



**APPENDIX 11 EGG INDUSTRY DESIGN PHILOSOPHY**

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# T-Block Free Range Layer Farm | Torrumbarry

Egg Industry Design Philosophy

**Date** November 2025

**Project Number** 25E-0010

## REPORT CONTROL SHEET

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<b>Report author:</b>	I. Kerridge

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			Name	RPEQ no.	Signature	Date
0	I. Kerridge	G. Suhinin	A. Olm			29/08/2025
1	A. Baker	A. Olm	A. Olm			06/11/2025

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*This report will comment on the Civil infrastructure to the project and may outline probable costs but the extent of the commission of RMA does not extend to detailed cost feasibility, as such the costs should not be relied on for financing arrangements.*

*The conclusions in this report should not be read in isolation. We recommend that its contents be reviewed in person with the author so that the assumptions and available information can be discussed in detail to enable the reader to make their own risk assessment in conjunction with information from other sources.*

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# 1. Introduction

## 1.1 Background

RMA Engineers Pty Ltd have been commissioned by McLean Farms Australia Pty Ltd to prepare an Egg Industry Design Philosophy Report in support of a Development Application for the State Minister's Office for a proposed integrated egg laying operation located in Torrumbarry, Victoria, within the Campaspe Shire Council (CSC).

The purpose of this technical report is to evaluate the proposed development against the Egg Industry Environmental Guidelines and investigate compliance.

The report will outline environmental mitigation strategies regarding the following considerations:

- Proposed location including climate, land, geotechnical investigations, erosion and sediment control and landscaping.
- Proposed facility including, size, infrastructure, by-product management and storage and biosecurity.
- Surface and groundwater assessment.
- Control measures and shed design suitable for a Low Environmental Risk Rating in accordance with the Australian Egg Industry Guidelines.

## 1.2 Basis of Report

This report has been prepared based on:

- Information provided by discussions between RMA Engineers Pty Ltd and the client.
- Proposed Site Layout Plan.
- Australian Egg Industry Environmental Guidelines.
- Victorian Code for Broiler Farms.
- GeoVIC Interactive Mapping.
- Campaspe Shire Council Planning Scheme.

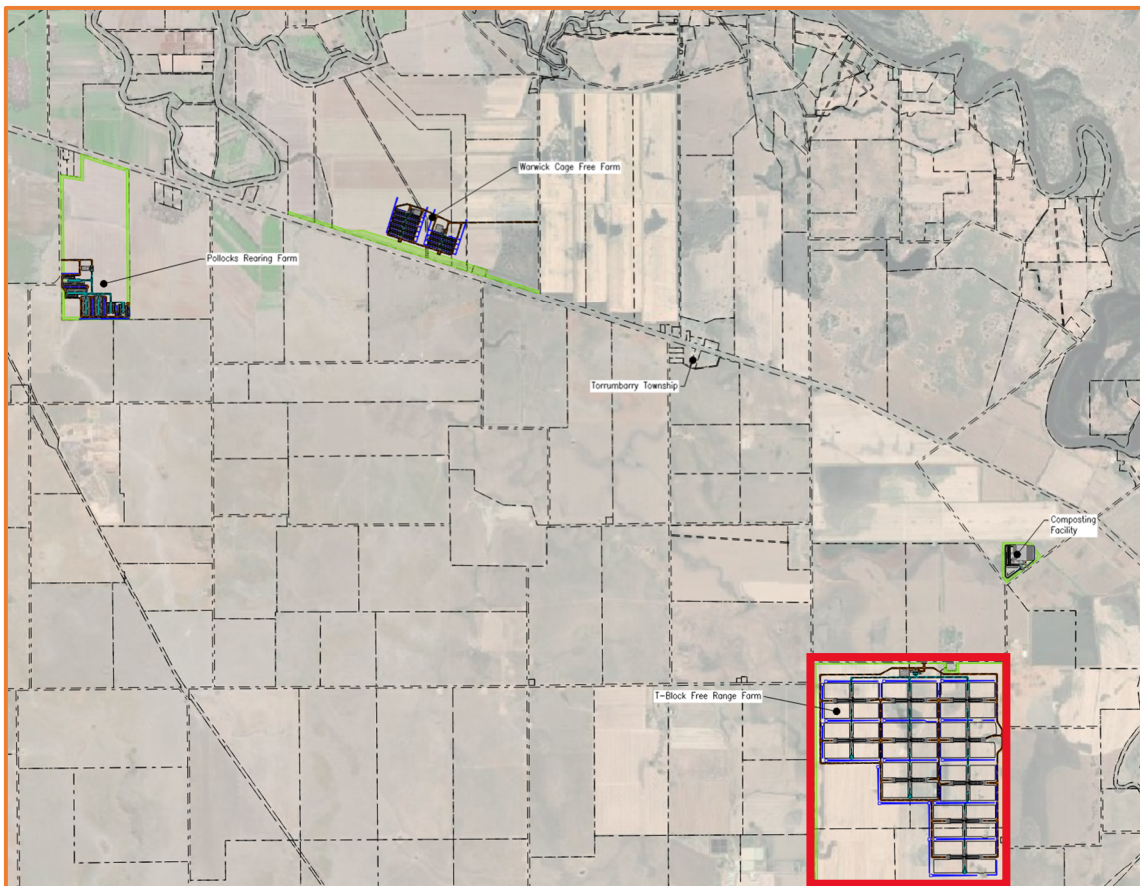
This report has been prepared specifically for the Client, site and project. It has been written solely for the purpose of providing engineering advice on the above issues for the Council and the Client for this development site. Please note that this report has been compiled based on the information that is current at the time of report printing, and that the recommendations supplied within this report are based solely on the above.

### 1.3 Proposed Development

The proposed development is intended to be constructed in conjunction with two other applications to form an integrated egg laying operation consisting of:

- Pollock's Block Rearing Farm (720,000 birds),
- Warwick's Block Cage Free Layer Farm (1,280,000 birds),
- T-Block Free Range Layer Farm (800,000 birds) and,
- Organic Nutrients Composting Facility (OGN). This will be submitted as part of T-Block Application.

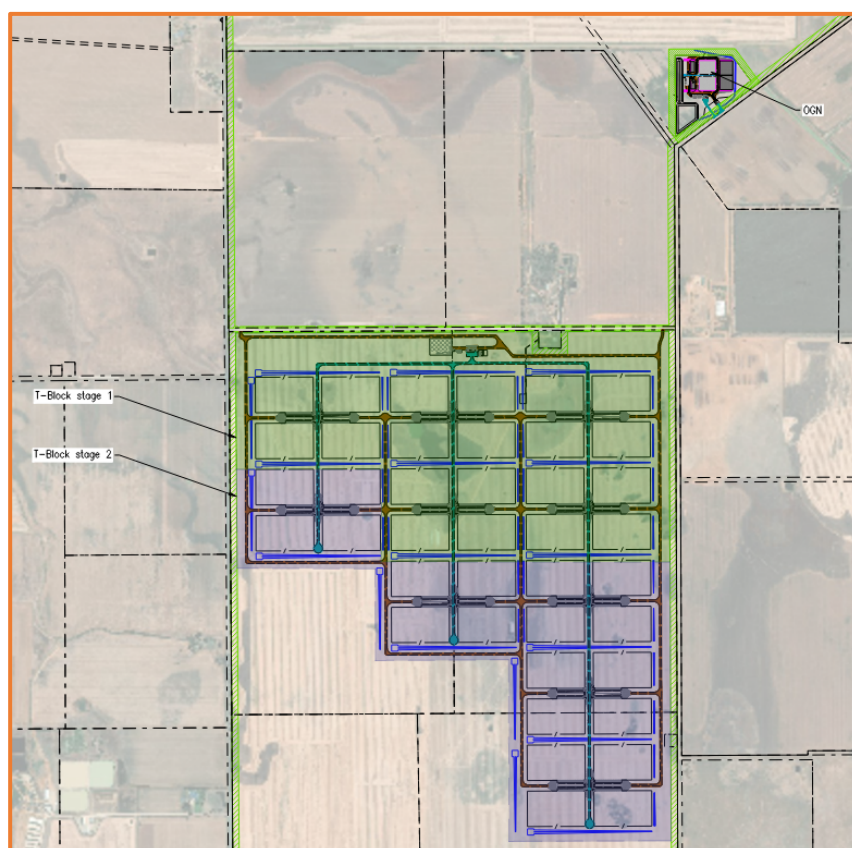
Refer to **Figure 1-1** below for the ultimate farming operation concept plan.



**Figure 1-1: Ultimate Concept Layout Plan**

This report has been developed in relation to the T-Block Free Range Laying Farm and is intended to be assessed in conjunction with other development applications mentioned above.

