



## Department initiated Amendment

### Part V Division 3 of the *Environmental Protection Act 1986*

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<b>Licence Number</b>	L8849/2014/1
<b>Licence Holder</b>	Fogarty Family Wines Pty Ltd
<b>ACN</b>	009 155 551
<b>File Number</b>	DER2014/002340-1
<b>Premises</b>	Deep Woods Estate 871 Commonage Road YALINGUP WA 6282  Legal description – Lot 10 on Diagram 75204 and Part of Lot 21 on Plan 20521  As defined by the premises maps attached to the revised licence.
<b>Date of Report</b>	15/10/2024
<b>Decision</b>	Revised licence granted

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# 1. Scope of amendment

Licence L8849/2014/1 is held by Fogarty Family Wines Pty Ltd (licence holder), issued under Part V Division 3 of the *Environmental Protection Act 1986*.

The licence relates to a wine production facility known as Deep Woods Estate (the premises), located at 871 Commonage Road, Yallingup WA 6282.

Due to time constraints involved in going through a formal licence renewal application process, the department has determined to undertake a CEO initiated amendment to extend the expiry date of the licence and undertake a partial review and update the licence into the latest format.

## 1.1 Amendment summary

Due to the age and format of the existing licence and that the premises has not been subjected to a review and environmental risk assessment since it was issued in 2015, the department has undertaken a partial review of the licence as part of extending the duration of the licence by a further 5 years (2029), to ensure:

- the licence still accurately reflects the activities being conducted on the premises;
- includes an approved infrastructure table;
- all emissions and discharges have been properly identified;
- there is an appropriate level of regulatory control being applied, commensurate with the risk of impacts from ongoing operations to public health and the environment.
- The licence expiry date aligns with the expiry date of the disposal (irrigation) area lease.

Under section 59(1) of the *Environmental Protection Act 1986* (EP Act), the CEO may amend a licence at any time, including varying the conditions which apply to a licence, removing redundant conditions or imposing new conditions and requirements where necessary. The department will undertake any licence amendments resulting from a licence review in accordance with s.59(2) of the EP Act. This report sets out the delegated officer's decision making.

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant guidance statements which are available at <https://dwer.wa.gov.au/regulatory-documents>.

## 1.2 Background

Deep Woods Estate is situated within the locality of Yallingup Siding in the Shire of Busselton and consists of a vineyard, cellar door, wine processing facility, wastewater treatment plant (WWTP), water storage dam, a homestead and remanent vegetation. The nearest receptors are neighboring wineries approximately 250 metres to the west and southeast of the winery. There is also a rural residential development approximately 400 metres northwest of the winery.

The winery was established in 1998 with a maximum crush capacity of 400 tonnes/year. In 2005 Deep Woods Estate was acquired by the Fogarty Wine Group operating as LTC Management Pty Ltd. In 2014 LTC applied for a works approval W5707/2014/1 to upgrade thier WWTS to enable the winery to increase production to a maximum crush capacity of 2000 tonnes of fruit per year and to produce up to 1400kL/wine per year.

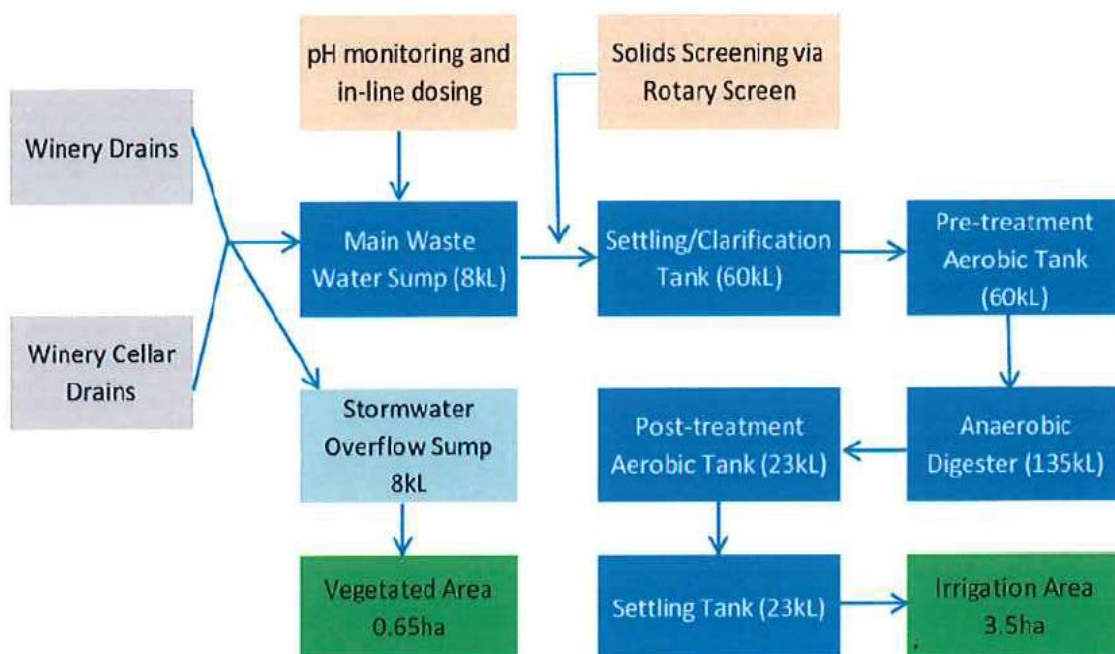
## 1.3 Infrastructure and operational aspects

