



Licence

Environmental Protection Act 1986, Part V

Licensee: Water Corporation

Licence: L5961/1991/12

Registered office: 629 Newcastle Street
LEEDERVILLE WA 6007

Premises address: Geraldton No. 2 Wastewater Treatment Plant
Webborton Road
Wonthella
GERALDTON WA 6530
Being Lot 1 & 2 on Diagram 57545 and Lot 3 on Diagram 72567
as depicted in Schedule 1.

Granted date: Thursday, 22 October 2015

Commencement date: Sunday, 1 November 2015

Expiry date: Wednesday, 31 October 2035

Prescribed premises category

Schedule 1 of the *Environmental Protection Regulations 1987*

Category number	Category description	Category production or design capacity	Approved Premises production or design capacity
54	Sewage Facility: premises – (a) On which sewage is treated (excluding septic tanks); or (b) From which treated sewage is discharged onto land or into waters.	100 cubic metres per day or more	3,500 cubic metres per day

Conditions

This Licence is subject to the conditions set out in the attached pages.

Date signed: 25 August 2016

Steve Checker

MANAGER LICENSING (WASTE INDUSTRIES)
Officer delegated under section 20
of the *Environmental Protection Act 1986*



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Introduction

This Introduction is not part of the Licence conditions.

DER's industry licensing role

The Department of Environment Regulation (DER) is a government department for the state of Western Australia in the portfolio of the Minister for Environment. DER's purpose is to advise on and implement strategies for a healthy environment for the benefit of all current and future Western Australians.

DER has responsibilities under Part V of the *Environmental Protection Act 1986* (the Act) for the licensing of prescribed premises. Through this process DER regulates to prevent, control and abate pollution and environmental harm to conserve and protect the environment. DER also monitors and audits compliance with works approvals and licence conditions, takes enforcement action as appropriate and develops and implements licensing and industry regulation policy.

Licence requirements

This Licence is issued under Part V of the Act. Conditions contained within the Licence relate to the prevention, reduction or control of emissions and discharges to the environment and to the monitoring and reporting of them.

Where other statutory instruments impose obligations on the Premises/Licensee the intention is not to replicate them in the licence conditions. You should therefore ensure that you are aware of all your statutory obligations under the Act and any other statutory instrument. Legislation can be accessed through the State Law Publisher website using the following link:
<http://www.slp.wa.gov.au/legislation/statutes.nsf/default.html>

For your Premises relevant statutory instruments include but are not limited to obligations under the:

- *Environmental Protection (Unauthorised Discharges) Regulations 2004* – these Regulations make it an offence to discharge certain materials such as contaminated stormwater into the environment other than in the circumstances set out in the Regulations.
- *Environmental Protection (Controlled Waste) Regulations 2004* - these Regulations place obligations on you if you produce, accept, transport or dispose of controlled waste.
- *Environmental Protection (Noise) Regulations 1997* – these Regulations require noise emissions from the Premises to comply with the assigned noise levels set out in the Regulations.



You must comply with your licence. Non-compliance with your licence is an offence and strict penalties exist for those who do not comply.

Licence holders are also reminded of the requirements of section 53 of the Act which places restrictions on making certain changes to prescribed premises unless the changes are in accordance with a works approval, licence, closure notice or environmental protection notice.

Other Guidelines which you should be aware of include:

- Western Australian Guidelines for Biosolids Management, Department of Environment and Conservation, December 2012 (as amended from time to time).

Licence fees

If you have a licence that is granted for more than one year, you are required to pay an annual licence fee prior to the anniversary date of issue of your licence. Non-payment of annual licence fees will result in your licence ceasing to have effect meaning that it will no longer be valid and you will need to apply for a new licence for your Premises.

Ministerial conditions

If your Premises has been assessed under Part IV of the Act you may have had conditions imposed by the Minister for Environment. You are required to comply with any conditions imposed by the Minister.

Premises description and Licence summary

The Geraldton No. 2 Wastewater Treatment Plant (WWTP) is situated in Wonthella, Geraldton. The WWTP has a maximum design capacity to process 3,500 cubic metres (m³) per day. On 12 May 2016, Water Corporation requested an upgrade to the premises with the inclusion of four additional infiltration ponds to increase the infiltration capacity at the premises by up to 3.5 ML/day to a maximum of 8.8 ML/day.

The WWTP treats wastewater to a secondary standard and consists of 2 stabilisation ponds (i.e. a primary aerated pond and a secondary oxidation pond), and an infiltration pond (pond 3). Treated wastewater is disposed across broad acreage via sprinkler irrigation. The balance of the treated wastewater is fed into a series of infiltration ponds. Effluent infiltration is reclaimed from an on-site production bore and supplied under commercial terms as non-potable water to the City of Greater Geraldton, Geraldton Golf Club, Geraldton Turf Club, Wonthella Bowling Club and Geraldton Cemetery.

The proposed upgrade to the premises will include:

- Four additional infiltration ponds with a total storage capacity of 28 ML and a total infiltration rate capacity of 8.8 ML/ day;
- Six new monitoring bores;
- Pond 3 to be replaced with a distribution chamber;
- Existing infiltration ponds to be remediated through stabilisation of pond embankments and improved access for desludging works; and
- Irrigation area to be taken off line for the incorporation of the new infiltration ponds.

The annual rainfall averages 460 millimetres with evaporation rates predominantly six times greater than rainfall. The topography is characterised by a coastal dune system. The geology varies from coastal dunes with underlying limestone near the surface to red loam sands or yellow sands inland with underlying limestone.

The WWTP is surrounded by 150 - 500 m bushland and is approximately three kilometres east the coast, and approximately 606 m south of the Chapman River. The nearest sensitive receptor is a housing development which is located approximately 500 m north of the WWTP. Adjacent lots to the east of the premises boundary are zoned 'rural residential' and to the west are zoned 'Industry – General'. Adjacent lots north of the premises boundary are zoned 'residential' with the southern boundary adjoining zoned 'recreation' (local authority reserve) area.



A desktop assessment identified that depth to groundwater is variable, with TDS being approximately 1,500 mg/L (brackish). The Annual Environmental Reports submitted by Water Corporation confirms standing water level within the monitoring bores varies across the premises, approximately 13.8 to 25 mBGL.

The main potential emissions from the construction phase includes fugitive emissions (dust), noise, odour and during operation of the WWTP include emissions land and groundwater water (via infiltration).

This Licence amendment is as a result of a proposed works upgrade to the premises for the inclusion of additional infiltration ponds and increased infiltration capacity at the premises. Additional administrative changes have been included within the amendment process.

The licences and works approvals granted for the Premises, since 04/10/2000, are:

Instrument log		
Instrument	Granted	Description
W2748/1991/1	11/05/1999	Works Approval
L5961/1991/4	02/10/2000	Licence re-issue
L5961/1991/5	03/10/2001	Licence re-issue
L5961/1991/6	11/10/2002	Licence re-issue
L5961/1991/7	06/10/2003	Licence re-issue
L5961/1991/8	12/08/2004	Licence re-issue
L5961/1991/9	21/09/2006	Licence re-issue
L5961/1991/10	31/10/2008	Licence re-issue
L5961/1991/11	22/10/2010	Licence re-issue
L5961/1991/12	22/10/2015	Licence re-issue and update to new format
L5961/1991/12	25/08/2016	Licence amendment for inclusion of additional infiltration ponds

Severance

It is the intent of these Licence conditions that they shall operate so that, if a condition or a part of a condition is beyond the power of this Licence to impose, or is otherwise *ultra vires* or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within the power of this Licence to impose and are not otherwise *ultra vires* or invalid.

END OF INTRODUCTION



Licence conditions

1 General

1.1 Interpretation

1.1.1 In the Licence, definitions from the *Environmental Protection Act 1986* apply unless the contrary intention appears.

1.1.2 For the purposes of this Licence, unless the contrary intention appears:

'Act' means the *Environmental Protection Act 1986*;

'annual period' means the inclusive period from 1 July until 30 June in the following year;

'AS/NZS 2031' means the Australian Standard AS/NZS 2031 *Selection of containers and preservation of water samples for microbiological analysis*;

'AS/NZS 5667.1' means the Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples*;

'AS/NZS 5667.10' means the Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of waste waters*;

'AS/NZS 5667.11' means the Australian Standard AS/NZS 5667.11 *Water Quality – Sampling – Guidance on sampling of groundwaters*;

'averaging period' means the time over which a limit is measured or a monitoring result is obtained;

'engineered containment system' means any infrastructure associated with the containment of wastewater, sewage sludge or inlet screenings;

'CEO' means Chief Executive Officer of the Department of Environment Regulation;

'CEO' for the purpose of correspondence means;

Chief Executive Officer
Department Administering the *Environmental Protection Act 1986*
Locked Bag 33
CLOISTERS SQUARE WA 6850
Email: info@der.wa.gov.au;

'controlled waste' has the definition in *Environmental Protection (Controlled Waste) Regulations 2004*;

'freeboard' means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point;

'hardstand' means a surface with a permeability of no greater than 1×10^{-9} metres/second or equivalent;

'Licence' means this Licence numbered L5961/1991/12 and granted under the Act;

'Licensee' means the person or organisation named as Licensee on page 1 of the Licence;

'NATA' means the National Association of Testing Authorities, Australia;



'NATA accredited' means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis;

'Premises' means the area defined in the Premises Map in Schedule 1 and listed as the Premises address on page 1 of the Licence;

'quarterly' means the 4 inclusive periods from 1 July to 30 September, 1 October to 31 December and in the following year, 1 January to 31 March and 1 April to 30 June;

'Schedule 1' means Schedule 1 of this Licence unless otherwise stated;

'Schedule 2' means Schedule 2 of this Licence unless otherwise stated;

'six monthly' means the 2 inclusive periods from 1 July to 31 December and 1 January to 30 June in the following year;

'spot sample' means a discrete sample representative at the time and place at which the sample is taken; and

'triennial' means a submission date of 25 February 2020 and every three years thereafter;

'usual working day' means 0800 – 1700 hours, Monday to Friday excluding public holidays in Western Australia.

1.1.3 Any reference to an Australian or other standard in the Licence means the relevant parts of the standard in force from time to time during the term of this Licence.

1.1.4 Any reference to a guideline or code of practice in the Licence means the version of that guideline or code of practice in force from time to time, and shall include any amendments or replacements to that guideline or code of practice made during the term of this Licence.

1.2 General conditions

1.2.1 The Licensee shall maintain all production bores, monitoring bores, flow meters and sampling points at the premises to enable their operation in accordance with design specifications.

1.2.2 The Licensee shall immediately recover, or remove and dispose of spills of screenings, sewage sludge and waste (as defined in Table 1.3.1) outside an engineered containment system.

1.2.3 The Licensee must ensure that the proposed Works specified in Column 1 of Table 1.2.1 meets or exceeds the specifications in Column 2 of Table 1.2.1 for the infrastructure in each row of Table 1.2.1.

1.2.4 The Licensee must not depart from the specifications in Table 1.2.1 except:
(a) where such departure is minor in nature and does not materially change or affect the infrastructure; or
(b) where such departure improves the functionality of the infrastructure and does not increase risks to public health, public amenity or the environment;
and all other Conditions in this Licence are still satisfied.



