Government of Western Australia
Department of Water and Environmental Regulation

Licence

Licence number	L7352/1989/10
Licence holder	Derby Industries Pty Ltd
ACN	009 033 612
Registered business address	6 Short Street FREMANTLE WA 6160
DWER file number	DER2017/000118/1A PP-0026197
Duration	13/02/2015 to 12/02/2035
Date of amendment	15/07/2025
Premises details	Linley Valley Pork Linley Valley Road WUNDOWIE WA 6560 Legal description - Lot 7 on Diagram 45818, Lot 8 on Diagram 43110, Lot 10 on Plan 12508, Lot 421 on Plan 300357, Lot 5485 on Plan 114980 and Lot 722 on Plan 421746 As depicted in the premises map in Schedule 1.

Prescribed premises category description (Schedule 1, ***Environmental Protection Regulations 1987***)	**Assessed production capacity**
Category 15: Abattoir: premises on which animals are slaughtered	80,000 liveweight tonnes (pigs) per annual period

This licence is granted to the licence holder, subject to the attached conditions, on 15 July 2025, by:

Caron Goodbourn
Digitally signed by Caron Goodbourn
Date: 2025.07.15 10:11:51 +08'00'

MANAGER, PROCESS INDUSTRIES
APPROVALS – STATEWIDE DELIVERY

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

Licence history

Date	Reference number	Summary of changes
13/02/2010	L7352/1989/9	Licence re-issue
13/10/2010	L7352/1989/9	Licence amendment
15/08/2013	L7352/1989/9	Licence amendment to REFIRE format
05/02/2015	L7352/1989/10	Licence granted
29/04/2016	L7352/1989/10	Administrative Notice – Licence duration extension to 12/02/2028
11/01/2017	L7352/1989/10	Amendment Notice 1 - Amendment to wastewater pond management conditions.
28/11/2017	L7352/1989/10	Amendment Notice 2 – Amendment to delete improvement conditions
30/09/2023	L7352/1989/10	CEO initiated licence review to conduct a formal risk-based assessment of the premises of current waste handling and disposal activities. This review amalgamated amendment notice 1 and 2 into the licence, updated the licence format, and removed redundant conditions.
16/01/2024	L7352/1989/10	CEO initiated licence amendment to correct the licence holder's name on the front page of L7352/1989/10 and other administrative updates.
15/07/2025	L7352/1989/10	CEO initiated licence amendment to incorporate, the wastewater storage and treatment ponds, associated irrigation infrastructure, disposal areas and management requirements of the El Caballo Golf Course, onto this licence.

Interpretation

In this licence:

(a) the words 'including,' 'includes' and 'include' in conditions mean "including but not limited to," and similar, as appropriate;

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

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

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

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

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

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

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

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

Licence conditions

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

Works

1. The licence holder must ensure that the site infrastructure items listed in Table 1 are constructed/installed in accordance with the corresponding design and construction requirements at the corresponding infrastructure location, within the timeframe set out in Table 1.

Table 1: Design, construction, and installation requirements

	Site infrastructure and equipment	Design, construction, installation and inspection requirements	Infrastructure location	Timeframe
1.	Groundwater monitoring wells MB10, MB11, MB12, MB13, MB14, MB15, MB16, MB17 and MB18	The licence holder must design, construct, and install groundwater monitoring wells in accordance with the following requirements. Well design and construction: Designed and constructed in accordance with *ASTM D5092/D5092M-16: Standard practice for design and installation of groundwater monitoring bores*. Wells must be constructed with a screened interval that intersects with the water table and has a maximum length of 3 metres.[1] Logging of borehole: Soil samples must be collected and logged during the installation of the monitoring wells. A record of the geology encountered during drilling must be described and classified in accordance with the Australian Standard Geotechnical Site Investigations AS1726. Any observations of staining / odours or other indications of contamination must be included in the bore log. Well construction log: Well construction details must be documented within a well construction log to demonstrate compliance with *ASTM D5092/D5092M-16*. The construction logs shall include elevations of the top of casing position to be used as the reference point for water-level measurements, and the elevations of the ground surface protective installations. Well development: All installed monitoring wells must be developed after drilling to remove fine sand, silt, clay and any drilling mud residues from around the well screen to ensure the hydraulic functioning of the well. A detailed record should be kept of well development activities and included in the well construction log. Installation survey: the vertical (top of casing) and horizontal position of each monitoring well must be surveyed and subsequently mapped by a suitably qualified surveyor. Well network map: a well location map (using aerial image overlay) must be prepared and include the location of all monitoring wells in the monitoring network and their respective identification numbers.	As labelled in Schedule 1, Figure 3	To be installed no later than **30 October 2025**

Note 1: refer to Section 8 of Schedule B2 of the Assessment of Site Contamination NEPM for guidance on bore screen depth and length.

2. The licence holder must, within 60 calendar days of the groundwater monitoring bores being constructed, submit to the CEO a bore construction report evidencing compliance with the requirements of Condition 1.

Infrastructure and equipment

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

Table 2: Infrastructure and equipment requirement

	Site infrastructure and equipment	Operational requirement	Infrastructure location Schedule 1
Lairage			
1	Half open-air roof lairage with concrete slat floors draining to a wastewater collection pit	a. Pigs awaiting slaughter must only be held in the lairage; b. All wastewater from the lairage must pass through solids screens to remove gross solids before being directed to the wastewater treatment system c. The flooring and drainage system must be d. maintained to ensure all wastewater is contained and directed to the wastewater e. treatment system; f. Manure from the lairage must be removed on a daily basis for stockpiling in the solid waste storage area for off-site disposal by a licenced contractor; and g. Deceased animals, afterbirth and foreign materials not being processed must be removed from sheds or pens by the end of the working day in which they were discovered.	As depicted in Figure 4 and Figure 6, labelled as 'lairage'
Slaughter operations			
2	Enclosed Abattoir facility with concrete flooring and drainage consisting of: - stunning area - slaughter floor - hook rooms - pre-breaker storage - condemned room - casing and paunch area - salting area - pickling area - offal area - chopper and boning - chiller, freezer, and dispatch - LNG operated boiler (100kL) and pressurised steel ammonia tank (36kL), (refrigeration gas storage) - External blood collection and removal truck tank, over bunded hardstand (37 tonne capacity)	a. All wastewater from the abattoir must pass through solids screens to remove gross solids before being conveyed to the wastewater treatment system; b. The flooring and drainage system must be maintained to ensure all wastewater is directed to the wastewater treatment system; c. The slaughter room floor drainage system must separate all blood waste and direct it to the blood collection and removal tank; d. Animal carcasses, skins, offal, paunch, fat, and bone must be collected and contained in a covered shed, hoppers, bins, or trucks over bunded concrete flooring for no longer than 24 hours prior to being stored in cold storage or disposed of offsite by a licenced contractor; e. The blood collection and removal truck tank must be contained over a bunded concrete hardstand prior to off-site disposal; f. The blood collection and removal truck tank must be sealed and maintained free of leaks; g. The blood collection and removal truck tank must receive all blood waste; and h. Blood must be disposed of offsite each day following animal processing and removed by a suitably licenced contractor.	As depicted in Figure 6 labelled in the premises infrastructure schematic As depicted in Figure 4 labelled as 'blood collection and removal' (truck)
Truck Washing Bay			

