Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice 1

Licence Number	L8337/2009/2
Licence Holder	St Barbara Limited
ACN	009 165 066
File Number:	2012/006861
Premises	Gwalia Mine LEONORA WA 6438 Legal description – Mining Tenements: G37/25, G37/26, G37/27, M37/17, M37/25, M37/55, M37/137, M37/170, M37/200, M37/247, M37/251, M37/333, M37/391, M37/454, M37/849, M37/903, M37/1026, M37/1027, L37/33, L37/34, L37/35, L37/36, L37/56, L37/58 and L37/66
Date of Amendment	20/07/2018

Amendment

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

[redacted]

Tim Gentle

Manager – Resource Industries

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

Definitions and interpretation

Definitions

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

Table 1: Definitions

Term	Definition
ACN	Australian Company Number
AER	Annual Environment Report
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the *Environmental Protection Act 1986* Locked Bag 33 Cloisters Square PERTH WA 6850 info@dwer.wa.gov.au
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EP Act	*Environmental Protection Act 1986* (WA)
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of and during this Review
Licence Holder	St Barbara Limited
m^3	cubic metres
Minister	the Minister responsible for the EP Act and associated regulations
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report.
USEPA SESDPROC-100-R3'	document titled *Operating Procedure Field pH Measurement*, U.S. Environmental Protection Agency, 23 January 2013

Amendment Notice

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

This notice is limited to the following changes to the original Licence:

- Increase in Category 52: Power generation – 12 MW to 16 MW operational capacity
- Extension of Category 89: Class II landfill boundaries
- Inclusion of mining tenements M37/849 and M37/454 to the operational boundaries
- Modifying monitoring requirements to allow on-site pH readings
- Including 'pastefill mine void stabilisation' methodology

The following guidance statements have informed the decision made on this amendment:

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Land Use Planning (February 2017)*
- *Guidance Statement: Licence Duration (August 2016)*
- *Guidance Statement: Decision Making (November 2016)*
- *Guidance Statement: Risk Assessment (November 2016)*
- *Guidance Statement: Environmental Siting (November 2016)*

Amendment description

Category 52: Power generation

St Barbara Limited (St Barbara) has applied to install and operate two gas-power generation units (1 x 1.75 MW and 1 x 2 MW) in addition to its existing power station. The additional units will be installed within the current power station's footprint. With the additional two units, the total installed capacity will be 20 MW, but operational capacity is set at 16 MW. This assessment is for 16 MW capacity.

The additional power station units will be to provide additional load support for the operation of the underground Paste Aggregate Fill System.

Table 2 below outlines the proposed changes to the Licence

Table 2: Proposed changes

Category	Current capacity	Proposed capacity	Description of proposed amendment
52	12 Megawatts in aggregate (operational)	16 Megawatts in aggregate (operational)	Increase of 4 megawatts in aggregate

The units are self-contained structures with installation essentially involving placement on site. All construction activities will take place within the current Premises Boundary within the footprint of the existing Power station (see Figure 1) and no clearing of vegetation is required.

Figure 1: Gwalia Power Station

St Barbara appointed Lloyd George Acoustics (LGA) to undertake an Environmental Noise Assessment of the impacts that the additional generation units would have on noise levels at the surrounding noise-sensitive premises. The LGA assessment noted that the addition of the 2 extra generators will have a negligible increase in the noise impacts at the nearest sensitive receptor, an additional 1 dB. However, the noise report concluded that the overall noise from the existing mining operation is 12 to 15 dB over the levels prescribed in the *Environmental Protection (Noise) Regulations 1997*. This is a significant exceedance of allowed levels and this amendment notice will therefore include a requirement for St Barbara to develop a noise management plan to bring the noise levels at the mine to the prescribed levels.

