Licence

Environmental Protection Act 1986, Part V

Licensee: Water Corporation

Licence: L9094/2017/1

Registered office: 629 Newcastle Street
LEEDERVILLE WA 6007

Premises address: Broome North Wastewater Treatment Plant
Lot 1502 on Plan 75036 Crab Creek Road
BROOME WA 6725
as depicted in Schedule 1.

Issue date: Friday, 22 September 2017

Commencement date: Friday, 22 September 2017

Expiry date: Monday, 21 September 2037

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 or more per day	3 500 cubic metres per day
61	Liquid waste facility: premises on which liquid waste produced on others premises (other than sewage waste) is stored, reprocessed, treated or irrigated.	100 tonnes or more per year	1 200 tonnes per annual period

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

Date signed: 22 September 2017
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Stephen Checker
MANAGER LICENSING (WASTE INDUSTRIES)
Officer delegated under section 20
of the *Environmental Protection Act 1986*

Contents

Introduction

This Introduction is not part of the Licence conditions.

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

DWER has responsibilities under Part V of the *Environmental Protection Act 1986* (the Act) for the licensing of prescribed premises. Through this process DWER regulates to prevent, control and abate pollution and environmental harm to conserve and protect the environment. DWER 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.

Licence fees
If you have a licence that is issued 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 construction of Broome North Waste Wastewater Treatment Plant (BNWWTP) was approved by DWER under works approval W4531/2009/1. Construction commenced in 2009 and was completed via a staged approach. A partial compliance document was provided to DWER in April 2011 for the construction of the BNWWTP sewage treatment ponds and the tanker receivable bay. An operating licence (L8556/2011/1) was therefore issued to WC in July 2011 which allowed for storage and processing of wastewater to commence at the premises. A final compliance document was received in September 2012 for the remaining irrigation pump station, pipe work and chlorination unit constructed under W4531/2009/1.

The BNWWTP currently consists of three ponds, one Facultative Treatment Pond (Primary), one Maturation Treatment Pond (Secondary) and a third Treated Wastewater Storage Pond and the spray irrigation field. The site also contains a tanker receivable facility where approximately 100 cubic metres per month of wastewater from septic tanks will be disposed via a tanker facility into the wastewater pond system. Attachment 4 shows the layout of Stage 1 of the BNWWTP.

The proposal for the BNWWTP is a three-staged operation occurring over a span of 35 years and works approval W4531/2009/1 was issued for Stage One only. Stage One has a design capacity of 3.5ML/day of wastewater which is over the threshold of 100m^3/day for Schedule 1, Category 54 of the *Environmental Protection Regulations 1987*. Stages Two and Three will be constructed according to population demand and will require separate applications to be provided to DWER.

As per requirements of the original works approval, a Nutrient Irrigation Management Plan (NIMP) was provided and approved by DWER for the BNWWTP site. The premises irrigates treated wastewater from the WWTP to land, which is regulated by licence conditions. The irrigation area is to the North of the WWTP and is comprised of one pivot with the capacity for two pivots to be installed in the future. The applicant was recently granted approval to install pipelines to allow treated wastewater to be irrigated to Pivot 2 as well. The total area cleared for the civil works (pivot, pipeline drainage and firebreak) will be 29Ha.

In order to undertake the proposed works a total of 26 ha of Native vegetation are required to be cleared. The clearing will be assessed and undertaken in accordance with the Water Corporation's state wide *Clearing permit (CPS185/7)*.

The average irrigation rate will remain at around 20.9ML/ha/yr for each stage. The species to be irrigated is a crop of Rhodes Grass, selected for its ability to uptake high levels of nitrogen and phosphorus. WC has indicated trials will be undertaken in future to determine other appropriate species that may be grown onsite and irrigated with effluent. The crop will be regularly harvested as a way of removing nutrients from the irrigation system.

The nearest sensitive receptor is Morrell Park Aboriginal Community settlement located approximately 1.4km from the north-western corner of the site. An "Essential Services Buffer" has been established to provide an odour buffer around the WWTP to ensure that future urban encroachment does not compromise the buffer zone. The Environmental Protection Authority's *Separation Distances between Industrial and Sensitive Land Uses No. 3* does not recommend a buffer distance for WWTPs, which are to be determined on a case-by-case basis. The Waterbank Industrial Area is proposed to be located approximately 2km north of the site, which will include the future location of the Broome International Airport.

Water Corp have also dedicated 17.91 hectares (ha) of the BNWWTP to the Mamabulanjin Aboriginal Corporation (MAC) to establish seedlings which will be utilised as a seed bank, or for future rehabilitation works in the area. To assist with the establishment of the seedlings, MAC is proposing to irrigate the

seedlings with treated wastewater (TWW). An application rate of 1L/day per tree is required, which equates to 14Kl/day across the 17.91ha area. Irrigation will only occur during the dry season for a period of no more than 2 years.

Water Corp will provide TWW to the Seedling Irrigation Area via 1km pipeline. The pipeline will connect directly to the existing TWW tanks. TWW quality will remain as per the discharge to the Stage 1 Irrigation Area.

New Licence 2017

Licence (L9094/2017/1) replaces the former Licence (L8556/2011/1). L8556/2011/1 ceased to have effect after fee payment was only received 30 days after the anniversary date (3 July 2017) of the Licence. This resulted in the issuing of a new (replacement) instrument. This Licence also includes conditions imposed under Amendment Notice 1 issued in February 2017.

The licences and works approvals issued for the Premises since3/07/2017 are:

Instrument log		
Instrument	**Issued**	**Description**
L9094/2017/1	22 September 2017	Application for a new Licence. L8556/2011/1 ceased to have effect due to non-payment of fees within required time frame (3 July 2017).

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;*

'AHD' means the Australian height datum;

'Annual Audit Compliance Report' means a report in a format approved by the CEO as presented by the Licensee or as specified by the CEO from time to time and published on the Department's website;

'annual period' means a 12 month period commencing 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 4439.1' means the Australian Standard AS 4482.1 *Wastes, sediments and contaminated soils – Preparation of leachates – Preliminary assessment*;

'AS/NZS 4882.1' means the Australian Standard AS 4482.1 *Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds*;

'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;

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

'CEO' for the purposes of notification means:
Director General
Department Administering the *Environmental Protection Act 1986*
Locked Bag 33 Cloisters Square
PERTH WA 6850
info-der@dwer.wa.gov.au

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

'Department' means the department established under s.35 of the Public Sector Management Act and designated as responsible for the administration of Division 3 Part V of the *Environmental Protection Act 1986.*

'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 10^{-9} metres/second or less;

'Licence' means this Licence numbered L9094/2017/1 and issued 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;

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

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

'Seedling Irrigation Area' means irrigation area located between the southern boundary of the Premises and treatment ponds as depicted in Schedule 1; and

'Stage 1 Irrigation Area' means irrigation area located between the north western boundary of the Premises and the treatment ponds as depicted in Schedule 1.

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 ensure stormwater runoff resulting from site drainage is prevented from entering the wastewater treatment ponds or causing erosion of the outer pond embankments.

1.2.2 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 1.2.2.

1.2.3 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: Works specifications

Column 1 Infrastructure[1]	*Column 2 Specifications (design and construction)*
Irrigation area- Pivot 2	*The irrigation system and irrigation area must be designed and constructed so as to meet the following specification:* *1. consists of 25 hectare irrigation area* *2. ensure DN200 PVC pipes are used; and* *3. ensure all pipelines are buried to a depth of 900mm.*

1.2.4 If any departures outlined in Condition 1.2.3 apply, then the Licensee must provide the CEO with a list of departures which are certified as complying with Condition 1.2.3 at the same time as the certifications under Condition 1.2.5.

1.2.5 The Licensee must ensure the construction compliance document:
(a) is certified that each item of infrastructure specified under Condition 1.2.3, Table 1.2.1 has been constructed in accordance with the Conditions of the Licence and any documentation submitted under condition 1.2.4 with no material defects; and
(b) is 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 exceedance 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 1.3.2;
(b) the quantity accepted is below any limit listed in Table 1.3.2; and
(c) it meets any specification listed in Table 1.3.2.

Table 1.3.2: Waste acceptance

Waste	Waste Code	Quantity Limit	Specification
Sewage	K130	3 500 m^3 per day	Accepted through sewer inflow(s) and tankered waste only
Septage	K210	1 200 tonnes per annual period	Septage Receival Pit.

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 1.3.3 and in accordance with any process limits described in that table.

Table 1.3.3: Waste processing

Waste type	Process	Process requirements
Sewage	Biological, physical and chemical treatment	Treatment of sewage waste shall not exceed the treatment capacity of 3 500 m^3 per day.
Septage	Biological, physical and chemical treatment	Treatment of tankered septage waste shall not exceed the treatment capacity of 1 200 tonnes per annual period.
Sewage sludge	Storage	In accordance with the document titled 'Western Australian guidelines for biosolids management' (Department of Environment and Conservation 2012) as amended from time to time.
Treated wastewater	Disposal to Irrigation Area	Disposal to irrigation area with fast growing, harvestable fodder crop cover. Ensure there is no ponding or pooling of irrigated water in the irrigation area. No run-off of treated effluent outside the irrigation area is to occur.
Treated wastewater	Disposal to Seedling Irrigation Area	Disposal to irrigation area with planted native seedlings.

1.3.4 The Licensee shall ensure that waste material is only stored and/or treated within vessels or compounds provided with the infrastructure detailed in Table 1.3.4.

Table 1.3.4: Containment infrastructure		
Vessel or compound	**Material**	**Requirements**
Inlet screen	Grit and 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.
Tanker receivable bay	Septage waste	A bunded, hardstand area capable of preventing surface run-off of leachate and septage and which returns septage leachate to the start of the treatment process.
Facultative Treatment Pond (Primary Pond)	Wastewater	Lined partly with concrete and an impermeable (1×10^{-9} m/sec) liner (clay liner).
Maturation Treatment Pond (Secondary Pond)	Wastewater	Lined with ELCOSEAL: X2000 (a geosynthetic clay liner manufactured from polypropylene geotextiles and sodium bentonite powder to achieve a permeability of 2×10^{-11} m/sec) or equivalent.
Storage Pond (Storage Dam)	Treated wastewater	Lined with ELCOSEAL: X2000 (a geosynthetic clay liner manufactured from polypropylene geotextiles and sodium bentonite powder to achieve a permeability of 2×10^{-11} m/sec) or equivalent.
Sludge Drying Beds	Sewage sludge	Two bunded, concrete areas with a sand filter capable of preventing surface run-off of leachate and sludge and which returns sludge leachate to the start of the treatment process.