Table 1.2.1: Column 1 Infrastructure	Works specifications Column 2 Specifications (design and construction)
1) Infiltration ponds (IP5-IP8)	<p>The Licensee must ensure that the the four new infiltration ponds IP5 –IP8 as defined in Schedule 1: Maps are designed, constructed and tested in accordance with:</p> <ol style="list-style-type: none">1. AS 1141 – Methods for sampling and testing aggregates;2. AS 1289 – Methods for testing soils for engineering purposes. <p>The Licensee shall ensure that the combined total capacity of infiltration ponds IP5-IP8 does not exceed 28 ML.</p>
2) Monitoring bores	<p>The Licensee must construct six new groundwater monitoring bores at the locations defined in Schedule 1: Map of proposed new monitoring bore locations.</p> <p>New groundwater monitoring bores are to be designed and constructed in accordance with:</p> <ol style="list-style-type: none">1. Department of Water - Minimum Construction requirements for water bores in Australia. Water Quality Protection Note WQPN 30. February 2006.2. AS/NZS 5667/1998: Water Quality – Sampling – Guidance on sampling Groundwater, and the Minimum Construction Requirements for Water Bores in Australia: Edition 3 February 2012.
3) Distribution chamber (existing pond 3)	<p>The Licensee must ensure that the replacement of the existing Pond 3 with a distribution chamber is undertaken and tested in accordance with:</p> <ol style="list-style-type: none">1. AS 1141 – Methods for sampling and testing aggregates;2. AS 1289 – Methods for testing soils for engineering purposes.
4) Existing infiltration ponds	<p>The Licensee must undertake;</p> <ol style="list-style-type: none">a) remediation and stabilisation of existing infiltration pond embankments; andb) works to improve access for desludging; <p>in accordance with:</p> <ol style="list-style-type: none">1. AS 1141 – Methods for sampling and testing aggregates;2. AS 1289 – Methods for testing soils for engineering purposes.

1.2.5 If departures from the specifications outlined in Table 1.2.1 apply, then the Licensee must provide the CEO with a list of departures which are certified as complying with Condition 1.2.4 at the same time as the certifications under Condition 1.2.6.

1.2.6 The Licensee must submit a construction compliance document to the CEO, within one month, following the construction of the new works at the premises.

1.2.7 The Licensee must ensure the construction compliance document:

- (a) is certified by a suitably qualified professional engineer or builder that each item of infrastructure specified in Table 1.2.1 has been constructed in accordance with the Conditions of the Licence with no material defects; and
- (b) be signed by a person authorised to represent the Licensee and contain the printed name and position of that person within the company.

1.3 Premises operation

1.3.1 The Licensee shall record and investigate the exceedence of any descriptive or numerical limit in this section.

1.3.2 The Licensee shall only allow waste to be accepted on to the Premises if:

- (a) it is of a type listed in Table 1.3.1;
- (b) the quantity accepted is below any limit listed in Table 1.3.1; and
- (c) it meets any specification listed in Table 1.3.1.



Table 1.3.1: Waste acceptance

Waste	Waste Code	Quantity Limit	Specification ¹
Putrescible and Organic wastes			
Sewage - waste from the reticulated sewerage system	K130	3,500m ³ / day	Accepted through sewer inflow(s) only.
Septage wastes	K210		Tankered into the premises and discharged directly into the primary pond only, via the receival point.

Note 1: Additional requirements for the acceptance of controlled waste are set out in the *Environmental Protection (Controlled Waste) Regulations 2004*.

- 1.3.3 The Licensee shall ensure that the wastes accepted onto the Premises are only subjected to the process(es) set out in Table 1.3.2 and in accordance with any process limits described in that table.

Table 1.3.2: Waste processing

Waste type	Process	Process limits
Sewage	Physical, biological and chemical treatment	- Dispose of collected screenings to a licenced landfill
Treated wastewater	Irrigation area	- Treated wastewater discharged to on-site vegetated irrigation area; - ensure no erosion, pooling or ponding occurs; and - pH of treated wastewater to be maintained at 6.5 to 8.
Treated wastewater	Infiltration area	- Treated wastewater discharged to on-site infiltration area; - ensure no erosion, pooling or ponding occurs; and - pH of treated wastewater to be maintained at 6.5 to 8.
Sewage sludge	Storage	- Stored within geobags on a bunded, HDPE lined area; - waste activated sludge leachate returned to Pond 1; and - dispose of sludge and biosolids to a licensed landfill or in accordance with the <i>Western Australian Guidelines for Biosolids Management</i> , Department of Environment and Conservation, December 2012 (as amended from time to time).

- 1.3.4 The Licensee shall ensure that wastewater and sewage sludge is only stored and/or treated within vessels or compounds provided with the infrastructure detailed in Table 1.3.3.

Table 1.3.3: Containment infrastructure

Storage vessel or compound	Material	Infrastructure details
Inlet works	Screenings	Stored in a sealed bin which is surrounded by a bunded hardstand area which returns sludge leachate to the start of the treatment process.
Ponds 1-2	Wastewater	Lined to achieve a permeability of no greater than 1×10^{-9} m/s or equivalent.
Pond 3 ¹ (Infiltration)	Wastewater	Unlined, in-situ soils.
Ponds IP5-IP8 ² (Infiltration)	Wastewater	Unlined, in-situ sils.



Temporary holding ponds	Sewage Sludge	<p>Temporary or permanent infrastructure to consist of a bunded hardstand or lined area (lined to achieve a permeability of less than 10^{-9} m/s or equivalent), capable of preventing surface run-off of leachate and sludge and which includes a leachate collection system.</p> <p>The sewage sludge geobag laydown area should be managed such that:</p> <ul style="list-style-type: none">(a) stormwater runoff is prevented from entering the area;(b) discharges/ leachate from the area are directed to the primary pond.
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Note 1: Prior to installation and commissioning of Distribution Chamber. Pond 3 to be taken off line on the operation of the Distribution Chamber.

Note 2: After submission of the construction compliance document, as defined in condition 1.2.8, and commissioning of ponds IP5-IP8.

- 1.3.5 The Licensee shall manage the wastewater treatment ponds such that:
- (a) overtopping of the wastewater treatment ponds does not occur;
 - (b) storm water runoff is prevented from entering the wastewater treatment ponds or causing the erosion of outer pond embankments; and
 - (c) vegetation and floating debris (emergent or otherwise) is prevented from encroaching onto pond surfaces or inner pond embankments.
- 1.3.6 The Licensee shall:
- (a) implement security measures at the site to prevent as far as is practical unauthorised access to the site;
 - (b) undertake regular inspections of all security measures and repair damage as soon as practicable; and
 - (c) ensure the entrance gates are closed and locked when the site is closed or unmanned.



2 Emissions

2.1 General

2.1.1 The Licensee shall record and investigate the exceedance of any descriptive or numerical limit specified in any part of section 2 of this Licence.

2.2 Emissions to land

2.2.1 The Licensee shall ensure that where waste is emitted to land from the emission points in Table 2.2.1 and it is done so in accordance with the conditions of this Licence.

Table 2.2.1: Emissions to land			
Emission point reference	Emission point reference on Map of emission points	Description	Source including abatement
Irrigation area ¹	L1	Irrigation of treated wastewater to vegetated acreage on site.	Discharge of treated wastewater from final treatment pond only.
Infiltration area	L2	Infiltration of wastewater on site.	Discharge of treated wastewater from final treatment pond only. Groundwater from infiltration area is redrawn via production bores for reuse.

Note 1: Irrigation area 'L1' to be taken off line and Infiltration area 'L2' to come on line following the construction and commissioning of 'IP5-IP8' infiltration ponds.

3 Monitoring

3.1 General monitoring

3.1.1 The licensee shall ensure that:

- (a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;
- (b) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;
- (c) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;
- (d) all microbiological samples are collected and preserved in accordance with AS/NZS 2031;
- (e) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in the relevant table.

3.1.2 The Licensee shall ensure that :

- (a) monthly monitoring is undertaken at least 15 days apart;
- (b) quarterly monitoring is undertaken at least 45 days apart; and
- (c) six monthly monitoring is undertaken at least 5 months apart.

3.1.3 The Licensee shall ensure that all monitoring equipment used on the Premises to comply with the conditions of this Licence is calibrated in accordance with the manufacturer's specifications.

3.1.4 The Licensee shall, where the requirements for calibration cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods.



3.2 Monitoring of emissions to land

3.2.1 The Licensee shall undertake the monitoring in Table 3.2.1 according to the specifications in that table.

Table 3.2.1: Monitoring of emissions to land					
Emission point reference	Parameter	Limits	Units	Averaging period	Frequency
M3 (Flow meter)	Volumetric flow rate	3,500	m ³ / day	Monthly	Continuous
M2 (Monitoring point - FL No. S4000068)	pH ¹	6.5-8.5	pH units	Spot sample	Quarterly
	Total suspended solids	-	mg/L		
	Total dissolved solids	-			
	5-day Biochemical oxygen demand	-			
	Total Nitrogen	125			
	Total Phosphorus	12			
	Ammonium-nitrogen	-			
	Nitrate-nitrogen	-			
	Nitrite-nitrogen	-			
	<i>Escherichia coli</i> (<i>E. coli</i>) ²	-	cfu/ 100ml		
	Aluminium	-	mg/L	Spot sample	Annual
	Arsenic	-			
	Beryllium	-			
	Boron	-			
	Cadmium	-			
	Chromium	-			
	Cobalt	-			
	Copper	-			
	Flouride	-			
	Lead	-			
	Mercury	-			
	Nickel	-			
	Selenium	-			
	Zinc	-			

Note 1: In-field non-NATA accredited analysis permitted.

Note 2: Actual units are to be reported except where the result is greater than the highest detectable level of 24,000 cfu/100mL. In this case the reporting of the highest detectable level is permitted.

3.3 Monitoring of inputs and outputs

3.3.1 The Licensee shall undertake the monitoring in Table 3.3.1 according to the specifications in that table.

Table 3.3.1: Monitoring of inputs and outputs					
Input/Output	Monitoring point reference	Parameter ¹	Units	Averaging period	Frequency
Sewage received	Inflow meter (M1 – S4000066)	Volumetric flow rate (cumulative)	m ³ / day	Monthly	Continuous
Treated wastewater discharged from the final treatment pond to on-site infiltration/ irrigation ²	Outflow meter (M3)	Volumetric flow rate (cumulative)	m ³ / day	Monthly	Continuous



Septage received into the premises	Tankered waste receivable point	Volumetric flow rate (cumulative)	m ³ / day	Monthly	Each load received
Redraw of groundwater	Outflow meter from production bore 'A1/97'	Volumetric flow rate (cumulative)	m ³ / day	Monthly	Continuous

Note 1: In-field non-NATA accredited analysis permitted.

Note 2: Irrigation area to be taken off line on the operation of IP5-IP8 infiltration ponds.

3.4 Ambient environmental quality monitoring

3.4.1 The Licensee shall undertake the monitoring in Table 3.4.1 according to the specifications in that table and record and investigate results that do not meet any limit specified.