The addition of the extra 2 generators will see an increase in emissions to air from the powerhouse stack.

	kg/year		
Emissions	FY16 power emissions (@12 MWH)	Per MWH	Projected increase (4 MWH)
Oxides of nitrogen	1,483,694	123,641	**494,565**
Carbon monoxide	122,379	10,198	**40,793**
Volatile organic compounds	43,246	3,604	**14,415**
Formaldehyde (Methyl Aldehyde)	18,949	1,579	**6,316**
Particulates (Total PM)	1,068	89	**356**
Sulphur oxides	196.00	16.33	**65.33**
Benzene	166.00	13.83	**55.33**
Xylenes	68.00	5.67	**22.67**
Vinyl chloride	5.34	0.45	**1.78**
Polycyclic aromatic hydrocarbons	0.07	0.01	**0.02**

Figure 2: Point source powerhouse stack emission estimations

Figure 2 above shows the current and projected point source air emissions from the power station at the mine site.

The addition of the extra 2 generators will see an increase in emissions to air from the powerhouse stack. No previous monitoring or modelling has been undertaken on the emissions from the power plant and its possible impacts on nearby receptors. As the nearest receptor (private residence) is less than 500 metres from the power plant, St Barbara will be required to ensure that emissions are within the standards set out in Schedule 4 of the *Protection of the Environment Operations (Clean Air) Regulation (NSW) 2010.*

Ambient air monitoring conditions will be placed on the licence to determine the levels of NO_2 at the nearest receptor and will be coupled with a requirement for appropriate wind monitoring to determine if NO_2 emissions from the power plant impact on the receptor.

Category 89: Class II landfill

St Barbara have proposed to extend the area of the current Class II landfill to allow for continuing waste disposal and an area to dispose of asbestos waste. St Barbara is not planning on increasing their waste disposal over their existing design capacity of 5000 tonnes per annual period.

The proposed extension will be situated next to the existing landfill, located on top of the above-ground Tailings Storage Facility 2 (TSF2). The capped TSF2 is considered to be suitable for a Class II landfill as it has a low permeability from the TSF construction and capping and will not disturb any flora or fauna. The extension is isolated from any drainage

lines and an additional soil bund will be constructed to encircle the landfill footprint to ensure localized runoff does not enter the pit. The site is also surrounded by a lockable wire fence.

St Barbara is planning to segregate the landfill cells to allow an area to accept Special Waste Type I (asbestos). St Barbara is undertaking a project to remove legacy asbestos piping within the mine boundary and intend on disposing of it at the on-site landfill. The project will aim to dispose of approximately 1800 m^3 of asbestos piping, equating to 4-5 trenches in the current footprint. The trenches will be closed following the completion to the asbestos pipe project. During the project, asbestos materials will be handled, transported and disposed of according to the document *Controlled Waste Factsheet: Asbestos* – DER, July 2016.

Figure 3 below shows the current and proposed landfill layout.

