

# **Amendment Notice 1**

Licence Number	L8151/2005/2
Licence Holder	Independence Jaguar Pty Ltd
ACN	060 620 721
Registered business	Suite 4, Level 5
	85 South Perth Esplanade
	SOUTH PERTH WA 6151
Date of amendment	8 March 2017
Prescribed Premises	5 – processing of ore and 6 – mine dewatering
Premises	Jaguar Operation
	Mining tenements M37/44, M37, 515, M37/1132, M37/1228, M37/1230, M37/1231, M37/1257 and M37/1290

#### Amendment

The Chief Executive Officer (CEO) of 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: 8 March 2017

#### Tim Gentle

#### 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**

On 21 December 2016 Independence Jaguar Pty Ltd (Independence) submitted an application to DER for an amendment to the Jaguar Operation licence L8151/2005/2. The licence amendment application relates to the raising of tailings storage facility (TSF) 2 for the Jaguar zinc-copper-silver-gold mine. The height of the facility is currently at 8 m RL and the proposed lift is for Stage 2, a 2.5 m lift using upstream construction methods to give a total height of 10.5 m (RL 472.5 m).

TSF 2 is a circular paddock-type facility with embankments constructed of mine waste. Tailings are deposited by multi-point spigotting. The raising will utilise compacted dry tailings borrowed from within the facility. The downstream batter of the tailings embankment will be capped with a minimum of 0.5m thick clayey mine waste in order to reduce ingress of oxygen and water into the embankment. The decant rock-ring and decant causeway will also be raised.

Independence's timeframe is to complete TSF2 lift at the end of Q3 for the 2017 financial year. The processing plant currently operates at 550 000 tpa. A Stage 3 lift will be required in the future for a further 2.5 m to bring the total height to RL 475 m.

In addition, an amendment was applied for in April 2016 to change the occupier name from Independence Jaguar Limited to Independence Jaguar Pty Ltd. The change in occupier name will be reflected in this amendment notice.

#### **Risk Assessment**

Tables 1 and 2 below apply a screening level risk assessment for the potential emissions which may arise from the proposal. The tables identify whether these emissions present a material risk requiring regulatory control.

Note: The geotechnical stability of the tailings storage facility, including risk of tailings wall failure do not form part of the current assessment as these are matters regulated by the Department of Mines and Petroleum under mine safety legislation.

## Table 1 – Risk assessment for proposed amendments during construction

Activity	Potential emission	Potential receptors	Potential pathway	Potential impacts	Material risk	Reasoning
Cat 5 Processing or	<b>Dust:</b> associated with construction activities of TSF2 raise	Nearby residents: The closest sensitive receptor is the pastoral	<b>Air:</b> Particulate matter (fugitive dust)	Dust can cause health and amenity impacts to humans.	No	The Delegated Officer considers there is no material risk due to the distance to the nearest sensitive receptor.
metallic or non- metallic ore	<b>Noise:</b> associated with construction activities of TSF2 raise	homestead, located about 30 km south of the Jaguar Operations.	<b>Air:</b> Noise generated by the operation of equipment during construction	Amenity impacts to nearby noise sensitive receptors	No	The Delegated Officer notes the lack of sensitive receptors and determines that there is no material risk of noise impact.

