



<b>Licence number</b>	L7643/1999/8
<b>Licence holder</b>	Flying Fish Cove Pty Ltd
<b>ACN</b>	009 163 544
<b>Registered business address</b>	Level 11, 216 St Georges Terrace PERTH WA 6000
<b>DWER file number</b>	DER2015/002878-1~5
<b>Duration</b>	28/07/2014 to 27/07/2029
<b>Date of issue</b>	17/07/2014
<b>Date of amendment</b>	22/08/2024
<b>Premises details</b>	Flying Fish Cove Pty Ltd 3763 Caves Road, Wilyabrup WA 6280  Legal description - Lot 125 on Plan 21450

<b>Prescribed premises category description (Schedule 1, <i>Environmental Protection Regulations 1987</i>)</b>	<b>Assessed production capacity</b>
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.	Not more than 1,400 kL of beverages (wine, beer and spirits) produced per annual period.

This licence is granted to the licence holder, subject to the attached conditions, on 22 August 2024, by:

**MANAGER, PROCESS INDUSTRIES  
INDUSTRY REGULATION**

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

## Licence history

Date	Instrument	Summary of changes
17/07/2014	L7643/1999/8	Licence re-issue and conversion to REFIRE format
28/07/2014	L7643/1999/8	CEO initiated amendment to extended licence expiry date.
16/05/2022	L7643/1999/8	CEO initiated amendment to change requirement for the Annual Environmental Report to be submitted biennially.
22/08/2024	L7643/1999/8	Licence holder-initiated amendment to upgrade the wastewater treatment system, construction and operation of a distillation unit and brewery, construction of an aeration pond and two wastewater reed beds. Includes department initiated amendments to the licence format, requirement to submit an updated wastewater management plan and change annual environmental reporting requirements back to annually.

## Interpretation

In this licence:

- (a) the words ‘including’, ‘includes’ and ‘include’ in conditions mean “including but not limited to”, and similar, as appropriate;
- (b) 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;
- (c) where tables are used in a condition, each row in a table constitutes a separate condition;
- (d) 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;
- (e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and
- (f) 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:

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

**Table 1: Beverage production limits**

Beverage type		Production limit
1	Total combined (wine, beer, and spirits)	<1400 kL per annual period
2	Beer	<3.9 kL per annual period
3	Spirits	<25 kL per annual period

## Infrastructure and equipment

2. The licence holder must ensure that the site infrastructure and equipment listed in Table 2 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 2.

**Table 2: Infrastructure and equipment requirements**

Site infrastructure and equipment		Operational requirement	Infrastructure location – Schedule 1
<b>Beverage production facility</b>			
1	Enclosed winery building containing wine production equipment, fermenters and wine storage tanks. <u>Once installed</u> brewery and distillation equipment	a) All wastewater collected from internal and external hardstand floor drains must be directed to the two collection sumps for wastewater treatment. b) Uncontaminated stormwater must be directed away from all wastewater collection drains and the wastewater treatment system.	Labelled in Figures 1 and 2 as: Production warehouse
2	Bottling building consisting of all bottling associated infrastructure.	c) Wastewater drainage system (including any sumps, pipelines, and drainage channels) and concrete flooring or hardstands must be maintained to prevent wastewater or product leaks to underlying soils.	Labelled in Figures 1 and 2 as: Bottling warehouse
3	Wine tank farm consisting of a series of wine fermentation and storage tanks situated on hardstand.	d) All beverage production must take place in enclosed buildings (excluding the outdoor wine fermentation and storage tanks).	Labelled in Figures 1 and 2 as: Outdoor tank farm
4	Open air production area consisting of open fermenters, and barrel work situated on hardstand.	e) The brewery and distillation equipment must not be operated during the peak vintage months of January to April. f) All non-repurposed heads and tails must be stored in impervious storage to be removed offsite for disposal by a licenced waste carrier.	Labelled in Figures 1 and 2 as: Open air production
<b>Wastewater treatment system (WWTS)</b>			