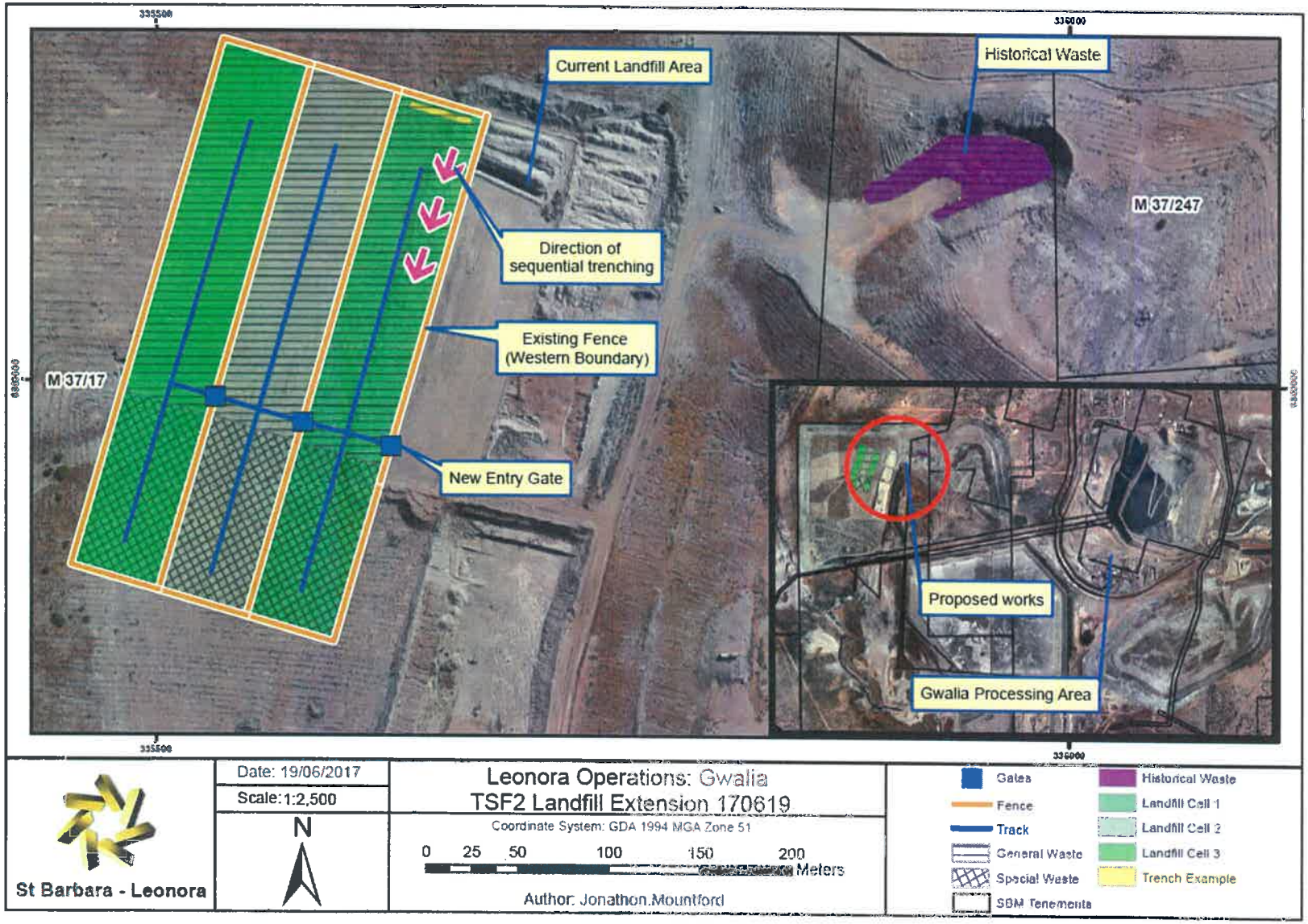

Figure 3: St Barbara Landfill

Inclusion of mining tenements M37/454 and M37/849

Continuing exploitation of the Gwalia Deeps orebody requires St Barbara to include two additional mining tenements immediately south east of the current premises boundary.

A mining proposal for the M37/454 and M37/849 mining leases was submitted to Department of Mines and Petroleum (DMP) on 10 May 2017. DMP approved the proposal on 26 July 2017 with a number of conditions set. The conditions relate to minimising rubbish, vegetation protection, topsoil protection, dust minimisation, saline water for dust suppression, rehabilitation and mine closure. Figure 4 below shows the current leases used in L8337 with the addition of M37/454 and M37/849.