Table 3.4.1: Monitoring of ambient groundwater quality					
Monitoring point reference and location ³	Parameter	Limits	Units	Averaging period	Frequency
Monitoring and production bores: A1/97, 1/94, 2/94, 3/94, 4/94, 5/94, 6/94, 7/94, 8/94, 9/94, 10/94 and New 1-6 (as defined within Schedule 1: Maps)	Standing water level	-	m(BGL)	Spot sample	Six monthly
	Electrical conductivity	-	µS/cm		
	Total dissolved solids	-	mg/L		
	Total Nitrogen	-			
	Total Phosphorus	-			
	pH ¹	6.5-8.5	pH		Monthly
	<i>E. coli</i> ²	< 1,000	cfu/ 100ml		
	Aluminium	-	mg/L	Annual	
	Arsenic	-			
	Beryllium	-			
	Boron	-			
	Cadmium	-			
	Chromium	-			
	Cobalt	-			
	Copper	-			
	Flouride	-			
	Lead	-			
	Mercury	-			
	Nickel	-			
	Selenium	-			
	Zinc	-			

Note 1: In-field non-NATA accredited analysis permitted.

Note 2: Actual units are to be reported except where the result is greater than the highest detectable level of 24,000 cfu/100mL. In this case the reporting of the highest detectable level is permitted.

Note 3: Monitoring bores 'New 1-6' to be operational prior to submission of construction compliance document, as per condition 1.2.8.

3.4.6 The Licensee must undertake a triennial review of the ambient groundwater monitoring data to validate the 'Rockwater Report 2010' modelling data, as submitted for the new infiltration ponds. The review shall incorporate all monitoring and production bore ambient quality data obtained since initiating discharge to the new infiltration ponds (IP5-IP8). The triennial review shall consider:

- the 'Rockwater Report 2010' modelling data, as submitted for the new infiltration ponds;
- 'Australian Guidelines for Water Recycling – Managed Aquifer Recharge, July 2009';
- the 'ANZECC 2000' guidelines;
- nutrient loads to the irrigation and infiltration areas; and
- groundwater directional flow.



- 3.4.7 The Licensee must submit the triennial review (as defined in Condition 3.4.6) to the CEO by 25 February 2020 and by 25 February every three years thereafter.
- 3.4.8 The Licensee must include in the initial triennial review (to be submitted by 25 February 2020 in accordance with Condition 3.4.7), a timeline for the installation of additional bores for monitoring the MAR area, to be located on the basis of validating the modelled extent of the wastewater plume after 10 years of infiltration, as outlined within Section 10.1 of the 'Rockwater, 2010' report.

4 Improvements

4.1 Improvement programme

- 4.1.1 The Licensee shall complete the improvements in Table 4.1.1 by the date of completion in Table 4.1.1.

Table 4.1.1: Improvement program		
Improvement reference	Improvement	Date of completion
IR1	<p>The Licensee shall develop and submit to the CEO:</p> <p>A 'nutrient management strategy' for treated wastewater discharged at the premises.</p> <p>The strategy must include, but not limited to:</p> <ul style="list-style-type: none">- an assessment of the nutrient loads to the irrigation and infiltration areas;- determination of groundwater directional flow;- identification of potential environmental risks as a result of irrigation or infiltration taking place at the premises.	15/12/2017
IR2	<p>Following completion of IR1, the Licensee shall:</p> <ul style="list-style-type: none">- Implement any remedial actions required to rectify any issues/ risks identified from the assessment completed in IR1; and- Submit a report to the CEO on completion of all remedial actions, stating what improvements have been undertaken in relation to IR1.	31/06/2018

5 Information

5.1 Records

- 5.1.1 All information and records required by the Licence shall:
- be legible;
 - if amended, be amended in such a way that the original and subsequent amendments remain legible or are capable of retrieval;
 - except for records listed in 5.1.1(d) be retained for at least 6 years from the date the records were made or until the expiry of the Licence or any subsequent licence; and
 - for those following records, be retained until the expiry of the Licence and any subsequent licence:
 - off-site environmental effects; or
 - matters which affect the condition of the land or waters.



- 5.1.2 The Licensee shall ensure that:
- (a) any person left in charge of the Premises is aware of the conditions of the Licence and has access at all times to the Licence or copies thereof; and
 - (b) any person who performs tasks on the Premises is informed of all of the conditions of the Licence that relate to the tasks which that person is performing.
- 5.1.3 The Licensee shall complete an Annual Audit Compliance Report indicating the extent to which the Licensee has complied with the conditions of the Licence, and any previous licence granted under Part V of the Act for the Premises for the previous annual period.
- 5.1.4 The Licensee shall implement a complaints management system that as a minimum records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.

5.2 Reporting

- 5.2.1 The Licensee shall submit to the CEO an Annual Environmental Report within 63 calendar days after the end of the annual period. The report shall contain the information listed in Table 5.2.1 in the format or form specified in that table.

Table 5.2.1: Annual Environmental Report		
Condition or table (if relevant)	Parameter	Format or form ¹
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken	None specified
Table 2.2.1	Summary of emissions to land	
Table 3.2.1	Summary of monitoring of emissions to land	
Table 3.3.1	Summary of monitoring of inputs/ outputs	
Table 3.4.1	Summary of monitoring of ambient groundwater quality	
Table 4.1.1	Confirmation of completion of Improvement programme condition	
5.1.3	Compliance	Annual Audit Compliance Report (AACR)
5.1.4	Complaints summary	None specified

Note 1: Forms are in Schedule 2

- 5.2.2 The Licensee shall ensure that the Annual Environmental Report also contains:
- (a) any relevant process, production or operational data recorded; and
 - (b) an assessment of the information contained within the report against previous monitoring results and Licence limits.
- 5.2.3 The Licensee shall submit the information in Table 5.2.2 to the CEO according to the specifications in that table.

Table 5.2.2: Non-annual reporting requirements				
Condition or table (if relevant)	Parameter	Reporting period	Reporting date (after end of the reporting period)	Format or form ¹
-	Copies of original monitoring reports submitted to the Licensee by third parties	Not Applicable	Within 14 days of the CEO's request	As received by the Licensee from third parties



5.3 Notification

5.3.1 The Licensee shall ensure that the parameters listed in Table 5.3.1 are notified to the CEO in accordance with the notification requirements of the table.

Table 5.3.1: Notification requirements			
Condition or table (if relevant)	Parameter	Notification requirement ¹	Format or form ²
-	Taking a treatment pond offline for maintenance	Notify 72 hours prior to any action taking place.	None specified
-	Removal of sludge from a treatment pond	No less than 14 days prior to removal.	None specified
2.1.1; 3.2.1	Breach of any limit specified in the Licence	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable	N1
3.1.4	Calibration report	As soon as practicable.	None specified

Note 1: Notification requirements in the Licence shall not negate the requirement to comply with s72 of the Act

Note 2: Forms are in Schedule 2.



Schedule 1: Maps

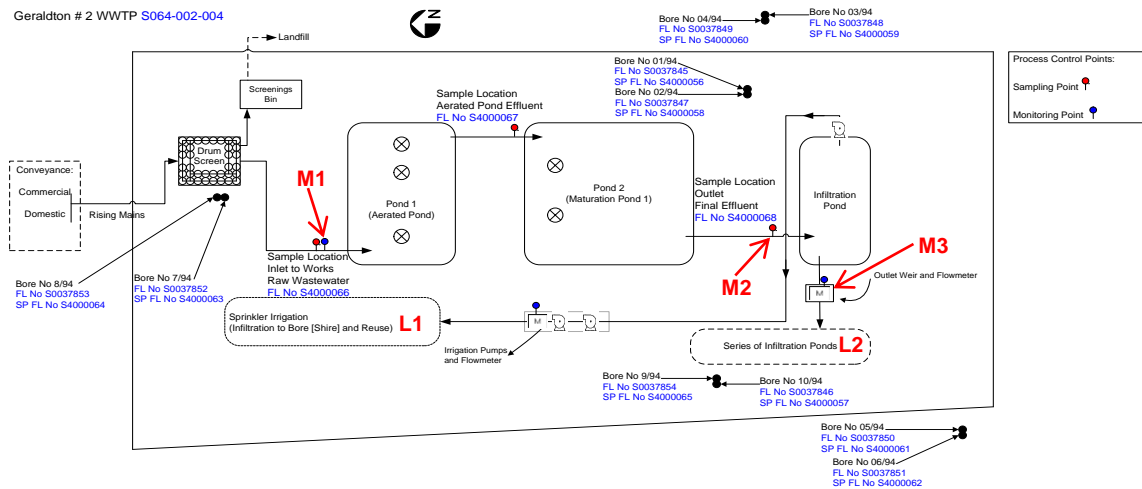
Premises map

The Premises is shown in the maps below. The red line depicts the Premises boundary.



