Government of Western Australia
Department of Environment Regulation

Amendment Notice 1

Licence Number	L4496/1988/11
Licensee	Big Bell Gold Operations Pty Ltd
ACN	090 642 809
Registered business address	Level 3, 18-32 Parliament Place WEST PERTH WA 6005
Date of amendment	23 May 2017
Prescribed Premises	Category 5: Processing or beneficiation of metallic or non-metallic ore Category 6: Mine dewatering Category63: Class I inert landfill site Category 85: Sewage facility
Premises	Bluebird Gold Mine Mining Tenements M20/12, M20/45, M20/68, M20/70 - M20/73, M20/77, M20/107, M20/214, M20/249, M20/421, M51/35, M51/132, M51/190, M51/209, M51/211, M51/236-M51/237 M51/254, M51/393, M51/438 - M51/440, M51/455, M51/459, M51/462, M51/463, M51/483, M51/491 - M51/495, M51/523, M51/572, M51/666, M51/757, M51/762, M51/781, M51/784, M51/788, M51/824, M51/834 and E51/1484. 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: 23 May 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.

This notice is limited only to an amendment to change the category 6 assessed premises production or design capacity, include an emission to surface water and to incorporate relevant *Administrative Changes implemented within the Department of Environment Regulation* (Administrative Changes).

The following DER Guidance Statements have informed the decision made on this amendment*:*

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

Amendment Description

This Amendment Notice is the result of an applicant initiated amendment and relates to the dewatering of the pit lake and groundwater at the Aladdin Pit with the dewatering effluent being discharged to Lake Annean, and the inclusion of additional mining tenements to the Premises description to identify the additional prescribed activities.

The Bluebird Gold Mine currently consists of the Paddy's Flat, Yaloginda and Reedy mined areas as part of the prescribed premises. The Licensee will now commence mining of the Aladdin Pit at Nannine.

Mining at the Aladdin Pit consists of a cutback extension of the existing open pit over a period of four months. The current depth of the Aladdin Pit is 40 metres below ground level (mbgl). Mining of the pit will further deepen the pit to a final depth of 115 metres mbgl. Depth to ground water in this location is approximately 22 mbgl, therefore there is an existing pit lake within the pit void which requires dewatering before mining operations can commence. The current volume of water contained within the Aladdin Pit void is approximately 273,780 kilolitres (kL). The applicant has nominated two scenarios for the dewatering of the Aladdin Pit.

Scenario 1

Gradually remove the Aladdin Pit lake during the mining cut-back and deepening over a four month period. Assuming that groundwater inflows will increase linearly to 1,000 kL per day (kL/d) and 500 kL/d will be used at the Premises, this method will result in 273,700 kL being discharged into Lake Annean over the four months.

Scenario 2

Empty the pit lake over 19 days. A total of approximately 283,000 kL would be pumped for those 19 days which includes inflows from groundwater. If the pit was subsequently mined over a period of four months, the total volume discharged to Lake Annean would be 356,000 kL after water use at the Premises.

The dewatering pipeline is located within earthen bunding prior to reaching Lake

Annean. The section of pipeline on Lake Annean is not bunded and is restrained in position by steel pickets. The pipeline outlet is located within a salted playa, avoiding the lake edges. Holes are located in the side of the pipeline at the discharge area to allow a diffused flow of the dewatering effluent to minimise scouring or erosion of the lake surface. The dewatering effluent is directed towards deeper parts of the lakes basin to prevent backflow of saline water into creek lines and tributaries.

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
Town of Meekatharra	33 km to the north.

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

Environmental receptor	Distance from Prescribed Premises Boundary
Lake Annean	Approximately 1.2 kilometres (km) south west of the Aladdin Pit
Groundwater	6 to 18 mbgl (Department of Water WIR database)
Vegetation	Lake bed unvegetated. A Level 1 Flora assessment of riparian vegetation at Lake Annean was conducted during September 2015. The assessment identified no threatened flora species or priority species. Riparian vegetation dominated by salt tolerant species.
Livestock watering bores	Borwick Well – Approximately 4.0 km east of the Premises. No current owner
	Town Well – Approximately 1.0 km south west of the Premises. No current owner
	Racecourse Well – Approximately 2.7 km north east of the Premises. No current owner

Risk assessment

Table 3 below applies a risk assessment to the potential emissions which may arise from the amendment application. The table identifies whether these emissions present a material risk requiring regulatory controls.

