Government of Western Australia
Department of Environment Regulation

Licence

Licence Number	L8972/2016/1
Licence Holder	Harris Cav Pty Ltd
ACN	121 454 484
Registered business address	431 Roberts Rd SUBIACO WA 6008
Duration	29 August 2016 to 28 August 2036
Prescribed Premises	Category 25: Alcoholic beverage manufacturing Category 85: Sewage facility
Premises	Mandoon Estate 10 Harris Road CAVERSHAM WA 6055 Lot 170 on Plan 62929

This Licence is granted to the Licensee, subject to the following conditions, on 26 August 2016, by:

Christine West
Manager Licensing (Process Industries)

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

Conditions

Environmental compliance

1. The ***Licensee*** must comply with the ***EP Act*** and all regulations prescribed under the EP Act and applicable to the Premises, including:

(a) The duties of an occupier under s 61;

(b) The duty to notify the ***CEO*** of discharges of waste under s 72; and

(c) Not causing, or doing anything that is likely to cause, an offence under the ***EP Act***

except where the ***Licensee*** does something in accordance with a ***Condition*** which expressly states that a defence under s 74A of the ***EP Act*** may be available.

Notification of Material Change

2. The ***Licensee*** must notify the ***CEO*** of any ***Material Change*** within 14 days of a ***Material Change*** occurring and such notification (which the ***CEO*** will make publicly available) must:

(a) be in writing;

(b) include details of the changes, including duration, infrastructure details (if any); and

(c) include risk analysis of the changes, including proposed controls to mitigate risks.

Nothing in this Condition constitutes a defence to offences under the ***EP Act***.

3. The ***Licensee*** must provide to the ***CEO*** any additional information the ***CEO*** may reasonably require to assess the ***Material Change*** under ***Condition*** 4 and in order for the ***CEO*** to determine if an amendment is required under the ***EP Act***.

4. The ***Licensee*** must cease carrying out, or modify, a ***Material Change*** in the manner and at the time required by the ***CEO*** if:

(a) the ***CEO*** forms the view, acting reasonably, that the ***Material Change*** has or may have an unacceptable impact on public health, amenity or the environment; and

(b) the ***CEO*** has provided written notice (which the ***CEO*** will make publicly available) to the Licensee specifying the grounds for the ***CEO's*** views.

Nothing in this ***Condition*** prevents the Licensee subsequently submitting an amendment in relation to the ***Material Change***.

Infrastructure and Equipment

5. The ***Licensee*** must maintain and operate the infrastructure and equipment specified in column 1 of Table 1 in accordance with the requirements specified in column 2 of Table 1.

6. The ***Licensee*** must ensure that the equipment and infrastructure in Table 1 are maintained in good order.

Table 1: Infrastructure Requirements

Column 1	Column 2
Site infrastructure	**Specified requirements**
Brewery manufacturing and processing area	• All plant and equipment must be installed within purpose built warehouse structures; • Uncontaminated stormwater must not enter the manufacturing and processing area; and • Any process water and wash down water from the beer manufacturing and processing area is directed to the Main WWTP.
Wine manufacturing and processing area	• All plant and equipment must be installed within a purpose built warehouse structures. • Uncontaminated stormwater must not enter the manufacturing and processing area. • Any process water, wash down water from the wine manufacturing and processing area is directed to the Winery WWTP.
Main WWTP	• Maintain capability to treat up to 30 m^3/day of waste water; • Must be operated and maintained in accordance with design specifications to ensure treated wastewater quality is consistent with design specifications. • Overtopping of the wastewater treatment vessels must not occur. • Containment bunds must be maintained to prevent any leaks or spills of untreated or partially treated wastewater into the environment. • Volumetric flowmeter and associated automatic data capture system to allow for the volume of wastewater discharged to the leach drains to be determined on a daily basis.
Winery WWTP	• Maintain capability to treat up to 10 m^3/day of waste water. • ATU must be operated and maintained in accordance with manufacturer's specifications to ensure treated wastewater quality is consistent with design specifications. • Overtopping of the wastewater treatment vessels must not occur. • Containment bunds must be maintained to prevent any leaks or spills of untreated or partially

Column 1	Column 2
Site infrastructure	**Specified requirements**
	treated wastewater into the environment. • Volumetric flowmeter and associated automatic data capture system to allow for the volume of wastewater discharged to the irrigation area to be determined on a daily basis.
Ablution Block WWTP	• Maintain capability to treat up to 1.8 m^3/day of waste water. • ATU must be operated and maintained in accordance with manufacturer's specifications to ensure treated wastewater quality is consistent with design specifications. • Overtopping of the wastewater treatment vessels must not occur. • Containment bunds must be maintained to prevent any leaks or spills of untreated or partially treated wastewater into the environment. • Volumetric flowmeter and associated automatic data capture system to allow for the volume of wastewater discharged to the irrigation area to be determined on a daily basis.
Stormwater Retention Basins 1, 2 and 3, and associated stormwater conveyance infrastructure	• All stormwater runoff resulting from 1 year, 1 hour ARI storm event must be retained on site. • Stormwater management system must be maintained to ensure that there is no direct drainage connection to the Swan River through drains, swales or paths from the site. • Stormwater retention basins must be sited at locations indicated in Map 9.
Leach Drains	• Must be maintained to ensure efficient delivery of treated waste water.
Irrigation Area	• Olive trees are to be maintained in good condition to facilitate constant and stable uptake of nutrients.

Waste Storage

7. The ***Licensee*** must ensure that wastes produced on the premises, specified in column 1 of Table 2 are managed in accordance with the requirements specified in column 2 and column 3 of Table 2.

Table 2: Waste Management Specifications

Column 1	**Column 2**	**Column 3**
Waste type	**Disposal strategy**	**Specified requirements**
Treated wastewater from Winery WWTP	Treatment and disposal onsite by irrigation	Subject to requirements specified in condition 8, 10,11, 12, 13 and 14
Treated wastewater from Main WWTP	Treatment and disposal on site to leach drains	Subject to requirements specified in condition 9, 10, 11, 12,13 and 14
Sludge from Main WWTP, Winery WWTP and Ablution Block WWTP	Disposal offsite	• Must not be applied to land on site; • Must be removed from the premises on a regular basis for disposal at an authorised facility; and • Any spills must be immediately recovered
Solid waste from wine manufacturing (marc, lees, screening solids and other organic wastes)	Temporary storage onsite prior to offsite disposal	• Must be stored in enclosed containers to prevent leachate entering the environment • Must be removed from the premises on a regular basis for disposal at an authorised facility
Spent grain from beer manufacturing	Temporary storage onsite prior to offsite disposal	

Treated Wastewater Disposal

8. The ***Licensee*** must ensure that when irrigating treated wastewater from the Winery WWTP and Ablution WWTP:

(a) irrigation is only undertaken at discharge locations authorised in Table 3;
(b) discharge limits specified in Table 4 are not exceeded;
(c) irrigation does not occur in areas where the water table rises to within 2 m of the surface;
(d) bunding is maintained adjacent to wastewater irrigation areas to divert uncontaminated stormwater away from the irrigation area;
(e) no irrigation generated runoff, spray drift or discharge occurs beyond the boundary of the premises;
(f) treated wastewater is evenly distributed over the irrigation area;
(g) no soil erosion occurs;
(h) vegetation cover is maintained over the wastewater irrigation area;
(i) irrigation does not occur on land that is waterlogged; and
(j) irrigation is not undertaken when rainfall is imminent or immediately after a rainfall event.

9. The ***Licensee*** must ensure that when disposing treated wastewater from the Main WWTP via leach drains:

(a) infiltration is only undertaken at discharge locations authorised in Table 3;
(b) discharge limits specified in Table 4 are not exceeded;
(c) leach drain infiltration area of at least 3600 m^2 must be maintained;
(d) the space between the leach drains must be planted with olive trees spaced approximately 7m apart to aid nutrient uptake;
(e) leach drains use must be alternated such that only four out of six leach drains installed are operational at a time, to ensure even dispersion of water;
(f) Wastewater must not be disposed of via leach drains during rainfall events;
(g) Soil moisture sensors, rainfall sensors, and flow meters must be used to determine suitable rate of discharge such that hydraulic loading capacity of the soil is not exceeded, and no pooling of wastewater occurs; and
(h) Infiltration must not result in soil erosion and surface ponding and must allow soils to dry between disposal events.

10. The licensee must ensure treated wastewater from the Main WWTP and Winery WWTP is discharged to land only at locations specified in column 2 of Table 3.

Table 3: **Authorised discharge locations for treated wastewater**

Column 1	**Column 2**
Emission point reference on Map	**Description**
L1	Discharge of treated wastewater from combined Winery WWTP and Ablution WWTP via irrigation
L2	Discharge of treated wastewater from Main WWTP via leach drains

Treated Wastewater Limits and Monitoring

11. The Licensee must undertake the following while a discharge point specified in Table 3 is active:

(a) Ensure emissions do not exceed the limits specified by condition 12;
(b) Monitor emissions in accordance with condition 13; and
(c) Report any limit exceedances in accordance with condition 14.

12. The licensee must not cause or allow emissions to land greater than the limits specified in column of Table 4.

Table 4: Annual loading limits for nutrients discharged to land

Column 1	**Column 2**	**Column 3**	**Column 4**
Discharge point reference	**Parameter**	**Limit (including units)**	**Averaging period**
L1 (Irrigation Area)	Total nitrogen	300kg/ha/year	Annual
	Total phosphorus	50kg/ha/year	Annual
	Biochemical Oxygen Demand (BOD_5)	30kg/ha	Daily
L2 (Leach Drains)	Total Nitrogen	300kg/ha/year	Annual
	Total phosphorus	50kg/ha/year	Annual
	Biochemical Oxygen Demand (BOD_5)	30kg/ha	Daily

13. Pursuant to condition 14, the licensee must ensure that parameters specified in column 3 of are monitored at monitoring points specified in column 2 of and in accordance with requirements specified in columns 4, 5 and 6 of Table 5.

Table 5: Point source emissions monitoring requirements

Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**	**Column 6**
Discharge point reference	**Monitoring point reference**	**Parameter**	**Units**	**Averaging period**	**Frequency**
L1	M1 - outflow from the central irrigation system which accepts treated	Volumetric flow rate	m^3/day	Daily	Continuous when discharging
		Volume of wastewater discharged	m^3	Daily	Continuous when discharging
		pH	-	Spot sample	Monthly

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Discharge point reference	**Monitoring point reference**	**Parameter**	**Units**	**Averaging period**	**Frequency**
	wastewater from Winery WWTP and Ablution Block WWTP	TN	mg/L		when discharging
		TP			
		TDS			
		BOD5			
		E.coli	cfu/100 mL	Spot sample	Monthly when discharging
L2	M2 - outflow from Main WWTP	Volumetric flow rate	m^3/day	Daily	Continuous when discharging
		Volume of wastewater discharged	m^3	Daily	Continuous when discharging
		pH	-	Spot sample	Monthly when discharging
		TN	mg/L		
		TP			
		TDS			
		BOD5			

14. The licensee must 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, using low-flow sampling; and
(d) All wastewater samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in this licence.

Groundwater quality monitoring

15. Pursuant to condition14, the Licensee must undertake groundwater monitoring at locations specified in column 1 of for parameters specified in column 2 and in accordance with requirements specified in columns 3, 4 and 5 of Table 6.

Table 6: Groundwater quality monitoring requirements

Column 1	Column 2	Column 3	Column 4	Column 5
Monitoring point reference and location	**Parameter**	**Units**	**Averaging period**	**Frequency**
MW1R MW2R MW3 MW4	Standing water level	m(AHD)	Spot sample	Three monthly
	pH[1]	-		
	Total nitrogen (TN)	mg/L		
	Total phosphorus (TP)			
	Total dissolved solids			
	BOD 5-day			

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

16. The Licensee must ensure that the groundwater monitoring bores specified in Table 6 are:

(a) Installed to meet the requirements of Minimum Construction Requirements for Water Bores in Australia (AIH 2012); and

(b) Sited in accordance with Water Quality Protection Note 30: Groundwater Monitoring Bores (Department of Water, 2009); and

(c) Surveyed to allow the ground level (to Australian Height Datum) at each location to be accurately determined.

Emissions

17. The Licensee must not cause any emissions from the Premises except for Specified Emissions and General Emissions described in column 1 of Table 7, subject to the exclusions, limitations, or requirements specified in column 2 of Table 7 below.

If the Licensee proves that it has acted in accordance with this condition, it may be a defence under s 74A of the EP Act to proceedings for offences under the *EP Act* (including offences under section 56).

Table 7: Emissions Table

Column 1	**Column 2**
Emission Type	**Exclusions/Limitations/Requirements**
Specified Emissions	
Land and Groundwater – Disposal of combined treated wastewater from Winery WWTP and Ablution Block WWTP via irrigation	Subject to compliance with conditions: • condition 7, 8, 10-14
Land and Groundwater – Disposal of treated wastewater from Main WWTP via leach drains	Subject to compliance with conditions: • condition 7, 9- 14
General Emissions (excluding Specified Emissions)	
Emissions which: • originate from the activities on the Premises arising from matters set out in, or incidental to the matters set out in, the ***General Description*** in Schedule 2; or • originate from the activities on the Premises arising from activities arising from a ***Material Change*** (except where Condition 4 applies).	Emissions excluded from General Emissions are: • ***unreasonable emissions***; or • emissions that result in, or are likely to result in, ***pollution, material environmental harm*** or ***serious environmental harm;*** or • discharges of ***waste*** in circumstances likely to cause ***pollution***; or • emissions that result, or are likely to result in, the ***discharge*** or abandonment of ***waste*** in water to which the public has access; or • emissions or discharges which do not comply with an ***approved policy***; or • emissions or discharges which do not comply with prescribed standard; or • emissions or discharges which do not comply with the conditions in an ***implementation agreement or decision***; or • emissions or discharges the subject of offences under regulations prescribed under the EP Act, including materials discharged under the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.

Information

18. The ***Licensee*** must maintain accurate and auditable records in relation to:

(a) the calculation of fees payable in respect of this ***Licence***; and

(b) any ***Material Change***.

19. If an ***emission*** type referred under ***Condition 15*** occurs on the ***Premises***, then the ***Licensee*** must:

(a) investigate why the ***emission*** occurred;

(b) take all reasonable steps to prevent the ***emission*** occurring again;

(c) record the details of the investigation and all steps taken; and

(d) provide a copy of the record to the ***CEO*** within 21 days of the date ***Licensee*** became aware that the ***emission*** had occurred.

20. The ***Licensee*** must record the number and details of any complaints received by the ***Licensee*** relating to the ***Premises***, and any action taken by the ***Licensee*** in response to the complaint. Details of complaints must include:

(a) an accurate record of the concerns or issues raised, for example, a copy of any written complaint or a written note of any verbal complaints made;

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

(c) the date of the complaint; and

(d) the details and dates of the actions taken by the ***Licensee*** in response to the complaints.

21. The ***Licensee*** must submit to the ***CEO*** within 30 days after the ***Anniversary Date***, a ***Compliance Report*** indicating the extent to which the ***Licensee*** has complied with the ***Conditions*** in this Licence for the ***Annual Period***.

22. The Licensee must submit to the ***CEO*** within 30 days after the ***Anniversary Date***, an Annual Environmental Report. The Annual Environmental Report must include:

(a) monitoring data required by any condition of this Licence;
(b) a comparison of the monitoring data against emission or discharge limits specified in any condition of this Licence;
(c) an assessment and interpretation of the monitoring data contained within the report against the previous 5 years monitoring results ; and
(d) a summary of complaints data recorded in accordance with Condition 20.

23. If the ***Licensee*** exceeds a limit specified in this licence, they must notify the ***CEO*** within 24 hours of becoming aware of the exceedance.

24. The ***Licensee*** must comply with a ***CEO*** Request, within 7 days from the date of the ***CEO Request*** or such other period specified in the ***CEO Request***.

Definitions and Interpretation

Definitions

In this Licence, the following terms have the following meanings:

Anniversary Date means 30 June of each year.

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.

Annual Period means a 12 month period commencing from 1 July until 30 June in the following year.

CEO for the purposes of notification means:

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

CEO Request means a request made by the ***CEO*** to the ***Licensee*** in writing, sent to the ***Licensee's*** address for notifications, as described at the front of this ***Licence***, in relation to:

(a) information, records or reports in relation to specific matters in connection with this ***Licence*** including in relation to compliance with any ***Conditions*** and the calculation of fees (whether or not a breach of condition or the EP Act is suspected); or
(b) reporting, records or administrative matters:
    (i) which apply to all ***Licences*** granted under the ***EP Act***; or
    (ii) which apply to specified categories of ***Licences*** within which this ***Licence*** falls.

Condition means a condition to which this ***Licence*** is subject under s 62 of the ***EP Act***.

Continuous means a data recovery rate of at least 90%.

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***.

Environmental Harm has the same meaning given to that term under the ***EP Act***.

EP Act means the *Environmental Protection Act 1986* (WA).

EP Regulations means the *Environmental Protection Regulations 1987* (WA).

General Description means the description of activities and operations carried out on the Premises as set out in Schedule 2 of this Licence.

Licence refers to this document, which evidences the grant of ***Licence*** by the ***CEO*** under s 57 of the EP Act, subject to the ***Conditions***.

Licensee refers to the occupier of the premises being the person to whom this ***Licence*** has been granted, as specified at the front of this ***Licence***.

Material Change means a change to the activities carried out on the ***Premises*** as described in the ***General Description*** set out in Schedule 2 and:

(a) that may result in an increased risk to public health, amenity or the environment; and

(b) includes the types of changes specified in Schedule 2; and

(c) does not include the excluded changes specified in Schedule 2.

Material Environmental Harm has the same meaning given to that term under the ***EP Act***.

NATA means National Association of Testing Authorities.

Pollution has the same meaning given to that term under the ***EP Act***.

Premises refers to the premises to which this ***Licence*** applies, as specified at the front of this ***Licence*** and as shown on the map in Schedule 1 to this ***Licence***.

Serious Environmental Harm has the same meaning given to that term under the ***EP Act***.

Unreasonable Emission has the same meaning given to that term under the ***EP Act***.

Waste has the same meaning given to that term under the ***EP Act***.