3	Stock truck washing bay	a. The licence holder must only wash trucks that are delivering pigs to the premises; b. All wastewater from the truck washing area must pass through solids screens to remove gross solids before being conveyed to the primary wastewater treatment system; and c. Truck washing bay to be cleaned and all solid waste removed after each truck washing.	As depicted in Figure 4, labelled as 'truck wash area'
Site infrastructure and equipment		**Operational requirement**	**Location as shown in Schedule 1**
Primary wastewater treatment system			
4.	Primary wastewater system consisting of; Save-all pit solids screen: manure holding hydro sieve and built-in enclosed steel silo of 18m3 capacity over a bunded concrete hardstand In-ground concrete waste containment : - transfer sump and pump (15.78m3) - overflow pit (78.97m3) - Warman pump sump (58.35m3) - settling pond (273.28m3) Primary wastewater ponds (clay-lined) : - anerobic ponds 2 & 3 - aerobic ponds 4 to 7 and, pond 9 with spillway Pipework conveying wastewater from the abattoir, through the primary wastewater treatment system to the secondary wastewater system.	a. The manure holding hydro sieve and silo must only receive manure; b. Wastewater from lairage, abattoir and truck washing activities must be screened by the hydro sieve and solids stored within the enclosed steel silo prior to off-site removal; c. Manure must be disposed offsite weekly or earlier if storage is near capacity; d. All wastewater conveying hardstands, sumps, drains, pipes, and ponds must be maintained to prevent leakage to subsurface soils; e. In case of a wastewater collection pit pump system failure, an automated backup pump system is to be available for use; f. An audible and visual high level water alarm operational below the level of the overflow pipes on each collection pit, must be maintained and connected to the premises office; g. Slaughtering must immediately cease Should the alarms referred to in condition (e) be activated and not be resumed until the fault leading to the overfilling of the collection pit has been rectified; h. Flow meters FM01, FM02 must be clearly named, numbered, shown on the premises map, and maintained operational at all times, on the primary wastewater collection pit system and the secondary wastewater Pond 9 pump house; i. A minimum freeboard of 0.3m must be maintained on wastewater treatment pond 9; j. Stormwater runoff must be prevented from causing erosion of outer pond embankments; k. The integrity of all containment infrastructure is to be maintained to prevent overflowing and leakage of wastewater; l. Vegetation on inner pond embankments must not interfere with the integrity of pond walls or mask overtopping or other leakage; m. Vegetation on anerobic ponds 2 and 3 must not interfere with the integrity of the crust; n. Aerobic wastewater pond surfaces must be kept clear of floating matter and algal mats; o. No wastewater is to be discharged into wastewater treatment ponds 1 and 8 (as shown in Schedule 1, Figure 5); p. A stock proof fence must be maintained around the wastewater pond area and all monitoring bores, which prevents livestock accessing and damaging the ponds and groundwater monitoring bores. q. All wastewaters from premises operations including wash down water, by-products wastewater and contaminated run-off are only directed to the primary wastewater treatment system or removed offsite by a licensed controlled waste contractor.	As depicted in Figure 4, labelled as: 'save-all pit solids screen' 'in-ground concrete transfer sump & pump' 'in-ground concrete settling pond', 'in-ground concrete sump & Warman pump & flow meter FM01', Flow meter locations as depicted in Figure 4, Figure 5 and Figure 8, labelled as FM01, FM02 Pond 9 outflow depicted in Figure 5, labelled as 'spillway' and, 'pump house and flow meter FM02'. Primary wastewater ponds as depicted in Figure 5, labelled as: 'Pond 2' 'Pond 3' 'Pond 4' 'Pond 5' 'Pond 6' 'Pond 7' 'Pond 9'
Secondary wastewater treatment system – El Caballo Golf Course Lot 722 on Plan 421746			
5.	Consisting of: - aerobic pond 1a - aerobic pond 2a - aerobic pond 3a - aerobic pond 4a - aerobic pond 5a - big rock dam (storage pond)	a. All uncontaminated stormwaters must be diverted away from the ponds to minimise the threat of erosion of pond embankments or flooding; b. The licence holder must ensure all wastewater conveying pipework and ponds are maintained to prevent any seepage or leaking of wastewater; c. The following minimum freeboards must be maintained on the following wastewater ponds: d. Aerobic pond 1a, - 0.3m	As depicted in Figure 7 and Figure 8, secondary wastewater ponds, labelled as : aerobic pond 1a aerobic pond 2a

	- constructed of compacted clay and in-situ soils of unknown permeability.	e. Aerobic ponds 2a to 5a, - 0.3m' f. Big rock dam, - 0.3m g. Outlets on each wastewater pond/dam must be maintained to prevent blockages and the carry- over of floating matter to subsequent ponds/dam/lakes; and h. Aerobic pond1a receives wastewater from Pond 9 i. Wastewater pond/dam surfaces must be kept clear of floating matter and algal mats as not to interfere with the integrity of pond walls or mask overtopping or other leakage.	aerobic pond 3a aerobic pond 4a aerobic pond 5a big rock dam
Secondary wastewater system - El Caballo Golf Course Lot 722, Plan 421746			
6.	Wastewater lakes consisting of: - lake 4, - lake 4A, - Lake 4B - Lake 5. - constructed of in-situ soils with unknown permeability	a. Outlets on each wastewater lake must be maintained to prevent blockages and the carry- over of floating matter to subsequent lakes; b. Lake surfaces must be kept clear of floating matter and algal mats; c. Lake 4 receives wastewater from big rock dam; d. Big rock dam receives water from aerobic pond 9 e. Flow meter FM03 must be maintained and operational on the final treatment pond of the secondary wastewater Lake 5 pump station at all times;	As depicted in Figure 7 and Figure 8, wastewater storage lakes, labelled as: Big rock dam Lake 4, Lake 4A, Lake 4B, Lake 5
Site infrastructure and equipment		**Operational requirement**	**Location as shown in Schedule 1**
Wastewater Land Application Area (Irrigation) – El Caballo Golf Course Lot 722 on Plan 421746			
7.	35 Ha wastewater Land Application Area (LAA) consisting of: - wastewater pipeline connecting Lake 5 to the Pump station and, connected to flow meter labelled FM03 (flow meter tracking wastewater discharged across irrigation area). - sprinkler irrigation system	a. Flow meter FM03 must be clearly named, numbered, shown on the premises maps and maintained operational at all times to accurately measure the cumulative volumes of wastewater discharged to the LAA; b. Only wastewater from Lake 5 must be irrigated to the LAA; c. No irrigation-generated run-off, spray drift, or discharge must occur beyond the boundary of the LAA; d. The licence holder must ensure no soil erosion or ponding/pooling results from the irrigation of wastewater; e. Treated wastewater must be equally distributed over the LAA; f. Irrigation must not occur on land that is visibly waterlogged; g. Healthy grass cover must be maintained over the LAA to maximise wastewater and nutrient uptake; h. Sprinkler irrigation system is to be maintained to ensure even and effective spray, no blockages, and functionality of stopping and cut-off mechanisms; and i. Irrigation is not to be undertaken during, or 24 hours immediately after a rainfall event over 2 mm.	As depicted in Figure 7 and Figure 8, secondary wastewater irrigation area (Land Application Area, LAA) flow meter, labelled as FM03
Groundwater monitoring bores			
8.	Groundwater monitoring bores MB06, MB07, MB08, MB09, MB10, MB11, MB12, MB13, MB14, MB15, MB16, MB17 and MB18 (once installed)	a. Maintained to allow access to groundwater for measuring its level, physical and chemical properties; and allow groundwater samples to be withdrawn for laboratory analysis; b. Must be capable of intercepting surficial groundwater (if present); and c. Must be protected from damage by stock.	As depicted in Figure 1 & 3, groundwater monitoring bores, labelled as MB06, MB07, MB08, MB09, MB10, MB11, MB12, MB13, MB14, MB15, MB16, MB17 and MB18

4. The licence holder must not discharge or allow to be discharged raw, stabilised or any other potentially contaminated wastewater or manure directly, or indirectly, into the Wooroloo Brook and Coates Gully or its tributaries, nor any other waterway and only to infrastructure specified in this licence.

Waste Management

5. The licence holder must ensure that the waste types specified in **Table 1** are only subjected to the corresponding process(es), subject to the corresponding process specifications.

Table 1: Waste processing

Waste type	Process(es)	Process specifications
Blood	Emptying of blood collection tank	The blood tank must be emptied daily by a licenced contractor and taken offsite for disposal to a waste or rendering facility that is lawfully able to accept it
Dead and downer pigs (not being processed in abattoir)	Off-site disposal	Within 24 hours of death, carcasses must be removed offsite by a licenced contractor for disposal or processing
Abattoir solid waste by-products (skins, offal, paunch, fat and bone) not being processed in the abattoir	Disposal of abattoir by-products offsite	All solid waste material generated from abattoir operations must be collected daily and stored in cold storage and/or disposed offsite to a waste or rendering facility that is lawfully able to accept it.
Manure	Emptying of manure from solid screens/sieves and storage silo	All stored manure waste must be disposed offsite to a waste facility that is lawfully able to accept it, at least weekly
Wastewater	Treatment, storage and irrigation	Where wastewater cannot be irrigated or stored onsite, the wastewater must be removed by a licensed controlled waste carrier and transported off-site to a licensed liquid waste facility
Wastewater treatment pond sludge	De-sludging of wastewater ponds	Dewatered solids must be contained in leakproof storage infrastructure/equipment and removed to a licensed waste facility within 48 hours of pond excavation. The CEO must be notified at least 14 days prior to a pond being de-sludged.

Emission and Discharge

6. The licence holder must ensure that treated wastewater is only discharged via irrigation to the specified discharge point(s) in accordance with the concentration limits and loading limits specified in Table 4.

Table 4: Wastewater discharge limits

Emission point reference	Parameter	Limit (including units)	
(a) MP02 (monitoring point) (b) Land Application Area	Total nitrogen	180 kg/ha/annual period	Annual
	Total phosphorus	120 kg/ha/annual period	Annual
	BOD	1500 kg/ha/Month	Monthly
	pH	6 and 8.5 pH units	Monthly
	Electrical conductivity	635 mS/m	Monthly
	Sodium adsorption ratio (SAR EC, Schedule 4)	Stable soil structure range depicted in Figure 9.	Monthly
	E.coli	<1000 cfu of MPN/100ml	Monthly

7. The licence holder must ensure that the volume of wastewater directed to the secondary wastewater treatment system and/or discharged to the LAA, when monitored in accordance with condition 12, does not exceed the limit specified in Table 5.