Refer to **Figure 1-2** below for the individual proposed development site layout plan that will be assessed in this report.



**Figure 1-2: Proposed Development Site Layout Plan**

The proposed T-Block Free Range Laying Farm is located on land fronting the Murray Valley Highway to the north, Ballieu Road to the east and Roslynmead Road to the west within Torrumbarry. The land also encompasses Chrystal Road between the proposed OGN site and the proposed free-range farm. The land includes multiple titles and has a combined area of 846ha. The site is located within the Farming Zone under the Campaspe Planning Scheme.

The proposed development involves the construction of a new poultry free-range laying farm which is used for production of eggs intended for human consumption. The proposed farm will accommodate a maximum of 800,000 laying birds within 20 purpose-built, best practice laying sheds. These sheds will be constructed in 2 stages (10 sheds each).

The proposed sheds will be supported by ancillary services and infrastructure including:

- Staff office and amenities building
- Egg collection infrastructure
- Holding rooms
- Workshop
- Water treatment
- Shed specific feed silos
- Truck wash
- Perimeter fencing and,
- Internal range areas.

The proposed farm will house laying hens that are placed within the sheds at around 17 weeks of age. Once placed the typical laying cycle will last for around 68 weeks of production, and an additional 2 weeks of down time allocated for shed cleaning and set up prior to the next batch. The birds will be free to move around both inside and outside the shed in the ranging area.

The proposed T-Block Free-Range Laying Farm is defined as a **Poultry Farm** and is identified as development requiring a permit within the Farming Zone. As the project involves an agricultural use with a capital value of greater than \$10 million, the project is classified as Significant Economic Development, and the Minister for Planning (Ministers Office for Assessment) will be the responsible authority for determination of the application.

The farm is intended to operate as a free-range laying farm whereby the birds are provided with daily access to the range areas. The are ranged at

In addition to the poultry farm, this application also includes an ancillary composting facility located on the T-Block lots. This facility is located directly north of the T-Block farm and will accept manure and floor litter directly from the poultry farm. The manure and litter will then be composted to create a soil conditioner and fertilizer product which will be utilised for onsite soil rejuvenation. The composting facility is a common facility that will accept manure and litter from both Pollocks and Warwick Poultry farms as well.

The proposed free-range laying farming operation is to be established in two stages and would include the construction of 20 free range laying sheds.

Refer to **Appendix A Typical Shed Concept Layout Plans** for further information.

### **1.3.1 Site Characteristics**

The development site is approximately 846ha of mixed irrigation and dryland cropping. The site terrain is generally flat.

A series of overland flow paths are located throughout the site. There are existing dams located along the perimeter of the site on the western boundary.

The current site access is assumed to be through a driveway located on Chrystal Road.

## 2. Egg Industry Environmental Guidelines

The purpose of the Australian Egg Industry Environmental Guidelines is to provide a proactive guideline for the establishment and expansion of egg production in Australia and to encourage egg producers to improve environmental management practices.

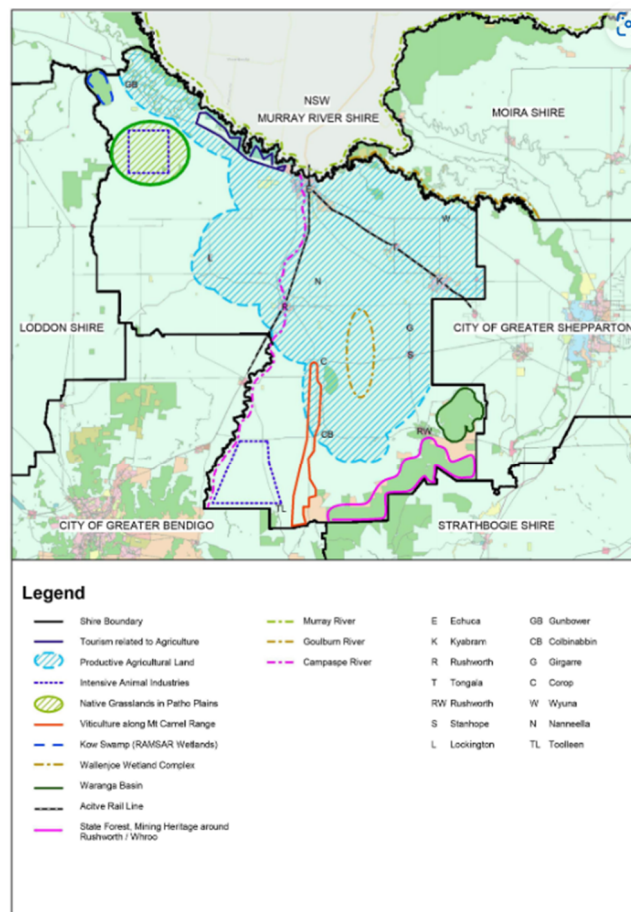
The guidelines detail considerations that should be made in the establishment and management of poultry laying farms. The following sections illustrate how this guideline's recommendations have been utilised to design the proposed development.

## 3. Location

### 3.1 General

In accordance with the Egg Industry Environmental Guidelines, the location of the farming operation has been considered in accordance with recommendations from the local government planning scheme. Clause 14.01-2L-02 of the Campaspe Shire Council Planning Scheme identifies that Council's strategy for intensive farming location is within the Patho Plainlands. Refer to **Figure 3-1** below for Campaspe Shire Council Strategic Framework that identifies the location of the Patho Plainlands.

The proposed development is located within the Productive Agricultural Land zoning and is located adjacent to the Intensive Animal Industries Zoning.



**Figure 3-1: Campaspe Shire Council Planning Scheme Strategic Framework**

### 3.1.1 Climate

The development site is located in Torrumbarry which can be described as a ‘semi-arid’ climate that is characterised by hot summer months and mild winter months. The hottest temperatures are observed in January with a mean temperature of 31.1 degrees Celsius. The coldest temperatures occur in July with a mean temperature of 13.5 degrees Celsius.

Refer to for the climatic summary of all years as taken from 26 kilometres away, Torrumbarry’s nearest weather station, Echuca Aerodrome VIC (080015).

**Table 1. Climatic Conditions of Torrumbarry (Bureau of Meteorology, accessed July 2025)**

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Temperature</b>												
Mean	31.1	30.7	27.4	22.3	17.6	14.3	13.5	15.3	18.4	22.2	26.2	29.1
Highest Daily	46.9	46.8	41.8	38.2	28.4	24.4	24.2	26.8	36.0	38.4	43.2	46.3
Lowest Daily	16.6	11.8	12.4	11.8	8.12	3.82	5.5	8.3	8.2	10.7	12.2	13.9
<b>Rainfall</b>												
Mean	28.4	25.5	30.6	32.7	40.1	42.8	40.5	42.0	38.4	42.7	33.3	29.9
Median	18.4	13.5	19.8	26.3	34.8	38.2	36.2	39.2	33.0	33.2	28.1	19.1
Highest Daily	90.7	90.2	94.0	59.4	56.6	69.1	54.9	45.5	44.5	73.6	77.0	123.0

The relative humidity of Torrumbarry is ideal for poultry, ranging between 68% at 9am in the morning and 45% at 3pm on average.

There is low annual rainfall, on average 426.9mm, making it a suitable location for a poultry farming operation where the risks of nutrient loss in local water bodies and diseases contracted from ponding water are reduced.

The site has been chosen to avoid overland flow paths and avoid water ponding onsite. There are existing water systems in the area, however, these sites are anticipated to pose minimal risks to the farming operations.

A monitoring program will be implemented to assess and monitor wildlife movements around the site.

### 3.1.2 Land

In general, for poultry farms, larger land areas are ideal to allow for ranging and establishment of adequate buffer zones.

The land is ideal for the T-Block free range farm operation due to:

- The offset from overland flow paths reduces the risks of nutrient loss and erosion.
- The existing land use is zoned for farming which supports the proposed purpose.
- The terrain of the site is relatively flat which is ideal for large scale construction and poultry ranging.
- The T-Block free range layer farm is to be established on approximately 846ha which is suitable to implement suitable odour and vegetation buffer zones.

### 3.1.3 Flora and Fauna

The intention of flora and fauna is to avoid impacts to remnant vegetation, wildlife habitats and wetlands. Strategic placement of onsite flora has been considered to minimise impacts to existing external environments and habitats. The existing trees located adjacent to the property boundaries are intended to be retained in the design to avoid disturbance to the remaining onsite vegetation.

The existing property is cultivated land, previously used for cropping grains and cereals with portions of dry land and irrigated land. Due to the nature of the previously disturbed land, the proposed construction is likely to have minimal further impacts on any remaining flora and fauna. Further land clearing is not required for the construction of the poultry operation.