Interpretation

In this Licence:

(a) the words 'including', 'includes' and 'include' will be read as if followed by the words 'without limitation';

(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;

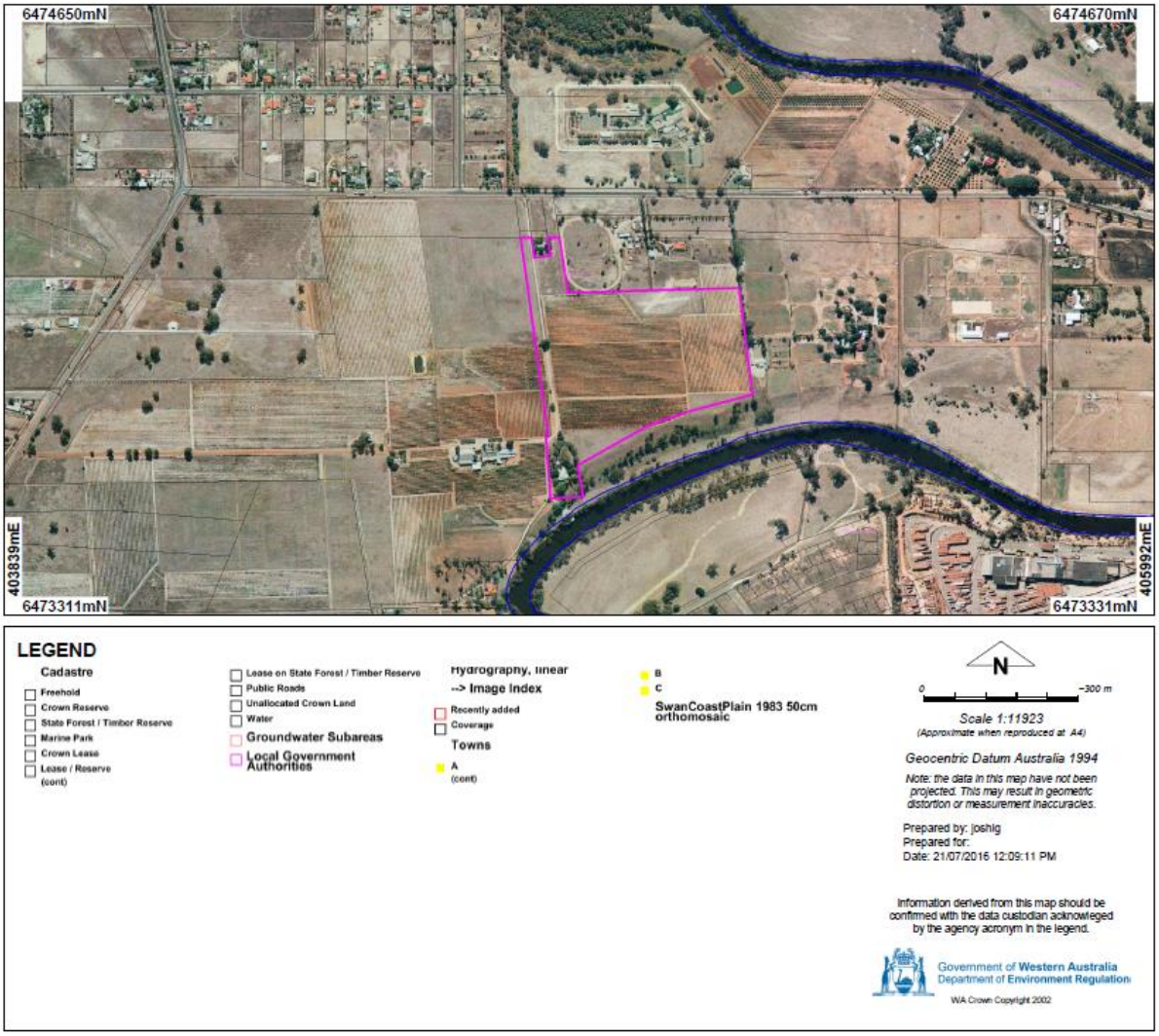
(c) where tables are used in a ***Condition***, each row in a table constitutes a separate ***Condition***; and

(d) any reference to an Australian or other standard, guideline or code of practice in this ***Licence*** means the version of the standard, guideline or code of practice in force at the time of granting of this ***Licence*** and includes any amendments to the standard, guideline or code of practice which may occur from time to time during the course of the ***Licence***.

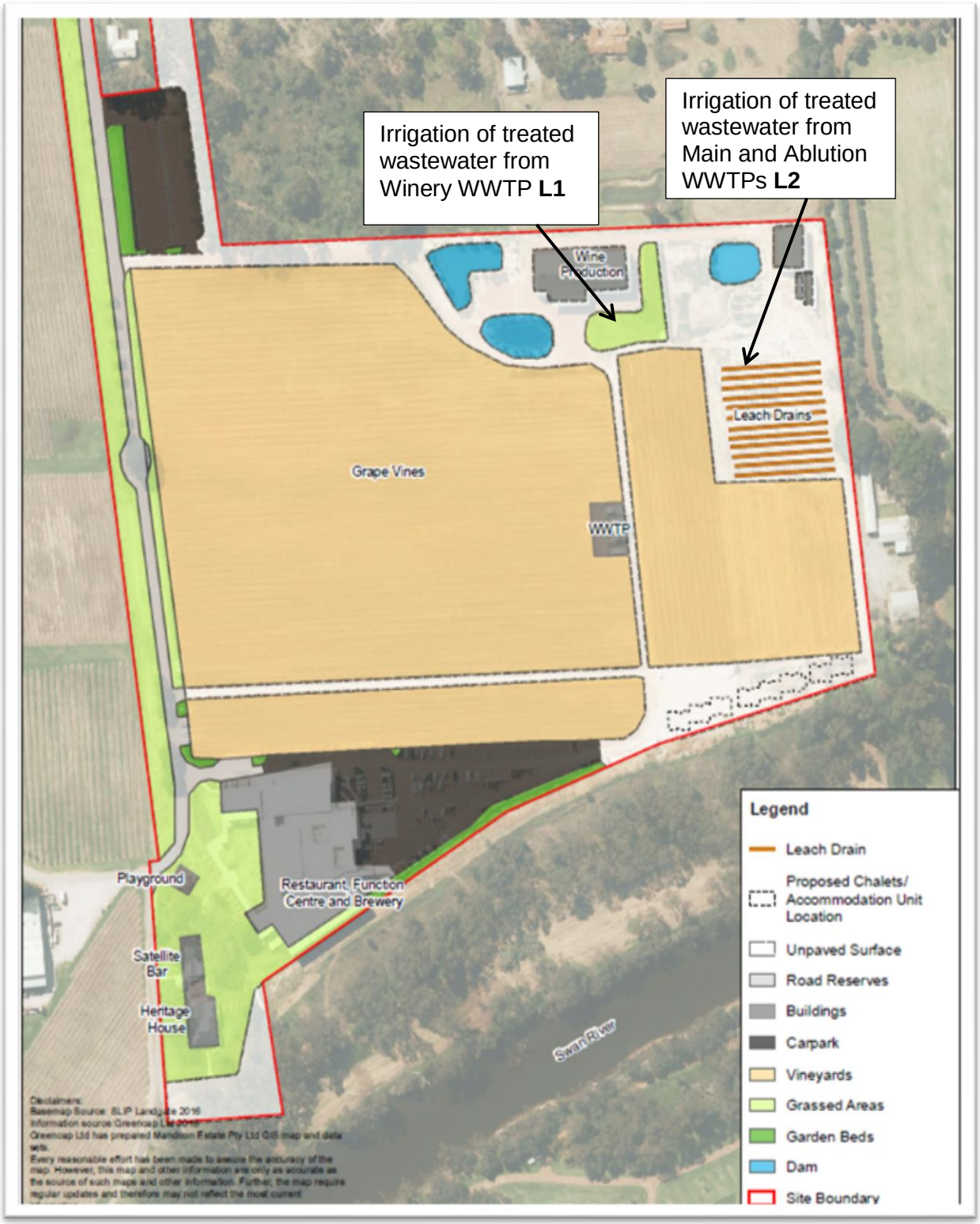
Schedule 1: Maps

Map 1: Premises Map

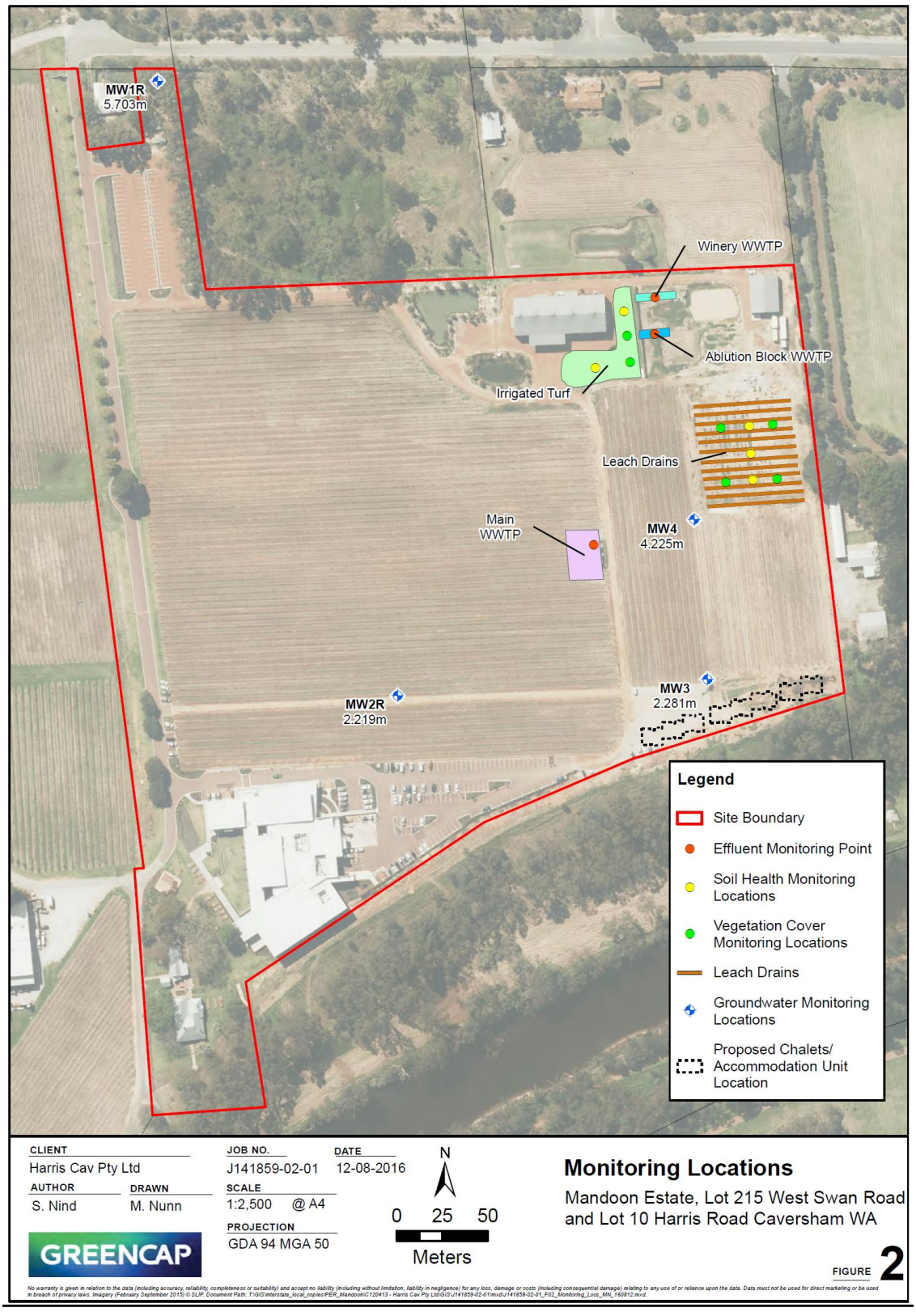
The ***Premises*** are shown in the map below. The pink line depicts the boundary to the ***Premises***.



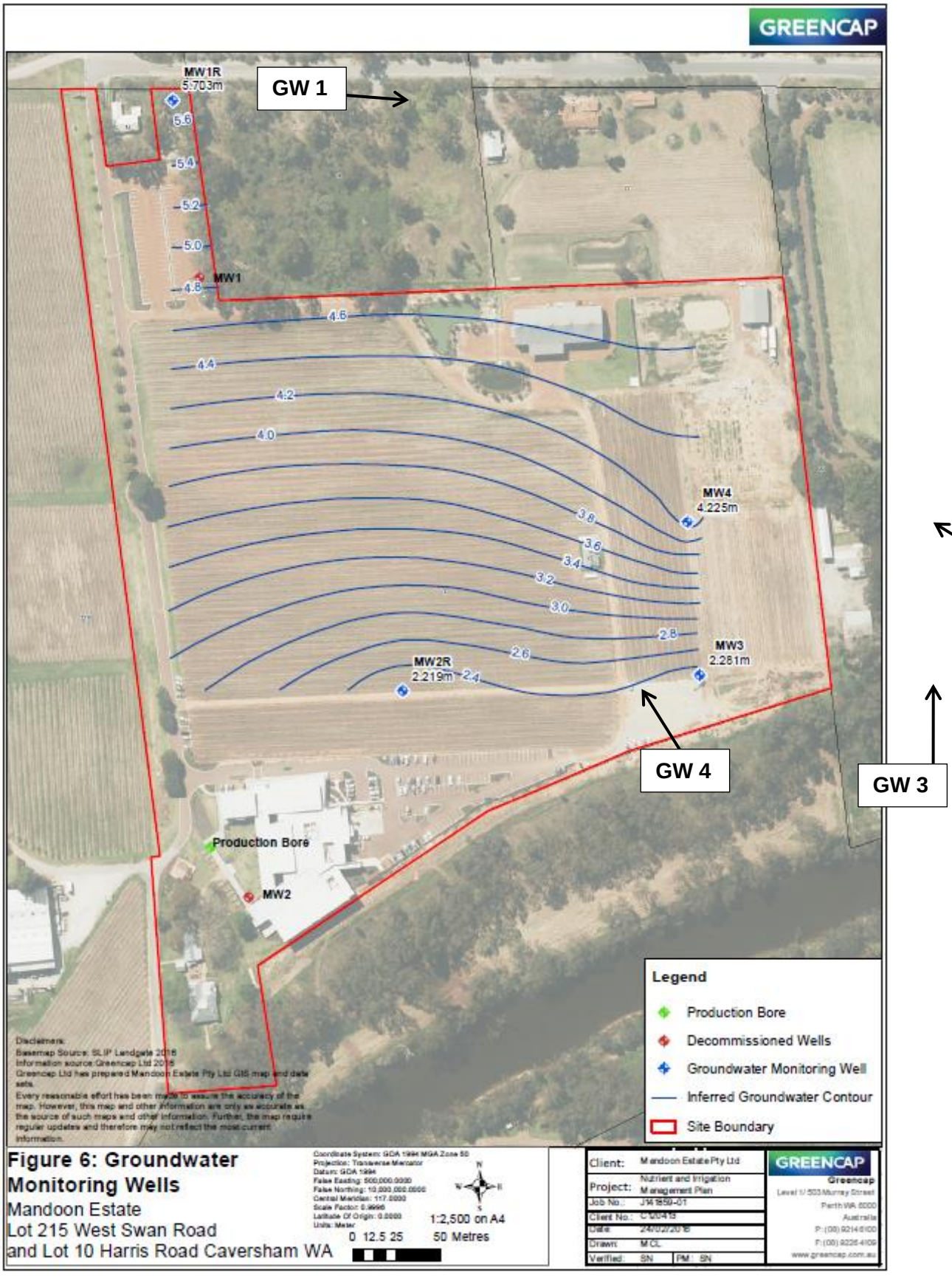
Map 2: Treated wastewater discharge locations map



Map 3: Treated wastewater monitoring locations map – Discharge via leach drains



Map 4: Groundwater Monitoring Locations Map



Schedule 2: General Description

At the time of assessment, the following activities and operations were considered in the determination of the risk and related conditions for the ***Premises***.

The ***Licensee*** is carrying out activities at the ***Premises*** which fall within the meaning of Prescribed ***Premises*** under the ***EP Act***. The ***Premises*** constitute Category 25 ***Premises*** on which alcoholic beverage (beer and wine) is manufactured and treatment and disposal of wastewater is undertaken.

The infrastructure and equipment situated on the ***Premises*** are detailed below.

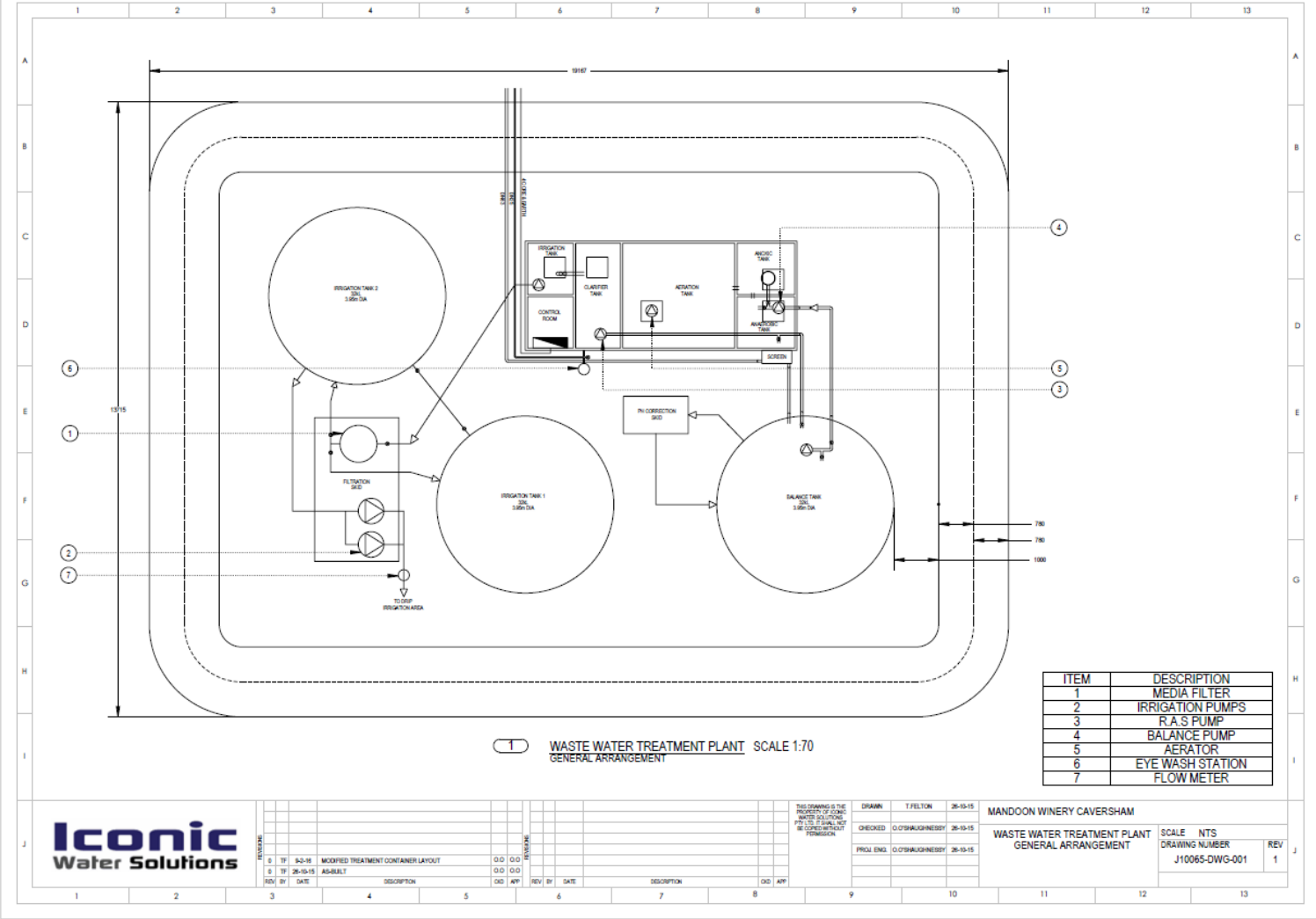
	Infrastructure	Plan reference
1	**Brewery Infrastructure:**	Map 6 Schedule 2
	Hopper above a compact malt mill : 400 kg capacity	
	Chain elevator for transfer of milled barley and wheat to the grist case	
	Grist case, for storing milled grain before mashing	
	Dual purpose tank (2200 L capacity), used as the mash tun (for mashing the milled grain with water)	
	kettle (for boiling the mash)	
	Two separate tanks each with a Lauter tun overhead (2200 L capacity), and whirlpool beneath (2200 L capacity)	
	Fermenter tanks (6 x 5000 L)	
	Bright beer tank (4000 L tank)	
	Auxiliary infrastructure including cold water tank for the heat exchange process, hot water tank and 'clean in place' tank system used for cleaning inside the process tanks.	
2	**Winery Infrastructure:**	Map 7 Schedule 2
	Crusher	
	Press, large cylinder to extracting juice from grape skins and stems	
	6x red fermenter tanks	
	6x 2500 L tanks, general purpose	
	12x 5000 L storage tank	
	6x 10,000 L storage tank	
	4x 7800 L storage tank	
	Brine or cooling tank	
	Auxiliary infrastructure including laboratory, for analysis of grape juice and wine.	
3	**Main WWTP** *Bardenpho Biological Nutrient Removal System which has the capacity to treat up to 30kL per day*	Map 4 Schedule 2
	Balance tank (32 kilolitres) and pH correction skid	
	Five stage Bardenpho wastewater treatment unit comprising: Screening, Anoxic tank, Anaerobic tank, Aeration Tank, Clarifier tank and Irrigation Tank	
	Irrigation Tanks x2 (32 kilolitres each)	
	Filtration skid	
4	**Winery WWTP** Four-phase *Aquarius O-3 Alternative Treatment*	Map 10 Schedule 2

