



<b>Licence Number</b>	L8731/2013/1
<b>Licence Holder</b>	Santos WA Energy Limited
<b>ACN</b>	009 301 964
<b>File Number:</b>	DER2016/001677
<b>Premises</b>	Devil Creek Gas Plant  Legal description –  Lots 5001 and 5002 on Deposited Plan 53412 and Lot 5008 on Deposited Plan 53413 MARDIE WA 6714
<b>Date of Amendment</b>	23 April 2019

## 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.

## Manager Process 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
Amendment Notice	refers to this document
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 Joondalup DC JOONDALUP DC WA 6919 <a href="mailto:info@dwer.wa.gov.au">info@dwer.wa.gov.au</a>
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
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
GEAs	Gas Engine Alternator units
GDE	Groundwater Dependent Ecosystem
GTGs	Gas Turbine Generation units
Licence Holder	Santos WA Energy Limited
MS	Ministerial Statement
MW	Megawatt

NEPM	National Environmental Protection Measure
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997 (WA)</i>
Occupier	has the same meaning given to that term under the EP Act.
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.
Risk Event	as described in <i>Guidance Statement: Risk Assessment</i>
Works Approval	Relates to the original works approval for the prescribed premises W4560/2009/1 issued to the previous occupier, Apache Northwest Pty Ltd on 9 November 2009.

## 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 only to an amendment for Category 34 oil and gas refining: premises on which crude oil, condensate gas is refined or processed. The Licence Holder is requesting the removal of the two existing gas turbine generation units (GTAs) with three more efficient Gas Engine Alternator units (GEAs). No other changes relating to the aspects of the original Licence relating to either Category 34 or Category 10: oil or gas production from wells has been requested by the Licence Holder.

The guidance statements that have informed the decision made on this amendment are listed in Appendix 1.

## Amendment description

Electrical power is required for the extraction of oil and gas from production wells, for the oil and gas refining processes and for ancillary site operations. Santos WA (Santos WA Energy Limited) generates its own energy by combusting fuel products that the company generates on site in two existing gas turbine generation units.

On the 25 March 2019, Santos WA Energy Limited (the Licence Holder) submitted an application to amend Licence L8731/2013/1 for the Devil Creek Gas Plant. Appendix 1 contains a list of the documents which form the application.

This notice is limited to an amendment to Category 34: Oil and gas refining premises and the Licence Holder has applied to make the following changes:

- Decommissioning of the two existing gas turbine generation units (also known as the gas turbine alternator units; or GTAs) which have a combined maximum energy output of 10MW;
- Installation of three self-contained Gas Engine Alternator units (GEAs). Only two GEAs will be capable of being operated at any one time and they will have a combined maximum energy output of 3.3MW (1.1MW each)
- Inclusion of two existing emergency back-up power generation diesel generators as point sources of air emissions (site asset reference numbers G9000 and G9005 in Figure 2).

The Licence Holder advises that the electrical power requirement of the premises have not exceeded 1.5MW since the site commenced operations and that the current system is oversized. There are no longer term plans to expand existing operations to require more than the current nominal amount of 1.5MW of electrical power demand at any one time. The existing GTAs have combined capacity of 10MW and operation of these turbines for significant periods below their optimal operating capacity is inefficient, using proportionally greater volumes of fuel and emitting a higher proportion air emissions per unit of energy generated than when the turbines are operated at or near capacity. The replacement of the existing GTAs with the GEAs will result in an approximate two thirds reduction of fuel (gas) consumption and corresponding carbon dioxide emissions.

Two of the three new GEAs will be capable of being operational at any one time due to the electrical isolation of the third unit, thus allowing for the third unit to serve as a back-up generator only during servicing and maintenance of the other units. The installation works will include ancillary equipment including an automated control system, gas supply pipework and safety features and instrumentation. The GEAs are expected to have an operational life of 10 years and will be housed in self-bundled sea containers.

Figure 1 below shows the proposed location of the GEAs on Lot 5008 near the condensate load out facility, as highlight in green shaded area below.