Please refer to the Ecological Report provided in conjunction with this report for further ecological considerations.

### 3.1.4 Landscaping and Vegetation

The landscaping and vegetation are important to consider when designing a free-range farm as vegetation improves the visual appearance of the site and filters the dust, odour and noise that is exposed to the external environment and society.

Additionally, appropriate utilisation of vegetation reduces the quantities of ammonia, byproducts and dust leaving the site through surface and groundwater flows.

The following has been considered in designing the proposed farming operation:

- Planting of low-maintenance native species specific for the environment and the climate, to tie in seamlessly with the existing perimeter vegetation.
- Vegetation Environmental Buffers (VEBs) are proposed around the perimeter of the site to enrich existing vegetation with a seamless transition from existing vegetation to the proposed vegetation. Different shape and sized vegetation are anticipated to be planted to achieve upper and lower canopy screening around the perimeter of the site.
- Native onsite vegetation and existing terrain is expected to be implemented in the design where possible.

Refer to the **Site layout plan** in **Appendix A** provided in support of this application for further information on the proposed Vegetation Environmental Buffer location and extent.

## 3.2 Geotechnical Investigation

### 3.2.1 General

A Preliminary Geotechnical Investigation was carried out on site on the 15<sup>th</sup> of February 2025. Refer to the Geotechnical Investigation Report in **Appendix B**.

The preliminary investigation consisted of excavating and logging 7 test pits on the proposed development sites up to 1.0m in depth. Laboratory testing was carried out on selected samples collected from the field investigation.

The testing of the subsurface materials assessed:

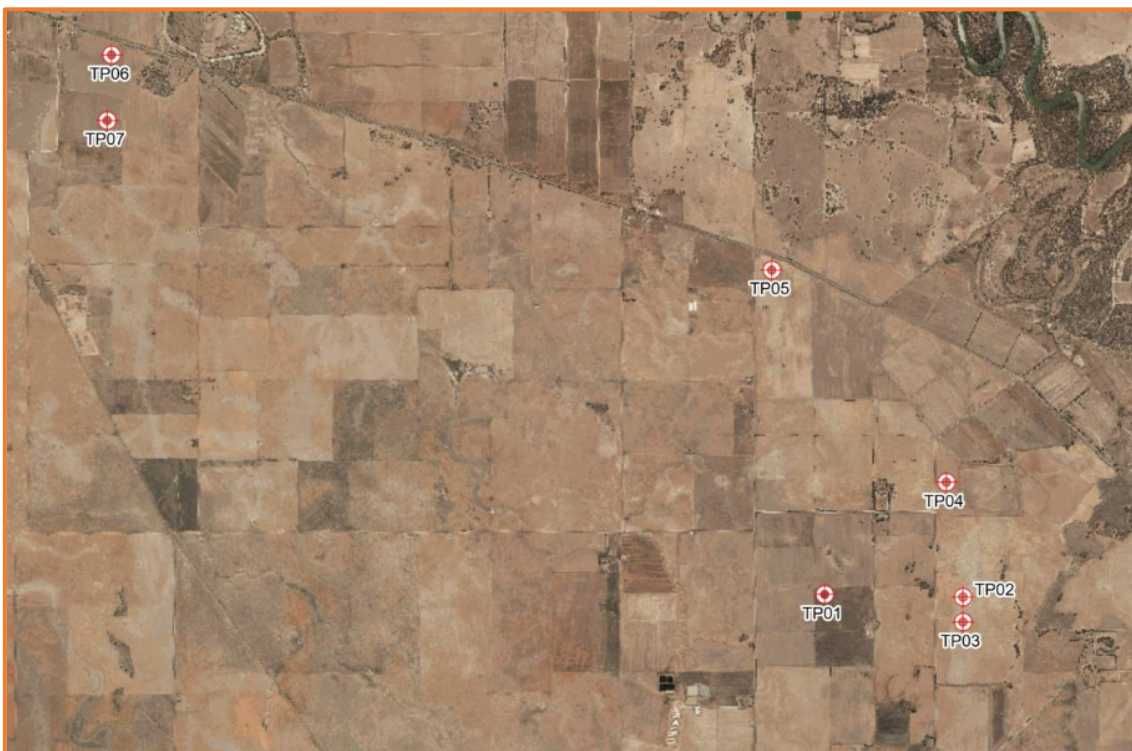
- Plasticity and dispersive characteristics
- Atterberg limits
- Emerson Class Number

The subsurface profile encountered during the site investigation generally consisted of:

- Sandy Silty CLAY – high plasticity (CH), fine to coarse grained sand, dry to moist, firm.
- Sandy CLAY – high to very high plasticity (CH), dry to moist, stiff, fine to coarse grained.

### 3.2.2 Borehole Locations

The borehole test pit locations can be seen in **Figure 3-2** below.



**Figure 3-2: Test Pit Location Plan**

Within the Geotechnical Report (**Appendix B**), the following Test Pit locations are relevant to the T-Block Free Range Laying Farm development:

- TP01
- TP02
- TP03
- TP04
- TP05

### 3.2.3 Geotechnical Assessment

The following tables shows the Atterberg Limits test results and Emerson Class Number results within the vicinity of the proposed development. The tables below also identify the key characteristics of the subsurface materials.

**Table 2: Laboratory Test Results - Atterberg Limits.**

Test Locations	Depth (m)	Material Type	Liquid Limit (%)	Linear Shrinkage (%)
TP01	0.20 – 0.50	Sandy Silty Clay	53	13.0
	0.60 – 0.90	Sandy Silty Clay	50	13.5
	0.90 – 1.00	Sandy Clay	54	15.5
TP03	0.70 – 1.00	Sandy Clay	51	16.5
TP04	0.10 – 0.30	Sandy Clay	57	17.0
TP05	0.10 – 0.30	Sandy Silty Clay	63	17.5

**Table 3: Laboratory Test Results - Emerson Class Number.**

Test Locations	Depth (m)	Material Type	Emerson Class Number	Dispersive Potential
TP01	0.20 – 0.50	Sandy Silty Clay	5	Low
	0.60 – 0.90	Sandy Silty Clay	5	Low
	0.90 – 1.00	Sandy Clay	4 *	Moderate
TP03	0.70 – 1.00	Sandy Clay	4 **	Moderate
TP04	0.10 – 0.30	Sandy Clay	6	Very Low
TP05	0.10 – 0.30	Sandy Silty Clay	6	Very Low

\* Gypsum in the soil

\*\* Carbonate in the soil.

**Table 4: Summary of Subsurface Profile.**

Test Pit		Profile		Ys Value (mm)
Number	Depth (m)	Type	Thickness (m)	
TP01	1.0	Sandy Silty Clay	0.90	65 – 90
		Sandy Clay	0.10	
TP02	1.0	Sandy Silty Clay	0.80	65 – 90
		Sandy Clay	0.20	
TP03	1.0	Sandy Silty Clay	0.70	65 – 90
		Sandy Clay	0.30	
TP04	1.0	Sandy Clay	1.00	80 – 110
TP05	1.0	Sandy Silty Clay	0.60	75 – 100
		Sandy Clay	0.40	

Refer to **Appendix B** for the Preliminary Geotechnical Report and further details.

### 3.3 Erosion and Sediment Control Assessment

Where soil is left uncovered after being disturbed, the risk of erosion is increased. Refer to the PEAR prepared by RMA Engineers Pty Ltd prepared in conjunction with this report for further erosion and sediment control information.

