Amendment Report

Application for Licence Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number	L8731/2013/1
Licence Holder	Santos WA Energy Limited
ACN	009 301 964
File Number	DER2016/001677-1
Premises	Devil Creek Gas Plant Fourty Mile Beach Road MARDIE WA 6714 Legal description - Lots 5001 and 5002 on Deposited Plan 53412, Lot 5008 on Deposited Plan 53413 Certificate of Title Volume 3154 Folios 221, 222 and 228 As defined by the premises map in Schedule 1 of the Revised Licence
Date of Report	11 January 2023
Decision	Revised licence granted

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1. Decision summary

Licence L8731/2013/1 is held by Santos WA Energy Limited (licence holder) for the Devil Creek Gas Plant (the premises), located at Lots 5001, 5002 and 5008, Fourty Mile Beach Road, Mardie, Western Australia.

This Amendment Report documents the assessment of potential risks to the environment and public health from a proposed temporary reduction to the freeboard of the premises Evaporation Ponds requested by the licence holder. As a result of this assessment, Revised Licence L8731/2013/1 has been granted.

The Revised Licence issued as a result of this amendment consolidates and supersedes the existing licence and amendment notices previously granted in relation to the premises. The Revised Licence has been granted in a new format with existing conditions being transferred, but not reassessed, to the new format.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this amendment report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary

On 4 January 2023, the licence holder submitted an application to the department to amend the Devil Creek Gas Plant licence L8731/2013/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The licence holder is seeking an amendment to temporarily reduce the freeboard requirement specified on the licence for the premises evaporation ponds from 800 mm to 500 mm for the period 9 January to 10 February 2023.

The licence holder requested the temporary reduction of freeboard due to the evaporation ponds receiving an increased volume of production water as a result of production from the premises needing to be increased from December 2022 through to February 2023. The licence holder's request is aimed at contributing to ensuring State gas supply continuity in response to a series of broader gas supply incidents and events as outlined in the State Government media statements on 7 January 2023 and 8 January 2023 (available at https://www.mediastatements.wa.gov.au).

At the time of the application the evaporation ponds were at 90% of their maximum operating level based on a freeboard of 800 mm. In order to maintain water levels in the ponds below the currently specified 800 mm freeboard, the gas plant would need to reduce production which may have broader implications for the continuity of supply to the Dampier to Bunbury Gas Pipeline (DBGP) to meet demand.

This amendment is limited only to the reduction in evaporation pond freeboard requested by the licence holder and the administrative amalgamation of previous Amendment Notices. No other changes have been requested by the licence holder.

2.3 Background

2.3.1 Premises details

The premises is located approximately 65 km southwest of Karratha. The gas plant processes

gas and liquids from the Reindeer gas field which are transported onshore from an offshore platform to produce natural gas for the domestic market and condensate. The premises has four high density polyethylene (HDPE) lined evaporation ponds for disposal of wastewater produced on the premises and from the adjacent Devil Creek Accommodation Village also operated by the licence holder.

The evaporation ponds primarily receive treated produced water recovered from the gas during processing which has undergone treatment via hydrocyclones and a stripping column designed to reduce hydrocarbon content to 30 mg/L. The maximum production rate of produced water is facility limited at 76 m^3/hr. The ponds also receive treated wastewater from the accommodation village (average of 1.69 m^3/hr), the premises sewage treatment system (<0.5 m^3/day) and the Contaminated Stormwater Pond (estimated to occur 1-2 times per year if the ponds reach capacity with a total inflow based on the pond capacity approximately 3,660 m^3).

The ponds are approximately 150 m by 150 m, have been excavated to a depth of approximately 1.6 m and have constructed embankments of approximately 0.8 m (total depth of 2.4 m). The ponds were designed and constructed with a freeboard of 0.8 m (equivalent to the embankments) which includes an allowance of 300 mm to account for a 1 in 100 year, 24 hour rain event and an additional 500 mm.

