Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Licensee: Water Corporation

Licence: L6426/1991/13

Registered office: 629 Newcastle Street
LEEDERVILLE WA 6007

Premises address: Esperance Wastewater Treatment Plant
Lot 924 on Plan 240409, Jetty Road
CHADWICK WA 6450
Being Lot 924 on Plan 240409 as depicted in Schedule 1

Issue date: Thursday, 31 October 2013

Commencement date: Friday, 1 December 2013

Expiry date: Thursday, 30 November 2018

Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER), has decided to issue an amended licence. DER considers that in reaching this decision, it has taken into account all relevant considerations and legal requirements and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by: Clarrie Green
Licensing Officer

Decision Document authorised by: Steve Checker
Manager Licensing

Contents

1 Purpose of this document

This Decision Document explains how DER has assessed and determined the application and provides a record of DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's 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.

Works approval and licence conditions
DER has three types of conditions that may be imposed on works approvals and licences. They are as follows:

Standard conditions (SC)

DER has standard conditions that are imposed on all works approvals and licences regardless of the activities undertaken on the Premises and the information provided in the application. These are included as the following conditions on works approvals and licences:

Works approval conditions: 1.1.1-1.1.4, 1.2.1, 1.2.2, 5.1.1 and 5.1.2.

Licence conditions: 1.1.1-1.1.4, 1.2.1-1.2.4, 5.1.1-5.1.4 and 5.2.1.

For such conditions, justification within the Decision Document is not provided.

Optional standard conditions (OSC)

In the interests of regulatory consistency DER has a set of optional standard conditions that can be imposed on works approvals and licences. DER will include optional standard conditions as necessary, and are likely to constitute the majority of conditions in any licence. The inclusion of any optional standard conditions is justified in Section 4 of this document.

Non standard conditions (NSC)

Where the proposed activities require conditions outside the standard conditions suite DER will impose one or more non-standard conditions. These include both premises and sector specific conditions, and are likely to occur within few licences. Where used, justification for the application of these conditions will be included in Section 4.

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	2,637 cubic metres per 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		
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 and assessment

The Esperance Wastewater Treatment Plant (WWTP) is located on Jetty Road in the Esperance suburb of Chadwick (WWTP#1). The premises is surrounded by environmentally sensitive areas including, the Lake Warden system (RAMSAR and ANCA wetland) approximately 240m NW of the premises; a Priority 3 Public Drinking Water Source Area approximately 450m to the SW. The Esperance Bay is 250m to the east and a fertiliser plant adjacent to the north of the premises.

Treated effluent from the site is disposed of at two infiltration ponds (WWTP#2) located at Lot 2 on Plan 22578, Wylie Bay Road in Bandy Creek to the east of the Jetty Road site. The two sites are connected by pipeline approximately 8.5 km long and both sites have historically formed the premises description on the Esperance WWTP licence. Due to DER policy which requires licensed premises to form one contiguous area of land occupied by the Licensee, WWTP#2 and the connecting pipeline has been removed from this Licence.

WWTP#1 utilises a two pond system to treat a maximum throughput of 2,637 cubic metres per day (m^3/day) and discharging into four onsite infiltration ponds. The primary pond is an aerobic pond fitted with three 22 kW and one 11 kW mechanical aerators. WWTP#1 consists of the following ponds (as depicted in Schedule 1):

- Primary Treatment Pond;
- Secondary Treatment Pond;
- Pond 3 (infiltration);
- Pond 4 (infiltration);
- Infiltration Lagoon #1; and
- Infiltration Lagoon #2

Infiltration ponds located at WWTP#1 have the capacity to infiltrate 1,700 m^3/day. When infiltration ponds at WWTP#1 are at capacity a transfer pump station is engaged to pump effluent to Esperance WWTP#2. The average daily outflow from the Esperance WWTP in 2013/14 was 1,494 m^3/day.

Treated wastewater is abstracted from Infiltration Lagoon #1 for reuse by the Shire of Esperance (the Shire) for the irrigation of a golf course and sporting grounds. Treated wastewater from the Esperance WWTP undergoes chlorine dosing before being discharged to Shire grounds although chlorination is the responsibility of the Shire. The volume sent to the Shire is measured by a flow meter within the Esperance WWTP boundary.

Although no treatment of wastewater occurs at WWTP#2, the site remains a discharge location for treated wastewater from WWTP#1 and therefore groundwater monitoring nearby to WWTP#2 remain on the Licence. Groundwater monitoring bores are also located around WWTP#1 to identify potential contamination from the Esperance WWTP. Groundwater flows at both sites are toward the ocean and monitoring bores are located both up and down hydraulic gradient. Water Corporation's Annual Environmental Review for 2013/14 identified elevated levels of Total Nitrogen at monitoring bores located down gradient of all infiltration ponds at both sites. The highest concentrations of Total Nitrogen were recorded at monitoring bores 4/00 and 2/00 which are located east of Ponds 3 and 4 and displaying concentrations at 80 mg/L and 90 mg/L respectively. Water Corporation have indicated that at least a portion of the nutrient concentrations in these monitoring bores may be sourced at the adjacent fertiliser manufacturer.

