sensitive Premises	**Distance from Prescribed Premises Boundary**
Karalundi Aboriginal Education Community	More than 10 km to the north.
Killara Homestead	More than 25 km to the south-east
Meekatharra	More than 45 km to the south

Table 2 below lists the relevant environmental receptors in the vicinity of the prescribed premises.

Environmental receptor	Distance from Prescribed Premises Boundary
Yalgar River	Approximately 9 kilometers (km) north east and 12 km north west of the Premises
Groundwater	3.87 – 10.53 metres below ground level
Pastoral stock watering bores	Northern Well – Approximately 1.5 km north of the Premises
	Breakaway Well – Approximately 3 km east of the Premises
	Bonus Bore – Approximately 3 km south of the Premises

Risk assessment

Tables 3 and 4 below apply a risk assessment to the potential emissions which may arise from the amendment application. Both tables identify whether these emissions present a material risk requiring regulatory controls.

Risk Assessment

Table 3. Risk assessment for construction of the TSF lift

Activity	Potential emission	Potential receptors	Potential pathway	Potential impacts	Material risk	Reasoning
Construction of the TSF	**Dust:** Release of particulate matter from construction activities and vehicular movement	Karalundi Aboriginal Education Community	**Air:** Transport through air then transfer through respiratory system	Human health impacts – respiratory illness	No	The Delegated Officer considers the distance to human receptors to be too great for health impacts to occur. In addition, construction activities will be of short-term duration. Karalundi Aboriginal Education Community is five times the recommended separation distance.
	Noise and vibration: Associated with construction activities and vehicular movement	Karalundi Aboriginal Education Community	**Air:** Vibration of particles	Human health impacts – amenity impacts	No	The Delegated Officer considers the distance to human receptors to be too great for health impact to occur. In addition, construction activities will be of short-term duration. Karalundi Aboriginal Education Community is five times the recommended separation distance.

Table 4. Risk assessment for the operation of the TSF lift

Activity	Potential emission	Potential receptors	Potential pathway	Potential impacts	Material risk	Reasoning
Operation of the TSF	**Dust:** Release of particulate matter from operation of the TSF lift	Karalundi Aboriginal Education Community	**Air:** Transport through air then transfer through respiratory system	Human health impacts – respiratory illness	No	The Delegated Officer considers the distance to human receptors to be too great for health impacts to occur. Karalundi Aboriginal Education Community is five times the recommended separation distance. Rotation of the tailings discharge through tailings spigots allows the surface of the active cell to remain moist therefore limiting the likelihood of dust generation. The TSF surface is rehabilitated following decommissioning. A salt crust forms on the surface of the inactive TSF cell.
	Waste: Leachate from TSF seepage	Groundwater dependent ecosystems Surrounding vegetation Pastoral stock watering bores	**Land:** Infiltration through soil profile to groundwater	Contamination of surrounding land and groundwater with toxic metals and metalloids, dissolved solids and cyanide affecting soil and groundwater quality and causing vegetation stress or death.	Yes	The Premises is not located within a drinking water area and the surface water systems located on the Premises are minor and non-perennial. Groundwater in the area is used for stock purposes only by pastoral properties. The nearest pastoral bore is located 1.5 km north of the Premises however the inferred direction for groundwater is in a SW direction. The nearest pastoral bore downstream of the TSF is located 3 km away in a southerly direction. Sampling of the nearest pastoral bores to date show seepage at the TSF has not impacted the water quality at the bores. There are no Threatened or Priority Ecological Communities within the survey area and no Declared Rare or Priority flora within the mine disturbance footprint. Existing toe drains are in place for the capture of any seepage from the TSF walls. No seepage has been observed during operations. Originally six groundwater monitoring bores were installed at the TSF. These bores were decommissioned during 2015 when the TSF footprint was increased. Six new groundwater monitoring bores were installed at that time to replace the decommissioned bores. An additional groundwater monitoring bore has been installed further downstream of the TSF following a recommendation made by an independent hydrogeologist. This groundwater monitoring bore is used to identify migration of any seepage from the TSF. All bores are monitored quarterly. The Licensee is required to report the results of the ambient groundwater quality monitoring in the Annual Environmental Report along with a comparison against previous years' data (conditions L4.2.1 and L4.2.2), which will allow DER to review the SWL and see any trends in TDS over time. Groundwater monitoring at the TSF until the end of 2015 indicates seepage from the TSF may have elevated TDS in the groundwater. An independent study (SKM Consulting, 2014) was conducted for the Licence Holder to determine the cause of the elevated TDS levels and the potential impacts. The studies concluded that the cause of the elevated TDS may be a combination of seepage from the TSF,