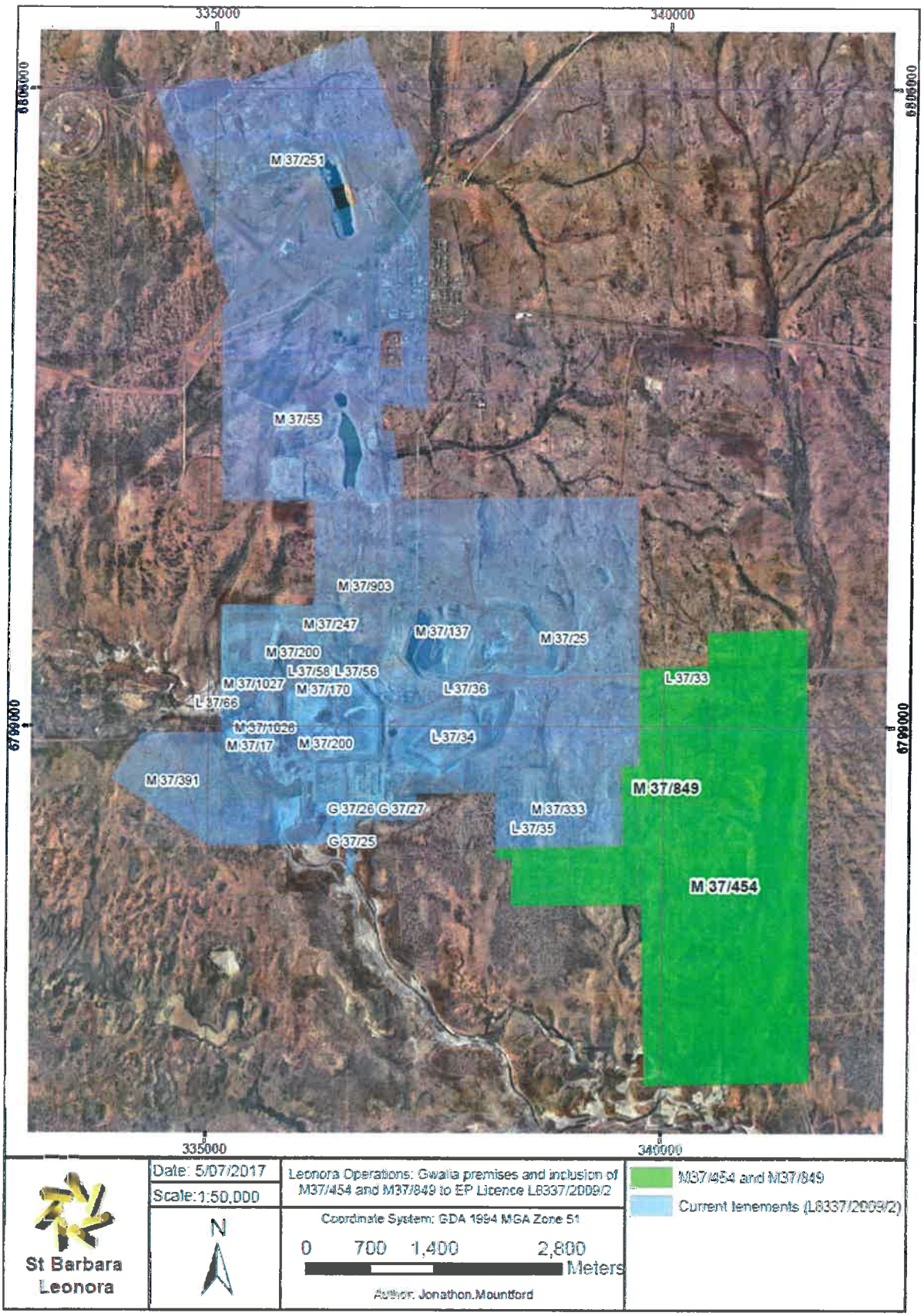

Figure 4: Premises boundary

On-site pH readings

Currently, the Licence requires St Barbara to analyse all water samples in a NATA accredited laboratory. As the site is remote, this poses a timing problem when it comes to monitoring for pH as the holding time is less than 6 hours for an accurate reading. St Barbara has proposed being allowed to conduct field sampling for pH. As measuring pH levels is a relatively simple procedure that can be undertaken easily with the correct field instrumentation, the Delegated Officer will allow field sampling of pH on the condition that the instrument used is calibrated according to the manufacturer's instructions.