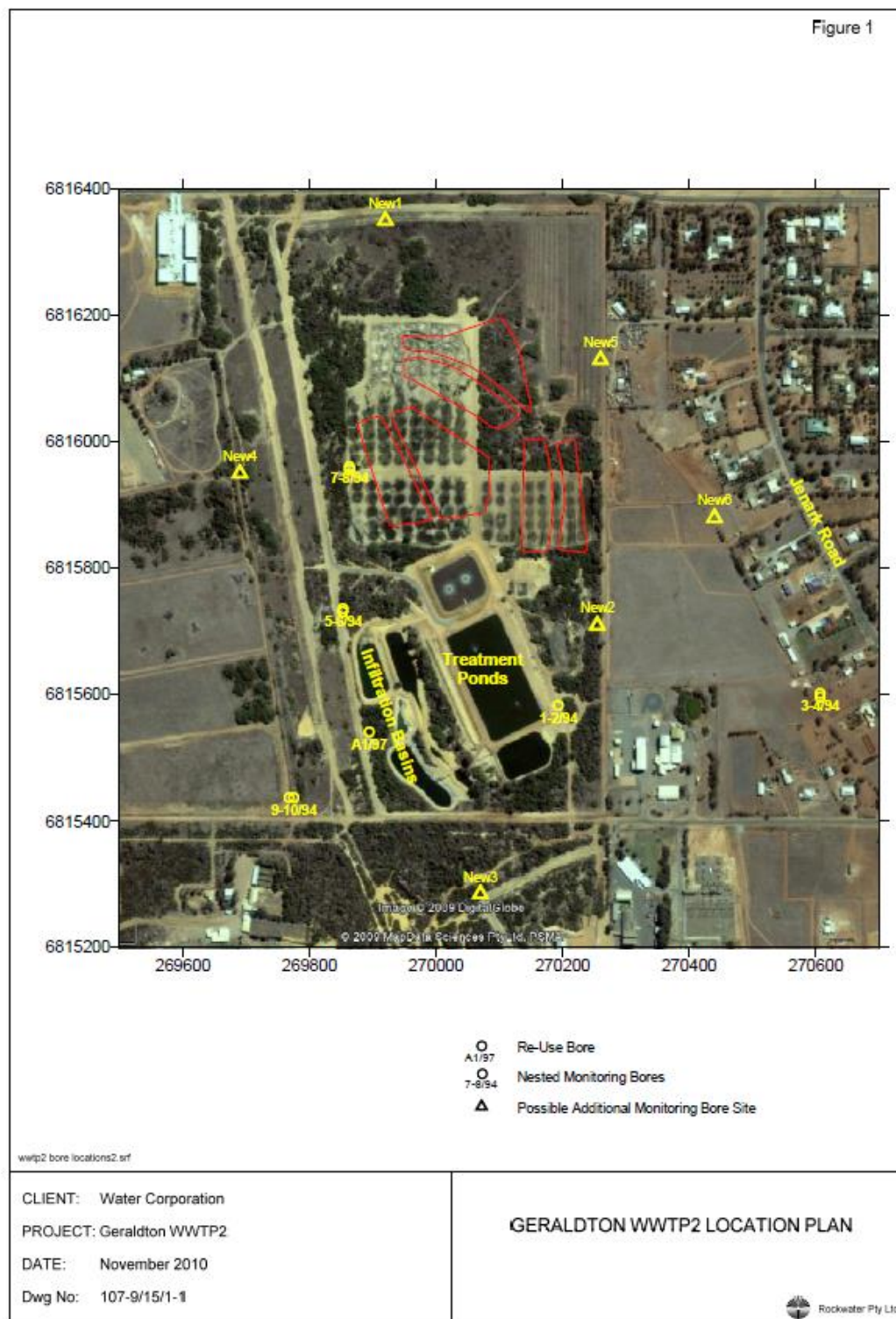


Map of emission and monitoring points



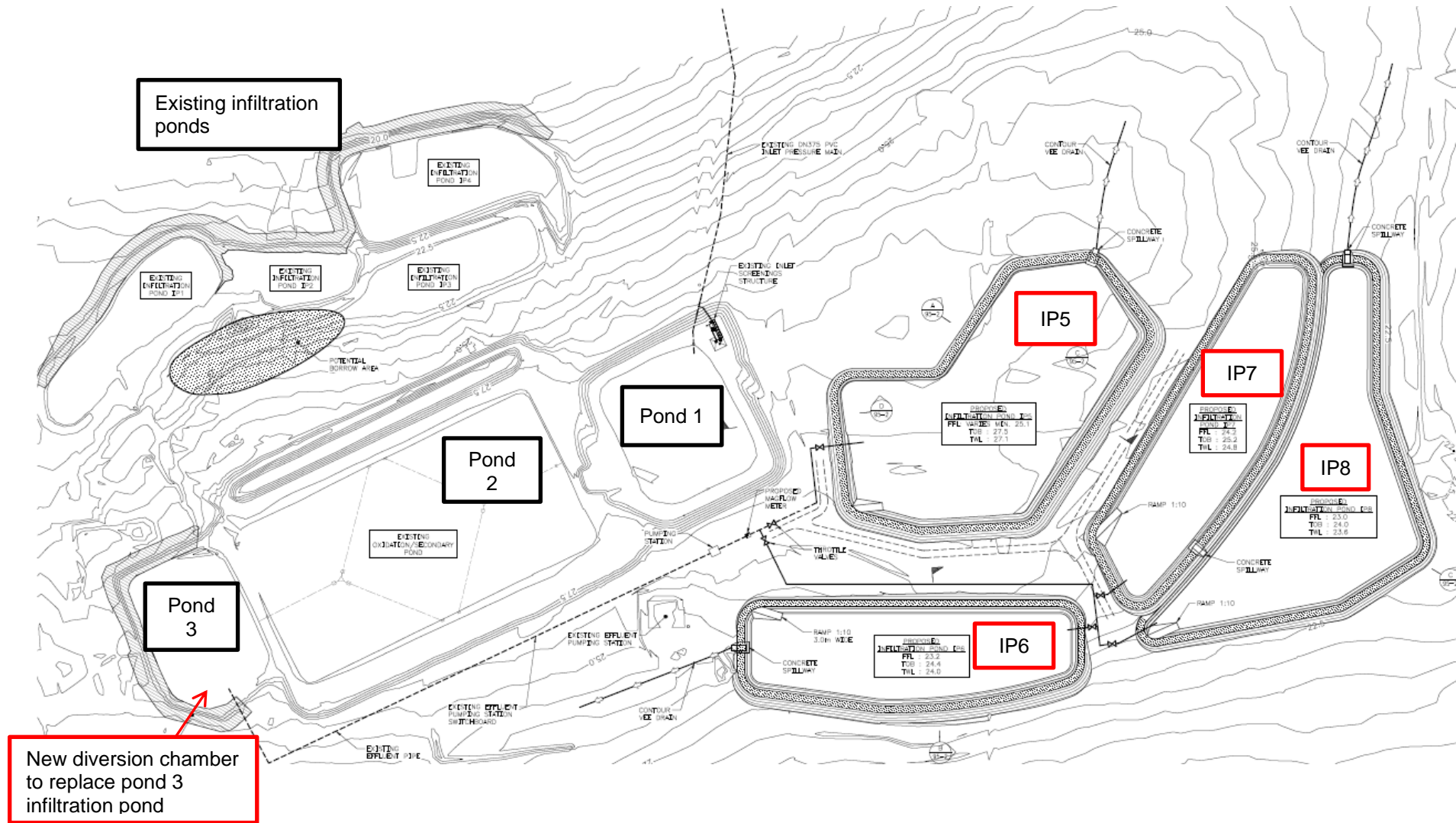


Map of proposed new monitoring bore locations





Map of proposed new premises layout





Schedule 2: Reporting & notification forms

These forms are provided for the proponent to report monitoring and other data required by the Licence. They can be requested in an electronic format.

ANNUAL AUDIT COMPLIANCE REPORT PROFORMA

SECTION A LICENCE DETAILS

Licence Number:	Licence File Number:
Company Name: Trading as:	ABN:
Reporting period: _____ to _____	

STATEMENT OF COMPLIANCE WITH LICENCE CONDITIONS

1. Were all conditions of the Licence complied with within the reporting period? (please tick the appropriate box)

Yes ☐ Please proceed to Section C

No ☐ Please proceed to Section B

Each page must be initialled by the person(s) who signs Section C of this Annual Audit Compliance Report (AACR).

Initial:



SECTION B

DETAILS OF NON-COMPLIANCE WITH LICENCE CONDITION.

Please use a separate page for each Licence condition that was not complied with.

a) Licence condition not complied with:	
b) Date(s) when the non-compliance occurred, if applicable:	
c) Was this non-compliance reported to DER?:	
<input type="checkbox"/> Yes <input type="checkbox"/> Reported to DER verbally Date _____ <input type="checkbox"/> Reported to DER in writing Date _____	<input type="checkbox"/> No
d) Has DER taken, or finalised any action in relation to the non-compliance?:	
e) Summary of particulars of the non-compliance, and what was the environmental impact:	
f) If relevant, the precise location where the non-compliance occurred (attach map or diagram):	
g) Cause of non-compliance:	
h) Action taken, or that will be taken to mitigate any adverse effects of the non-compliance:	
i) Action taken or that will be taken to prevent recurrence of the non-compliance:	

Each page must be initialled by the person(s) who signs Section C of this AACR

Initial:



SECTION C

SIGNATURE AND CERTIFICATION

This Annual Audit Compliance Report (AACR) may only be signed by a person(s) with legal authority to sign it. The ways in which the AACR must be signed and certified, and the people who may sign the statement, are set out below.

Please tick the box next to the category that describes how this AACR is being signed. If you are uncertain about who is entitled to sign or which category to tick, please contact the licensing officer for your premises.

If the licence holder is		The Annual Audit Compliance Report must be signed and certified:
An individual	<input type="checkbox"/> <input type="checkbox"/>	by the individual licence holder, or by a person approved in writing by the Chief Executive Officer of the Department of Environment Regulation to sign on the licensee's behalf.
A firm or other unincorporated company	<input type="checkbox"/> <input type="checkbox"/>	by the principal executive officer of the licensee; or by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
A corporation	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	by affixing the common seal of the licensee in accordance with the <i>Corporations Act 2001</i> ; or by two directors of the licensee; or by a director and a company secretary of the licensee, or if the licensee is a proprietary company that has a sole director who is also the sole company secretary – by that director, or by the principal executive officer of the licensee; or by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
A public authority (other than a local government)	<input type="checkbox"/> <input type="checkbox"/>	by the principal executive officer of the licensee; or by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
a local government	<input type="checkbox"/> <input type="checkbox"/>	by the chief executive officer of the licensee; or by affixing the seal of the local government.

It is an offence under section 112 of the *Environmental Protection Act 1986* for a person to give information on this form that to their knowledge is false or misleading in a material particular. There is a maximum penalty of \$50,000 for an individual or body corporate.

I/We declare that the information in this annual audit compliance report is correct and not false or misleading in a material particular.

SIGNATURE: _____

NAME:
(printed) _____

POSITION: _____

DATE: ____/____/____

SEAL (if signing under seal)

SIGNATURE: _____

NAME:
(printed) _____

POSITION: _____

DATE: ____/____/____



Licence: L5961/1991/12
Form: N1

Licensee: Water Corporation
Date of breach:

Notification of detection of the breach of a limit.

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

Part A

Licence Number	
Name of operator	
Location of Premises	
Time and date of the detection	

Notification requirements for the breach of a limit	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	



Part B

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident.	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission.	
The dates of any previous N1 notifications for the Premises in the preceding 24 months.	

Name	
Post	
Signature on behalf of Water Corporation	
Date	



Decision Document

Environmental Protection Act 1986, Part V

Proponent: Water Corporation

Licence: L5961/1991/12

Registered office: 629 Newcastle Street
LEEDERVILLE WA 6007

Premises address: Geraldton No. 2 Wastewater Treatment Plant
Webborton Road
Wonthella
GERALDTON WA 6530
Being Lot 1 & 2 on Diagram 57545 and Lot 3 on Diagram 72567

Granted date: Thursday, 22 October 2015

Commencement date: Sunday, 1 November 2015

Expiry date: Wednesday, 31 October 2035

Decision

Based on the assessment detailed in this document, the Delegated Officer has decided to issue an amended licence. The Delegated Officer considers that in reaching this decision, all relevant considerations have been taken into account.

Decision Document prepared by: Caroline Conway-Physick
Licensing Officer

Decision Document authorised by: Steve Checker
Delegated Officer



Contents

Decision Document	1
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1 Purpose of this Document	2
2 Administrative summary	3
3 Executive summary of proposal and assessment	4
4 Decision table	6
5 Advertisement and consultation table	17
6 Risk Assessment	25
Appendix A	26

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.