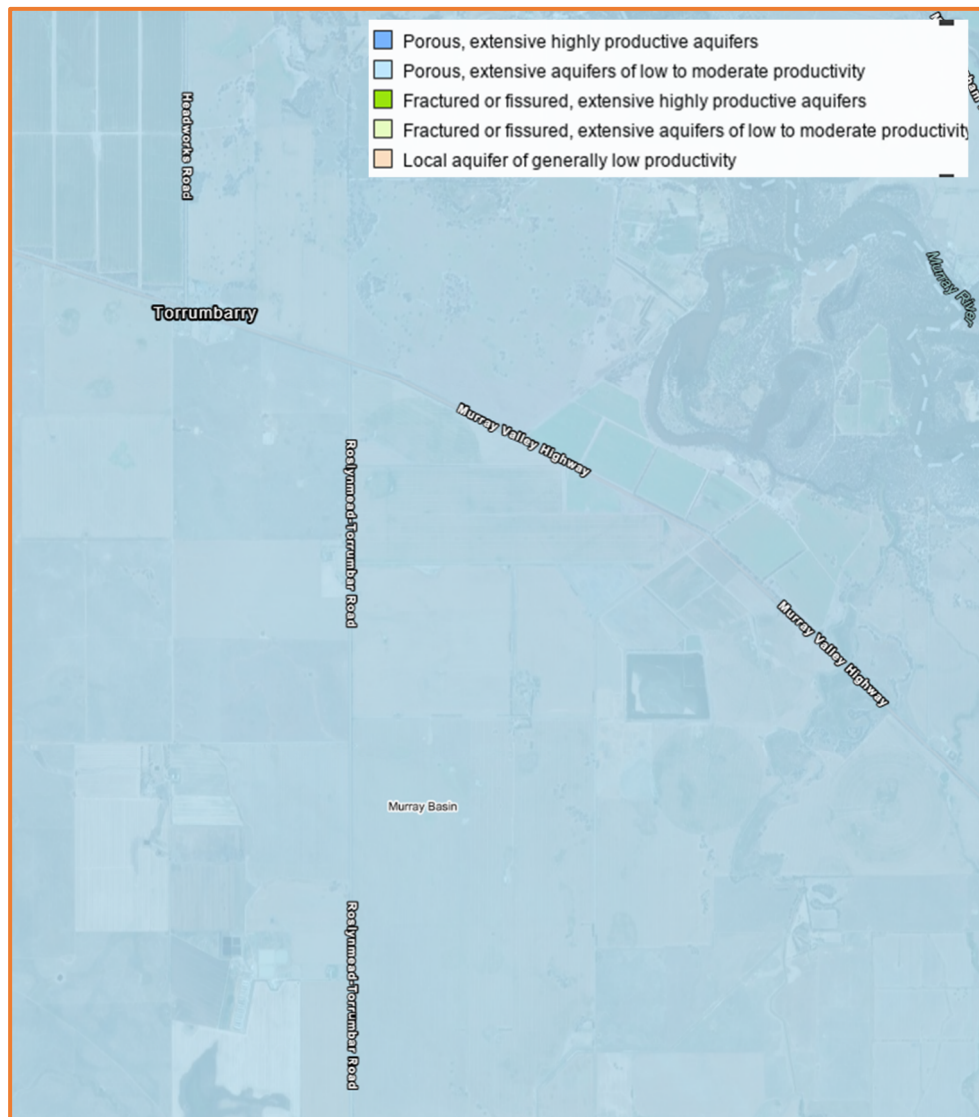
The following erosion and sediment control objectives are anticipated for the construction and operational phase of development:

- Where cut and fill are required onsite, the fill material should be clean spoil recovered from the site cut and is to be laid down in 150mm (maximum depth) layers where each layer should have adequate moisture and compaction. A balanced approach is anticipated to be utilised where cut material will be stripped of topsoil and refuse and then used as fill material where needed.
- Topsoil and silt materials that are prone to erosion and are unsuitable for compaction are not intended to be used as fill material.
- Areas where ground is disturbed is to be promptly revegetated upon completion of construction to minimise ongoing erosion.
- Stormwater drainage is anticipated to be designed to minimise flow velocity and volume eroding the site.
- Range areas are expected to have gentle sloping batters away from the sheds.

### 3.4 Groundwater Locations

At the time of the preliminary geotechnical investigation conducted by RMA Soils Pty Ltd, groundwater was not encountered within the termination depth of the boreholes. However, various soil types were encountered during excavation and there is potential for seepage to occur through permeable layers of soil.

The site is located within a 'porous, extensive aquifers of low to moderate productivity' zoning according to the Geoscience Australia Portal. Refer to **Figure 3-3** below for groundwater zoning map.



**Figure 3-3: Groundwater Zoning Map (Geoscience Australia Portal).**

The T-Block / OGN development site is also located within the Shepperton Irrigation Groundwater Management Area which suggests that groundwater limits and restrictions may be implemented by the governing authority.

A Hydrogeological Desktop Review has been prepared in support of this development which has identified that the site may have potential to be serviced by local aquifers.

There are various aquifers located within the vicinity of the development site; however, further testing should be undertaken to assess the output potential and water quality of the aquifers.

Two levels of aquifers have been identified, the Shepperton Formation (shallow upper level) and the Calvil (Deep Lead) Formation (deeper level).

Due to the nature of a high-level desktop analysis, there remains uncertainty regarding the quality and quantity available from groundwater aquifers in the area.

## 4. Proposed Facility

### 4.1 Facility Size

The Egg Industry Guidelines requirements for facility size indicates that considerations need to be made for future expansion of the operation.

According to Appendix B of the Egg Industry Environmental Guidelines, for a free-range farm to be considered “Free Range”, there is a maximum stocking density of 10,000 birds per hectare.

Based on these conditions, the following table has been created for the T-Block Free Range Farm.

**Table 5: Stocking Density for T-Block Free Range Laying Farm.**

QTY of Birds Per Shed	Number of Sheds	Total Birds	Range Area per Shed	Total Range Area	Stocking Density
40,000	20	800,000	4.5 ha	90 ha	8889 birds/ha

Based on the calculations in Table 5, the facility size can be considered compliant with the “Free Range” accreditation requirements.

The farm size is located on a small portion of the available land and is anticipated to be suitable to accommodate any future growth and further expansions. Any expansions would be subject to development assessments and environmental factors that would need to be considered prior to any proposed expansion works.

### 4.2 Facility Staff

The general operations of the facility will require 48 staff including managers, supervisors, leading hands, shed hands, cleaners and rouse. Additional staff will work within ancillary facilities and will perform tasks like relocation, veterinary and onsite maintenance.

To maintain operational biosecurity measures, staff should not come into contact with other avian or poultry from external sites.

### **4.3 Facility Infrastructure**

The infrastructure utilised in the ranging areas and laying sheds has been designed to service the birds' needs. Considerations have also been made to minimise environmental impacts from utilising necessary infrastructure.

#### **4.3.1 Ventilation System**

The natural ventilation system proposed within the free-range farm is specifically designed to support the health of the birds by providing a constant circulation of airflow to create the ideal temperatures and humidity inside the sheds.

Fans utilised within the ventilation systems are designed to provide sufficient air movement to allow soiled litter and water spills to dry.

The ventilation system has been specifically designed by a poultry operations supplier for large-scale egg-laying poultry farms.

The operational cycle of the ventilation system has been designed to operate based on the temperature and season of the day.

#### **4.3.2 Feeding Systems**

The feeding system utilised within the sheds has been designed to allow feed access to all birds via feeding columns that have been strategically aligned with the stillages. The feed is intended to be delivered into silos located externally to the laying sheds. The feed will then be distributed to the birds through a closed feeding system.

The closed silo to feed system has been designed to prevent pest access into the feeding system and prevent feed spills or wastage.

The feed silos have been designed to allow for multiple days of feed in the event of an emergency.

The operation of the feeding systems ensures that feed will be ordered prior to the silos becoming empty.

#### **4.3.3 Watering Systems**

The shed design has considered the placement of the watering system to always allow for adequate water access for the birds.

Water is intended to be delivered into the water tanks located external to the laying sheds at the comment site amenities facility; the water will then be piped to the birds through a closed watering system. The shed has been designed with a closed water system to minimise water leakage, wastage, pest access and disease contamination.

The operation of the watering systems enables birds to have unrestricted access to water.

### 4.3.4 Water Treatment

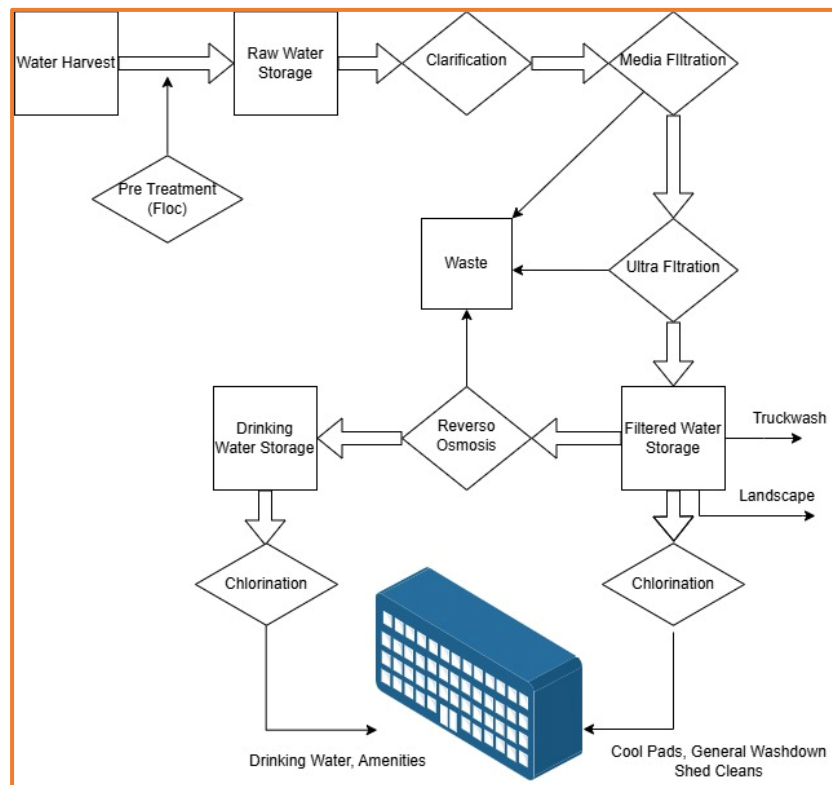
#### 4.3.4.1 Water Pumped from Unprotected Water Bodies

In addition to monitoring water administering systems, due to the water supply processes, all water to be utilised on the laying farm will require extensive water treatment.