The highest Total Phosphorous concentrations recorded at the Site was 0.12 mg/L, in a groundwater sample collected from monitoring bore 1/02 located south of WWTP#2.

This partial decision document relates to the conversion of the licence to the REFIRE format, proposed construction and commissioning of an inlet screen, and a reassessment of discharges and emissions has been made. Where possible conditions in the Licence have been added, removed or

amended to reflect the conditions of other similar Water Corporation WWTP licences. A DER compliance inspection in 2015 identified inadequate freeboard capacity within the treatment ponds onsite and an improvement condition has been incorporated into this licence to require a plan to address this issue.

Currently there is no screening facility at the plant resulting in solid waste material accumulating in the ponds and reducing the treatment capacity. Water Corporation proposes to construct and commission an inlet screen at WWTP#1 that will be connected to two incoming pressure mains upstream of the discharge manhole where effluent is currently discharged to the Primary Treatment Pond. Wastewater will enter the screen and solids larger that the screen perforations will be retained on the screen.

As screened material collects, the flow of wastewater will be obstructed and the upstream water level will rise. Once the backed-up wastewater levels reach a specified level, the screen will begin to rotate to clear away screened material and allow water to move to the Primary Treatment Pond. Screens will be taken to a compression zone for dewatering and will then be dropped into a bin via a discharge chute. The inlet screen and screening material will be washed when the screen is operating. Screened material will be disposed to a suitable licensed waste facility.

If upstream water levels rise too high, inflow will then enter the manual overflow bypass and be screened by a bar screen. The discharge manhole infrastructure will be retained for use during events where the entire inlet screening facility needs to be taken offline. It is anticipated that onsite construction and commissioning of the inlet screen will take approximately four weeks. The volume of wastewater being treated is not anticipated to change as a result of the inlet screen.

4 Decision table

All applications are assessed in line with the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987* and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision they are detailed in the decision document.

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
General conditions	L1.2.1 – 1.2.5	OSC	General conditions relating to pollution control and management have been applied to the Licence.	
		N/A	Due to DER policy which requires licensed premises to form one contiguous area of land occupied by the Licensee, WWTP#2 and the connecting pipeline has been removed from this Licence.	
Premises operation	L1.3.3 and L1.3.4	OSC	Replaces previous licence condition 7.	Application supporting documentation
	L1.3.5	OSC	OSC L1.3.5 replaces condition 4. A 300mm freeboard is expected to be met at most WWTPs to manage overtopping risks. As the Esperance WWTP cannot currently meet this figure, an improvement condition has been placed on the licence to ensure that overtopping and freeboard management risks are addressed.	
	L1.3.6	OCS	Replaces and clarifies previous licence condition 5, requiring management of infiltration ponds to avoid groundwater mounding at monitoring bores to rise within one metre of the surface. Monitoring bore 7/01 at WWTP#2 is excluded as it lies in a low lying area and the water table has been less than one metre since it was established (otherwise Water Corporation would never be able to comply with this condition).	
	L1.3.7	OSC	Included to ensure security of premises.	
	L1.3.8	NSC	Construction requirement conditions have been incorporated into the licence amendment to allow the installation of an inlet screening plant. The screening plant is expected to improve the performance of the WWTP by increasing pond capacity and improving the operation of aerators used to remove nutrients.	

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Emissions general	L2.1.1	OSC	Descriptive limits will be set through condition 2.5.1 and 2.7.1 of the licence and therefore the OSC regarding recording and investigation of exceedances of limits or targets has been included.	
Point source emissions to air including monitoring	L2.2	N/A	There are no anticipated point source emissions to air as a result of construction of the inlet screens or operation of the Esperance WWTP.	
Point source emissions to surface water including monitoring	L2.3	N/A	There are no anticipated point source emissions to surface water as a result of construction of the inlet screens or operation of the Esperance WWTP.	
Point source emissions to groundwater including monitoring	L2.4	N/A	There are no anticipated point source emissions to groundwater as a result of construction of the inlet screens or operation of the Esperance WWTP.	
Emissions to land including monitoring	L1.3.5 L3.5.1	OSC	**Construction** There are no anticipated emissions to land as a result of construction of the inlet screens. **Operation** See Appendix A for the risk assessment on discharges to land.	Australian and New Zealand guidelines for fresh and marine water quality – *2000* Australian Standard AS/NZS 5667.1 – Water Quality – Sampling – Guidance on the Design of sampling programs, sampling techniques and