Table 5: Wastewater emissions and discharge

Emission point reference as specified in Schedule 1	Parameter	Discharge limit value (including units)
Primary wastewater System **Pond 2** as depicted in Figure 7, labelled '**Pond 2 Discharge point**'. Receiving wastewater from the Abattoir process via inground concrete sump and Warmun pump identified in Figure 4.	Cumulative wastewater volume	No more than 310,000 kL discharged to Pond 2 per annual period
Secondary wastewater system **Aerobic Pond 1a** as depicted in Figure 8, labelled '**Aerobic Pond 1a discharge poin**t'. Receiving wastewater from Pond 9 via the pump house and flow meter identified in Figure 5.	Cumulative wastewater volume	No more than 310,000 kL discharged to Aerobic Pond 1a per annual period
Land Application Area **Wastewater irrigation Area** (El Caballo Golf Course) as depicted in Figure 7, labelled '**Wastewater Irrigation Area discharge point'**, receiving wastewater from Lake 5 via pump station, flow meter FM02 and sampling point identified in Figure 8.	Cumulative wastewater volume	No more than 310,000 kL discharged to the wastewater irrigation area per annual period

8. Subject to conditions 7 and 14, the licence holder must submit to the CEO a written report within 14 days of becoming aware of the limit of exceedance listed in Table 4 and Table 5.

The report must contain the following information:

(a) description of any emission exceedance;

(b) time and date when exceedance(s) occurred;

(c) whether any environmental impact occurred as a result of the exceedance and, if so, what that impact was and where the impact occurred;

(d) details of the management action(s) taken in response to resolving the exceedance; and

(e) details and results of any investigation undertaken into the cause of the exceedance.

Monitoring

Monitoring of inputs and outputs

9. The licence holder must undertake monitoring in Table 6, according to the specifications in that table.

Table 6: Process monitoring

Input/output	Parameter	Units	Averaging period	Frequency type
Pigs received at the premises	Pigs	Animals	Monthly	Each batch arriving at the premises
Slaughtered pigs	Hot standard carcass weight	kg		Total per week
Dead and downer pigs (those not being processed in the abattoir)	Dead and downer pigs	Carcasses		Number removed from the premises
Solid waste by-product not being processed in the abattoir	Skin, offal, blood, paunch, fat, bone	Tonnes	Annual	Waste removed from the premises each year
Manure	Manure	Tonnes/ m^3	Monthly	Each batch removed from the premises
Wastewater treatment pond sludge	Pond sludge	m^3	Each de-sludging event	
Pig delivery truck	Number of trucks washed	Number	Weekly	Total of all trucks washed at the

Input/output	Parameter	Units	Averaging period	Frequency type
wash bay	Estimated volumes of water used for each truck (pump hours x flow rate)	kL		premises

10. All sample analysis must be undertaken by laboratories with current accreditation from the National Association of Testing Authorities (NATA) for the relevant parameters, unless otherwise specified in Tables 7, 8, 9 and 10.

11. The licence holder must ensure that:

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

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

(c) monitoring is undertaken in each six-monthly period such that there are at least 5 months, in between the days on which samples are taken, in successive periods of six months

Monitoring of ambient surface water

12. The licence holder must undertake the surface water sampling specified in Table 7 according to the specifications in that table.

Table 7: Monitoring of ambient surface water

Monitoring point reference as specified in Schedule 1	Parameter	Units	Method	Frequency
a. SS01, Coates Gully upstream; b. SS02, Wooroloo Brook downstream boundary; c. SS03, Wooroloo Brook downstream boundary.	pH[1]	pH units	Spot sample in accordance with *AS/NZS5667.1* and *AS/NZS5667.4, AS/NZS 6557.6* or *AS/NZS5667.9* as relevant	Within 24 hours of any discharge to Wooroloo Brook and /or Coates Gully (intended or unintended).
	Total Suspended Solids (TSS)	mg/L		
	Total dissolved Solids (TDS)			
	5-Day Biochemical Oxygen Demand (BOD5)			
	Total Nitrogen (TN)			
	Total Phosphorus (TP)			
	E.coli	cfu/ 100 mL	*AS 4276.7*	

Note 1: In field non-NATA accredited analysis permitted

Monitoring of wastewater

13. The licence holder must undertake the wastewater monitoring specified in Table 8 according to the specifications in that table.

Table 8: Monitoring wastewater for irrigation

Monitoring / sampling point reference	Parameter	Units	Method	Frequency/type
a. LAA irrigation b. monitoring point, MP02; As labelled Schedule 1, Figure 1, defined by the GPS coordinates in Schedule 3.	E.coli	cfu	Spot sample in accordance with *AS/NZS5667.1* and *AS/NZS5667.10*	Monthly/ when irrigating
	pH[1]	pH units		
	Total Suspended Solids (TSS)	mg/L		
	Total dissolved Solids (TDS)			
	5-Day Biochemical Oxygen Demand (BOD5)			
	Total Nitrogen			
	Total Phosphorus			

	Available phosphorus (Colwell)			
	Available nitrogen			
	Sodium ion (Na^+)			
	Calcium ion (Ca^{2+})			
	Magnesium ion (Mg^{2+})			
	Potassium			
	Chlorine			
	Electrical conductivity	dS/m		
Flow meter readings - FM01, FM02, FM03; GPS location in Schedule 3, Table 16.	Volumetric flow rate	kL	Cumulative flow	Monthly

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

Monitoring of groundwater

14. The licence holder must undertake the groundwater monitoring specified in Table 9 according to the specifications in that table.

Table 9: Monitoring of ambient groundwater concentrations

Monitoring point reference:	Parameter	Units	Method	Frequency
Primary wastewater treatment system monitoring bores[1]: MB06 (North), MB07 (East), MB08 (South), MB09 (West); Wastewater Irrigation Area (LAA) monitoring bores[1] : MB10, MB11, MB12, MB13, MB14, MB15, MB16, MB17, MB18, MB19, MB20; As labelled in Schedule 1, Figure 1 and Figure 3.	Standing water level[2]	mAHD mbgl	Spot sample in accordance with *AS/NZS5667.1* and *AS/NZS5667.11*	Quarterly
	pH[2]	pH units		
	Total Suspended Solids	mg/L		
	Total dissolved Solids			
	5-Day Biochemical Oxygen Demand (BOD5)			
	Total Nitrogen			
	Total Phosphorus			
	Chlorine			
	E.coli	cfu/100mL		

Note 1: To be operational for sampling by no later than 31 August 2025, as per condition 1.
Note 2: In field non-NATA accredited analysis permitted.

Monitoring of Soil

15. The licence holder must undertake the soil monitoring specified in Table 10, according to the specifications in that table.

Table 10: Monitoring of ambient soil concentrations

Monitoring location in Schedule 1	Parameter	Unit	Frequency	Core sample number	Soil Profile	Core sample number	Soil Profile
				Composite Surface Soil Sample		Composite Deep Soil Sample	
S1–S20, as depicted in Figure 2	pH (CaCl2)	pH units	During the months of February, March or April. Every 3 years, after 2025 baseline survey.	40	0-10cm	5	Composite sample of each major soil horizon to 1 metre depth increments[1,2]
	Electrical conductivity (1:5)[3]	dS/m					
	Cation exchange capacity	meq/ 100g					
	Exchangeable sodium percentage	%					
	Exchangeable potassium percentage	%					

	Total available N[4]	mg/kg					
	Total Nitrogen						
	Available Phosphorous (Colwell)	mg/kg			0-10cm		
	Total Phosphorous						
	Available Potassium (Colwell)						
	Heavy metals and pesticides	mg/kg	Every 3 years, after 2025 baseline survey.		0-10cm		
	Phosphorus retention (CSIRO method 9H1 Anion Storage Capacity)	mg P/kg	Every 5 years	N/A	N/A		
EMI survey area as depicted in Figure 2	EMI survey[5]	mS/m, Soil ECe in dS/m		Topsoil and subsoil samples collected to 1 metre depth in the most conductive areas of each LAA.			

Notes: (1). Positioned within major soil horizons or layers. (2). Within a 5m diameter plot. (3). Converted to saturated extract (ECe) based on field texture. (4). Nitrate-N and ammonium-N. (5). with EM 38 + soil sampling in the highest conductivity area (EC:1:5) converted to ECe using field texture.

Specified actions

16. The licence holder must undertake visual inspections of the infrastructure specified in Table 11 according to the specifications in that table.

Table 11: Inspections of critical containment

Infrastructure (refer to Table 2)	Type of inspection	Information requirement	Frequency
All drains and above ground pipes transporting wastewater through the primary and secondary wastewater system.	Condition confirmation i.e. integrity, visible damage to infrastructure, leaks or blockages of interconnecting wastewater pond pipelines.	A record of the inspector's name, signature, date and time of inspection and observations.	Days when the plant is operating.
Primary wastewater ponds 2, 3, 4, 5, 6, 7 and 9 as labelled in Schedule 1, Figure 5.			
Secondary wastewater system ponds 1, 2, 3, 4, 5 and big rock dam labelled in Schedule 1,Figure 8.			
Freeboard marker in wastewater pond 9 from in-situ staff gauge,	Record freeboard in mm from the surveyed marker level		

17. The licence holder must engage a suitably qualified and experienced consultant to revise the **Nutrient Irrigation Management Plan** (dated 8 July 2024). Providing the information listed in column , in accordance with the timeframe in column 2, of Table 12.

Table 12: Revision of Nutrient Irrigation Management Plan

Information requirements	Timeframe
1. Hydrogeological conditions, including: a. potential connections to groundwater b. elevations of groundwater monitoring bores in m AHD c. groundwater flow direction d. groundwater elevation contours in m AHD	Submit a revised Nutrient Irrigation Management Plan to DWER no later than **30 November 2025**
2. Locations of the sub-soil drains where known, and potential connections to groundwater and surface water.	
3. Quantify the amounts of nitrogen and phosphorus removed, i.e., during harvesting and removal of grass clippings, volatilisation, denitrification, soil absorption and storage.1	
4. A direct comparison between the volumes of water produced by the abattoir and the volumes irrigated by the golf course, to quantify the potential losses at each part of the process.i.e., water balance.	