## Table 2 – Risk assessment for proposed amendments during operation

Activity	Potential emission	Potential receptors	Potential pathway	Potential impacts	Material risk	Reasoning
	Dust: associated with operational activities Nearby residents: The closest sensitive receptor is the pastoral	<b>Air:</b> Particulate matter (fugitive dust)	Dust can cause health and amenity impacts to humans.	No	The Delegated Officer considers there is no material risk due to the distance to the nearest sensitive receptor. The substantive offenses of the <i>Environmental Protection Act 1986</i> provide enforceable prohibitions for dust emissions that result in pollution or environmental harm.	
Cat 5 Processing or beneficiation of metallic or non-	<b>Noise:</b> associated with operational activities	homestead, located about 30 km south of the Jaguar Operations.	<b>Air:</b> Noise generated by the operation of equipment during construction	Amenity impacts to nearby noise sensitive receptors	No	The Delegated Officer notes the lack of sensitive receptors and determines that there is no material risk of noise impact.
metallic ore	Waste: leachate from TSF seepage	Groundwater dependent ecosystems, surrounding vegetation	Land: infiltration through soil profile to groundwater	Contamination of surrounding land and groundwater with metals and metalloids, sulfide minerals (if present), dissolved solids and affecting soil and groundwater quality and causing vegetation stress or death.	Yes	<ul> <li>TSF2 was originally constructed in 2013 under works approval W5262/2012/1.</li> <li>Groundwater in the vicinity of the project is contained in fractured rock and alluvial sediments, with depth ranging from 28 to 32 m below ground level (mbgl). TSF2 was designed with a herringbone structure where seepage is channeled to the southwest corner and pumped back to the processing plant for re-use.</li> <li>Monitoring has occurred in a series of 12 bores since the operation of TSF2 and has shown a slight rise in SWL.</li> <li>Monitoring results of the quality of the water from all 12 bores, as indicated in the 2016 Annual Environmental Report, shows TDS of less than 1,000 mg/L which is classed as potable. A pastoral bore does exist 1.1 km northeast of the TSF. This bore is up-gradient of the TSF and historically supplied supplementary water to the RO plant for drinking water, however, this has not been used since mid-2014 as it was not</li> </ul>

		deemed feasible. It is now only used as a monitoring bore. There are no
		beneficial uses of the groundwater within the vicinity of the operation.
		There are no specified ecosystems identified as per DER's Guidance
		Statement on Environmental Siting within the vicinity of the operation
		Statement of Environmental Starg warm are vienity of the operation.
		A second time second
		A vegetation survey was carried out prior to the construction of 1SF2 in
		2012. There are no Threatened Ecological Communities (TEC) or
		Declared Rare Flora species within the project area. Seven photo
		monitoring sites have been set up around the TSF2 to monitor any
		impacts the facility may be having on vegetation. So far, there are been
		no impacts resorted. No found of opportunity of the implementation of the intervention of the interventin
		no impacts recorded. No fauna of conservation significance occur within
		the project area.
		Testing of the ore the TSF receives indicated that the material is
		potentially acid forming due to the fresh nature of the sulfide ore.
		TOFO was designed with the following means not so the date of any me
		1 SF2 was designed with the following management methods to ensure
		seepage does not occur:
		<ul> <li>The TSF was constructed to achieve a permeability of</li> </ul>
		between 1 x $10^{-8}$ m/s and 1 x $10^{-9}$ m/s:
		<ul> <li>A commitment to install production boros in the future if</li> </ul>
		• A communent to instain production boles in the future if
		required to maintain groundwater water levels to less than 6
		mbgl;
		<ul> <li>TSF2 includes a network of underdrainage pipelines to direct</li> </ul>
		tails liquor to wells on the downstream side of the TSF
		ambankmonte liquor is then resirvulated back to the
		enbankments – induoris then recirculated back to the
		processing plant,
		<ul> <li>By removing the tailings liquor, the hydrostatic pressure on the</li> </ul>
		basin liner is decreased, resulting in less seepage to the
		groundwater:
		<ul> <li>Underdrainage features a controlly located berring hope</li> </ul>
		<ul> <li>Ordertrainage reactines a centrally located hering bone</li> </ul>
		pattern and an upstream perimeter line;
		A two meter deep seepage recovery trench downstream of the
		embankment which lies lowest in the landscape (south west
		corner):
		Strategic spigot operation controls supernatant pond location
		<ul> <li>Strategic spigor operation controls superintatalli pollutocation, besch design and tails appresidation and driver in an</li> </ul>
		beach design and tails consolidation and drying;
		<ul> <li>A monitoring regime with the 12 monitoring bores has been</li> </ul>
		established;
		<ul> <li>Vibrating wire piezometers are installed within the</li> </ul>
		ombankamente ta detect the presence of water
		If the event leachate from seepage were to occur, there is a lack of
		sensitive receptors in the vicinity of the project. However, given the good
		quality of the water with future use and protection in mind, the Delegated
		officer considers that the consequence would be <b>moderate</b> and the
		likelihood is <b>possible</b> . Therefore the risk rating for appendix and the
		incentiood is possible. Therefore the fisk fatting for seepage is medium.

