



Application for licence amendment

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

Licence Number	L8356/2009/2
Licence Holder	NewGen Neerabup Pty Ltd
ACN	126 965 722
File Number	2010/007483-2
Premises	Neerabup Power Station 45 Trandos Road NEERABUP WA 6031 Legal description – Lot 100 on Deposited Plan 63371
Date of report	29 November 2021
Status of report	Final

1. Decision summary

Licence L8356/2009/2 is held by NewGen Neerabup Pty Ltd (licence holder) for the Neerabup Power Station (the premises), located at 45 Trandos Road, Neerabup.

This report documents the assessment of potential risks to the environment and public health from proposed changes to the premises monitoring requirements. As a result of this assessment, revised licence L8356/2009/2 has been granted.

The revised licence issued as a result of this amendment also consolidates and supersedes the existing licence and any 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 report, the department 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 29 June 2020 the licence holder submitted an application to the department to amend licence L8356/2009/2 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

1. change to registered business address;
2. changes to monitoring and reporting requirements for emissions to air, including:
 - the deletion of condition 2.2.2 prescribing targets for emissions of nitrogen oxides (NOx); and
 - amendment to condition 3.2.1 to make the frequency of stack testing dependant on hours of operation, with monitoring to occur at least once every 4,000 hours of operation for each gas turbine; and
3. other administrative changes.

With respect to point 2, the licence holder has applied to the Environmental Protection Authority (EPA) to change the conditions of Ministerial Statement (MS) 759 under Part IV of the EP Act. Specifically, the licence holder has requested the removal of condition 9 of MS 759 that relates to the management stack emissions to air. In relation to its stack emissions management plan (SEMP) under condition 9 of MS 759, the EPA advised the licence holder to consider carbon monoxide, nitrous oxides, sulfur dioxide, moisture content, dry gas density, molecular weight, oxygen and particulates in proposing any licence changes under Part V of the EP Act.

2.2.1 Update and consolidation of licence

The department has initiated amendments to the licence to consolidate changes made under previous amendment notices and update the licence into the current format. The obligations of the licence holder have not changed in making these amendments therefore the department has not undertaken any additional risk assessment associated with these changes.

In amending the licence, the CEO has:

- updated the format and appearance of the licence;
- amalgamated the amendment notice issued on 26 April 2016 which extended the licence expiry date;

- deleted the redundant AACR form set out in schedule 1 of the previous licence and updated conditions and definitions relating to the AACR to the current format;
- updated definitions;
- revised licence condition numbers, removed redundant conditions and realigned condition numbers for numerical consistency; and
- corrected clerical mistakes and unintentional errors.

The changes as they relate to the amended licence are detailed in section 6.1. 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.

2.3 Background

The licence holder operates a 330 megawatt (MW) power station, comprising two open cycle gas turbines with a design capacity of 165 MWe each. The premises commenced operation in 2009 and operates as a peaking power station that supplies power into the South West Interconnected System, as requested.

The existing licence authorises emissions to air via a stack on each gas turbine, and includes a requirement undertake annual monitoring of emissions to air from each stack and report the results of the monitoring to the department in an annual environmental report. The licence also specifies an emission target for emissions of NOx with exceedances of the target required to be reported to the department. The NOx target was based on the design criteria for low NOx burners incorporated in the gas turbines.

Monitoring of NOx is required annually by the existing licence, however the power station is used for peaking lopping and is therefore frequently inactive. Difficulties of scheduling stack tests with infrequent and short duration activity means annual testing may require the turbines to be started up solely for the purpose of monitoring. The licence holder proposed an amendment to alter the stack monitoring frequency from annual to after every 4,000 hours of operation for individual turbines and proposed that based on historical operations this would equate to about once every 3 years.

A summary of the operating hours of the premises turbines up to FY 2020 is presented in Table 1. Based on this operating profile, a frequency of monitoring based on 4000 hours of operation would result in monitoring occurring approximately once every seven years for each turbine.

