



# Decision Document

## *Environmental Protection Act 1986, Part V*

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**Proponent:** Agnew Gold Mining Company Pty Ltd

**Licence:** L5110/1988/10

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**Registered office:** Level 5, 50 Colin Street  
WEST PERTH WA 6005

**ACN:** 098 385 883

**Premises address:** Lawlers Gold Mine  
Mining tenements M36/91, M36/171, M36/208, M36/277, M36/622,  
L36/161, L36/162, G36/36, G36/37, G36/38, and G36/42  
LEINSTER WA 6437  
As depicted in Schedule 1 of the licence.

**Issue date:** Thursday, 13 October 2011

**Commencement date:** Wednesday, 19 October 2013

**Expiry date:** Sunday, 18 October 2020

### **Decision**

Based on the assessment detailed in this document the Department of Environment Regulation (DER), has decided to issue a licence amendment. DER considers that in reaching this decision, it has taken into account all relevant considerations and legal requirements and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by: Neville Welsh  
Senior Licensing Officer

Decision Document authorised by: Tim Gentle  
Manager Licensing – (Resources Industries)



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## 1 Purpose of this Document

This Decision Document explains how DER has assessed and determined the application for a licence amendment and provides a record of DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's assessment and decision making under Part V of the *Environmental Protection Act 1986*. Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their premises.

## 2 Administrative summary

Administrative details		
Application type	Works Approval <input type="checkbox"/> New Licence <input type="checkbox"/> Licence amendment <input checked="" type="checkbox"/> Works Approval amendment <input type="checkbox"/>	
Activities that cause the premises to become prescribed premises	<b>Category number(s)</b>	<b>Assessed design capacity</b>
	5	1 000 000 tonnes per year
	6	1 000 000 tonnes per year
	89	1 100 tonnes per year
Application verified	Date: 09/12/2015	
Application fee paid	Date: N/A	
Works Approval has been complied with	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	
Compliance Certificate received	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	
Commercial-in-confidence claim	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Commercial-in-confidence claim outcome	N/A	
Is the proposal a Major Resource Project?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the <i>Environmental Protection Act 1986</i> ?	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"/>
Is the proposal subject to Ministerial Conditions?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Ministerial statement No: N/A EPA Report No: N/A
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the <i>Environmental Protection Act 1986</i> )?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Department of Water consulted Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the premises within an Environmental Protection Policy (EPP) Area Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If Yes include details of which EPP(s) here.		
Is the premises subject to any EPP requirements? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If Yes, include details here, eg Site is subject to SO <sub>2</sub> requirements of Kwinana EPP.		

### 3 Executive summary of proposal

#### Premises description and licence summary

Agnew Gold Mining Company Pty Ltd (Agnew Gold) is wholly owned by Goldfields Limited; an international producer of gold with operating mines in Australia, Ghana, Peru and South Africa. Agnew Gold purchased Lawlers Gold Mine (Lawlers) from Barrick (Australia Pacific) Limited in October 2013.

Lawlers is located approximately 9km south of Agnew and 30km south-east of Leinster, Western Australia. Lawlers consists of one underground operation (Fairlyland), a mill and numerous historic open-cut pits and associated waste rock dumps across mining and general purpose leases.

Lawlers Gold Mine was originally assessed as a “prescribed premises” under category 5 (processing or beneficiation of metallic or non-metallic ore), 6 (mine dewatering), 33 (chemical blending and mixing), 63 (class I inert landfill site), 64 (class II or III landfill site) and 85 (sewage facility) under schedule 1 of the Environmental Protection Regulations 1987.

The Lawlers gold processing plant uses a carbon-in-pulp (CIP) process to separate gold oxide from primary ores. Ore is milled and mixed with lime and water to form resultant slurry which is passed through a leach and absorption circuit consisting of various agitated vessels, leaching tanks and absorption tanks containing carbon. Waste in the form of tailings is pumped along a bunded pipeline corridor to a two celled tailings storage facility (TSF) where it is discharged in a manner that maximises solids consolidation and process water return.