Risk Assessment

Table 3. Risk assessment for the Discharge of dewatering effluent to Lake Annean

Activity	Potential emission	Potential receptors	Potential pathway	Potential impacts	Material risk	Reasoning
Dewatering of the Aladdin Pit lake and groundwater	**Discharge to surface water:** Discharge of dewatering effluent to Lake Annean	**Surface water:** Lake Annean is a large 18,000 hectare salt lake with a salinity of up to 204,000 mg/L TDS when water is present. **Vegetation:** The lake beds are highly saline and unvegetated. The riparian zones are dominated by salt tolerant genus and families.	**Water:** Interaction of pit water with groundwater aquifers and surface water	Impacts to riparian vegetation Contamination of surface water Contamination of local groundwater Scouring of the lake bed	No	The Delegated Officer considers the material risk of discharging dewatering effluent to Lake Annean has remained unchanged. Currently a total of 2,700,000 tonnes per annum of dewatering effluent is discharged from the Premises to Lake Annean. Dewatering of the Aladdin Pit increases the total dewatering discharge to Lake Annean by up to an additional 356,000 tonnes per annum if scenario 2 is used. This is a 13 percent increase to the current licence throughput. Mining of the Aladdin Pit and the subsequent dewatering required is only for a period of four months. The Aladdin Pit dewatering discharge location is separate to the existing dewatering discharge from other pits at the Premises. These two separate dewatering discharge locations are not expected to influence each other as they are approximately 20 kilometres apart. Water in the Aladdin Pit was sampled in April 2013 and in May 2016. Sampling results indicate the water in the Aladdin pit is hypersaline with a TDS range of about 150,000 to 163,000 mg/L. Water in Lake Annean was also sampled at the same time as the water in the Aladdin Pit with sampling results indicating Lake Annean is hypersaline with a TDS range of about 146,000 to 204,000 mg/L. The water quality of the dewatering discharge effluent is of similar ionic composition to the water sampled at Lake Annean. The nitrate levels in the dewatering effluent are higher than those in Lake Annean (160 mg/L compared to 0.2 mg/L) however this is expected because groundwater in this region naturally has high background nitrate levels and the Aladdin Pit interacts with the local groundwater. The likelihood of nitrification occurring due to these high nitrate levels is unlikely due to the lake being dry for most parts of the year, the dewatering will only occur for a period of four months and the ponding only makes up 1.2 percent of the lake surface. This is expected to dry out quickly due to high evaporation rates in this area (greater than 2,000 mm per year). Any impact to groundwater at Lake Annean from an increase in nitrate levels is negligible as the groundwater composition is the same as that contained in the Aladdin Pit. This is due to the local groundwater flowing under a low gradient towards Lake Annean where it discharges. Lake Annean is a large inland salt lake covering an area of over 18,000 ha. Modelling results for the expected extent of water ponding on Lake Annean from the dewatering discharge, indicates an area of up to 40 hectares (ha) for the scenario 1 dewatering program, and up to 210 ha for the scenario 2 dewatering program (Rockwater, June 2016). The lakebeds are highly saline and unvegetated with the dewatering effluent not expected to impact on any riparian vegetation due to the riparian vegetation being dominated by salt tolerant species and the discharge is to the playa, avoiding the lake edges.