						underground dewatering activities condensing ions in solution and/or disturbance of a saline lens beneath the TSF. Additionally, the decommissioned monitoring bores may also be providing a conduit for TSF leachate to enter groundwater if they were not properly decommissioned prior to the previous extension of the TSF footprint. The study also suggests that any impacts are expected to be short term with the TDS to reduce over time in the nearby downstream groundwater monitoring bores. DER supports the outcomes from the studies. Recommendations from the consultant's findings were implemented by the Licence Holder and included construction of a seventh TSF monitoring bore, and inclusion of a regional groundwater monitoring bore in the routine quarterly groundwater monitoring programme. These two additional monitoring bores act as 'canary bores' to enable assessment of any impacts on regional groundwater quality. To date no deleterious readings have been recorded at either of the two bores. The Licence Holder has a management plan in place. If an increasing trend in TDS is observed, the Licence Holder has committed to undertake the recovery of seepage from the TSF through the use of the existing groundwater monitoring bores. More recent monitoring results from sampling of the TSF groundwater monitoring bores during 2016 indicates a slight declining trend in the TDS levels for all groundwater monitoring bores with exception of one bore which has remained steady. Standing water levels in all bores indicates a decreasing trend (standing water level is dropping). The Licensee has committed to: • continue quarterly monitoring as per current Licence conditions; • maintain the supernatant water pond around the decant structure below one-third of the distance to the perimeter embankment; • maintain flow meters to monitor water recovery which will be checked against the water balance model predictions; • monthly monitoring and plotting of the standing water levels to assess trends in groundwater movement; and • maintain the decant pond a minimum of 60 metres away from the perimeter embankment. Based on the Licensee controls, the observed declining trend in the TDS levels for all groundwater monitoring bores with exception of one bore which has remained steady, and no nearby sensitive receptors, the Delegated Officer considers that the likelihood of impact to be **unlikely** and the consequence to be **moderate.** The risk rating is therefore **medium**.