To ensure the TSF maintains compliance with the International Cyanide Compliance Code (ICMC) the tailings must have a cyanide concentration less than 50 parts per million (ppm) when the tailings are deposited. A hot Caro’s acid plant is present onsite for the mixing and blending of hydrogen peroxide and sulphuric acid to form H<sub>2</sub>SO<sub>5</sub> which is used for rapid and effective deconstruction of free and Weak Acid Dissociable (WAD) cyanide in the tailings. Due to the instability of this mixture, the solution must be prepared onsite and used quickly after preparation. The mixture enters the tailings hopper where the cyanide slurry and sulphuric acid mixture remain for a short residence time to complete the cyanide reaction.

A wastewater treatment plant (WWTP) with the capacity to treat up to 80m<sup>3</sup> per day was located at the Lawlers accommodation village. Grey and black water was treated by the WWTP using extended aeration activated sludge with separation and denitrification. Treated wastewater from this process was discharged into the tailings storage facility (TSF) for reuse within the processing circuit, whilst



solid waste was removed by a licensed contractor to the Leonora Sewage Treatment Plant for disposal.

Groundwater is sourced from a number of locations across the Lawlers operation and is used for various purposes. Water extracted from the Fairyland pit and Daisy Queen pit is used for mineral ore processing and dust suppression. The Fairyland Borefield located approximately 6.5km to the north-east of the processing plant supplies Lawlers with groundwater for domestic water purposes.

Previously waste facilities at Lawlers were licensed under category 63 (class I inert landfill site) and 64 (class II or III). To ensure consistency with DER's approach for licensing mine sites that manage waste facilities, these two categories were removed and substituted with category 89. Lawlers have two operational landfills onsite due to the large geographic area encompassed in the licence. These facilities include the Lawlers and Fairyland landfill sites which reside within waste rock dumps. On average, Lawlers dispose of 1100 tonnes of waste per year.

### **5 May 2016 Amendment**

This licence amendment was proponent initiated to amend the mining tenements of the Premises which subsequently have a flow on effect requiring amendments to licence conditions relevant to those tenements removed. The amendment of tenements resulted in the revision and replacement of schedule 1 maps and figures. This amendment also provided the opportunity to address redundant conditions and align the licence with the new licence format.

Errors made during the last amendment of 20 June 2014 in transposing ambient groundwater limits and targets have been corrected. The analytes for the mine dewatering quality monitoring program have also been amended to be consistent with analytes sampled in the ambient groundwater monitoring program.

Categories 33 and 85 were removed from the licence as mixing of cyanide no longer occurs on the Premises (category 33) and the Wastewater Treatment Plant has been decommissioned and removed (category 85).

### **23 May 2016 Amendment**

An administrative amendment was completed to correct errors in the Premises description, in the authorised volume of waste able to be disposed of in condition 1.2.1, Table 1.2.1 and in the frequency of landfill cover requirements in condition 1.2.8, Table 1.2.4.



## 4 Decision table

All applications are assessed under the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987*, and the risk matrix attached to this Decision Document in Section 6 and DER's Industry Regulation Emissions and Discharges Assessment Framework. Where other references have been used in making the decision they are detailed in the decision table.

DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
Tenement amendment and requested amendments	N/A	<p>Tenements M36/174, M36/314, L36/43, L36/44, L36/83, L36/108 and L36/196 have been removed from this licence. The removal of these tenements has resulted in amendments to conditions 1.3.2, 2.5.1, 3.5.1, 3.6.1.</p> <p>This amendment updates former condition 1.3.5 inspection frequency from 'Daily' to 'Monthly', plus former condition 3.8.1 will be amended to rectify a previous error to change targets to 6 mbgl and limit to 4 mbgl. As part of the licence format review, all targets will be removed from the licence.</p> <p>Schedule 1 maps 1 to 4 have been replaced with more recent accurate maps, Map 5 remains unchanged and map 6 has been removed from the licence. Schedule 2 Form ET1 has been removed and substituted by existing form N1.</p>	N/A
Interpretation	L1.1.3 - L1.1.4	<p>The definitions of 'code of practice for the storage and handling of dangerous goods', 'dangerous goods', 'landfill waste classification and waste definitions 1996 (as amended December 2009)' and 'fugitive emissions' have been removed.</p> <p>The definition of 'acceptable criteria', 'clean fill', 'CEO' for the purpose of correspondence, 'contaminated solid waste', 'environmentally hazardous material', 'inert waste type 1', 'inert waste type 2', 'special waste type 1', 'special waste type 2' and 'TSF' have been either added or amended to reflect the most current definitions.</p>	N/A