	Infrastructure	Plan reference
	Unit (ATU) with a design capacity to treat a maximum hydraulic load of 10kL per day	
	Primary 7,000L untreated effluent tank	
	Secondary 3,000L untreated effluent tank	
	Alum flocculent dosage system	
	Primary 1,800L aeration tank	
	Secondary 1,800L aeration tank	
	1,800L clarifying tank	
	1,800L ozonation/discharge tank	
5	**Ablution Block WWTP** Three-phase *Aquarius Alternative Treatment Unit (ATU) with a design capacity to treat a maximum hydraulic load of 1.8kL per day*	Map 9 Schedule 2
	1,800 L Primary Tank	
	1,800 L Secondary/Aeration tank	
	250 L Discharge Tank which ozonation pump	
6	Leach drains disposal area used for disposal of treated wastewater from Main WWTP and Ablution WWTP	Map 5 Schedule 2

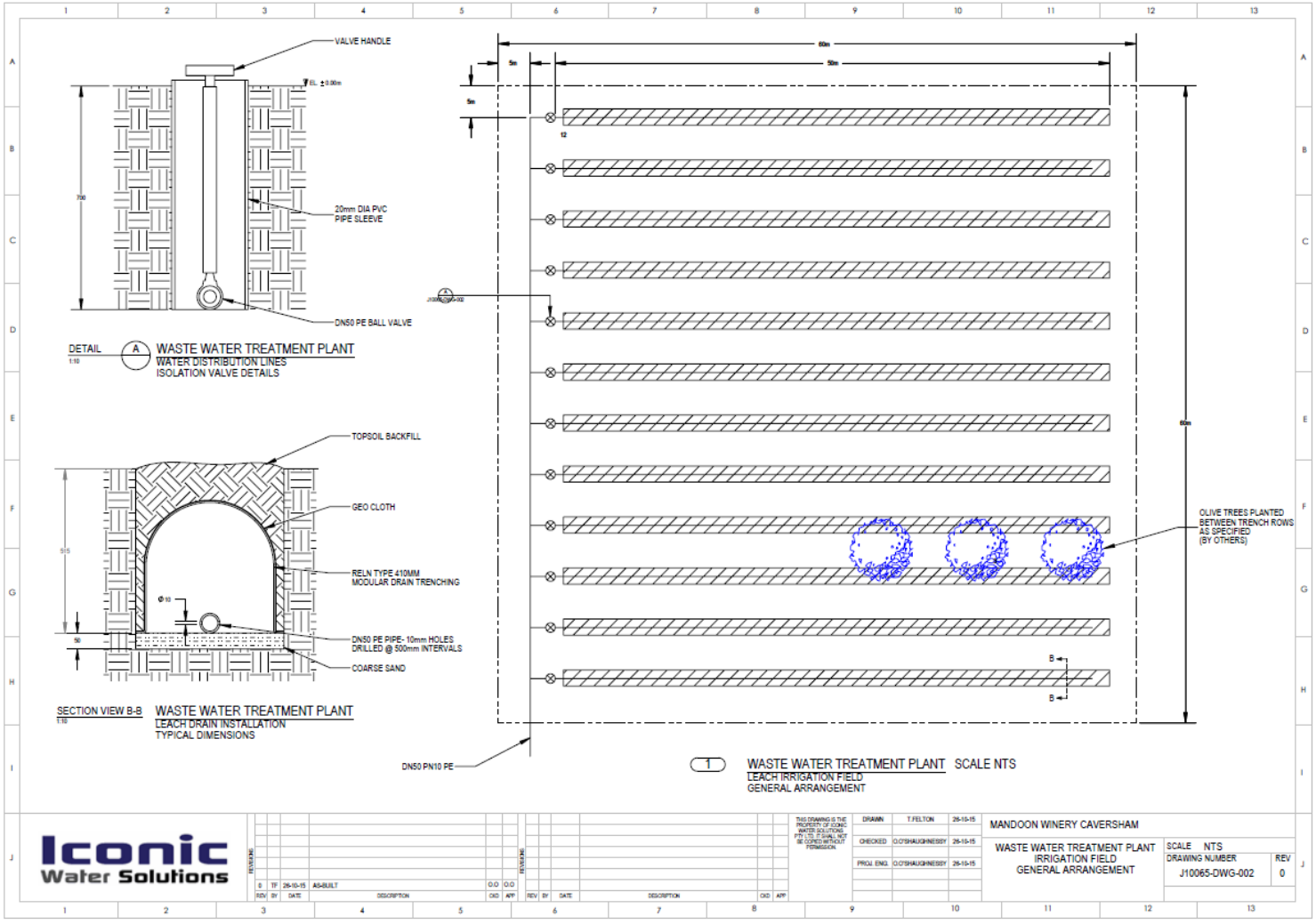
Site layout

The infrastructure and equipment are set out on the ***Premises*** in accordance with the site layout specified on Maps 1-4 Schedule 1 and Maps 5-7 Schedule 2.

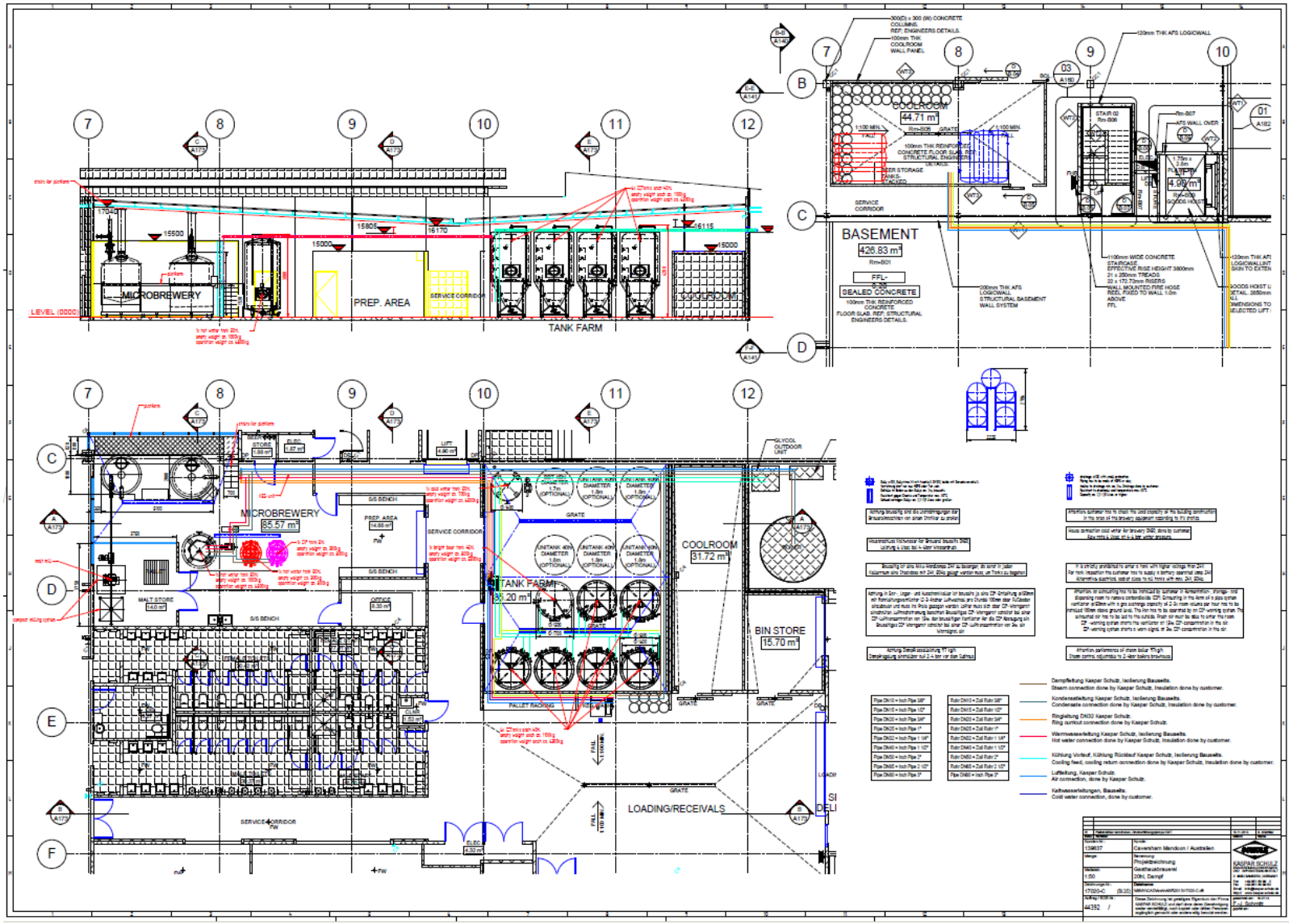
Map 5: Main WWTP layout



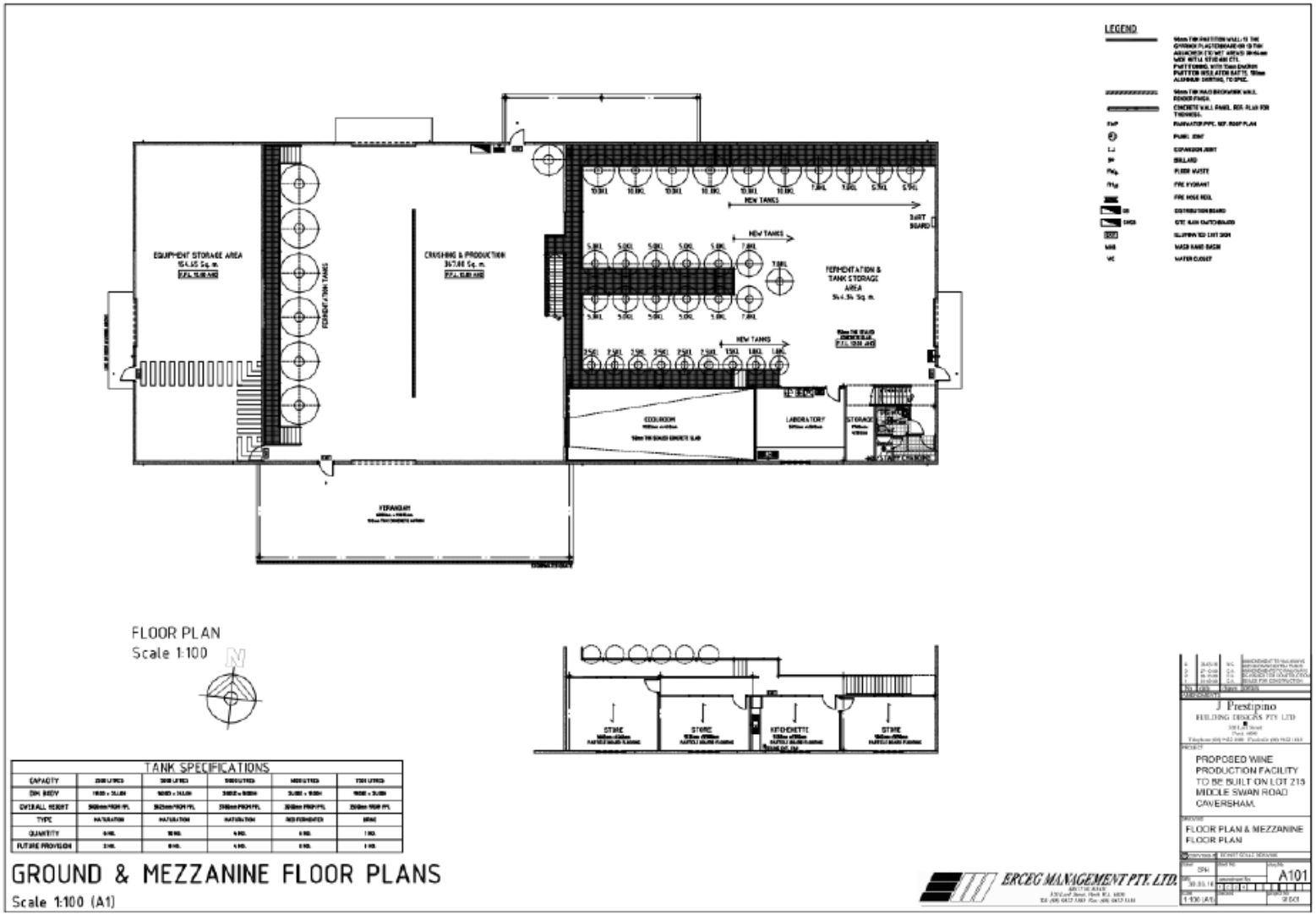
Map 6: Leach drains disposal area layout



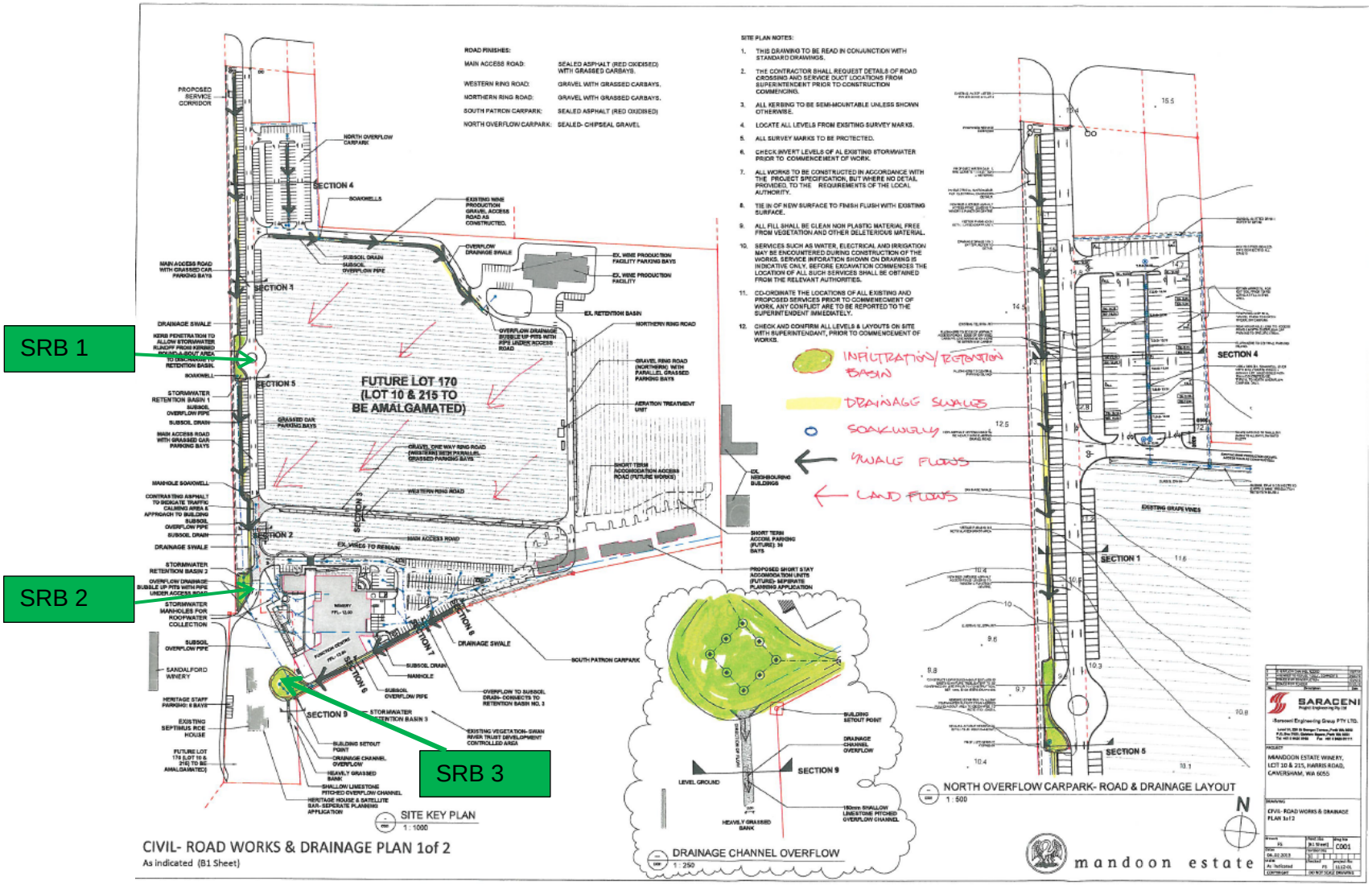
Map 7: Microbrewery infrastructure layout