Information requirements	Timeframe
4. Specific locations for the potential off-site disposal of any excess wastewater.	
5. Include reference to the department's guideline: *Water Quality Protection Note 33 :Nutrient and Irrigation Management Plans*.	
6. Provide updated hydraulic and nutrient loading calculations (including use of the Licence Holder Loading Rates Calculator, Schedule 2).	
7. Prepare a plan to manage potential soil structural constraints that can develop from excess sodium and/or potassium contained in wastewater.	
8. Provide information on wastewater treatment, including any reagents, disinfectants, or treatment chemicals used.	
9. Provide organic loading rate calculations based on the BOD of the applied effluent and, prepare a plan to manage any soil pore clogging that may result from excess organic matter[2] (including use of the Licence Holder Loading Rates Calculator, Schedule 2).	
10. Provide dimensions and holding capacity of each wastewater pond : with reference to DPIRD recommendations from *ABD Factsheet - Pond Freeboard.pdf*.	
11. Provide clearly labelled information on the designated irrigated wastewater land application areas in the form of an aerial map or spatial representation, showing area measurements in hectares (Ha) and all sprinkler locations.	
12. Management actions are to be developed and implemented to reduce and mitigate the associated nutrient proximity risk to the Wooroloo Brook and Coates Gully. Irrigation buffers are to be developed based on the body of evidence from monitoring results. Include reference to the Department guidelines, *Water Quality Protection Note 06* (*WQPN 6 - Vegetation buffers to sensitive water resources*)	
13. Provide a nutrient off-take(grass harvesting) strategy for the current wastewater irrigation area and if a nutrient off-take strategy cannot be implemented, identify a new additional wastewater irrigation area where a nutrient off-take strategy (harvesting) can be implemented. The new irrigation area proposal must be able to be incorporated into the prescribed premises and must include species options for crop yield and nutrient up-take. Define the extent of the new irrigation area and the requirements to achieve a nutrient balance for the 'whole of the site' wastewater stream.	

Notes (1): Leaf tissue analysis can be used to determine site-specific nitrogen and phosphorus requirements. (2): For further information, refer to page 51 of the Environmental Guidelines, *Use of effluent by irrigation,* published by the Department of Environment and Conservation (NSW).

18. The licence holder must submit to the CEO a management plan for testing the permeability of all wastewater ponds or dams on the premises. The plan is to be submitted no greater than 3 months from the granting of this licence, with:

(a) testing timeframes

(b) pond Drop Test[2] methodology as outlined in Schedule 5.

(c) a scope of work to re-line[1] all wastewater ponds or dams where required, by July 2030 to achieve a maximum permeability of $1x10^{-9}$ m/s.

(d) details of any changes to wastewater management associated with the works, identification of environmental risk and measures to manage, mitigate or eliminate this risk.

Note (1): 14 days' notice in writing shall be given to the CEO, prior to the commencement of any re-lining and/or de-sludging works associated with the plan in Condition 18. (2): Results of pond testing evidencing works are to be submitted to the CEO, with the next applicable Annual Environmental Report.

Records and reporting

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

(a) the name and contact details of the complainant, (if provided);
(b) the time and date of the complaint;
(c) the complete details of the complaint and any other concerns or other issues raised; and
(d) the complete details and dates of any action taken by the licence holder to investigate or respond to any complaint.

20. The licence holder must:
(a) undertake an annual audit of their compliance with the conditions of this licence during the preceding annual period; and
(b) prepare and submit to the CEO by no later than **30 April** after the end of the annual period an Annual Audit Compliance Report in the approved form.

21. The licence holder must maintain accurate and auditable books including the following records, information, reports, and data required by this licence:
(a) the calculation of fees payable in respect of this licence;
(b) maintenance of infrastructure that is performed in the course of complying with condition 4 of this licence;
(c) monitoring and inspection programs undertaken in accordance with all conditions of this licence; and
(d) complaints received under condition 20 of this licence.

(a) any amendments to records must remain legible, be capable of retrieval and detail the reasons and time/date of such amendments;

22. The licence holder must submit to the CEO by no later than **30 April** after the end of each annual period, an Annual Environmental Report for that annual period for the conditions listed in Table 13, and which provides information in accordance with the corresponding requirement set out in Table 12.

Table 13: Annual Environmental Report

Condition	Requirement:	Format or form
Condition 9	Monitoring and reporting of inputs and outputs as indicated in Table 6.	Tabular format, monthly totals
Condition 7	Provide flow meter photographic evidence i.e. illustrating the date, the flow meter name, readings and serial numbers (ensuring the cumulative flow volume. Serial numbers must be visible and readable in the supplied photographs).	Monthly
Conditions 11, 12. 13 and 14.	Tabulated results and time series graphs for surface water, wastewater, groundwater and, soil sampling data, for each sampling location showing concentrations of all parameters including: a. laboratory data sheets for sampling in accordance with Table 7, Table 8, Table 9, Table 10, and the relevant Australian Standards. b. A tabulated data summary of sampling results c. present monthly and annual tabulated loadings of nitrogen, phosphorus and BOD applied to the irrigation area using the Nutrient Loading Spreadsheet in Schedule 2. d. an assessment and interpretation of sample data including comparison to historical trends, water quality limits, targets and loading limits.,	Tabular, graphical and/or summarized format; Relevant frequency and/or averaging; Nutrient Loading Spreadsheet as depicted in Schedule 2, labelled as *Licence Holder Loading Rates Calculator*, for recording wastewater irrigation sampling data.
Condition 15	A summary of the results of inspecting critical containment infrastructure.	None specified
Condition 18	Complaints summary	None specified
Condition 19	Annual Audit Compliance Report	AACR[1]
	Any changes to site boundaries, location of groundwater monitoring bores, surface drainage channels	None specified
	Summary of any failure or malfunction of any pollution control infrastructure/equipment or any incidents that have occurred and any action taken, during the annual period	None specified

Note (1): AACR form can be accessed on DWER's website.

Notification

The licence holder shall ensure that the parameters listed in Table 14 are notified to the CEO in accordance with the notification requirements of the table.

Table 14: Notification requirements

Condition or table	Parameter	Notification requirement[1]	Format or form
~~All~~ applicable	Any failure or malfunction of any pollution control equipment or any incident which has caused, is causing or may cause pollution	Within 24 hours of a failure, malfunction or pollution observed	Not specified
Condition 3, Table 2	Any breach of freeboard on wastewater pond 9 and the proposed actions to be taken.	Within 24 hours of the breach being observed.	
Condition 3, Table 2	Any discharge of liquid waste to the environment from the premises abattoir, pipelines, or wastewater treatment system. Notice to include: a. The area in which the discharge has occurred clearly indicated on a premises site map; b. the type of waste material discharged; c. the times and dates of the discharge (if known); and d. all remedial action and repairs conducted to cease the discharge and what action (planned or completed) taken to prevent any further discharge.	Within 24 hours discharge being observed.	
	Any scheduled pond desludging works. Notification to include: a. the intended dates that desludging will occur; b. the scheduled contractor completing the works; and the intended facility the pond sludge will be taken to.	At least 14 days prior to any pond desludging works.	
	Any notification received that El Caballo Golf Course is or will (for any reason) be unable to receive wastewater from the Linley Valley Pork premises and what actions Linley Valley Pork will take to ensure all wastewater is appropriately contained and not discharged to the environment	Within 24 hours of being notified.	

Note (1): No notification requirement in the Licence shall negate the requirement to comply with s72 of the EP Act.

Definitions

In this licence, the terms in Table 15 have the defined meanings.

Table 15: Definitions

Term	Definition
ACN	Australian Company Number.
(AACR)	Annual Audit Compliance Report: a report submitted in a format approved by the CEO (relevant guidelines and templates may be available on the Department's website).
annual period	a 12-month period commencing from 1 April until 31 March of the immediately following year.
AS/NZS 5667.1	Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples* as amended from time to time.
AS/NZS 5667.6	Australian Standard AS/NZS 5667.6 *Water Quality – Sampling – Guidance on sampling of rivers and streams* as amended from time to time.