Site infrastructure and equipment	Operational requirement	Infrastructure location – Schedule 1
<p>5 Wastewater treatment system consisting of:</p> <ul style="list-style-type: none"> <li>i. Main winery collection sump (7.5 kL)</li> <li>ii. Secondary collection sump (7.5 kL)</li> <li>iii. Rotating screen separator</li> <li>iv. Post screen sumps (3 x 7.5 kL)</li> <li>v. Settling tank (25 kL)</li> <li>vi. Clay lined aeration pond (1.8 ML)</li> <li>vii. <u>Once installed</u> new aerator (5.5 kW) in existing aeration pond.</li> <li>viii. Sample tap (SM1)</li> <li>ix. <u>Once installed</u> holding tank (25kL).</li> </ul>	<ul style="list-style-type: none"> <li>a) All wastewater generated from the winery, brewery, distillation, and bottling operations must be directed to the WWTS.</li> <li>b) All wastewater must undergo screening, settling, aeration, and post settling before being discharged from the holding tank.</li> <li>c) Post screen sumps must be maintained and free of solids build up, all solids to be removed to the marc storage pad.</li> <li>d) Settling tank must be desludged at a minimum once per annual period, with the sludge material carted offsite by a licenced waste carrier.</li> <li>e) Prior to any ponds being made non-operational for desludging or any other reason, the licence holder must notify the CEO before the non-operational period can commence.</li> <li>f) Overtopping of and seepage from the wastewater treatment system must not occur.</li> <li>g) Uncontaminated stormwater runoff must be prevented from entering the wastewater treatment system</li> <li>h) The aerator within the aeration pond must be maintained to sure it provides continual aeration.</li> <li>i) A minimum freeboard of 300mm must be maintained in the aeration pond.</li> <li>j) Vegetation and floating debris (emergent or otherwise) must be prevented from encroaching onto pond surfaces or inner pond embankments.</li> <li>k) <u>Once installed</u> all treated wastewater samples must be taken from the sample tap.</li> <li>l) <u>Once installed</u> the high-level alarm on the 25kL wastewater holding tank must be maintained in working condition.</li> <li>m) Until the holding tank is installed treated wastewater must be directed from the aeration pond through the flow meter to the land application area.</li> <li>n) <u>Once the holding tank is installed</u> treated wastewater must be directed from the holding tank through the flow meter to the land application area.</li> </ul>	<p>Labelled in Figure 1 and 2 as: WWTS infrastructure</p> <p>Labelled in Figure 2 as: Aeration pond</p> <p>Holding tank</p> <p>Sample tap (SM1)</p>

Site infrastructure and equipment	Operational requirement	Infrastructure location – Schedule 1	
<b>Solids management</b>			
6	Solid waste (marc) pad - Impervious clay-lined compacted limestone lined pad with a leachate sump fitted with a pump to pump collected leachate back to the WWTS	<ul style="list-style-type: none"> <li>a) Only on-site generated organic wastes such as marc, lees, wastewater treatment sludge may be stored on the pad.</li> <li>b) All marc and other organic solids generated from beverage production must be stored in plastic bins to be transported to the solid waste pad before being taken off-site for disposal or reuse.</li> <li>c) All leachate generated on the pad must drain into the leachate sump and be pumped into the aeration pond.</li> <li>d) Bunding or cut off drains must be maintained around the pad to exclude stormwater from accessing the pad (and wastewater treatment system)</li> </ul>	<p>Labelled in Figures 1 and 2 as:</p> <p>Marc pad</p>
<b>Wastewater management and disposal (irrigation)</b>			
7	<p>1.75 ha wastewater land application areas (LAA) disposal irrigation system consisting of:</p> <ul style="list-style-type: none"> <li>L1 (0.24 ha), L2 (0.1 ha), L3 (0.51 ha), and L4 (0.9 ha)</li> <li>i. Flow Meter (FM1)</li> <li>ii. Sprinklers and pipeline from the holding tank to the irrigation area.</li> <li>iii. Vegetated with native tree species and grasses (L2, L3 4), olive trees (L1).</li> <li>iv. Piezometers (P1, P2, and <u>once installed</u> P3)</li> </ul>	<ul style="list-style-type: none"> <li>a) Only treated wastewater must be irrigated to the LAA.</li> <li>b) Treated wastewater must only be discharged to the LAA at a rate not greater than 30 kL per day.</li> <li>c) All treated wastewaters must flow through the volumetric flow meter which must be maintained to enable the cumulative volume of treated wastewater discharged to the LAA to be accurately measured.</li> <li>d) Irrigation must not be undertaken 12 hours before, during or after a rainfall event of &lt;2mm or 24 hours immediately after a rainfall event of 10 mm or more.</li> <li>e) Irrigation must not occur during the months of June, July and August.</li> <li>f) Irrigation must not occur when groundwater is within 1 m below ground level.</li> <li>g) Irrigated wastewater must be evenly distributed over the LAA.</li> <li>h) No irrigation-generated run-off occurs beyond the boundary of the LAA.</li> <li>i) Irrigation must not occur on areas of the LAA that is visibly waterlogged.</li> <li>j) Actively growing vegetation cover is maintained over the LAA.</li> <li>k) Trees in L2, L3 and L4 must be coppiced annually, with all coppiced material</li> </ul>	<p>Labelled in Figure 2 as:</p> <p>Flow Meter (FM1)</p> <p>Land application area (L1, L2, L3, L4).</p> <p>Piezometer (P1, P2, P3)</p>

Site infrastructure and equipment	Operational requirement	Infrastructure location – Schedule 1
	collected, weighed, recorded and removed from the LAA. l) Olive trees in L1 must be harvested or coppiced annually with all fruit and coppiced material collected, weighed, recorded and removed from the LAA.	

## Emissions and discharges

3. The licence holder must ensure that wastewater discharged to each land application area listed in Table 3 for the corresponding parameter do not exceed the corresponding limit when monitored in accordance with condition 5.

