Government of Western Australia
Department of Water and Environmental Regulation

Licence

Licence number	L9275/2020/1
Licence holder	Eagle Bay Brewing Co. Pty Ltd
ACN	124 209 794
Registered business address	21/22 Railway Road SUBIACO WA 6008
DWER file number	DER2020/000613
Duration	03/08/2021 to 02/08/2031
Date of amendment	26/11/2024
Premises details	Eagle Bay Brewing Co. 236 Eagle Bay Road NATURALISTE WA 6394 Legal description – Lots 150 & 151 on Plan 412213

Prescribed premises category description (Schedule 1, *Environmental Protection Regulations 1987*)	**Assessed design capacity**
Category 25: Alcoholic beverage manufacturing: premises on which an alcoholic beverage is manufactured and from which liquid waste is or is to be discharged onto land or into waters	1,000 kL per annual period of alcoholic beverage (beer and cider)

This licence is granted to the licence holder, subject to the attached conditions, on 26 November 2024, by:

Caron Goodbourn

Digitally signed by Caron Goodbourn
Date: 2024.11.26 13:02:48 +08'00'

MANAGER, PROCESS INDUSTRIES
INDUSTRY REGULATION
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Licence history

Date	Reference number	Summary of changes
02/08/2021	W6491/2021/1	Works approval granted for the construction of a brewhouse wastewater treatment plant.
03/08/2021	L9275/2020/1	Licence granted for existing brewery not constructed through a works approval
26/11/2024	L9275/2020/1	Licence holder-initiated amendment to add the brewery wastewater treatment plant constructed under W6491/2021/1 to the licence, remove completed conditions and request changes to monitoring requirements. This amendment includes department-initiated amendments limiting alcoholic beverage production, requiring photographic evidence of metering, new discharge limits and the provision of a new Nutrient Irrigation Management Plan

Interpretation

In this licence:

(a) the words ‘including’, ‘includes’ and ‘include’ in conditions mean “including but not limited to”, and similar, as appropriate;

(a) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

(b) where tables are used in a condition, each row in a table constitutes a separate condition;

(c) any reference to an Australian or other standard, guideline, or code of practice in this licence:

  (i) if dated, refers to that particular version; and

  (ii) if not dated, refers to the latest version and therefore may be subject to change over time;

(d) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and

(e) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This licence requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this licence.

Licence conditions

The licence holder must ensure that the following conditions are complied with:

Production Limit

1. The licence holder must ensure that the production limits listed in Table 1 are not exceeded.

Table 1: Production limits

	Product	Production Limit
1	Beverage (beer and cider)	1,000kL or less per annual period

Infrastructure and operational requirements

2. The licence holder must ensure that the site infrastructure and equipment listed in Table 2 is maintained in good working order and operated in accordance with the corresponding requirements set out in Table 2.

Table 2: Infrastructure operational requirements

	Site infrastructure and equipment	Operational requirements	Infrastructure location
	Brewery production and shed hardstand area		
1	10 HL Brew house consisting of: 1 x Mash tun (1,200 L) 1 x Kettle (1,200 L) 1 x Whirlpool - holding vessel (1,200 L) and Fermentation vessels: 2 x 1,200 L 5 x 2,400 L 8 x 3,600 L 2 x 6,000 L and Bright tanks (storage tanks): 3 x 1,200 L 3 x 2,400 L	(a) All brewing equipment listed must be installed and maintained within an enclosed building that has an impermeable hardstand surface where drainage is contained, and all wastewater or spillages are directed to the concrete settling tank. (b) Bucket traps (solids removal) to be maintained within the drains.	Located within 'Brewery' building, as depicted in Figure 2, Schedule 1: Maps.
	Wastewater treatment system		