2 Administrative summary

Administrative details		
Application type	Works Approval <input type="checkbox"/> New Licence <input type="checkbox"/> Licence amendment <input checked="" type="checkbox"/> Works Approval amendment <input type="checkbox"/>	
Activities that cause the premises to become prescribed premises	Category number(s)	Assessed design capacity
	54 – Sewage facility	3,500 cubic metres per day
Application verified	Date: N/A	
Application fee paid	Date: N/A	
Works Approval has been complied with	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	
Compliance Certificate received	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	
Commercial-in-confidence claim	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Commercial-in-confidence claim outcome	N/A	
Is the proposal a Major Resource Project?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the <i>Environmental Protection Act 1986</i> ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision No: Managed under Part V <input type="checkbox"/> Assessed under Part IV <input type="checkbox"/>
Is the proposal subject to Ministerial Conditions?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	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 <i>Environmental Protection Act 1986</i>)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Department of Water consulted Yes <input type="checkbox"/> No <input type="checkbox"/>	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes <input type="checkbox"/> No <input type="checkbox"/> If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes <input type="checkbox"/> No <input type="checkbox"/> If Yes, include details here, eg Site is subject to SO ₂ requirements of Kwinana EPP.		



3 Executive summary of proposal and assessment

Location and siting

The Geraldton No. 2 Wastewater Treatment Plant (WWTP) is situated in Wonthella, Geraldton. The WWTP has a maximum design capacity to process 3,500 cubic metres (m³) per day. Water Corporation is proposing an upgrade to the premises with the inclusion of four additional infiltration ponds to increase the infiltration capacity at the premises up to 3.5 ML/ day.

The WWTP treats wastewater to a secondary standard and consists of 2 stabilisation ponds (i.e. a primary aerated pond and a secondary oxidation pond), and an infiltration pond (pond 3). Treated wastewater is disposed across broad acreage sprinkler irrigation. The balance of the treated wastewater is fed into a series of infiltration ponds. Effluent infiltration is reclaimed from an on-site bore and supplied under commercial terms as non-potable water to the City of Geraldton Greenough, Geraldton Golf Club, Geraldton Turf Club, Wonthella Bowling Club and Geraldton Cemetery.

Proposed works

The proposed upgrade to the premises will include:

- Four additional infiltration ponds (IP5-IP8); with a total storage capacity of 28 ML and a total infiltration rate capacity of 8.8 ML/ day
- Six new monitoring bores;
- Pond 3 to be replaced with a distribution chamber;
- Existing infiltration ponds to be remediated through stabilisation of pond embankments and improved access for desludging works; and
- Irrigation area to be taken off line for the incorporation of the new infiltration ponds.

Potential emissions

The annual rainfall averages 460 millimetres with evaporation rates predominantly six times greater than rainfall. The topography is characterised by a coastal dune system. The geology varies from coastal dunes with underlying limestone near the surface to red loam sands or yellow sands inland with underlying limestone.

The WWTP is surrounded by 150 - 500 m bushland and is approximately three kilometres east the coast, and approximately 606 m south of the Chapman River. The nearest sensitive receptor is a housing development which is located approximately 500 metres north of the WWTP. Adjacent lots to the east of the premises boundary are zoned 'rural residential' and to the west are zoned 'Industry – General'. Adjacent lots north of the premises boundary are zoned 'residential' with the southern boundary adjoining zoned 'recreation' (local authority reserve) area.

A desktop assessment identified that depth to groundwater is variable, with TDS being approximately 1,500mg/L (brackish). The Annual Environmental Reports submitted by Water Corporation confirms standing water level within the monitoring bores varies across the premises, approximately 13.8 to 25 mBGL.

The main potential emissions from the construction phase include fugitive emissions (dust), noise, and odour, and during operation of the WWTP include emissions land and groundwater water (via infiltration).

This decision document is as a result of a proposed works upgrade to the premises for the inclusion of additional infiltration ponds and increased infiltration capacity at the premises. Additional administrative changes have been included within the amendment process.



Occupation and planning approval

The premises falls within the City of Greater Geraldton and is zoned within community and public purpose under the District Scheme - Greater-Geraldton. The lands are fenced and solely owned by Water Corporation with no access to the public.

The premises has been owned and managed by Water Corporation since 1991 as a Wastewater Treatment Plant under Licence. Water Corporation confirmed via email on 1 June 2016 that consultation was undertaken with the City of Greater Geraldton during 2009 for the proposed upgrade. "The approval was partly driven by re-use demand but mainly by catchment growth."

Following gazettal of the *Water Services Act 2012* (as gazetted on 18 November 2013) a 'Development Approval' is not required for the proposed works at the premises. Section 137 of the *Water Services Act 2012*, identifies that Water Corporation (in its capacity as service provider) is exempt from the requirement to obtain development approvals for Public Service Works. The City of Greater Geraldton confirmed on 12 July 2016 that no development approval is required for this proposal.

Consultation

Consultation is defined within Section 5 of the Decision Document and has been undertaken with the City of Greater Geraldton, the Department of Water and DER Environmental Sciences, Contaminated Sites Branch



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	Justification (including risk description & decision methodology where relevant)	Reference documents
Interpretation	L1.1.1-L1.1.4	<p>Construction and operation</p> <p>Conditions 1.1.1 – 1.1.4 require that terminology used within the Licence is referenced to the appropriate definitions where applicable, and that any reference to a standard or guideline is to the most current version of that standard or guideline.</p> <p>An administrative change has been undertaken to amend minor changes to the Licence to latest version. Definitions have been updated.</p> <p>Previous condition 1.1.5 has been removed from the Licence. The condition is considered an explanatory statement that is not enforceable or risk based.</p> <p>Construction and operation</p> <p>Construction and operation is subject to the general provisions of the <i>Environmental Protection Act 1986</i>. Category 54 activity falls under Schedule 1 Part 1 of the <i>Environmental Protection Regulation 1987</i> and is subject to Licence. The premises currently operates an active Licence L5961/1991/12, under which the works upgrade will be completed.</p>	DER Policy
General conditions	L1.2.1, L1.2.3 L1.2.4-L1.2.9	<p>Construction and operation</p> <p>Condition 1.2.1 includes an administrative change to better define the types of pollution control and monitoring equipment used at the premises.</p> <p>Condition 1.2.3 relating to stormwater management has been removed from the Licence. The condition is not specific to the premises is not sufficiently clear in</p>	Application supporting documentation. General provisions of the



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p>relation to premises operation.</p> <p>Conditions 1.2.4 to 1.2.9 have been incorporated into the Licence as a result of the proposed works upgrade to the premises which:</p> <ul style="list-style-type: none">• defines the specifications for the design and construction of the premises upgrade;• requires the Licensee to list and report any departures that may have been undertaken during the course of the works upgrade to the premises;• requires the Licensee to submit a compliance document on the works upgrade of the upgraded premises; and• outlines the detail required within the compliance document to be submitted to DER. <p>Condition 1.2.4 of the Licence will become condition 1.2.3 as a result of the completed Licence amendment process.</p>	<i>Environmental Protection Act 1986.</i>
Premises operation	L1.3.5	<p>Operation</p> <p>Condition 1.3.3, Table 1.3.2 includes the addition of the new distribution chamber as part of the waste processing infrastructure at the premises, as defined within condition 1.2.5 of the Licence amendment process. Explanatory notes have been included as to when the new infrastructure is to be operational.</p> <p>Condition 1.3.3, Table 1.3.3 includes the addition of the new infiltration ponds (IP5-IP8) as part of the containment infrastructure proposed for construction at the premises through the amendment process. Explanatory notes have been included as to when the new infrastructure is to be operational.</p> <p>Condition 1.3.5, includes an administrative change with the removal of 1.3.5 (c) relating to discernible seepage loss. The use of 'discernible' is considered not clear and objective. In addition, m(AHD) has been changed to m(BGL).</p>	DER Procedure



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
Emissions to land including monitoring	L2.2 L3.2	<p>Construction and operation</p> <p><u>Emission Description</u></p> <p><i>Emission:</i> Discharge of increased volumes (3,500 cubic metres/ day) of treated wastewater during commissioning (testing) and operation.</p> <p><i>Impact:</i> Potential contamination of surrounding land (nutrient loading) and groundwater resources (via infiltration).</p> <p><i>Controls:</i> The proponent proposes to infiltrate 3.5 ML/ day of treated wastewater via the four new infiltration ponds in addition to the current infiltration ponds at the premises. Groundwater will then be drawn out through a production bore at the premises and sold on for reuse for commercial purposes as non-potable water supply.</p> <p>The reuse water is used on recreational grounds throughout the City of Greater Geraldton.</p> <p>Modelling of nutrient infiltration rates was undertaken by 'Rockwater Consultancy' (Section 10 of the application supporting documentation) and assumed no further irrigation of wastewater would be included. The proposed infiltration rate increase after ten years showed expansion of the nitrogen plume in a westerly direction with a concentration change of approximately 1 mg/L, up to approximately 550 m away from the infiltration basins/ ponds. Phosphorus concentrations indicated a nutrient plume up to 90 m from the infiltration basins/ ponds (limited by strong absorption capacity of the underlying limestone layer).</p> <p>The modelling is based on the requirement of pumping out of groundwater for reuse by the Shire, which is stated as 70% of the infiltrated wastewater volume and assumptions on the extent to which denitrification would take place in the superficial aquifer (Appendix C: Groundwater Nutrient Modelling – Rockwater).</p> <p>Department of Water (DoW) provided the following advice:</p> <p>1) Supply of treated wastewater to other users such as the Geraldton golf club, turf track and cemetery has reduced pressure on the groundwater resource, in which</p>	<p>Application supporting documentation.</p> <p>General provision of the <i>Environmental Protection Act, 1986</i>.</p> <p>Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2000 (ANZECC, 2000).</p> <p><i>Environmental Protection (Unauthorised Discharges) 2004</i>.</p>



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p>the salinity has been observed as rising.</p> <p>2) GWL64525 (groundwater licence) authorises the abstraction of 730 000 kL/yr from the superficial aquifer. One production bore abstracts from the groundwater mound form by the infiltration of wastewater.</p> <ul style="list-style-type: none">• During the 2013/14 water year 236 817 kL was abstracted (2% increase on previous year)• During the 2014/15 water year 234 365 kL was abstracted.• Salinity is stable at about 1,400 mg/L TDS.• Water levels respond to abstraction and have been observed to fall and rise as much as three meters monthly.• The production bore is located at 269793 mE 6815840 mN (MGA Z50) with a depth of 31.97 m BTOC screened between 14.11 and 31.97 m BTOC with the SWL at 17.10 when drilled in 1997. <p>3) Metered abstraction is about 32% of the licence entitlement, typically an application to increase the entitlement would be made when abstraction reaches 90% of the licensed entitlement, as such no amendment to the licence is required at this stage. Abstraction from the groundwater mound will be related to demand from users and limited by infrastructure to treat and supply wastewater.</p> <p>DoW stated that the increase in infiltration at the premises “will have no adverse impacts on the local groundwater use or the environment and is supported by DoW”. Monitoring parameters at the groundwater monitoring and production bores is recommended for bacteria coliforms (<i>E. coli</i>), Total Phosphorus and Total Nitrogen on a six monthly (Correspondence received from Department of Water on 20 and 21 June 2016).</p> <p>Advice received from DER Environmental Sciences, Contaminates Sites Branch, on the assessment of the works submission recommended the inclusion of monitoring for emissions to land. Additional parameters have been included within conditions 3.2.1 with the additional monitoring parameters for metals and metalloids.</p>	