**Table 3: Discharge limits**

Discharge point	Parameter	Limit (including units)
Land Application Areas L1, L2, L3 and L4 as shown in Figure 2, Schedule 1	Total nitrogen	<180 kg/ha/annual period
	Total phosphorus	<20 kg/ha/annual period
	Biological Oxygen Demand (BOD)	<1500 kg/ha/month
	pH	5.5-8.5 (spot sample)
	SAR and electrical conductivity (EC)	The relationship between SAR and EC must be in the “stable soil structure” range as depicted in Figure 3 in Schedule 1 (spot sample).
	EC	<2.9 dS/m (spot sample)

4. Subject to condition 3, the licence holder must submit to the CEO a written report within 14 days of becoming aware of a limit exceedance listed in Table 3. The report must contain the following information:
- a description of the emission exceedance.
  - the time and date when the exceedance occurred;
  - whether any environmental impact occurred as a result of the exceedance and, if so, what that impact was and where the impact occurred;
  - details of the management action(s) taken in response to resolving the exceedance; and
  - the details and result of any investigation undertaken into the cause of the exceedance.

## Monitoring

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

**Table 4: Monitoring of emissions to land**

Discharge point	Monitoring location	Parameter	Units	Frequency	Averaging period	Method
Land application areas L1, L2, L3 and L4	Flowmeter (FM1) located at – outflow from wastewater treatment system  Sample tap (SM1)	Volumetric flow rate (cumulative)	L/day	Continuous when discharging	Daily	N/A
		pH <sup>1</sup>	-	Monthly while irrigating.  Quarterly while irrigating	Spot sample	AS/NZS 5667.1 and AS/NZS 5667.10
		Electrical conductivity <sup>1</sup>	dS/m			
		Total nitrogen	mg/L			
		Total phosphorus				
		Total dissolved solids				
		Total suspended solids				
		BOD				
		Sodium ion (Na <sup>+</sup> )				
		Calcium ion (Ca <sup>2+</sup> )				
		Magnesium ion (Mg <sup>2+</sup> )				
		Sodium adsorption ratio	-			

<sup>1</sup> In field non-NATA accredited analysis permitted for pH and electrical conductivity.

6. The licence holder must ensure that all non-continuous analysis undertaken pursuant to condition 5 is undertaken by a holder of a current accreditation from the National Association of Testing Authorities (NATA) for the methods of analysis relevant to the corresponding relevant parameter.
7. The licence holder must ensure that monitoring is undertaken in each monthly period such that there are at least 21 days between the days on which samples are taken in successive months.
8. The licence holder must ensure that the wastewater irrigation flow meter (FM1) is calibrated in accordance with the manufacturer's specifications.
9. The licence holder must, where the requirements for calibration cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods-

## Wastewater management plan

10. The licence holder must submit to the CEO, by 31 March 2025, a wastewater irrigation management plan. The Plan must:
  - (a) describe the irrigation area, irrigation discharge rates, irrigation schedule and irrigated crop or vegetation.
  - (b) demonstrate that the wastewater irrigation rate, wastewater quality and schedule of application does not saturate the soil, infiltrate past the root zone of the crop or contaminate the soil.
  - (c) upon selection of a crop able to take up high levels of nutrients and water, present site-specific nutrient loading rates, based on the irrigated crops' ability

to assimilate nutrients and remove nutrients through harvesting to replace existing nutrient loading levels;

- (d) provide monthly groundwater levels (mbgl) for the previous 12 months as measured from piezometers installed in the LAA; and
- (e) demonstrate how crops within the irrigation area will be maintained with a healthy coverage over the LAA's during each month of the irrigation period (September – May).

## Works

11. The licence holder must submit to the CEO, a decommissioning plan for the pre-construction (emptying) of the aeration pond at least 30 days before taking the pond off-line for the commencement decommissioning and construction activities. The plan must:
  - a) describe the anticipated duration (days) of the decommissioning process including how both liquid and sludge wastes contained in the pond will be removed, temporarily stored or dewatered and disposed off.
  - b) describe how odour emissions will be mitigated during the decommissioning process; and
  - c) describe how both liquid and sludge wastes from the operation WWTS will be managed during the decommissioning and construction period whilst the aerobic pond remains off-line.
12. The licence holder must construct and/or install the infrastructure in accordance with the corresponding design and construction / installation and at the corresponding infrastructure location, and by the specified timeframe as set out in Table 5.