	Waste: Overtopping of TSF causing tailings discharge to land	Surface water systems Surrounding soils Surrounding Vegetation Groundwater	**Land:** Direct discharge to soils and infiltration through soils to groundwater	Contamination of surrounding land and groundwater with toxic metals and metalloids, dissolved solids and cyanide affecting soil and groundwater quality and causing vegetation stress or death.	No	The Premises is not located with a drinking water area and the surface water systems located on the Premises are minor and non-perennial. There are no Threatened or Priority Ecological Communities within the survey area and no Declared Rare or Priority flora within the mine disturbance footprint. The 2 metre lift of the TSF embankments has been designed to ensure a minimum total freeboard of 715 mm (300 mm operational freeboard + 200 mm beach freeboard + 215 mm Average Recurrence Interval (ARI)) to prevent overtopping. The Licence Holder evaluated the hazard category of the TSF following the 2 metre raise in accordance with the Department of Minerals and Petroleum guidelines (2013). The hazard category remained at Category 2 which is consistent with the previous design report by Coffey Mining for the initial construction of the TSF. Existing discharge spigots will be relocated to the newly constructed embankments. Tailings deposited into the TSF is conducted sub-aerially via multiple spigots at nominally 20 metre centres on the upstream crest of the embankment. Tailings placement is via several spigots at any given time. Tailings are deposited sub-aerially and spirally in thin layers. Freeboard is inspected daily in accordance with condition 1.3.13. The TSF raise requires engineering certification at the completion of the works to certify that the works have been completed with no material defects. The Delegated Officer considers the material risk of the discharge of tailings from overtopping due to lifted embankments at the TSF to remain unchanged.
	Pipeline rupture to land: Associated with transport of tailings in tailings pipelines	Vegetation adjacent to tailings pipeline alignment Groundwater	**Land:** Direct discharge to soils and infiltration through soils to groundwater	Contamination of surrounding land and groundwater with toxic metals and metalloids, dissolved solids and cyanide affecting soil and groundwater quality and causing vegetation stress or death.	No	The Delegated Officer considers there has been no change in the risk to the environment from the transporting of tailings material in pipelines. There is no change to the existing tailings discharge and return lines which will remain in the same location and are located inside bunded open trenches to contain any spillage resulting from pipeline leaks or bursts during operation. To date no tailings pipeline failures have been reported to DER. There is no change to the annual rate of tailings discharged to the TSF following the TSF raise. The Premises is not located with a drinking water area and the surface water systems located on the Premises are minor and non-perennial There are no Threatened or Priority Ecological Communities within the survey area and no Declared Rare or Priority flora within the mine disturbance footprint. All pipelines are inspected daily for leaks (condition 1.3.13) and where any inspection identifies an appropriate level of environmental protection is not being maintained, corrective action is taken.

Decision

The Delegated Officer has determined that the key emissions associated with the construction or operation of this TSF raise is seepage, and overtopping of the newly constructed embankments.

Structural integrity of the TSF is regulated by DMP who require an annual audit and assessment of the structural stability of the TSF.

The Delegated Officer has imposed conditions to authorise the construction of the embankment lift at the TSF with the works to be certified by a suitably qualified engineer following completion and prior to operation.

The Delegated Officer has determined that should the Annual Environmental Report (as required by condition 4.2.1) indicate potential impacts or areas of concern from the operation of the raised TSF, DER may initiate an amendment to include conditions to impose immediate management actions.

Amendment History

Instrument	Issued	Amendment
L8698/2012/1	7/6/2013	Licence amendment to add Category 5
L8698/2012/1	31/10/2013	Licence amendment to correct administration error
L8698/2012/1	21/11/2013	Licence amendment to increase throughput
L8698/2012/1	17/07/2014	Licence amendment to increase throughput and conversion to new licence template
L8698/2012/1	25/9/2014	Licence amendment to change groundwater monitoring
L8698/2012/1	21/01/2016	Licence amendment to increase the limit for Total Dissolved Solids discharged for mine dewatering and remove monitoring bores TSFMB01-06 and replace with TSFMB08-13
L8698/2012/1	27/01/2017	Amendment Notice 1 Licence amendment for TSF lift.

Amendments

1. The Licence is amended by the insertion of the following condition 1.3.15:

The Licensee shall ensure that each item of infrastructure or equipment specified in column 1 of Table 1.3.6 is designed and constructed in accordance with the requirements specified in column 2 of Table 1.3.6.

Table 1.3.6: Infrastructure or equipment requirements (design and construction) of the TSF Cell A and Cell B embankment lift

Column 1	***Column 2***
Infrastructure	***Requirements (design and construction)***
TSF embankment raise to Cell A and Cell B	*Raised by 2 metres only from RL1489m to RL1491m*
	Minimum embankment freeboard designed to ensure a minimum total freeboard of 715 mm (300 mm operational freeboard + 200 mm beach freeboard + 215 mm ARI)
	Embankments lifted utilising either compacted tailings or compacted oxide mine waste sourced from pit development
	Corresponding central concrete decant tower and causeway are raised by 2 metres
	Clean rock fill placed around slotted precast concrete at the extended decant tower
	Perimeter embankment and decant accessway crests sheeted with a nominal 150 mm thickness of wearing course material
	Tailings spigots located at nominally 20 m centres on the upstream crest of the embankment

2. The Licence is amended by the insertion of condition 1.3.16

The Licensee must not depart from the requirements specified in Table 1.3.6 except:

(a) where such departures are minor in nature and do not materially change or affect the infrastructure; or

(b) where such departure improves the functionality of the infrastructure and does not increase the risks to public health, public amenity or the environment.