**Figure 1: Location of the new Gas Engine Alternator units on Lot 5008**

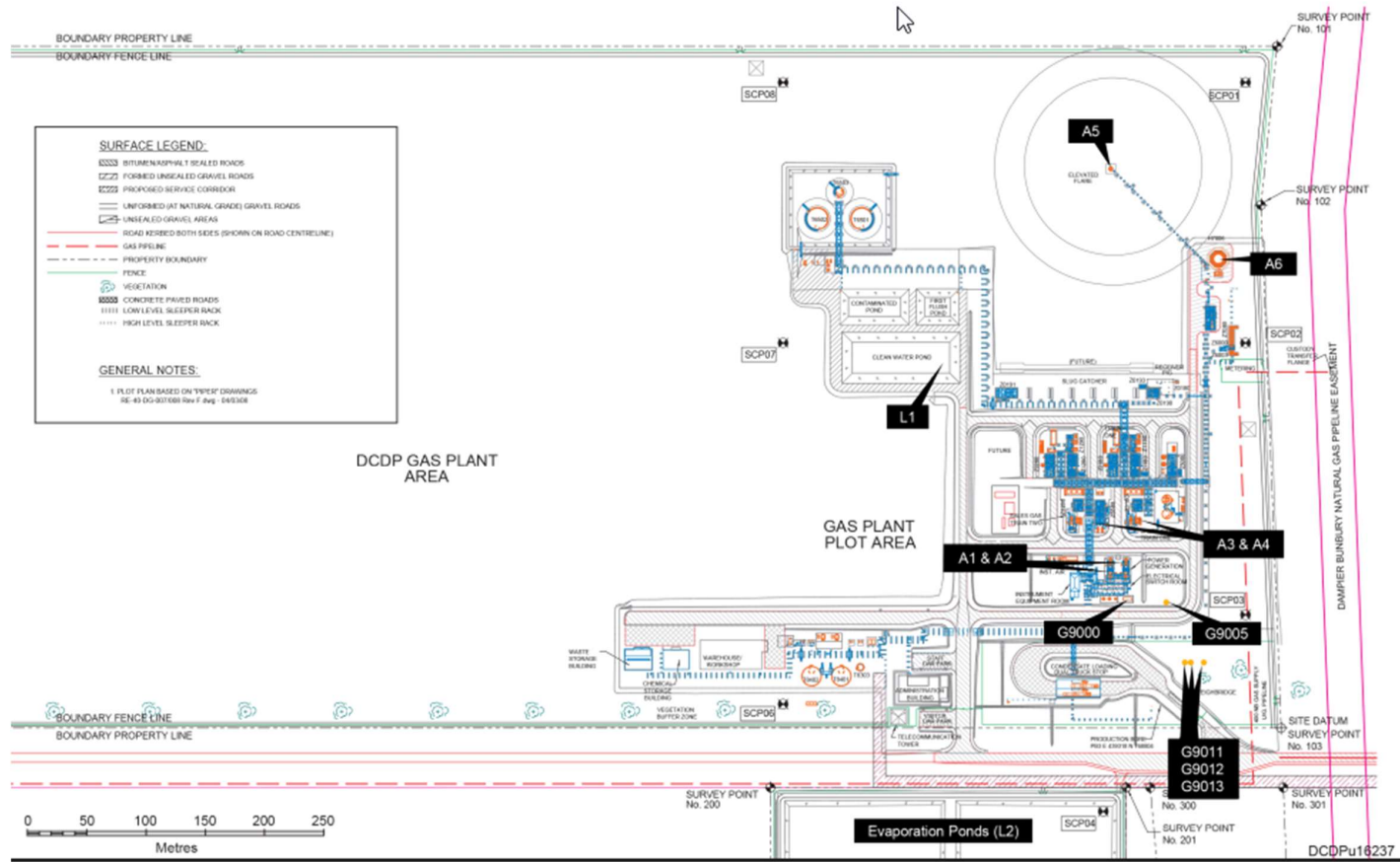


Source: Figure3-1 Devil Creek Gas Plant – Licence Amendment Application (L8731/2013/1) Supporting Information (Santos WA, 2019)

The GEAs will supply operational electricity to the site. Emergency generator G9000 is to be used in instances of complete electrical power failure at the premises.

Figure 2 below shows the location of the three new GEAs in the context of other site infrastructure on Lot 5008 including the two back up power generator units which are included as emission points through this amendment. G9000 shows the location of the emergency generator and 9005 is the temporary back-up generator. G9011, G9012 and G9013 are the proposed GEAs.

Figure 2:



**DCGP : GAS PLANT LAYOUT**

Source: Figure3-1 Devil Creek Gas Plant – Licence Amendment Application (L8731/2013/1) Supporting Information (Santos WA, 2019)



The Licence Holder intends to leave the existing GTAs in place until the GEAs are successfully installed and commissioned at which point they will be decommissioned and removed from the premises (emission points A1 and A2 as shown in Figure 2).