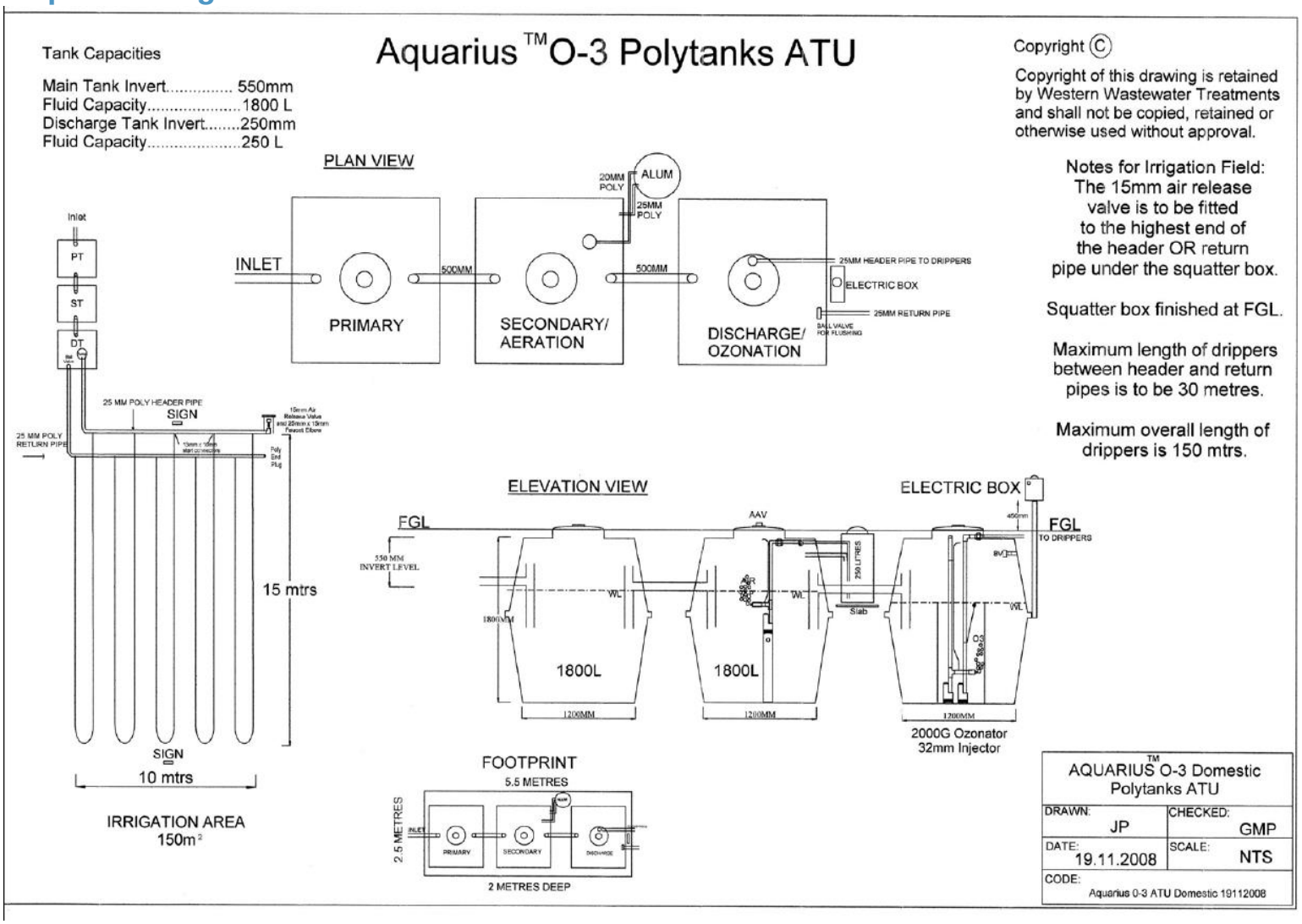
Map 8: Winery infrastructure layout



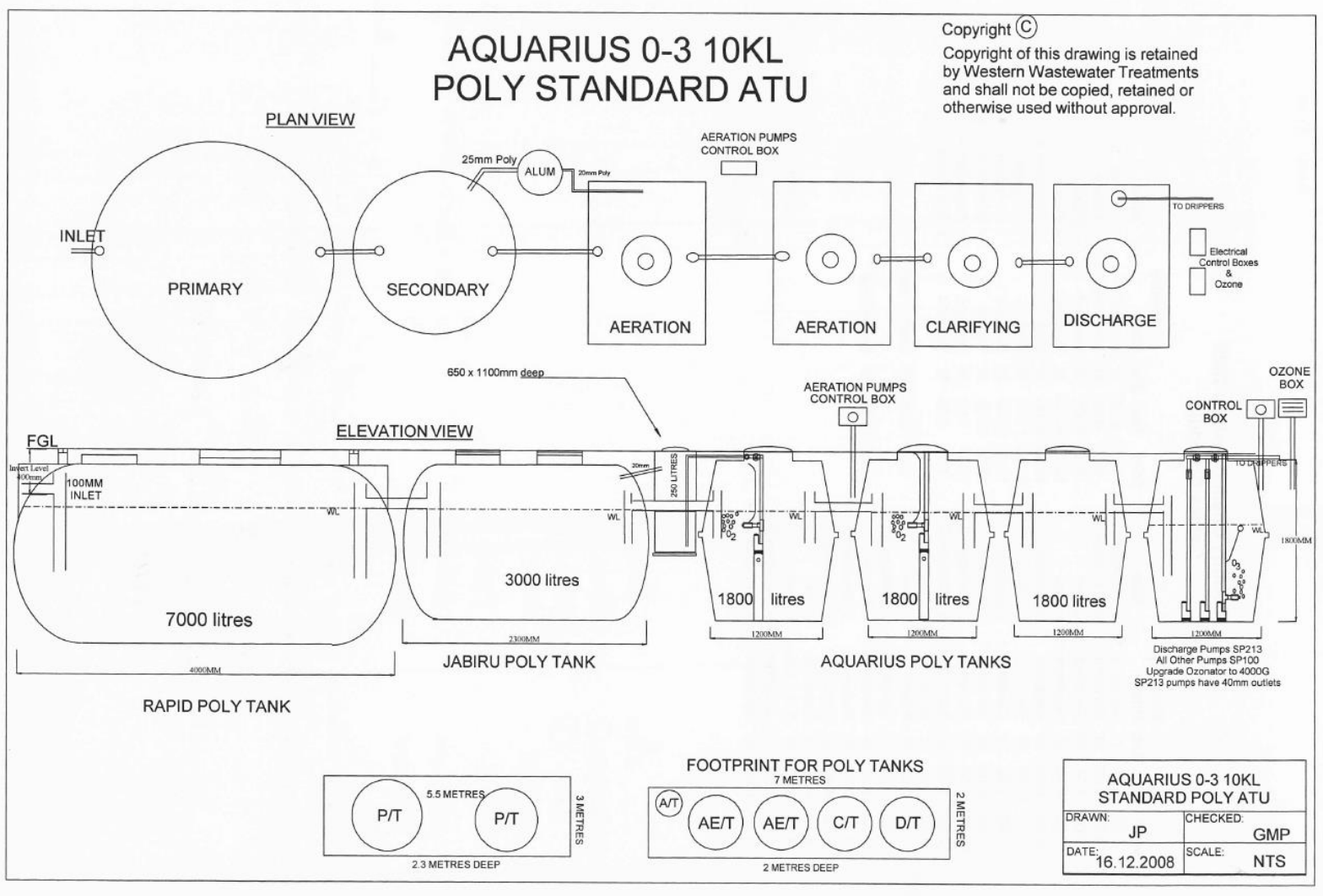
Map 9: Stormwater conveyance infrastructure including locations of stormwater retention basins (SRB) on the premises



Map 10: Design of Ablution Block WWTP ATU



Map 11: Design of Winery WWTP ATU



Decision Report

Application for Licence

Division 3, Part V *Environmental Protection Act 1986*

Applicant:	Harris Cav Pty Ltd
ACN:	121 454 484
Licence Number:	L8972/2016/1
File Number:	DER2016/000669
Premises:	Mandoon Estate 10 Harris Road CAVERSHAM WA 6055 Lot 170 on Plan 62929 Certificate of Title Volume *2883* Folio *279*
Date of report:	26 August 2016
Status of Report	Final

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Definitions of terms and acronyms

Term	Definition
Category/Categories (Cat.)	Categories of prescribed premises described in Schedule 1 of the EP Regs
DER	Department of Environment Regulation
EP Act	means the *Environmental Protection Act 1986*
EP Regs	means the *Environmental Protection Regulations 1987*
Premises	As defined in the EP Act. Means residential, industrial or other premises of any kind whatsoever and includes land, water, and equipment
Prescribed Premises	Premises of the types listed in Schedule 1 of the EP Regs.

1. Purpose and Scope of Assessment

Harris Cav Pty Ltd has operated Mandoon Estate, a winery located in the Swan Valley, since 2010. Works Approval W4816/2010/1 was granted on 25 July 2011, and subsequently amended on 20 March 2014, for the construction of a brewery and associated wastewater treatment facility on the site. Construction of the brewery, wastewater treatment facility, and other works including a function centre, accommodation, and satellite bar was completed in October 2015. On 3 May 2016, Harris Cav Pty Ltd applied for a licence to undertake alcoholic beverage manufacturing and wastewater treatment activities on the site.

This Decision Report presents an assessment of potential environmental and public health risks from emissions and discharges from these activities.

2. Background

Mandoon Estate Pty Ltd is a subsidiary of Erceg Management Pty Ltd and is involved in viticulture and hospitality. Mandoon Estate (the Site) is managed by Mandoon Estate Pty Ltd. The land that the Premises occupies is owned by Harris Cav Pty Ltd, part of the Caversham Property Syndicate.

The Premises was purchased by Erceg Management in 2008, with a commercial winery being established in 2010. Infrastructure constructed at this time included a wine manufacturing building and two wastewater treatment plants, one servicing the winery and the other servicing the ablution facilities used by staff.

Expansion of Mandoon Estate to include a brewery was planned in 2011. Works Approval W4816/2010/1 was granted on 25 July 2011 for the construction of the brewery and associated wastewater treatment plant. Construction of these works was completed in October 2014. Although a compliance document was required to be provided to DER as part of the works approval, this document was not submitted.

On 3 May 2016, Harris Cav Pty Ltd submitted a licence application to undertake alcoholic beverage manufacturing and wastewater treatment activities on the Mandoon Estate premises. The premises has been operational prior to this licence application being received. As part of the licence application, a compliance document and an updated Nutrient Irrigation Management Plan were submitted.

Table 1 describes the prescribed premises categories applicable to the premises.

Table 1: Prescribed Premises categories

Classification of Premises	Description	Production for Preceding Year	*Schedule 1 Category Threshold*
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.	584 kL/ year	*350 kilolitres or more per year*
85	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.	41.23m^3/day	*More than 20 but less than 100 cubic metres per day*

3. Overview of premises

3.1 Infrastructure

Mandoon Estate consists of a wine production facility, brewery, function centre, restaurant and satellite bar, together with three functioning wastewater treatment plants (WWTPs). The Main WWTP treats waste water from the function centre, restaurant, kitchen, satellite bar and brewery. Treated wastewater from the Main WWTP is discharged into a network of leach drains. The wine production facility uses a separate WWTP to treat waste water generated by the wine production process. The third WWTP treats sewage from the staff ablution block. The treated wastewater from both the Winery WWTP and the Ablution Block WWTP is combined and used for irrigating lawn adjacent to the wine manufacturing facility.

Infrastructure relating to Category 25 and 85 activities is detailed in Table 2. Information has been summarised from the application documents.

Table 2: Prescribed Premises categories

	Infrastructure
	Prescribed Activity: Category 25 - Brewery
Beer is manufactured on the premises from Grist (barley and wheat), hops, yeast, and apple juice. Beer is carbonated and stored in 50L steel kegs for distribution or sale. The premises currently produces 154 kL per year of beer and cider and has the capacity to increase up to 384 kL per year. Solid waste generated in the process includes spent grains. Wastewater generated in the brewery is treated in the Main WWTP.	
1	Hopper above a compact malt mill: 400 kg capacity
2	Chain elevator for transfer of milled barley and wheat to the grist case
3	Grist case, for storing milled grain before mashing
4	Dual purpose tank (2200 L capacity), used as the mash tun (for mashing the milled grain with water)

	Infrastructure
5	Kettle (for boiling the mash)
6	Two separate tanks each with a Lauter tun overhead (2200 L capacity), and whirlpool beneath (2200 L capacity)
7	Fermenter tanks (6 x 5000 L)
8	Bright beer tank (4000 L tank)
9	Auxiliary infrastructure including cold water tank for the heat exchange process, hot water tank and 'clean in place' tank system used for cleaning inside the process tanks
	Prescribed Activity: Category 25 Main WWTP
Wastewater generated from the brewery is treated in the Main WWTP (assessed under W4816). The Main WWTP is a five-stage Bardenpho Biological Nutrient Removal System which has the capacity to treat up to 30kL per day. The Main WWTP also receives wastewater from the function centre, restaurant, wine tasting facility, tavern, staff usage, heritage house and satellite bar. Treated wastewater is discharged via leach drains on site. Solid waste from the Main WWTP is removed monthly and taken offsite for disposal.	
1	Balance tank (32 kL) and pH correction skid
2	Five stage Bardenpho wastewater treatment unit comprising: Screening, Anoxic tank, Anaerobic tank, Aeration Tank, Clarifier tank and Irrigation Tank
3	Irrigation Tanks x2 (32 kL each)
4	Filtration skid
	Prescribed Activity: Category 25 - Winery
Both red and white wine is manufactured on site. Although the manufacturing process varies for red and white wine, key stages include crushing of grapes (for white wine only), fermentation, the addition of sulfur dioxide solution as a preservative, and the addition of bentonite clay to settle out proteins. The wine is filtered and bottled on site for sale or distribution. The premises currently produces 150 kL per year of wine and has the capacity to increase up to 200 kL per year. Solid waste generated in the process includes marc (grape skins and stems) and lees (sediments comprising grape particles, sugar, alcohol, bentonite clay, potassium bitartrate, sulphur, yeast, grape juice and wine). Wastewater generated in the wine manufacturing facility is treated in the Winery WWTP.	
1	Crusher
2	Press, large cylinder to extracting juice from grape skins and stems
3	6x red fermenter tanks
4	6x 2500 L tanks, general purpose
5	12x 5000 L storage tank

	Infrastructure
6	6x 10,000 L storage tank
7	4x 7800 L storage tank
8	Brine or cooling tank
9	Auxiliary infrastructure including laboratory, for analysis of grape juice and wine.
	Prescribed Activity: Category 25 Winery WWTP
Wastewater generated from the wine manufacturing process is treated in the Winery WWTP. An Aquarius O-3 Aerobic Treatment Unit (ATU) with a design capacity of 10kL per day is used. The treated wastewater is irrigated to lawn. Sludge is removed periodically from the site by a licensed waste removal contractor.	
1	Primary 7,000L untreated effluent tank
2	Secondary 3,000L untreated effluent tank
3	Alum flocculent dosage system
4	Primary 1,800L aeration tank
5	Secondary 1,800L aeration tank
6	1,800L clarifying tank
7	1,800L ozonation/discharge tank
	Contributory Activity: Category 25 Ablution Block WWTP
Wastewater from the staff ablution block, including showers and toilets, is treated in the Ablution Block WWTP. This WWTP uses an Aquarius O-3 Aerobic Treatment Unit (ATU) with a design capacity of 1.8kL per day. Treated wastewater is disposed of in the same irrigation system as the Winery WWTP. The emissions from the Ablution Block WWTP are considered a contributory activity to category 25 as the WWTP uses the same wastewater disposal infrastructure as the Winery WWTP.	
1	1,800 L Primary Tank
2	1,800 L Secondary/Aeration tank
3	250 L Discharge Tank which ozonation pump

3.2 Operational Aspects

Mandoon Estate consists of a wine manufacturing facility, brewery, function centre, restaurant, kitchen, satellite bar and three wastewater treatment plants.

3.2.1 Brewery

The brewery uses barley, wheat, hops, yeast and apple juice to manufacture beer using standard manufacturing techniques. Grains are milled on site, mixed with water and other substances, and then heated to aid fermentation. Subsequent to filtering, the beer is cooled, carbonated, and stored in 50L steel kegs for distribution or sale.

Water used in the beer manufacturing process is sourced from the existing Water Corporation scheme system; electricity is sourced from the grid.

Wastes generated by the beer manufacturing process are:

- Wastewater: approximately 1,440 kL per year containing yeast, hops and protein solids, beer, cider, caustic cleaning chemicals, phosphoric and peracetic acids;
- Spent grain: approximately 32.4 tonnes per year; and
- Carbon dioxide: produced by the fermentation process and vented to atmosphere.

Wastewater generated by the brewery is collected by a gravity sewer system and is pumped to the Main WWTP by several duty wastewater pump stations. The Main WWTP uses a five-stage Bardenpho wastewater treatment unit in which wastewater enters the system through a screen to remove unwanted inorganic material. Organic matter is initially broken down using activated sludge treatment, followed by anaerobic and anoxic treatments to convert nitrogenous compounds. Aeration and clarification are finally used to treat the wastewater. The treated wastewater is transferred to two irrigation tanks in which further treatment (flocculation) may be conducted to remove any remnant biological material. The treated wastewater is pumped periodically to the leach drain system which consists of 600m of trench with a coarse sand bed and modular drain trenching.

The Main WWTP also accepts wastewater from the function centre, restaurant and satellite bar. A total of 30,740 L/day may be treated, with actual volumes depending on the daily production, number of functions and restaurant usage; highest flow is expected during December to March.

Sludge from the WWTP is removed on an ‘as necessary’ basis, with sludge removed at a greater frequency during December to March, the high traffic season of Mandoon Estate and vintage season.

The spent grains are stored in a designated waste receptacle with a lid to prevent emission of odours and access by vermin. Spent grain is collected typically within the week of storage by a local farmer as a livestock feed supplement, on an ‘as necessary’ basis.

3.2.2 Winery

Both red and white wine is manufactured on site. Although the manufacturing process varies for red and white wine, key stages include crushing of grapes (for white wine only), fermentation for two weeks (with yeast, tartaric acid, and diammonium phosphate), the addition of sulfur dioxide solution as a preservative, and bentonite clay for settling out proteins. Sediments are settled, and clean raw wine is skimmed off the top. Wines are blended, and additives such as skim milk or isinglass (obtained from swim bladders of fish) are added to remove bitterness and dryness. The wine is cold stabilized at $<0^{o}C$ for two to three weeks, filtered and bottled for sale/ distribution.

Water used in the process is sourced from Water Corporation’s scheme system, and electricity is sourced from the grid.

Wastes generated by the wine manufacturing process are:

- Wastewater: includes water used for cleaning and wash down, and water collected in sumps in the facility floor;
- March solids: consisting of grape skins and stems; and
- Sediments: consisting of grape particles, sugar, alcohol, bentonite clay, potassium di-tartrate,

sulfur and yeast.

Wastewater generated from the wine manufacturing process (peak load of 10,000 L/day; a non-vintage load of 2,000 L/day) is treated in the Winery WWTP, which was not assessed under works approval W4816. An Aquarius O-3 Alternative Treatment Unit (ATU) with a design capacity of 10kL per day is used. The treated wastewater is combined with the treated wastewater from the Ablution Block WWTP and irrigated to lawn.

Sludge from the WWTP is removed by a licensed waste contractor.

Grape skins and stems are collected during the pressing process and stored in a designated waste area within a waste receptacle/ bin and disposed of offsite by a licensed contractor.

3.2.3 Ablution Block WWTP

Wastewater from the staff ablution block is treated in the Ablution Block WWTP, which was not assessed under works approval W4816. An Aquarius O-3 Alternative Treatment Unit (ATU) with a design capacity of 0.49kL per day is used. The treated wastewater is combined with the treated wastewater from the Winery WWTP and irrigated to lawn. The emission from the Ablution Block WWTP is considered to be a contributory activity for the purpose of this assessment.