The water supplied to birds for drinking water will require extensive treatment. Below outlines the general intended process.

- Clarification – the first process for removing suspended solids, oils and particle matter from water using methods like coagulation, flocculation and sedimentation.
- Media Filtration – the process of passing water through a bed of granular media like sand, gravel, anthracite to remove suspended solids and contaminants.
- Ultra Filtration – the process of passing water through a semi-permeable membrane to remove large particles and solutes.
- Reverse Osmosis – the process of pumping pressurised water through a semi-permeable membrane to remove contaminants and salts.
- Chlorination – the process of adding chlorine to water to disinfect and make safe for consumption.

Refer to **Figure 4-1** below for the water treatment process to be utilised for treatment of extracted water from bodies of water.



**Figure 4-1: Water Treatment Process.**

The water treatment process will result in various by-products in the form of waste. These by-products are intended to be disposed of in suitable ways by a licensed contractor or taken to the proposed composting site.

Treated wastewater can be used for irrigation whereas sludge may be treated to produce biosolids and used for agricultural purposes.

#### **4.3.4.2 Groundwater Extracted Through Boreholes**

Groundwater extracted through boreholes will require extensive treatment processes due to the quality of water in the area.

The water administered to birds for drinking water will require extensive treatment following the processes in the following respective order:

- Ultra Filtration – the process of passing water through a semi-permeable membrane to remove large particles and solutes.
- Reverse Osmosis – the process of pumping pressurised water through a semi-permeable membrane to remove contaminants and salts.

Prior to consumption, the water extracted from boreholes will require the following process:

- UV Disinfection – the process of exposing water to ultraviolet light to kill and damage the DNA of harmful pathogens and bacteria. Following UV disinfection, water should be immediately utilised and not stored in tanks.
- Chlorination – the process of adding chlorine to water to disinfect and make safe for consumption.

Refer to the T-Block Free-Range Laying Farm PEAR prepared by RMA Engineers provided in conjunction with this report for further information.

#### **4.3.5 Monitoring and Control Systems**

To maintain conditions for the hens, the following design controls are proposed:

- Installation of automatic monitoring systems that alert abnormalities e.g. humidity, temperature levels.
- Audible alarms for malfunctions and abnormal shed conditions.

#### 4.4 By-Product Management – Composting

When developing a poultry farm, it is imperative consideration is given to the full life cycle of the operation. This has been defined clearly in the guidelines. A key ancillary operation is the by-product management requirement defined as Manure and Litter Composting (OGN).

It is proposed that all three poultry farms have a common composting facility (OGN) which is proposed to be located on the northern section of T-Block land aggregation. The size of the OGN will have a proposed throughput of 50,000T at Stage 2.

The raw materials generated from the poultry rearing and laying farms are intended to be stored and transported using the following considerations:

- Individual sheds will have manure belts that will be scraped every two to three days or as required. By-product materials are to be collected and transported directly from the farms to the composting facility. By-product materials are not intended to remain onsite for any period of time following the manure scrape down.
- During the cleanout stage – a two-week period of cleaning the sheds and facilities between batches of hens – litter will be removed and transported to the composting facility. Sheds are to be hosed out and sanitised, a grey water system with a grit chamber will be used to collect any remaining by-product materials.
- An impermeable base is designed below the composting facility (located at another site) to minimise groundwater contamination and nutrient loss through soil.

Any bird mortalities within the farm are expected to be disposed of through composting.

Dead birds are to be disposed of immediately or kept in a cold storage facility until they can be composted in the ancillary composting facility, as they attract odour and diseases that can put further birds at risk.

At the end of each laying cycle, batches of hens will be euthanised. The birds will then be transported to the nutrients composting facility (or off-site rendering facility) and kept in cold storage until ready for composting or transported to an off-site rendering facility.

Quantities of material composted will vary with production and economic factors. The finished compost production will vary according to material availability but may be up to 25,000t annually for Stage 1 and increased to 50,000t for Stage 2.

The compost operation combines by-products from production facilities to produce a value-add, quality soil conditioner. This process reduces the potential for pollution and groundwater contamination by reducing storage of by-products at the production facilities and processing the by-products at a properly designed compost facility.

The organic by-products generated from the poultry include chicken manure, soiled litter, dead birds and feathers (raw material). They are to be collected directly from the laying sheds and will be transported directly to the proposed composting facility.

The process of composting the by-products transforms them into valuable product(s) with less variation in quality parameters, reduced moisture content and increased nutrient content. As a result, the composted material is more suitable for transport and application to cropping operations.

All composted material will then be utilised on the cropping land surrounding the poultry farms aiding in soil rejuvenation and crop health.

Any solid waste materials that cannot be composted will be removed to an approved waste disposal facility through a garbage collection process by a licensed contractor.

In general, the proposed OGN operation will include the utilisation of an in-vessel composting process that will convert the production waste into compost.

The OGN will require approval. The anticipated approvals will include:

- Planning approval. This will be submitted as part of the T-Block Free-Range poultry farm.
- Development Licence.
- Operating Licence.

To gain the above approvals and licenses, it is imperative that the facility operates in accordance with Environment Act (EA) 2017 (GED, risk mitigation, waste duties etc), EPA Victoria (2024b), EP regulations 2021, Planning legislation and all other approval processes.

The following speciality reports have assisted in developing the schematic design and location of the proposed OGN site.

- Refer to Acoustic report T-Block Free Range Farm and OGN by Enfield dated 31/10/2025.
- Refer to Separation Distance Assessment report for Odour consideration by Astute Environmental Consulting dated 04/11/2025.
- Refer to Traffic Impact Assessment Report by RMA Engineers dated 15/10/2025.
- Refer to Bushfire Hazard Assessment and Management Plan by Spiire dated 04/11/2025.
- Refer to Ecological Impact Avoidance Review – Biodiversity Assessment Report by EHP Partners dated 15/08/2025
- Refer to: Stormwater Management Reports (for all farms) by RMA Engineers dated 31/10/2025

#### **4.4.1 Environmental Objectives**

To ensure best practices are adopted to meet what is 'reasonably practical' for operations at the OGN Site, the applicant is committed to:

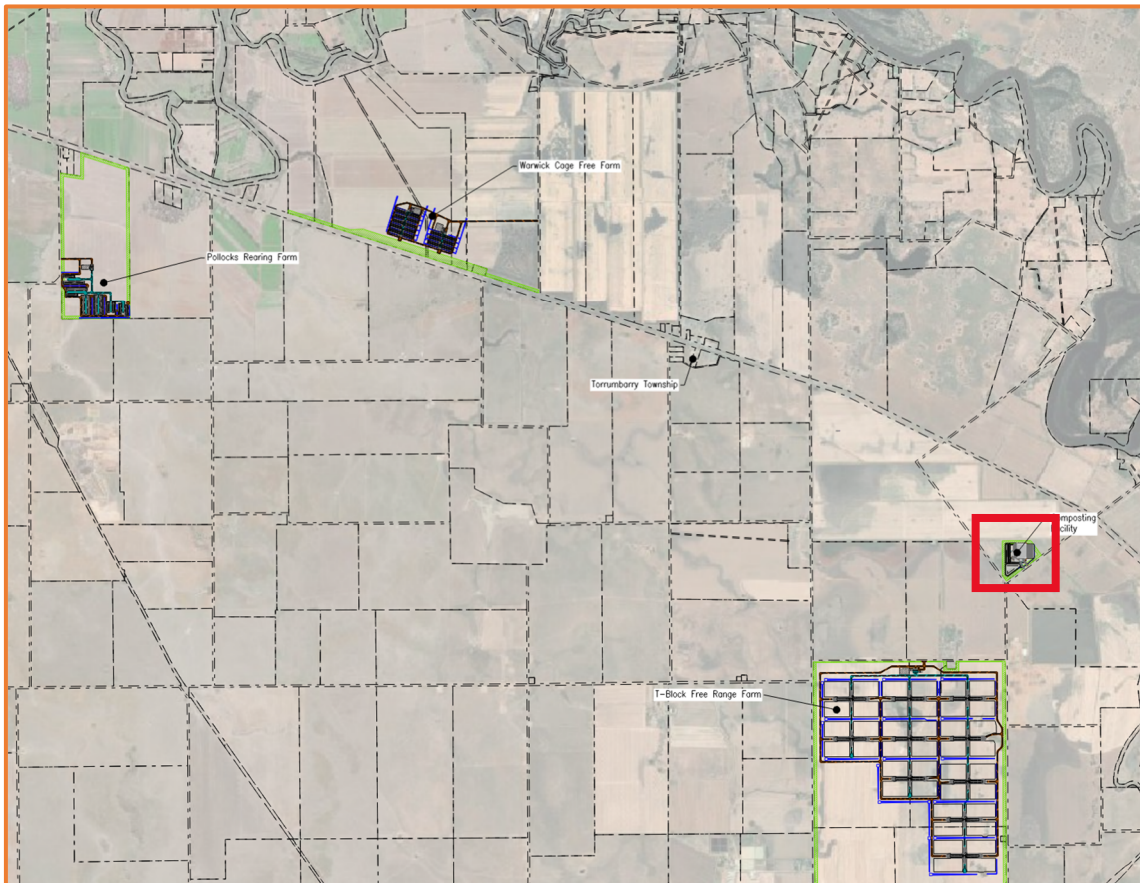
- Operating practises which seek to minimise impacts, prevent pollution, and minimise the likelihood of environmental harm through work and management practises, continual improvement and training.
- Operational practices and design considerations to protect the amenity of the area, deal with surface water and to prevent groundwater contamination.
- Compliance with all applicable environmental laws and regulations and Codes of Practise for existing operations and proposed developments.
- Utilising in-vessel composting to convert waste products from egg production into compost that satisfies the AS4454 standards.
- Management review of environmental objectives and targets.
- Waste management to minimise waste, develop viable recycling opportunities, and utilise proper handling and disposal methods.
- Environmental Incident Response – contingency plans to minimise health, safety, and

environmental risks.

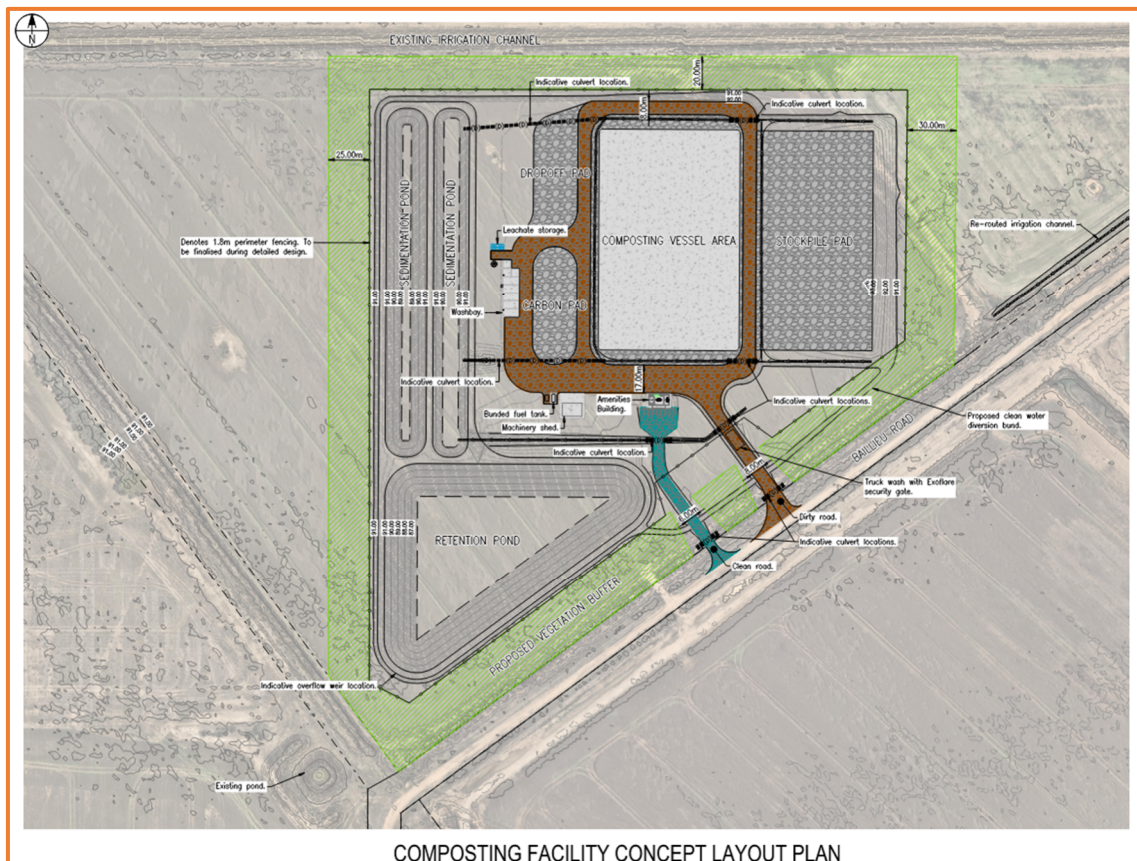
- Energy management which is integral to managing greenhouse gas emissions from operations.
- Water management which is integral to achieving sustainability.

#### 4.4.2 Site description

The proposed composting site (OGN) is located to the northeast of T-Block Free-Range Laying farm. Located at 192 Baillieu Road, Torrumbarry, Lot 2 PS404897.



**Figure 4-2. Ultimate Concept Layout Plan**

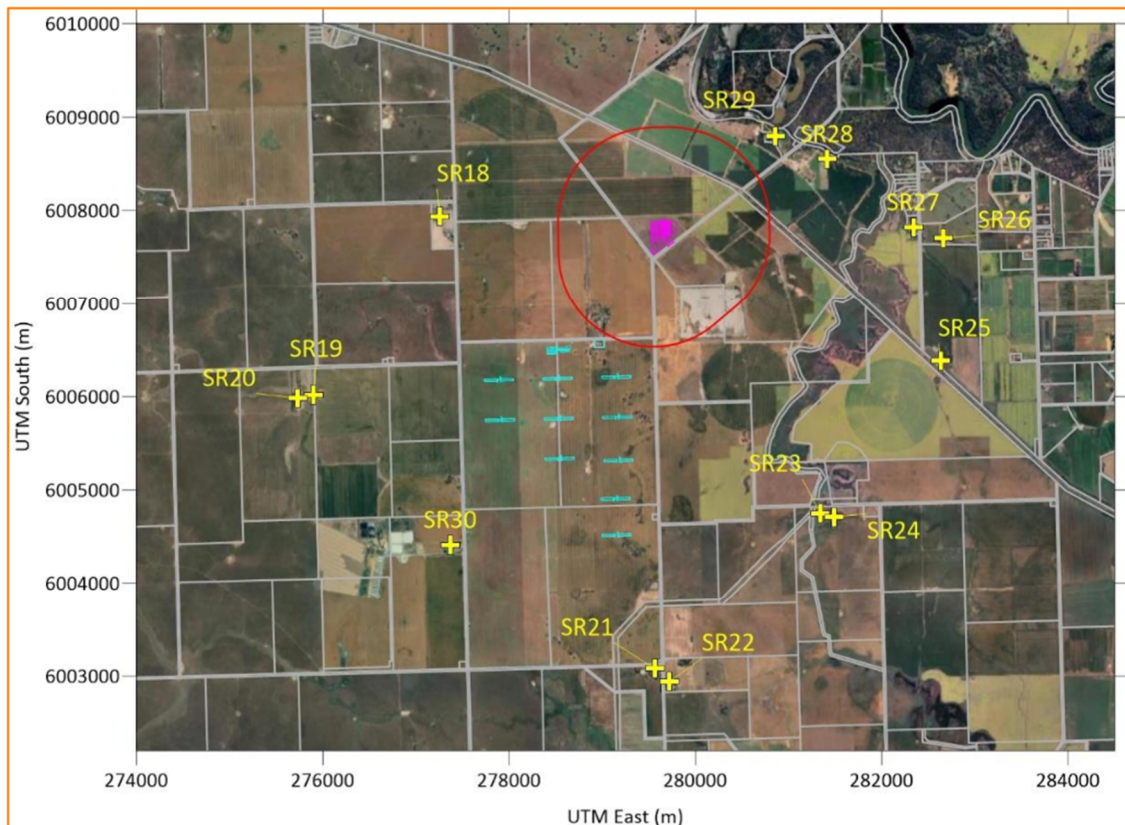


COMPOSTING FACILITY CONCEPT LAYOUT PLAN

**Figure 4-3. OGN Layout Plan.**

The location of the OGN was chosen to consider the following factors:

- Proximity to sensitive receptors. Achieving the required odour buffer zone using the S factor requirement. The site achieves greater than 1km to the closest receptor. Refer to figure below.
- Biosecurity offsets. Achieving offsets from all other poultry farms including McLeans. Both rearing and cage free farms achieve greater than 5km separation and free-range farm achieves greater than 1.35km separation.
- Separation distance from waterways and flood inundation. The site is greater than 1.8km to the closest mapped waterway (to the east of the site).
- Location that has a reduced impact on existing use/conditions. The proposed location of the compost site is currently used for both irrigated and dry land cropping. The existing surface is cultivated land. No existing natural vegetation is present which reduces the impact on the natural flora and fauna.
- Adequate grades for the activity. The natural slope is minimal which grades towards a controlled irrigation drain.
- Location where adequate landscaping buffer zones can be planted. The OGN will have a minimum of 30m landscaped buffer zone around the parameter of the site.
- Other considerations: Proximity to reduce traffic movements, ability to control external stormwater (separation of clean and dirty water), adequate size to suit the operational catering for internal stormwater collection and adequate composting area.



**Figure 4-10: Composting Buffers (Red, 1 km)**

**Figure 4-4. Composting buffers (refer specialist consultant reports).**

#### 4.4.3 OGN Composting Process Design

The OGN proposed operational process includes:

- Receiving raw material. The raw material will be collected from the farms and then then transported to the OGN site. It is then unloaded to the raw material (feedstock) storage area. The transportation used will be controlled and covered.
- Feedstock storage area. The feedstock storage area will allow prior preparation of the material prior to being moved to the in-vessel composting area. The feedstock storage area will be uncovered.
- In-vessel composting. After the feedstock has been prepared it is then moved via loaders to the in-vessel compost bunders. The proposed vessels are fully covered/contained during the composting process. All leachate run off during the composting process will be collected and managed in enclosed tanks before re-mixing.
- Finished Product (fertiliser/ soil conditioner) Storage. Once the composting process has finished, the composted material is then moved to the finished produce storage area. This is then used on the surrounding cropping land.

While the final OGN plant design and layout is yet to be defined, the composting process undertaken is committed to be in accordance with best practice environmental management.

#### 4.4.3.1 General Design Methodology

The OGN proposed site design will incorporate the following:

- The site will have a min of 30m landscaping buffer zone. This will assist with improving visual amenity, noise, dust and odour control.
- The compound will have secure fencing addressing both wildlife and human safety.
- There will be a clean water diversion bund around the site to redirect upstream clean water runoff from local storm events and not allow cross contamination.
- All stormwater runoff generated inside the bunded area will be graded to the sedimentation and retention ponds.
- The pond systems will include main catch drains that will discharge into the first sedimentation pond. The runoff will then flow into the second sedimentation pond which will then discharge into the retention pond. Two sedimentation ponds are optimal to allow the facility to maintain operation during regular maintenance and to allow for extra treatment during general operation. The water captured in the retention pond will be utilised back in the composting operation and if required can be irrigated out on the adjacent cropping land.
- As outlined in the stormwater management plan for T-Block & OGN prepared by RMA – the ponds have been sized to capture a 5% AEP, 24hr storm (as described in Section 3.2.4 EPA Victoria’s “operating organic waste processing facilities,” dated May 2024). Exact volumes and treatment processes will be confirmed during the detailed design phase.
- The site will be graded to suit the process requirements i.e. the feedstock storage area will not flow into the finished product storage area. The site will have sufficient slope to not encourage water ponding with consideration of erosion or cross-contamination. The proposed average slope on gravelled areas is 2-2.5% and any concreted areas will be 1%.
- The pavement design under all areas will be designed to consider infiltration and to cater for the traffic movements anticipated on the site. The proposed pavements will include compacted clay material with a gravel wearing surface (located in the feedstock storage and finished product area) and sections with concrete hardstand (proposed in-vessel composting area). The in-vessel composting area will be impervious having a full leachate capturing system.
- There will be an onsite truck wash for all vehicles entering and leaving the facility.
- Staff amenities and office area with shower facilities (with a separate blackwater system).
- Water supply and storage. Water is required for the composting process to maintain adequate moisture content to produce a final product that conforms with Australian Standard (AS) 4454-2012. This water is supplied from both fresh and leachate sources. The primary water supply is from the retention pond and onsite storage tanks supplied by the existing water licences. The use of compost runoff and leachate provides a sustainable reuse of this water. Water will be reused from the retention ponds prior to utilisation of fresh water.
- Internal wash bay.
- All facility areas will be covered by a regular pest and rodent management program.

#### **4.4.3.2 Feedstock and Composting**

The materials composted will come from rearing and laying farms operated by McLean Farms. The exact materials used will vary depending on production, economic and market factors, but can include the following:

- Poultry - manure/litter/carcass/egg shells/egg pulp; and
- Sawdust / woodchip / mulch / straw (as bulking material and carbon source in the composting process).
- Additives which may include selective nutrient or biological treatments to add in agricultural production to be applied on site.

Quantities of material composted will vary with production and economic factors. The finished compost production will vary according to material availability. The anticipated annual amount will be between approximately 25,000t annually for Stage 1 and increased to 50,000t for Stage 2.

There are many options for in-vessel composting. In general, in-vessel composting process is described as:

- Raw organic waste is delivered and prepared.
- The material is then transferred to the sealed composting vessel. The vessels can be bunkers and tarps, tunnels, rotating drums, container etc.
- Microbial activity begins to break down the material, generating heat. It is important that appropriate consistent heat is maintained during this to achieve pasteurisation and to kill any other pathogens.
- Monitoring is undertaken for correct oxygen, moisture and airflow controls.

#### **4.4.4 Environmental Management**

##### **4.4.4.1 Feedstock Management**

All incoming raw material will be inspected to check that the material is of acceptable quality. Any raw material that is excessively mouldy or rotten and not ideal for composting is rejected and disposed of at an accredited facility.

All poultry material will be mixed with carbon and bulking material. Moisture level will be increased to 60 to 65% and transferred into the Composting Vessel Area (CVA) as soon as mixing occurs. If the CVA is not full prior to close of business, the CVA will be covered overnight / weekend and re-opened the next business day until full and operational.

A record of all feedstocks received/removed from site will be kept. The records will contain:

- date of pickup/delivery of feedstock.
- description of feedstock.
- quantity of feedstock.
- origin of the feedstock; and
- destination of the compost.

These CVAs are then managed for temperature and oxygen levels whilst operational to achieve the requirements to comply with the pasteurisation process under AS 4454-2012 standard.

#### **4.4.4.2 Composting Vessel Area Management**

A specialist compost turner is used to ensure that feedstock, carbon / bulking material and water are adequately mixed at optimum levels prior to placement in the CVA. CVA feedstock will be tested for moisture and porosity prior to commencement of operation for that batch and electronic record kept for each batch.

Once operational, the CVA will then be monitored and recorded for temperature and oxygen levels throughout the composting process, which will vary between 4 to 6 weeks per batch.

At the end of the operational phase, the CVA will be uncovered and moved to a finished product storage location where pathogen and nutrient samples will be taken and sent to laboratories for testing. Once the batch has passed pathogen testing, it will then be moved to a stockpile / screening area for dispatch to farm.

The finished compost is screened on-site prior to being moved to farm. This is done by a trommel or like machine. The trommel will be fitted with a 10 mm rotating screen but may change (+/-) if end use requires a different screening size.

Materials with sizes smaller than 10 mm are collected and moved to a screened area awaiting dispatch. Materials with sizes greater than 10 mm are collected and then moved back to the carbon / bulking area to be re-used in the composting process.

To facilitate the destruction of pathogens, monitoring must be conducted to confirm all materials being composted are subjected to a pasteurising temperature for a minimum of either:

- Not less than 55°C for three (3) consecutive days; or
- Between 50°C and 55°C for twelve (12) days.

The Site Supervisor must take all practical measures as per site Stand Operation Procedures so that the activity is conducted in a way that prevents cross-contamination between feedstock materials and finished product derived from the composting processes.

The compost site will have two nominal storage areas. One area will store the finished product (clean area) and the other will store feedstock, composting material and carbon / bulking materials (dirty area).