### Wastewater treatment system

The wastewater treatment system (WWTS) consists of the following in sequence:

- Solids screen via rotary screen
- pH monitoring and inline dosing of wastewater within the 8 kL main waste sump
- 60 kL settling tank
- Flow meter (M1) sitting inline
- 60 kL pretreatment aerobic tank
- 135 kL Anaerobic digester
- 23 kL post treatment aerobic tank
- 23 kL post settling tank

Winery infrastructure is located within a concrete hardstand area. Wastewater and stormwater from within the concretes hardstand is directed to a wastewater treatment system (WWTS) capable of treating up to 35 kL/day. The WWTS includes pH adjustment, solids screening, settlement and clarification, and aeration and anaerobic digestion to reduce biological oxygen demand (BOD) to 150 mg/L, nitrogen to 10 mg/L and phosphorus to 5 mg/L. A schematic of the WWTS is included in Figure 1.



**Figure 1: Outline of the WWTS**

The WWTS has been designed with the capacity to divert stormwater to an overflow sump during high rainfall events (>20mm/day). Diverted uncontaminated stormwater is used for irrigation. Diversion is prohibited during vintage (February to April) to ensure all potentially contaminated stormwater and wastewater is collected for treatment. Treated wastewater is discharged through a cannon spray irrigation system onto as designated 3.5 ha irrigation area (L1) comprised of a paddock and a cricket oval.

There are no alarms or sensors to manage tank spills, leaks, and overtopping. However, the tanks are inspected daily when operating.

**The delegated officer has determined to condition a work's condition for a new flow meter and sampling tap located on the outlet to the irrigation area to ensure accurate**

**discharge measurements are taken to inform fee calculations and monthly irrigation volumes and water quality data.**

### **Irrigation Infrastructure**

Treated wastewater will be discharged through a cannon spray system onto a designated 3.5 ha paddock of mixed grasses that is used as a cricket oval. Maximum application is set to not exceed 24 mm/hr.

The licence holder provided additional information on 16 July 2024 indicating that they used a travelling irrigator that had a maximum spread of 40 metres, that was run along two parallel irrigation lines measured to be 250 metres in length. The irrigated wastewater is transferred via an underground pipeline from the WWTS to the irrigation boundary with an above ground pipe connecting to flat hoses on the irrigator runs.

**The delegated officer notes that the existing irrigation area is 300 metres long and 115 metres wide. The licence holder supplied information indicated that only 250 metres in length and 80 metres width is utilised under existing irrigation practices. The delegated officer has determined to reduce the existing irrigation area to the existing practices from 3.5 ha to 2 ha.**

### **Solids Infrastructure**

Marc, lees, screening solids and other organic wastes generated by the winery and WWTP are collected and stored on a designated concrete bunded area (marc storage area) before collection by a licenced contractor for offsite disposal.

The marc storage area contains a drainage sump which directs collected leachate back to the WWTP.