1.3.5 The Licensee shall manage all wastewater treatment ponds such that:
- (a) overtopping of the ponds does not occur;
- (b) a freeboard equal to, or greater than, 500mm is maintained;
- (c) the integrity of the containment infrastructure is maintained;
- (d) trapped overflows are maintained on the outlet of ponds to prevent carry-over of surface floating matter; and
- (e) vegetation and floating debris (emergent or otherwise) is prevented from encroaching onto pond surfaces or inner pond embankments.

1.3.6 The Licensee shall manage the irrigation of treated wastewater such that:
- (a) bunding/cut-off drains are maintained around the Stage 1 Irrigation Area such that run-off is recirculated back into the wastewater treatment system;
- (b) no irrigation generated run-off, spray drift or discharge occurs beyond the boundary of the defined irrigation area(s);
- (c) treated wastewater is evenly distributed over the irrigation area;
- (d) no soil erosion occurs;
- (e) irrigation does not occur on land that is waterlogged; and
- (f) vegetation cover is maintained over the irrigation area.

1.3.7 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.

1.3.8 The Licensee shall dispose of grit, screenings, sludge and biosolids to a licensed landfill facility.

2 Emissions

2.1 Emissions to land

2.1.1 The Licensee shall ensure that where waste is emitted to land from the emission points in Table 2.1.1 and identified on the map of emission points in Schedule 1, it is done so in accordance with the conditions of this Licence.

Table 2.1.1: Emissions to land

Emission point reference	Description	Source including abatement
Discharge to Reuse S3002406 (Pivots 1 and 2 as depicted in Schedule 1)	Discharge to Stage 1 Irrigation Area via wastewater discharge point	Treated wastewater pipeline from wastewater treatment plant
Discharge to Reuse S3002405 (as depicted in Schedule 1)	Discharge to Seedling Irrigation Area via wastewater discharge point	Treated wastewater pipeline from wastewater treatment plant

2.1.2 The Licensee must ensure that treated wastewater discharged to the irrigation field does not exceed limits specified in Table 2.2.2.

Table 2.2.2: Emission limits to land

Monitoring point reference	*Parameter*	*Discharge limits*	*Units*
Discharge to Reuse S3002406 and S3002405	Total Nitrogen	< 500	kg/ha/year
	Total Phosphorous	<224	kg/ha/year

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 soil samples are collected and preserved in accordance with AS/NZS 4882.1 and leachates prepared in accordance with AS/NZS 4439.1; and
(f) all 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; and
(b) quarterly monitoring is undertaken at least 45 days apart;

3.1.3 The Licensee shall ensure that the flow meters used on the Premises to comply with the conditions of this Licence are maintained and calibrated in accordance with the manufacturer's specifications and the requirements of the Licence.

3.1.4 The Licensee shall maintain the monitoring bores referred to in Tables 3.4.1 and 3.4.2 of this licence to allow representative water samples to be collected.

3.1.5 Where the requirements for sampling, calibration or maintenance cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, the Licensee shall 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 ambient groundwater quality

Monitoring point reference	***Parameter***	***Units***	***Frequency***
Effluent Trans PS S3002405	Oil and Grease	mg/L	*Monthly*
	pH	pH units	
	Total Dissolved Solids calculated from Electrical Conductivity	mg/L	
	Total Suspended Solids	mg/L	
	Total Nitrogen as N	mg/L	
	Total Phosphorus	mg/L	
	Biochemical Oxygen Demand	mg/L	
	Nitrate Nitrogen	mg/L	
	Ammonium Nitrogen	mg/L	
	Total Kjeldahl Nitrogen	mg/L	
	Filterable Reactive Phosphorous	mg/L	
	E. coli	CFU/100ml	
	pH[1]	pH units	
	Arsenic	mg/L	
	Cadmium	mg/L	
	Copper	mg/L	

	Chromium	mg/L	
	Lead	mg/L	
	Mercury	mg/L	
	Nickel; and	mg/L	
	Zinc	mg/L	
Discharge to Reuse S3002406 (as depicted in Schedule 1: Maps)	Total Residual Chlorine;	mg/L	
	E. coli	CFU/100ml	
	Total Nitrogen as N	mg/L	
	Total Phosphorous	mg/L	

Note 1: In field non-NATA accredited analysis 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	Units	Averaging period	Frequency
Sewage - Inlet Flow	Inlet Flow Meter	Volumetric flow rate (cumulative)	m^3 per day	Monthly	Continuous
Treated wastewater discharged to the Stage 1 Irrigation Area	Effluent Flow Meter	Volumetric flow rate (cumulative)	m^3 per day	Monthly	Continuous
Treated wastewater discharged to the Seedling Irrigation Area	Effluent Flow Meter	Volumetric flow rate (cumulative)	m^3 per day	Monthly	Continuous

3.4 Ambient environmental quality monitoring

3.4.1 The Licensee shall undertake the monitoring in Tables 3.4.1 and Table 3.4.2 according to the specifications in those tables.

Table 3.4.1: Monitoring of ambient soil quality

Monitoring point reference and location	Parameter	Units	Averaging period	Frequency
1; 2; 3; 4; 5; 6; and 7. (as depicted in Schedule 1: Maps)	pH[1];	pH units	Spot sample	Quarterly
	Total Dissolved Solids;	mg/kg		
	Total Nitrogen;	mg/kg		
	Total Phosphorus; and	mg/kg		
	Copper	mg/kg		

Note 1: In field non-NATA accredited analysis permitted

Table 3.4.2: Monitoring of ambient groundwater quality

Monitoring point reference and location	Parameter	Units	Averaging period	Frequency
Monitoring bores; 1/10; 2/10; 3/10; 4/10; 5/10; 6/10; 7/10; 8/10; 9/10; 10/10; 11/10; 12/10; 13/10; 14/10; 15/10; 16/10; 17/10; 18/10; 19/10; 20/10; 21/10; 22/10; 23/10; 24/10; BH4; BH5; BH6; BH7; BH8; and BH9. (as depicted in Schedule 1: Maps)	Total Dissolved Solids calculated from Electrical Conductivity;	mg/L	Spot sample	Quarterly
	Total Nitrogen;	mg/L		
	Ammonium- Nitrogen;	mg/L		
	Nitrate + Nitrite-Nitrogen;	mg/L		
	Total Phosphorus;	mg/L		
	Standing Water Levels[1];	AHD		
	pH[1];	pH units		
	Arsenic;	mg/L		
	Cadmium;	mg/L		
	Copper;	mg/L		
	Chromium;	mg/L		
	Lead;	mg/L		
	Mercury;	mg/L		
	Nickel; and	mg/L		
	Zinc.	mg/L		

Note 1: In field non-NATA accredited analysis permitted

4. Information

4.1 Records

4.1.1 All information and records required by the Licence shall:
- (a) be legible;
- (b) if amended, be amended in such a way that the original and subsequent amendments remain legible or are capable of retrieval;
- (c) except for records listed in 4.1.1(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
- (d) for those following records, be retained until the expiry of the Licence and any subsequent licence:
  - (i) off-site environmental effects; or
  - (ii) matters which affect the condition of the land or waters.

4.1.2 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.

4.1.3 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 issued under Part V of the Act for the Premises for the previous annual period.

4.1.4 The Licensee shall:
- (a) implement a complaints management system that shall record the following information (if known or provided) about complaints received at the Premises concerning any environmental impact of the activities undertaken at the Premises:
  - (i) name and address of the complainants (if consented);
  - (ii) date and time of complaint;
  - (iii) date and time of alleged incident;
  - (iv) alleged source of the incident;
  - (v) general description of the alleged incident, including any environmental or health impacts reported by the complainant;
  - (vi) wind direction, wind speed and temperature at time of alleged incident;
  - (vii) likely source of the alleged incident; and
  - (viii) actions taken by the Licensee to address the complaint, including the outcome of any investigation(s) and action(s) to verify any impacts.
- (b) complete an annual analysis and review of complaints recorded under 4.1.4(a) to identify any common factors and root cause of complaints and proposals to address these.

4.2 Reporting

4.2.1 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 4.2.1 in the format or form specified in that table, which was collected during the annual period.

Table 4.2.1: Annual Environmental Report

Condition or table (if relevant)	Parameter	Format or form
-	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 1.3.2	Waste acceptance	Tabular and graphical
Table 1.3.3	Waste processing	Tabular and graphical
Table 3.2.1	Monitoring of emissions to land	Tabular and graphical
	Contaminant loading to land of parameters (total annual loading kg/ha/yr for nitrogen and phosphorus, average daily loading kg/ha/day for BOD) for S3002406 (pivots 1 and 2), and S3002405	
Table 3.3.1	Monitoring of inputs and outputs	Tabular and graphical
Table 3.4.1	Monitoring of ambient soil quality	Tabular and graphical
Table 3.4.2	Monitoring of ambient groundwater quality	Tabular and graphical
4.1.3	Compliance	Annual Audit Compliance Report (AACR) – available at http://www.dwer.wa.gov.au/
4.1.4 (b)	Complaints analysis and review	None specified

4.2.2 The Licensee shall ensure that the Annual Environmental Report also contains:

(a) an assessment of the information contained within the report, against monitoring results and Licence limits that were collected over the previous three annual periods;

(b) cumulative monthly volumes (in cubic metres) of treated effluent discharged to the Stage 1 Irrigation Area during the annual period, in tabular and graphical format;

(c) calculation of the annual nutrient loading rates applied to the Stage 1 Irrigation Area during the annual period, and discussion of those rates in relation to the estimated volume of nutrients exported (from harvested biomass) from the premises during the annual period;

(d) any changes to site boundaries, location of groundwater monitoring bores, surface drainage channels and on-site or off-site impacts or pollution that occurred during the annual period;

(e) quantities of sludge removed during each desludging event that occurred during the annual period; and

(f) a summary of controlled waste dockets including the calculation of the cumulative monthly volume of controlled waste accepted into the premises during the annual period.

4.2.3 The Licensee shall submit the information in Table 4.2.3 to the CEO according to the specifications in that table.

Table 4.2.3: Non-annual reporting requirements				
Condition or table (if relevant)	**Parameter**	**Reporting period**	**Reporting date (after end of the reporting period)**	**Format or form**
-	Copies of original monitoring reports submitted to the Licensee by third parties	Not Applicable	Within 14 days of the CEOs request	As received by the Licensee from third parties

4.3 Notification

4.3.1 The Licensee shall ensure that the parameters listed in Table 4.3.1 are notified to the CEO in accordance with the notification requirements of the table.