2	Brewhouse wastewater treatment plant consisting of: 3 x 50kL enclosed poly tanks (Anaerobic tank, Aeration tank, Sequential Batch Reactor Tank) 1 x 2.5kL sump 1 x submersible transfer pump 2 x submersible aerators 3 x level sensors 3 x submersible transfer pumps 1 x PLC (programmed monitoring control) 1 x flocculant dosing pump 1 x 200L flocculant tank	(a) Settling tank must be kept covered whilst holding brewery wastewater. (b) Overtopping of tanks must not occur. (c) No discernable seepage or leakage of wastewater from tanks and interconnecting pipes must occur. (d) Aerators in the aeration tank to be operated and maintained in good working order. (e) Must ensure the leach drains are not used for the disposal of any brewery wastewater. (f) Sludge must be removed from the tanks by a licensed controlled waste contractor.	'WWTP' 'Decommissioned Leach Drains" as depicted in Figure 2, Schedule 1: Maps.
	Treated wastewater storage		
3	1 x 50 kL poly wastewater irrigation tank fitted with the following: 1 x float switch 1 x irrigation pump 1 x Flow meter (FM1) located on outflow pipe of wastewater irrigation tank FM1 Serial Number: 20201201	(a) Flow meter (FM1) maintained to enable the cumulative volume of wastewater discharged to LAA1 to be accurately measured. (b) Wastewater in excess to storage capacity must be removed for off-site disposal by a licensed controlled waste contractor if irrigation cannot occur.	'50kL Polytank' located next to 'WWTP' 'FM1" as depicted in Figure 2, Schedule 1: Maps.
	Solids management		
4	Solid waste storage area (concrete hardstand) consisting of sealed and impervious bins (1,000 L)	(a) Bins must be positioned on the concrete hardstand. (b) Bins must only be used for the storage of spent grains and hops (c) Waste to be removed off-site for disposal.	"Hardstand" as depicted in Figure 2, Schedule 1: Maps.
	Wastewater irrigation area (LAA1)		
5	2.3ha land application area (LAA1) and irrigation system consisting of: -central hydrant riser with four sprinklers -3-way valve	(a) Irrigation system valves, pumps, pipelines and other fittings must be maintained and inspected daily for ruptures or leaks when irrigating. (b) must be capable of achieving a spray radius of not less than 17 metres for each sprinkler. (c) Sprinklers must be positioned 17 meters apart to ensure wastewater is evenly distributed over the irrigation area (d) Daily wastewater irrigation rates must be recorded. (e) Only treated wastewater from the 50-kL poly storage tank must be irrigated. (f) No irrigation occurs between 1 June and 31 July (inclusive). (g) Irrigation must not be undertaken 12 hours before, during or 24 hours	'Irrigation area' as depicted in Figure 2, Schedule 1: Maps.

		immediately after a rainfall event. (h) Irrigation occurs on a rotational basis ensuring that areas are not irrigated for at least 24 hours between applications. (i) No irrigation generated run-off occurs beyond the boundary of LAA1. (j) Vegetation in LAA1 is harvested at least once per annual period. (k) Livestock are only permitted to graze LAA1 for a maximum of 3 weeks in any annual period to manage fire risk. (l) No soil erosion occurs. (m) Wastewater is only irrigated onto healthy vegetation to maximise water and nutrient uptake	

Emissions and discharges

3. The licence holder must by 28 January 2025, submit to the CEO a revised Nutrient Irrigation Management Plan (NIMP). The NIMP must include but not be limited to:

a) Assessment of adequacy of existing irrigation area based on:
   i) Hydraulic loading rates
   ii) Nutrient loading rates
   iii) Biochemical Oxygen Demand loading rates; and
   iv) Soil sampling results.

b) Assessment of the adequacy of current wastewater storage including:
   i) Monthly water balance showing the wastewater produced compared to when irrigation can and cannot occur.[1]
   ii) Contingency plan for storage of wastewater during wet weather periods when irrigation cannot occur.

c) Specify what crop is to be sowed and include:
   i) The water requirements for this crop
   ii) The nutrient balance which identifies nutrient uptake rates
   iii) A harvest strategy

d) Where the NIMP identifies any issues with (a), (b) or (c) above, the NIMP must include recommendation on how to resolve the limitations.

Note 1: The maximum amount of rain days that occur in a year must be used when calculating storage requirements for when irrigation is not suitable.

4. The licence holder must ensure that emissions from the discharge point listed in Table 3 for the corresponding parameter do not exceed the corresponding limit when monitored in accordance with Condition 5

Table 3: Emission and discharge limits

Discharge point	Parameter	Limit
Irrigation area (LAA1) as shown in**Error! Reference source not found.**, Figure 2 Schedule 1.	pH	≥6 and ≤9
	Volumetric flow rate of wastewater irrigated	< 5,350 L/day
	Total dissolved solids	< 3,000 mg/L (concentration)
	Total nitrogen	<180 kg/ha/annual period
	Total phosphorus	<20 kg/ha/annual period

Discharge point	Parameter	Limit
	Biochemical oxygen demand	<1500kg/ha/month
	Sodium absorption ratio (SAR) and EC	Within the “stable soil structure” range depicted in Figure 4, Schedule 1

Note 1: See Schedule 2 loading calculation spreadsheet.