## **2. Review of monitoring data (from AERs)**

### **2.1.1 Water quality data**

The existing licence requires the licence holder to undertake monitoring of wastewater from M2 (unknown outflow to the irrigation area). Monitoring required is continuous volumetric flow rate (M1) and treated wastewater monthly sampling when irrigating for pH, total nitrogen (TN), total phosphorus (TP), total dissolved solids (TDS), total suspended solids (TSS), electrical conductivity (EC) and biological oxygen demand (BOD). The licence has conditions for water quality and loading targets to land, including water quality targets for TN, TP, TSS, BOD and pH, and annual load limits for total nitrogen and phosphorus, and daily load limits for BOD. The delegated officer reviewed the licence holders water quality data submitted within Annual Environmental Reports (AERs) from April 2016 to March 2024 (see Appendix 2), covering a period of 8 years. It was determined that the water quality data provided by the licence holder was not able to be verified as laboratory analysis data sheets were not provided.

It was noted that the licence holders WWTP wastewater quality did not meet the targets in their licence for pH – 24 % of the time, TN – 88 % of the time, TP – 88% of the time, TSS - 64% of the time, and BOD 60 % of the time.

The 8 years of monthly flow data submitted by the licence holder indicated that irrigation occurred every month of the year.

### **Biological oxygen demand**

The existing licence targets for BOD are equal to and less than 150 mg/L and the National Water Quality Management Strategy guidelines for sewerage systems and effluent management (NWQMS) recommend that for primary treatment systems, typical biological oxygen demand (BOD) ranges for treated effluent should range between 120-250 mg/L. Wastewater from the existing treatment system at the premises is on average 7 times above this typical BOD range. It is noted that additional aspiration and holding times could improve

BOD.

### **Nutrient levels**

Nutrients including total nitrogen and total phosphorus reported levels were more than 2 times higher than licence target levels but were within average effluent management recommendations for primary treated systems under the NWQMS. The NWQMS recommends a minimum level of secondary treatment that includes solid and BOD removal for irrigation of wastewater to agriculture. It is noted that increased aeration and storage (post settling) treatment times, could reduce nitrogen levels as biological treatment has time to take effect.

### **pH**

The pH of the wastewater had an average value of 7, exceeding target water quality levels 24% of the time. It is noted that when irrigating at low pH many elements become less available to plants, while others such as iron, aluminum and manganese become toxic to plants. Ongoing irrigation of wastewater with an acidic pH will reduce plant growth and thus nutrient uptake for plants.

### **Total dissolved solids, electrical conductivity, and sodium adsorption ratio**

Electrical conductivity (EC) and total dissolved solids (TDS) levels are extrinsically linked and represent measurements of salts. TDS measures the breakdown of a range of dissolved substances whilst EC measures ion concentration. It is noted that the EC levels provided by the applicant, indicate that the wastewater is brackish to saline. The EC of the wastewater were consistently within DPIRD's 2022 irrigation categories of moderately salty (456 – 1425 mg/L) to salty (1425 – 2850 mg/L) and exceeded salty levels (above 2850 mg/L and pasture levels tolerances) 38% of the time. Where irrigation of EC above 1,425 mg/L will result in a minimum 25% yield loss, which increases with the increase in salts within the wastewater. Therefore, the existing wastewater quality is likely to affect the yields of the proposed mixed grass pasture and have implications on the uptake of nutrients applied through the wastewater. The treatment of salts within the wastewater and limiting salts applied will be required to irrigate long-term sustainable pasture.

The sodium adsorption ratio (SAR) indicates the amount of sodium relative to calcium and magnesium in water. When SAR is high in wastewater it can affect the exchangeable sodium percentage of the soil. High SAR levels will adversely affect the soil structure resulting in dispersive soils, reduced infiltration, and drainage. SAR was not tested in the wastewater, however, with the high EC/TDS levels, a risk of medium to long-term effects on soil structure could occur. The NSW Department of Primary Industries (DPI) indicate a SAR level >6 has an increasing effect on all soils at moderate salinity levels (2.5 dS/m (1,600 mg/L)).

**The delegated officer has determined to add the following treated wastewater limits in the licence in line with ANZECC long-term irrigation guidelines and NSW DPI, they are:**

- **290 mS/m (2.9 dS/m or 1,856 mg/L) electrical conductivity irrigation limits**
- **<6 SAR**

**The following additional wastewater sample parameters:**

- **Sodium, calcium, magnesium, and sodium adsorption ratio.**

### **2.1.2 Review of the nutrient loading**

The licence holder has a Nutrient Irrigation Management Plan (NIMP) (version March 2015) that outlines nutrient loadings applied after wastewater treatment. The NIMP outlines the bases for nutrient management based on Water Quality Protection Note 22- Irrigation with nutrient -rich wastewater (WQPN 22) based on risk category C. It is noted that these nutrient loading figures have also been conditioned in the existing licence.