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p>In the absence of natural attenuation, ongoing groundwater abstraction and monitoring will be required to ensure that the plume does not migrate too far from the proposed infiltration site.</p> <p>The closest sensitive residential receptor is approximately 500 m north of the premises, with the Chapman River approximately 606 m north and the Indian Ocean approximately 3 km west of the premises boundary.</p> <p><u>Risk Assessment</u> <i>Consequence:</i> Minor <i>Likelihood:</i> Possible <i>Risk Rating:</i> Moderate</p> <p><u>Regulatory Controls</u> Conditions 3.2.1 , 3.3.1 and 3.4.1 are considered adequate to monitor and assess parameter emissions from the premises through monitoring of emissions to land, inputs, outputs and ambient groundwater monitoring and production bores. The monitoring regime and parameters stated supports the recommendations made by DoW.</p> <p>The total volumes redrawn from the production bore at the premises (A1/97) is managed under groundwater licence GWL64525 which is managed through Department of Water.</p> <p>In addition, improvement programmes have been proposed within condition 4.1.1 for the development of a 'Groundwater Monitoring Strategy' (IR3).</p> <p><u>Residual Risk</u> <i>Consequence:</i> Minor <i>Likelihood:</i> Possible <i>Residual Risk Rating:</i> Moderate</p>	



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		Condition 2.2.1, Table 2.2.1 has been amended with an explanatory note confirming when the irrigation area 'L1' is to be taken off line as a result of completion of the proposed works at the premises. The irrigation area will utilised for the installation of the new infiltration ponds IP5-IP8, as defined within Schedule 1: Maps within the Licence.	
Monitoring of inputs and outputs	L3.3	Operation Condition 3.3.1, Table 3.3.1 includes the monitoring of groundwater redrawn from production bore A1/97. Table 3.3.1 has also been amended with an explanatory note confirming that the irrigation area is to be taken off line as a result of completion of the proposed works at the premises. The irrigation area will utilised for the installation of the new infiltration ponds IP5-IP8, as defined within Schedule 1: Maps within the Licence. See the risk assessment within Appendix A of the Decision Document.	
Ambient environmental quality monitoring	L3.4	Operation Condition 3.4.1, Table 3.4.1 has been amended to include the six new monitoring bores ('New1-6') that are proposed for installation and operation at the premises as a result of the change to process and increase in infiltration volume (See Schedule 1: Maps within the Licence). An explanatory note has been included to define when the monitoring bores are expected to be operational. See the risk assessment within Appendix A of the Decision Document.	
Fugitive emissions	-	Construction <u>Emission Description</u> <i>Emission:</i> Dust generated from construction equipment operations and removal of soil. <i>Impact:</i> Interference with the health, welfare, convenience, comfort or amenity of sensitive residential receptors.	Application supporting documentation. General provisions



DECISION TABLE

Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p><i>Controls:</i> The proponent proposes to undertake ongoing visual monitoring of dust emissions and will damp/ wet down the area with the use water carts/ sprinklers. The works are to be undertaken during the autumn/ winter months. In addition, sterile rye grass, wind fences and hydro-mulch will be applied to areas that are affected by erosion. A buffer exists (500 m) around the premises operations which should assist in diminishing any 'rogue' dust escaping other management measures in place (Section 5.4 and 9.1 of the Application supporting documentation).</p> <p>The premises does not require any significant vegetation clearing prior to construction and will be restricted to approximately 4.5 ha. Any clearing undertaken will be in accordance with the <i>Environmental Protection (Clearing of Native Vegetation) Regulations 2004</i>, under exemption (Item 1).</p> <p><u>Risk Assessment</u> <i>Consequence:</i> Insignificant <i>Likelihood:</i> Possible <i>Risk Rating:</i> Low</p> <p><u>Regulatory Controls</u> Section 49 of the <i>Environmental Protection Act 1986</i> and the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> are considered sufficient to manage any low risk emissions from the construction phase at the premises. This is in 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.</p> <p><u>Residual Risk</u> <i>Consequence:</i> Insignificant <i>Likelihood:</i> Possible <i>Risk Rating:</i> Low</p>	<p>of the <i>Environmental Protection Act 1986</i>.</p> <p><i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i>.</p>



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		Operation No dust emissions are expected from the operation of the premises. No additional conditions have been considered for inclusion into the Licence as a result of this amendment process.	
Odour	-	Construction and operation <u>Emission Description</u> <i>Emission:</i> Odour generated from excavation and remediation of pond 3 and the current infiltration ponds, respectively, and increased infiltration capacity at the premises. <i>Impact:</i> Interference with the health, welfare, convenience, comfort or amenity of sensitive residential receptors approximately 500 m north of the premises, and reduced local air quality. <i>Controls:</i> The proponent has submitted odour modelling (Section 12 of the application supporting documentation) which was undertaken by Consulting Environmental Engineers. Odour has been modelled as being reduced compared to the current use of irrigation method to the area. The proponent has confirmed that if a complaint of odour is received, an investigation would be undertaken, as per Water Corporation Incident Response Procedure. The premises has received odour complaints historically from residents. The odour was suspected to be originating from the irrigation laterals at the premises. The location of the new infiltration ponds will be further away from residents (>500 m). Total odour emissions for the plant has been identified as 41,500 OU/s. <u>Risk Assessment</u> <i>Consequence:</i> Insignificant <i>Likelihood:</i> Possible <i>Risk Rating:</i> Low <u>Regulatory Controls</u> It is considered that low risk odour emissions can be sufficiently regulated under	Application supporting documentation. General provisions of the <i>Environmental Protection Act 1986</i> .



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p>section 49 of the <i>Environmental Protection Act 1986</i>, in 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.</p> <p><u>Residual Risk</u> <i>Consequence</i>: Insignificant <i>Likelihood</i>: Possible <i>Risk Rating</i>: Low</p>	
Noise	-	<p>Construction and operation</p> <p><u>Emission Description</u> <i>Emission</i>: Noise from heavy vehicle movement to and from the premises, and receipt of construction materials to the premises. <i>Impact</i>: Interference with the health, welfare, convenience, comfort or amenity of sensitive residential receptors. <i>Controls</i>: The proponent proposes to only undertake works between the hours of 7am to 5pm, Monday to Friday. In the event the construct is required outside of the pre-set construction times then Water Corporation will develop a 'Noise Management Plan' and notify a residents and the Shire of the proposed deviation to construction times.</p> <p>The closest sensitive receptor is approximately 500 m north of the premises, with the premises holding a 500 m buffer around all operational areas. General noise emissions from the operation of the premises are low risk/ low intermittent emissions from aerators.</p> <p><u>Risk Assessment</u> <i>Consequence</i>: Insignificant <i>Likelihood</i>: Possible <i>Risk Rating</i>: Low</p>	<p>Application supporting documentation. General provisions of the <i>Environmental Protection Act 1986</i>.</p> <p><i>Environmental Protection (Noise) Regulations 1997</i></p>



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p><u>Regulatory Controls</u></p> <p>It is considered that the provisions of the <i>Environmental Protection (Noise) Regulations 1997</i> will be sufficient to regulate the noise emissions during construction and operation. This is in 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.</p> <p>No additional conditions have been considered for the prescribed premises Licence through this amendment process.</p> <p><u>Residual Risk</u> <i>Consequence:</i> Insignificant <i>Likelihood:</i> Possible <i>Residual Risk Rating:</i> Low</p>	
Improvements	L4.1.1	<p>Operation</p> <p>An improvement programme has been proposed within condition 4.1.1, Table 4.1.1, 'IR3' for the development of a Groundwater Monitoring Strategy. This has been recommended by DER Environmental Sciences, Contaminated Sites in the assessment and ongoing management of the managed aquifer recharge (MAR) area around the infiltration ponds.</p> <p>The improvement condition is considered appropriate and consistent in the management and review of a MAR area, as confirmed by DER Environmental Sciences and Department of Water analysis of the proposal.</p> <p>Assessment has been defined within Appendix A of the Decision Document.</p>	General provisions of the <i>Environmental Protection Act, 1986</i> .
Information	L5.2.1	<p>Operation</p> <p>Condition 5.2.1, Table 5.2.1 includes an administrative change with the addition of a reporting requirement with an annual assessment of Total Nitrogen and Total Phosphorus concentration values at the premises using the ANZECC 2000 guidelines</p>	Australian and New Zealand Guidelines for Fresh and Marine Water



DECISION TABLE

Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		methodology defined in Section 9.2.6 of Volume 3.	Quality, 2000 (ANZECC, 2000).
Licence Duration	N/A	<p>The Licence duration has not been reassessed as part of this amendment process.</p> <p>The Licence duration has been previously determined in accordance with 'DER guidance statement, Licence duration, May 2015' during a previous amendment process and currently expires on 31 October 2035.</p>	



5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
2009; 12/07/2016	Application referred to interested parties listed: City of Greater Geraldton	Water Corporation confirmed via email on 1 June 2016 that consultation was undertaken during 2009. "The approval was partly driven by re-use demand but mainly by catchment growth."	Consultation with the City of Greater Geraldton on 12 July 2016 confirmed that the premises and proposed works are .
26/05/2015	Department of Water (DoW)	Comment received from DoW on 20 & 21 June 2016. DoW stated that the increase in infiltration at the premises "will have no adverse impacts on the local groundwater use or the environment and is supported by DoW". Monitoring parameters at the groundwater monitoring and production bores is recommended for bacteria coliforms (<i>E. coli</i>), Total Phosphorus and Total Nitrogen on a six monthly basis. <u>Recommendations:</u> 1. groundwater samples from the new and existing monitoring bores and re-use production bores should be evaluated for bacteria coliforms and nutrient loading (P, N) every 6 months. 2. ongoing need for evaluation should be reviewed in association with the GN2WWTP triennial review.	The current licence requires sampling of monitoring bores on a six monthly basis for all recommended parameters stated by DoW. Monitoring from the production bore will be included within the Licence amendment. The Delegated Officer notes DoW advice in relation to 'no adverse impacts' based on an assessment of modelled predictions and information submitted in support of the application. Conditions 3.4.6, 3.4.7 and 3.4.8 have been included to validate the submitted modelled predictions and evaluate actual performance of increased infiltration at the premises against modelled predictions on an ongoing basis.
19/05/2016	Contaminated Sites Branch (DER)	Advice received from DER Contaminated Sites Branch on 24 June 2016 with the following determination: 1. The extent to which natural attenuation processes will lower nitrogen	The recommendations of DoW have been considered within the condition 3.4.6.