Term	Definition
AS/NZS 5667.10	Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of wastewaters* as amended from time to time.
AS/NZS 5667.11	Australian Standard AS/NZS 5667.11 *(R2016) Water quality - sampling - guidance on sampling groundwater* as amended from time to time.
averaging period	time over which a limit or target is measured, or a monitoring result is obtained.
BOD	biochemical oxygen demand
books	the same meaning given to that term under the EP Act.
CEO	Chief Executive Officer of the Department. "Submit to / notify the CEO" (or similar), means either: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 or: info@dwer.wa.gov.au
cfu	colony forming units
Colwell	'Colwell method' - a widely used soil test for measuring plant-available phosphorus (P) in agricultural soils, particularly in Australia.
Department	the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
discharge	the same meaning given to that term under the EP Act.
EC	electrical conductivity
emission	the same meaning given to that term under the EP Act.
EP Act	*Environmental Protection Act 1986* (WA).
EP Regulations	*Environmental Protection Regulations 1987* (WA).
freeboard	the distance between the maximum water surface elevations and the pond spillway (being the lowest spill point in pond 9).
hardstand	a surface with a permeability of 10^{-9} metres/second or less.
kg/ha	kilograms per hectare
kL	Kilolitre
LAA	land application area
L/day	litres per day
licence	refers to this document, which evidences the grant of a licence by the CEO under section 57 of the EP Act, subject to the specified conditions contained within.
licence holder	the occupier of the premises, being the person specified on the front of the licence as the person to whom this licence has been granted.
m	Metre
mg/L	milligrams per litre
MPN	most probable number

Term	Definition
mS/m	milliSiemens per metre
NATA	National Association of Testing Authorities, Australia.
NATA accredited	in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis.
premises	premises to which this licence applies, as specified at the front of this licence and as shown on the premises map (Figure 1) in Schedule 1 to this licence.
prescribed premises	the same meaning given to that term under the EP Act.
SAR	sodium adsorption ratio
six-monthly	means the 2 inclusive periods from 1 April to 30 September and 1 October to 31 March in the following year.
spot sample	means a discrete sample representative at the time and place at which the sample is taken.
quarterly	means the 4 inclusive periods from 1 January to 31 March, 1 April to 30 June, 1 July to 30 September, and 1 October to 31 December.
waste	the same meaning given to that term under the EP Act.

END OF CONDITIONS

Schedule 1: Maps

Premises maps and sampling points

The prescribed premises areas (pink) and monitoring locations defined in Error! Reference source not found. **are shown in the maps below (Figure 1 and Figure 2).**

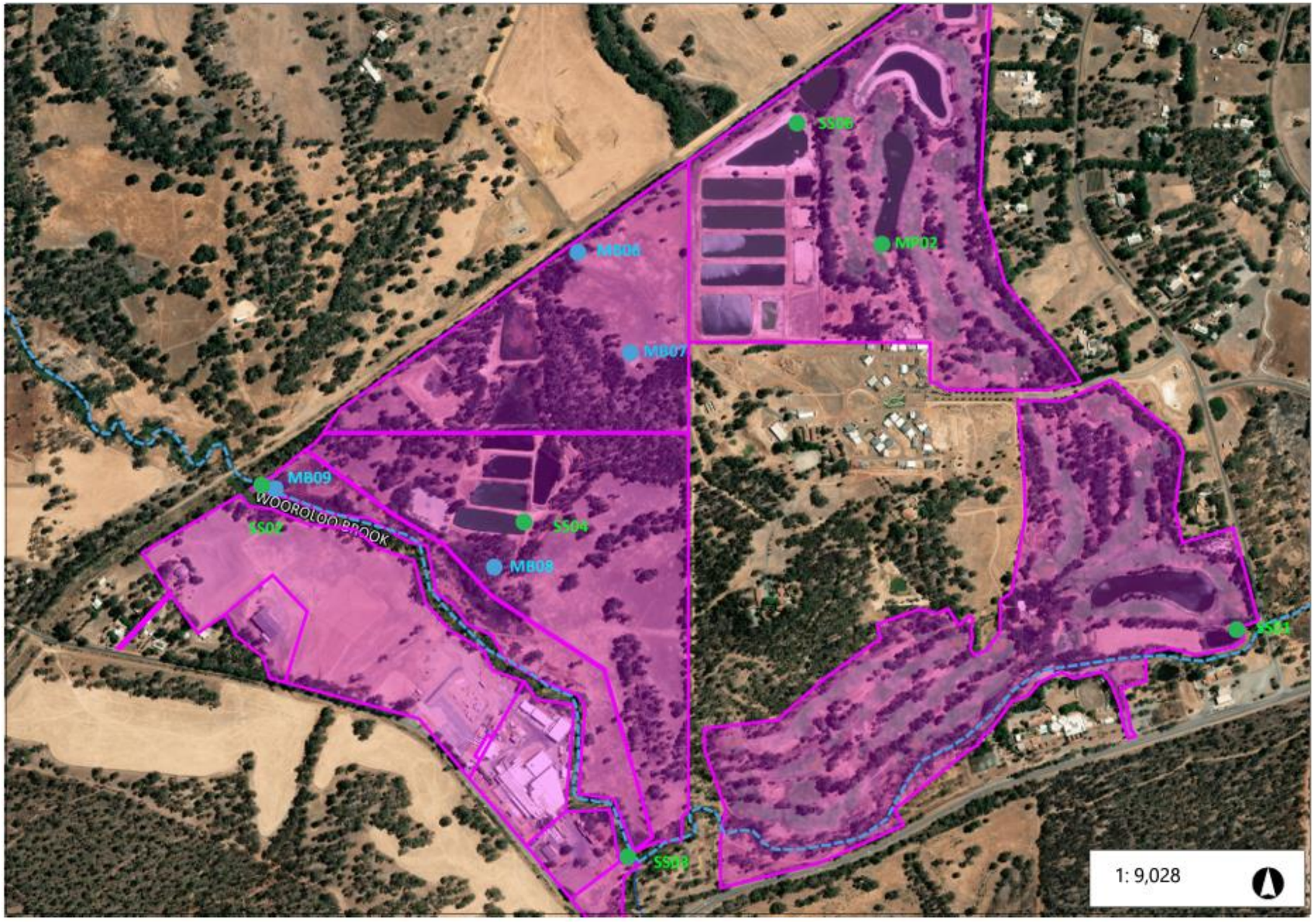

Figure 1: Map of the premises boundary, wastewater, surface water and monitoring bore sampling locations

L7352/1989/10 (15/07/2025)