The application of WQPN 22 has been incorrectly applied and has failed to consider that the risk category C water concentration levels are for inorganic TN and TP, and the loadings are based on inorganic nutrients for a 32 week/year irrigation schedule. The water quality data outlined in Schedule 2 indicates low inorganic and high organic nutrient levels. Nor has the growth needs of the crop being irrigated and the nutrient export through harvesting been considered.

**The delegated officer determined that a revised NIMP is required to be submitted to reflect current treatment quality and that the 2015 NIMP is insufficient. The new NIMP must include a nutrient and hydraulic balance that considers hydraulic and nutrient loading rates for the irrigated crop and nutrient export to determine site-specific nutrient loading rates and the viability of winter irrigation when soils are already saturated.**

### 3. Other approvals

#### Planning approvals

The department was referred a development approval application (DA) from the City of Busselton in May 2023 for a new wine storage tank farm, a new covered tank hardstand and a new wine barrel store with a concrete hardstand area, which it advised would be required to be approved by a works approval or licence amendment before the works commence. The DA1- location site plan showed a *New Wastewater Pump Sump Connecting To Existing Wastewater System*, which would also will also need to be included in the *Environmental Protection Act 1986* application.

### 4. Decision

The delegated officer has reviewed the existing licence and has determined that changes are required to ensure that ongoing wastewater irrigation operations at the premises do not pose an unacceptable risk of impacts to public health and the environment. This determination is based on the following.

- A review of the existing water quality parameters taken from the treated wastewater discharged to L1 (irrigation area) exceed those specified in ANZECC (2000) guidelines for primary industries' long-term irrigation and DPIRDs salinity limits for health pasture.
- The review of the licence holders NIMP (2015) did not consider hydraulic loading, nutrient growth requirements of the crop and nutrient export for sustainable irrigation.
- The flow meter was not located on the outlet of the WWTP to the irrigation area providing accurate irrigation volumes per month.

To address the above issues, the delegated officer has determined to require the preparation and/or undertaking of the following through the revised licence:

- Works condition for installation and monitoring of a new flow meter and sampling tap.
- Requirement to submit a revised NIMP to determine site specific loading rates;
- New water quality limits for treated wastewater discharge for salinity and SAR.
- Addition of wastewater sampling parameters.
- Updated wording reporting of conditions for clarity.

The delegated officer is satisfied that the above controls, once implemented, will lower the risk profile of the premises, and ensure the winery can irrigate wastewater in a sustainable manner that does not pose an unacceptable risk of impacts to public health and the environment.

### 3. Licence holder comments on draft decision

The licence holder was provided with a copy of the revised licence and amendment report on 6 June 2024 and 31 July 2024. Comments received are outlined in Appendix 1.

### 4. Summary of amendments

The below table provides a summary of the proposed amendments and will act as a record of implemented changes. All proposed changes have been incorporated into the revised works approval as part of the amendment process.

Condition no.	Proposed amendments
Cover page	Restructured to the new format, expiry date extended to 2029
Introduction	Deleted, consistent with current DWER template. This guidance is now available in DWER's Guide to Licensing (June 2019).
Interpretation	Inserted, consistent with current DWER template. Supersedes previous conditions 1.1.3 & 1.1.4
History	Updated, consistent with current DWER template.
Definitions	Updated, Table 8
Condition 1 Table 1	New table added to specify operational requirements for key site infrastructure, including winery, WWTP, irrigation and solids management. Incorporates previous conditions 1.2.5, 1.2.6, 1.3.1, 1.3.2, 1.3.3 1.3.4, 1.5.1
Conditions 2 and 3	New works condition for installation of flow meter and sampling tap and reporting.
Condition 4	Updated condition 2.5.2
Condition 5	Update condition 2.5.3 and additional water quality targets.
Conditions 6, 7 and 8	Updated condition 3.1.1, 3.1.2, 3.1.3, 3.5.1, additional water quality sampling parameters
Condition 9	Updated conditions 3.1.3 and 3.6.1
Condition 10	Updated conditions 4.1.1 and 4.1.2, requirement for new NIMP
Condition 11	Update condition 5.1.4
Condition 12	Update condition 5.1.3, extension of due date by 2 days. AACR condition updated consistent with current DWER template.
Conditions 13 and 14	Update condition and replaces 5.1.1. Annual record keeping requirements inserted, consistent with current DWER template.
Condition 15	Updated condition 5.2.3 and 5.3.1, clarified reporting requirements for limit and target exceedances.
Condition 16	Updated condition 5.3.1 clarified notifications requirements.
Condition 17	Updated conditions 5.2.1 and 5.2.2.
Conditions 2.6, 2.7, 2.8, 3.1.4, 3.1.5, 3.2, 3.3, 3.4, 5.1.3	Deleted, redundant condition.
5.2.3	Non-annual reporting requirements deleted, as considered to duplicate the legislation.
Schedule 1	Premise map and emission point maps updated to premise map Figure 1 and site layout Figure 2.
Schedule 2: Reporting and notification forms	Deleted, redundant attachments.
Schedule 2	Nutrient loading calculator spreadsheet