4. Legislative Context

4.1 Contaminated Sites

The premises is not a reported contaminated site and is not subject to any remediation requirements under the *Contaminated Sites Act 2003*.

4.2 Planning Approval

Development approval DA-184/2009 for the winery including the wastewater treatment plant was issued from the City of Swan on 17 September 2009.

The Application Document also notes that wastewater treatment plant has received 'Approval in Principle' from the Department of Health on 11 April 2011.

4.3 Part V of the EP Act

4.3.1 Works Approvals

Works Approval W4816/2010/1 was granted on 25 July 2011 for the construction of the brewery and the associated Main WWTP. The Works Approval was amended on 20 March 2014 and expired on 24 July 2014.

Construction of the brewery, function centre, satellite bar and accommodation was completed in October 2014. The Main WWTP was constructed in October 2014, and leach drains were installed in October 2015. A compliance report, as required by condition 5.1.1 of the Works Approval, was not submitted at the completion of works. This document was submitted on 3 May 2016 as part of the Licence application. The premises has been operational prior to Harris Cav Pty Ltd submitting the licence application.

4.3.2 Variance with Works Approval W4816

The original proposal assessed under Works Approval W4816/2010/1 assessed emissions and discharges during operation of the Main WWTP. The Applicant had submitted a Nutrient Irrigation Management Plan (NIMP) at the time of the initial application which proposed irrigation of treated wastewater via drip irrigation.

During a scoping meeting between DER officers and representatives from Harris Cav Pty Ltd in January 2016, it was identified that a leach drain system had been installed rather than a drip irrigation system as originally proposed. Harris Cav Pty Ltd has submitted an updated NIMP with the Licence application which reviews acceptability of emissions and discharges associated with disposal of treated wastewater via leach drains. The updated NIMP also considers disposal of treated wastewater from the Winery WWTP and the Ablution WWTP.

Key Finding: The Delegated Officer has reviewed the information regarding the licence application and has determined that:

1. *the effect of the variance from the original proposal on emissions and discharges from the premises can be adequately assessed under existing scope of assessment of this Decision Report.*

4.3.3 Prescribed premises boundary

Works Approval W4816/2010/1 authorised the construction of the brewery and the Main WWTP. The prescribed premises boundary specified in the works approval did not include the wine manufacturing facility, Winery WWTP and Ablution Block WWTP which existed on site prior to the grant of the works approval.

It has been determined that the design capacity of beer and wine manufacturing facilities at the premises, both individual and cumulative, meet the Category 25 threshold specified in Schedule 1 of the EP Regulations. In accordance with DER's *Guidance Statement: Licensing and Works Approval processes*:

- the beer and wine manufacturing processes, operation of the Main WWTP (associated with the brewery) and Winery WWTP (associated with the winery) and disposal of treated wastewater to land are considered to be "primary activities" on the prescribed premises;
- the operation of the Ablution WWTP is considered to be a "contributory activity" as it uses the same wastewater disposal infrastructure as the Winery WWTP.

The prescribed premises boundary for the purpose of the licence has been updated to include all primary and contributory activities on the premises.

Key Finding: The Delegated Officer has reviewed the information regarding the licence application and has determined that:

1. *the prescribed premises boundary specified in the licence should include all primary and contributory activities undertaken on the premises.*

4.3.4 Compliance history check

The Applicant did not meet the conditions of Works Approval W4816/2010/1 by commissioning and operating the Main WWTP and brewery prior to submitting a Compliance Document, and by changing the method of disposal of treated wastewater from drip irrigation to disposal via leach drains.

This was considered by DER's Compliance and Enforcement functional area. It was determined that there was no evidence of environmental harm and that the licence application demonstrates operator and infrastructure controls necessary to manage environmental risks

associated with ongoing premises activities. No further action was considered necessary.

Key Finding: The Delegated Officer has reviewed the information regarding the compliance history and has found:

1. *the licence application adequately addresses variance from the original proposal assessed under Works Approval W4816/2010/1; and*
2. *the licence application has information required to undertake assessment of environmental risks of emissions and discharges associated with ongoing activities at the premises.*

4.3.5 Excluded activities under this assessment

The premises includes an existing tavern, function and pre-function centre, restaurant and wine tasting area, heritage house and satellite bar, and chalet accommodation, which are not prescribed activities. This Decision Report does not consider potential light or noise emissions associated with activities undertaken in these areas and from traffic movement. These are considered to be planning matters for consideration by the Local Government Agency (City of Swan).

5. Assessment of operator

DER's Incident and Complaints Management System (ICMS) is used to record complaints received and non-compliances requiring investigation. Following a review of ICMS, no records of a complaint received from a member of the public or business relating to activities at Mandoon Estate in the past 24 months were found.

Key Finding: The Delegated Officer has reviewed the information regarding the *assessment of operator* and has found:

1. *Activities onsite do not indicate any unacceptable amenity impacts over the past 24 months.*

6. Consultation

DER referred the application on 18 April 2016 to the City of Swan as the Delegated Officer considered that they have a direct interest in the application. The City of Swan advised that operation of the premises did not raise any concerns and that the City considered DER to be best placed to condition and monitor the site at Mandoon Estate.

DER also publically advertised the application in The West Australian newspaper and on the DER website on 18 April 2016. No submissions were received.

7. Location and Siting

7.1 Siting Context

The Mandoon Estate winery and beer manufacturing facility is located in the Swan Valley region, east of Perth. The Site is bound by Harris Road and rural properties to the north, rural

properties to the east, Sandalford Winery to the west, and the Swan River to the south. A remnant vegetation buffer exists to the south on the banks of the Swan River.

The premises occupies an area of 13.1 hectares (ha) and includes Septimus Roe House which is a heritage listed homestead, commercial wine and beer production facility, function centre, restaurant, satellite bar at the heritage building, and a 6.8 ha vineyard. The premises is located in an area zoned as 'Swan Rural' under the City of Swan Local Planning Scheme 17. The site layout, as included in the application, is indicated in Figure 1.

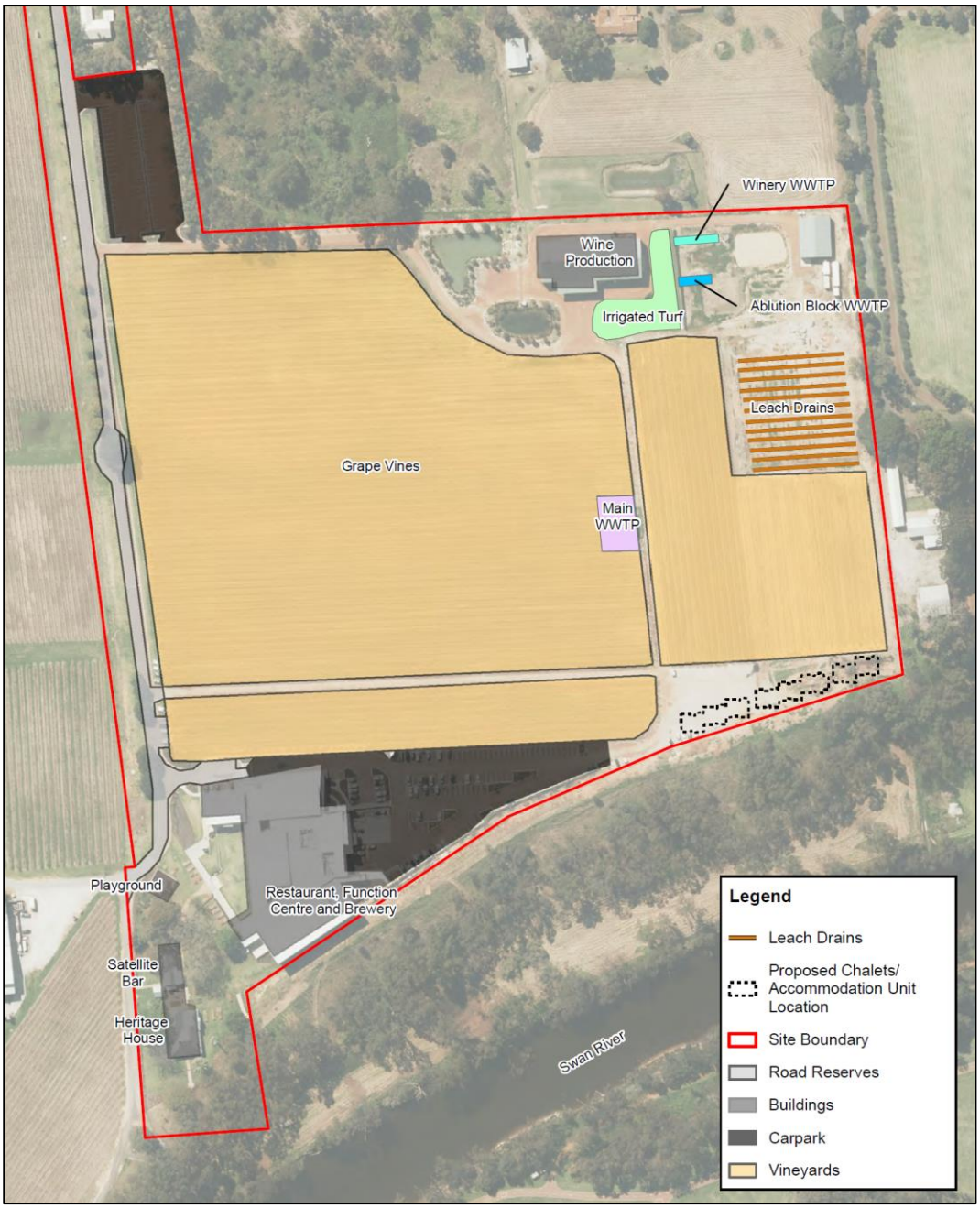


Figure 1: Site layout and location of treated wastewater irrigation areas

7.2 Residential and Sensitive Premises

The distance to residential and sensitive receptors is as follows:

Table 3: Receptors and distance from prescribed activity

Residential and Sensitive Premises	Distance from Prescribed Activity
Residential premises	220 m north of the wine manufacturing facility 354 m north of the brewery
Residential area	370 m north-west of the wine manufacturing facility 579 m south of the wine manufacturing facility 384 m south of the brewery
Other odour sensitive premises: • Bandyup Women's Prison	Approximately 290 m north of the wine manufacturing facility 574 m north of brewery
Other industrial receptors: • Sandalford Winery	Located adjacent to the west of the premises boundary

7.3 Specified Ecosystems

There are no surface water bodies on the premises. Ecosystems near the premises are described in Table 4 and Figure 2.

Table 4: Specified ecosystems

Specified ecosystems	Distance from Prescribed Premises
Swan River	Approximately 80m south from the premises boundary 82 m south of the beer manufacturing facility 312 m south of the wine manufacturing facility
Public Drinking Water Source Protection Area- Priority 2 and 3	Approximately 5km northwest and up-hydraulic gradient from the premises
Rights in Water and Irrigation Act 1914 (RIWI Act) proclaimed Swan groundwater area and surface water area	The premises is located within these areas

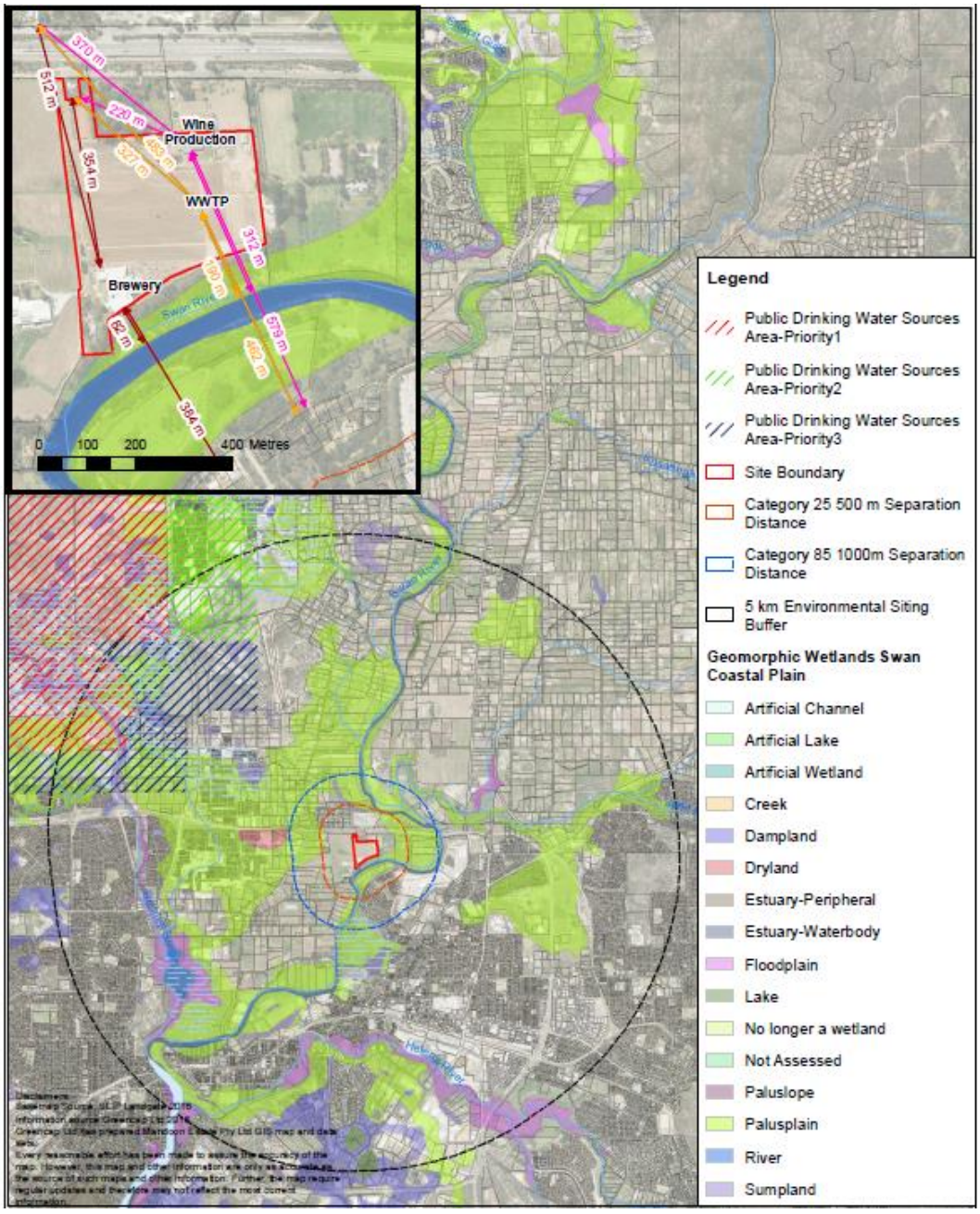


Figure 2: Location of specified ecosystems

7.4 Groundwater and water sources

A summary of the ground water sources and surface water sources in the vicinity of the site are presented in Table 5.

Table 5: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental Value
Groundwater	Local groundwater flow of south-south-easterly, with some south-westerly flow on the eastern side of the premises. Groundwater levels recorded at the monitoring bores on the premises vary between 7.7mbgl to 9.9 mbgl.	Used for irrigation and landscaping on the premises
Swan River	Approx. 80m south from the premises boundary	Agricultural and recreational use

7.5 Other site characteristics

Table 6: Other landscape features, relevant factors or receptors

Other receptors or areas of concern	Location
Remnant native vegetation	Located along the southern boundary of the prescribed premises

7.6 Soil Type

The soils beneath the site are generally categorised as clayey silt, which is detailed as yellow-brown to strong brown, variable clay content and of alluvial origin. The *Acid Sulphate Soil Risk Map, Swan Coastal Plain* indicates that the majority of the Site is not within a low to high-risk area. The application notes that there is a small area (~100 m^2) of high Acid Sulphate Soils (ASS) risk area present in the most southwest corner of the premises. The application notes that existing groundwater abstraction rates on the premises are not expected to impact the ASS.

The Applicant has undertaken Phosphorus Retention Index testing to investigate the ability of soils to limit leaching of phosphorus into the environment (groundwater). The application notes that soils in the area where leach drains have been installed have a PRI of 47.2 at a depth of 0.2m and can be classified as 'strongly absorbing' in accordance with *Methods for Analysis of Phosphorus in Western Australian Soils, Report on Investigation No. 37, Chemistry Centre.*

7.7 Meteorology

7.7.1 Wind direction and strength

A wind rose generated using meteorological data from Perth Airport is presented below in Figure 3. This shows the annual wind rose based on the five-year average annual wind direction and strength. It is important to note that this wind rose shows historical wind speed and wind direction data at the Perth airport weather station and should not be used to predict future data at the site.

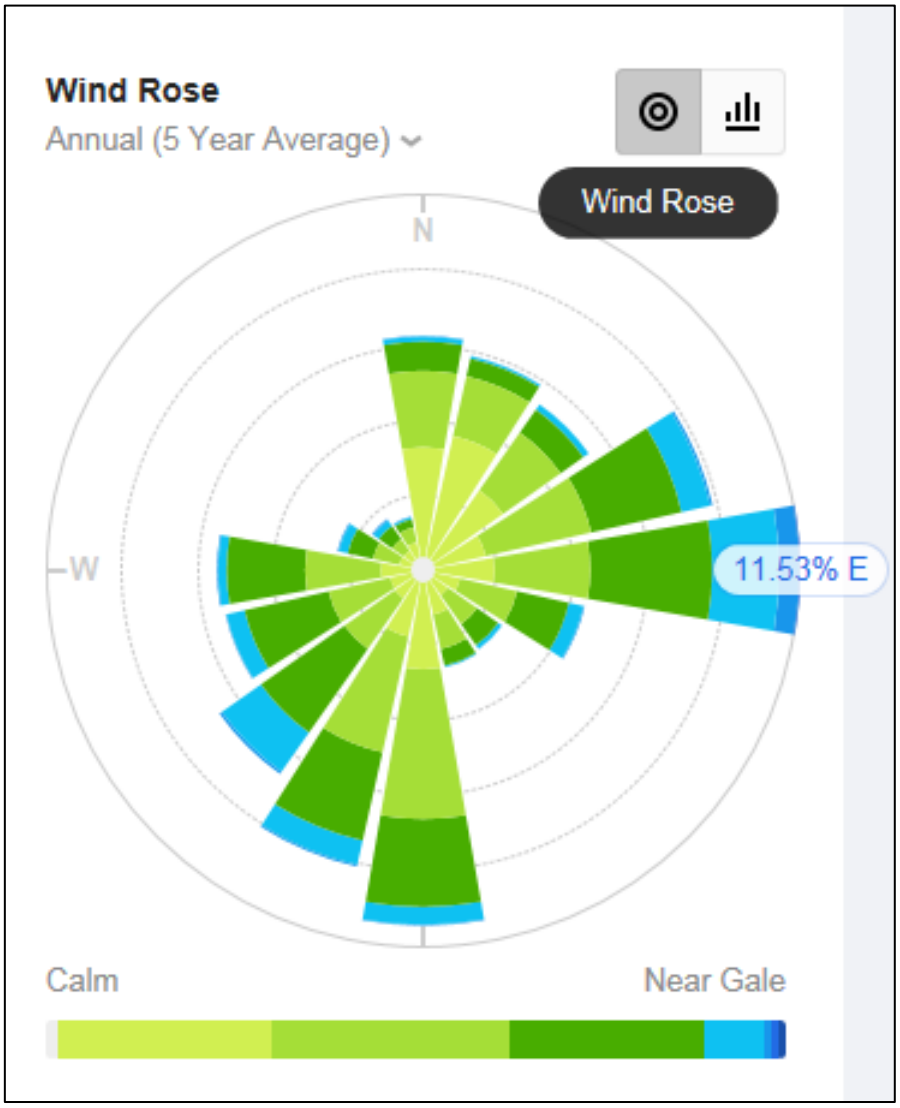


Figure 3: Windrose, Perth Airport based on 2011-2016 annual average
(Sourced from wind.willyweather.com.au on 15 July 2016)

7.7.2 Rainfall and temperature

The closest Bureau of Meteorology monitoring station is located at Perth Airport. The average rainfall, temperature and evaporation data is presented in Figure 4.