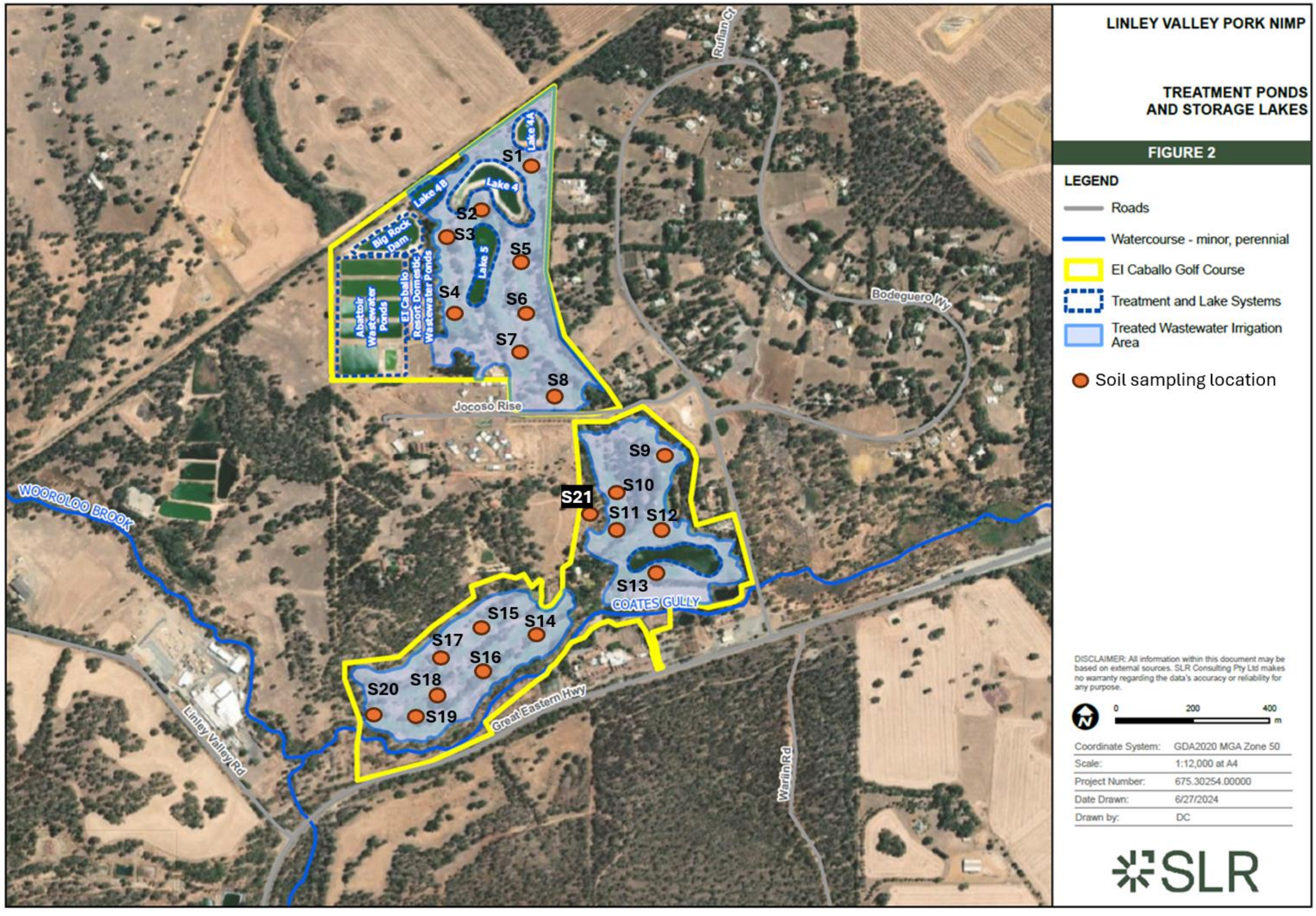

Figure 2: Map of soil sampling locations

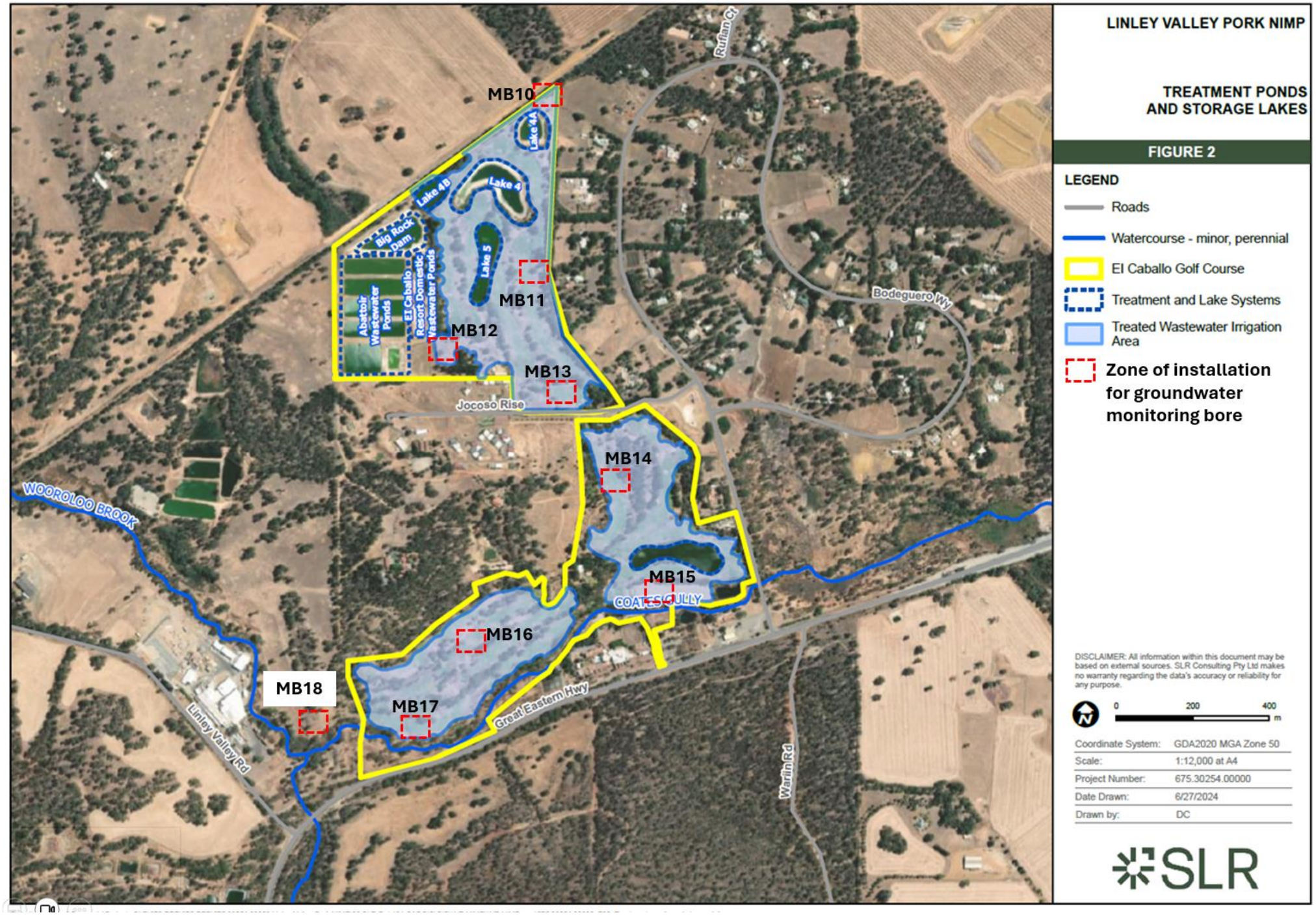

Figure 3: Locations of additional groundwater monitoring bores to be installed

Premises wastewater pre-treatment infrastructure

The premises wastewater drainage and primary treatment infrastructure is shown in the map below (Figure 4).

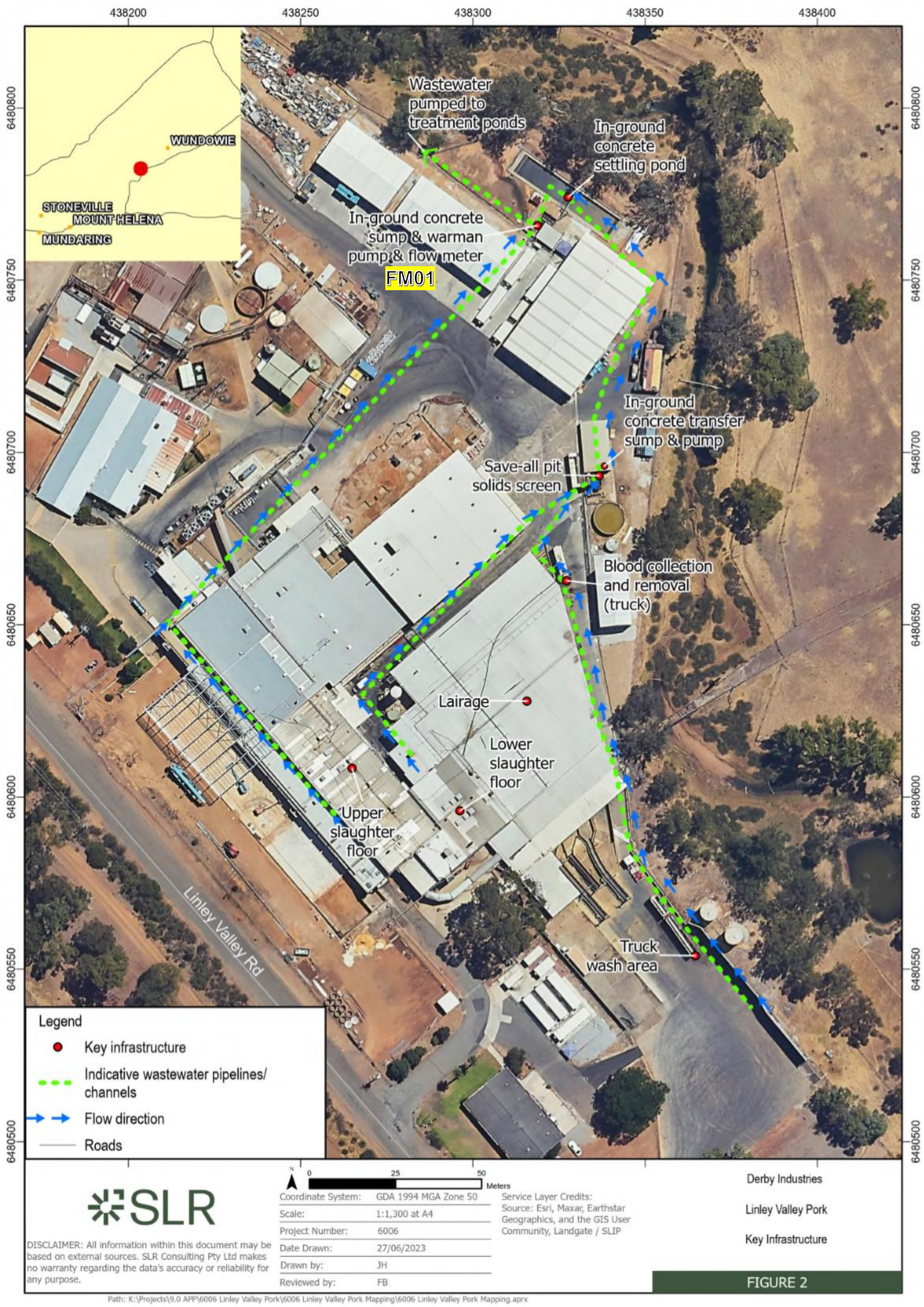

Figure 4: Map of the premises wastewater drainage and primary treatment infrastructure

Premises primary wastewater treatment ponds map

The premises wastewater ponds and flow direction is shown in the map below (Figure 5).