Table 4.3.1: Notification requirements

Condition or table (if relevant)	Parameter	Notification requirement[1]	Format or form
3.1.5	Calibration report	As soon as practicable.	None specified
-	Taking process equipment offline for maintenance works	No less than 72 hours in advance of works	None specified
-	Removal of sewage sludge from a treatment pond, wastewater treatment vessel, sewage sludge storage pond or Geobag.	No less than 14 days in advance of works	The following information shall be included: (i) when desludging is proposed to occur; (ii) the desludging method; (iii) action to mitigate potential odour impacts; and (iv) the method by which the community will be advised of the desludging activities.
1.3.1 and 2.1.1	Breach of any limit specified in the Licence	Part A: As soon as practicable but no later than 5pm of the next working day Part B: 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

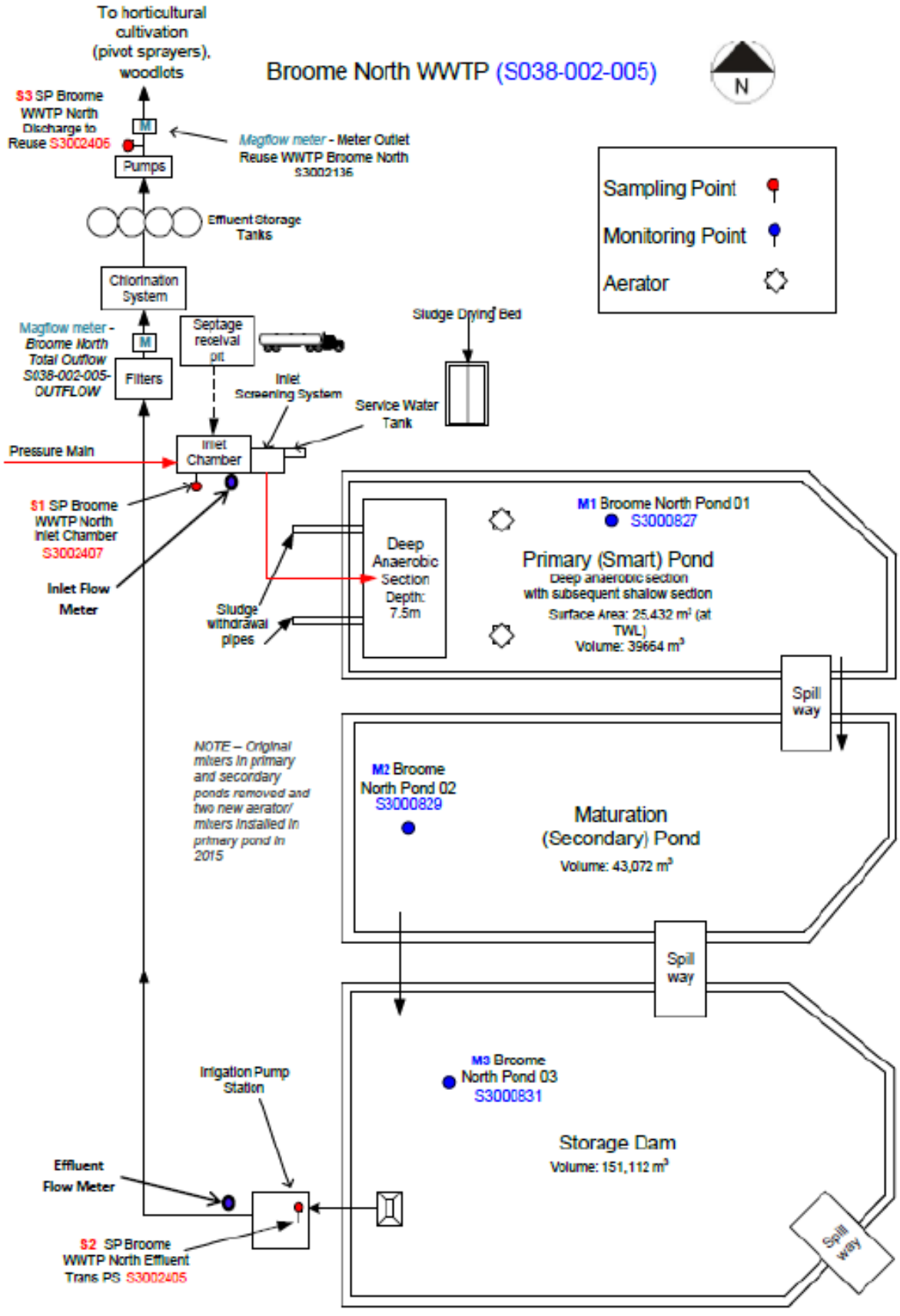
Schedule 1: Maps

Premises map

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

Map of emission points

The location of the emission point defined in Table 2.2.1 is shown below.



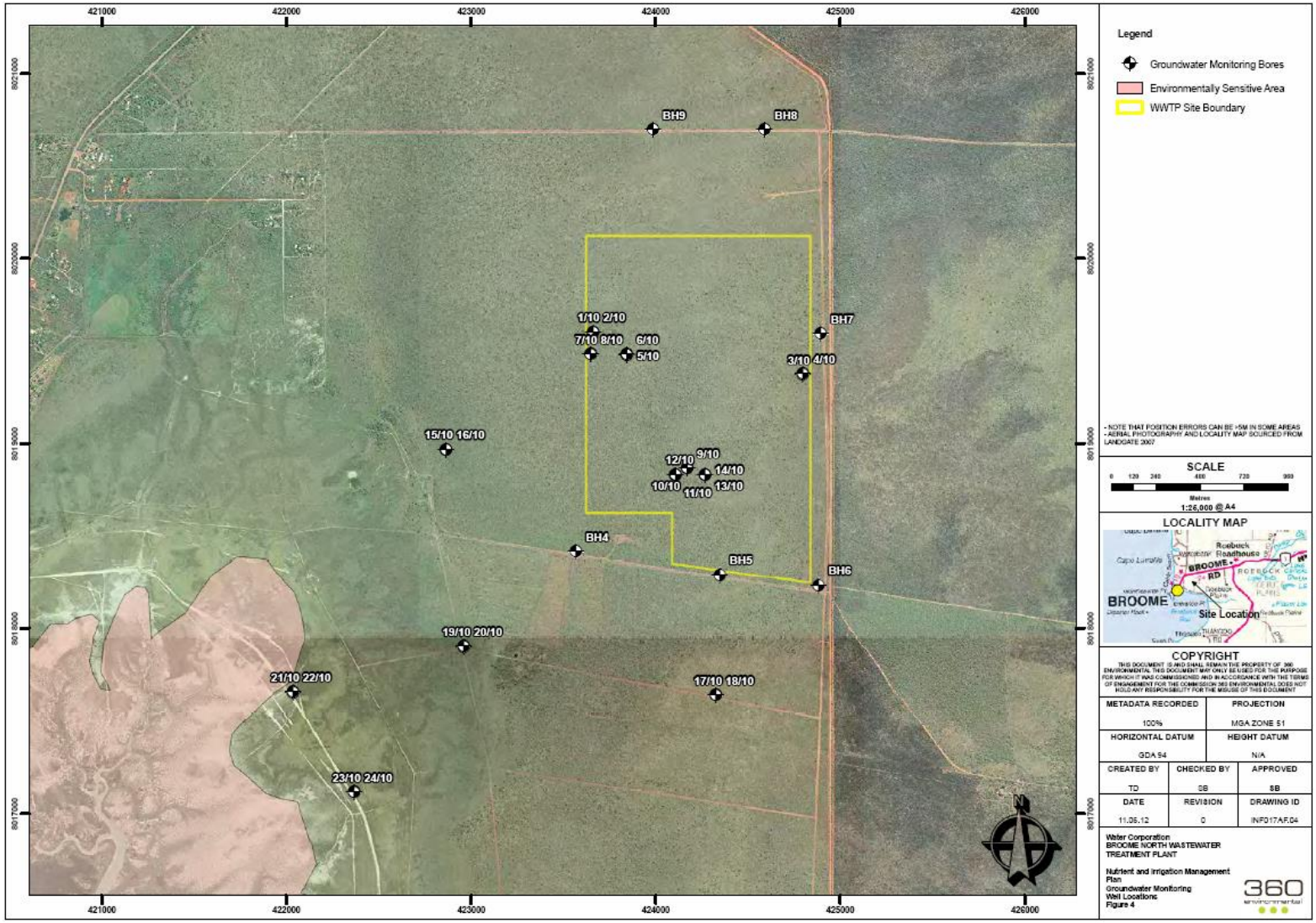
Map of emission points
The location of the emission point defined in Table 2.2.1 is shown below.

Map of monitoring locations

The locations of the ambient soil monitoring points defined in Table 3.4.1 are shown below.

Map of monitoring locations

The locations of the ambient groundwater monitoring points defined in Table 3.4.2 are shown below.



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.

Licence: L9094/2017/1 Licensee: Water Corporation
Form: N1 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	

Government of Western Australia
Department of Water and Environmental Regulation

Decision Document

Environmental Protection Act 1986, Part V

Proponent: Water Corporation

Licence: L9094/2017/1

Registered office: 629 Newcastle Street
LEEDERVILLE WA 6007

Premises address: Broome North Wastewater Treatment Plant
Lot 1502 on Plan 75036 Crab Creek Road
BROOME WA 6725
as depicted in Schedule 1.

Issue date: Friday, 21 September 2017

Commencement date: Friday, 22 September 2017

Expiry date: Monday, 21 September 2037

Decision

Based on the assessment detailed in this document the Department of Water and Environment Regulation (DWER), has decided to issue an amended licence. DWER considers that in reaching this decision, it has taken into account all relevant considerations and legal requirements.

Decision Document prepared by: Abnesh Chetty
Licensing Officer

Decision Document authorised by: Stephen Checker
Delegated Officer

Contents

1 Purpose of this Document

This decision document explains how DWER has assessed and determined the application and provides a record of DWER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DWER'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 ☐ New Licence ☒ Licence amendment ☐ Works Approval amendment ☐	
Activities that cause the premises to become prescribed premises	**Category number(s)**	**Assessed design capacity**
	54	3 500 cubic metres per day
	61	1 200 tonnes per annual period
Application verified Application fee paid	Date:19/09/2017 Date: 12/09/2017 (Annual fee paid for previous licence whilst ceased)	
Works Approval has been complied with Compliance Certificate received	Yes☐ No☐ N/A☒ Yes☐ No☐ N/A☒	
Commercial-in-confidence claim	Yes☐ No☒	
Commercial-in-confidence claim outcome		
Is the proposal a Major Resource Project?	Yes☐ No☒	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes☐ No☒	Referral decision No: Managed under Part V ☐ Assessed under Part IV ☐
Is the proposal subject to Ministerial Conditions?	Yes☐ No☒	Ministerial statement No: EPA Report No:
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes☐ No☒ Department of Water consulted Yes ☐ No ☒	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes☐ No☒ If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes☐ No☒ If Yes, include details here, eg Site is subject to SO_2 requirements of Kwinana EPP.		