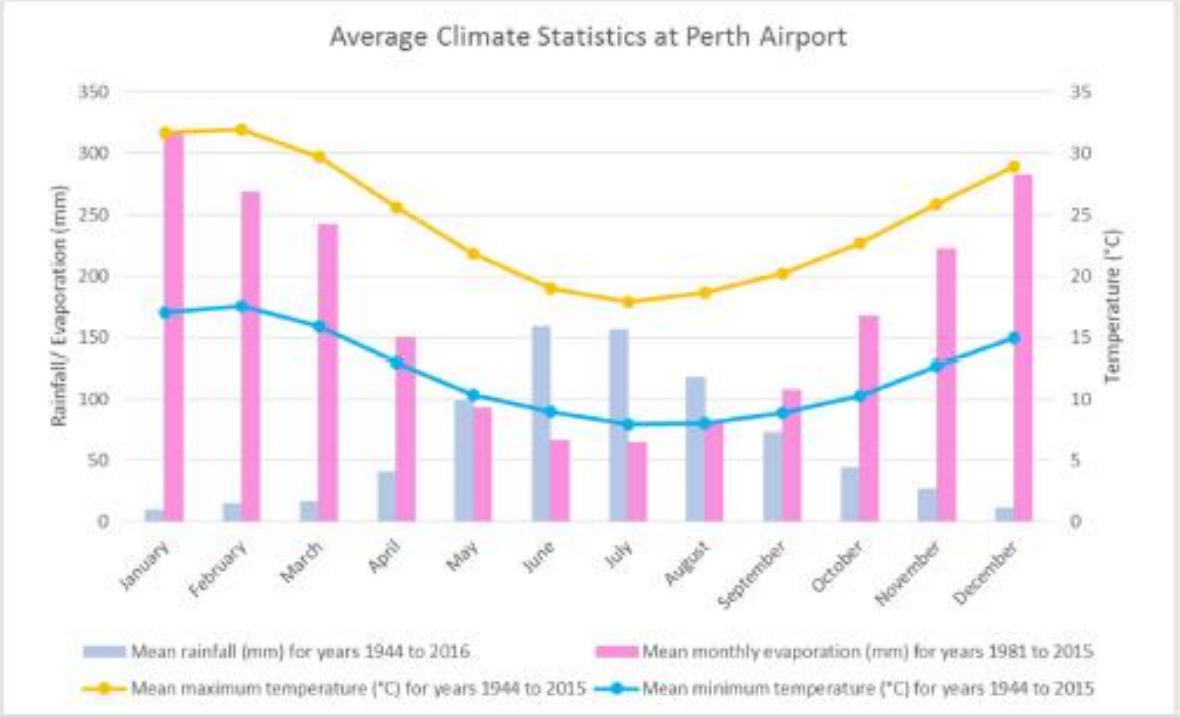


Figure 4: Local rainfall and temperature data

8. Risk Assessment

8.1 Emission, pathway, receptor identification

Identification of key potential emissions, pathways, receptors and impacts are set out in Table 7 below. Table 7 also identifies which potential emissions and impacts will be progressed to a full risk assessment. Some potential emissions/impacts may not receive a full risk assessment if a potential receptor or pathway cannot be identified.

Table 7: Identification of key emissions

			Potential Emission	Potential Receptor	Potential Pathway	Potential Impacts	Continued to detailed risk assessment?	Reasoning
Source (See Section 4 for infrastructure requirements)	***Beer and wine manufacturing***	*Manufacture of beer and wine*	*Fugitive emissions to air (VOCs) from fermentation process*	*Community/ residential receptors*	*Air/ wind dispersion*	*Potential amenity (odour)*	*Yes* *(see section 8.4)*	*Receptor proximity; receptors are less than 500m away from the premises boundary*
			Noise emissions associated with handling, transportation of goods, operation of the fermenting plant and equipment	*Community/ residential receptors*	*Air/ wind dispersion*	*Potential amenity/ health impacts*	*Yes*	*Receptor proximity.*
		Storage/ handling of solid wastes	*Odour*	*Community/ residential receptors*	*Air/ wind dispersion*	*Potential amenity impacts*	*Yes*	*Receptor proximity.*
			Emissions to land (nutrients leaching to groundwater)	*Groundwater, Swan River*	*Seepage through soil.* *Indirect impact on water quality due to groundwater flow direction*	*Groundwater contamination.* *Surface water contamination, potential for eutrophication*	*Yes*	*Natural groundwater flow is towards Swan River (less than 80m from the premises.* *Groundwater depth varies between 7-9mbgl.*

			Potential Emission	Potential Receptor	Potential Pathway	Potential Impacts	Continued to detailed risk assessment?	Reasoning
			Emissions to stormwater	*Swan River*	*Indirect impact on water quality due to contaminated stormwater discharge*	*Surface water contamination, potential for eutrophication*	*Yes*	*Natural groundwater flow is towards Swan river which is less than 80m away from the premises* *Groundwater depth varies between 7-9mbgl*
	Waste Water Treatment	*Treatment of wastewater*	*Odour*	*Community/ residential receptors*	*Air/ wind dispersion*	*Potential amenity impacts*	*Yes*	*Receptor proximity.*
			Noise	*Community/ residential receptors*	*Air/ wind dispersion*	*Potential amenity impacts*	*Yes*	*Receptor proximity.*
		Storage/ handling of sludge from WWTP	*Odour*	*Community/ residential receptors*	*Air/ wind dispersion*	*Potential amenity impacts*	*Yes*	*Receptor proximity.*
			Emissions to land (nutrients leaching to groundwater)	*Groundwater, Swan River*	*Seepage through soil* *Indirect impact on water quality due to groundwater flow direction*	*Groundwater contamination* *Surface water contamination, potential for eutrophication*	*Yes*	*Natural groundwater flow is towards Swan River, less than 80m away from the premises* *Groundwater depth varies between 7-9mbgl*
			Emissions to stormwater	*Swan River*	*Indirect impact on water quality due to contaminated stormwater discharge*	*Surface water contamination, potential for eutrophication*	*Yes*	*Receptor proximity*
		Onsite disposal of waste water	*Emissions to land (nutrients leaching to groundwater)*	*Groundwater, Swan river*	*Seepage through soil* *Indirect impact on Swan river surface water quality on account of*	*Groundwater contamination* *Surface water contamination, potential for*	*Yes*	*Natural groundwater flow is towards Swan river which is less than 80m away from the premises.*

			Potential Emission	Potential Receptor	Potential Pathway	Potential Impacts	Continued to detailed risk assessment?	Reasoning
					groundwater flow direction	*eutrophication*		*Groundwater depth varies between 7-9mbgl*
			Emissions to stormwater	*Swan River*	*Indirect impact on water quality due to contaminated stormwater discharge*	*Surface water contamination, potential for eutrophication*	*Yes*	*Natural groundwater flow is towards Swan river which is less than 80m away from the premises* *Groundwater depth varies between 7-9mbgl*
	Bulk Storage of Chemicals	*Storage, handling of chemicals*	*Emissions to land*	*Groundwater, Swan River*	*Seepage through soil.* *Indirect impact on water quality due to groundwater flow direction.*	*Groundwater contamination* *Surface water contamination, potential for eutrophication*	*Yes*	*Natural groundwater flow is towards Swan river which is less than 80m away from the premises* *Groundwater depth varies between 7-9mbgl*
			Emissions to storm water	*Swan River*	*Indirect impact on water quality due to contaminated stormwater discharge*	*Surface water contamination, potential for eutrophication*	*Yes*	*Natural groundwater flow is towards Swan river which is less than 80m away from the premises* *Groundwater depth varies between 7-9mbgl*

8.2 Risk Criteria

During the assessment the risk criteria in Table 8 below will be applied to determine the risk ratings as set out in Section 8.4 to Section 8.7.

Table 8: Risk criteria

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the risk / opportunity occurring.		The following criteria has been used to determine the consequences of a risk occurring:		
			Public Health	Ecosystem/ Environmental
Almost Certain	The event is expected to occur in most circumstances	Severe	• Loss of life • Exposure to hazard with permanent prolonged adverse health effects expected to large population • Health criteria is significantly exceeded	• Irreversible impact to significant high value or sensitive ecosystem expected • Irreversible and significant impact on a wide scale • Total loss of a threatened species expected • Ecosystem criteria is significantly exceeded
Likely	The event will probably occur in most circumstances	Major	• Exposure to hazard with permanent prolonged adverse health effects expected to small population • Significant impact to amenity for extended periods expected to large population • Health criteria is exceeded	• Long-term impact to significant high value or sensitive ecosystem expected • Long-term impact on a wide scale • Adverse impact to a listed species expected • Ecosystem criteria is exceeded
Possible	The event could occur at some time	Moderate	• Exposure to hazard with short-term adverse health effects expected requiring treatment • Impact to amenity expected for short periods to large population • Health criteria is at risk of not being met	• Minor and short-term impact to high value or sensitive ecosystem expected • Off-site impacts at a local scale • Ecosystem criteria is at risk of not being met
Unlikely	The event is unlikely to occur	Minor	• Exposure to hazard with short-term adverse health effects expected • Impact to amenity expected for short periods to small population • Health criteria are likely to be met	• Moderate to minor impact to ecosystem component (physical, chemical or biological) • Minor off-site impacts at a local scale • Ecosystem criteria are likely to be met
Rare	The event may only occur in exceptional circumstances	Insignificant	• No detectable impacts to health • No detectable impacts to amenity • Health criteria met	• None or insignificant impact to ecosystem component (physical, chemical or biological) expected with no effect on ecosystem function • Ecosystem criteria met

8.3 Risk Treatment

DER will treat risks in accordance with the Risk Treatment Matrix below.

Table 9: Risk treatment

Risk Rating	Acceptability	Treatment
Extreme	Unacceptable.	Risks will not be tolerated. DER will refuse proposals.
High	Acceptable subject to primary and secondary controls.	Risks will be subject to multiple regulatory controls including primary and secondary controls. This will include both outcome-based and management conditions.
Moderate	Acceptable, generally subject to primary controls.	Risks will be subject to regulatory controls with a preference for outcome-based conditions where practical and appropriate.
Low	Acceptable, generally not requiring controls beyond the proponent's controls.	Risks are acceptable and will generally not be subject to regulatory controls.

8.4 Risk of Odour Emissions Impact Analysis

8.4.1 General Hazard Characterisation and Impact

Odour emissions from brewery operations are generally associated with wort boiling, maturation and fermentation vessels, brewery wastewater, leaks of coolant (ammonia), and storage of spent grains.

Odour emissions from wine manufacturing may arise from fermentation and storage of waste grape skins (marc/ lees etc.).

Other potential odour emission sources on the premises include the three WWTPs and temporary storage of sludge from these WWTPs prior to offsite disposal. Treated wastewater is discharged onsite via leach drains (Main WWTP) and by irrigation (Winery WWTP and Ablution WWTP). Higher biochemical oxygen demand (BOD) loads in inadequately treated wastewater may contribute to odour emissions.

The premises has been operational prior to the date of submission of the licence application. DER has no record of odour complaints associated with premises activities.

8.4.2 Criteria for Assessment

There are no set threshold or concentration criteria for odour assessment. Under section 49(5) of the EP Act, it is an offence to emit or cause to be emitted, an unreasonable emission from any premises. An unreasonable emission is defined in section 49(1)) of the EP Act as an emission of transmission of noise, odour or electromagnetic radiation which unreasonably interferes with the health, welfare, convenience, comfort or amenity of any person. The premises is located adjacent to Sandalford Winery which is also a prescribed premises. Odour emissions from these operations are likely to be similar in characteristics.

8.4.3 Assessment of Proponent Controls

Summary of operational control measures as per the application is included in Table 10 below.

Table 10: Proponent operational controls for odour emissions

Source	Summary of controls from application
Beer and wine manufacturing	• Beer manufacturing and wine manufacturing plant are located indoors. • Controlled release of gases will be scheduled during business hours and only during weekdays.
Solid waste disposal	• All spent grain waste from the brewery will be stored in containers, protected from adverse weather and vermin, and removed from site promptly. • Grape skins and stems from the winery will be stored in designated waste storage receptacles, and removed from the site by a licensed waste contractor as necessary. • The designated waste storage area is located away from areas of public use, so as not to cause a nuisance. • All personnel will be provided with training on waste management. • Monthly inspections of waste storage areas will be carried out.
Wastewater treatment plants	• WWTP units are completely enclosed, and odour emissions are only likely when servicing the system; • Wastewater will be treated to Class A treatment standard as per DoH Guidelines and regular monitoring will be undertaken to ensure excessive BOD loading is avoided in treated wastewater discharged on premises; • Regular maintenance of the treatment systems including removal of sludge; • Licensed waste contractor will remove the sludge from site; and • No solid waste will be applied onsite.

The application does not propose any specific infrastructure controls such as vapour condensing units to contain odorous volatile organic compounds associated with wort boiling, maturation, and fermentation vessels; however given the scale of operations and location of the brewery infrastructure inside enclosed buildings, this is considered acceptable.

8.4.4 Key Findings

The Delegated Officer has reviewed the information regarding the odour impacts from the premises and has found:

1. *Odour emissions from the premises have the potential to cause limited impact;*
2. *Operational controls implemented by the Applicant are satisfactory considering the scale of operations; and*
3. *The characteristics of odour emissions from the premises are expected to be consistent with established land use in the area (wineries and wastewater treatment).*

8.4.5 Consequence

Based upon operational controls at the premises, proximity of receptors, and surrounding land use, the Delegated Officer has determined that an odour impact to amenity by may be experienced for short periods by a small population.

Therefore, the Delegated Officer considers the consequence to be **Minor.**

8.4.6 Likelihood of Consequence

Based upon information provided in the application and operator controls, the Delegated Officer has determined that this minor consequence is unlikely to occur. Therefore, the Delegated Officer considers the likelihood to be **Unlikely**.

8.4.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above to the Risk Matrix (Table 8) and determined that the overall risk rating for an odour emissions impact on sensitive receptors during operation is ***Moderate.***

8.5 Risk of Noise Emissions Impact Analysis

8.5.1 General Hazard Characterisation and Impact

Noise is generated from normal operations at the premises including the operation of the beer/ wine manufacturing plant, handling, and transportation of goods, fermenting plant and equipment, pump stations and wastewater treatment plants.

As discussed in Section 0 of this document, residential and odour sensitive premises to the north of the facility are located approximately of 500m from the premises. Noise emissions from the premises may potentially have short term impact on the amenity of receptors if processes on site are not adequately managed.

The premises has been operational prior to the date of submission of the licence application. DER has no record of noise complaints associated with premises activities.

8.5.2 Criteria for Assessment

The applicant has not undertaken noise modelling or demonstrated that total sound power level for all sources on site during daytime and night time at sensitive receptors would be acceptable. Assigned noise levels as specified in *the Environmental Protection (Noise) Regulations 1997 (*EP (Noise) Regulations) are the applicable criteria for assessment.

8.5.3 Assessment of Proponent Controls

The Licensee has the following controls in place to reduce and manage noise emissions:

Table 11: Proponent controls for noise

Control	Description
Engineering	• All pump stations are housed within permanent structures below ground, with sound proofing installed on structures in the vicinity of the function centre; and • Fermenting plant equipment is installed inside a purpose built warehouse structures to contain noise emissions.
Operational	• Transportation of goods and traffic movement will be restricted to business hours; • All plant and machinery will be turned off when not in use; and • Equipment that is not compliant with EP (Noise) Regulations will be repaired or removed from the site.

Controls undertaken by the applicant are considered appropriate to manage noise emissions associated with primary, contributory and secondary activities on the premises. As detailed in Section 4.3.5, the DER risk assessment does not consider the potential impact of noise emissions from 'non-prescribed' activities on the premises.

8.5.4 Key Findings

The Delegated Officer has reviewed the information regarding the noise impacts from the premises and has found:

1. *Noise emissions from the premises have the potential to cause limited impact given the proximity of receptors;*
2. *Operational controls are satisfactory considering the scale of operations and noise emissions modelling is not required; and*
3. *The EP (Noise) Regulations are the appropriate regulatory tool to manage noise emissions from primary, contributory and secondary activities on the premises.*

8.5.5 Consequence

Based on information provided in the application and operator controls, the Delegated Officer has determined that noise emissions are not likely to have a detectable impact on health or amenity. Therefore, the Delegated Officer considers the consequence to be **Insignificant**.

8.5.6 Likelihood of Consequence

Based on information provided in the application and operator controls, the Delegated Officer has determined that the likelihood of an insignificant consequence is **Unlikely**.

8.5.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above to the Risk Matrix (Table 8) and determined that the overall risk rating for a noise emissions impact on sensitive receptors during operation is ***Low.*** The risks are deemed to be acceptable and will not be subject to additional regulatory controls.

8.6 Risk of Waste Water and Leachate on Groundwater Impact Analysis

8.6.1 General Hazard Characterisation and Impact

The premises operates three WWTPs which treat both brewery and winery wastewater, as well as black water from ablution facilities. Brewery and winery wastewater typically exhibits high biochemical oxygen demand (BOD) and chemical oxygen demand (COD) and has high nutrient concentrations (total nitrogen and total phosphorus). Wastewater from ablution facilities is expected to have high BOD, COD, total suspended solids and potentially high pathogen concentrations.

The premises is located within a RiWI Act proclaimed Swan groundwater area. Groundwater depth at the premises varies between 7.7 to 9.9 mbgl. Local groundwater flow is towards the Swan River, located approximately 80m from the premises boundary. Soils beneath the site are generally categorised as clayey silt with variable clay content. As discussed in Section 7.6, soils near the leach drains have been classified as having strongly absorbing PRI at a depth of 20cm.

Disposal of treated wastewater is conducted both by irrigation and discharge to leach drains constructed at a depth of 70 cm below ground level. Irrigation of wastewater at rates exceeding the PRI and the nutrient uptake capacity of vegetation can lead to leaching of nutrients (specifically nitrogen) to groundwater. Given the natural groundwater flow gradient and proximity of Swan River, groundwater contamination can lead to an indirect impact on surface water quality as well.

Emissions to land are also likely from solid waste storage/ handling and sludge storage activities on the site. Leachate from these areas is likely to contain high nutrient concentrations and can infiltrate through the soil to impact groundwater.