2.3.2 Climate

The premises is located in the Pilbara region of Western Australia which is characterised by very hot summers, mild winters and low and variable rainfall. From late spring to early autumn (November–April) is the region's wet season which is characterised by hot temperatures (daily maximum temperatures averaging 36–37 °C) and the majority of the annual rainfall occurring. Wet season rains are associated with the Australian monsoon and occasional tropical cyclones. Tropical cyclones cause the most extreme rainfall events and generate 25–34% of the total annual rainfall near the Pilbara coast. Hot, dry and sunny conditions mean the Pilbara is also subject to very high evaporative demand (Sudmeyer 2016).

A summary of historical rainfall and evaporation data from the Bureau of Meteorology (BOM) Mardie weather station (05008) is provided in Table 1 with data most relevant to the assessment highlighted.

Table 1. BOM Mardie weather station 05008 monthly climate statistics (all years of data 1885-2022)

Month	Average monthly rainfall (mm)	Highest monthly rainfall (mm)	Decile 9 monthly rainfall (mm)	Highest daily rainfall (mm)	Monthly evaporation[1] (mm)
January	37.6	259.6	110.2	211	275
February	62.4	675.2	162.3	364	225
March	48.5	330.4	167	241.3	225
April	19.4	222	77.6	183	225
May	38.7	257.2	112.3	130.6	200
June	36.8	274.9	100.9	131.3	175
July	13.6	150.6	39.2	89.8	175
August	7.0	117.1	18.4	39.9	200
September	1.3	63.5	2.7	63.5	250
October	0.8	24.4	1.2	16.3	375
November	1.5	32.2	2.6	21.4	400
December	9.1	171.3	32.6	168.6	300

NOTE 1: Monthly average pan evaporation based on BOM pan evaporation maps for the period1975-2005 (http://www.bom.gov.au/climate/maps/averages/evaporation)

2.4 Consolidation of Licence

As part of this amendment package the department has consolidated the licence by incorporating changes made under previous Amendment Notices issued for the licence which included an amendment to replace two existing gas turbine generation units with more efficient gas engine alternator units and addition of back-up power generation diesel generators as authorised point sources of air emissions.

The obligations of the licence holder have not changed in consolidating the licence. The department has not undertaken any additional risk assessment of the premises related to previous Amendment Notices.

In consolidating the licence, the CEO has:

- updated the format and appearance of the Licence;
- revised licence condition numbers, and removed any redundant conditions and realigned condition numbers for numerical consistency; and
- updated out of date definitions.

The full consolidation of licence conditions as they relate to this Revised Licence are detailed in Section 5.1. Previously issued Amendment Notices will remain on the department's website for future reference and will act as a record of the department's decision making.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the

receptor from exposure to that emission. The key emissions and associated actual or likely pathway during premises operation which have been considered in this Amendment Report are detailed in Table 2 below. Table 2 also details the control measures the licence holder has proposed to assist in controlling these emissions, where necessary, and the potential human and environmental receptors that may be impacted as a result of these emissions *(Guideline: Environmental siting* (DWER 2020)).

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and take into account potential source-pathway and receptor linkages identified in Table 2.

