Government of **Western Australia**
Department of **Environment Regulation**

Decision Document

Environmental Protection Act 1986, Part V

Proponent: Water Corporation

Licence: L6270/1991/10

Registered office:	629 Newcastle Street LEEDERVILLE WA 6007
Premises address:	Kununurra Wastewater Treatment Plant Reserve 30945 Duncan Highway, KUNUNURRA WA 6743 Being Lot 3008 on Plan 48173
Issue date:	Thursday, 31 October 2013
Commencement date:	Friday, 01 November 2013
Expiry date:	Wednesday, 31 October 2026

Decision

Based on the assessment detailed in this document, a decision has been made to issue an amended licence. It is considered that in reaching this decision, all relevant considerations have been taken into account.

Decision Document prepared by:	Damian Thomas Licensing Officer
Decision Document authorised by:	Stephen Checker Delegated Officer

Contents

1 Purpose of this Document

This decision document explains how the licence amendment application has been assessed and determined the licence amendment, and provides a record of the decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to the assessment and decision making under Part V of the *Environmental Protection Act 1986*. Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

2 Administrative summary

Administrative details		
Application type	Works Approval ☐ New Licence ☐ Licence amendment ☒ Works Approval amendment ☐	
Activities that cause the premises to become prescribed premises	**Category number(s)**	**Assessed design capacity**
	54	2000m^3/day
Application verified Application fee paid	Date: N/A Date: N/A	
Works Approval has been complied with Compliance Certificate received	Yes ☐ No ☐ N/A ☒ Yes ☐ No ☐ N/A ☒	
Commercial-in-confidence claim	Yes ☐ No ☒	
Commercial-in-confidence claim outcome	N/A.	
Is the proposal a Major Resource Project?	Yes ☐ No ☒	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes ☐ No ☒	Referral decision No: Managed under Part V ☐ Assessed under Part IV ☐
Is the proposal subject to Ministerial Conditions?	Yes ☐ No ☒	Ministerial statement No: EPA Report No:
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes ☐ No ☒ Department of Water consulted Yes ☐ No ☒	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes ☐ No ☒ If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes ☐ No ☒ If Yes, include details here, eg Site is subject to SO_2 requirements of Kwinana EPP.		

3 Executive summary of proposal

The Kununurra Wastewater Treatment Plant (WWTP) is licensed to treat up to 2000kL/day of wastewater. It treats wastewater to a secondary standard using two series of primary, secondary, tertiary and quaternary ponds. Following pond treatment, effluent is subject to chlorination before being discharged to the M1 Channel. Any significant degradation to the quality of the water within the M1 Channel (as a result of discharge from the WWTP) may have impact on the suitability of the water for irrigation purposes.

Water Corporation (WC) has installed a Sodium Nitrate Dosing Unit (SNDU) at the WWTP. The intent of the SNDU is to assist with treatment during the peak tourist season when the facultative ponds tend to turn anaerobic. The SNDU is a temporary solution until the WWTP upgrade project is completed (currently the project has been put on hold pending DER's review of the existing licence).

The objective of the SNDU is to rapidly increase the availability of free oxygen in the ponds to facilitate greater bacterial biodegradation of organic material, resulting in a higher treatment capacity. This is useful during short periods of higher inflow Biochemical Oxygen Demand (BOD) loading such as that experienced during the tourist season at Kununurra. The proposed dosing period will coincide with the "tourist" season which is primarily between June to September when higher BOD loadings inflows and lower temperatures are experienced. Facultative wastewater lagoons are designed to operate under varying redox conditions through the water column – aerobic at the top, to anaerobic at the bottom sludge layer. Because of this, and the fact that the depth of oxygen penetration changes daily and seasonally (due to algal photosynthesis), the microbial population tends to be dominated by facultative, as opposed to obligate, bacteria. Facultative bacteria might for example use oxygen as a terminal electron acceptor if available, but be able to use nitrate or sulfate if not (and further down the electron acceptor redox chain if required). Oxygen is the most efficient, then nitrate, then sulfate etc. The final product of nitrate reduction is nitrogen gas.

Regular practice to increase the capacity of overloaded ponds is to add more oxygen, usually via aeration. In this case however WC couldn't go down this path because of the change it would have to WWTP retention time and possible impacts to helminth removal. The next best option, in terms of the redox chain, is nitrate. It could be added in dissolved form, avoiding the impact of aeration or mixing on retention time. The focus of this practice is principally providing an energy, rather than nutrient, source. The use of nitrate as a management practice for acutely overloaded ponds is established in pond literature and has been used by WC at various sites in the past. The expectation of the SNDU is that sufficient nitrate will be added to supply the electron acceptor demand deficit, and no more. It is therefore not expected that the WWTP will see a significant increase in nitrate in the WWTP effluent as it will be removed via the denitrification pathway. Regular monitoring of the effluent quality is already conducted and an increase in nitrate concentration will trigger adjusting of the dose rate.

The estimated increase in sodium concentration is at most 17mg/L, though it is not expected the full design dose rate to be required. This is against an average water supply concentration of 33mg/L. WC gave consideration to the use of ammonium nitrate, potassium nitrate and calcium nitrate; however, both ammonium nitrate & potassium nitrate were not considered further due to the difficulties in sourcing the required quantities. Calcium Nitrate was not considered further as often with the case of high pH effluent there is a calcium-scaling risk to the chlorination system and impact its working lifespan and reliability.