**Table 5: Design and construction / installation requirements**

Item	Infrastructure and equipment	Design and construction / installation requirements	Infrastructure location and design – Schedule 1	Timeframe
1	Aeration pond (1800 m <sup>3</sup> )	<ul style="list-style-type: none"> <li>a) All embankment slopes must be built to a slope of 1:3.</li> <li>b) Pond must have a water holding capacity of at least 1800 m<sup>3</sup>, including the allowance for a 300 mm freeboard.</li> <li>c) Pond must be constructed with a compacted clay liner which is constructed in accordance with the requirements specified in Schedule 2.</li> <li>d) Pond must have a surveyed marker that enables the freeboard at its lowest point to be measured in millimeters and can be viewed by a person standing near the edge of the aeration pond.</li> <li>e) Must have a wastewater pump capable of transferring water from the aeration pond to reed</li> </ul>	<p>Location in Figure 2 as: Aeration pond</p> <p>Constructed in accordance with the pond design in, Figure 4 and 5.</p>	By no later than <b>30/08/2026</b>

Item	Infrastructure and equipment	Design and construction / installation requirements	Infrastructure location and design – Schedule 1	Timeframe
		bed 1 (R1). f) Pond must not be operated prior to submission of the infrastructure report required by condition 14.		
2	Two 220 m <sup>3</sup> capacity reed beds	a) Combined reed beds must have a maximum holding capacity of 440 m <sup>3</sup> , including the allowance for a 500 mm freeboard. b) All embankment slopes must be built to a slope of 1:3. c) The base of the reedbeds must be lined with 200 mm of topsoil above the clay liner. d) Reed beds must be constructed with a compacted clay liner which is constructed in accordance with the requirements specified in Schedule 2. e) Reed beds are to be planted with sedges: <i>Juncus kraussii</i> , <i>Schoenoplectus validus</i> , <i>Baumea articulata</i> . f) Spillway between aeration pond, reed beds and collection pond must be constructed in accordance with the requirements in Figure 6.	Location in Figure 2 as: Reed beds (R1 and R2)  Constructed in accordance with the pond design in, Figure 4,5 and 6.	
3	Collection pond (14.4 m <sup>3</sup> )	a) Collection pond must have a maximum holding capacity of 14.4 m <sup>3</sup> , including the allowance for a 300 mm freeboard. b) All embankment slopes must be built to a slope of 1:3. c) Collection pond must be constructed with a compacted clay liner which is constructed in accordance with the requirements specified in Schedule 2. d) Must install a pump in the collection pond to enable water to be pumped to the holding tank. e) Must be fitted with a high level alarm.	Location in Figure 2 as: Collection pond  Constructed in accordance with the pond design in, Figure 4 and 5	

13. The licence holder must within 60 calendar days of the items identified by condition 12 being constructed and prior to waste being discharged into the aeration pond,

reed beds and collection pond:

- (a) undertake an audit of their compliance with the requirements of condition 12; and
  - (b) prepare and submit to the CEO Infrastructure Report(s) on that compliance.
- 14.** The Infrastructure Report required by condition 13 must include as a minimum the following:
- (a) certification by a suitably qualified civil engineer that item 1 in Table 5 has been constructed in accordance with the relevant design and construction requirements and at the location specified in condition 12, Table 5;
  - (b) certification by a suitably qualified engineer technician that items 2 and 3 in Table 5 has been built and installed in accordance with the relevant design and construction requirements and at the locations specified in condition 12, Table 5.
  - (c) as constructed plans and a detailed site plan showing the location and dimensions for each item of equipment or infrastructure, as specified in condition 12;
  - (d) photographic evidence of the installation of all of infrastructure items listed in condition 12, Table 5; and;
  - (e) be signed by a person authorised to represent the licence holder and contains the printed name and position of that person.
- 15.** Within 60 days of submitting the Infrastructure Report required by condition 13, the licence holder must submit a licence amendment application in order to operate items 1, 2 and 3 in Table 5.

## Records and reporting

- 16.** The licence holder must record the following information in relation to complaints received by the licence holder (whether received directly from 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.
- 17.** 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 July** after the end of that annual period an AACR in the approved form.
- 18.** The licence holder must maintain accurate and auditable books including the following records, information, reports, and data required by this licence:
- (a) the works conducted in accordance with conditions 12 of this licence
  - (b) any maintenance of infrastructure that is performed in the course of complying with conditions 2 and 12 of this licence;

- (c) monitoring programmes undertaken in accordance with condition 5 of this licence; and
  - (d) complaints received under condition 16 of this licence.
- 19.** The books specified under condition 18 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.
- 20.** The licence holder must, within 24 hours of becoming aware of any discharge of wastewater (leak or spills) from the WWTS or pipeline must notify the CEO in writing and include in that notification the following information:
- (a) the time and date when the discharge occurred;
  - (b) if any environmental impact occurred because of the discharge and if so, what that impact is and where the impact occurred, and
  - (c) the details and result of any investigation undertaken into the cause of the discharge.
- 21.** The licence holder must submit to the CEO by no later than **30 July** after the end of each annual period, an Annual Environmental Report for that annual period for the conditions listed in Table 6, and which provides information in accordance with the corresponding requirement set out in Table 6.