Table 1: Operating hours of the Neerabup power station since commissioning¹

Financial year	Unit 11	Unit 12	Total
FY10	11	20	31
FY11	1236	1242	2479
FY12	646	577	1222
FY13	104	109	212
FY14	263	196	459
FY15	332	392	723
FY16	694	529	1223
FY17	449	515	965
FY18	831	634	1465
FY19	541	542	1084
FY20	913	1539	2452
Annual average	547	572	1120

Note 1: Data taken from the 2019-20 Neerabup DWER Annual Environmental and Compliance Report August 2020 (ERM Power).

2.4 Part IV of the EP Act

Ministerial approval for construction and operation of a 330 MW gas-fired power station, on the premises was granted under Part IV of the EP Act on 21 January 2008 (MS 759). MS 759 includes ministerial conditions 9-1 to 9-4 relating to stack emissions which are relevant to this amendment. The requirements of the conditions are summarised below.

- Submit an engineering design report for approval prior to construction detailing the design details for stacks emitting gaseous and particulate pollutants.
- Prepare and submit a SEMP prior to commencement of operation which includes:
 1. emission targets and standards;
 2. stack emission monitoring program; and
 3. annual reporting.
- Implement the SEMP and make it publicly available.

A SEMP was submitted to the EPA and was approved in 2013. The plan has been implemented by the licence holder since this time. The licence holder has requested changes to the implementation conditions of MS 759, which includes a request to remove conditions 9-1 to 9-4 from MS 759 and for stack emissions to be regulated under the EP Act Part V licence L8356/2009/2. The proposal was subject to an inquiry by the EPA under section 46 of the EP Act.

MS 1176 was subsequently published on 25 November 2021, which amended MS 759 by removing condition 9 in its entirety.

2.5 Air emissions

In accordance with requirements of the SEMP and licence L8356/2009/2, the licence holder has conducted annual stack monitoring and reporting. Table 2 shows the most recent results of this monitoring. A target of 25 ppm for NO_x emissions is specified in condition 2.2.2 of the existing licence.

Table 2: Monitoring of stack emissions results since 2015

	Unit 11		Unit 12	
	NO _x (ppm)	CO (ppm)	NO _x (ppm)	CO (ppm)
2015-16	19	<1	20	<1
2016-17	19	<1	16	<1
2017-18	21	<2	17	<2
2018-19	19	<2	11	<2
2019-20	19	<1	19	<1

Modelling was undertaken prior to construction of the power station based on worst case scenario and emissions. Maximum predicted ground level concentrations (GLCs) are shown in Table 3 with reference to ambient air quality criteria set out in the 2015 National Environmental Protection Ambient Air Quality Measure (NEPM). All pollutants were predicted to be less than 8% of the relevant criteria within the model domain and less than 4.5% of the criteria at the nearest sensitive receptors.

Table 3: Predicted maximum ground level concentration of pollutants due to operation of Neerabup power station

Concentration (ug/m ³)	NO _x		SO ₂		PM
	1-hour	Annual	1-hour	Annual	1-hour
2015 NEPM criteria	246	62	570	228	50

Maximum in model domain	18.44	0.04	0.82	0.06	0.83
% of Standard	7.5%	0.07%	0.14%	0.03%	1.7%
Maximum at receptor locations	10.89	0.02	0.48	0.04	0.58
% of Standard	4.4%	0.03%	0.08%	0.02%	1.2%

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.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this report are detailed in Table 4 below. Table 4 also details the control measures the licence holder has proposed to assist in controlling these emissions, where necessary. Only emissions relevant to the proposed amendments have been considered.

Table 4: Emission sources and controls

Emission	Sources	Potential pathways	Proposed controls
NOx	Combustion of gas within two open cycle gas turbines for power generation	Air/windborne pathway	Low NOx burners with a design criteria of less than 25 ppm
Carbon monoxide (CO)			Natural gas as only fuel
Particulates (PM ₁₀)			
SO ₂			

3.1.2 Receptors

In accordance with the *Guideline: Risk Assessments* (DWER 2020), the delegated officer has excluded employees, visitors and contractors of the licence holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies and is provided for under other state legislation.