There are currently six groundwater monitoring bores on-site, two of which are decommissioned and four of which are operational (refer to Appendix 4).

8.6.2 Criteria for Assessment

The Department of Health's (DoH) *Guidelines for the Non-potable Uses of Recycled Water in Western Australia, August 2011* are considered appropriate assessment criteria to determine the acceptability of quality of treated wastewater and to determine potential public health risks associated with recycled water use.

Australian and New Zealand (ANZECC) Guidelines for Fresh and Marine Water Quality are considered appropriate assessment criteria to assess the potential impact on groundwater or surface water quality.

8.6.3 Assessment of proponent controls

The Nutrient Irrigation Management Plan (NIMP) submitted by the Applicant, titled *Nutrient Irrigation Management Plan, Mandoon Estate Pty Ltd, March 16, J141859-01:C120413:SN*, has been reviewed as part of this assessment. A summary of the proposed controls is set out in Table 12 below.

Table 12: Controls outlined for irrigation of wastewater

<table>
<tr><th colspan="2">Controls for treated wastewater quality recommended by Applicant</th></tr>
<tr><td>Treated wastewater quality</td><td>
The Winery and Ablution WWTPs are Aerobic Treatment Units (ATUs) installed prior to DER assessment of works approval W4816/2010/1. The applicant has stated that these units comply with following criteria prescribed by Department of Health, Western Australia.
<table>
<tr><th>Parameter</th><th>Winery WWTP</th><th>Ablution WWTP</th><th>DoH Criteria for ATUs as identified by the applicant</th></tr>
<tr><td>BOD₍₅₎ (mg/L)</td><td>20</td><td>20</td><td><20</td></tr>
<tr><td>TP (mg/L)</td><td>< =1</td><td>< =1</td><td><1</td></tr>
<tr><td>TN(mg/L)</td><td><10</td><td><10</td><td><10</td></tr>
<tr><td>Suspended solids (mg/L)</td><td>30</td><td>30</td><td><30</td></tr>
<tr><td>E. Coli (E.Coli/100ml)</td><td>10</td><td>10</td><td><10</td></tr>
</table>
The Main WWTP, assessed as part of Works Approval W4816/2010/1, treats wastewater to comply with the following water quality parameters:
<table>
<tr><th>Parameter</th><th>Main WWTP</th><th>DoH Criteria
(Medium exposure risk level)</th></tr>
<tr><td>BOD₍₅₎ (mg/L)</td><td><25</td><td><20</td></tr>
<tr><td>TP (mg/L)</td><td><1</td><td>--</td></tr>
<tr><td>TN(mg/L)</td><td><20</td><td>--</td></tr>
<tr><td>Suspended solids (mg/L)</td><td><30</td><td><30</td></tr>
<tr><td>Total thermotolerant coliforms (cfu/L)</td><td><1000cfu/100ml</td><td>--</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th colspan="2">Controls for treated wastewater quality recommended by Applicant</th></tr>
<tr><td>Design of leach drains

Nutrient loading rates management – disposal via leach drains</td><td>

Leach drains installed are a semi-inverted trench system and are able to maintain a separation distance of approximately 7m from groundwater table.
Leach drain system has been designed to minimise leaching of nutrients into groundwater through rotating zones of discharge, design discharge rates, and water storage during rainfall events.
Leach drain infiltration area available (3600 m^2) is greater than the minimum required area (3000 m^2) determined based on Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974.
Leach drains will be used alternatingly (with only four of twelve used at a time) to ensure even dispersion of water.
Discharge rate will be determined by the season to maximise nutrient uptake.
The volume of wastewater irrigated will be managed so as to comply with recommended loading rates (soil vulnerability category C) as per Water Quality Protection Note (WQPN) 22 Irrigation with nutrient-rich wastewater.
<table>
<tr><th>Parameter</th><th>Output quality</th><th>Annual application rate</th><th>WQPN 22 recommended rate
(Category C)</th></tr>
<tr><td>BOD_5 (mg/L)</td><td>20</td><td>116kg/ha/year</td><td><30 kg/ha/day
(Note: Limit not specific to soil vulnerability category)</td></tr>
<tr><td>TP (mg/L)</td><td>1</td><td>6kg/ha/year</td><td>50 kg/ha/year</td></tr>
<tr><td>TN(mg/L)</td><td>25</td><td>168kg/ha/year</td><td>300 kg/ha/year</td></tr>
</table>

Wastewater will not be disposed of via leach drains during rainfall events to minimise the risk of nutrients leaching into groundwater.
Soil moisture sensors, rainfall sensors, and flow meters will be used to manage the application of wastewater and prevent excessive leaching of nutrients to groundwater.
The space between the leach drains has been planted with olive trees spaced approximately 7m apart to aid nutrient uptake.
Olive trees planted in the leach drain area have typical root system depth of 1m below ground level, which is deeper than the leach drain system. This is expected to limit movement of nutrients to groundwater.
A small amount of fringing grass will be maintained surrounding the leach

</td></tr>
</table>

Controls for treated wastewater quality recommended by Applicant	
	drain area to minimise movement of nutrients away from the area and uptake of excess water. • No additional fertilizer will be applied to olive trees unless obvious signs of stress are present. No single application of fertilizer will exceed 10kg/ha of nitrogen. Fertiliser will not be applied prior to storm events or predicted heavy rain.
Nutrient loading rates management – *disposal via irrigation*	• Treated wastewater from Winery WWTP/Ablution Block WWTP will be applied to approximately 1.4 ha of turf and 0.1 ha of garden. • Sprinklers utilised on site allow for optimal wetting of the soil, with the operating time, application rate and frequency set to reduce leaching and groundwater table mounding. • Irrigation is expected to be at its peak during the dry season (January-April) commensurate with the increase in wastewater production volumes.
Wastewater quality monitoring	• Monthly wastewater quality sampling will be undertaken in accordance with Appendix 4.
Groundwater monitoring	• Six groundwater bores are located on site, four of which are operational. • Groundwater quality monitoring will be undertaken in accordance with Appendix 5 (3-monthly and 6-monthly).
Soil health monitoring	• Soil health monitoring will be undertaken in accordance with Appendix 6 to ensure irrigation does not cause soil salinity/ sodicity issues.
Maintenance of WWTPs	• The Winery WWTP and Ablution WWTP, which use ATUs, were installed in accordance with DoH's *Code of Practice for the Design, Manufacture, Installation and Operation of the ATUs*. • Maintenance is undertaken every six months for all three WWTPs. • Maintenance schedule involves: ○ visual inspection of each chamber of ATU; ○ Inspection and maintenance of each mechanical pump, blower and disinfection component; and ○ checking irrigation and leach drain system.
Contingency measures	• Treated wastewater from Main WWTP will be stored in 2 irrigation tanks. • The wastewater treatment system has contingency storage capacity of 96kL (the equivalent of three days production at peak flow). • In the event of power failure, all wastewater production from the brewery and restaurant (larger producers of wastewater on site) will cease. Backup power generators will be sued to ensure that no overflow of wastewater occurs.

Controls for treated wastewater quality recommended by Applicant	
	• If backup power generators are not available, wastewater transport trucks will be arranged to facilitate offsite disposal. • The system includes audible and visual alarms and remote monitoring to notify an appropriate person.
Controls for Solid Waste Management recommended by Applicant	
Storage	• All spent grain waste will be stored in containers, protected from adverse weather and vermin and removed from site promptly; and • Grape skins and stems will be stored in designated waste storage receptacles, and removed from the site by a licensed waste contractor as necessary.
Operational	• All personnel will be provided with training on waste management; • Monthly inspections of waste storage areas will be carried out; and • Sludge from WWTPs will be disposed of offsite using licensed contractors.

8.6.4 Key Findings

The Delegated Officer has reviewed the information regarding the waste water and leachate impacts from the premises to ground and surface water and has found:

1. *Irrigation of treated wastewater and disposal of treated wastewater via leach drains has the potential to impact groundwater quality and indirectly impact surface water quality of Swan River due to natural groundwater flow direction;*
2. *Solid waste/ sludge storage and handling and storage of chemicals have the potential to impact groundwater quality if not appropriately contained; and*
3. *In most case, the NIMP includes adequate management controls and management measures to address potential environmental impacts.*

8.6.5 Consequence

Based upon information provided in the application and operator controls, the Delegated Officer has determined that emissions of treated wastewater to land may cause a minor impact on groundwater quality and minor off-site impact at a local scale if irrigation of wastewater, disposal via leach drains or solid waste storage/ disposal is not appropriately managed. Therefore, the Delegated Officer considers the consequence to be **Minor**.

8.6.6 Likelihood of Consequence

Based upon operator controls and management measures proposed by the applicant (NIMP), the Delegated Officer has determined that the likelihood of emissions to land impacting groundwater quality may occur at some time. Therefore, the Delegated Officer considers the consequence to be **Possible**.

8.6.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above to the Risk Matrix (Table 8) and determined that the overall rating for the risk of emissions to land on sensitive receptors during operation is ***Moderate***.

8.7 Risk of Contaminated Stormwater to Surface Water Impact Analysis

8.7.1 General Hazard Characterisation and Impact

No direct discharge of wastewater to surface water is proposed. However, activities on the premises can lead to contamination of stormwater which has the potential to impact the surface water quality of the Swan River, located down-gradient from the premises.

Stormwater runoff from treated wastewater disposal areas may have elevated nitrogen and phosphorus concentrations or suspended solids load. Irrigation, if undertaken at rates in excess of the soil infiltration capacity or during wet weather periods, can lead to increased movement of nutrients through stormwater. Stormwater runoff from chemical storage areas, solid waste storage/ handling areas, and sludge storage areas may have high BOD/ COD or low pH.

The premises is located within a RiWI Act proclaimed Swan surface water area. The Swan River is located approximately 80m from the premises boundary. Contaminated or potentially contaminated stormwater, if discharged to the Swan River, can impact surface water quality. Potential impacts associated with nutrient-rich wastewater discharge to surface water include algal blooms, fish kills, etc. Potential impacts associated with stormwater with elevated BOD/ COD being discharged to surface water include the effect of aesthetics/ recreational use of water and impact on the ecosystem.

8.7.2 Criteria for Assessment

ANZECC Guidelines for Fresh and Marine Water Quality are considered appropriate assessment criteria to assess the potential impact on groundwater or surface water quality.

8.7.3 Assessment of proponent controls

The applicant had developed a Stormwater Management Plan titled *Proposed Mandoon Estate Lot 10 and Lot 215 Harris Road Caversham, Western Australia Storm Water Management Plan, SARACENI Project Engineering Pty Ltd, dated July 2013* to support the original development approval process. The following design and management measures included in this plan have been reviewed for the purpose of this assessment:

Controls for Storm Water Management	
Engineering	• Three stormwater retention basins have been installed onsite; one at the southern end (closest to Swan River), one at the function centre and another along the site entrance road. • All stormwater runoff complying up to maximum 1 year, 1 hour ARI storm events will be retained onsite by retention and filtration; • The stormwater management system is designed to ensure that no sediment-laden overflow discharge will take place across the

Controls for Storm Water Management	
	boundary to the Swan River Reserve or catchment area; • There is no direct drainage connection to the Swan River through drains, swales or paths from the site; and • A drainage overflow channel has been installed to accommodate excess volumes of surface water runoff above the 1 year, 1-hour storm volume. The channel contains energy baffling limestone boulders and discharges to a grassed area which assists in retarding runoff toward the Swan River.
Controls for Chemical Storage	
Storage	• Chemicals are stored in a bunded area; and • A spill control kit is used to isolate any spills, absorb the liquid and to dispose of the waste offsite

The Stormwater Management Plan does not specifically indicate measures that will be undertaken to minimise potential contaminant runoff from wastewater irrigation/ disposal areas. However, as detailed in Table 12, the applicant has committed to avoid application of treated wastewater to land during wet weather periods. This is expected to reduce the likelihood of contaminated stormwater runoff from irrigation areas.

8.7.4 Key Findings

The Delegated Officer has reviewed the information regarding the risk of contaminated stormwater discharging to surface water impacts from the premises and has found:

1. *The NIMP and stormwater/ drainage control measures undertaken by the Applicant are satisfactory to prevent potential impact on surface water quality of Swan River during normal operations;*
2. *Wet weather periods, beyond the design specifications of stormwater retention basins, may lead to discharge of stormwater. Key contaminants in this runoff are not likely to contain TN/ TP/ BOD from treated wastewater disposal due to applicant commitment to not irrigate prior to significant rainfall events; and*
3. *Potentially contaminated stormwater runoff from other areas on the premises (chemical storage, car park and other infrastructure areas not associated with prescribed activities) may contain elevated hydrocarbons, chemical oxygen demand/ BOD.*

8.7.5 Consequence

Based upon the design and management measures as detailed in the NIMP and Stormwater Management Plan, the Delegated Officer has determined that the impact of potentially contaminated or contaminated stormwater runoff on surface water quality in Swan River may have minor off-site impacts at a local scale. Therefore, the Delegated Officer considers the consequence to be **Minor**.

8.7.6 Likelihood of Consequence

Based upon design specification of stormwater retention basin (1 year 1 hour ARI storm event), the Delegated Officer has determined that the likelihood of *contaminated or potentially contaminated stormwater runoff impacting surface water quality* could occur at some time. Therefore, the Delegated Officer considers the consequence to be **Possible**.

8.7.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Matrix (Table 8) and determined that the overall rating for the risk of contaminated or potentially contaminated stormwater runoff impacting surface water quality on sensitive receptors during operation is **Moderate.**

8.8 Summary of Risk Assessment and Acceptability

The risk items identified in Section 8.7 including the application of risk criteria and the acceptability with treatment are summarised in Table 13 below.

Table 13: Risk rating of emissions

	Emission		Pathway and Receptor	Proponent controls	Impact	Risk Rating	Acceptability with treatment (conditions on instrument)
	Type	**Source**					
1.	Odour	Fugitive VOC emissions from beer/ wine manufacturing Storage/ handling of solid waste from process or sludge from Ablution WWTP and Main WWTP Treatment of wastewater	Air/ wind dispersion Receptor: Community/ residential receptors	Infrastructure controls Management controls	Amenity	**Moderate**	Acceptable subject to proponent controls and regulatory controls
2.	Noise	Handling, transportation of goods, operation of the fermenting plant and equipment Treatment of wastewater	Air/ wind dispersion Receptor: Community/ residential receptors	Infrastructure controls (Engineering, plant and equipment)	Amenity	**Low**	Acceptable subject to proponent controls
3.	Emissions to land (nutrients leaching to ground-water)	Storage/ handling of solid waste from process or sludge from WWTP Irrigation/ on-site disposal of treated wastewater Bulk storage of chemicals	Seepage through soil Receptor: Groundwater	Infrastructure controls Management controls (NIMP, training, offsite disposal of waste)	Groundwater quality Indirect impact on surface water quality	**Moderate**	Acceptable subject to proponent controls and regulatory controls
4	Emissions to storm water (indirect impact on surface water)	Storage/ handling of solid waste from process or sludge from WWTP Irrigation/ on-site disposal of treated wastewater Bulk storage of chemicals	Stormwater runoff Receptor: Surface water (Swan River)	Infrastructure controls Management controls (NIMP, training, offsite disposal of waste)	Surface water contamination	**Moderate**	Acceptable subject to proponent controls and regulatory controls

9. Determined Regulatory Controls

9.1 Summary of Controls

		Controls			
		9.2 Specified Infrastructure and Equipment Controls	9.3.1 Specified Action for Odour Risk	9.3.2 Specified Action for Groundwater Contamination Risk	9.3.3 Specified Action for Surface Water Contamination Risk
Risk Items (see Section 8.8)	1. Odour	●	●		
	2. Noise	Low Risk			
	3. Emissions to Land (Nutrients leaching to groundwater)	●		●	
	4. Emissions to Storm Water (Indirect Impact to Surface Water)	●			●

9.2 Specified Infrastructure and Equipment Controls

The following infrastructure and equipment must be maintained and operated onsite for management of odour, wastewater, and contaminated stormwater:

Table 14: Site infrastructure and equipment controls

Site infrastructure	Specified requirements
Brewery manufacturing and processing area	• All plant and equipment must be installed within purpose built warehouse structures; • Uncontaminated stormwater must not enter the manufacturing and processing area; and • Any process water and wash down water from the beer manufacturing and processing area is directed to the Main WWTP.
Wine manufacturing and processing area	• All plant and equipment must be installed within a purpose built warehouse structures; • Uncontaminated stormwater must not enter the manufacturing and processing area; and • Any process water, wash down water from the wine manufacturing and processing area is directed to the Winery WWTP.

Site infrastructure	Specified requirements
Main WWTP	• Maintain capability to treat up to 30 m^3/day of wastewater; • Must be operated and maintained in accordance with design specifications to ensure treated wastewater quality is consistent with design specifications; • Overtopping of the wastewater treatment vessels must not occur; • Containment bunds must be maintained to prevent any leaks or spills of untreated or partially treated wastewater into the environment; and • Volumetric flowmeter and associated automatic data capture system to allow for the volume of wastewater discharged to the leach drains to be determined on a daily basis.
Winery WWTP	• Maintain capability to treat up to 10 m^3/day of waste water; • ATU must be operated and maintained in accordance with manufacturer's specifications to ensure treated wastewater quality is consistent with design specifications; • Overtopping of the wastewater treatment vessels must not occur; • Containment bunds must be maintained to prevent any leaks or spills of untreated or partially treated wastewater into the environment; and • Volumetric flowmeter and associated automatic data capture system to allow for the volume of wastewater discharged to the irrigation area to be determined on a daily basis.
Ablution Block WWTP	• Maintain capability to treat up to 1.8 m^3/day of waste water; • ATU must be operated and maintained in accordance with manufacturer's specifications to ensure treated wastewater quality is consistent with design specifications; • Overtopping of the wastewater treatment vessels must not occur; • Containment bunds must be maintained to prevent any leaks or spills of untreated or partially treated wastewater into the environment; and

Site infrastructure	Specified requirements
	• Volumetric flowmeter and associated automatic data capture system to allow for the volume of wastewater discharged to the irrigation area to be determined on a daily basis.
Stormwater Retention Basins 1, 2 and 3, and associated stormwater conveyance infrastructure	• All stormwater runoff resulting from 1 year, 1 hour ARI storm event must be retained on site; • Stormwater management system must be maintained to ensure that there is no direct drainage connection to the Swan River through drains, swales or paths from the site; and • Stormwater retention basins must be sited at locations indicated in Appendix 5.
Leach Drains	• Must be maintained to ensure efficient delivery of treated waste water.
Irrigation Area	• Olive trees are to be maintained in good condition to facilitate constant and stable uptake of nutrients.

Grounds: The Delegated Officer considers that the provision, operation, and maintenance of the specified infrastructure is necessary to manage the moderate risk of odour, contaminated stormwater, wastewater and leachate impacting the environment. Conditions 5 and 6 have been added to the licence and specify existing infrastructure and controls to be implemented.

9.3 Operational Controls

9.3.1 Specified Actions for Odour Risk

The following operational and management controls should be implemented and maintained onsite for odour emissions risk management:

- Short-term storage of solid wastes from wine manufacturing or beer manufacturing must be stored in enclosed containers.
- Solid waste from wine manufacturing (marc, lees, screening solids and other organic wastes) and spent grain from beer manufacturing must be disposed of offsite.
- Sludge from the Main WWTP, Winery WWTP, and Ablution block WWTP must be disposed of off-site by a licensed waste contractor.