Where the licence holder has proposed mitigation measures/controls these have been considered when determining the final risk rating. Where the Delegated Officer considers the licence holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the licence holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 2.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 2. Risk assessment of potential emissions and discharges from the premises during operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of amended licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Storage and disposal of treated produced formation water, treated hydrocarbon contaminated water from the Contaminated Water Pond and treated sewage from the Devil Creek Accommodation Village in four HDPE lined evaporation ponds, with a reduced freeboard (500 mm) for approximately 5 weeks.	Contaminated wastewater (hydrocarbons, nutrients and elevated salinity)	Direct discharge to ground due to overtopping of the ponds which may result in soil contamination, flooding and vegetation smothering in surrounding area and runoff toward surrounding seasonal drainage watercourses potentially impacting the health of the watercourse and vegetation.	– Minor seasonal watercourses ~300-800 m north and west of the ponds – Devil Creek ~600 m east of the ponds (gas plant in between) – Vegetation within the Priority 3 Horseflat Land System of the Roebourne Plains Ecological Community (located within the extent) – Groundwater is approximately 10 mbgl.	When operating with a reduced freeboard of 500 mm the following controls will apply to the ponds: – Installation of visible side wall markers on each pond indicating 500mm freeboard level – Daily monitoring and recording of pond levels. – Rate of discharge into the ponds to be reduced to match evaporation rates (or less) if three ponds are full to the 500 mm freeboard level and the fourth pond exceeds the 800 mm freeboard level – Production to be shut-in if all ponds achieve maximum operation level of 500mm freeboard. – Production not to be restarted until freeboard for at least one pond has reduced to below 800 mm. – The maximum produced water production rate is facility limited at 76m^3/hour which is approximately equivalent to 130mm/day on a single pond. – BOM weather forecast to be discussed in morning operational meetings. – Water discharge rates to be reduced to match evaporation rates (or less) in advance if high rainfall event is predicted (BOM) and if pond levels are between 500 – 600mm freeboard. – The maximum rain event (1 in 100 year) is designed for as 300mm over 24-hour period. – In event a high rainfall event results in freeboard reducing to less than 500mm in a pond produced water will not be sent to the applicable pond until the water level drop below the 500mm freeboard.	C = Moderate, low level offsite impacts at a local scale L = Rare, risk event may only occur in exceptional circumstances **Medium Risk**	N	**<u>Condition 1.3.2</u>**	The evaporation ponds are proposed to operate with a reduced freeboard of 500 mm during the Pilbara wet season, when the region is subject to higher rainfall and potentially to cyclonic activity and tropical lows with associated heavy rainfall and flooding which presents an increased risk of overtopping. The delegated officer noted that the licence holder has provided a strategy to mitigate this risk which involves monitoring pond levels and weather activity with associated reduction of discharge into the ponds when a high rainfall event is predicted or only one pond remains with capacity, as well as stopping production when the freeboard level of 500 mm is reached in all ponds. It was also noted that the freeboard includes a 300 mm allowance to contain a 1 in 100 year 24 hour storm event with an additional 200 mm. The delegated officer referred to relevant climate data (Table 1) and found that the maximum recorded daily rainfall exceeds this (364 mm in February 1995 when the highest monthly rainfall also occurred) but is still within the 500 mm freeboard allowance. Additionally, the 90% percentile monthly rainfall for the months where there will be a reduced freeboard is less than 200 mm which is less than the monthly evaporation rates. Given the above the delegated officer considered the proposed temporary freeboard reduction does not present an unacceptable risk for the finite period proposed, subject to the licence holder's proposed controls being implemented through conditions on the licence to mitigate the risk of overtopping. Recording requirements related to the controls have also been included to ensure compliance with requirements can be demonstrated. The delegated officer noted that condition 4.3.1 of the licence requires the licence holder to report any exceedance of limits specified in the licence to the department no later than 5 pm of the next working day therefore no additional reporting is required. The delegated officer identified that if water levels within the ponds reach the 500 mm freeboard, there would be a period of time required for the pond water levels to recede to within the normal 800 mm freeboard. The licence holder advised that based on evaporation rates of approximately 8 mm per day, and discharge into the ponds being approximately half the evaporation rate it was expected to take approximately 11 weeks for the water level to reduce to a freeboard of 800 mm. The delegated officer therefore determined it necessary to include conditions which allow the water level in the ponds to exceed 800 mm until 30 April 2023 subject to discharge into the ponds during this time period being limited to a rate equivalent to half the evaporation rate.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

Note 2: Proposed licence holder's controls are depicted by standard text. **<u>Bold and underline text</u>** depicts additional regulatory controls imposed by department.

4. Consultation

The licence holder was provided with the draft decision on 10 January 2023. The licence holder responded on 11 January 2023 and advised they agreed with the proposed conditions and waived the remainder of the comment period.

5. Decision

The delegated officer has determined the proposal to temporarily reduce the specified freeboard for the premises evaporation ponds from 800 mm to 500 mm, does not pose an unacceptable risk of impacts to public health or the environment. The determination is based on the following:

- the freeboard reduction being authorised only for a short term period until 10 February 2023 which coincides with the timeframe the Devil Creek Plant and is required to continue increased production to supplement the State's gas supplies;
- the licence holder proposing additional controls in place to manage the risk of overtopping when operating at a reduced freeboard and that those controls will be included in the licence to mitigate the risk of ponds overtopping; and
- the reduced freeboard having adequate capacity to contain a 1 in 100 year 24 hour storm event.