						The Delegated Officer considers existing conditions to manage the current TSF are satisfactory for the operation of facility at the new height. The Licence requires quarterly ambient groundwater monitoring through condition 3.4.1 of the twelve monitoring bores. This monitoring will indicate whether seepage and groundwater contamination is occurring. The Licence Holder is required to continue to monitor as per the condition and report on these in the Annual Environmental Report, including identifying any trends or whether the water levels have had any environmental impacts. Existing condition 1.2.6 requires the Licensee to undertake an annual water balance which will identify amount of seepage occurring. The Delegated Officer considers existing conditions to manage TSF seepage are satisfactory for the proposed raise of TSF2.
Cat 5 Processing or beneficiation of metallic or non- metallic ore	Waste: associated with tailings pipeline rupture or failure	Terrestrial ecosystems - surrounding soils, vegetation and surface water	Direct discharge	Contamination of surrounding soils with metals and metalloids, sulfide minerals (if present), dissolved solids and affecting soil and groundwater quality and causing vegetation stress or death.	Yes	<ul> <li>Independence committed to the following management methods for the tailings pipelines in the original works approval which still apply:</li> <li>Tailings delivery and return water pipelines will be 'double piped' and raised where they cross drainage lines;</li> <li>Emergency discharge sumps on each side of drainage crossing points to capture tailings from any ruptures;</li> <li>Isolation valves have been installed at the tailings discharge pump and return water pump;</li> <li>Telemetry system in place on the tailings delivery and return water pipelines to alert plant control of any leaks;</li> <li>A bund on the downstream side of the embankment crest will capture any spills from the spigot distribution pipeline; and</li> <li>Surface hydrology modelling indicated that natural topographic features divert uncontaminated surface water flow around the TSF.</li> </ul> The nearest surface water body is Sullivan Creek, located approximately 10 km to the south of the TSF. Drainage in the project area consists of braided channels running north to south. No other surface water bodies exist in the area. Based on the Licence Holder controls, the Delegated officer considers that the consequence would be <i>moderate</i> and the likelihood is <i>unlikely</i> . Therefore the risk rating for pipeline rupture is <i>moderate</i> . Existing conditions on the licence are in place to manage pipelines containing tailings, including twice daily I inspections of tailings lines for visual integrity checks.

					associated with the raise of TSF2.
					<ul> <li>associated with the raise of TSF2.</li> <li>Condition 1.2.12 ensures pipelines containing tailings will be managed appropriately and corrective action is taken in the event that pipelines leak or rupture.</li> <li>TSF2 has been designed as follows to ensure overtopping is avoided: <ul> <li>Tailings in the form of slurry will be discharged sub-aerially and cyclically into the facility in discrete layers not exceeding 300 mm thickness to allow optimum density and strength gain by subjecting each layer to a drying cycle. Deposition will take place via multiple spigots located on the upstream perimeter embankment crest.</li> <li>Spigotting is to be carried out such that the supernatant pond is maintained around the decant (rock ring type). The pond is to be maintained away from the perimeter embankments at all times. Regulating the size of the surface water pond will</li> </ul> </li> </ul>
Waste: overtopping of tailings due to heavy rainfall resulting in decant water outside of containment infrastructure	Terrestrial ecosystems - surrounding soils, vegetation and surface water	Land and water	Contamination of surrounding soils with metals and metalloids, sulfide minerals (if present), dissolved solids and affecting soil and groundwater quality and causing vegetation stress or death.	Yes	<ul> <li>reduce seepage and evaporation from the facility and assist in optimizing water recovery and tailings density.</li> <li>Water from TSF2 will be removed from the facility and pumped back to the process plant via a decant pump located within the 'rock-ring'.</li> <li>The tailings storage area will assume the form of a truncated prism with a depressed cone on the top surface. The minimum decant pond freeboard for TSF2 under normal operating conditions is 0.7m (below the embankment crest) and allows for temporary storage of the 1 in 100 year ARI, 72-hour event whilst maintaining required total freeboard.</li> <li>Based on the Licence Holder controls and the lack of sensitive receptors in the vicinity of the project, the Delegated officer considers that the consequence would be <i>moderate</i> and the likelihood is <i>rare</i>. Therefore</li> </ul>
					Existing condition 1.2.4 requires that a minimum operational freeboard of 300 mm is maintained. Inspection of infrastructure, include freeboard inspection, is specified in Table 1.2.5. The Delegated Officer considers that existing conditions in the Licence ensure the operation of TSF2 is managed appropriately so as to avoid overtopping.