**Table 6: Annual environmental report**

Condition	Parameter
1	a) Volumes of beverages (wine, beer and spirits) produced
2	b) Amount (tonnes) of marc/sludge/organic material removed from the premises for offsite disposal. c) Amount (tonnes) of organic material removed (harvested) from <u>each</u> Land Application Area- L1, L2, L3, and L4, including description of methods used to weigh the material. d) Monthly photographic evidence illustrating the date, the flow meter serial number and flow meter reading (M1) (ensuring the numbers are readable).

3 and 5	<ul style="list-style-type: none"> <li>e) Monitoring of emissions to land data in tabulated form that includes the sample date compared to the discharge limits. If limits have been exceeded and explanation of why and what actions will be taken to ensure limits are not exceeded in the future.</li> <li>f) Present monthly and annual tabulated loadings of nitrogen, phosphorus and BOD applied to <u>each</u> Land Application Area (L1, L2, L3 and L4) using the Nutrient Loading Spreadsheet in Schedule 3.</li> <li>g) Wastewater monitoring data in tabulated and graphical form including the sampling date.</li> <li>h) An assessment and interpretation of the data including comparison to historical trends (minimum of 5 years), water quality limits and loading limits. Copies of laboratory sample analysis reports.</li> </ul>
8	i) Copies of flowmeter calibration reports
16	j) A summary of complaints recorded in the annual period.
17	k) An audit of the licence conditions. The AACR report link can be found on the department's website.
-	l) Summary of any failure or malfunction of any pollution control equipment, flow meters and any environmental incidents that have occurred during the annual period and any action taken.

## Definitions

In this licence, the terms in Table 7 have the meanings defined.

**Table 7: Definitions**

Term	Definition
ACN	Australian Company Number
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	a 12-month period commencing from 1 July until 30 June of the immediately following year.
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
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer of the Department. “submit to / notify the CEO” (or similar), means either: Director General Department administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 Joondalup DC WA 6919 or: <a href="mailto:info@dwer.wa.gov.au">info@dwer.wa.gov.au</a>
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (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.
emission	has the same meaning given to that term under the EP Act.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
EP Regulations	<i>Environmental Protection Regulations 1987</i> (WA)
freeboard	Means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point
kL	Kilolitres
L	litres

<b>Term</b>	<b>Definition</b>
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	refers to the occupier of the premises, being the person specified on the front of the licence as the person to whom this licence has been granted.
monthly period	means a one-month period commencing from the first day of a month until last day of the same month.
dS/m	decisiemens per metre
premises	refers to 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.
SAR	sodium adsorption ratio
spot sample	means a discrete sample representative at the time and place at which the sample is taken.
suitably qualified civil engineer	a person who: a) holds a Bachelor of Engineering; and b) has a minimum of five years of working experience in civil engineering
suitably qualified engineer technician	a person who: a) has a minimum of five years of working experience as an engineer technician
treated wastewater	wastewater that has passed through the WWTS as listed in Table 1.
waste	has the same meaning given to that term under the EP Act.