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*An officer delegated by the CEO under section 20 of the EP Act*



## References

1. Department of Environment Regulation (DER) 2015, *Licence L8849/2014/1 and decision report for LTC Management Pty Ltd*, Perth Western Australia
2. DER 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
3. Department of Water and Environmental Regulation (DWER) 2019, *Guideline: Decision Making*, Perth, Western Australia.
4. Department of Environmental Regulation 2016, *Guidance Statement: Licence duration*
5. Nutrient Irrigation Management Plan L889 2014 1 (2015).
6. L8849/2014/1 – 2023/2024 Annual Environmental Report and AACR
7. Wastewater irrigation agreement between Deep Woods Estate and Rivendell dated 3 October 2024 (*2024 Lease*)

## Appendix 1: Summary of licence holder's comments on risk assessment and draft conditions

Condition	Summary of licence holder's comment	Department's response
<b>Licence</b>		
Condition 1 Table 1	Licence holder provided wine production equipment list and map of infrastructure location.	This information has been updated within the licence Table 1 and Figure 2.
	Licence indicated that tanks do not have alarms and are visually inspected daily.	This information has been updated as conditions within the licence Table 1.
<b>Amendment Report</b>		
Section 1.3	Licence holder provided additional details on the irrigation pipeline, irrigator and irrigation coverage.	This information has been updated in the decision report and as a result the irrigation area has been reduced in accordance with the provided information which indicated that wastewater is being applied to a smaller area..
	Licence holder provided an updated lease for the off-site wastewater disposal area.	Licence expiry date to coincide with lease expiry date

## Appendix 2: Wastewater quality data

Date	pH	EC mS/cm	<sup>1</sup> Salinity mg/L	TN mg/L	TP mg/L	TDS mg/L	TSS mg/L	BOD mg/L
<b>Applicants criteria and Existing licence target limits</b>	<b>6-8.5</b>			<b>&lt;20</b>	<b>&lt;5</b>		<b>&lt;100</b>	<b>&lt;150</b>
<b><sup>2</sup>ANZECC 2000-Primary Industries<sup>1</sup></b>	<b>5.5-9.0</b>	<b><sup>4</sup>1.3- 2.9 Moderate salt crop</b>		<b>25-125<sup>3</sup></b>	<b>0.8-12<sup>3</sup></b>		<b>&lt;40</b>	
Apr-2016	4.4	3.13	2,003.20	39	7540	3300	250	7540
May-2016	4.8	2.57	1,644.80	46	11	3100	320	4660
Jun-2016	4.7	2.32	1,484.80	50	11	2400	200	3940
Jul-2016	5	1.48	949.12	14	3.8	1700	110	3380
Aug-2016	4.5	1.13	721.92	17	5.2	1100	98	2880
Sep-2016	7.2	1.17	745.60	24	5.1	640	210	161
Oct-2016	7.20	1.17	748.80	24.00	5.10	640.00	210.00	161.00
Nov-2016	6.8	1.52	973.44	13	4.1	1200	120	560
Dec-2016	6.9	2.32	1,484.80	29	10	1900	340	698
Jan-2017	7.9	3.26	2,086.40	93	13	1500	120	133
Feb-2017	7.9	3.26	2,086.40	93	13	1500	120	133
Mar-2017	7.9	3.26	2,086.40	93	13	1500	120	133
Apr-2017	4.50	2.96	1894.40	38.00	8.90	2400	390	208
May-2017	5.00	4.02	2572.80	22.00	10	3400	310	155
Jun-2017	5.00	4.02	2572.80	22.00	10	3400	310	155
Jul-2017	5.30	3.10	1984.00	44.00	11	2800	200	3500
Aug-2017	6.70	1.10	704.00	19.00	3.20	1000	200	740
Sep-2017	4.80	2.50	1600.00	51.00	9.30	2100	130	3000
Oct-2017	5.30	2.60	1664.00	62.00	10.00	2000	270	1900
Nov-2017	5.30	2.60	1664.00	62.00	10	2000	270	1900
Dec-2017	7.60	3.20	2048.00	69.00	11	1800	110	490
Jan-2018	7.60	3.20	2048.00	69.00	11	1800	110	490