Date	Event	Comments received/Notes	How comments were taken into consideration
27/07/2016	Department of Health (DoH)	<p>concentrations in groundwater down gradient of the managed aquifer recharge (MAR) is considered to be overestimated;</p> <ol style="list-style-type: none">ongoing groundwater abstraction and continuous monitoring will be required to ensure that the treated-wastewater plume is constrained to the immediate vicinity of the infiltration area;Recommendation for the inclusion of concentration limits for specific chemical constituents wastewater discharged to land;Recommendation for the ongoing monitoring for metals and metalloids in recovered groundwater, particularly for mercury;Recommendation for a network of monitoring bores to define the boundaries of the proposed MAR scheme. <p>Copy of letter received from DoH on 12 August 2016, dated 28 July 2016 (letter addressed to Derek Duffy, Water Corporation) stating the following:</p> <ol style="list-style-type: none">Implementation of an operational procedure for the drying and desludging activities to ensure adequate design infiltration rate of 0.2 m/day is maintained in the long-term.Sludge from infiltration pond remediation works to be stored in an approved lined hard stand drying beds and disposed to an authorised landfill facility.Compliance with the Western Australian	<p>The Licence has addressed the advice given as follows:</p> <ol style="list-style-type: none">Acknowledged. See Appendix A of the Decision Document;The Licence requires the monitoring of parameters at the monitoring bores and at the production bore/s within condition 3.4.1;Limits have been included within condition 3.4.1;Condition 3.4.1 has incorporated the monitoring of metals and metalloids on an annual basis from the monitoring and production bores;This recommendation has been incorporated within Condition 3.4.8. <p>The Licence has addressed the advice given as follows:</p> <ol style="list-style-type: none">Condition 1.3.3 of the Licence addresses this issue.Conditions 1.3.3 and 1.3.4 of the



Date	Event	Comments received/Notes	How comments were taken into consideration
		<p>Guidelines for Biosolids Management 2012.</p> <p>4. Notification of the Department of Health if and when the water quality of any or all of the six new monitoring bores exceeds the low exposure risk level recycled water quality of the Guidelines for the non-potable uses of recycled water in WA.</p>	<p>Licence addresses this issue.</p> <p>3. Condition 1.3.3 of the Licence addresses this issue.</p> <p>4. Condition 3.4.1 of the Licence addresses this issue.</p>
18/07/2016	Proponent sent a copy of draft instrument	<p>Comments received from Craig Chaudhry via email on 3/08/2016, as follows:</p> <p><u>Licence comments</u></p> <ol style="list-style-type: none"> 1. 'Six' new monitoring bores – scope of project CS01593 is for 5 bores so this needs to be changed to five; 2. Removal of item 1.3.5 (c) "there is no discernible seepage loss from the wastewater treatment plant" We would like this retained as permeability is not a good measure of seepage loss. Rather type of liner and liner thickness. In addition the use of monitoring bores around the WWTP's are used as control point to determine if seepage loss is occurring from WWTP treatment ponds. 3. Condition 3.2.1 <i>Metals and Metalloids</i> Parameters suggested are not relevant to the wastestream that Water Corporation Receives and its end point use. It has been proven through the parent plant monitoring conducted by Water Corporation that metals and metalloids are not usually present in TWW (e.g Leonora) . In addition the use of the trigger values comes from ANZECC Guidelines (2000) Section 4.2.6 	<p>The comments have been addressed as follows:</p> <ol style="list-style-type: none"> 1. Comment withdrawn by Craig Chaudhry via email 8/8/2016. No change. 2. No change. Condition 1.3.5 (c) to be removed as per DER Licensing requirements. Water Corporation are required to ensure all infrastructure is operating as per the conditions of the Licence. 3. Condition 3.2.1 - <i>Metals & Metalloids</i>: The monitoring parameters for metals and metalloids have been amended and limits removed; <i>PFOS</i>: Water Corporation have identified that they are unable to meet the NATA standard for analysis as PFOS testing is only conducted in the Eastern States, the parameter has been removed until such time that a suitable laboratory able to undertake testing has been identified. It is understood that an assessment is being undertaken currently by Water Corporation on



Date	Event	Comments received/Notes	How comments were taken into consideration
		<p>Table 4.2.10 and 4.2.1. This refers to agricultural irrigation to land for food crops. The TWW at Geraldton No.2 WWTP upon abstraction from the groundwater is used for the irrigation of turfs and parks. In addition it is direct infiltration to ground. This ANZECC standard is not relevant to the operation of the plant and re-use scheme. Hence the standard of imposing limits or parameters to be monitored for metals and metalloids is out of context and not mandated by the ANZECC Guidelines. In addition the groundwater area is not used for agricultural purposes. The metals and Metalloids limits imposed in the licence are not valid and are required to be removed.</p> <p><i>PFOS</i> PFOS is not relevant to TWW. Testing for PFOS was conducted at a trial site by Water Corporation at a WWTP and it was revealed that it was not present in the wastewater stream. In addition, note if we have to test for PFOS (firefighting foam/retardants) we could not meet the NATA standard to analysis it as analysis is only conducted in the Eastern States PFOS is not relevant and should be removed. According to preliminary information, treated wastewater samples would need to be couriered to eastern states based laboratories for determination of PFOS. Approximate cost for single analysis is \$250; which excludes courier fees. Further explanation is required on requirement for monitoring PFOS emissions to land as</p>	<p>metropolitan wastewater and biosolids sampling which will assist in determining the appropriateness of sampling parameters in the near future. This may be used for future amendment processes in informing monitoring parameter requirements within the Licence; <i>Total Nitrogen and Total Phosphorus Limit</i>: No change to limits; <i>E. coli</i>: Limit has been removed.</p>



Date	Event	Comments received/Notes	How comments were taken into consideration
		<p>domestic waste only is accepted at the premises. In addition note if we have to test for PFOS (firefighting foam) we could not meet the NATA standard to analysis it as analysis is only conducted in the Eastern States.</p> <p><i>Total Nitrogen and Total Phosphorus Limits:</i> These limits are not based on ANZECC relevant requirements and appears again to have been taken out of the ANZECC guidelines for irrigation of food crops. Water Corp request these limits and targets be removed.</p> <p><i>E coli:</i> There is no purpose to set a limit for <i>E coli</i> at the emission point. Through the denitrification process <i>E coli</i> does not make its way to the groundwater given its characteristic of TWW. Sampling shows there has not been an occurrence of <i>E coli</i> in abstraction bore monitoring since the schemes establishment.</p> <p>4. Condition 3.4.1 <i>Metals and Metalloids</i> Parameters suggested are not relevant to the wastestream that Water Corporation Receives and its end point use. It has been proven through the parent plant monitoring conducted by Water Corporation that metals and metalloids are not usually present in TWW. In addition the use of the trigger values comes from ANZECC Guidelines (2000) Section 4.2.6 Table</p>	<p>4. Condition 3.4.1 - <i>Metals and Metalloids:</i> Parameters have been amended. <i>PFOS:</i> Water Coporation have identified that they are unable to meet the NATA standard for analysis as PFOS testing is only conducted in the Eastern States, the parameter has been removed until such time that a suitable laboratory able to undertake testing has been identified. It is understood that an assessment is being undertaken</p>



Date	Event	Comments received/Notes	How comments were taken into consideration
		<p>4.2.10 and 4.2.1. This refers to agricultural irrigation to land for food crops?. The TWW at Geraldton No.2 WWTP upon abstraction from the groundwater is used for the irrigation of turfs and parks. In addition it is direct infiltration to ground. This ANZECC standard is not relevant to the operation of the plant and re-use scheme. Hence the standard of imposing limits or parameters to be monitored for metals and metalloids is out of context and not mandated by the ANZECC Guidelines. In addition the groundwater area is not used for agricultural purposes.</p> <p><i>PFOS</i> PFOS is not relevant to TWW. PFPS was tested by Water Corporation at other sites have revealed that it was not present. In addition note if we have to test for PFOS (firefighting foam) we could not meet the NATA standard to analysis it as analysis is only conducted in the Eastern States.</p> <p><i>M (AHD):</i> Water Corporation does not measure groundwater bore levels in m(AHD) rather m (BGL). This unit should be changed or comparison of historical data of groundwater will be able to be carried in AER's.</p> <p>5. Improvement condition IR3 IR3 appears to be directing Water Corporation to carry out a Groundwater Monitoring strategy including the installation</p>	<p>currently by Water Corporation on metropolitan wastewater and biosolids sampling which will assist in determining the appropriateness of sampling parameters in the near future. This may be used for future amendment processes in informing monitoring parameter requirements within the Licence; <i>M(AHD)</i>: Amended to mBGL.</p> <p>Conditions 3.4.6 and 3.4.7 have been included within the Licence to require a review of the monitoring data on a triennial basis to assess the potential risk of impact from emissions to groundwater.</p> <p>5. Improvement condition 'IR3' has been removed. Condition 3.4.8 has been included to require the Licensee to submit a timeline for the installation of</p>



Date	Event	Comments received/Notes	How comments were taken into consideration
		<p>of IR3 appears that DER is directing us to install three sentinel bores and on background monitoring bore. As the DOW has stated there is no environmental impact from the increased infiltration up to 3.5 the Water Corporation requests the removal of IR3 on the grounds it is not relevant based on DOW advice and the Rock Water Nutrient Modelling.</p> <p><u>Decision Document comments</u></p> <p>6. Comment from Contaminated Sites Branch is not justified. The statement that there is no natural attenuation processes that will lower nitrogen concentrations groundwater and that Rock Waters report has overestimated this. Water Corporation request DER to remove this statement unless the claim can be justified.</p> <p>7. In general the decision document is lacking justification. It appears as the majority of items are low risk but DER is mandating controls. Water Corporation request a revision of the decision document with key justification provisioned for all items.</p> <p>An email was sent to Steve Checker (DER, Delegated Officer) on 09/08/2016 by Craig Chaudhry (Water Corporation) requesting that the application be placed on hold until a single round of sampling at the wastewater discharge point could be undertaken to assess emissions in the discharge water.</p>	<p>monitoring bores for the MAR area to assess the rate/ degree at which the plume is progressing within the groundwater. The Delegated Officer notes DoW advice but considers it necessary to validate the submitted modelled predictions and evaluate modelling against actual data periodically to ensure the ongoing validity of predicted plume behavior.</p> <p>6. Please see Appendix A of the Decision Document. The review does not say there is no attenuation but speaks to the assumption within the submitted report of the degree to which denitrification may not be occurring.</p> <p>7. Statement noted. Please see the Decision Document and risk ratings for the relevant associated emissions. Appendix A has incorporated additional information.</p> <p>On 19 August 2016 Water Corporation submitted results for the monitoring of full suite of additional parameters proposed for the Licence. Water Corporation requested that the metal and metalloid parameters be removed from the Licence.</p> <p>The single round of sampling identified that none of the parameters are currently exceeding limits as defined by the ANZECC short term values. The Delegated Officer notes the submission however considers</p>



Date	Event	Comments received/Notes	How comments were taken into consideration
			<p>that a single round of sampling does not sufficiently represent potential impact or performance of the plant.</p> <p>The additional metal/ metalloid parameters have however been placed within the Licence for annual sampling to allow for ongoing assessment of potential emissions to land and groundwater (reuse water for irrigation drawn via the production bore) to evaluate potential impacts. Proposed metalloid limits have been removed, but may be reconsidered for inclusion based on the results of monitoring.</p>



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

Ambient environmental quality monitoring and monitoring of emissions to land

The premises proposes to discharge up to 3,5 ML of wastewater via infiltration, for redraw via production bore 'A1/97' for commercial purposes under groundwater abstraction Licence GWL64525.

An additional four infiltration ponds are being proposed in conjunction with the current set of ponds being used, as follows:

Pond	Surface Area (m ²)	Storage (ML)	Infiltration Rate (ML/day)
IP5	14,855	10	2.9
IP6	8,502	6	1.7
IP7	9,230	5	1.8
IP8	12,365	7	2.4

Current volume/ capacity of the active infiltration ponds could not be supplied by Water Corporation due to the irregularity in the design of the ponds.