Monitoring

Monitoring of emissions to land

5. The licence holder must monitor wastewater emissions to land in accordance with the requirements specified in Table 4 and record the results of all such monitoring.

Table 4: Emissions to land monitoring

Discharge point	Monitoring location	Parameter	Units	Frequency	Method
Irrigation area (LAA1)	Flow meter (FM1) on 50 kL storage tank	Volumetric flow rate (cumulative)	L/day	Continuous when discharging	N/A
	50 kL poly tank (storage)	pH[1]	-	Monthly	AS/NZS 5667.1 and AS/NZS 5667.10
		Electrical conductivity[1]	µS/cm		
		Total nitrogen	mg/L		
		Total phosphorus			
		Total dissolved solids			
		Total suspended solids			
		BOD			
		Sodium ion (Na^+)			
		Calcium ion (Ca^{2+})			
		Magnesium ion (Mg^{2+})			
		Sodium adsorption ratio	-	Quarterly	

[1] In field non-NATA accredited analysis permitted for pH and electrical conductivity.

6. The licence holder must ensure that photographic evidence is taken of the flow meters (FM1) reading at the end of each month.

Monitoring of ambient groundwater

7. The licence holder must monitor groundwater for concentrations of the identified parameters in accordance with Table 5 and record the results of all such monitoring.

Table 5: Groundwater Monitoring

Monitoring well location	Parameter	Units	Frequency	Averaging period	Sampling method
MB01, MB02, MB03, MB04, and MB05 as shown in Figure 2, Schedule 1: Maps	Standing water level	m AHD; and m BGL	Quarterly (March, June, September and December)	Spot, in-field measurement	N/A
MB01, MB02, MB03, MB04 and MB05 as shown in Figure 2 Schedule 1: Maps	pH[1]	-		Spot sample	AS5667.1 AS5667.11
	Electrical conductivity[1]	µS/cm			
	Total nitrogen	mg/L			
	Ammonia nitrogen				
	Nitrate nitrogen				
	Total phosphorus				
	Reactive phosphorus (or orthophosphate)				
	Total dissolved solids				

[1] In field non-NATA accredited analysis permitted for pH and electrical conductivity.

Monitoring of ambient soil

8. The licence holder must monitor, using a certified soil scientist, soil for concentrations of the identified parameters in accordance with Table 6 and record the result of all such monitoring.

Table 6: Soil sampling and monitoring requirements

Soil Sampling Location	Soil sample	Soil profile	Parameter	Units	Sampling frequency	Sampling method
S01 and S02 within irrigation area LAA1 as shown in Figure 3, Schedule 1	Surface composite sample, comprising of 20 samples collected from across S01 and S02.	0-10 cm	pH	-	Every two years in March, starting March 2025.	AS/NZS 4482.1
			Electrical conductivity	dS/m		
			Total nitrogen	mg/L		
			Nitrate – Nitrogen			
			Total Phosphorus			
			Phosphorus (Colwell)			
			Exchangeable sodium percentage	%		
			Phosphorus sorption capacity	kg/ha		
			Saturated	mm/hr		

Soil Sampling Location	Soil sample	Soil profile	Parameter	Units	Sampling frequency	Sampling method
			hydraulic conductivity			
S01 and S02 within irrigation area LAA1 as shown in Figure 3, Schedule 1	5 deep soil composite core samples, collected from across S01 and S02	Within each major soil horizon to 1 meter	pH	-	Every two years in March, starting March 2025.	AS/NZS 4482.1
			Electrical conductivity	dS/cm		
			Total nitrogen	mg/L		
			Nitrate – Nitrogen			
			Total Phosphorus			
			Phosphorus (Colwell)			
			Exchangeable sodium percentage	%		
			Phosphorus sorption capacity	kg/ha		

Monitoring of ambient conditions (rainfall)

9. The licence holder must monitor rainfall at the premises in accordance with the requirements specified in Table 7 and record the results of all such monitoring.