3 Executive summary of proposal and assessment

The Broome North Wastewater Treatment Plant (BNWWTP) site, operated by the Water Corporation (Water Corp) is located at Lot 1502 Crab Creek Road, Broome. This location is on pastoral property, approximately 12km northeast of the Broome town centre. The wastewater treatment plant currently consists of three ponds, one Facultative Treatment Pond (Primary), one Maturation Treatment Pond (Secondary) and a third Treated Wastewater Storage Pond and the spray irrigation field. The site also contains a tanker receival facility where approximately 100 cubic metres per month of wastewater from septic tanks will be disposed via a tankering facility into the wastewater pond system.

The premises irrigates treated wastewater from the WWTP to land, which is regulated by licence conditions. The irrigation area is to the North of the WWTP and is comprised of one pivot with the capacity for two pivots to be installed in the future. The applicant was recently granted approval to install pipelines to allow treated wastewater to be irrigated to Pivot 2 as well. The total area cleared for the civil works (pivot, pipeline drainage and firebreak) will be 29Ha.

Water Corp have also dedicated 17.91 hectares (ha) of the BNWWTP to the Mamabulanjin Aboriginal Corporation (MAC) to establish seedlings which will be utilised as a seed bank, or for future rehabilitation works in the area. To assist with the establishment of the seedlings, MAC is proposing to irrigate the seedlings with treated wastewater (TWW). An application rate of 1L/day per tree is required, which equates to 14Kl/day across the 17.91ha area. Irrigation will only occur during the dry season for a period of no more than 2 years.

Water Corp will provide TWW to the Seedling Irrigation Area via 1km pipeline. The pipeline will connect directly to the existing TWW tanks. TWW quality will remain as per the discharge to the Stage 1 Irrigation Area.

New Licence 2017

This decision document relates to the issue of a new Licence (L9094/2017/1) to replace the former Licence (L8556/2011/1). L8556/2011/1 ceased to have effect after annual fee payment was only received 30 days after the anniversary date of the Licence (3 July 2017). This resulted in the expedited issuing of a new (replacement) instrument to allow continued operation of the wastewater treatment plant, which is essential infrastructure for the township of Broome.

This Licence mirrors the conditions of the previous licence, L8556/2011/1 and also includes conditions imposed under Amendment Notice 1, issued in February 2017. The Delegated Officer has reviewed the original Environmental Assessment Report (Attachment 1) and Amendment Notice (Attachment 2) and is satisfied that the licence conditions adequately regulate the emissions and discharges from the Premises.

4 Decision table

The overarching legislative framework of this assessment is the *Environmental Protection Act 1986 (*EP Act) and the *Environmental Protection Regulations 1987* (EP Regulations).

DWER Guidance Statements which inform the assessment in accordance with the legislation include*:*

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Land Use Planning (February 2017)*
- *Guidance Statement: Licence Duration (August 2016)*
- *Guidance Statement: Decision Making (November 2016)*
- *Guidance Statement: Risk Assessment (November 2016)*
- *Guidance Statement: Environmental Siting (November 2016)*

DECISION TABLE			
Works Approval / Licence section	**Condition number** **W = Works Approval** **L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Licence Duration	N/A	The proposal for the BNWWTP is a three-staged operation occurring over a span of 35 years. In accordance with DWER's Guidance Statement: *Licence Duration*, DWER will issue the Licence for a twenty year period. The Premises is licenced to accepted 3.5ML/day of wastewater and is currently receiving less than 1.3ML/day.	Guidance Statement: *Licence Duration*

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
20/09/17	Proponent sent a copy of draft instrument	Clarification required as to whether tanker sewage disposed at the waste water treatment plant from burst sewage main, due to pump station breakdown or where maintenance is undertaken relates to K130 waste code.	As per advice from DWER's Controlled Waste Functional Area, in the event that waste is tanked to a WWTP (ie. due to an emergency) the waste code for tracking purposes would be K130. Clarification included in the Licence (Table 1.3.2). The Delegated Officer considers that this change to the licence is administrative only does not represent a change to the risk profile of the premises.

Attachment 1 – Environmental Assessment Report

LICENCE NUMBER: L8556/2011/1

LICENCE FILE NUMBER: 2011/003611

COMMENCEMENT DATE: July 2011

EXPIRY DATE: July 2016

PREMISES DETAILS

WORKS APPROVAL HOLDER AND OCCUPIER

Water Corporation
629 Newcastle Street
Leederville WA 6007

Address (Postal)

PO Box 100

LEEDERVILLE WA 6902
ABN: 28 003 434 917

PREMISES

Broome North Wastewater Treatment Plant

Lot 502 Crab Creek Road,

Broome WA 6725

PRESCRIBED PREMISES CATEGORY

Table 1: Prescribed Premises Category from Schedule 1 of the *Environmental Protection Regulations 1987*

Category number	Description	Production or Design Capacity	Nominated Rate of Throughput	Throughput Classification *
54	**Sewage facility**: Premises on which sewage is treated (excluding septic tanks); or from which treated sewage is discharged onto land or into waters.	3.5 ML per day (Stage One)	3.5 ML per day	More than 2,000 cubic metres per day

61	**Liquid waste facility:** premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated.	100 cubic metres per month	100 cubic metres per month	More than 100 but not more than 10,000 tonnes per year

* From Schedule 4 of the *Environmental Protection Regulations 1987*

This Environmental Assessment Report (EAR) has been drafted for the purposes of detailing information on the management and mitigation of emissions and discharges from the prescribed premises. The objective of the EAR is to provide a risk assessment of emissions and discharges, and information on the management of other activities occurring onsite which are not related to the control of emissions and discharges from the prescribed premises activity. It is important to note that the Licence is not a mechanism to regulate those activities that occur on-site that are not related to the prescribed premises activity.

Basis of Assessment

The Broome North Wastewater Treatment Plant (BNWWTP) has been assessed as "prescribed premises" categories number 54 and 61 under Schedule 1 of the *Environmental Protection Regulations 1987*:

The Broome tourist season (June to September) attracts a large tourist population when sewage inflows can exceed the capacity of the existing Broome WWTP. Water Corporation (WC) has constructed a second municipal WWTP at the BNWWTP to cater for the tourist season as well as an expanding population, which is growing at the rate of 4-5% per annum. The BNWWTP currently consists of three ponds, one Facultative Treatment Pond (Primary), one Maturation Treatment Pond (Secondary) and a third Treated Wastewater Storage Pond. WC proposes at this stage to accept sewage for treatment at BNWWTP and then store the treated wastewater within the storage pond. The storage pond has sufficient capacity to store treated wastewater for many months so WC will not irrigate the treated wastewater from the BNWWTP presently. This licence relates only to the treatment and storage of wastewater, not for the irrigation. When WC needs to irrigate to pasture, the licence will be amended and WC will have to formally apply to DEC for a licence amendment to allow for irrigation of treated wastewater.

The site also contains a tanker receival facility where approximately 100 cubic metres per month of wastewater from septic tanks will be disposed via a tankering facility into the wastewater pond system.

WC has provided DEC a partial compliance certificate for the construction of the BNWWTP sewage treatment ponds and the tanker receival bay (Attachment 4). Once WC decides to start irrigation of the treated wastewater, WC will provide a full compliance certificate consistent with the requirements of works approval 4531/2009/1.

The proposal for the BNWWTP is a three-staged operation occurring over a span of 35 years but works approval W4531 is for Stage One only. Stage One will have a throughput of 3.5ML/day of wastewater which is over the threshold of 100m^3/day for Schedule 1, Category 54 of the *Environmental Protection Regulations 1987*. As indicated above, WC

has submitted a partial compliance certificate for the construction of the three treatment ponds and the tanker receival bay. This allows for the operation of such Plant. Accordingly, a licence is required for operation of this Plant. Stages Two and Three will be constructed according to population demand and will require separate applications for Works Approvals and licences to be provided to the Department of Environment and Conservation (DEC).

1.0 BACKGROUND

1.1 GENERAL COMPANY DESCRIPTION

WC provides water and wastewater services to Perth and hundreds of towns and communities spread over 2.5 million square kilometres within Western Australia. They also provide drainage and irrigation services to thousands of households, businesses and farms across the State. WC holds many licences for WWTPs with DEC.

WC currently holds Licence No. L6266/1991/8 for the operation of the Broome WWTP located at Reserve 37454 Lot 1639 Clementson St, Broome. This licence expires on 31 October 2011 and covers the prescribed activities occurring on site which include Categories 54: Sewage facility and Category 61: Liquid Waste Facility.

1.2 LOCATION OF PREMISES

The site is located at Lot 502 Crab Creek Road, Broome, as noted in Attachment One. This location is on pastoral property, approximately 12km northeast of the Broome town centre.

Landform:
The site is on a broad pindan sand plain with gently sloping topography. Soil is composed of deep red fine–textured, well-drained sands of Aeolian origin (4.5 to 9.8m depth), alluvium/Quaternary sands (~9.3 to 13.5m depth) unconformably overlying Broome Sandstone. Test drills have identified ~20 to 30% clay and silt sized particles between the pindan sands and the Broome Sandstone.

Groundwater:
The Broome Sandstone is a major unconfined aquifer that supplies groundwater to the Broome township, rural, horticultural and pastoral areas. Piezometers have been installed in the Pindan sands and Broome Sandstone at 30 locations at and around the BNWWTP site. Results from an old stock bore at the site recorded groundwater in the Pindan sands at 4.0m below ground level (11m AHD) which is 6.0m above the inferred water level in the Broome Sandstone. It was deemed likely to indicate a localised perched aquifer above the Broome Sandstone.

The layered aquifer in the Broome Sandstone contains low salinity water of 500 to 1,500mg/L TDS and is about 220m thick, at levels of 4.5m to 6.2m AHD in the vicinity of BNWWTP. Groundwater flows to the south and south-west towards Roebuck Bay and Dampier Creek and recharge is from localised rainfalls. A saltwater wedge extends ~15km inland with a fresh water layer ~100m thick overlying the wedge at the WWTP site.

High nitrate levels have been found to naturally occur in the groundwater (>40mg/L) which are probably a result of nitrate fixation by native acacias and termite activity. A pre-commissioning groundwater monitoring program has been established to accurately record the existing groundwater quality at the site prior to development of BNWWTP.