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
				the preservation and handling of samples Water Corporation Annual Environmental Report – Esperance WWTP, September 2014
Fugitive emissions	L2.6	N/A	**Construction** Emission Description *Emission:* Dust generated during construction as a result of small amounts of earthworks at the location of the new inlet screen and bins. *Impact:* Dust generated during construction is expected to be minor and very unlikely to reach the nearest residences located approximately 200 m to the north and south of WWTP#1. *Controls:* Water Corporation proposes to manage dust onsite using a water cart. Risk Assessment *Consequence*: Minor *Likelihood:* Rare *Risk Rating:* Low Regulatory Controls As there is a low risk of dust emissions impacting nearby receptors no further regulatory control has been applied. Water Corporation will be required to manage any dust with the aid of a water cart under construction condition NSC1.3.8 that requires Water Corporation to carry out application commitments.	

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
			Operation No fugitive dust emissions are anticipated during operation of the inlet screen or the Esperance WWTP.	
Odour	L2.7.1 L5.2.1	OSC	**Construction** There are no anticipated odour emissions as a result of construction of the inlet screens. **Operation** <u>Emission Description</u> *Emission:* Odour generated at WWTP#1 predominantly arises from untreated wastewater and the buildup of solid materials within the primary and secondary ponds. *Impact:* The nearest sensitive odour receptors are located approximately 200 m north and south of WWTP#1 and have the potential to be impacted by offensive odours. Solid materials are currently removed by hand from the ponds and often cannot be placed in bins due to high water content resulting in offensive odour emissions. No odour complaints were received by DER or Water Corporation during the 2013/14 annual period. *Controls:* The proposed installation of the screening plant and waste bin is expected to reduce odour concentrations emanating from WWTP#1 as all screened material will be contained within a lidded containment vessel. All contaminated stormwater and leachate will return to the treatment process. Therefore the likelihood of odours becoming offensive is reduced from 'possible' to 'unlikely'. <u>Risk Assessment</u> *Consequence*: Moderate *Likelihood:* Unlikely *Risk Rating:* Moderate	Application supporting documentation

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
			Regulatory Controls OSC 2.7.1 has been added to require Water Corporation to take the necessary precautions to limit offensive odour emissions on site. Standard condition 5.2.1 replaces condition 12 and requires Water Corporation to submit a complaints summary for each annual period. Residual Risk *Consequence*: Moderate *Likelihood:* Unlikely *Risk Rating:* Moderate	
Noise	L2.8	N/A	**Construction** Emission Description *Emission:* Noise generated during construction as a result of small amounts of earthworks and machinery use at the location of the new inlet screen and bins. *Impact:* Noise generated during construction is expected to be minor and highly unlikely to impact upon the nearest residences located approximately 200 m to the north and south of WWTP#1. Construction will only take place during daylight hours. *Controls:* Water Corporation proposes to monitor noise if required although no management is proposed. Risk Assessment *Consequence*: Minor *Likelihood:* Rare *Risk Rating:* Low	

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
			Regulatory Controls As there is a low risk of significant noise emissions impacting nearby receptors no further regulatory control has been applied. **Operation** An insignificant level of noise is expected to continue during operations from pumps and aerators although volumes are not anticipated to negatively impact nearby residents.	
Monitoring general	L3.1.1 – L3.1.3		Condition 9 and 10 of the previous licence has been transferred across to the new licence (3.1.1) to ensure that Water Corporation monitors groundwater in accordance with Australian Standards. Further standards have been included in OSC3.1.1 in line with other Water Corporation licences although it is understood that these standards are currently met. Previous licence condition 1 and 3 has been incorporated into L3.1.3	
Monitoring of inputs and outputs	L3.6.1	OSC	OSC3.6.1 has been added to the licence to provide DER with a detailed understanding of water flows to each infiltration site. Flow meter requirements also exist on other REFIRE Water Corporation licences and are standard conditions for all pond type systems.	
Process monitoring	L3.7	N/A	There are no specified conditions relating to process monitoring.	
Ambient quality monitoring	L3.8.1	OSC	OSC3.8.1 has been directly transferred from condition 8 of the previous licence to ensure ambient groundwater quality is regularly monitored. Although no treatment of wastewater occurs at WWTP#2, the site remains a discharge location for treated wastewater from WWTP#1 and therefore groundwater monitoring nearby to WWTP#2 remain on the Licence.	Australian Standard AS/NZS 5667.1 – Water Quality – Sampling – Guidance on the Design of sampling programs, sampling techniques and the preservation and handling of samples Australian Standard

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
				AS/NZS 5667.11 – Water Quality – Sampling – Guidance on the sampling of groundwaters
Meteorological monitoring	L3.9	N/A	There are no specified conditions relating to meteorological monitoring.	
Improvements	L4	N/A	Improvement conditions have been added to the Licence to require Water Corporation to reduce the risk of pond overflow identified in Appendix A.	
Information	L5.1.1 – L5.3.1	OSC	Standard information conditions have been applied to the Licence that reflect reporting conditions of the previous Licence (previous conditions 2, 6, 11, 12 and 13).	
Licence Duration	N/A	N/A	The Licence expiry date has not been changed as a result of this amendment.	