Table 7: Monitoring of rainfall

Parameter	Unit	Monitoring location	Frequency
Rainfall	mm/day	Cape Naturaliste Lighthouse – weather station 9519	Daily, excluding during the non-irrigation period of 1 June to 31 July

10. The licence holder must ensure that all non-continuous analysis undertaken pursuant to conditions 5,7 and 8 is undertaken by a holder of a current accreditation from the National Association of Testing Authorities (NATA) for the methods of sampling and analysis relevant to the corresponding relevant parameter.

11. The licence holder must ensure that:

(a) monitoring is undertaken in each daily period such that there are at least 12 hours in between the time on which samples are taken in successive days;

(b) monitoring is undertaken in each monthly period such that there are at least 15 days in between the days on which samples are taken in successive months;

(c) monitoring is undertaken in each quarterly period such that there are at least 45 days in between the days on which samples are taken in successive quarters; and

(d) monitoring is undertaken in each annual period such that there are at least 9 months in between the days on which samples are taken in successive years.

Records and reporting

12. The licence holder must notify the CEO within 14 days of detecting a malfunction of any site infrastructure listed in Table 2.

13. The licence holder must record the following information in relation to complaints received by the licence holder (whether received directly form a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:

(a) the name and contact details of the complainant, (if provided);

(b) the time and date of the complaint;

(c) the complete details of the complaint and any other concerns or other issues raised; and

(d) the complete details and dates of any action taken by the licence holder to investigate or respond to any complaint.

14. The licence holder must maintain accurate and auditable books including the following records, information, reports, and data required by this licence:

(a) the calculation of fees payable in respect of this licence;

(b) any maintenance of infrastructure that is performed in the course of complying with condition 2 of this licence;

(c) monitoring programmes undertaken in accordance with conditions 5, 7, 8, and 9 of this licence; and

(d) complaints received under condition 16 of this licence.

15. The books specified under condition 14 must:

(a) be legible;

(b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;

(c) be retained by the licence holder for the duration of the licence; and

(d) be available to be produced to an inspector or the CEO as required.

16. The licence holder must:

(a) undertake an audit of their compliance with the conditions of this licence during the preceding annual period; and

(b) prepare and submit to the CEO by no later than 30 April after the end of that annual period an Annual Audit Compliance Report in the approved form.

17. The licence holder must submit to the CEO by no later than 30 April after the end of each annual period, an Annual Environmental Report for that annual period for the conditions listed in Table 8, and which provides information in accordance with the corresponding requirement set out in Table 8.

Table 8: Annual environmental report

Condition	Parameter per annual period
Condition 2 Table 2	Amount (tonnes) of sludge removed from the aeration tank for off-site disposal. Volume (in m^3 or kL) of treated wastewater removed for off-site disposal. Volume/mass (tonnes) of harvested biomass within irrigation area. Type (species) of crop(s) harvested within irrigation area. Month the crop(s) were harvested within irrigation area.
Condition 4 Table 3	Tabulated loadings of nitrogen, phosphorus and BOD applied to irrigation area (LAA1) including an explanation of the basis for determining loading rates. SAR & EC values plotted on Figure 4 graph.

Condition	Parameter per annual period
Condition 5 Table 4	Daily volume (m^3 or kL) of wastewater applied to irrigation area (LAA1) Wastewater monitoring data in tabulated and graphical form including the sampling date, including at least the last 5 years (once available) of data for comparison An assessment and interpretation of the data including comparison to historical trends and loading limits Copies of laboratory sample analysis reports.
Condition 6	Photographs of the end of month readings of the flow meter
Condition 7	Groundwater monitoring data in tabulated and graphical formats including the sampling date, including at least the last 5 years (once available) of data for comparison An assessment and interpretation of the data including comparison to historical trends. Copies of laboratory sample analysis reports.
Condition 8	Soil monitoring data in tabulated and graphical formats including the sampling date. Name of the soil scientist who collected the soil samples Locations of position samples taken An assessment and interpretation of the data including comparison to historical trends. Copies of laboratory sample analysis reports.
Condition 9	Rainfall monitoring data in tabulated format including the monitoring date.
Condition 12	Summary of any failure or malfunction of any infrastructure listed in Table 2 and any environmental incidents that have occurred during the annual period and any corrective actions taken.
Condition 13	Summary of complaints recorded for the annual period.
-	Summary of recommendations based on review of monitoring data

Definitions

In this licence, the terms in Table 10 have the meanings defined.