## Other approvals

The premises was granted primary approval under Part IV of the EP Act under Ministerial Statement (MS) 795. The changes proposed under the current amendment are commensurate with Condition 10-1(2) of the Statement which requires the proponent to annually and for the life of the project to investigate improvements in equipment, technology and procedures to reduce greenhouse gas emissions. The implementation of improvements, as facilitated by this Amendment Notice addresses the requirements of Condition 10-1(3) of MS 795.

The Licence Holder has provided the following information relating to other approvals as outlined in Table 3

**Table 2: Relevant approvals**

Legislation	Number	Approval
<i>Land Administration Act 1997</i>	L22354	Santos WA Energy Limited hold a 25 year lease over the prescribed premises (expires 30 June 2034).
<i>Environmental Protection Act 1986</i> Part IV	Ministerial Statement 795	The construction and operation of a gas processing plant, onshore supply gas pipeline, onshore sales gas pipeline, and horizontal directionally drilled shore crossing  Published 9 July 2009
Environmental Protection Regulations 1987 <sup>1</sup>  Environmental Protection (Abrasive Blasting) Regulations 1998	Registration R2196/2010/1 for category 94 Abrasive Blasting Operations is no longer applicable as Schedule 2 of the Environmental Protection Regulations 1987 was removed on 8 May 2012	Abrasive blasting operations occur as part of maintenance works undertaken to site infrastructure (mainly pipework).  The Environmental Protection (Abrasive Blasting) Regulations 1998 apply.
<i>Rights in Water and Irrigation Act 1914</i>	GWL166033(4)	Groundwater is abstracted at the premises from the Pilbara Fractured Rock groundwater aquifer. The Current Licence is for 180,000kL per year and is for use at the Devil Creek Gas Plant and the Devil Creek Accommodation Facility approximately 1km south of the premises..
<i>Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007</i>	DGS021469	Diesel is stored on site for use in the back-up generators (G9000 and G9005). Two tanks exist on site. One for 28,000L and another of 2,000L capacity.

Note 1: Reference to R2196/2010/1 is included in Table 3 as it is included in the current application documentation

## Amendment history

Table 4 provides the amendment history for L8731/2013/1.

**Table 3:** Licence amendments

Instrument	Issued	Amendment
L8731/2013/1	18/7/2013	Licence for the facility as constructed under W4560/2009/1
L8731/2013/1	4/2/2016	Amendment to update the Licence template and add Category 34 activities. Update to premises maps and removal of redundant conditions
L8731/2013/1	29/4/2016	Amendment to extend the expiry date by general notice from 26 March 2018 to 26 March 2026.
L8731/2013/1	22/2/2019	Transfer of Licence from Quadrant Energy Australia Limited to Santos WA Energy Limited
L8731/2013/1	23/04/2019	Amendment Notice 1 To replace two Gas Turbine Alternator units (10MW total energy) with three low fuel Gas Engine Alternator Units (1.5MW total energy)

## Location and receptors

Table 5 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment. The Devil Creek Gas Plant is located approximately 65km south west of Karratha and there are no residential sensitive receptors within the vicinity of the premises. The nearest dwelling is the Karratha Station homestead situated some 35km south of the Prescribed Premises.

Gnoorea Point camping ground is the closest sensitive human receptor.

**Table 4: Receptors and distance from activity boundary**

Residential and sensitive premises	Distance from Prescribed Premises
Gnoorea Point Camping ground	9km from the north western corner of the premises boundary
Devil Creek Accommodation Village	1km south of the premises but considered part of the premises for purposes of this assessment

Table 5 below lists the relevant environmental receptors in the vicinity of the Prescribed Premises.