Grounds: The Delegated Officer considers that the long-term storage of solid wastes on site or the application of these wastes on the ground, can lead to the generation of odours. Solid wastes may be stored short-term on site in enclosed containers. Condition 7 has been added to the licence to specify these controls.

9.3.2 Specified Actions for Groundwater Contamination Risk

Waste Storage

The following operational and management controls should be implemented and maintained onsite for groundwater contamination risk management.

- Solid wastes from the wine and beer manufacturing facilities must be stored in enclosed containers.
- Solid wastes from the wine and beer manufacturing facilities must be removed from the premises on a regular basis and disposed of off site at an authorised facility.
- Any spills of sludge must be recovered immediately.
- Sludge from Main WWTP, Winery WWTP, and Ablution block WWTP must be disposed of off-site by a licensed waste contractor, and not applied to land on the site.

Grounds: The Delegated Officer considers that the long-term storage of solid wastes on site or the application of these wastes on the ground, can lead to the generation of leachate which can infiltrate the groundwater and lead to environmental impacts on water quality. Condition 7 has been added to the licence to specify these controls. The specified controls are consistent with the NIMP provided by the Applicant. Condition 20 requires the Licensee to record any complaints received during the Annual Period, and Condition 22(d) requires these complaints to be reported to the DER in the Annual Environmental Report. This will help allow an ongoing assessment of odour impacts. These conditions are additional to the NIMP provided by the Applicant, and allows for the ongoing monitoring of odour impacts on sensitive receptors.

Treated Wastewater Disposal

The following operational and management controls should be implemented and maintained onsite for groundwater contamination risk management.

- The location and size of the irrigation area and leach drains is specified.
- Irrigation of treated wastewater or disposal of treated wastewater via leach drains must not exceed the TN, TP, BOD_5 loading rates and hydraulic loading limit of the soil.
- Irrigation must not occur in areas where the water table rises to within 2m of the surface.
- Treated wastewater must be evenly distributed over the irrigation/ leach drain area.
- Vegetation cover must be maintained to aid nutrient uptake.
- Irrigation/wastewater disposal via leach drains must not occur on land that is waterlogged or when rainfall is imminent or immediately after a rain event.
- Leach drains must be operated on a rotational basis to ensure even dispersion of water and minimum area required for infiltration must be maintained.

Grounds: The Delegated Officer considers that the long-term irrigation/disposal of treated wastewater on the site may impact groundwater quality if discharge to land is not conducted in a controlled manner. The main factors affecting environmental impacts are considered to be the quality of the treated wastewater (particularly nutrient concentrations), the volume of the waste water discharged, and the soil characteristics of the irrigation area and the leach drain area during the discharge. Conditions 8, 9 and 10 have been added to the licence to specify controls required for irrigation and discharge to leach drains. The controls specified in these conditions are consistent with the NIMP provided by the Applicant.

Treated Wastewater Limits and Monitoring

The following operational and management controls should be implemented and maintained onsite for groundwater contamination risk management.

- Treated wastewater quality monitoring for indicative parameters (TN, TP, BOD5 and TDS) should be undertaken on a regular basis.
- Limits for total nitrogen, total phosphorus and Biological Oxygen Demand (BOD) are set;
- All wastewater sampling and analysis must be undertaken in accordance with relevant Australian Standards.

Grounds: The Delegated Officer considers that the long-term irrigation/disposal of treated wastewater on the site may impact groundwater quality if discharge to land is not conducted in a controlled manner. The main factors affecting environmental impacts are considered to be the quality of the treated wastewater (particularly nutrient concentrations), the volume of the waste water discharged, and the soil characteristics of the irrigation area and the leach drain area during the discharge. Conditions 11 and 12 have been added to the Licence to specify key water quality limits. Limits are based on the risk assessment, with values for nitrogen and phosphorus being based on WQNP22. These are consistent with limits presented in the NIMP. Conditions 13 and 14 have been added to the licence to specify the parameters which require monitoring in order for compliance to the limits to be determined. Condition 14 has been added to the Licence to ensure appropriate quality control of the analysis undertaken.

Groundwater Quality Monitoring

The following operational and management controls should be implemented and maintained onsite for groundwater contamination risk management:

- Six-monthly groundwater monitoring should be undertaken to demonstrate whether disposal of wastewater via irrigation and leach drains is impacting groundwater quality.
- Trends in groundwater quality parameters must be reviewed to determine potential impact. The frequency of monitoring can be reviewed based on analysis of data reported by the licensee.
- Location of groundwater monitoring bores must be suitable for allowing environmental impacts to be identified.

Grounds: The Delegated Officer considers that the long-term irrigation/disposal of treated wastewater on the site may impact groundwater quality if discharge to land is not conducted in a controlled manner. Three-monthly monitoring, together with annual reporting, will allow changes to ground water quality to be identified. Condition 14 has been added to the Licence to ensure appropriate quality control of the sampling and analysis undertaken. Low flow sampling using a peristaltic pump is specified in Condition 14(c), rather than bailing as suggested by the Applicant in the NIMP, as this sampling technique provides greater long-term integrity of the groundwater monitoring bore. Condition 15 has been added to the licence to specify key groundwater parameters to be monitored.

Given that the Applicant has already installed groundwater monitoring bores on site, the appropriateness of their location and the suitability of their construction must be confirmed. Some information regarding well construction has been provided in Appendix D of the NIMP. Condition 16 has been added to the Licence to specify the requirements for bore construction.

Condition 22 (a), (b) and (c) requires monitoring data to be reported in the Annual Environmental Report, and for the Licensee to interpret this data to assess potential

groundwater impacts.

9.3.3 Surface water contamination Risk

The Delegated Officer considers that the controls implemented to manage potential groundwater impacts will also help manage impacts to surface water. Please refer to Section 9.3.2 for a discussion of these controls and the grounds of the same.

10. Setting Conditions

The conditions in the Issued Licence have been determined in accordance with DER's *Guidance Statement on Setting Conditions*.

DER's *Guidance Statement on Licence Duration* has been applied, and the Issued Licence expires in twenty (20) years from the date of issue.

Condition Ref	Grounds
Environmental Compliance Condition 1	Environmental compliance is a valid, risk-based condition to ensure appropriate linkage between the licence and the EP Act.
Notification of Material Change Conditions 2, 3 and 4	These conditions are valid, risk-based and enable flexibility in operations.
Infrastructure and Equipment Conditions 5 and 6	These conditions are valid, risk-based and contain appropriate controls (see section 8 of this decision report).
Specified Action Condition 7	These conditions are valid, risk-based and contain appropriate controls (see sections 8.4, 8.6, 8.7) of this decision report).
Treated Wastewater Disposal Conditions 8-12	These conditions are valid, risk-based and contain appropriate controls (see section 8.6, 8.7) of this decision report).
Treated Wastewater Quality Monitoring Conditions 13-14	These conditions are valid, risk-based and contain appropriate controls (see section 8.6, 8.7) of this decision report).
Groundwater Quality Monitoring Condition 15	These conditions are valid, risk-based and contain appropriate controls (see section 8.6, 8.7) of this decision report).
Emissions Condition 16	This is a valid, risk-based condition and ensures appropriate linkage between the licence and the EP Act.
Information Conditions 17-23	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

DER notes that it may review the appropriateness and adequacy of controls at any time and that following a review, DER may initiate amendments to the licence under the EP Act.

11. Applicant's Comments on Risk Assessment

The applicant was provided with the draft decision report and draft issued licence on 5 August 2016. Comments are presented in Appendix 2.

12. Conclusion

This assessment of the risks of activities on the premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this decision report (summarised in Appendix 1).

Based on this assessment, it has been determined that the Issued Licence will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements. .

Christine West
Manager Licensing (Process Industries)
delegated Officer under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key Documents

	Document Title	In text ref	Availability
1	Licence L8972/2016/1	-	accessed at http://www.der.wa.gov.au
2	Works Approval W4816/2010/1	-	DER records (A739609)
5	DER *Guidance Statement on Regulatory principles,* July 2015	DER 2015	accessed at http://www.der.wa.gov.au
6	DER *Guidance Statement on Setting conditions,* September 2015	DER 2015	
7	DER *Guidance Statement on Licence duration,* November 2014	DER 2014	
8	DER *Guidance Statement on Licensing and works approvals processes,* September 2015	DER 2015	

Appendix 2: Summary of Applicant's Comments on Risk Assessment and Draft Conditions

The Applicant was provided with the draft Decision Report on 5 August 2016. Comments were received from the Applicant on 12 August 2016 and 25 August 2016.

A summary of the Applicant's responses to the draft Decision Report are provided below:

Section of draft Decision Report	Suggested changes/amendments made by Applicant	DER response
Section 3	Applicant provided additional details requested by DER regarding operational aspects such as: • Production volumes of wine; • Frequency of sludge removal; and • Storage of spent grains.	The Delegated Officer reviewed the information provided and has included the necessary details in the Decision Report.

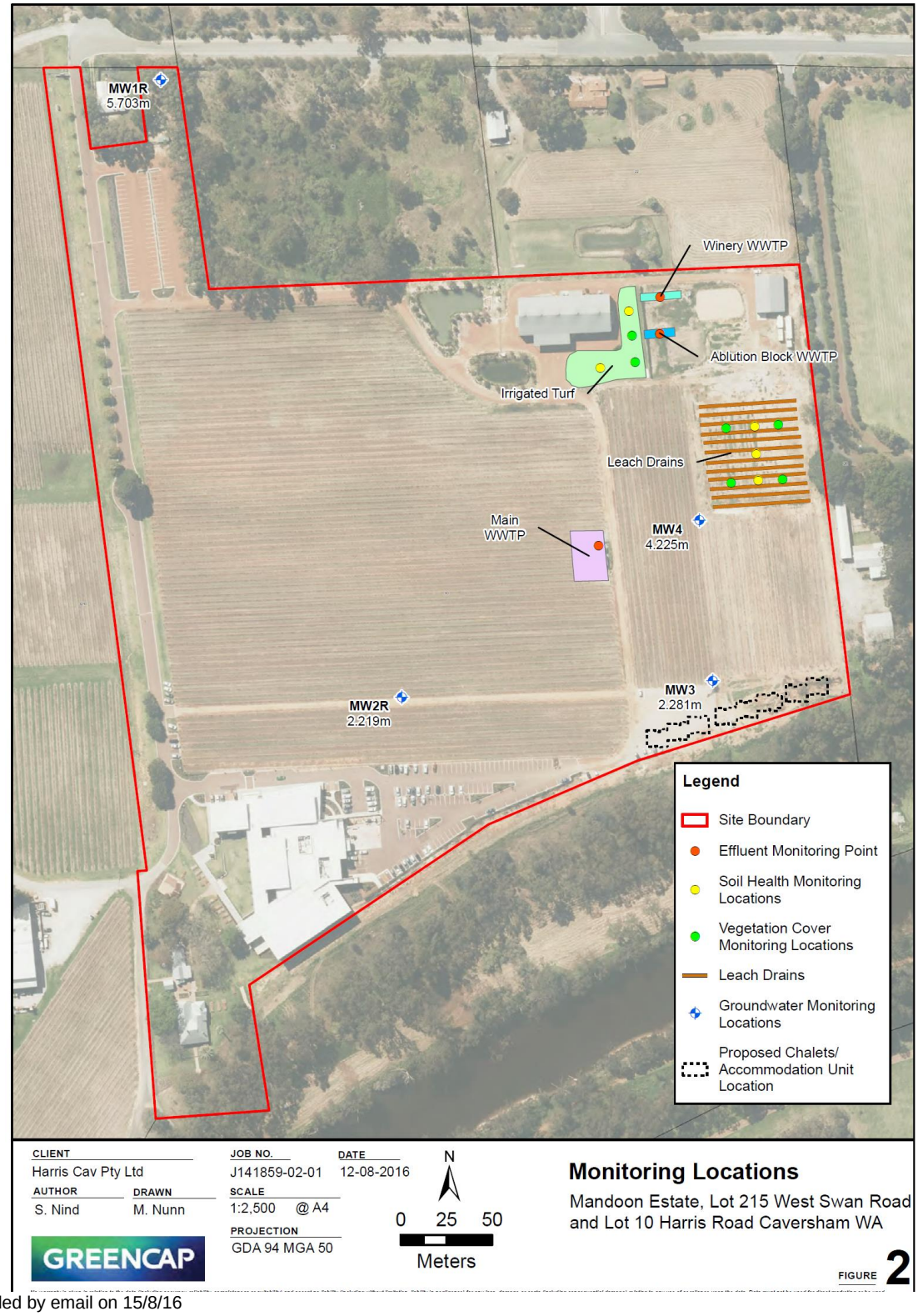
Section of draft Licence	Suggested changes/amendments made by Applicant	DER response
--	No comments made by Applicant regarding conditions in draft Licence.	Not applicable.
--	Applicant provided updated map of monitoring point locations and infrastructure details of ATUs.	Not applicable.

Appendix 3: Due Diligence

ASIC Search

A search of the ASIC insolvency notices database shows no notices listed for the ACN: 121 454 484 registered for Harris Cav Pty Ltd.

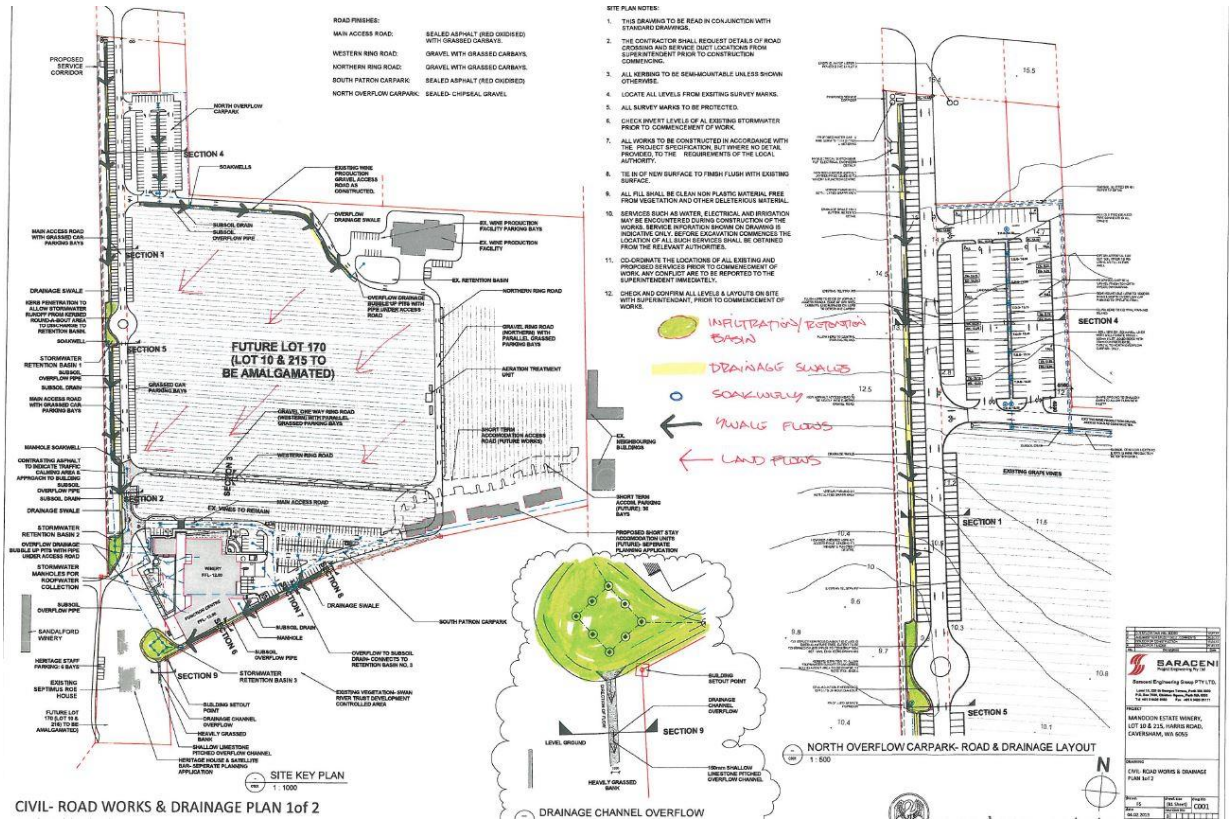
Appendix 4: Position of Groundwater Monitoring Bores



Provided by email on 15/8/16

Appendix 5: Position of Stormwater Retention Basins

Extract from Application



Appendix 6: Treated wastewater quality monitoring program proposed by applicant

Extract from application:

April 16

GREENCAP

Table 13: Wastewater quality monitoring

Sample	Parameter	Units	Frequency	Sample quantity	Acceptable range	Action Threshold	Action
Waste Water	Nitrogen	mg/L	Monthly	1 L	≤19 mg/L	>19 mg/L	Resample weekly
	Phosphorus	mg/L	Monthly	1 L	≤1 mg/L	>1 mg/L	Resample weekly
	BOD_5	mg/L	Monthly	1 L	≤20 mg/L	>20 mg/L	Resample weekly
	pH (at exit of tank)	pH units	Monthly	N/A	6.5-8 pH	<6.5 and >8	Resample weekly
	pH (at exit of winery system	pH units	Daily during vintage	N/A	6.5-8 pH	<6.5 and >8	Cease pumping to storage tank, buffer wastewater, resample.
	E. coli	Cfu/100 mL	Monthly	500 mL	<10 cfu/100 mL	>10 cfu/100 mL	Cease discharge; engage service contractor to correct wastewater treatment; retest.
	Activity in the winery	N/A	Monthly	N/A	Detail type of activity including volume of wastewater produced	N/A	N/A
	Volume	Log / register	Daily	N/A	Record volume of wastewater produced	>30,000 L/day	Assess water usage
Resample	Nitrogen	mg/L	Weekly	1L	<25 mg/L	Second failure	Engage service contractor to remediate, arrange pump out by licensed liquid waste contractor.
	Phosphorus	mg/L	Weekly	1L	<1 mg/L	Second failure	
	BOD_5	mg/L	Weekly	1L	<20 mg/L	Second failure	
	pH	pH units	Weekly (at point of sample)	N/A	6.5-8 pH	Second failure	Cease dicharge, Engage service contractor to adequately buffer pH of water, then retest.

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Appendix 7: Groundwater quality monitoring program proposed by applicant

Extract from application:

Table 17: Groundwater quality monitoring

Parameter	Method	Frequency	Measurement	Action Threshold	Action
Groundwater height	Dipper	6 months (March and Oct)	m AHD	Maintain min 2 m vertical separation	N/A
Soil moisture	Soil moisture probe	Constant	% water	Dry	Supplementary irrigation from production bore
Groundwater quality	Bailer	3 months	Water quality (pH, EC, TN, NH_4, TP)	In excess of assessment criteria[1]	Revise irrigation of nutrients

1. Refer to **Table 18** for assessment criteria for the analysis of groundwater.

Attachment 1: Issued Licence L8972/2016/1