Date	pH	EC mS/cm	<sup>1</sup> Salinity mg/L	TN mg/L	TP mg/L	TDS mg/L	TSS mg/L	BOD mg/L
<b>Applicants criteria and Existing licence target limits</b>	<b>6-8.5</b>			<b>&lt;20</b>	<b>&lt;5</b>		<b>&lt;100</b>	<b>&lt;150</b>
<b><sup>2</sup>ANZECC 2000-Primary Industries<sup>1</sup></b>	<b>5.5-9.0</b>	<b><sup>4</sup>1.3- 2.9 Moderate salt crop</b>		<b>25-125<sup>3</sup></b>	<b>0.8-12<sup>3</sup></b>		<b>&lt;40</b>	
Feb-2018	7.70	3.30	2112.00	60.00	9.90	1800	240	190
Mar-2018	4.90	5.30	3392.00	55.00	11.00	5400	580	5500
Apr-18	7.5	4.4	2816.00	41	14	3600	300	640
May-18	8.4	8.6	5504.00	93	24	4300	260	590
Jun-18	8.9	4.6	2944.00	63	15	2300	110	11
Jul-18	8.9	4.6	2944.00	63	15	2300	110	11
Aug-18	8	3.7	2368.00	67	11	2100	120	72
Sep-18	7.5	1.7	1088.00	20	1.6	1200	100	1000
Oct-18	7.6	2.5	1600.00	29	4.4	2200	130	340
Nov-18	7	2.2	1408.00	49	2.8	150	93	780
Dec-18	7	2.2	1408.00	49	2.8	150	93	780
Jan-19	8.1	3.2	2048.00	43	6.1	1900	50	88
Feb-19	7.3	2.7	1728.00	22	5.1	1700	51	180
Mar-19	8.2	2.8	1792.00	28	5.7	1600	6	45
Apr-19	8.2	2.8	1792.00	28	5.7	1600	6	45
May-19	7	3.4	2176.00	38	5.5	2700	180	2100
Jun-19	7.3	3.7	2368.00	58	11	1800	650	340
Jul-19	6.9	1.1	704.00	16	2.5	900	84	350
Aug-19	6.8	1.6	1024.00	22	4.2	1400	90	870
Sep-19	7.2	2.1	1344.00	28	4.8	1400	70	220
Oct-19	6.2	2.6	1664.00	45	3	2700	270	3000
Nov-19	7.5	2.6	1664.00	44	10	2500	93	250
Dec-19	7.5	2.6	1664.00	44	10	2500	93	250

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<b><sup>2</sup>ANZECC 2000-Primary Industries<sup>1</sup></b>	<b>5.5-9.0</b>	<b><sup>4</sup>1.3- 2.9 Moderate salt crop</b>		<b>25-125<sup>3</sup></b>	<b>0.8-12<sup>3</sup></b>		<b>&lt;40</b>	
Jan-20	8	4	2560.00	140	18	1800	110	25
Feb-20	8.1	3.1	1984.00	41	12	1900	330	110
Mar-20	7.1	3.3	2112.00	110	14	2700	2800	1300
Apr-20	7.4	3	1920	26	9.9	1500	570	100
May-20	7.4	3.3	2112	65	20	2300	140	80
Jun-20	7.99	1.9	1216	19	6.4	1700	96	72
Jul-20	7.2	1.6	1024	17	4.1	780	180	200
Aug-20	8	1.7	1088	9	4.1	1400	110	49
Sep-20	7.9	1.9	1216	16	6.8	1800	14	19
Oct-20	7.5	2.3	1472	36	9.7	1200	50	23
Nov-20	7.7	2.2	1408	27	7.8	1900	34	46
Dec-20	7.6	2.5	1600	62	16	1900	680	5
Jan-21	7.6	2.5	1600	62	16	1900	680	5
Feb-21	7.5	3.2	2048	58	17	1900	680	420
Mar-21	7.5	3.2	2048	58	17	1900	680	420
Apr-21	7.7	2.6	1664	54	16	1800	110	51
May-21	7.7	1.4	896	31	6.6	710	25	28
Jun-21	6.9	1.1	704	14	4.4	1300	120	110
Jul-21	7.4	1.6	1024	60	7.5	1100	230	150
Aug-21	7.4	1.6	1024	60	7.5	1100	230	150
Sep-21	7.3	1.8	1152	47	9.7	1400	24	330
Oct-21	7.8	1	640	20	9	600	54	33
Nov-21	7.9	2.5	1600	110	76	1500	76	27