						The dewatering discharge outlet is designed with holes cut into the side of the pipe to allow a diffuse flow so as to minimise scouring and erosion of the lake bed. The Licensee has committed to: • record the amount of water drawn and discharged monthly; • assess discharge and surface water quality through sampling and analysis; • monthly visual monitoring of sediment at the discharge point and sampling for laboratory analysis of major components.
	Pipeline rupture to land: Associated with transport of dewatering effluent	**Vegetation:** Native vegetation at the Premises degraded due to historical mining and pastoral grazing. **Groundwater:** Depth to groundwater 6 - 18 mbgl. Salinity levels of groundwater ranges from 690 – 1,450 mg/L TDS at the water table and become saline to hypersaline at depth.	**Land:** Direct discharge to soils and infiltration through soils to groundwater	Contamination of surrounding land and groundwater with hypersaline water 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 dewatering effluent in newly installed pipelines. The Premises is not located within a drinking water area and the nearest pastoral bore for stock watering is 1.0 km away in a south westerly direction from the Aladdin Pit. The dewatering pipeline heads in a south easterly direction and is down gradient from the bore. The nearest surface water is Lake Annean which is located 1.2 km away. Any discharged dewatering effluent from ruptured pipelines is not expected to reach the lake however if this occurred no impacts are expected as the receiving environment is of similar quality as the dewatering effluent. Vegetation in this area is degraded as a result of grazing and mining activities. No threatened flora species or priority flora species were recorded during an on ground survey conducted in September 2015. Depth to groundwater is 6 to 18 mbgl at the Premises. The groundwater is brackish at the water table and becomes saline to hypersaline at depth. The groundwater flows under a low gradient towards the hypersaline Lake Annean where it discharges. The pipeline corridor will be located within an existing drainage channel that has previously been disturbed through alluvial mining of the topsoil profile. The channel extends from the turkeys nest adjacent to the Aladdin pit right through to the discharge point at Lake Annean. Analysis of the surface hydrology indicates that any significant spillage would be confined to the channel and flow down toward the discharge point at Lake Annean. Additional bunding will be installed in areas where further protection is required to prevent loss of saline water beyond the pipeline corridor in the event of a spill. In addition, daily inspections of the pipeline will be conducted (in accordance with Licence condition 1.3.3) and recorded to identify potential damage, leaks, or other issues which can be addressed to prevent total pipeline failure. The pipeline used is rated for 125m of vertical head pressure, and because it is running down hill in a gravity situation to the discharge point, there is a very low likelihood of structural failure. The suction and discharge lines for the diesel trailer pump both have pressure gauges with inbuilt sensors in them that in turn is connected to the ECU engine control unit. If there is high or low discharge pressures the engine and pump will shut down as it is controlled through the sensors to the ECU.

Decision

The Delegated Officer has determined that the key emissions associated with the dewatering of the Aladdin Pit is dewatering effluent being discharged into Lake Annean and accidental discharge of saline dewatering effluent to land.

The Delegated Officer considers that the risk to the environment at the Premises has remained unchanged with the discharging of dewatering effluent from the Aladdin Pit to Lake Annean.

The Delegated Officer has included new conditions and amended existing conditions in the licence for:

- discharging dewatering effluent from the Aladdin Pit to Lake Annean;
- the routine monitoring, analysis and reporting of dewatering effluent discharged from the Aladdin Pit into Lake Annean;
- setting a limit for hydrocarbon in dewatering effluent discharged from the Aladdin Pit into Lake Annean; and
- increasing the design capacity for dewatering discharged from the Premises.

The Delegated Officer has also made changes to the Licence in accordance with administrative changes implemented within DER.

Amendment History

Instrument	Issued	Amendment
L4496/1988/11	21/01/2016	Dewatering of the Reedy mining area with discharge to Lake Annean (Category 6) and a new Class I landfill (Category 63)
L4496/1988/11	12/05/2016	Include Bluebird East as an Inpit tailings storage area
L4496/1988/11	23/05/2017	Amendment Notice 1

Amendments

1. The Premises address on page 1 of the licence is amended by the insertion of the following additional mining tenements shown in bold text and underlined below:

M51/6, M51/31, M51/62, M51/203, M51/320, M51/374, M51/486, M51/575, M51/795, M51/819

2. 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'*

3. 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.

'CEO' *for the purpose of correspondence means:*

Chief Executive Officer
~~*Department Administering the Environmental Protection Act 1986*~~
~~*Locked Bag 33*~~
~~*CLOISTERS SQUARE WA 6850*~~
~~*Email: info@der.wa.gov.au*~~

Department Div.3 Pt. V EP Act
Locked Bag 33 Cloister Square
Perth WA 6850
info@der.wa.gov.au

4. The Licence is amended by the deletion of the following conditions:

~~*1.2.1 The Licensee shall immediately recover, or remove and dispose of spills of environmentally hazardous materials outside an engineered containment system.*~~

5. Condition 1.3.10 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.

1.3.10 The Licensee shall ensure the limits specified in Table 1.3.6 are not exceeded.

Table 1.3.6 Production or design capacity limits		
Category[1]	**Category description**[1]	**Premises production or design capacity limit**
5	Processing or beneficiation of metallic or non-metallic ore	2,500,000 tonnes per annual period
6	Mine dewatering	~~2,700~~**3,056**,000 tonnes per annual period
63	Class I inert landfill site	500 tonnes per annual period
85	Sewage facility	99 cubic metres per day

Note 1: *Environmental Protection Regulations 1987*, Schedule 1.