Table 5 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental Siting* (DWER 2020)). Only those receptors which may be impacted as a result of emission sources and pathways identified in Table 4 have been included.

Table 5: Sensitive receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
House associated with chicken farm	290 m boundary to boundary – 400 m house to stack.
Residential Area	1.7 km south east from boundary to boundary.
Recreational facility (Go Cart hire)	520 metres north

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources relevant to the amendment and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the licence holder has proposed mitigation measures/controls (as detailed in Section 3.1), 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 6.

The revised licence L8356/2009/2 that accompanies this report authorises emissions associated with the operation of the premises i.e. power generation. The conditions in the revised licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 6. Risk assessment of potential emissions from the Premises operation

Risk Event					Risk rating ¹	Licence Holder's controls sufficient?	Conditions ² of licence	Reasoning
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls	C = consequence L = likelihood			
Combustion of gas within two open cycle gas turbines for power generation	Emissions to air: particulates NO _x , SO ₂ and CO	Air/windborne pathway causing impacts to health and amenity	One residence 290 metres away and residential area 1.7 km away.	Refer to Section 5.1	C = Minor L = Rare Low Risk	Y	Condition 2, 3, 4, 5, 16	<p>The burners on the turbines are designed to yield low NO_x emissions and annual monitoring has demonstrated that emission rates are consistently less than the design criteria of 25 ppm. Worst case air quality modelling predicted GLCs of <4.5% of NEPM criteria at sensitive receptors. The delegated officer considers that the risk of impacts from NO_x emissions is low and therefore does not require a limit, however periodic stack monitoring is required to verify that the turbines continue to work efficiently.</p> <p>The gas turbines only burn natural gas which yields low levels of particulates and SO₂. The delegated officer considers the risk of impacts from emissions of particulates and SO₂ do not warrant limits or routine monitoring. Gas turbines also yield low levels of CO and the risk of emissions of CO is considered to also be low, however the presence of CO is an important indicator of incomplete combustion, therefore monitoring of CO emissions has been retained in the licence, to demonstrate the turbines continue to operate effectively over time.</p> <p>Based on the operating profile of the premises (peak lopping), the delegated officer considers the frequency of monitoring can be reduced from annually to every 2,000 hours of operation for each turbine, which is expected to equate to about once every three years.</p> <p>Moisture content, dry gas density and oxygen are required to be measured as part of the prescribed methods for monitoring.</p>

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guidance Statement: Risk Assessments* (DER 2017).

Note 2: Proposed Licence Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Decision

The delegated officer has determined to remove the target for NOx emissions from the licence. This determination is based on the following:

- monitoring has established that emissions of NOx are consistently lower than the NOx design criteria 25 ppm; and
- modelling (based on the design criteria) demonstrates that worst case ground level concentrations are predicted to be less than 8% of the relevant ambient standard, and less than 4.5% at the nearest sensitive receptor, therefore NOx emissions pose a low risk to public health and the environment.

The delegated officer also determined to amend the required monitoring frequency of point source emission to air monitoring from annually to every 2,000 hours of operation for each turbine (occurring within nine months of every 2,000 hours). This determination is based on the following:

- the power station operates as a peaking station and therefore there is no certainty over when and how long the power station will operate which can result in operation of the power station solely for the purpose of stack emission monitoring therefore generating emissions which may otherwise not have been;
- the low and variable run time hours for the premises gas turbines each year;
- the consistent low emissions results from monitoring to date which indicate the risk associated with air emissions is low;
- the operating history of the premises monitoring indicates monitoring is likely to occur approximately every three years if a frequency of every 2,000 hours is specified; and
- continued monitoring at a reduced frequency will enable the department to confirm if emissions remain consistent with historic results.

The delegated officer has determined that additional parameters requested for consideration by the EPA (moisture content, dry gas density, molecular weight oxygen) are addressed by the prescribed monitoring methods in the monitoring conditions.