**Table 5: Environmental receptors and distance from activity boundary**

Environmental receptors	Distance from Prescribed Premises
<p>Devil Creek is an ephemeral creek line that runs adjacent to the eastern boundary of the premises and flows after cyclonic weather events. The riparian vegetation surrounding the creek is identified as a groundwater dependent ecosystem and vegetation health is monitored under the <i>Rights in Water and Irrigation Act 1914 Licence</i>.</p>	<p>300m from the premises</p>
<p>Groundwater in the area is sourced from the Pilbara Fractured Rock aquifer and varies from fresh to brackish (between 500mg/L- 1500mg/L TDS) The groundwater is used in the nearby accommodation village and for stock watering and industrial purposes.</p> <p>The Licence Holder undertakes groundwater monitoring under the <i>Rights in Water and Irrigation Act 1914 Licence</i> GWL166033(4) to ensure abstraction activities do not cause adverse impacts to Groundwater Dependent Ecosystems (GDE) as the standing water levels may vary by as much as 5m over the year. Large trees within the drawdown impact area and riparian vegetation associated with Devil Creek are considered GDE likely to be impacted by groundwater abstraction. The results are compared with historical baseline data under the Operating Strategy for the site and no adverse impacts have been noted (Astron 2017).</p>	<p>Beneath the premises</p>
<p>Historical surveys undertaken as part of the original EP Act development approvals for the site identified the following threatened fauna within the vicinity of the premises:</p> <ul style="list-style-type: none"> <li>•Lakeland downs mouse (<i>Leggadina lakedownensis</i>)</li> <li>•Australia bustard (<i>Ardeotis australis</i>)</li> <li>•Bush Stone curlew (<i>Burhinus grallarius</i>)</li> </ul>	<p>Unspecified</p>

## Risk assessment

Table 6 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. The table identifies 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				
<b>Cat 34</b> oil and gas refining	Installation three of self-contained Gas Engine Alternator Units (GEAs) and associated infrastructure including pipework and pumps. Decommissioning and dismantling of the two the Gas Turbine Alternator Units ancillary equipment and pumps (GTAs)	Noise: associated with vehicle movements	Closest place of residence is 35km south of the premises	No pathway for noise to impact on sensitive receptors				The Delegated Officer considers the separation distance between the construction area and the nearest residential dwelling is sufficiently large for there to be no impacts.  No further assessment required.

**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				
<p><b>Cat 34</b> oil and gas refining</p>	<p>Combustion of natural gas in GEAs Resulting in a reduction of NOx, CO2</p> <p>Inclusion of the two existing generators used for back up stand-by power generation to be included on the Licence</p>	<p><b>Air emissions:</b> associated with the combustion of natural gas for energy production</p>	<p>Closest place of residence is 35km south of the premises.</p> <p>Gnoorea Point camping ground 9km northwest of the premises boundary</p> <p>Threatened fauna within vicinity of prescribed premises</p>	<p>The amendment will result in an overall reduction of air emissions from the premises as the GEAs consume approximately two thirds less fuel.</p>			<p>There will be an improvement in air emissions from this amendment notice</p> <p>Table 2.2.1 of Licence Condition 2.2.1 will be updated to reflect the changes to the infrastructure for point source emissions to air.</p> <p>Condition 2.2.3 is included to prevent the operation of both energy generation systems simultaneously</p> <p>No further assessment required</p>	

## Decision

Air dispersion modelling was undertaken as part of the original approvals for the premises under Works Approval W4560/2009/1 using the CSIRO Atmospheric Research model TAPM. The information as presented at this time indicated that the predicted cumulative air emissions from the premises for all parts of the operations (including use of the gas turbines for power generation, gas compression and flaring activities) under worst case operating scenario was unlikely to exceed the National Environmental Protection (Ambient Air Quality) Measure (NEMP) at the nearest human receptor at any time for any of the key pollutants. Ambient monitoring that was undertaken for a period of seven months during 2012 approximately 1km from the premises boundary (Devil Creek Gas Plant accommodation village) validated the predictive data (Santos WA 2019). During normal operations the main contaminant of concern, being the oxides of nitrogen (NOx) was predicted to be less than 20% of the NEPM at the nearest sensitive receptor (Gnoorea Point). It should be noted that feedstock gas does not contain elemental sulphur so oxides of sulphur have not been considered in the assessment.

The Delegated Officer has considers there is no pathway for air emissions from the GEAs, standby or back-up generators to cause impacts to the nearest human sensitive receptors

The reduction in emissions will be achieved though reduction of the overall fuel consumption of the energy generation infrastructure of the facility by approximately two thirds.

Potential impacts to threatened fauna within the project development area were not assessed under the original Works Approval for the premises (they were assessed under the Ministerial Statement 795 and the Part IV EP Act approvals for the site). The Delegated Officer notes that while no current faunal monitoring or impact assessment data has been received or requested as part of this assessment, the changes proposed by this amendment will reduce the potential risk exposure pathway for air emissions to impact on nearby faunal communities and are therefore deemed acceptable.

The Delegated Officer has determined that Licence Condition 2.2.1 which contain a list of point sources for air emissions from the premises will be updated to:

- Allow the use of the two existing gas turbine generation units A1 and A2 (as annotated on Figure 2) until the installation and commissioning of the three GEAs is complete;
- Include the three self-contained Gas Engine Alternator units (GEAs) 9011; 9012 and 9013; and
- Include the existing emergency back-up power generation diesel generator (G9000) and standby generator (G9005).