6. The licence is amended by the inclusion of the new conditions shown below in bold text and underlined.

2.3 Emissions to surface water

2.3.1 The Licensee shall ensure that where waste is emitted to surface water from the emission points in Table 2.3.1 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this Licence.

Table 2.3.1: Emission points to surface water		
Emission point reference and location on Map of emission points	**Description**	**Requirements**
Aladdin discharge point	**Dewatering effluent from the Aladdin Pit and discharged to Lake Annean**	**Discharged in a manner which does not cause erosion and scouring impacts, and avoids lake edges**

2.3.2 The Licensee shall not cause or allow point source emissions to surface water greater than the limits listed in Table 2.3.2.

Table 2.3.2: Point source emission limits to surface water				
Emission point reference	**Parameter**	**Limit (including units)**	**Averaging period**	**Frequency**
Aladdin discharge point	**Hydrocarbon**	**15 mg/L**	**Spot sample**	**Monthly**

7. Table 3.2.1 of the Licence is amended by the insertion of the bold text shown in underline below:

Table 3.2.1: Monitoring of inputs and outputs				
Input/Output	**Parameter**	**Units**	**Averaging period**	**Frequency**
Mine dewater discharged to North of Reedy Drainage Channel	Volume	m^3	Monthly	Cumulative monthly total
Mine dewater discharged to South of Reedy Drainage Channel				
Mine dewater discharged to Lake Annean				

8. The licence is amended by the inclusion of the new condition shown below in bold text and underlined.

3.5 Monitoring of point source emissions to surface water

3.5.1 The Licensee shall undertake the monitoring in Table 3.5.1 according to the specifications in that table.

Table 3.5.1: Monitoring of point source emissions to surface water				
Emission point reference	**Parameter**	**Units**	**Averaging period**	**Frequency**
Aladdin discharge point	**pH[1]**	**None specified**	**Spot sample**	**Monthly**
	Aluminium	**mg/L**		
	Arsenic			
	Cadmium			
	Chromium			
	Copper			
	Lead			
	Manganese			
	Mercury			
	Nickel			
	Nitrate (as NO_3)			
	Selenium			
	Sulphate			
	Total Recoverable Hydrocarbons			
	Total suspended solids			
	Total dissolved solids			
	Zinc			

9. Condition 4.1.2 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.

4.1.2 ~~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.

10. Conditions 4.2.1 and 4.2.2 of the Licence are amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below.

4.2 Reporting

4.2.1 The Licensee shall submit to the CEO an Annual Environmental Report within 61 calendar days after the end of the annual period. The report shall contain the information listed in Table 4.2.1 in the format or form specified in that table.

Table 4.2.1: Annual Environmental Report		
Condition or table (if relevant)	***Parameter***	***Format or form[1]***
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken.	None specified
Table 1.3.6	Summary of authorised activities including comparison of the approved production and design capacities and actual production/throughput for the Annual period.	None specified
3.2.1	Monitoring of dewater outputs.	None specified
3.3.1	Monitoring of point source emissions to land and comparison against the ANZECC Livestock Drinking Water Guidelines.	LR1
3.4.1	Monitoring of ambient groundwater quality and comparison against the ANZECC Livestock Drinking Water Guidelines.	GR1
3.5.1	**Monitoring of emissions to surface water.**	**WR1**
-	An assessment of the information contained within the report against previous monitoring results and any Licence limits.	None specified
4.1.2	Compliance	Annual Audit Compliance Report (AACR)
4.1.3	Complaints summary	None specified