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
11 December 2014	Proponent sent a copy of draft instrument	Proponent requested that: 1) tankered waste be permitted for acceptance at the premises; 2) permeability requirements are removed; 3) freeboard targets are removed; 4) sewage inflow meter is removed as there is none within the premises boundary; 5) improvement condition IR1 relating to management actions to achieve target freeboards be removed; and 6) Forms LR1 and AGWQ1 in line with other Water Corporation licences are removed.	1) Tankered waste discharge point incorporated into Schedule 1. 2) Ponds were constructed historically and therefore permeability requirements have been removed; 3) Proposed target freeboard conditions are not able to be achieved onsite and have been removed. An improvement condition has been updated to require a plan for managing overtopping risk and achieving acceptable freeboard; 4) Inflow metering not required as there is no inflow meter at the WWTP; 5) Improvement condition modified to require a management/works plan to be prepared with consideration of adequate freeboard; and 6) Forms removed.
26 February 2015	Proponent sent a copy of draft instrument	Comments received. Minor typographical changes proposed but requested improvement plan condition be extended to 31 December 2015.	Changes and revised date incorporated into licence. The proposed date is considered reasonable as approval from a number of internal departments is required for proposed works.

6 Risk Assessment

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

Table 1: Emissions Risk Matrix

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

Appendix A

Normal operation

Emission Description

Emission: Infiltration of treated wastewater resulting in contamination of groundwater with treated wastewater that contains high concentrations of nutrients.

Impact: There is evidence of existing groundwater contamination as a result of infiltration of treated wastewater at both WWTP#1 and WWTP#2. Monitoring data provided for the 2013/14 annual period indicated that elevated concentrations of Total Nitrogen (TN) and Biochemical Oxygen Demand (BOD) above background concentration were evident in monitoring bores down hydrogeological gradient of infiltration locations. Pond 3 of WWTP#1 is located approximately 450m north of a Priority Area 3 Public Drinking Water Source with infiltration at this pond having the potential to result in contamination of a drinking water supply. However, as water flows in a south-easterly direction contamination of this resource is considered highly unlikely under current site layout and operating capacity. Therefore the issue of general groundwater (non-public drinking water) contamination is assessed in this section and is considered to have a moderate environmental consequence.

Controls: The installation of the screening plant is expected to marginally improve the quality of treated wastewater discharged to infiltration locations at both Esperance WWTP sites. By removing solid materials, aerators in the Primary Treatment Pond are less likely to become blocked thereby improving their efficiency and reducing nutrient content, particularly nitrogen, in the wastewater. Despite this improvement, groundwater quality is not anticipated to improve significantly.

Risk Assessment

Consequence: Moderate
Likelihood: Almost certain
Risk Rating: High

Regulatory Controls

OSC3.5.1 has been directly transferred from condition 8 of the previous licence to ensure treated wastewater quality is regularly monitored.

Although chlorine dosing of primary treated wastewater is conducted by the Shire at the Esperance WWTP, there is no chlorine dosing of treated wastewater being infiltrated to land. Therefore there is a need for *Escherichia coli* (*E. coli*) to be analysed in sampling. This requirement is in line with standard requirements for other pond-based, infiltration wastewater treatment plants operated by Water Corporation.

Residual Risk

Consequence: Moderate
Likelihood: Almost certain
Risk Rating: High

Abnormal operation

Emission Description

Emission: Overflow of wastewater that is either untreated or partially treated resulting in an emission to surrounding sandy soils that will eventually permeate to groundwater.

Impact: Contamination of soils and groundwater with wastewater containing high concentrations of TN, TP, BOD and *E. coli*. Contamination is expected to be greater than that from infiltration as wastewater is not treated.

Controls: Currently ponds at Esperance WWTP#1 have less than 300mm freeboard capacity with a spillway at the Primary Treatment Pond that directs overflows to an adjacent area with soils that could be described as highly permeable sand. The installation of the screening plant and current desludging activities at Infiltration Lagoon 2 are expected to increase the capacity of Esperance WWTP ponds and reduce the likelihood of overflow from likely to possible.

Risk Assessment
Consequence: Moderate
Likelihood: Possible
Risk Rating: Moderate

Regulatory Controls
An improvement condition has been placed on the Licence to require the submission freeboard/overtopping management plan.

Residual Risk
Consequence: Moderate
Likelihood: Possible
Risk Rating: Moderate