Including 'pastefill mine void stabilisation' methodology

Works Approval W5703/2014/1 was issued to St Barbara on 24 September 2014 to allow St Barbara to increase the stockpile capacity at the 'paste plant'. The construction of W5703/2014/1 saw the paste plant stockpile constructed on a hardstand area and be bunded with a sedimentation basin installed to ensure runoff is captured.

The licence will be amended to reflect the works undertaken in W5703/2014/1.

The assessment for the Works Approval identified fugitive emissions from the stockpile as the only notable emission from the operation of the paste plant. Fugitive emissions were rated as *moderate* residual risk and the current licence conditions were deemed suitable to minimise emissions. Table 1.2.1 of the licence will be modified to include the pastefill stockpile as a defined specified infrastructure.

Amendment history

Table 3 provides the amendment history for L8337/2009.

Table 3: Licence amendments

Instrument	Issued	Amendment
L6059/1988/1	20/11/2000	New licence issued
L6059/1988/2	20/11/2001	Licence re-issue
L6059/1988/3	20/11/2002	Licence re-issue
L6059/1988/4	20/11/2003	Licence re-issue
L6059/1988/5	15/12/2004	Licence re-issue
L8337/2009/1	09/04/2009	New licence issued – old licence expired
L8337/2009/2	09/02/2014	Licence re-issue
L8337/2009/2	08/12/2016	Licensee amendment to construct and operate new landfill and TSF4 construction
L8337/2009/2	19/07/2018	Licensee initiated amendment notice

Location and receptors

Table 4 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 4: Receptors and distance from activity boundary

Residential and sensitive premises	Distance from Prescribed Premises
Residential Premises	Closest is 375 metres from the Northern premises boundary

Risk assessment

Tables 5 and 6 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments.* Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 5: Risk assessment for proposed amendments during construction

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
Cat 52 Electric power generation	Construction / placement of infrastructure	Dust	Nearest sensitive receptor is ~375 metres north of the power plant	Air / wind dispersion	Health and amenity impacts	Slight	Rare	Low	The separation distance to the receptors and short duration of construction means there is low risk of dust impacts. Section 49 of the *Environmental Protection Act 1986* is sufficient to regulate dust emissions during construction, if necessary.
		Noise				Slight	Rare	Low	The separation distance to the receptors and short duration of construction means there is low risk of significant noise impacts. The operation is required to comply with the *Environmental Protection (Noise) Regulations 1997*.
Cat 89 Class II landfill	Construction of cells, bund and fence.	Dust	Nearest sensitive receptor is ~775 metres north west of the landfill	Air / wind dispersion	Health and amenity impacts	Slight	Rare	Low	The separation distance to the receptors and short duration of construction means there is low risk of dust impacts. Section 49 of the *Environmental Protection Act 1986* is sufficient to regulate dust emissions during construction, if necessary.
		Noise				Slight	Rare	Low	The separation distance to the receptors and short duration of construction means there is low risk of significant noise impacts. The operation is required to comply with the *Environmental Protection (Noise) Regulations 1997*.

Table 6: Risk assessment for proposed amendments during operation

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
Cat 52 Electric power generation	Operation of the power station	Combustion emissions	Nearest sensitive receptor is ~375 metres north of the power plant	Air / wind dispersion	Health and amenity impacts	Minor	Unlikely	Medium	Risk ranking is preliminary. NEPM estimation data from current and projected air emissions from the power plant show that there may be potential for NO_2 emissions to impact the nearest sensitive receptors. To verify the projected emissions, conditions will be included on the licence to require St Barbara to undertake an ambient monitoring program for NO_2 at the nearest sensitive receptor for a period of one year.
		Noise				N/A	N/A	N/A	Noise modelling shows that, at the nearest sensitive receptor, noise levels from the existing operations are up to 15 dB above the prescribed noise levels. The proposed two additional power plants will increase the impacts at the sensitive receptor by only 1 dB. Condition to be imposed requiring the Licence Holder to develop a plan to bring the entire operation into compliance with the *Environmental Protection (Noise) Regulations 1997*.
Cat 89 Class II landfill	Operation of the Class II landfill	Odour	Nearest sensitive receptor is ~775 metres north west of the landfill	Air / wind dispersion	Health and amenity impacts	Slight	Rare	Low	The separation distance to the receptors is a sufficient buffer to prevent significant odour, dust or noise impacts.
		Dust				Slight	Rare	Low	
		Noise				Slight	Rare	Low	