Surface Water:
The site is well drained with little or no development. Dampier Creek is a tidal creek which is located ~2.8km south west of the site. BNWWTP lies within the catchment boundary where stormwater runoff naturally flows in a west south-westerly direction towards the Creek. An area subject to inundation during the wet season lies 700m west of the site. Dampier Creek is characterised by an area of mangrove tidal flats with supratidal flats further inland. There is a boundary between the sandplain and the supratidal flats marked by a sharp concave break of slope. Dampier Creek discharges into Roebuck Bay, a Ramsar recognised wetland, which is located 5.5km south southeast the site. The Roebuck Bay wetlands have a very large tidal range and support a high macro-invertebrate biomass which attracts at least 20 species of migratory shorebirds, accounting for up to 300,000 waders visiting the beach each year.

Land Uses:
The site is currently not in use although some cattle access the site from neighbouring properties. The nearest sensitive receptor is Morrell Park Aboriginal Community settlement located approximately 1.4km from the north-western corner of the site. The site is being rezoned "Public Purposes – Wastewater Treatment Plant" and an "Essential Services Buffer" has been established to provide an odour buffer around the WWTP to ensure that future urban encroachment does not compromise the buffer zone (see Attachment three). The Environmental Protection Authority's *Separation Distances between Industrial and Sensitive Land Uses No. 3* does not recommend a buffer distance for WWTPs which are to be determined on a case-by-case basis. The Waterbank Industrial Area is proposed to be located approximately 2km north of the site where this area will include the relocation of the Broome International airport.

Climate:

Broome has a tropical climate with hot, humid summers and warm winters. There is a distinct wet and dry season where high rainfalls and thunderstorms occur during summer with an average annual rainfall of approximately 600mm falling between December and March. The site can be subject to tropical cyclones during the wet season.

Flora and Fauna:
The site is located in the Northern Botanical Province where the Pindan is grassland wooded by a sparse upper layer of trees (up to 15m height). A dense thicket of Acacia was recorded in the specific survey area. No Declared Rare Flora and Priority Flora species were located in the survey area. No rare fauna species were recorded at the site and, according to Mattiske (2006), the WWTP has the potential to provide new habitat where water birds and shorebirds may use the ponds for feeding, roosting and possibly as a breeding site.

Aboriginal Heritage:
No sites of Aboriginal heritage significance are recorded on the site.

1.3 PROPOSAL DESCRIPTION

Construction is planned to commence in 2009 and the infrastructure associated with Stage One of BNWWTP is as follows:

- Inlet screen;
- Tanker receival bay;
- 1 x module of treatment ponds (one facultative pond and one maturation pond with total treatment capacity of 3.5ML/day) (see Attachment Five);
- 150ML storage dam;
- WW reuse irrigation area between 25 to 33ha (see Attachment Four);
- Stormwater diversion drain;
- Independent power supply (diesel generators); and
- Emergency overflow spillway.

The three treatment ponds will be constructed as follows:

Table 2: Pond Dimensions

Pond	Average Depth	Surface area	volume
Facultative Treatment Pond (Primary)	1.8m	25,048m^2	42,396m^3
Maturation Treatment Pond (Secondary)	1.5m	30,560m^2	43,042m^3
Treated Wastewater Storage Dam	4.2m	40,762m^2	149,280m^3

- Freeboard on the ponds will be a minimum of 500mm.
- The facultative pond has been lined partly with concrete and an impermeable liner (clay liner).
- The liner for both the maturation pond and storage dam was to be constructed of local (Pindan) soils to achieve a permeability between $1.1x10^{-9}$m/sec and $2.5x10^{-8}$m/sec. Subsequent testing identified that the Pindan Sands could not meet this permeability so WC applied for an amendment to the works approval. The amendment was to change the permeability barrier from Pindan soils to a suitable synthetic geotextile (bentonite impregnated) membrane with typical permeability of 2×10^{-11} m/sec. DEC amended the works approval in August 2010 to allow the use of synthetic geotextile clay liner.
- On construction of the ponds, treated wastewater will be transferred from the current Broome WWTP and placed in the ponds (via tankers) to ensure that the compacted soils do not dry out. Treated wastewater will be used in preference to extracting groundwater in order to safeguard groundwater resources.
- The primary and secondary ponds will be located in the centre of the 200ha site to maximise buffering around the plant.
- Treated wastewater will be directed from the Secondary pond to the storage dam and from the storage dam to the irrigation area for reuse. WC will not be irrigating treated wastewater presently.

- Storage dam will have sufficient capacity to allow for storage during periods of rainfall when irrigation is not required, sufficient to contain a 1-in-50 year extreme rainfall event of 72-hour duration.
- If the storage dam overflows due to an extreme cyclone event, the treated wastewater will flow towards the future irrigation areas, located at the southern end of the site. Otherwise overflow will be directed in a dedicated spillway and directed overland.
- Approximately 0.4 to 0.5m of the ponds will be located under the existing ground level, where average groundwater levels under the ponds are 8.8m-10.5m below ground level.
- A stormwater diversion drain will direct rainfall away from the WW ponds.

WC has submitted a partial compliance certificate on 15 April 2011 stating that construction of the primary and secondary ponds, storage pond and inlet works (including tanker receival bay) has been completed as per condition G1 of Works Approval W4531/2009/1. An additional compliance certificate will be submitted for the irrigation pump station and irrigation area when constructed.

The partial compliance certificate states that the following Pond Permeability's have been achieved (Table 2a);

Table 2a: Pond Permeability

Pond	Measured Permeability
Facultative Treatment Pond (Primary)	7.5×10^{-10} m/s
Maturation Treatment Pond (Secondary)	5.1×10^{-10} m/s
Treated Wastewater Storage Dam	3.6×10^{-10} m/s

The partial compliance certificate states that the measured permeability of all ponds exceeds (are less permeable than) permeability specified in the Works Approval, namely '*the liner for both the maturation and storage dam will….achieve a permeability between 1.1 x 10 $^{-9}$ m/s and 2.5 x 10^{-9} m/s*'.

The emissions of major significance associated with BNWWTP include:
- Odour emissions (operations) and
- Emissions to land (operations).

Odour Emissions (operations):
Odour modelling was based on the existing Broome WWTP as well as other WC premises such as the Subiaco, Mandurah, Woodman Point and Beenyup WWTPs. This modelling showed that 5 odour units (OU) (using the Ausplume model at 99.9 percentile frequency over a 60-minute averaging period) for Stage 1 of the plant is within the boundary of the site except to the east due to strong prevailing west winds (see Attachment Three).

Modelling was carried out for predicted odour emissions at ultimate capacity (Stage 3) of the plant, where the contour for 5OU would still be contained within the buffer zone.

However, this works approval only assesses emissions expected from Stage One, where the modelling shows that no adverse odour impacts are expected at existing residential areas. The proposed life of the plant is expected to extend up to 100 years, hence the buffer area is important to protect against urban encroachment over the long term as well as changing the zoning for the area through the scheme amendment process.

Emissions to Land (operations):
There is the potential for nutrients to impact on the groundwater from both the irrigation of wastewater and seepage from the wastewater ponds. The draft Discussion Paper *Regulation of Application of Nutrient-Rich Wastewater to land (*Department of Environment, undated) recognises that the application of nutrient-rich wastewater to land is an effective means of utilising nutrient rich wastewater which can be effectively managed through various management mechanisms, including a *Nutrient Irrigation Management Plan*.

The Department of Water's (DoW) Water Quality Protection Notes have been considered during the planning of BNWWTP including:

- WQPN #22: Irrigation with nutrient rich wastewater (July 2008);
- WQPN #27: Liners for containing pollutants using engineered soils (Feb 2006);
- WQPN #33: Nutrient and irrigation management plans (July 2006); and
- WQPN #101: Tropical agriculture (Oct 2007).

Treated wastewater will be irrigated onto a dedicated area of land via an irrigation system where the treated wastewater quality is expected to comprise of the following:

- Total phosphorus (TP) 10-12mg/L;
- Total nitrogen (TN): 25-40mg/L; and
- Total dissolved solids (TDS): 713mg/L.

The area of land to be irrigated will increase as the volume of treated wastewater increases in keeping with the expanding population. The average irrigation rate is ~29.9ML/ha and the following table shows the predicted nutrient loads compared with DoW recommendations from the above WQPNs.

Table 3: Comparison between Predicted Nutrient loads and DoW Recommendations

	BNWWTP Predictions	*DoW Recommended Guideline**
Treated WW TN concentration (mg/L)	25-40	11
Treated WW TP concentration (mg/L)	10-12	1.2
Annual TN Loading Rates (kg/ha/yr)	375	180
Annual TP Loading Rates (kg/ha/yr)	224	20
Annual TN Loading Rates (kg/ha/yr) (allowing for pasture uptake)	0	180
Annual TP Loading Rates (kg/ha/yr) (allowing for pasture uptake)	134	20

*WQPN #22: Irrigation with nutrient rich wastewater (July 2008);

The TN load from the irrigated wastewater is expected to be less than that required by Rhodes Grass which is the pasture crop to be planted in the irrigated area. Therefore, leaching of nitrogen past the root zone is expected to be very low.

An excess of 134kg/ha/yr of TP applied to the soils is expected which could impact on groundwater in the area. Modelling carried out by a consultant shows that these levels will be reduced by the phosphorus retention index (PRI) and the phosphorus buffering index (PBI) of the native soils. WC will be submitting to DEC a Nutrient and Irrigation Management Plan prior to commencement of irrigation operations which needs to address issues associated with irrigation including frequency and application rates of irrigation, monitoring of the wastewater, soil sampling and analysis, ponding and run-off issues and contingency planning.

As discussed above, the partial compliance certificate has been submitted for the construction of the primary, secondary, storage pond and inlet works. WC will not be irrigating treated wastewater for many months. At this stage WC is only requesting to accept wastewater fro treatment and storage within the ponds, WC will not be irrigating. When WC decides to start irrigation operations they will need to apply to DEC for a licence amendment.

The partial compliance certificate indicates the following results from Hydrostatic Testing of the treatment and storage ponds;

Table 3a: Hydrostatic testing

Pond	Measured Leakage Rate (mm/day)	Expected Leakage Rate (mm/day)
Facultative Treatment Pond (Primary)	13.7	1.8
Maturation Treatment Pond (Secondary)	7.9	1.6
Treated Wastewater Storage Dam	14.0	3.9

The expected leakage rate was calculated on the basis of an assumed elcoseal liner permeability of 1×10^{-10} m/s derived from the manufacturer's specification. It can be seen that the measured leakage rates are greater then the expected leakage rate. It is not clear why this is the case however it is expected over time the leakage rates should decline due to clogging of particulate matter in the wastewater.