5. Consultation

The licence holder was provided with drafts of the revised works approval and this report on 15 December 2020 and sought minor corrections and clarifications.

The licence holder also queried the new operational requirement to maintain pond liners such that they do not leak and considers this requirement cannot be easily or practically demonstrated. The licence holder has suggested this be changed to require the ponds to be lined with HDPE at least 2 mm thick. The delegated officer considers this will achieve a similar outcome and has updated the condition accordingly.

6. Conclusion

Based on the assessment in this report, the delegated officer has determined that a revised licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

6.1 Summary of amendments

Table 7 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.

Table 7: Summary of licence amendments

Existing condition	Revised condition no.	Proposed amendments
Cover page		Restructured to clearly indicate what prescribed activities have been risk assessed. Expiry date has been changed to the amended expiry date.
Introduction		Deleted, consistent with current DWER template. This guidance is now available in DWER's <i>Guide to Licensing</i> (June 2019).
1.1.1, 1.1.3, 1.1.4	Interpretation	Updated consistent with current DWER template.
1.1.2	Definitions	Updates made consistent with current DWER template. Definitions deleted: APHA-AWWA-WEF, AS4323.1, averaging period, department, code of practice for storage and handling of dangerous goods, dangerous goods CEMS Code, environmentally hazardous materials, fugitive emissions, Schedule 1, Schedule 2, six monthly period, usual working day. Definitions added: ACN, Annual Audit Compliance Report (AACR), Department Definitions replaced: Act with EP Act, licensee with licence holder Definitions modified: CEO, licence, premises
1.2.1		Removed redundant condition consistent with current licensing format
1.2.2	1	Redundant condition. Adequately covered by alternative existing conditions. Deleted from licence.
1.2.3	-	Redundant condition. Adequately regulated by the <i>Dangerous Goods Safety Act 2004</i> . Deleted from licence.
1.2.4	-	Redundant condition. Adequately covered by the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> . Deleted from licence.
1.2.5	-	Redundant condition. Adequately covered by the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> . Deleted from licence.
1.3.1	1	Revised to current DWER template
2.1.1	-	Redundant condition deleted from licence
2.2.1	2	Revised to current DWER template
2.2.2	-	Condition deleted as part of this amendment
2.3-2.8	-	Redundant conditions deleted from licence
3.1.1	7	Revised to current DWER template
3.1.2	8	New numbering and revised to current DWER template. Remove reference to 6 monthly monitoring because it is not applicable.
3.1.3	5	Revised to current DWER template
3.1.4	9	Revised to current DWER template
3.1.5	10	Revised to current DWER template
3.2.1	3	New numbering and update to current format. Change in frequency of monitoring from annually to within 9 months of reaching 2000 hours of operation.
3.2.2	4	New numbering
3.3-3.6	-	Redundant conditions deleted from licence

3.7.1	11	Numbering updated
3.8.1	6	Revised to current DWER template
3.9, 4.1.1	-	Redundant conditions deleted from licence
5.1.1	16	Revised to current DWER template
5.1.2	-	Redundant conditions deleted from licence
5.1.3	13	Revised to current DWER template
5.1.4	12	Revised to current DWER template
5.2.1	15	Revised to current DWER template. Removed the requirement to report on malfunction of pollution control equipment.
5.2.2	-	Redundant condition. Deleted from licence.
5.2.3	-	Redundant condition. Deleted from licence. Duplicates provisions of the EP Act.
5.3.1	-	Redundant condition. Deleted from licence. Duplicates conditions already stated and provisions of the EP Act.t
Schedule 1 Maps	Schedule 1 Premises Maps	Maps have been updated showing existing infrastructure and emission points
Schedule 2	-	Redundant attachment deleted from licence. Forms accessed at www.dwer.wa.gov.au

Daniel Hartnup
A/MANAGER, PROCESS INDUSTRIES
REGULATORY SERVICES

An officer delegated by the CEO under section 20 of the EP Act

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
3. DWER 2020, *Guideline: Environmental Siting*, Perth, Western Australia