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
<b>General conditions</b>	N/A	<p>Former Condition L1.2.1 of the previous licence, which specified that the Licence did not authorise pollution and unreasonable emissions, has been removed as the condition is not valid or enforceable and is addressed under the general provisions of the <i>Environmental Protection Act 1986</i>.</p> <p>Former Condition L1.2.2, related to pollution control and monitoring equipment, has been removed from the licence as it is unclear as to which monitoring or pollution control equipment it relates to and as the site has no pollution control or monitoring equipment specified within the Licence, this condition is not applicable to this site.</p> <p>The previous licence included conditions L1.2.3 and L1.2.4 which related to specified storage and clean-up requirements for environmentally hazardous materials. These conditions have been removed from the licence. It is the Licensee's responsibility that environmentally hazardous materials are stored appropriately in a manner which prevents discharge to the environment. Any discharges to the environment may be subject to the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i>.</p> <p>Former condition L1.2.5 which relates to separation of stormwater from potential contamination sources is not clear or certain and does not specify what stormwater infrastructure is required to be constructed / maintained or what specific management actions are required and is removed from the licence.</p>	<i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i>
<b>Premises operation</b>	L1.2.1 - L1.2.9	<p>As there are no longer any conditions in the 'General Conditions' section, the 'Premises operation' conditions and tables have been re-numbered L1.2.1 to L1.2.9.</p> <p>Conditions L1.2.4, L1.2.5, L1.2.7 and Table 1.2.4 have been amended to remove the term 'as soon as practicable' as this term is invalid and unenforceable.</p>	
	L1.2.1	<p>There have been amendments to the <i>Environmental Protection (Controlled Waste) Regulations 2004</i> which include new waste codes for controlled wastes.</p> <p>Table 1.2.1 named 'Management of waste' has been amended to reflect the Controlled Waste</p>	<i>Environmental Protection (Controlled Waste) Regulations 2004</i>



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p>changes and column titled 'Waste Code' has been inserted.</p> <p>See Appendix A for DER assessment of asbestos waste facilities.</p> <p><b>23 May 2016 Administrative Amendment</b></p> <p>A correction has been made to the permitted volume of waste for disposal in Table 1.2.1 in order to ensure consistency with the allowed amount under category 89.</p>	<p><i>Environmental Protection (Rural Landfill) Regulations 2002</i></p> <p><i>Environmental Protection Act 1986</i></p> <p>DER Guidance Statement: <i>Licences and Works Approvals process</i> (September 2015)</p>
	L1.2.2	Due to the change in tenements covered within the Premises boundary, containment infrastructure located at the New Holland Mine (Genesis Turkey's Nest and Bioremediation Pad) have been removed from the licence. The containment point reference column has been removed as it is now redundant.	Application supporting documentation
	L1.2.2 L1.2.3 - L1.2.5	DER's assessment and decision making is attached as Appendix B.	<i>Environmental Protection Act 1986</i>
	L1.2.6	<p><b>Pipelines - Emergency Operation</b></p> <p><u>Emission Description</u></p> <p><i>Emission:</i> Environmentally hazardous materials including hypersaline mine dewater, tailings slurry or tailings liquor (supernatant) released to land from a pipeline failure.</p> <p><i>Impact:</i> Hypersaline water, tailings slurry or tailings liquor released to vegetation may result in vegetation impact or death.</p> <p><i>Controls:</i> Tailings delivery and water return pipelines will be situated within bunded drains that contain catchment pits situated at low points along the pipeline route for the containment of</p>	<i>Environmental Protection Act 1986</i>





DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p>spills. In the event of a pipeline failure, the drains will be able to hold the spilt hypersaline water within the sumps where it can be managed and recovered. A telemetry system with automatic cut-off sensors will be installed as part of the pipeline infrastructure which can alert operators to pipeline leaks and failures.</p> <p><u>Risk Assessment</u> <i>Consequence:</i> Minor <i>Likelihood:</i> Rare <i>Risk Rating:</i> Low</p> <p><u>Regulatory Controls</u> Condition 1.2.6 specifies that pipelines containing environmentally hazardous materials are either required to be equipped with automatic cut-outs in the event of a failure; have secondary containment sufficient to contain the spill; and/or have telemetry systems and pressure sensors installed to detect leaks and failures.</p> <p><u>Residual Risk</u> <i>Consequence:</i> Minor <i>Likelihood:</i> Rare <i>Risk Rating:</i> Low</p>	
	L1.2.8	<p><b>23 May 2016 Administrative Amendment</b></p> <p>Frequency of placement of cover on the landfills has been corrected to fortnightly for inert waste type 2, and weekly for putrescible waste. Refer also to Appendix A for DER's assessment and decision making.</p>	Application supporting documentation
Emissions general	L2.1.1	<p>Condition L2.1.1 has been amended to remove the terms 'or target' and 'any part of section 2 of'. As this was a previous licence condition an assessment was not required however validity and enforceability reconsidered.</p> <p>Former licence sections L2.2 to L2.4 plus sections L2.7 and L2.8 have also been removed as</p>	<p><i>Environmental Protection Act 1986</i></p> <p>Application supporting documentation</p>





DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		there are no conditions in each of these sections.	
<b>Point source emissions to groundwater including monitoring</b>	L2.2.1	Condition L2.5.1 has been renumbered to L2.2.1. Due to the change in tenements forming the Premises' boundary, emission point 'Hidden Secret pit' has been removed from Table 2.2.1 as it is no longer within the Premises boundary.  DER's assessment and decision making in relation to point source emissions to groundwater is included as Appendix C.	<i>Environmental Protection Act 1986</i>  Application supporting documentation
<b>Fugitive emissions</b>	N/A	Former Licence conditions L2.6.1 to L2.6.2 requiring reasonable and practical measures to be implemented to reduce dust emissions and prevent visible dust emissions from crossing the premises boundary have been removed due to administrative changes in the way DER is conditioning fugitive emissions.	N/A
<b>Noise</b>	N/A	Noise generated from the Lawlers operation originates from the crusher, milling circuit, haulage and mobile equipment associated with the processing plant. However, given the nearest sensitive receptor is located approximately 30km from the mine site (township of Leinster), the impact of any noise emissions is likely to be minimal. No specified conditions relating to noise are included in the licence and will be managed under the provisions of the <i>Environmental Protection (Noise) Regulations 1997</i> .	<i>Environmental Protection (Noise) Regulations 1997</i>
<b>Monitoring general</b>	L3.1.1, L3.2.1	Condition L3.1.1 remains unchanged.  Former licence sections L3.2 to L3.4 plus sections L3.7 and L3.9 have been removed as there are no conditions to these sections that require risk assessment.  Former condition L3.5.1 has been renumbered to L3.2.1. Due to the change in tenements forming the Premises boundary the emission point 'and from Vivien pit to Hidden Secret pit'	<i>Environmental Protection Act 1986</i>  Application supporting documentation



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		was removed from the Table.	
Monitoring of inputs and outputs	L3.3.1	Condition L3.6.1 has been renumbered to 3.3.1. The application to amend has requested the removal of 'Mine dewatering discharged from Vivien pit to Hidden Secret Pit' from the inputs and outputs table. This change presents low risk and therefore minimal impact to the environment and is considered an acceptable licence amendment.	<i>Environmental Protection Act 1986</i>  Application supporting documentation
Ambient environmental quality monitoring	L3.4.1	<p>Condition L3.8.1 and Table 3.8.1 has been renumbered to 3.4.1. The application to amend has requested the replacement of the target and limits values of 6 and 4 mbgl respectively. This was also an error made by DER at the last amendment of 20 June 2014.</p> <p>DER has also corrected the error of the ambient groundwater quality limits for bores L8 and Satellite Well being classed instead as targets. Previous licences prior to 2014 imposed the groundwater quality parameters as limits given the potential to impact on a downstream groundwater resource that is used for livestock. A stock bore, Butchers Well, is located 6km south-southwest of TSF2 and Lawlers Creek to the south west.</p> <p>Frequency of monitoring of metals and metalloids in groundwater bores surrounding the TSF has been reduced to annual monitoring, given the site is in care and maintenance. If then event that operations recommence, this frequency will require review.</p> <p>Refer also to DER's assessment and decision making in relation to the Tailings Storage Facility operation in Appendix B.</p> <p>DER considers the use of targets as not enforceable as it does not clearly indicate an outcome for the licensee to achieve. Therefore targets were removed from this table and outcome based limits will remain in the licence.</p>	<i>Environmental Protection Act 1986</i>  L5110/1988/10 Amendment date: 14 December 2012
Information	L4.1.1 to L4.1.3, L4.2.1 to 4.2.6	As the 'Improvement' sections of the licence have been removed, the 'Information' section has been re-numbered as number 4.	<i>Environmental Protection Act 1986</i>