Given the results of Table 3a, and the geometry of the ponds it is possible to calculate the actual permeability of the liner and the seepage to the environment. The results are summarised in Table 3b.

Table 3b: Seepage to the Environment

Pond	Area (m²)	Hydraulic Gradient	Liner Permeability (k, m/s)	Seepage (m³/day)
Facultative Treatment Pond (Primary)	23 500	210	7.5×10^{-10}	320
Maturation Treatment Pond (Secondary)	28 800	180	5.1×10^{-10}	230
Treated Wastewater Storage Dam	38 900	450	$3.6 \times ^{-10}$	550

Stormwater runoff
A stormwater drainage channel has been constructed on the eastern side of the ponds. The channel comprises of an inner ditch which will deal with the 1 in 10 annual rainfall events and an overall cross sectional area which is designed to cope with the 1 in 100 annual rainfall event. In the event of overflow, drainage will be towards the eastern side of the site away from the ponds in order to protect the integrity of the pond walls and embankments which are protected with rock armouring.

Spray drift from irrigation
Spray drift can impact on nearby vegetation from aerial irrigation practices and impact on sensitive premises and nearby vegetation. WC intends to manage this issue by reducing the distance between sprinklers and the crop and also utilise lager droplet sprinkler heads which will reduce spray drift during windy conditions.

Desludging of Wastewater
Although Stage 1 does not make provisions for an extra pond to allow a pond to be taken off- line for de-sludging, WC has made provisions to draw sludge from the deep anaerobic section of the primary pond by pumping which does not necessitate in taking the pond off-line. A Bypass from the inlet manhole to Pond 1 leading to Pond 2 will also allow the use of Pond 2 as the primary pond in an emergency situation. The sludge drying bed is located near the primary pond where any liquid wastes will drain back into the pond.

Category 61: Liquid Waste Facility
The site will receive wastewater from septic tanks from the Broome township and surrounding area where the wastewater will be trucked to the premises. The receival bay consists of a concrete platform with a steel grate. Trucks will drive onto the pad and the wastewater will be discharged through the grate into the facultative pond. The pad will be graded and the edges bunded so as to contain and direct spillage towards the facultative pond. The quantity of WW from septic tanks transferred to the BNWWTP will be 100cubic metres per month.

Supporting Infrastructure:
- Site will be accessed by existing roads (Crab Creek Road).
- Power will be generated onsite but generation is below 10MW in aggregate.
- The site will not be manned but visited regularly by WC staff.

1.4 REGULATORY CONTEXT

1.4.1 Part IV Environmental Protection Act 1986 (EP Act), Environmental Impact Assessment

Due to its location, the BNWWTP proposal was referred to the Federal Department of Environment, Water heritage and the Arts on 16 October 2008 but the project was determined to not be a controlled action and therefore did not require approval from the Federal Minister of the Environment.

The BNWWTP proposal was referred to the EPA under Section 38 of the *EP Act* where it was determined that the project did not warrant formal assessment on 22 December 2008 and the project was best assessed under Part V of the *EP Act*. No appeals were received against this decision.

1.4.2 Part V Environmental Protection Act 1986, Environmental Management

A works approval is required under Part V of the *EP Act*. Other regulation and legislation which applies to both construction and operation of the site includes:

- Environmental Protection Regulations 1987;
- Environmental Protection (Noise) Regulations 1997;
- Environmental Protection (Unauthorised Discharges) 2004;
- Environmental Protection (Controlled Waste) Regulations 2004; and
- Environmental Protection (Clearing of Native Vegetation) Regulations 2004.

1.4.3 Other DMA's Legislation which applies

The proposal to irrigate wastewater requires approval from the Department of Health (DoH) and the Shire of Broome. In principal approval has been received from DoH and the Shire has rezoned the land, as noted below.

The Department of Mines and Petroleum is the regulatory authority responsible for issuing a Dangerous Goods Storage licence to store diesel on site to power the generators.

1.4.5 Local Government Authority

Under the Broome Town Planning Scheme No. 4, the Shire has amended the scheme so that the site is zoned "Public Purpose (S: Sewerage)".

2.0 STAKEHOLDER AND COMMUNITY CONSULTATION

SUBMISSIONS RECEIVED DURING 21 DAY PUBLIC COMMENT PERIOD

The Application for Licence details for this facility was advertised in the West Australian newspaper on 23 May 2011 as a means of advising stakeholders and to seek public comments. No submissions have been received:

WC has identified stakeholders at a National, State and Local level. In particular, local stakeholders were involved in the selection of the pipeline route and reuse options for the wastewater. WC proposes to keep these stakeholder groups informed via an information and awareness campaign during the project implementation phase.

3.0 EMISSIONS AND DISCHARGES RISK ASSESSMENT

DEC considers that conditions should focus on regulating emissions and discharges of significance. Where appropriate, emissions and discharges which are not significant should be managed and regulated by other legislative tools or management mechanisms.

The following section assesses the environmental risk of potential emissions from BNWWTP. In order to determine the site's appropriate environmental regulation, an emissions and discharges risk assessment was conducted of BNWWTP using the environmental risk matrix outlined in Appendix B. The results of this are summarized in Table 4.

Table 4: Risk assessment and regulatory response summary table.

Risk factor	Significance of emissions	Socio-Political context of each regulated emission	Risk Assessment	DEC Regulation (EP Act-Part V)	EAR Reference	Other management (legislation, tools, agencies)
Dust emissions	Operations: Significance of 1 Dust emissions are not expected during the operation of the WWTP. However, there may be some emissions from the irrigation area when vegetation has been removed following harvesting or prior to sowing of crops. Area will be watered to suppress dust during these times.	No interest or concern. Nearest sensitive premises is the Morrell Park Aboriginal Community settlement, located 1.4km from the site	E: No regulation, other management mechanisms	LIC – Nil conditions	N/A	• General provisions of the *Environmental Protection Act 1986* (EP Act) • Environmental Protection (Unauthorised Discharges) Regulations 2004 (UD Regulations) • Construction Environmental Management Plan WC, 2009
Odour emissions	Operations: Significance of 3 Odour emissions will be emitted from the WWTP and modelling has been carried out based on existing WWTPs. Odour modelling contours show the contour for 5OU will be contained within the boundary of the site except to the east. However, the contour is within the buffer zone.	No interest or concern. Odour modelling results indicate that there will not be any detectible odour noted at the Morrell park Aboriginal Community settlement which is the closest sensitive premises to the plant at 1.4km from the north-western corner of the site	D: Licence conditions	LIC– Nil conditions Condition ensuring that odour emitted from the premises does not unreasonably interfere with the health, welfare, connivance, comfort or amenity of any person.	See Appendix 1.1	General provisions of the EP Act
Noise emissions	Operations: Significance of 1 Machinery such as pumps, generators	No interest or concern.	E: No regulation,	LIC– Nil condition	N/A	*Environmental Protection (Noise)*

	and aerators will emit noise during operational phase. Proponent is required to ensure emissions comply with the Environmental Protection (Noise Regulations) 1997 for both construction and operations.	Nearest noise sensitive residents are ~1.4km from the site and the plant is located in a general rural land use area.	other management mechanisms			*Regulations 1997*
Light emissions	Operations: Significance of 1 No significant light spill from operations apart from security lighting.	No interest or concern. Nearest sensitive residents are ~1.4km from the site	E: No regulation, other management mechanisms	LIC– Nil condition		General provisions of the EP Act
Discharges to water	Operations: there are no direct discharges to water.	N/A	N/A	N/A		UD Regulations, General provisions of the EP Act
Discharges to land	Operations: Significance of 3 Potential sources for discharge to land for the treatment and storage of wastewater include (highlighted): • Infiltration via irrigation • Ponding of irrigated WW • **Seepage from WWTP ponds** • **Overtopping of ponds and** • **stormwater runoff** The annual TP loading rates from irrigated WW is expected to be 184kg/ha/yr, allowing for pasture uptake. This exceeds the recommended 20kg/ha/yr (WQPN "Irrigation with nutrient rich WW"). Seepage from the irrigation area can impact on the surrounding environment resulting in salinisation, sodicity, waterlogging and acidification	No interest or concern. However, groundwater (up gradient of the proposed WWTP) in the Broome Sandstone aquifer supplies water to the Broome township.	D – licence condition (setting targets + MPs – longer timeframe)	LIC – standard licence conditions regulating acceptance of controlled waste, seepage, stormwater, overtopping of ponds, reporting and groundwater monitoring.	See appendix 1.2	• UD Regulations, • Draft Nutrient Irrigation Management Plan (WC) This plan will be finalised prior to irrigation operations commencing. • "Irrigation with nutrient-rich wastewater", Dept of Water - *Water Quality Protection Note* #22 • Draft Discussion Paper - *Regulation of Application of Nutrient-Rich Wastewater to land*

	of soils. Depending on quantities and frequency of irrigation, nutrients can seep through to the groundwater. WC has a Draft Nutrient Irrigation Management Plan (NIMP) to address these issues. Ponding of wastewater can occur if irrigation occurs on saturated soils, such as after a rainfall event. Ponding can encourage the breeding of vectors which are a nuisance issue. WC will address this potential by ensuring that there is sufficient storage capacity in the pond system to allow cessation of irrigation during periods of rain. Seepage from the wastewater ponds can infiltrate to the groundwater below the site. To manage potential for seepage, WC will construct the ponds with synthetic geotextile bentonite impregnated liner to have a permeability of $1.1x10^{-9}$m/sec to $2.5x10^{-8}$m/sec. DEC recommended permeability for wastewater ponds is $1x10^{-9}$m/sec and an undisturbed vertical separation of 3m between base of ponds and highest level of groundwater. In the event of a cyclonic event, there is the possibility of wastewater overtopping the ponds and escaping into the surrounding environment. Wastewater could impact on local vegetation as well as infiltrate an area subject to inundation during the wet season which lies 700m west of the site. To manage this eventuality, WC has: • included a 500mm freeboard on all ponds; and • construction of drainage channels on site WC do not intend to irrigate treated wastewater for many months so this licence will not address emissions from irrigation operations.					(Department of Environment, undated)
Solid / liquid wastes	Operations:: Significance of 3: Sludge from the wastewater ponds will be removed periodically and temporarily stored on site in an area where supernatant will drain back towards the primary pond. The waste will be disposed of to an authorised landfill. Wastewater from septic tanks will be transported to the site by licensed controlled waste carriers. Trucks will discharge this waste through a steel grate into the facultative pond where it will be processed through the pond system along with sewage wastewater.	No interest or concern. Nearest sensitive premises 1.4km from the site and plant is located in a general rural land use area.	D: Licence conditions. WC can only accept category 1.02 biological wastes consistent with the Controlled waste categories. Disposal can only be directed to the tanker receival bay.	LIC - Nil conditions	See Appendix 1.3	• Landfill Waste Classification and Waste definitions 1996, DoE • EP (Controlled Waste) Regulations 2004,