	Waste: supernatant water accessibility to surrounding wildlife	Terrestrial wildlife and birdlife.	Direct discharge	Consumption of decant water containing metals and metalloids and dissolved solids could cause wildlife or bird mortality.	Yes	Independence currently inspect the TSF twice daily. This inspection includes checking for the presence of fauna. The TDS of the decant averages 10,000 mg/L. This is considered brackish and could be attractive to fauna. However records of inspections show no fauna present in either TSFs in the last three years. Independence has also stated that fauna may be dissuaded from the facility due the pungent odour of the water. The Delegated Officer considers that the consequence of fauna consuming the water would be <i>moderate</i> but the likelihood is <i>rare</i> . Therefore the risk rating is <i>medium</i> . The Delegated Officer considers that the current TSF visual inspection conditions are sufficient to ensure any impacts on fauna are monitored and controlled. No further conditions are required for the licence.
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## Decision

The Delegated Officer has determined that the key potential emissions associated with the proposed lift of TSF2 are waste via tailings seepage, pipeline spills or possible TSF overtopping. There may also be potential for fauna or birds to be harmed if they access the tailings pond.

The Delegated Officer has determined that the construction and operation of the lift will not result in emissions which are unacceptable to public health or the environment.

Independence is required to operate in accordance with existing licence conditions relating to TSF management.

Instrument	Issued	Amendment
L8151/2005/2	23/08/2013	Licence amendment to include TSF2
L8151/2005/2	19/12/2013	Licence amendment to increase premises production and emissions to land to emission points L1 and L2
L8151/2005/2	1/05/2014	Licence amendment for an extension of the date of completion for compliance with condition 4.1.1 until 30 June 2014
L8151/2005/2	1/05/2014	Licence amendment to remove emissions to land limits.
L8151/2005/2	8/03/2017	Amendment Notice 1 Licence amendment to allow for stage 2 for the TSF2 raise.

#### **Amendment History**

## Amendment

1. The Licence Holder's name is amended from the name below:

Independence Jaguar Limited

To the new name below:

Independence Jaguar Pty Ltd

2. Condition 1.2.9 to be added to the Licence as below:

In relation to the construction of the Stages 2 and 3 TSF raises, the Licensee must construct the infrastructure in Column 1 of Table 1.2.6 at the location specified in Column 2 in accordance with the requirements set out in Column 3.

Table 1.2.6: Infrastructure requirements

Column 1	Column 2
Infrastructure	Requirements (design and construction)

Tailings storage facility 2 raise (stage 2)	<i>The embankment crest level of stage 2 will be RL 472.5 m</i>
	The raise will utilise compacted dried tailings
	borrowed from within the facility
	The downstream batter of the tailings
	embankment will be capped with a minimum of
	0.5m thick clayey mine waste in order to reduce
	ingress of oxygen and water into the
	embankment

#### 3. Condition 1.2.10 to be added to the Licence as below:

The Licensee must not depart from the requirements specified in Table 1.2.6 except:

- (a) Where such departures are minor in nature and do not materially change or affect the infrastructure; and
- (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 1.2.10(b) applies, then the Licensee must provide the CEO with a list of departures which are certified as complying with condition 1.2.9.

#### 4. Condition 1.2.11 to be added to the Licence as below:

The Licensee shall submit a construction compliance document to the CEO, following construction of both stages of TSF2 lift and prior to operation.

#### 5. Condition 1.2.12 to be added to the Licence as below:

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 1.2.6 has been constructed in accordance with the conditions of the Licence with no material defects; and
- (b) Be signed by a person authorized to represent the Licensee and contain the printed name and position of that person within the company.
- 6. Condition 1.2.13 to be added to the Licence as below:

The Licensee shall operate TSF2 in accordance with the conditions of this Licence, following submission of the construction compliance document required under condition 1.2.11.