Conditions have been imposed on the Revised Licence based on the controls described in Table 2 as they are considered critical to maintaining an acceptable level of risk with regards to overtopping of the ponds.

The delegated officer identified that if water levels within the ponds reach the 500 mm freeboard during the timeframe the freeboard is reduced for, there would be a period of time required to allow the pond water levels to reduce to within the normal 800 mm freeboard. The delegated officer has specified a time frame from 11 February 2023 to 30 April 2023 in which the specified freeboard will remain at the reduced level of 500 mm, however water discharge into the ponds during this time is restricted to a rate equivalent to approximately half the anticipated evaporation rate of 8 mm during this period to ensure levels return to a freeboard of 800 mm within this timeframe. The normal operating freeboard of 800 mm will apply from 1 May 2023.

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Licence will be granted, subject to conditions commensurate with the determined controls.

5.1 Summary of amendments

Table 3 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process. Changes made as a result of consolidating the licence are also details in the table but do not change any existing obligations on the licence holder.

Table 3: Summary of licence amendments

Condition no.	Proposed amendments
Introduction and licence requirements	Removed as is not part of the licence conditions and information is available in the Department's published Guidance materials.
Interpretation	Updated to reflect current licence format.
1.1.2 Definitions	Licensee terminology changed to licence holder throughout the licence to reflect current terminology.

Condition no.	Proposed amendments
	Definitions included for BOM 7-day forecast which is referred to in the amended conditions.
1.3.2 (Table 1.3.2)	Table 1.3.2 has been amended to include the following: • Temporary infrastructure controls for the evaporation ponds for the duration 14 January 2023 to 10 February 2023 based on licence holder's controls and an operating freeboard of 500 mm • Temporary infrastructure controls for the evaporation ponds for the duration 11 February 2023 to 30 April 2023 which allow the ponds to operate with a freeboard of 500 mm during this time subject to discharge into the ponds being restricted to a rate of 1613 m^3/week which is approximately equivalent to half the predicted rate of evaporation during the period. The normal operating freeboard of 800 mm specified in condition 1.3.1 will apply from 1 May 2023
2.2.1 (Table 2.2.1) and 2.2.2 (Table 2.2.2)	Conditions updated to reflect items 1 and 2 of amendment notice 1 which include the new power generators and emergency back-up diesel generators as authorised emissions point and require management actions in condition 2.2.2 to apply to these emission points..
2.2.3	Condition included to reflect item 3 of amendment notice 1 which inserts condition 2.2.3 to specify that Power Generators G9001 and G9002 may only be used for back up power following installation and commissioning of new power generators.

References

1. Apache Energy 2011, *Devil Creek Licence application including attachments*, Perth WA
2. Bureau of Meteorology (BOM) 2023a, *Climate Data Online – Climate statistics Mardie site number 05008*. Accessed January 2023 at http://www.bom.gov.au/climate/data/.
3. BOM 2023b, *Australian Bureau of Meteorology Climate outlooks—weeks, months and seasons (Weekly rainfall outlook scenario)*. Accessed January 2023 at http://www.bom.gov.au/climate/outlooks/#/rainfall/total/75/weekly/0
4. Department of Environment and Conservation 2012, *Devil Creek Gas Plant W4560/2009/1 Environmental Assessment Report (issued 2009, updated 2012)*, Perth, Western Australia.
5. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
6. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
7. DWER 2020a, *Guideline: Risk Assessments*, Perth, Western Australia.
8. Santos WA Energy Limited (Santos) 2022, *Application for a Licence amendment for L8731/2013/1 under the Environmental Protection Act 1986 (including application form and attachments)* (A2148301 and A2148302).
9. Sudmeyer, R 2016, *Climate in the Pilbara, Bulletin 4873, Department of Agriculture and Food*, Perth, Western Australia.