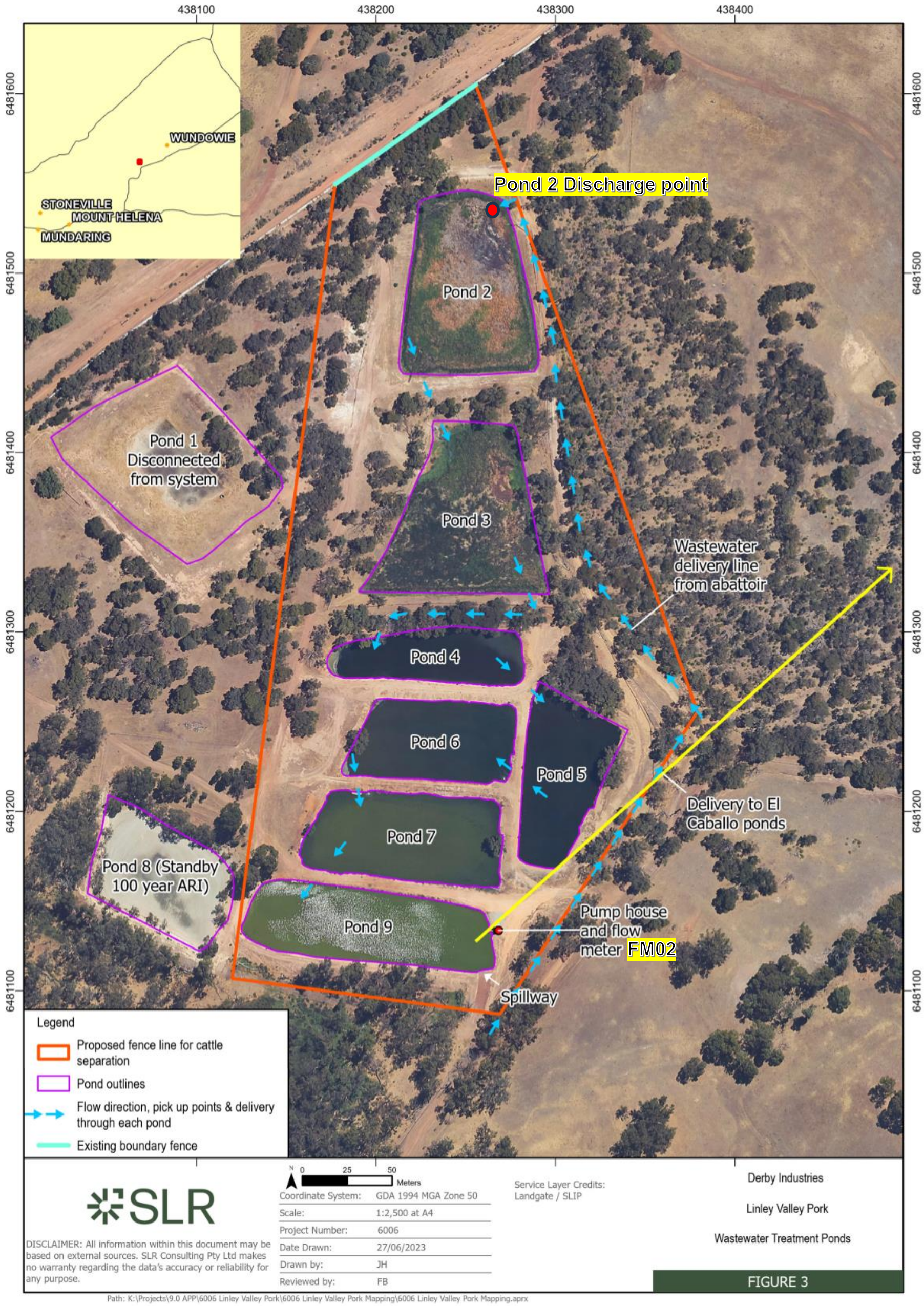

Figure 5: Map of the premises wastewater ponds and wastewater directional flow

Abattoir infrastructure schematic

The premises abattoir infrastructure is shown in the schematic below (Figure 6)

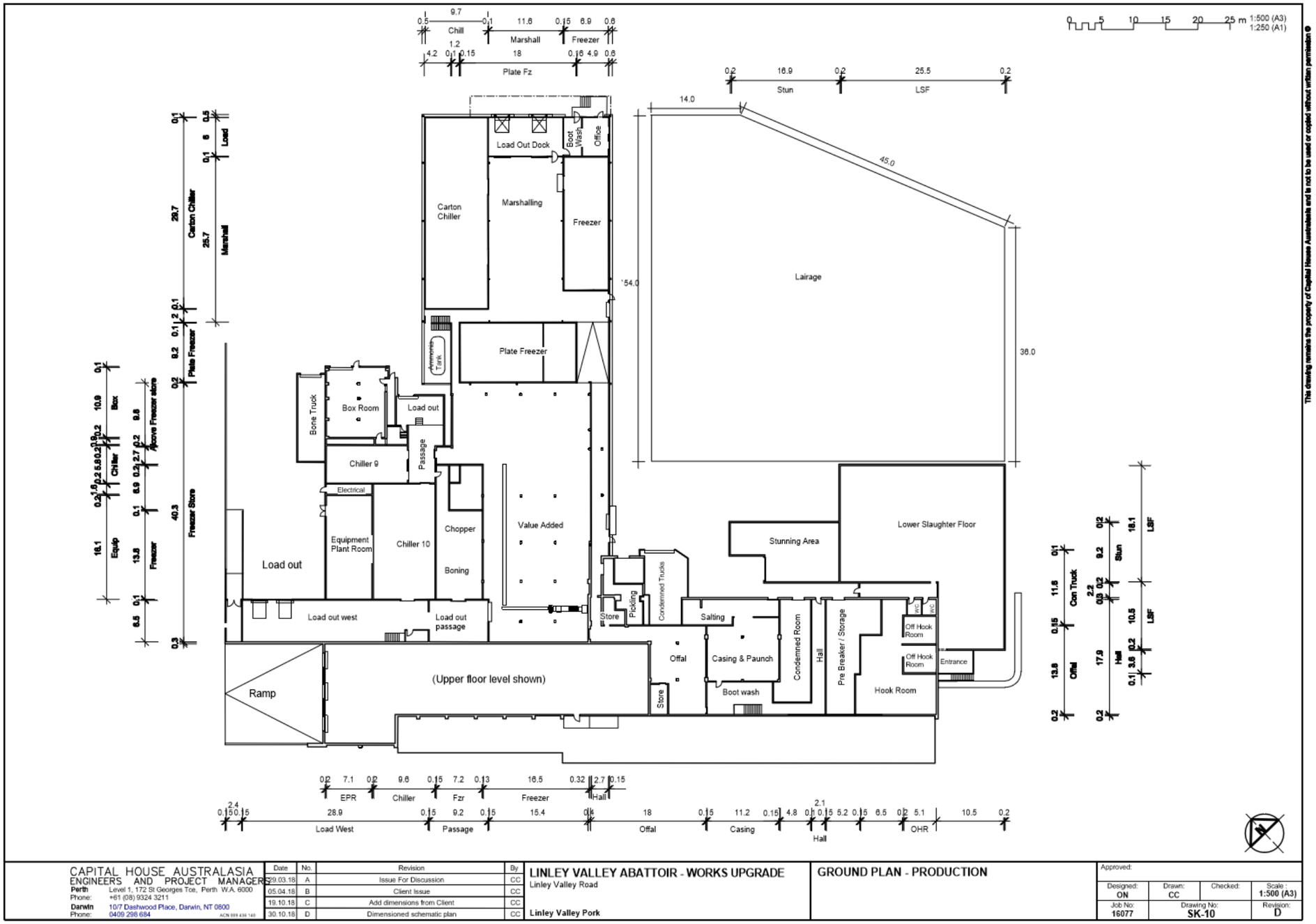

Figure 6: Map of premises abattoir infrastructure

Premises secondary wastewater treatment system – El Caballo Golf Course irrigation area

The premises wastewater irrigation area is shown in the blue shaded area on the map below (Figure 7)