If condition 1.3.16 (b) applies, then the Licensee must provide the CEO with a list of departures which are certified as complying with condition 1.3.15.

3. The Licence is amended by the insertion of condition 1.3.17

The Licensee shall submit a construction compliance document to the CEO, following construction of the embankment raise of TSF Cell A and Cell B and prior to operation.

4. The Licence is amended by the insertion of condition 1.3.18

The Licensee must ensure the construction compliance document:

(a) is certified by a suitably qualified professional engineer stating that each item of infrastructure specified in Table 1.3.6 has been constructed in accordance with the conditions of the Licence with no material defects; and

(b) be signed by a person authorised to represent the Licensee and contain the printed name and position of that person within the company.

5. The Licence is amended by the insertion of condition 1.3.19

The Licensee shall operate the embankment raise of TSF Cell A and Cell B in accordance with the conditions of this Licence, following submission of the construction compliance document required under condition 1.3.17.

6. The licence is amended by the addition of the following definitions below:

'Annual Audit Compliance Report' *means a report in a format approved by the CEO as presented by the Licensee or as specified by the CEO from time to time and published on the Department's website'*

'Department' *means the department established under section 35 of the Public Sector Management Act 1994 and designated as responsible for the administration of Division 3 Part V of the EP Act'*

7. The licence is amended by the removal of the Annual Audit Compliance Report template in Schedule 2.

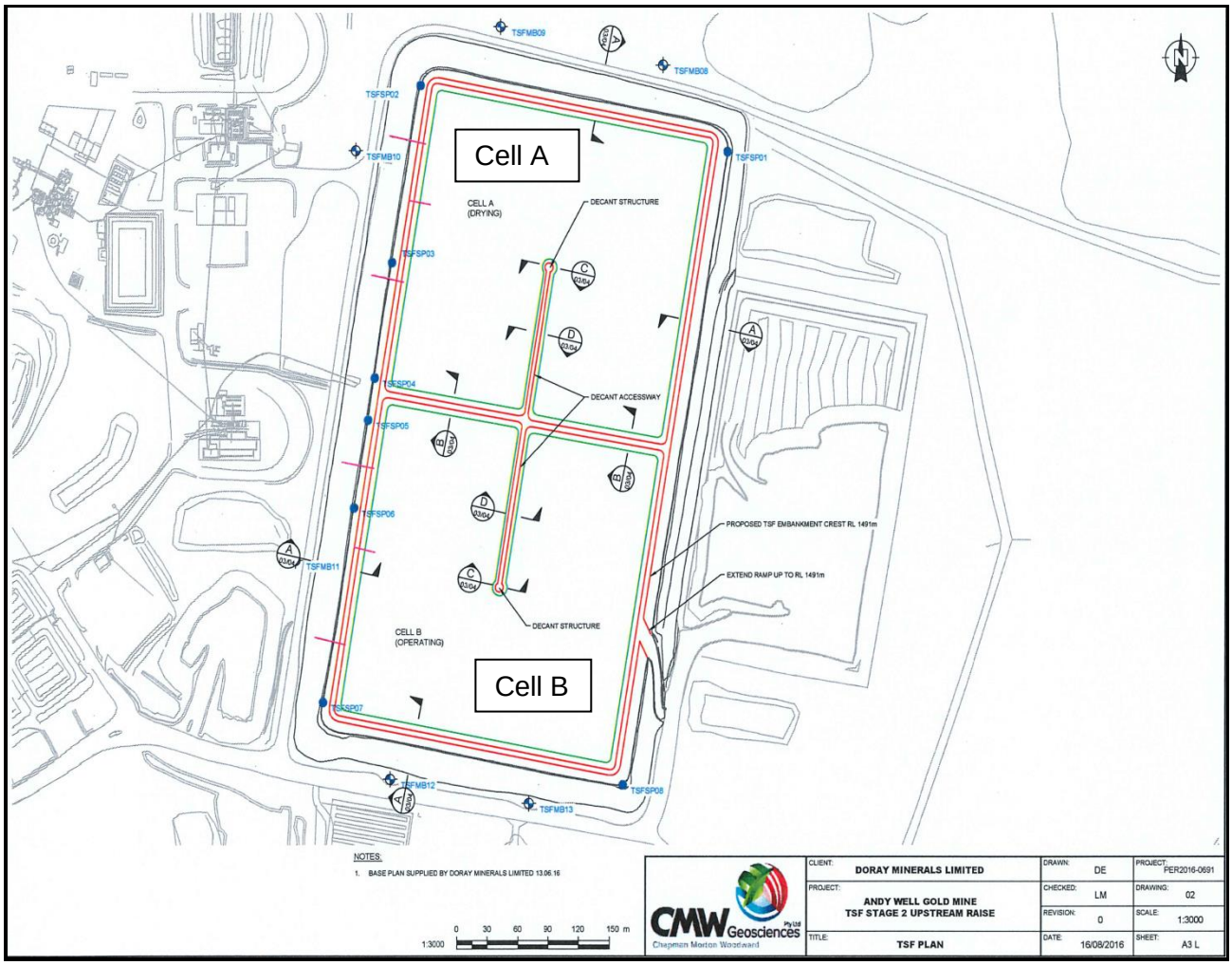
8. Condition 4.1.3 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below.