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
	L4.3.1	<p>Previous condition L5.1.2 has been removed. This condition required any person who was left in charge of the Premises, to be aware of the licence conditions. This condition is not clear or enforceable as knowledge of licence conditions does not prevent breaches from occurring, and it is not a defence to offences under the <i>Environmental Protection Act 1986</i> if the Licensee or its agents claim they are unaware of the conditions.</p> <p>Condition L4.2.1 has been amended to reflect the new numbering of conditions referred to in the table.</p> <p>Condition L4.3.1 has been amended to require notification if any limit of the licence is breached (i.e. limit exceedances from table 3.4.1).</p>	
Licence Duration		<p>This licence was subject to compliance inspection and annual environmental review in 2015 and the Premises has been risk assessed as having a low risk to the environment and public health.</p> <p>In accordance with the DER's Guidance Statement, <i>Licence duration</i> (Revised May 2015), and consideration to extended the licence period for 20 years will be assessed when this licence expires. The licence expiry date has been extended to 18 October 2020.</p>	DER's Guidance Statement, <i>Licence duration</i> (Revised May 2015)



## 5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
08/04/2016	Proponent sent a copy of draft instrument	Comments received 13/04/2016.	Licensee comments were not included in final Licence.
05/05/2016	Licence issued.	Licensee noted errors in signed Licence regarding previous comments.	DER has made an administrative amendment to the Licence to correct identified errors.
23/05/2016	Proponent sent a copy of draft updated instrument	No comments.	
23/05/2016	Amended licence issued.		



## 6 Risk Assessment

*Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management*

**Table 1: Emissions Risk Matrix**

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High



## Appendix A

### Premises Operation – Waste Facilities

#### Normal Operation

##### Emission Description

*Emission:* Asbestos fibres and putrescible waste leachate released into environment.

*Impact:* Contamination of surrounding land impacting water resources and/or reduced local air quality. Health impacts to humans including asbestosis.

*Controls:* The proponent has dug a cell trench within the defined landfill cell in the Premises for the placement and containment of asbestos and asbestos containing material.

This asbestos cell is separate from the general landfilling activities and is clearly identifiable.

Asbestos waste is covered and left undisturbed to reduce the risk of asbestos fines being released.

All other landfill wastes are covered during the life of the landfill.

##### Risk Assessment

*Consequence:* Minor

*Likelihood:* Unlikely

*Risk Rating:* Moderate

##### Regulatory Controls

Condition L1.2.1 identifies the waste produced at the premises and identifies the waste types, waste code (Controlled Waste Regulation), and process limits for the waste disposed of at the Premises.

Table 1.2.1 includes:

- a separation limit to ensure a 3 metre vertical separation distance between the base of the landfill and the highest groundwater level;
- within designated areas indicated in the licence schedule;
- placed in a defined trench with a restricted width of 30 metres;
- accumulative volumes of waste produced shall not exceed 1 100 tonnes per year;
- asbestos waste will be separated into a designated area greater than 2 metres from the landfill and will remain undisturbed;
- sewage waste to be disposed offsite to an appropriate facility couriered by a licensed contractor.

Condition L1.2.7 describes the management of the landfill by ensuring it is level, has stable slopes, well compacted and is capable of rehabilitation that shall be established within 6 months at the completion of the cell being filled.

Condition L1.2.8 specifies the cover material requirements and the timeframe the cover material shall be applied.

Condition L1.2.9 specifies the management methods for wind-blown waste.

The existing licence conditions provide adequate protection and ensure waste produced at the Premises is managed.

##### Residual Risk

*Consequence:* Minor

*Likelihood:* Unlikely

*Risk Rating:* Moderate



## Appendix B

### Premises Operation – Tailings Storage Facility

#### Normal Operation

##### Emission Description

*Emission:* Seepage from the TSF into the surrounding groundwater.

*Impact:* Seepage can result in groundwater mounding underneath the TSF, and if rising groundwater levels are within 4 m of the ground level, the groundwater may inundate rootzones of vegetation resulting in potential death.