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 29 March 2018. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

Amendment

1. Definitions of the Licence are amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

'AS 3580.1.1' means the Australian Standard AS 3580.1.1 *Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment*;

'AS 3580.5.1' means the Australian Standard AS 3580.5.1 *Methods for sampling and analysis of ambient air – Determination of oxides of nitrogen – Chemiluminescence method;*

'AS 3580.14' means the Australian Standard AS 3580.14 *Methods for sampling and analysis of ambient air – Meteorological monitoring for ambient air quality monitoring applications*;

'CEO' means Chief Executive Officer of the Department of Water and Environmental Regulation;

~~Chief Executive Officer~~ Director General
~~Department Div. 3 Pt. V EP Act~~ Department Administering the *Environmental Protection Act 1986*
Locked Bag 33
CLOISTERS SQUARE WA 6850
Email:~~info@der.wa.gov.au~~ info@dwer.wa.gov.au;

'USEPA SESDPROC-100-R3' means the document titled *Operating Procedure Field pH Measurement*, U.S. Environmental Protection Agency, 23 January 2013;

2. Table 1.2.1 of the Licence is amended by the insertion of the red text shown in underline below:

Table 1.2.1: Containment Infrastructure	
Containment identification	**Infrastructure requirements**
Tailings Storage Facility 3 (TSF3) Eastern and Western Cells	In-situ material
Tower Hill Pit	
Harbor Lights Pit	
Tailings Storage Facility 4 (TSF4)	Underlain by Grant's Patch TSF silty tailings; base permeability of 1 x 10^{-8} m/s
Pastefill facility stockpile	Bunded and drainage diverted into dedicated sediment pond.

3. Table 1.2.2 of the Licence is amended by the insertion of the red text shown in underline below:

Table 1.2.2: Inspection of infrastructure		
Scope of inspection	**Type of inspection**	**Frequency of inspection**
Mine dewater pipelines	Visual integrity	Daily when operating or weekly when not operating.
Tailings delivery pipelines	Visual integrity	
Tailings return water lines	Visual integrity	
Internal embankment freeboard of any active TSF	Visual to confirm required freeboard capacity is available	
Paste fill facility stockpile and sediment pond	Visual integrity of bunding	

4. Condition 3.4.3 of the licence is included to effect the following:

The Licensee shall undertake the monitoring in Table 3.4.3 according to the specifications in that table. The monitoring shall commence within one month of the date of issue of this Amendment Notice (or such other date as agreed by the CEO) and be continually undertaken for one year from commencement.

Table 3.4.3: Ambient air quality monitoring					
Monitoring point reference	**Parameter**	**Averaging period**	**Availability**	**Frequency**	**Method**
A1 (close to nearest sensitive receptor)	NOx	1-hour and 24-hour	90% per annum 95% per month	Continuous	AS 3580.5.1

5. Condition 3.4.4 of the licence is included to effect the following:

The Licensee shall undertake the meteorological monitoring in Table 3.4.4 according to the specifications in that table. The monitoring shall commence within one month of the date of issue of this Amendment Notice (or such other date as agreed by the CEO) and be continually undertaken for one year from commencement.

Table 3.4.4: Meteorological monitoring			
Monitoring point reference	**Parameter**	**Units**	**Method**
M1 (immediately adjacent to A1)	Wind speed	m/sec	AS 3580.14
	Wind direction	Degrees	

6. Condition 3.4.5 of the licence is included to effect the following:

Monitoring points 'A1' and 'M1' shall be sited in accordance with Australian Standard AS/NZS3580.1.1:2007 *Guide to siting air monitoring equipment* and Australian Standard AS 3580.14 *Methods for sampling and analysis of ambient air – Meteorological monitoring for ambient air quality monitoring applications* respectively.