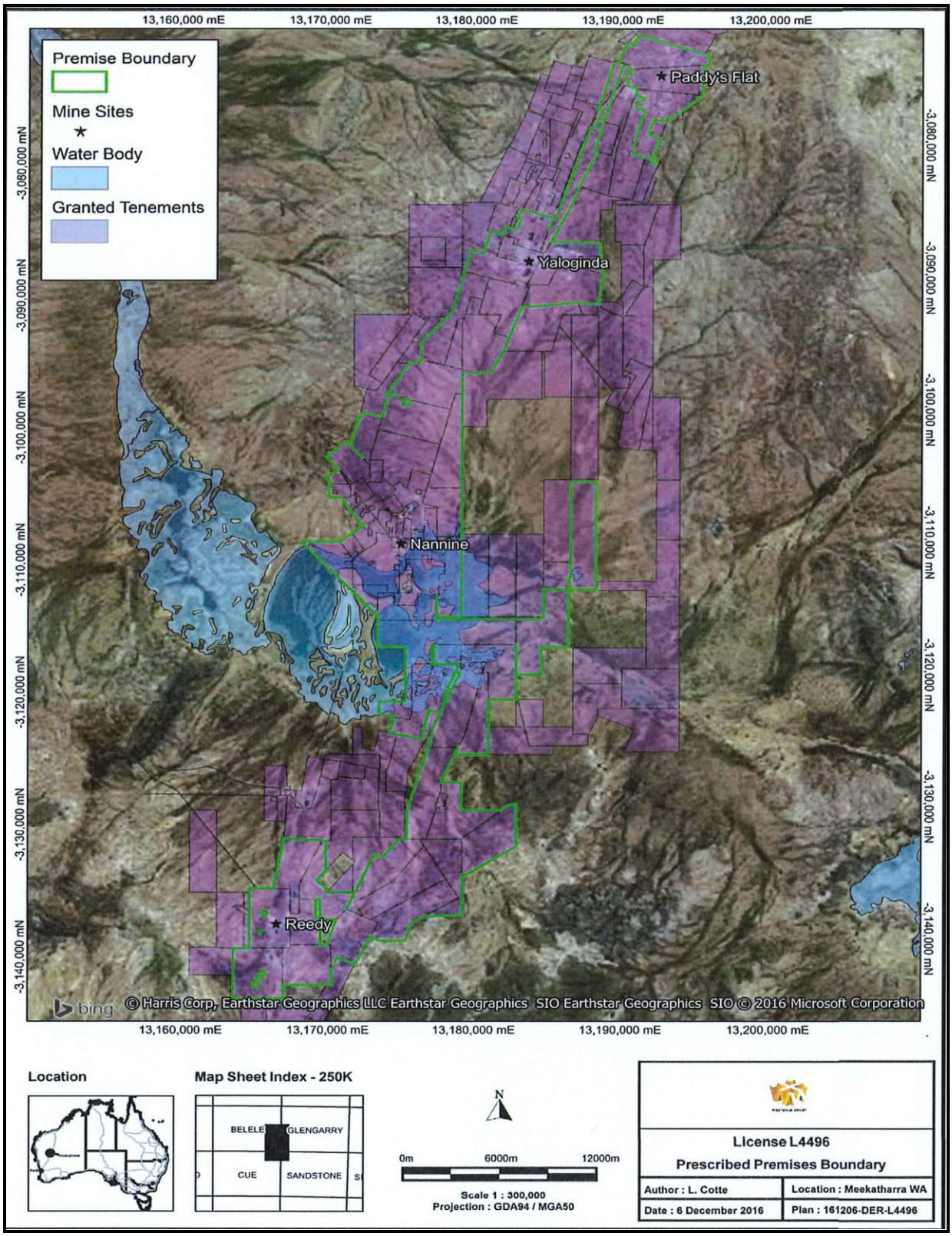
Note 1: Forms are in Schedule 2

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

12. The Licence is amended by removing the map in Schedule 1 Map of Premises and insertion of the map below:

Premises map

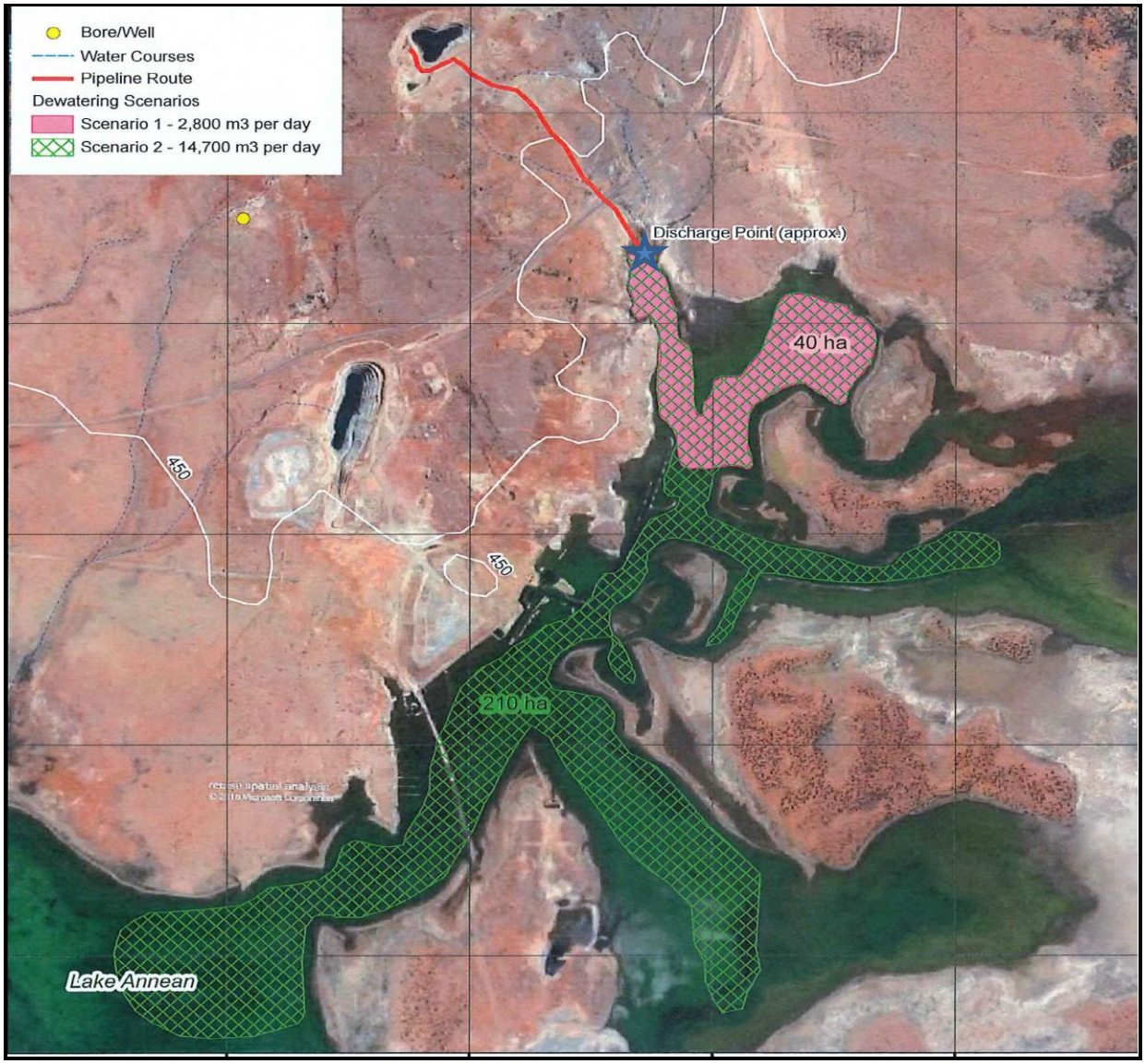
The Premises is shown in the map below. The green line depicts the Premises boundary.



13. The Licence is amended by the insertion of the map below into **Schedule 1 Map** of emission points:

Map of emission points

The location of the emission point defined in Table 2.3.1 is shown in the map below.



14. The Licence is amended by the insertion of the form below into **Schedule 2**: Reporting & notification forms:

Licence: L4496/1988/11 Licensee: Big Bell Gold Operations Pty Ltd
Form: WR1 Period:
Name: Monitoring of emissions to surface water

Form LR1: Monitoring of emissions to land					
Emission point	**Parameter**	**Result**	**Averaging period**	**Method**	**Sample date & times**
Aladdin Discharge Point	pH[1]				
	Aluminium				
	Arsenic				
	Cadmium				
	Chromium				
	Copper				
	Lead				
	Manganese				
	Mercury				
	Nickel				
	Nitrate (as NO_3)				
	Selenium				
	Sulphate				
	Total Recoverable Hydrocarbons				
	Total suspended solids				
	Total dissolved solids				
	Zinc				

Signed on behalf of Big Bell Gold Operations Pty Ltd: Signature:…….. Date: …….

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	Administrative changes implemented within DER	
6	Licence amendment application and supporting documentation received 15 December 2016	DER record A1343969
7	DER notification of acceptance of application and invoice dated 27 January 2017	DER record A1365556
8	Licensee clarification of additional mining tenements dated 20 February 2017	DER record A1429771
9	Provision of additional information regarding dewatering pipeline corridor dated 23 March 2017	DER record A1429775
10	DER notification of proposed amendment dated 6 April 2017	DER record A1408348
11	Big Bell Gold Operations Pty Ltd comments on draft 21 day amendment notice received 6 April 2017. No comments provided. Waiver form signed 6 April 2017.	DER record A1408423

Appendix 2: Summary of Licence Holder Comments

Comments received	Environmental risk	DER consideration of risk
6 April 2017	No comments received. Waiver form received.	Not applicable.