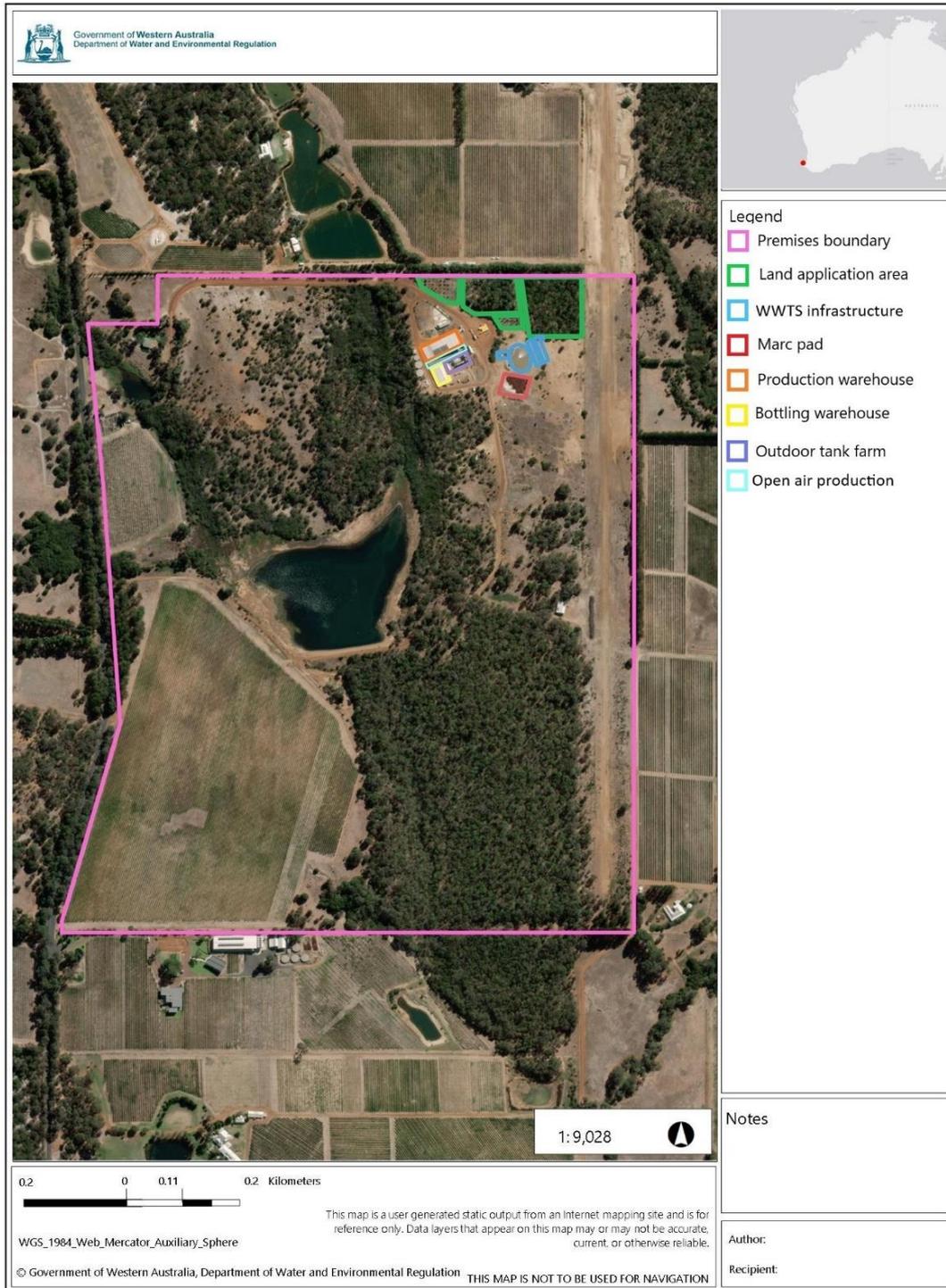
---

**END OF CONDITIONS**

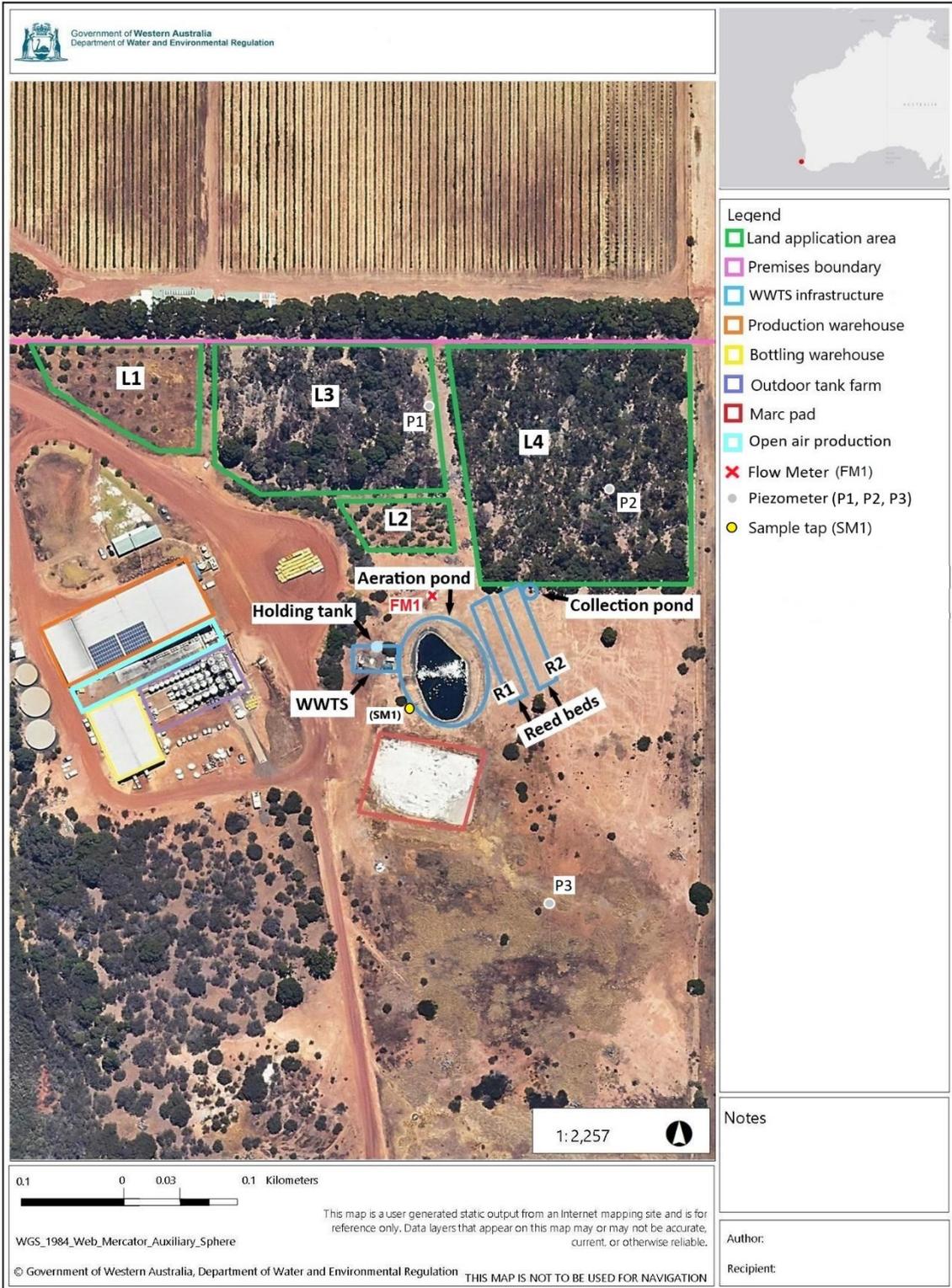
# Schedule 1:

## Premises map

The boundary of the prescribed premises is shown in pink in the map below (Figure 1).



**Figure 1:** Map of the boundary of the prescribed premises.



**Figure 2: Site layout map of the premises including the location of the proposed new aeration pond, reed beds and collection pond.**

### Relationship between Sodium Adsorption Ratio and Electrical Conductivity

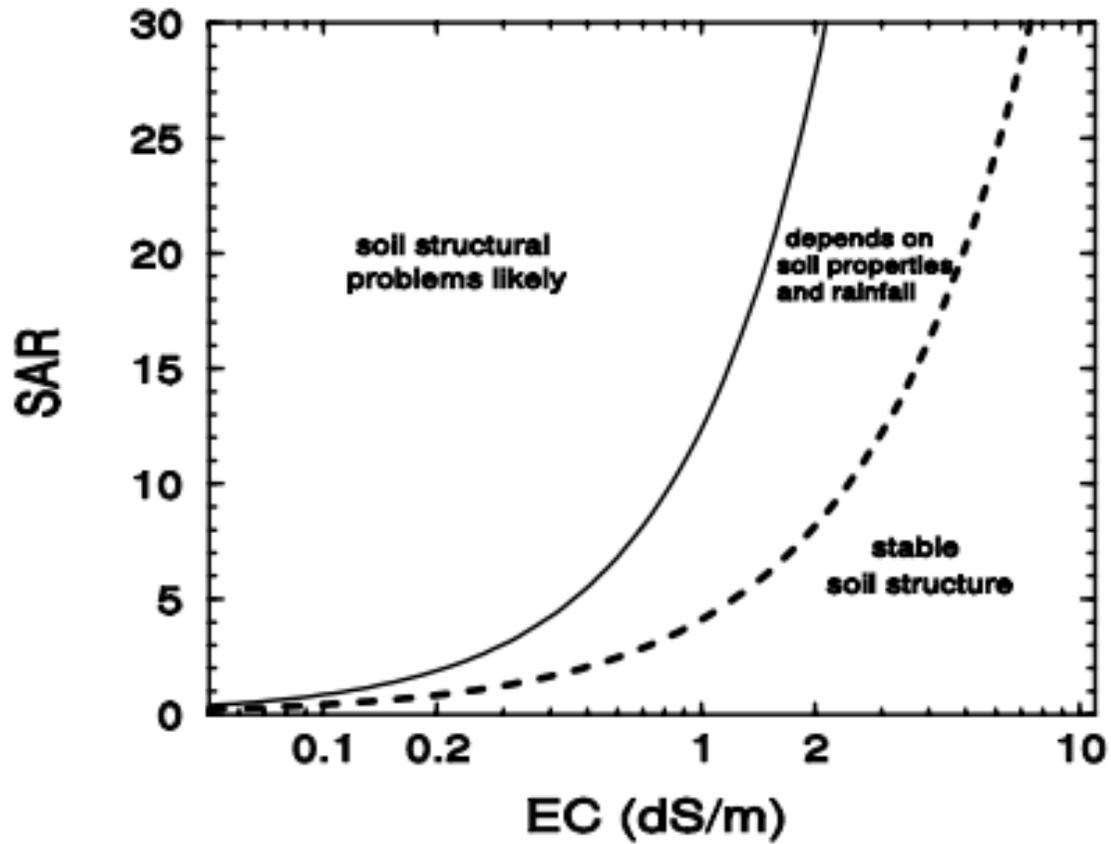


Figure 3: Relationship between Sodium Adsorption Ratio and Electrical conductivity of irrigation water for prediction of soil structural stability (ANZECC 2000).

## Schedule 2: Clay Liner requirements

### Liner material:

1. Soils used for the lining must conform to a design specification for an effective water retaining structure. The soils must be free from plant roots and reactive, soluble and organic matter. The selected liner material must consist of an inert and insoluble blend of sand, clay and silt particles that meet the minimum criteria described in Table 8.