7. Condition 3.4.6 of the licence is included to effect the following:

The Licensee shall submit to the CEO a report on the results of the ambient air quality monitoring required by conditions 3.4.3 and 3.4.4. The report is to be submitted no later than 3 months following the completion of the monitoring program and is to include all raw monitoring data as an attachment.

8. Condition 3.4.6 is included in the licence to effect the following:

The Licensee shall submit to the CEO a Noise Management Plan for the Gwalia mine in order to ensure noise emissions meet the requirements of the *Environmental Protection (Noise) Regulations 1997*. The Noise Management Plan shall be submitted no later than three months after the date of this amendment (or such other date as agreed by the CEO) and shall include a timeframe for reduction of noise levels to meet the requirements of the *Environmental Protection (Noise) Regulations 1997*.

9. Table 2.1.1 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

Table 2.1.1: Emission points to air		
Emission point reference as shown on map of emission points	**Emission point height (m)**	**Source, including any abatement**
Gold room furnace stack	10 m	Gold room furnace and gold electrowinning cells via gas scrubber
Carbon regeneration kiln stack x 2	12.5 m	Kiln
Absorption chiller exhaust x 4	12 m	Power plant's waste heat recovery circuit following power generation
~~Diesel/ gas turbine exhaust x 8~~ Dual fuel generator (KTA50-G3) exhaust x 8	8.5 m	Exhaust from generator ~~Two vents per generator: one emergency stack from generator in event waste heat recovery offline and the other for normal venting~~
~~Gas turbine x 16~~ Gas generators (C1750) x 8	8.5 m	
Gas generator (C2000) x 1	10 m	
Elution boiler exhaust	9 m	Gold Elution circuit

10. Condition 3.1.1 of the Licence is amended by the insertion of the red text shown in underline below:

3.1.1 The licensee shall ensure that:

(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;

(b) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;

(c) all pH field measurements are undertaken in accordance with USEPA SESDPROC-100-R3; and

(d) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured.