Hydrocarbon/ chemical storage	Operations: Significance of 1 Diesel for the generators and chlorine to disinfect the treated WW prior to irrigation will be stored in tanks in fully bunded areas in accordance with Australian Standards.	Little interest or concern. Plant is located in a general rural land use area	E: No regulation, other management mechanisms	LIC – Nil conditions		•Dangerous Goods storage licence (DMP) •Explosives and Dangerous Goods (Dangerous Goods Handling & Storage) Regulations 1992 •AS1940-2004 (diesel) •AS 2927-2001 (Chlorine)
Native vegetation clearing	The site is vegetated and a Clearing Permit is required. WC has been granted State wide Clearing Purpose Permits for both new proposals and for maintenance of existing services. WC will assess whether this permit will apply to the site. If not, a Clearing Application will be submitted	N/A	N/A	N/A		•EP Act section 51 •EP (Clearing of Native Vegetation) Regulations 2004
Contaminated site identification	N/A	N/A	N/A	N/A		Contaminated Sites Act 2003

4.0 GENERAL SUMMARY AND COMMENTS

Stage one of BNWWTP will include two ponds, a storage dam and an irrigation area. The main issues associated with the facility are the possibility of nutrients leaching through to the groundwater from the irrigation area and from the wastewater ponds. There is also the potential for contaminated stormwater to impact on the surrounding environment if there is overtopping of the ponds from an extreme rainfall event as the facility is located in a cyclonic prone area.

The Works Approval Application and supporting documentation outline WC's management practices for the above issues which include a Nutrient and Irrigation Management Plan (NIMP), currently in draft format. WC has submitted a partial compliance certificate for the construction of the primary, secondary, storage pond and inlet works (including tanker receival bay). WC is proposing to accept sewage fro treatment and storage only with this licence application. WC is not proposing to irrigate treated wastewater yet. When WC decides to start irrigating treated wastewater they will have to formally apply to DEC for a licence amendment to allow such operations. It is recommended that approval is given to accept, treat ands store sewage. The Staged Development of the BNWWTP will be given due approval for future construction stages when required and will be conditional to the results of groundwater and surface water monitoring data. It is recommended that standard licence conditions are included, but not limited to, requiring operations to monitor groundwater impacts as the emissions of significance at this current time.

Prior to amending and granting a licence for the irrigation of treated wastewater to pasture, it is necessary for the Draft NIMP to be completed and provided to DEC.

It is recommended that licence conditions be included on their operating licence, as noted in Appendix A, with the licence rated as a low priority licence with an extended licence period of five years.

OFFICER PREPARING REPORT

Damian Thomas

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Kimberley Region
Department of Environment and Conservation
9168 4200

29 May 2011

ENDORSEMENT

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Kimberley Regional Office
Department of Environment and Conservation
9168 4200

May 2011

Attachment 2 – Amendment Notice

Government of Western Australia
Department of Environment Regulation

Amendment Notice 1

Licence Number	L8556/2011/1
Licensee	Water Corporation
Registered business address	629 Newcastle Street LEEDERVILLE WA 6007
Date of amendment	16 February 2017
Prescribed Premises	Category 54: Sewage facility; Category 61: Liquid waste facility
Premises	Broome North Wastewater Treatment Plant Lot 1502 on Plan 75036 Crab Creek Road BROOME WA 6725

Amendment

The Chief Executive Officer (CEO) of the Department of Environment Regulation (DER) has amended the above licence in accordance with section 59 of the *Environmental Protection Act 1986* as set out in this Amendment Notice.

Steve Checker
MANAGER LICENSING (WASTE INDUSTRIES)
an officer delegated under section 20 of the Environmental Protection Act 1986 (WA)

Amendment Notice

This notice is issued under section 59 of the *Environmental Protection Act* 1986 (EP Act) to amend the licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

Amendment Description

DER received an application for a licence amendment on 3 November 2016 requesting approval to allow for an additional 26 hectares area for irrigation at the Broome North Wastewater Treatment Plant (BNWWTP). The construction of the BNWWTP was approved by DER then DEC under works approval W4531/2009/1. Construction was completed via a staged approach. A partial compliance document was provided to DER in April 2011 for the construction of the BNWWTP sewage treatment ponds and the tanker receival bay. An operating Licence (L8556/2011/1) was issued to Water Corporation (WC) in July which allowed for storage and processing of wastewater to commence at the premises. A final compliance document was received in September 2012 for the remaining irrigation pump station, pipe work and chlorination unit constructed under W4531/2009/1. The Licence was amended in December 2012 to allow treated wastewater to be irrigated to land via the centre pivot irrigation system.

The premises irrigates treated wastewater from the WWTP to land, which is regulated by licence conditions and managed under a Nutrient Irrigation Management Plan (NIMP) produced in 2012. The irrigation area is to the North of the WWTP and is comprised of one pivot with the capacity for two pivots to be installed in the future. The irrigation area is fenced off from the WWTP. Approximately 61 ha have been set aside for irrigation of pasture. Pivot 1 occupies approximately 26.5 ha of the irrigation area and Pivot 2 will occupy approximately 25 ha of the area. The average irrigation rate for Pivot 1 and Pivot 2 will be 20.9ML/ha/yr. WC has now requested an amendment to the operating licence to allow treated wastewater to be irrigated to Pivot 2 as well. The total area cleared for the civil works (pivot, pipeline drainage and firebreak) will be 29Ha.

In order to undertake the proposed works a total of 26 ha of Native vegetation are required to be cleared. The clearing will be assessed and undertaken in accordance with the Water Corporation's state wide *Clearing permit (CPS185/7)*.

Table 1 – Risk assessment for proposed amendments during construction

Activity	Potential emission	Potential receptors	Potential pathway	Potential impacts	Material risk	Reasoning
Category 54 Wastewater Treatment plant Construction, mobilisation and positioning of infrastructure relating to the irrigation field	**Dust:** associated with construction and vehicle movement activities (laying of pipes and digging trenches)	**Nearby residents:** The nearest sensitive receptor is Morrell Park Aboriginal Community settlement located approximately 1.4km from the north-western corner of the site	**Air:** Particulate matter (fugitive dust)	Dust can cause potential health and amenity impacts to humans.	No	No receptor present in close proximity. The Delegated Officer considers that the provisions of Section 49 of the *Environmental Protection Act 1986* are sufficient to regulate dust emissions during construction, therefore the risk is considered Low and does not require any further assessment.
	Noise: associated with construction and vehicle movement activities		**Air:** Noise generated by the operation of equipment during construction	Potential amenity impacts to nearby noise sensitive receptors	No	The Delegated Officer notes the lack of sensitive receptors and determines that there is no material risk of noise impact.

Table 2 – Risk assessment for proposed amendments during operation

Activity	Potential emission	Potential receptors	Potential pathway	Potential impacts	Material risk	Reasoning
Category 54 Wastewater Treatment plant irrigation field	Rupture of pipes and storage tank failure resulting in sewage discharge to land	**Groundwater-** Groundwater at the WWTP is between 5.75m and 17.8 metres below ground level.	Direct discharge	Potential impacts on quality of Groundwater via recharge, rise in the water-table, soil contamination inhibiting vegetation growth and contamination of surface water drainage system.	No	No receptor present in close proximity. The Delegated Officer considers that since the storage tank will be located on hardstand areas, all pipelines will be buried to a depth of 900mm and the quality of the treated wastewater will be of acceptable level therefore the provisions of Section 72 of the *Environmental Protection Act 1986* are sufficient to regulate discharges from rapture of pipes and storage tank failures, therefore the risk is considered Low and does not require any further assessment.
	Irrigation of treated effluent		Direct discharge		Yes	The Delegated Officer has reviewed the information regarding the risk of irrigation and has found: Emissions to land are planned under controlled conditions year round with all treated wastewater discharged to the irrigation area. Commitment from the applicant that the WWTP will produce water to the Medium Risk standard in accordance with the 'Guidelines for the Non-Potable Uses of Recycled Water in Western Australia' (DOH 2011). The species to be irrigated is a crop of Rhodes Grass selected for its ability to uptake high levels of nitrogen and phosphorous. Pivot 2 area has been appropriately sized based upon the maximum nutrient application rate. The spray field area (Pivots 1 & 2) will be securely fenced to prevent humans and animals from easily accessing the area and will include an internal buffer to the irrigation area. Licence conditions 1.2.2 - 1.2.6 require design and construction standards to be maintained to ensure emissions from irrigation do not result in nutrient export levels greater than the limits derived. Licence condition 2.2.2 requires the monitoring of the final effluent prior to disposal. Limits have been included to ensure that the treated effluent meets the quality outlined in the application document (medium risk) and as per the Guidelines for Non-potable Uses of Recycled Water in Western Australia (DoH, 2011). Licence condition 3.2.1 requires monthly monitoring of the final effluent prior to discharge via irrigation.

Decision

The Delegated Officer has reviewed the information regarding the risk of irrigation and has found that the Licensee has provided additional information regarding:

1. Confirmation of the locations and sizes of the individual parcels of land (Pivots 1 and 2) that are used for irrigation;
2. Confirmation that the quantity of treated wastewater applied to each parcel can be accurately measured; and
3. Confirmation that the application of treated wastewater to each parcel of land can be controlled.

The quality of wastewater currently irrigated to land is monitored through existing licence conditions.

Consequence

Based on the information detailed above and the absence of sensitive receptors in close proximity (approximately 1.4km from the north-western corner of the site), the Delegated Officer has determined that there will be minor impact on the sensitive receptors with little to no effect on ecosystem function. Therefore, the Delegated Officer considers the consequence to be **minor**.

Likelihood of consequence

Based upon the proposed controls, the Delegated Officer has determined that off-site impacts at a local scale are not likely to occur since no receptor is present in close proximity. Therefore, the Delegated Officer considers the consequence to be **unlikely**.

Overall rating

Based on DER's operational procedure on Assessing Emissions and Discharges from prescribed premises, the Delegated Officer has compared the consequence and likelihood ratings and determined that the overall rating for the risk of discharges to land on sensitive receptors from irrigation is **medium**.