Table 8: Minimum criteria for soil liners

Soil characteristic	Acceptability criterion	Test method
Percentage fines	> 25% passing a 75 µm sieve	Australian Standard (AS) 1289 3.6.1-2009
	> 15% passing a 2 µm sieve	
Liquid limit	30% to 70%	AS 1289 3.1.2- 2009
Plasticity index	> 15	AS 1289 3.3.1- 2009
Emerson class number	5 to 6	AS 1289 3.8.1- 2009

2. The liner material must be homogeneous in nature and properties, with no sandy patches exceeding the liner specification or rocks retained on a 37.5 mm sieve. Any non-conforming liner material must be removed and replaced with conforming soil. Where necessary, soils may be blended or have bentonite clay mixed in to achieve desired uniformity and geo-technical characteristics.
3. The liner material properties must not be altered by acidic or alkaline content of the contained waste.

### Liner construction

4. Liners must be installed in at least two layers of equal thickness to ensure adequate compaction is achieved and to minimise the risk of leakage. The liner material must be moisture-conditioned to achieve the maximum (in place) design soil density exceeding the 95 per cent maximum dry density (MDD) determined using AS 1289.5.2.1 (2003) and AS 1289 5.4.2 (2007).

5. The minimum thickness of the compacted soil liner must be 20 cm and construction tolerances must be within 5 cm.
6. The completed liner must uniformly cover both the base and perimeter of the aeration ponds and reed beds to achieve one integrated holding facility.
7. Test cores must be taken from the completed items as follows:
  - a. Tests must be conducted based on a four-by-four grid equally spaced over the base of the evaporation pond; and
  - b. One full depth core test per 30 lineal m of perimeter embankment.
  - c. Each soil sample core must have its coefficient of permeability determined via an accredited soil testing laboratory in accordance with AS 1289.6.7.1 (2001). The maximum acceptable core coefficient of permeability is  $10^{-9}$  m/s when subjected to 1 m pressure head of water.
  - d. Core test holes must be filled with cement slurry, bentonite or other suitable sealant.
8. The completed items must be proof-tested to confirm the initial seepage is less than 4 kL/ha/day of contained area under 1 m water pressure 24 hours after flooding.

**Figure 4:** Aeration pond location and design, including dimensions of aeration pond to reed beds to holding pond.

**Figure 5:** Reed bed and holding pond location and design, including aeration pond description.

**Figure 6:** Spillway design between aeration pond, reed beds and collection pond.

### Schedule 3: Nutrient loading calculator

Irrigation areas <sup>1</sup> : size, volume irrigated, irrigation days				Annual period (as defined by your licence) <sup>2</sup>												Volume irrigated during annual period (kL) <sup>3</sup>	
	Size (ha)			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 <sup>4</sup>	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: <sup>5</sup>																
	Total nitrogen		mg/L														
	Total phosphorus		mg/L														
Biochemical oxygen demand		mg/L															
Nutrient and BOD loadings <sup>6</sup>				January	February	March	April	May	June	July	August	September	October	November	December	kg/ha/annual period <sup>7</sup>	
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
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														
Explanatory notes and calculations:																	
White cells should be filled in where applicable. Pale yellow cells will calculate automatically.																	

Licence limits <sup>8</sup>				
		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			

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. <i>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.</i>
NOTE 3 - Volume irrigated during the annual period (kL), for each irrigation area is the sum of the monthly volumes irrigated to that area. <i>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.</i>
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. <i>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.</i> 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-vintage, 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): $\frac{\text{monthly concentration of parameter (TN, TP or BOD) in mg/L} \times \text{monthly volume of wastewater irrigated to irrigation area (kL)}}{1000}$ <p style="text-align: right;">size of irrigation area</p> <i>E.g. Using the example shown, for total nitrogen for January: <math>13.2 \text{ mg/L} \times 20,000 \text{ kL} / 1,000 = 264 \text{ kg/month}</math>. <math>264 / 25 \text{ ha} = 10.6 \text{ kg/ha/month}</math> (for January).</i>  Loading of parameter (BOD) each day per hectare for each irrigation area (kg/ha/day): $\text{BOD loading (kg/ha/month)} \div \text{number of days of irrigation during that month}$ . <i>E.g. Using the example shown, for BOD for October: <math>3.7 \text{ kg/ha/month} / 25 \text{ days of irrigation during October} = 0.15 \text{ kg/ha/day}</math> (for October)</i>
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. <i>E.g. Using the example shown, for total nitrogen: <math>10.6 \text{ (Jan)} + 17 \text{ (Feb)} + 12.7 \text{ (Mar)} + 11.5 \text{ (Apr)} + 20.9 \text{ (Sep)} + 27.9 \text{ (Oct)} + 35.7 \text{ (Nov)} + 47.3 \text{ (Dec)} \text{ kg/ha/month} = 183.5 \text{ kg/ha/annual period}</math></i>
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 holders can request a digital Excel spreadsheet (with in-built formulas) on request.

Send all requests to [info@dwer.wa.gov.au](mailto:info@dwer.wa.gov.au)

**Attention:** Process Industries and quote the licence number.