Table 10: Definitions

Term	Definition
AHD	Australian Height Datum
Annual Audit Compliance Report (AACR)	means a report submitted in a format approved by the CEO (relevant guidelines and templates may be available on the Department's website)
annual period	means the 12-month period commencing from 1 April until 31 March of the immediately following year
AS/NZS 4482.1	means the current version of Australia / New Zealand Standard AS/NZS 4482.1 *Guide to the investigation and sampling of sites with potentially contaminated soil*
AS/NZS 5667.1	means the current version of Australian / New Zealand Standard AS/NZS 5667.1 *Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*
AS/NZS 5667.10	means the current version of Australian / New Zealand Standard AS/NZS 5667.10 *Water Quality – Sampling, Part 10: Guidance on sampling of waste waters*

Term	Definition
AS/NZS 5667.11	means the current version of Australian / New Zealand Standards AS/NZS 5667.11 *Water Quality – Sampling, Part 11: Guidance on sampling of groundwaters*
averaging period	means the time over which a limit is measured or a monitoring result is obtained
BGL	below ground level
BOD	biochemical oxygen demand
books	has the same meaning given to that term under the EP Act.
Ca^{2+}	calcium ion
CEO	means Chief Executive Officer of the Department. "submit to / notify the CEO" (or similar), means either: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 JOONDALUP DC WA 6919 or: info@dwer.wa.gov.au
condition	a condition to which this licence is subject under section 62 of the EP Act
Department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3
discharge	has the same meaning given to that term under the EP Act
dS/m	decisiemens per metre
emission	has the same meaning given to that term under the EP Act
Environmental Compliance Report	means a report to satisfy the CEO that the conditioned infrastructure has been installed in accordance with this licence
environmental incident	means an uncontrolled release of waste to the environment
EP Act	*Environmental Protection Act 1986* (WA)
hardstand	means a surface with a permeability of 1×10^{-9} metres/second or less
healthy vegetation	means vegetation or seed that is living and capable of growing and taking up irrigated wastewater
kg/ha	kilograms per hectare
kL	kilolitres
L/day	litres per day
licence	refers to this document, which evidences the grant of a licence by the CEO under section 57 of the EP Act, subject to the specified conditions contained within
licence holder	means the occupier of the premises, being the person to whom this licence has been granted, as identified on the front of this licence
m	metres
malfunction	means a piece of equipment or machinery which fails to function normally. This can include but is not limited to flow meters failing to record, over topping of tanks, blocked sprinklers or pipes bursting.
Mg^{2+}	magnesium ion

Term	Definition
mg/L	milligrams per litre
monthly	means a one-month period from the first day of a month until the last day of that same month
Na^+	sodium ion
NATA	means the (Australian) National Association of Testing Authorities
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 premises to which this licence applies, as specified at the front of this licence and as shown on the premises map (Figure 1) in Schedule 1 to this licence
prescribed premises	has the same meaning given to that term under the EP Act
quarterly	means the 4 inclusive periods from 1 January to 31 March, 1 April to 30 June, 1 July to 30 September and 1 October to 31 December in the same year
rainfall event	means greater than or equal to 5 mm of precipitation within a 24-hour period
spot sample	means a discrete sample representative at the time and place at which the sample is taken
µS/cm	microsiemens per centimetre
waste	has the same meaning given to that term under the EP Act
Treated wastewater	means water that has passed through the wastewater treatment system, including basic settling of solids, aeration and pH adjustment.
WWTP	means wastewater treatment plant

END OF CONDITIONS

Schedule 1: Maps

The premises is shown in the map (Figure 1) below. The red line depicts the premises boundary.