Using the above information, the Delegated Officer has updated the following: conditions:

Condition 1.2 – General conditions

Condition 1.3.3 – Waste processing

Condition 2.2.1 – Emissions to land

Condition 2.2.2 – Emission limits to land

Condition 3.2.1 – Monitoring of emissions to land

Condition 5.2.1 – Annual Environment Report

The amended Licence conditions 1.2.2-1.2.4 details the design and construction specifications for works to be carried out at the premises in order to allow for treated wastewater to be irrigated to Pivot 2 as well. Licence conditions 1.2.5-1.2.6 will require the licensee to submit certifications to prove that all work has been satisfactorily carried out. The amendment also clarifies which areas are used for the irrigation of treated wastewater and ensure that emissions from irrigation do not result in nutrient export levels greater than the limits proposed in the licence. The Delegated Officer has reviewed the Nutrient Irrigation Management Plan (NIMP) considers the limits for Nitrogen and Phosphorus derived from the NIMP to be appropriate. The Delegated Officer also does not consider it appropriate to require compliance with an external management plan such as NIMP therefore the requirement has been

removed from the Licence with the maximum nutrient loading levels from the NIMP adopted as a regulatory control under condition 2.2.2. The amended monitoring condition also requires the Licensee to record total nitrogen and total phosphorous applied to each area to demonstrate that the nutrient loading limits have been met. Reporting conditions have been updated to require the Licensee to provide the additional monitoring data to DER in the Annual Environment Report (AER).

Amendment History

Instrument	Issued	Amendment
L8556/2011/1	13/12/2012	Licence amendment to irrigate to Pivot 1
L8556/2001/1	27/08/2015	Licence amendment to allow in-field pH and stand water level analysis, amend to Filterable Reactive Phosphorous analysis, amendments from inspection, update licence to v2.9 format.
L8556/2011/1	12/05/2015	Licence amendment for addition of 17.91 hectares of land to be irrigated for the purpose of establishing seedlings for use as a seed bank for future rehabilitation works in the area by the Mamabulanjin Aboriginal Corporation.
L8556/2011/1	DRAFT	Amendment Notice 1 Licence amendment to, specify the design and construction specifications for works to be carried out, requiring certification of works approved under the licence, update irrigation areas, emission to land condition, irrigation monitoring and reporting requirements.

Consultation

The Licence Holder was provided with a draft Amendment Notice on 13 January 2017 for comment. A summary of the Licence Holders comments are provided below.

Date	Event	Comments received/Notes	How comments were taken into consideration
13/01/2017	Proponent sent a copy of draft instrument.	The following comments were received: • Table 1.2.1-Condition requires a "contiguous fence, prescribed premise surrounded by fencing-; • Table 1.2.1-Our actual irrigation will be 25Ha (within the 26Ha stipulated) ; • Table 1.3.3-We will be following the natural contour of the land within the pivot footprint. It may be that during wet	 • Fencing requirement removed; • Irrigation area changed to 25Ha; • Condition now requires the licence holder to ensure there is no pooling of irrigated water;

Date	Event	Comments received/Notes	How comments were taken into consideration
		events there may be some localised pooling of water; • Table 1.3.3- The design has not allowed ensuring that there is zero runoff from the pivot area during high rainfall events, however irrigation is not proposed to occur during these periods; • Table 2.2.2-This 90kg/ha/yr is not consistent with the NIMP, which recommends 224kg/ha/yr. The Water Corporation should ensure a limit of 224kg/ha/yr (or greater as per TN), is used. It is suggested we set the Phosphorous loading rate at 300kg/ha/yr if we exceed these than a revision of the NIMP and additional groundwater modelling is required. Note Department of Water WQPN tropical guidelines are not relevant to the types of soils and climate that Broome experience (refer to pages 20 of the NIMP); • Confirm that removal of reference to the NIMP is not related to DER's non-acceptance of this document, rather they are choosing not to prescriptively reference it in the Licence. It should be referenced in the decision document that the NIMP has been considered; and	• Condition amended to refer to runoff of *irrigated* water only; • The Delegated Officer considers the limits for Phosphorus derived from the approved NIMP to be appropriate. Total Phosphorus discharge limit changed to NIMP values. • The Delegated Officer also does not consider it appropriate to require compliance with all aspects of an external management plan such as NIMP therefore the requirement has been removed from the Licence with the maximum nutrient loading levels from the NIMP adopted as a regulatory control under condition 2.2.2. However it is stipulated under amendment description above that the premises irrigates treated

Date	Event	Comments received/Notes	How comments were taken into consideration
		• Addition of the Department of Agriculture Fodder trial of different grass species into the Rhodes grass pivots. The purpose is to determine which species take up the maximum amount of the nutrients and are suitable for the Broome climate.	wastewater from the WWTP to land, which is regulated by licence conditions and managed under a Nutrient Irrigation Management Plan (NIMP) produced in 2012; and • The Delegated Officer does not expect the risk to increase with the use of different grass species. The Licence holder will be required to provide in the Annual Report a summary relating to the outcome of the Fodder Trial carried out in conjunction with Department of Agriculture.

Amendment

1. The Licence is amended by the addition of Conditions 1.2.2, 1.2.3, 1.2.4, 1.2.5 and 1.2.6 as shown below:

1.2.2 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 1.2.2.

1.2.3 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: Works specifications	
Column 1 Infrastructure[1]	***Column 2 Specifications (design and construction)***
Irrigation area- Pivot 2	*The irrigation system and irrigation area must be designed and constructed so as to meet the following specification:* *1. consists of 25 hectare irrigation area* *2. ensure DN200 PVC pipes are used; and* *3. ensure all pipelines are buried to a depth of 900mm.*

1.2.4 If any departures outlined in Condition 1.2.3 apply, then the Licensee must provide the CEO with a list of departures which are certified as complying with Condition 1.2.3 at the same time as the certifications under Condition 1.2.5.

1.2.5 *The Licensee must submit a construction compliance document to the CEO within one month, following the construction of the Works at the Premises.*

1.2.6 *The Licensee must ensure the construction compliance document:*
(a) is certified that each item of infrastructure specified under Condition 1.2.3, Table 1.2.1 has been constructed in accordance with the Conditions of the Licence and any documentation submitted under condition 1.2.4 with no material defects; and
(b) is signed by a person authorised to represent the Licensee and contain the printed name and position of that person within the company.

2. Table 1.3.3 of the licence has been amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

Table 1.3.3: Waste processing		
Emission point reference	***Description***	***Source including abatement***
Sewage	*Biological, physical and chemical treatment*	*Treatment of sewage waste shall not exceed the treatment capacity of 3500m^3 per day.*
Septage	*Biological, physical and chemical treatment*	*Treatment of tankered septage waste shall not exceed the treatment capacity of 1200 tonnes per annual period.*
Sewage sludge	*Storage*	*In accordance with the document titled "Western Australian guidelines for biosolids management" (Department of Environment and Conservation 2012) as amended from time to time.*
Treated wastewater	*Disposal to irrigation area*	*Disposal to irrigation area with fast growing harvestable fodder crop cover. ~~Disposal to be conducted in accordance with the Nutrient Irrigation Management Plan.~~ Ensure there is no ponding or pooling of irrigated water in the irrigation area. No run-off of treated effluent outside the irrigation area is to occur.*
Treated wastewater	*Disposal to Seedling Irrigation Area*	*Disposal to irrigation area with planted native seedlings. ~~Disposal to be conducted in accordance with the Nutrient and Irrigation Management Plan.~~*

3. Table 2.2.1 of the licence is amended by the insertion of the red text shown in underline below:

Table 2.2.1: Emissions to Land		
Emission point reference	***Description***	***Source including abatement***
Discharge to Reuse S3002406 (Pivots 1 and 2 as depicted in Schedule 1)	*Discharge to Stage 1 Irrigation Area via wastewater discharge point*	*Treated wastewater pipeline from wastewater treatment plant*
Discharge to Reuse S3002405 (as depicted in Schedule 1)	*Discharge to Seedling Irrigation Area via wastewater discharge point*	*Treated wastewater pipeline from wastewater treatment plant*

4. Licence condition 2.2.2 added to the licence as shown below:

2.2.2 *The Licensee must ensure that treated wastewater discharged to the irrigation*

field does not exceed limits specified in Table 2.2.2.

Table 2.2.2: Emission limits to land			
Monitoring point reference	**Parameter**	**Discharge limits**	**Units**
Discharge to Reuse S3002406 and S3002405	Total Nitrogen	< 500	kg/ha/year
	Total Phosphorous	<224	kg/ha/year

5. Table 3.2.1 of the licence is amended by the insertion of the red text shown in underline below:

Table 3.2.1: Monitoring of ambient groundwater quality			
Monitoring point reference	**Parameter**	**Units**	**Frequency**
Effluent Trans PS S3002405	Oil and Grease	mg/L	Monthly
	pH	pH units	
	Total Dissolved Solids calculated from Electrical Conductivity	mg/L	
	Total Suspended Solids	mg/L	
	Total Nitrogen as N	mg/L	
	Total Phosphorus	mg/L	
	Biochemical Oxygen Demand	mg/L	
	Nitrate Nitrogen	mg/L	
	Ammonium Nitrogen	mg/L	
	Total Kjeldahl Nitrogen	mg/L	
	Filterable Reactive Phosphorous	mg/L	
	E. coli	CFU/100ml	
	pH[1]	pH units	
	Arsenic	mg/L	
	Cadmium	mg/L	
	Copper	mg/L	
	Chromium	mg/L	
	Lead	mg/L	
	Mercury	mg/L	
	Nickel; and	mg/L	
	Zinc	mg/L	
Discharge to Reuse S3002406 (as depicted in Schedule 1: Maps)	Total Residual Chlorine;	mg/L	
	E. coli	CFU/100ml	
	Total Nitrogen as N	mg/L	
	Total Phosphorous	mg/L	

6. Condition 5.2.1 of the licence is amended by the insertion of the red text shown in underline below:

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
-	Summary of the fodder trial carried out of different grass species into the Rhodes grass pivots	
Table 1.3.2	Waste acceptance	
Table 1.3.3	Waste processing	
Table 3.2.1	Monitoring of emissions to land	
	Contaminant loading to land of parameters (total annual loading kg/ha/yr for nitrogen and phosphorus, average daily loading kg/ha/day for BOD) for S3002406 (pivots 1 and 2), and S3002405	None specified
Table 3.3.1	Monitoring of inputs and outputs	None specified
Table 3.4.1	Monitoring of ambient soil quality	None specified
Table 3.4.2	Monitoring of ambient groundwater quality	None specified
4.1.3	Compliance	Annual Audit Compliance Report (AACR)
4.1.4	Complaints analysis and review	None specified

Note 1: Forms are in Schedule 2