It is anticipated that a dose of up to 100kg/day will be required during the peak season which is primarily between the months of June to September each year. At this dose, the sodium salinity of the plant effluent will increase to around 17 mg/L. It is anticipated that all nitrate will be consumed in the process and denitrified to nitrogen, hence the current levels of 0 mg/L of nitrate in the effluent will be retained.

This Licence is the result of an amendment sought by the Licensee requesting an amendment to operate the SNDU.

As part of this amendment, the assessment has considered the acceptability of emissions and discharges from the Premises relating to the SNDU as outlined in the Decision table below. During this amendment process changes to the conditions on the licence have also been made in line with global changes and licence template updates.

4 Decision table

All applications are assessed under the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987*, DER's *Policy Statement No.7 – Operational Risk Management* and the risk matrix attached to this decision document in Appendix A. Where other references have been used in making the decision they are detailed in the decision table.

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
General conditions	1.2.1 – 1.2.4	Previous conditions 1.2.1 – 1.2.4 have been removed from the licence in line with DER new licensing process as they are considered redundant and adequately covered by existing legislation, or irrelevant in the context of this licence.	Application supporting documentation L6270/1991/10
Premises operation	1.2	General changes to licence and table numbers as required. Condition 1.2.5 has been revised to update 'targets' as published on DER's website www.der.wa.gov.au under "*Administrative changes implemented within the Department of Environment Regulation*"	Application supporting documentation L6270/1991/10
Emissions to surface water including monitoring	L3.2.1	**Operation** Emission Description *Emission:* Residual contaminants from sodium nitrate dosing in treated wastewater discharge to the M1 Irrigation Channel. *Impact:* Contamination of surrounding land and surface water drainage irrigation systems. Potential impacts on ecology of land (soil) and groundwater, surface water (Lower Ord River) and irrigated crops from the addition of sodium nitrate. *Controls:* Low dosing concentration. Nitrate expected to be fully used up in treatment process. The proponent proposes to direct treated effluent to a dedicated Irrigation Channel. *Risk Assessment* *Consequence:* Minor *Likelihood:* Unlikely	Application supporting documentation L6270/1991/10

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		Risk Rating: Moderate *Regulatory Controls* Licence condition 3.2.1 Monitoring of point source emissions to surface water has been amended to include the monitoring of Total Sodium, Nitrate/Nitrite and Ammonia/Ammonium. All three parameters will be monitored at all times (i.e. when both operating and not operating the SNDU) but the frequency will change from Quarterly to Monthly when the SNDU is operating in the tourist season (June to September). Monitoring results are required to be submitted in the Annual Environmental Report so analysis of the results can be undertaken to assess any impacts to the environment. The estimated increase in sodium concentration is at most 17mg/L, though it is not expected the full design dose rate to be required. This is against an average water supply concentration of 33mg/L. WC gave consideration to the use of ammonium nitrate, potassium nitrate and calcium nitrate; however, both ammonium nitrate & potassium nitrate were not considered further due to the difficulties in sourcing the required quantities. Calcium Nitrate was not considered further as often with the case of high pH effluent there is a calcium-scaling risk to the chlorination system and impact its working lifespan and reliability. It is anticipated that a dose of up to 100kg/day will be required during the peak season which is primarily between the months of June to September each year. At this dose, the sodium salinity of the plant effluent will increase to around 17 mg/L. It is anticipated that all nitrate will be consumed in the process and denitrified to nitrogen, hence the current levels of 0 mg/L of nitrate in the effluent will be retained. *Residual Risk* *Consequence:* Minor *Likelihood:* Unlikely *Risk rating:* Moderate	

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Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Odour	L2.5.1	The previous licence contained conditions for odour management. Fugitive odour conditions have been removed from the licence accordance with Departmental reform as published on DER's website under "*Administrative changes implemented within the Department of Environment Regulation*" www.der.wa.gov.au. Odour emissions can be sufficiently regulated under section 49 of the *Environmental Protection Act 1986*	*Environmental Protection Act 1986.S49*
Licence Duration	N/A	The licence was amended on 29/4/2016 to extend licence duration expiry date in line with DER Guidance Statement Licence Duration until 2026. No further changes are required under this licence amendment.	N/A

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
27/05/2016	Proponent sent a copy of draft instrument	Comments received Friday 3/06/2016. Proponent has no comments and requested the licence be issued as soon as possible.	N/A

6. Risk Assessment

Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High

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THE ROYAL AGRICULTURAL SOCIETY OF WA AGRICULTURE ENCOURAGEMENT AWARDS STUDENT APPLICATION GUIDELINES

You should treat the scholarship application like a job application - your application needs to stand out from the rest!

Please prepare a short written application and include a short summary of your interest and experience in agriculture to demonstrate why you should be selected. It is a great idea to include examples and evidence with your entry, such as;

- plans for your future in the agricultural industry
- details of any courses or qualifications you are working towards
- practical experience / work experience
- extra-curricular activities
- letters from referees
- school reports

You should also provide some information how you would use the funds, should you be successful, and your willingness to undertake a structured one day program at the 2016 IGA Perth Royal Show.

Applications must be received by 5:00pm, Friday 1 July 2016 and should be sent by post or email to;

Alysia Kepert
Claremont Showground
1 Graylands Road
Claremont WA 6010
T (08) 62 633 132
E akepert@raswa.org.au