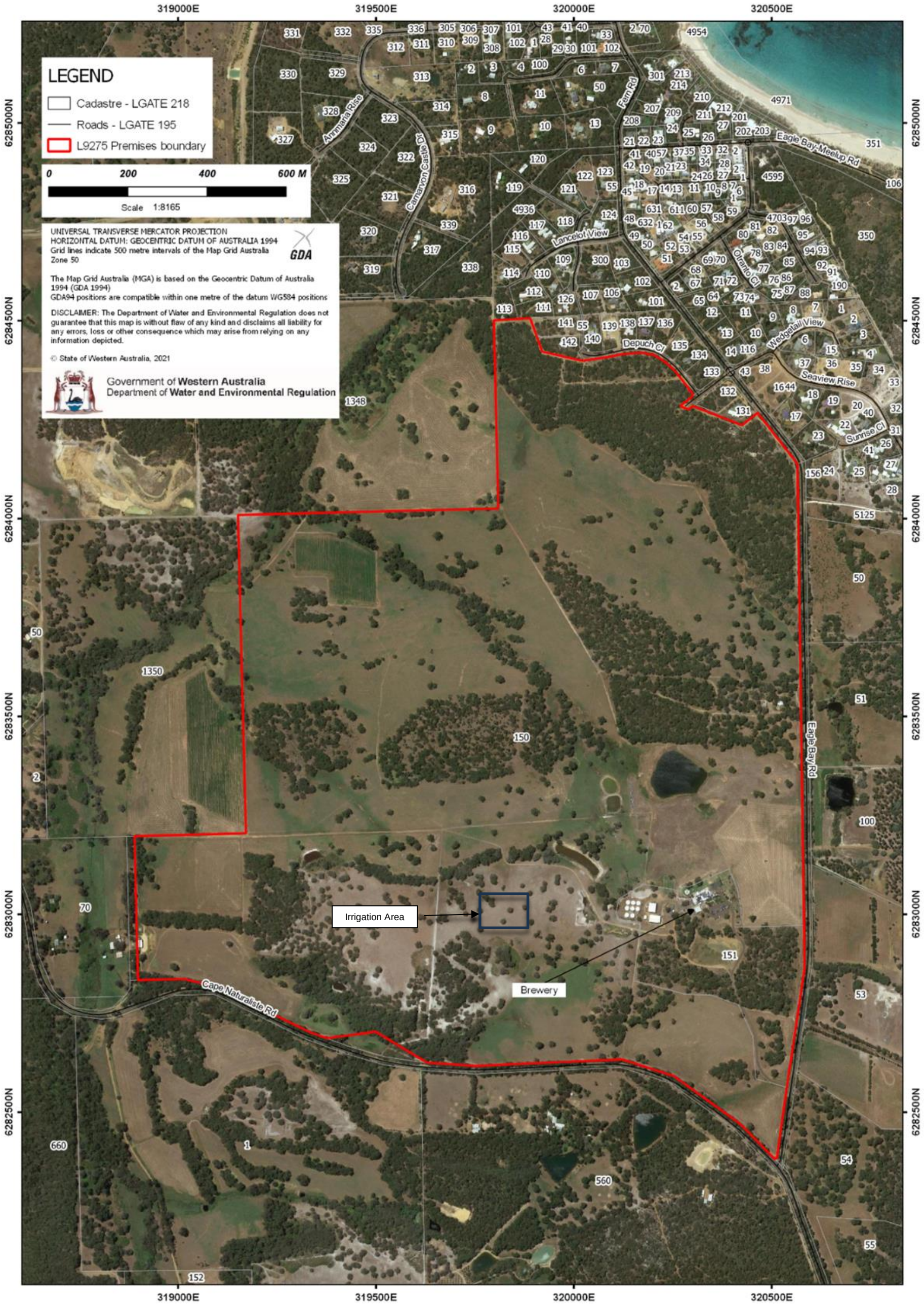

Figure 1: Premises map

Figure 2: Infrastructure layout

Figure 3. Soil sampling locations

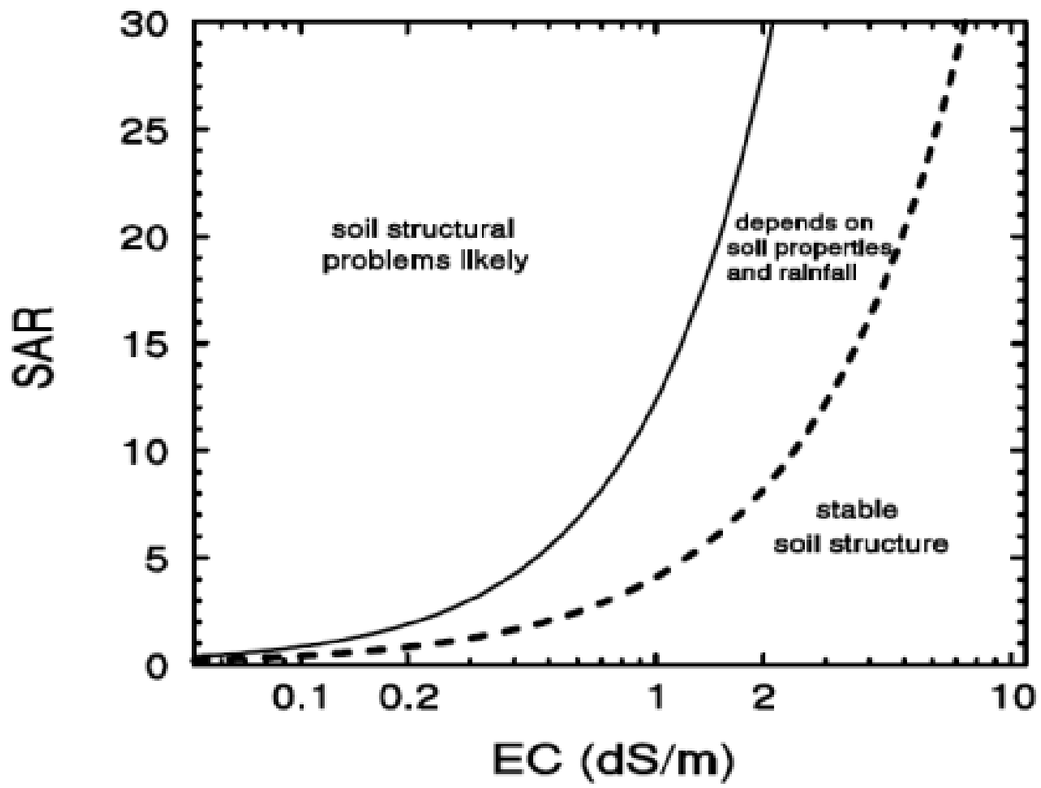

Figure 4. Soil structure: SAR and EC relationship

Schedule 2: Nutrient loading calculator

Irrigation areas[1]: size, volume irrigated, irrigation days				Annual period (as defined by your licence)[2]												Volume irrigated during annual period (kL)[3]
				January	February	March	April	May	June	July	August	September	October	November	December	
EXAMPLE irrigation area:	*25*	*volume irrigated*	*kL*	*20,000*	*20,000*	*18,000*	*15,000*	*0*	*0*	*0*	*0*	*15,000*	*18,000*	*20,000*	*25,000*	*151,000*
		days of irrigation	*days/month*	*29*	*28*	*30*	*25*	*0*	*0*	*0*	*0*	*20*	*25*	*30*	*27*	
Irrigation Area 1:		volume irrigated	kL													
		days of irrigation	days/month													
Irrigation Area 2:		volume irrigated	kL													
		days of irrigation	days/month													
Irrigation Area 3:		volume irrigated	kL													
		days of irrigation	days/month													
Wastewater quality[4]	*EXAMPLE sampling date:*			*20/01/2022*	*15/02/2022*	*17/03/2022*	*19/04/2022*	*12/05/2022*	*12/06/2022*	*9/07/2022*	*15/08/2022*	*12/09/2022*	*15/10/2022*	*13/11/2022*	*7/12/2022*	
	EXAMPLE total nitrogen		*mg/L*	*13.2*	*21.3*	*17.6*	*19.2*	*42.4*	*25.1*	*30.4*	*40.3*	*34.8*	*38.7*	*44.6*	*47.3*	
	EXAMPLE BOD		*mg/L*	*4.8*	*12.1*	*6.1*	*4.9*	*4.8*	*4.1*	*3.3*	*5.2*	*4.4*	*5.2*	*5.1*	*7.5*	