11. The map titled *Figure 1: Premises Map* within Schedule 1: Maps is replaced by the map shown below:

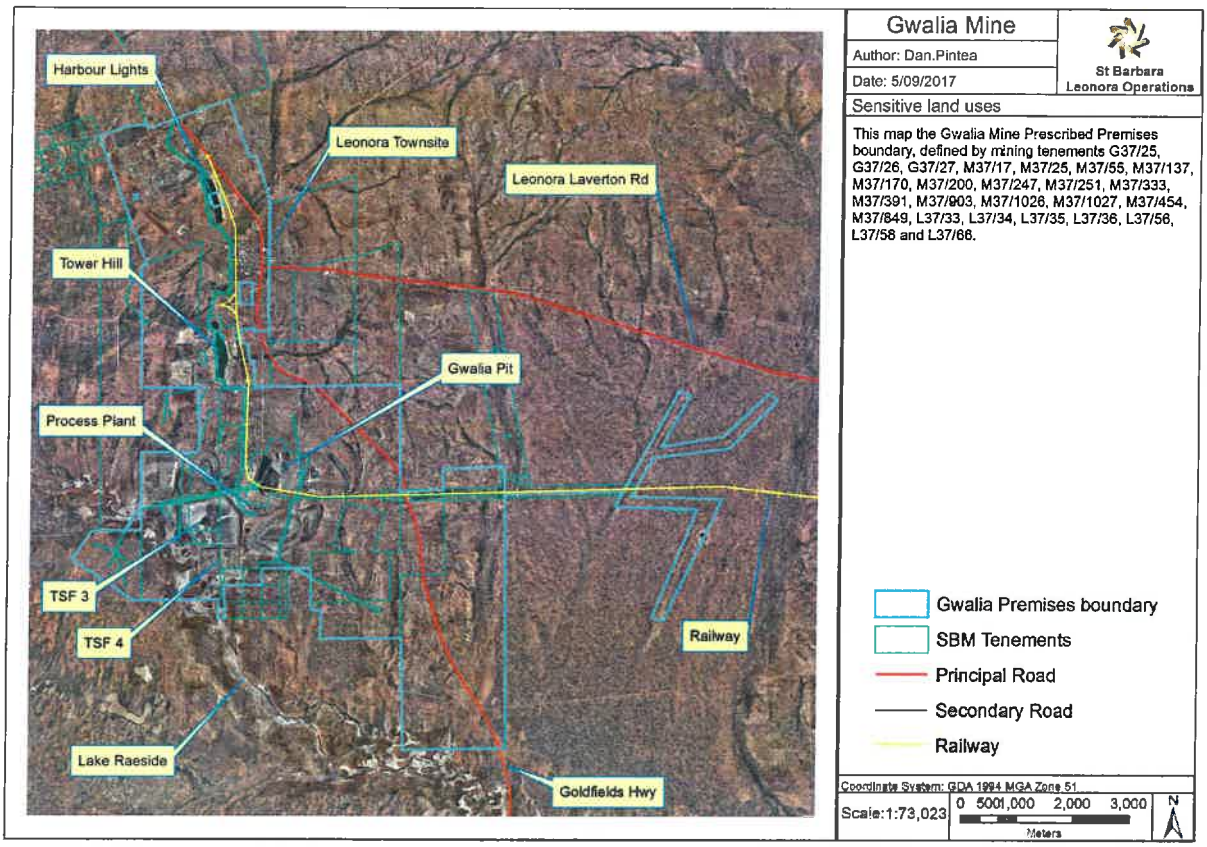

Figure 1: Premises Map

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L8337/2009/2 – Gwalia Mine	L8337/2009/2	accessed at www.dwer.wa.gov.au
2	Works Approval W5703/2014/1 – Gwalia Paste Plant Stockpile Expansion	W5703/2014/1	DWER records (A786315)
3	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
4	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DER 2015b	
5	DER, November 2016. *Guidance Statement: Risk Assessments.* Department of Environment Regulation, Perth.	DER 2016b	
6	DER, November 2016. *Guidance Statement: Decision Making.* Department of Environment Regulation, Perth.	DER 2016c	

Appendix 2: Summary of Licence Holder comments

The Licence Holder was provided with the draft Amendment Notice on 29 March 2018 for review and comment. The Licence Holder responded on 3 April 2018. The following comments were received on the draft Amendment Notice.

Condition	Summary of Licence Holder comment	DWER response
Description	Cat 52 Power generation: The installed capacity will be 20 MW, but the usable capacity will be 16MW	Changes made
Figure 1	Figure 1: Gwalia Power Station – updated map	Changes made
Table 3.1.5	Change the description of "turbine" with "generator"	Changes made
Table 2.2.1	Infrastructure description changes	Changes made

The Licence Holder was provided with a second draft Amendment Notice on 5 May 2018 for review and comment. The Licence Holder responded on 23 May 2018. The following comments were received on the draft Amendment Notice.

Condition	Summary of Licence Holder comment	DWER response
Amendment description	1.75 MW and 2.0 MW generators installed and operating capacity at 16 MW	Changes made
Condition 3.1.5	Various comments regarding the validity of the parameters and the units in Table 3.1.5.	Table 3.1.5 to be removed from the licence as the addition of the ambient air monitoring and Noise Management Plan will be more effective in monitoring impacts to nearby receptors.
Condition 3.4.5	Request to include a condition that requires the Licence Holder to submit a monitoring point and meteorological station point to DWER to describe the location and type of equipment used, including realistic timelines to have it operational.	Changes made
Condition 3.4.6	Include to conditions a requirement to report meteorological monitoring in the AER.	Changes made

The Licence Holder was provided with a third draft Amendment Notice on 13 July 2018 for review and comment. The Licence Holder responded on 16 July 2018. No comments were received.