Licence Condition 2.2.2 is amended to include the three GEAs, the back-up and standby generator. The condition requires management action to be taken to minimise air emissions from the point source infrastructure in case of specified events including: start up, shut down, upset or emergency situations. The Delegated Officer has determined that all point source air emission infrastructure are included in this condition.

New Licence Condition 2.2.3 is included to restrict the use of the existing GTAs once the GEAs are installed and commissioned, as there are no immediate plans to remove the GTAs from the premises. Commissioning is planned to occur by October 2019. Due to the low threshold capacity of the GEAs, no specific commissioning conditions are considered necessary by the Delegated Officer.

In summary, the amendment is approved subject to the changes and inclusion of the above three conditions, as detailed in the Amendment section below

## Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 16 April 2019. Comments received from the Licence Holder on 18 April 2019 have been considered by the Delegated Officer and included editorial comments.

## Amendment

- Condition 2.2.1 of the Licence is amended by the insertion of the red text shown in underline below:

2.2.1 *The Licensee shall ensure that where waste is emitted to air from the emission points in Table 2.2.1 and identified on the Map of emission points in Schedule 1 it is done so in accordance with the conditions of this licence.*

<b>Table 2.2.1: Emission points to air</b>		
<b>Emission point reference and location on Map of emission points</b>	<b>Emission Point</b>	<b>Emission point height (m)</b>
A1	Power generator stack (G9001)	13
A2	Power generator stack (G9002)	13
A3	Compressor 1 stack (K3100)	13
A4	Compressor 2 stack (K3200)	13
A5	Elevated flare (high pressure and low pressure)	48
<u>G9000</u>	<u>Emergency back-up power diesel generator (G9000)</u>	<u>3m</u>
<u>G9005</u>	<u>Stand-by diesel Generator (G9005)</u>	<u>3m</u>
<u>G9011</u>	<u>Power generator stack (9011)</u>	<u>5.2m</u>
<u>G9012</u>	<u>Power generator stack (9012)</u>	<u>5.2m</u>
<u>G9013</u>	<u>Power generator stack (9013)</u>	<u>5.2m</u>

- Condition 2.2.2 of the Licence is amended by the insertion of the red text shown in underline below:

2.2.2 *The Licensee shall take the specified management action in the case of an event in Table 2.2.2.*

<b>Table 2.2.2: Management actions</b>			
<b>Emission point reference</b>	<b>Event/action reference</b>	<b>Event</b>	<b>Management action</b>
<u>A1– A5</u> <u>G9000</u> <u>G9005</u> <u>G9011</u> <u>G9012</u> <u>G9013</u>	EA1	Start up, shut down, upset or emergency conditions	The Licensee shall take all practical measures to minimise emissions

- The Licence is amended by the insertion of the following Condition 2.2.3:

2.2.3 *The Licensee shall only operate Power Generator G9001 or Power Generator G9002 as back-up power following the installation and commissioning of Power Generators G9011, G9012 or G9013.*

## Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L8731/2013/1– Devil Creek Gas Plant	L8731/2013/1	accessed at <a href="http://www.dwer.wa.gov.au">www.dwer.wa.gov.au</a>
2	Licence Amendment Application Form and supporting information	Santos WA, 2019	DWER records: DWERTDT146402
3	Email correspondence on terminology to describe infrastructure	Santos WA, 2019a	DWER records: A1780975
4	Devil Creek GDE Monitoring – Trigger Development, November 2017 (Astron, 2017). Submitted as part of Devil Creek Groundwater Licence 166033 – 2017 Annual Report	Astron, 2017	DWER records: DWERDT136950
5	Ministerial Statement	MS 795	accessed at <a href="http://www.epa.wa.gov.au/">www.epa.wa.gov.au/</a>
6	DER, July 2015. <i>Guidance Statement: Regulatory principles.</i> Department of Environment Regulation, Perth.	DER 2015a	accessed at <a href="http://www.dwer.wa.gov.au">www.dwer.wa.gov.au</a>
7	DER, October 2015. <i>Guidance Statement: Setting conditions.</i> Department of Environment Regulation, Perth.	DER 2015b	
8	DER, November 2016. <i>Guidance Statement: Risk Assessments.</i> Department of Environment Regulation, Perth.	DER 2016b	
9	DER, November 2016. <i>Guidance Statement: Decision Making.</i> Department of Environment Regulation, Perth.	DER 2016c	