	Sampling date:															
	For wineries to indicate sampling period:[5]															
	Total nitrogen		mg/L													
	Total phosphorus		mg/L													
	Biochemical oxygen demand		mg/L													

Nutrient and BOD loadings[6]			January	February	March	April	May	June	July	August	September	October	November	December	kg/ha/annual period[7]
EXAMPLE total nitrogen loadings			*10.6*	*17.0*	*12.7*	*11.5*					*20.9*	*27.9*	*35.7*	*47.3*	*183.5*
EXAMPLE BOD loadings		*kg/ha/month*	*3.8*	*9.7*	*4.4*	*2.9*					*2.6*	*3.7*	*4.1*	*7.5*	*38.8*
		kg/ha/day	*0.13*	*0.35*	*0.15*	*0.12*					*0.13*	*0.15*	*0.14*	*0.28*	
Irrigation Area 1	Total nitrogen	kg/ha/month													
	Total phosphorus	kg/ha/month													
	Biochemical oxygen demand	kg/ha/month													
		kg/ha/day													
Irrigation Area 2	Total nitrogen	kg/ha/month													
	Total phosphorus	kg/ha/month													
	Biochemical oxygen demand	kg/ha/month													
		kg/ha/day													
Irrigation Area 3	Total nitrogen	kg/ha/month													
	Total phosphorus	kg/ha/month													
	Biochemical oxygen demand	kg/ha/month													
		kg/ha/day													

Licence limits[8]				
		kg/ha/annual period	kg/ha/month	kg/ha/day
Irrigation area 1	TN			
	TP			
	BOD			
Irrigation area 2	TN			
	TP			
	BOD			
Irrigation area 3	TN			
	TP			
	BOD			

Explanatory notes and calculations:

White cells should be filled in where applicable. Pale yellow cells will calculate automatically.