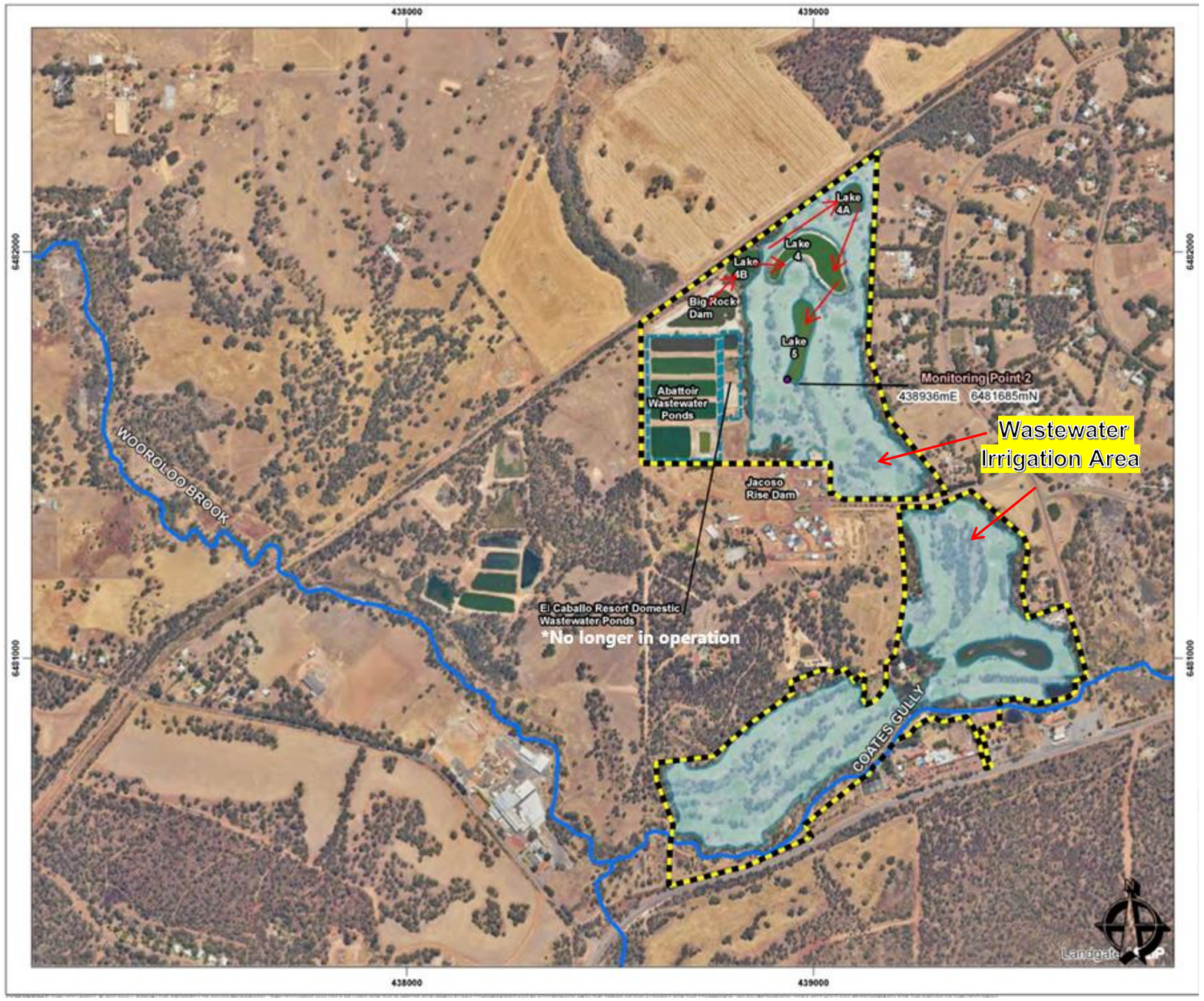

Figure 7: Map of the secondary wastewater treatment system and 'wastewater irrigation area' (Land Application Area, LAA) (shaded blue)

Premises secondary wastewater treatment system - wastewater storage ponds and lakes

The wastewater storage ponds and lakes are labelled in the map below (Figure 8).

Figure 8: Map of the secondary wastewater treatment system - storage ponds and lakes layout and flow direction

Schedule 2: Licence holder loading rates calculator

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

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

Explanatory notes and calculations:

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

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

Note: Licence holders will be provided a digital Excel spreadsheet (with in-built formulas) on request.

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

Attention: Process Industries and quote the licence number.

Schedule 3: Monitoring Points

The premises sampling locations in Figure 5 are defined by the coordinates in Table 16.

Table 16: Premises sampling locations (GDA 2020 Zone 50)

Reference point	Easting	Northing
Upstream Coates Gully (SS01)	439632.983	6480937.771
Downstream Wooroloo Brook (SS02)	437762.058	6481203.418
Upstream Wooroloo Brook (SS03)	438465.562	6480497.563
Primary wastewater system Pond 9 outlet (SS04),	438265.077	6481140.674
Big Rock Dam (SS06)	438783.813	6481899.511
Primary wastewater treatment system - northern monitoring bore (MB06)	438364.177	6481649.294
Primary wastewater treatment system – eastern monitoring bore (MB07)	438464.2188	6481462.361
Primary wastewater treatment system - southern monitoring bore (MB08)	438205.791	6481050.554
Primary wastewater treatment system - western monitoring bore (MB09)	437785.121	6481201.017
El Caballo Golf Course irrigation monitoring point (MP02)	438947.943	6481669.275
Position of flow meter (FM01)	438340.031	6480696.128
Position of flow meter (FM02)	438265.077	6481140.674
Position of flow meter (FM03)	438947.943	6481669.275
Pond 2 discharge point (1)	438275.007	6481528.093
Aerobic pond 1a discharge point (2)	438621.612	6481570.998
Land Application Area discharge point (3)	See Fig.7	See Fig.7

Schedule 4: SAR:EC relationship graph

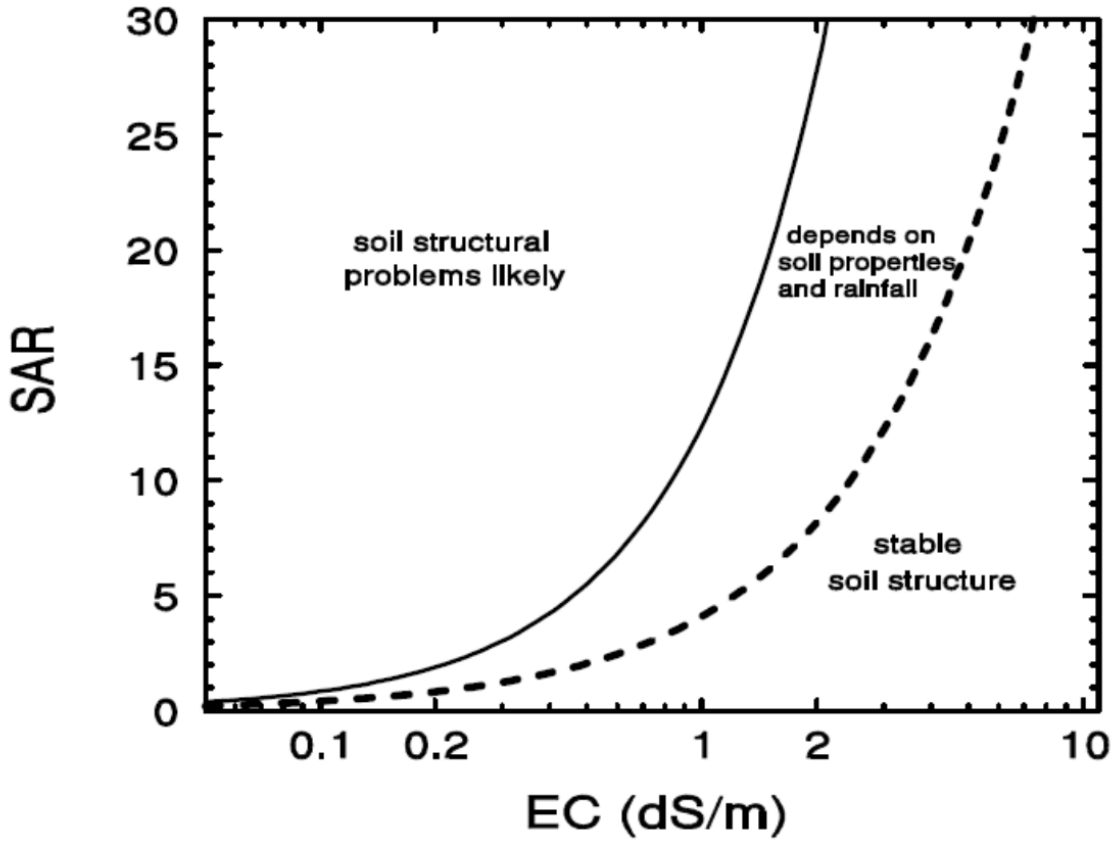

Figure 9: Relationship between Sodium Adsorption Ratio (SAR) and Electrical conductivity (EC) of irrigation water for prediction of soil structural stability (ANZECC, 2000).

Schedule 5: Pond Drop Test (PDT) Methodology

1. **Testing is undertaken over a minimum period of 48 hours. This** is to allow redundancy in the data set for heavy weather or other unforeseen issues. From this dataset, a minimum of 24 hours of continuous accurate data is essential for test calculation purposes.

2. **Continuous readings are taken at not more than 10 second intervals over the entire test period**. Effluent ponds can have different inputs over the course of a day and must be fully captured. A simple before and after measurement, or even an hourly measurement, does not provide a result of sufficient confidence.

3. **Ponds must be at or over 75% of the maximum design depth before a test can be undertaken.** This ensures that much of the working surface area of the pond is tested. If the pond is tested when relatively empty the result cannot be applied to the total volume of the pond and cannot be verified as sealed.

4. **The level of sludge or crust on the pond surface during the test should be minimised**. While it is not always possible to have no crust or sludge, this layer may or may not affect the test result by fouling the measuring technology and call into question the rate of evaporation on the pond. For example, does grass on the pond reduce evaporation or increase evapotranspiration?

5. **An anemometer shall be installed for the duration of the test and at no time should the wind speed exceed 50 kilometres per hour (14 m per second) during the test**. An onsite weather station allows proof of actual rain data. It can also be used to adjust for environmental effects such as evaporation and atmospheric pressure changes.

6. **Any change in pond fluid level over the test period needs to be accounted for. There** are many factors that can influence the level of the pond, not just milking wash-down and rain. Each change in level must be accounted for and explained to give a clear picture of why there is evidence of seepage (or not).

7. **Reported test result has a total test error of less than ±1 mm.**
Allowance must be made for atmospheric pressure and other environmental effects. Calibration in a test liquid for every test is recommended. A high level of accuracy from the test system is needed to give Regional Councils confidence in the accuracy of the results.

8. **Review and signoff of the test report from an engineering professional**
PDT's must be reviewed and signed off by an engineering professional independent of the testing and calculation. This provides credibility and professional engineering standing to the report if it is legally challenged, and if used to support the positions of either the farm owner/client, the regional council, or other parties.

Refer to : IPENZ, PRACTICE NOTE 21, Farm Dairy Effluent Ponds ISSN 1176-0907 August 2017, published by Dairy NZ.

END