4.1.3 ~~The Licensee shall complete an Annual Audit Compliance Report indicating the extent to which the Licensee has complied with the conditions of the Licence, and any previous licence issued under Part V of the Act for the Premises for the previous annual period.~~ ***The Licensee must submit to the CEO within 90 days after the end of the annual period, an Annual Audit Compliance Report indicating the extent to which the Licensee has complied with the Conditions of this Licence for the annual period.***

9. The Licence is amended by removing the map in Schedule 1 Map of storage locations and insertion of the map below:

Map of storage locations

The location of the storage area defined in Table 1.3.3 is shown below.



Appendix 1: Key Documents/References

	Document Title	Availability
1	DER *Guidance Statement on Regulatory principals*, July 2015	Accessed at https://www.der.wa.gov.au
2	DER *Guidance Statement on Setting conditions*, September 2015	
3	DER *Guidance Statement on Licence duration*, November 2014	
4	DER *Guidance Statement on Licensing and works approval processes*, September 2015	
5	Licence amendment application and supporting documentation received 3 October 2016	DER record A105017
6	DER notification of proposed amendment dated 24 October 2016	DER record A105018
7	Additional information on groundwater monitoring results received 11 January 2017	DER record A1356630
8	Technical advice regarding seepage from the TSF received 12 January 2017	DER record A1353316
9	Additional information on freeboard following embankment raise at Cell A and Cell B received 18 January 2017	DER record A1362152
10	Doray Minerals Limited comments on draft 21 day amendment notice received 26 January 2017	DER record A1365392

Appendix 2: Summary of Licence Holder Comments

Comments received	Environmental risk	DER consideration of risk
26/01/2017. Doray Minerals has a new registered business address. The direction of the Town of Meekatharra in relation to the Andy Well Gold Mine was incorrectly described. Condition 1.3.15 in Amendment 1 referred to Table 1.2.6, however this condition should refer to Table 1.3.6.	Nil risk – administrative change	The Delegated Officer has considered and agreed to the changes. Updated registered business address, corrected direction of nearest town and corrected amendment 1 condition.