Seepage may also alter the local groundwater quality due its elevated metals, metalloids, cyanide and salinity in relation to the receiving groundwater system. Unchecked seepage may result in contamination of a downstream water resource at Butchers Well (located to the south west of the Premises – refer map in Schedule 1). This resource is used for livestock drinking water.

*Controls:* Adequate design of the TSF with management measures including regular monitoring of groundwater around the TSF, regular inspections of infrastructure and surrounding vegetation. Seepage trenches are also in place around the TSF to recover seepage.

##### Risk Assessment

*Consequence:* Moderate

*Likelihood:* Possible

*Risk Rating:* Moderate

##### Regulatory Controls

Condition L1.2.2 ensures that tailings are only deposited into the specified containment infrastructure.

Condition L1.2.5 ensures that required inspections of the TSF are taken.

Conditions L1.2.3 and L1.2.4 are included in the Licence to ensure the TSF is managed and operated appropriately. An annual water balance is a consideration should impacts become apparent in the future.

Condition L3.4.1 requires ambient monitoring of groundwater quality in the area of the TSF and provides a target and limit for standing water levels in monitoring bores. Groundwater quality limits are also in place for the two monitoring bores upstream of Butchers Well (Satellite Well and L8)

In the event that current management practices are inadequate and groundwater monitoring results indicate that the groundwater standing water level target or groundwater quality limits are not met, a groundwater recovery plan must be developed and implemented (refer conditions L3.4.2, L3.4.3, L3.4.4 and L3.4.5).

##### Residual Risk

*Consequence:* Moderate

*Likelihood:* Possible

*Risk Rating:* Moderate

#### Emergency Operation

##### Emission Description

*Emission:* Overtopping of tailings liquor from the TSF during an extreme rainfall event or due to operator error.

*Impact:* Tailings (supernatant) liquor may adversely impact health of local vegetation and may affect the water quality of adjacent surface water resources, dependent of the size of the release and whether it occurs during a rainfall event.





*Controls:* The Licensee has committed to the maintaining a minimum freeboard of 300mm on the internal embankment of the TSF at all times and to daily visual inspections of the TSF (external TSF walls, surface ponding and tailings deposition).

Risk Assessment

*Consequence:* Moderate

*Likelihood:* Rare

*Risk Rating:* Moderate

Regulatory Controls

Condition L1.2.2 specifies the authorised containment infrastructure. Condition L1.2.3 specifies that the embankment freeboard must be below or at 300mm or the freeboard sufficient to contain a 1 in 100 year, 72 hour duration rainfall event (whichever is greater). Condition L1.2.4 requires that the supernatant pond on the TSF is minimised.

Daily inspections of embankment freeboard and tailings beaching are required by condition L1.2.5. L1.2.5 includes provision for monthly inspections when the mine is in care and maintenance.

Residual Risk

*Consequence:* Moderate

*Likelihood:* Rare

*Risk Rating:* Moderate



## Appendix C

### Point source emissions to groundwater, including monitoring – dewatering from one pit to another pit

#### Normal Operation

The Licensee has a Department of Water Licence permitting the abstraction of 4,830,000 kL mine dewater per annual period.

#### Emission Description

*Emission:* Mine dewatering discharge from Fairyland Pit into Daisy Queen receiving pit, then discharging to groundwater.

*Impact:* Concentration of salts in groundwater may occur due to evaporation in the pit, increasing salinity of the water source over time and raising local groundwater levels due to increased water level height of the receiving pit.

*Controls:* Condition L3.2.1 requires quarterly monitoring of the water quality. Condition L3.3.1 requires the volume being discharged from Fairyland pit to the Daisy Queen pit to be recorded.

#### Risk Assessment

*Consequence:* Minor, not significant as the dewater is of similar quality to that of the receiving environment.

*Likelihood:* Unlikely

*Risk Rating:* Moderate

#### Regulatory Controls

Condition L3.3.1 requires quarterly monitoring of the dewater quality and volumes being discharged from Fairyland pit to the Daisy Queen pit.

Condition L1.2.6 covers the operation of the infrastructure pipeline and leak detection addresses prevention and management of pipeline leaks.

#### Residual Risk

*Consequence:* Minor

*Likelihood:* Rare

*Risk Rating:* Low