NOTE 1 - Where there is irrigation to more than 3 areas, additional copies of this sheet should be completed.
NOTE 2 - This sheet should be completed for your annual period as defined by your licence. *E.g. If your annual period is from 1 October to the 30 September in the following year, for the 2022-2023 annual period, you should include data from January - September 2023, and October - December 2022.*
NOTE 3 - Volume irrigated during the annual period (kL), for each irrigation area is the sum of the monthly volumes irrigated to that area. *E.g. For the example shown: Volume irrigated during annual period = 20,000 (Jan) + 20,000 (Feb) + 18,000 (Mar) + 15,000 (Apr) + 15,000 (Sep) + 18,000 (Oct) + 20,000 (Nov) + 25,000 (Dec) = 151,000 kL. Noting that for the example there was no irrigation during the months of May, June, July or August.*
NOTE 4 - The sampling and analysis of your wastewater quality should be undertaken in accordance with your licence conditions. For sampling less often than monthly, i.e. quarterly, 6-monthly, or annually: for months where no sampling is required, wastewater quality should be taken to be equivalent to the most recent sample taken. *E.g. Quarterly sampling during Feb, May, Aug and Nov - total nitrogen concentrations were analysed to be 7, 11, 8 and 13 mg/L respectively in the wastewater. For March and April, as February was the most recent sample taken, total nitrogen concentration is estimated to be 7 mg/L. Similarly, for June and July, as May was the most recent sample, total nitrogen concentration is estimated to be 11 mg/L. There will be no sampling date associated with non-sampling months.* If your licence requires you to monitor loading rates for additional parameters (e.g. inorganic nitrogen, reactive phosphorus etc.) additional copies of this sheet should be completed for the additional parameters.
NOTE 5 - For wineries to indicate sampling period - this row is only required to be completed if your licence condition specifies a sampling period e.g. pre-vinatge, peak vintage, late vintage, post vintage, non-vintage. Indicate which sampling date corresponds with which period.
NOTE 6 - Parameter loading (TN, TP or BOD) each month per hectare for each irrigation area (kg/ha/month): monthly concentration of parameter (TN, TP or BOD) in mg/L * monthly volume of wastewater irrigated to irrigation area (kL) ÷ 1000 size of irrigation area *E.g. Using the example shown, for total nitrogen for January: 13.2 mg/L * 20,000 kL / 1,000 = 264 kg/month. 264 / 25 ha = 10.6 kg/ha/month (for January).* Loading of parameter (BOD) each day per hectare for each irrigation area (kg/ha/day): BOD loading (kg/ha/month) ÷ number of days of irrigation during that month. *E.g. Using the example shown, for BOD for October: 3.7 kg/ha/month / 25 days of irrigation during October = 0.15 kg/ha/day (for October)*
NOTE 7 - To calculate annual loading of parameter (TN, TP or BOD) per hectare (kg/ha/annual period): sum of monthly loadings (kg/ha/month). You should calculate an annual loading (kg/ha/annual period) for each relevant parameter for each irrigation area. *E.g. Using the example shown, for total nitrogen: 10.6 (Jan) + 17 (Feb) + 12.7 (Mar) + 11.5 (Apr) + 20.9 (Sep) + 27.9 (Oct) + 35.7 (Nov) + 47.3 (Dec) kg/ha/month = 183.5 kg/ha/annual period*
NOTE 8 - Relevant licence limits to be entered. Where TN = total nitrogen, TP = total phosphorus, and BOD = biochemical oxygen demand. Once applicable licence limits have been entered, the calculated loadings will become red text if they exceed the relevant limit.

Note: Licence holder provided a digital Excel spreadsheet (with in-built formulas).

Send all requests to info@dwer.wa.gov.au

Attention: Process Industries and quote the licence number.