The proponent supplied modelled information on the potential effects on groundwater influence (Rockwater, 2009 and 2010).

Nutrient Models were submitted based on different inflow volumes to the premises, as follows:

- 1) 2.0 ML/d Flows to WWTP (Current);
- 2) 3.5 ML/d Flows to WWTP (Targeted Treatment Capacity);
- 3) 20ML/d Flows to the WWTP (Simulated but not applicable).

The Rockwater 2009 report recommended monitoring of groundwater quality for *E.coli*, TDS, TN and TP from the abstraction bore A1/97, with lower volumes drawn over winter months (wet season) as opposed to summer (dry season).

The Rockwater 2010 report identified that the modelling of infiltration rates up to 18 ML/ day would not influence the groundwater discharge along the Chapman River, north of the premises. However, high rates of infiltration (20 ML/day) could result in groundwater flows from the premises towards any private bores to the north, east and south of the premises.

Department of Water assessment summary:

"Treated wastewater MAR to the Superficial Aquifer [is considered to] enhance the water quality and storage volume providing an important source of irrigation water for public open space (POS) and local recreation areas. The increase in the quantity of treated wastewater will provide an additional source of POS irrigation for the Geraldton central business district (CBD) and adjacent areas that have limited access to irrigation quality groundwater due to the brackish to saline quality of the underlying Superficial Aquifer and deeper confined aquifer systems.

Negative effects of the proposed process [include]:

- an increase in the nutrient loading;
- bacteria in the groundwater; and
- increased distribution of endocrinal disruptors (pharmaceutical by-products of human consumption).

The negative effects associated with the MAR are risks that are related to human consumption and not irrigation. The superficial aquifer underlying the Geraldton CBD is not used for drinking purposes.



The minor risks associated with an increase in groundwater nutrients and loading of trace quantities of pharmaceuticals will be offset by a general freshening of the groundwater system and enhanced “useability” (increased volume) of the groundwater for POS irrigation. Neither nutrient or trace pharmaceutical increases will be detrimental to use of the water for the irrigation of POS.

The low hydraulic gradient $> 1 \text{ m} / 500 \text{ m}$ combined with a porosity of about 0.2 supports the documented groundwater travel times of 28.57 m / month.

The risk of propagation of *Escherichia coli* (*E coli*), *Streptococcus faecalis* and *pseudomonas* bacteria is considered to be low as these organisms have limited ability to survive in groundwater conditions. The production bores are situated about 200 m west of the infiltration ponds. Groundwater velocity has been calculated using a hydraulic gradient reflecting the groundwater (pumped) drawdown of about 8 m ($i = 0.04$). the groundwater velocity with this gradient portray an infiltrated wastewater residence time of 20 days. Laboratory studies have portrayed a rapid reduction in organisms of 5 log 10 after 7 days at a temperature of 20°C. Coliform removal will occur through a process of die-off, dilution and filtering by underground strata with total coliform count being reduced by 90% (T90) in 6.5 days (*Survival of Pathogenic and indicator organisms in groundwater*, Bitton et al, Groundwater, Vol. 21 / No. 4, 1983). There may be some survival of bacteria within the area of monitoring and certainly within the area of groundwater production. Research suggests that total coliform count will be low, but should still be evaluated with the need for ongoing evaluation assessed following a period of data collection and evaluation.”

DER Environmental Sciences - summary of assessment of the modelling data and submission

The ‘Rockwater 2010’ modelling report has potentially over-estimated the extent to which natural attenuation processes will lower nitrogen concentrations in groundwater downgradient of the managed aquifer recharge (MAR) area.

This assessment stated that for a MAR area scheme to be environmentally acceptable, the following conditions must be met:

- Natural attenuation processes within the aquifer must reduce concentrations of potentially harmful constituents within the wastewater plume to levels that will not adversely affect nearby groundwater users; and
- Natural attenuation processes within the aquifer must reduce concentrations of potentially harmful constituents within the wastewater plume to levels that will not cause adverse impacts on surface water environments where (and when) groundwater discharge takes place.

These points are made in the Department of Water’s policy statements on how MAR schemes should be operated in Western Australia (DoW, 2011). The key DoW policy statement relevant to the protection of environmental receptors is:

“An MAR scheme should not adversely affect the environmental values of groundwater or connected surface water systems. Proponents will be required to identify, quantify and manage the risks to these systems to ensure their values are maintained and, where possible, enhanced”.

Water Corporation is considered to have correctly identified high nitrogen concentrations within the wastewater plume in groundwater as a potential contaminant of concern for the nearshore marine environment if the plume were to discharge to the coast. Water Corporation has argued that this would not take place due to the effects of denitrification within the aquifer that would lower nitrogen concentrations and due to the large distance of the wastewater infiltration site from the coast (about 3 km). Water Corporation has supported the argument with a groundwater model with an assumed



denitrification rate which suggests that elevated nitrogen concentrations would only be detected in groundwater within a few hundred metres of the infiltration site.

However, this argument and the modelling may not be valid because of assumptions that have been made about the extent to which denitrification would take place in the superficial aquifer at the Geraldton No. 2 Wastewater Treatment Plant.

Based on investigations made of a wastewater plume in a similar sandy aquifer in Cape Cod in the USA (Barbaro *et al.*, 2013) have indicated that the plume had extended about 6 km to the coast from the infiltration site with only limited attenuation of the nitrogen concentrations. The wastewater infiltration rate at this site (about 0.8 GL/year) was much lower than for the proposed Geraldton MAR scheme, and it has taken about 60 years for the plume to reach the coast. Detailed groundwater investigations (Repert *et al.*, 2006) have indicated that denitrification and removal of nitrogen from the aquifer has only taken place in the immediate vicinity of the infiltration basins where sufficient oxygen was introduced into the aquifer to allow ammonia and organic nitrogen compounds to be oxidised to nitrite and nitrate which were then removed from the aquifer by denitrification. These investigations indicated that nitrogen concentrations in the core of the wastewater plume downgradient of the infiltration site remained unchanged, even a decade after wastewater infiltration ceased.

These factors indicate that Water Corporation cannot assume that the wastewater plume will not reach the coast if the MAR scheme is not adequately managed. In the absence of natural attenuation, ongoing groundwater abstraction and monitoring will be required to ensure that the plume does not migrate too far from the proposed infiltration site."

A recommendation for additional monitoring parameter requirements for metals and metalloids has been included for the discharge waters from the final treatment pond and within groundwater, particularly Mercury, Zinc and Arsenic. In addition, of particular concern is the compound perfluorooctane sulfonate (PFOS), for which the Department of Health has recommended an interim guideline value for non-potable water use of 5 µg/L.

As ongoing groundwater abstraction will be required to reduce the risk of the wastewater plume migrating from the vicinity of the infiltration area towards the coast, it is recommended that a groundwater monitoring network is progressively established to ensure that the wastewater plume that develops for the proposed MAR scheme will not migrate a great distance from the infiltration area.

Department of Health assessment summary:

Advice submitted direct to Water Corporation (dated 28 July 2016) and received by DER from Department of Health (DoH) on 12 August 2016 included four comments within their advice for consideration within the Licence. All comments except one (point 4) had already been adequately addressed under conditions within the Licence (as defined within Section 5 'Advertisement and consultation table' above). Point four has been incorporated within Condition 3.4.1 of the Licence.

The redrawn wastewater from the production bore 'A1/97' at the premises is reused for non-potable commercial purposes as a result of the infiltration process. The advice given from DoH is considered appropriate for the processes being undertaken at the premises, and the monitoring of these parameters against the frequencies and limits identified will allow Water Corporation to adequately address the advice submitted to them from DoH. This will also ensure appropriate measures have been undertaken in the management of risks to the environment.

Emission Risk Assessment – Operations

Emission Description

Emission: Discharge of wastewater which contains contaminants (metals, metalloids) and nutrients to land and groundwater via infiltration ponds.



Impact: Degradation of groundwater quality and potential contamination or nutrient enrichment of surrounding land and groundwater, with long term potential to influence surface waters (Indian Ocean).

Controls: Redraw of groundwater resource through a groundwater abstraction licence for commercial reuse purposes via production bore 'A1/97' at the premises. Monitoring of discharge parameters within the prescribed premises Licence L5961/1991/12 held by the Licensee. Department of Water have issued a Licence to the Licensee for the purposes of groundwater abstraction.

Water Corporation submitted a single round of monitoring data from the wastewater treatment plant discharge point (prior to infiltration/ irrigation) on 19 August 2016, for all monitoring parameters proposed under the current Licence and proposed amendment (with the additional metals/ metalloids). The results identified that the metal and metalloid parameters are not currently triggering any short term values as defined under the ANZECC 2000 guidelines. Water Corporation have requested that the monitoring parameters do not include monitoring for metals/ metalloids. However, the wastewater is discharged to land via infiltration and redrawn via a production bore for reuse purposes off site. The continued monitoring through annual monitoring of metal/ metalloid parameters is considered appropriate. This will assist in assessing any change in discharge water or impacts to groundwater and reuse water. The Delegated Officer considers that a single round of sampling is not sufficiently representative of the potential impact or performance of the plant.

Risk Assessment

Consequence: Minor

Likelihood: Possible

Risk Rating: Moderate

Regulatory Controls

Conditions 3.2.1 (Monitoring of emissions to land) now includes monitoring of specific metals and metalloids. The monitoring of *E. coli* is now also a requirement as per the recommendation received from consultation with the Department of Water.

Condition 3.3.1 requires the ongoing recording and reporting of groundwater redrawn from the production bore 'A1/97' at the premises, as ongoing reuse of groundwater is considered essential in ensuring the wastewater plume from the premises does not migrate significantly from the infiltration area.

Condition 3.4.1 (Monitoring of ambient groundwater) includes metals and metalloid monitoring parameters. Ongoing monitoring of the recovered groundwater is to ensure that it remains suitable for its intended non-potable uses especially in the case of mercury which has a high potential for being released from aquifer sediments and which has a very low ANZECC 2000 water quality criteria for non-potable uses.

As a result of the advice received from DoH, DER has incorporated relevant limits and monitoring frequencies within Table 3.4.1 'Monitoring of ambient groundwater quality' (Condition 3.4.1) of the Licence, and made reference to the 'Guidelines for the Non-potable Uses of Recycled Water in Western Australia', August 2011, low exposure risk level, on which the limits and frequencies are based.

Conditions 3.4.6 and 3.4.7 requires ambient groundwater bore and production bore monitoring data review on a triennial basis. The review is to be considered in the context of the submitted modelling report to verify the validity of the modelling report submitted by 'Rockwater, 2010' (as submitted), and other relevant guidelines.

Condition 3.4.8 requires the development of a timeline for the installation of bores to monitor the MAR area and the wastewater plume as a result of the premises operation. This will enable the



validation and evaluation of the predicted behaviour of the plume as per the modelling report submitted by 'Rockwater, 2010'

Residual Risk

Consequence: Minor

Likelihood: Possible

Risk Rating: Moderate