Date	pH	EC mS/cm	<sup>1</sup> Salinity mg/L	TN mg/L	TP mg/L	TDS mg/L	TSS mg/L	BOD mg/L
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Dec-21	7.9	2.5	1600	110	76	1500	76	27
Jan-22	7.9	2.5	1600	110	76	1500	76	27
Feb-22	8.2	3.45	2208	26	22	2000	54	12
Mar-22	8	3.2	2048	30	15	1800	150	96
Apr-22	7.4	3	1920	62	9.8	1800	570	490
May-22	7.9	1.8	1152	23	8	2300	140	180
Jun-22	7.8	1.3	832	5.4	7	1500	58	25
Jul-22	8.4	1.5	960	56	5.6	1200	15	16
Aug-22	8	1.5	960	20	8.4	1400	44	5.5
Sep-22	8.1	1.5	960	12	7.7	1600	120	10
Oct-22	7.9	3.4	2176	39	14	2200	50	430
Nov-22	8.3	3.7	2368	34	16	2400	25	9.8
Dec-22	8.6	3.8	2432	56	20	3200	29	14
Jan-23	8.4	4.9	3136	81	18	3600	130	100
Feb-23	8.2	3.3	2112	14	6.9	2600	21	32
Mar-23	7.1	2.5	1600	35	2.2	2200	100	910
Apr-23	7.2	1.3	832	27	7.6	780	310	710
May-23	7.7	1.5	960	38	9.5	900	230	560
Jun-23	8.1	1.5	960	38	7.4	1200	52	70
Jul-23	7.3	5	3200	16	0.5	580	84	160
Aug-23	5.6	1	640	45	9.1	910	360	1600
Sep-23	7.1	1.1	704	24	5.1	660	43	230
Oct-23	7.7	1.8	1152	48	8.2	910	24	140

Date	pH	EC mS/cm	<sup>1</sup> Salinity mg/L	TN mg/L	TP mg/L	TDS mg/L	TSS mg/L	BOD mg/L
<b>Applicants criteria and Existing licence target limits</b>	6-8.5			<20	<5		<100	<150
<b><sup>2</sup>ANZECC 2000-Primary Industries<sup>1</sup></b>	<b>5.5-9.0</b>	<b><sup>4</sup>1.3- 2.9 Moderate salt crop</b>		<b>25-125<sup>3</sup></b>	<b>0.8-12<sup>3</sup></b>		<b>&lt;40</b>	
Nov-23	8.1	2.6	1664	37	8.9	1600	26	30
Dec-23	8	2.7	1728	55	12	2300	15	43
Jan-24	7.8	2.8	1792	44	15	1900	170	99
Feb-24	4.2	2.4	1536	23	9.4	1500	260	2500
Mar-24	5.2	3.5	2240	71	24	2100	550	2500

Note 1: Salinity converted from electrical conductivity (EC)

Note 2 National Water Quality Management Strategy Paper No. 4 – Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 3 Primary Industries long term irrigation (over 20 years), 2000, ARMC and ANZECC (ANZECC 2000).

Note 2- pH has been adjusted to suit southwest swan coastal plain lower pH values within ground water. pH has been adjusted from 6 – 9 to 5.5 -9.

Note 3 – ANZECC 2000, requires site specific assessment to determine actual value.

Note 4 – Salinity levels have been set based on effects to crop yields for rye grass and general pasture.