OGN will install a weather station on the site to have an accurate understanding and record of climatic conditions.

The nature of mixing feedstock prior to placing into the CVA, is identified as a high-risk activity for odour production, which will therefore be undertaken from approximately 06:30 am and is usually completed by 2 pm. This is so any potential odour dispersion is done during the lowest risk part of the day.

Regardless of wind direction, the lowest risk option is to commence feedstock mixing in the mornings. However, odour and dust emissions, and also for the management of workplace health and safety, mixing is to cease when wind speed is above approximately 20 km/h.

If feedstock mixing were to be postponed during this period when winds are unfavourable, the continuation of mixing may occur later in the day once wind has dropped below unfavourable levels. If mixing has not occurred for 24 hours due to climatic conditions, then at the Site Supervisors discretion, may continue mixing so feedstock does not become anaerobic adding to odour production.

Feedstock mixing is undertaken Monday to Fridays, but every Friday afternoon site maintenance

operations are undertaken which helps to minimise operations leading into the weekend.

#### 4.4.4.3 Traffic and Machinery Management

The movement of traffic along the internal access driveway and around the site has the potential to produce both dust and noise. As operating hours are generally daylight hours, Monday to Friday, the potential for significant noise impacts is minimal. However, the surface of the access road and internal roads or the composting pad will be maintained to prevent excessive noise emissions from truck bounce.

Dust emissions will be minimised by regular watering of the internal road during extremely dry and windy days. However, water use is likely to be prioritised for compost management to comply with AS 4454-2012 and assist with odour management. Additionally, trucks will be covered to prevent fugitive dust emissions and spills during the transport of materials. All spilt materials within the property or along public roads will be cleaned up.

Vehicle and machinery maintenance is also undertaken to minimise noise produced during operation.

#### 4.4.5 Environmental Impacts and Risk

The following section describes risks to environmental values in **Table 6** below and the magnitude of the impacts that can be generated with the proposed development.

##### 4.4.5.1 Risk Assessment Synopsis

The risk assessment adopted is a qualitative risk-based approach designed to assess risk based on the likelihood of an environmental impact event occurring. **Table 6** outlines the definitions of likelihood of environmental impacts.

**Table 6: Definitions of Risk Likelihood Ratings.**

Rating	Descriptor	Score
Rare	May occur only in exceptional circumstances	1
Unlikely	Could occur but doubtful	2
Possible	Might occur at some point in the future	3
Likely	Will probably occur	4
Almost Certain	Is expected to occur in most circumstances	5

**Table 7** outlines the definitions of consequences as a result of the environmental impact rating.

**Table 7: Definitions of Consequences from Impact Rating.**

Rating	Descriptor	Score
<b>Negligible</b>	Impacts not requiring any treatment or management action	1
<b>Minor</b>	Nuisance or insignificant environmental harm requiring minor management actions	2
<b>Moderate</b>	Serious environmental impacts, readily manageable at low cost	3
<b>Major</b>	Substantial environmental impacts, manageable but at considerable cost and some disruption	4
<b>Catastrophic</b>	Severe environmental impacts with major consequent disruption and heavy cost	5

**Table 8: Risk Assessment Matrix for Environmental Impacts.**

Likelihood of an Environmental Impact		Impact Consequence				
		Negligible	Minor	Moderate	Major	Catastrophic
		1	2	3	4	5
<b>Almost Certain</b>	5	5 Medium	10 High	15 High	20 Extreme	25 Extreme
<b>Likely</b>	4	4 Low	8 Medium	12 High	16 High	20 Extreme
<b>Possible</b>	3	3 Low	6 Medium	9 Medium	12 High	15 High
<b>Unlikely</b>	1	2 Low	4 Low	6 Medium	8 Medium	10 High
<b>Rare</b>	1	1 Low	2 Low	3 Low	4 Low	5 Medium

The consequence and likelihood scores identified, aid in understanding the final risk level assigned to each activity. The higher the risk score, the higher the priority for management.

**Table 9** identifies the possible actions required to support the final risk assessment ratings.

**Table 9: Management Options for Risk Assessment Ratings.**

Risk Rating	Risk Rating Scores	Indicative Management Options
<b>Extreme</b>	16 – 25	Manage by implementing site management and emergency procedures, equipment design controls and regular monitoring.
<b>High</b>	10 – 15	Manage by implementing site management procedures, specific monitoring, and may require some operation/equipment design controls.
<b>Medium</b>	5 – 9	Manage by implementing specific monitoring or response procedures.
<b>Low</b>	1 – 4	Manage by routine procedures, unlikely to need specific application resources.

#### 4.4.5.1 Potential Environmental Impacts

Activities associated with the proposed composting facility that have the potential to cause environmental harm and/or nuisance have been outlined below in **Table 10**.

**Table 10: Identification of Potential Impacts from Site Activities on Environmental Values.**

Activity	Potential Impacts				
	Environmental Values Impacted				
	Air	Water	Noise	Waste	Flora and Fauna
<b>Clearing and Grubbing</b>	✓	✓	✓		
<b>Feedstock Storage</b>	✓	✓		✓	
<b>In-vessel Composting (pathogens and other contaminants)</b>	✓	✓	✓	✓	
<b>Finished product storage</b>	✓	✓	✓	✓	
<b>Internal Stormwater Management</b>		✓			
<b>Fuelling area</b>	✓	✓	✓	✓	✓
<b>Sedimentation and Retention Ponds</b>		✓		✓	✓
<b>Heavy Vehicle Movement</b>	✓	✓	✓		✓
<b>Light Vehicle Movement</b>	✓	✓	✓		✓
<b>Waste Storage</b>				✓	
<b>Truck Washing</b>		✓			

#### **4.4.6 Incident Management**

##### **4.4.6.1 What is an incident**

An accident is any non-compliance as defined under the legislative requirements and Risk Management and Monitoring Program (RMMP) specific to this site. This may include but is not limited to:

- Spills from machinery, fuelling area or leachate tanks outside of the controlled areas.
- Complaints regarding the facility operations.
- Contaminated water leaving the site during high rainfall events/floods.
- Incorrect storage of highly flammable products.
- Improper maintenance of exhaust and ventilation equipment.
- Dusty, odorous, or noisy conditions
- Improper and unauthorised disposal of highly flammable and hazardous waste.
- Incorrect composting processes.

##### **4.4.6.2 Incident Investigation**

All incidents shall be investigated by the manager to determine:

- Nature, type, location, and extent of the incident and affected area.
- Actual and/or potential environmental impacts of the incident.
- Suspected cause of the incident.
- Measures required to mitigate any further environmental harm:
- Remedial measures required to correct any environmental harm; and
- Measures to be implemented to prevent a recurrence of the incident.

The requirements for the environmental assessment of impacts of an incident shall be determined by an environmental consultant. The assessment may include environmental monitoring of contaminant released in relation to land, water, noise, air and light (in addition to routine monitoring requirements). Based on the nature and type of the incident, the environmental consultant shall determine:

- Sampling and analytical requirements.
- Applicable guidelines or levels to apply to data for assessing compliance and level of impact; and,
- Reporting requirements

Any monitoring shall be undertaken by a competent person, and all monitoring equipment shall be appropriately maintained, calibrated, and operated. Monitoring will be designed in consultation with and DES.

##### **4.4.6.3 Incident Reporting**

In accordance with the Environmental Protection Act 2017 (EP Act), serious or material

environmental harm) shall be reported by to the acting authority within 24 hours of becoming aware of the event in accordance with the Duty to Notify.

Minor incidents (e.g. paint spill less than 20L) are to be recorded in the site diary and cleaned up / remediated. Full procedures will be outlined in the RMMP.

All personnel are responsible for reporting all incidents to the Site Manager. All incidents are to be recorded on the Incident Report Form provided by.

The Site Manager shall telephone the department as soon as practical after becoming aware of any release of contaminants not in accordance with the EP Act 2017. Following this, a written notice detailing the following information must be provided within 14 days of the initial notification:

- The name of the operator, including their approval / registration number.
- The name and telephone number of a designated contact person.
- Location and time of incident.
- Suspected cause of incident.
- A description of the effects resulting from incident.
- The results of any sampling performed in relation to the incident.
- Actions taken to mitigate any environmental harm caused by the incident and,
- Proposed actions to prevent the recurrence of the incident.

#### **4.4.6.4 Incident Prevention**

- To increase safety during operations, appropriate personal protective equipment is always required.
- Analysis of past incidents and potential future incidents is required to identify and minimise reoccurrences.
- Training and environmental awareness information and,
- Liaison with environmental consultants and EP officers.

#### **4.4.7 Complaint Management.**

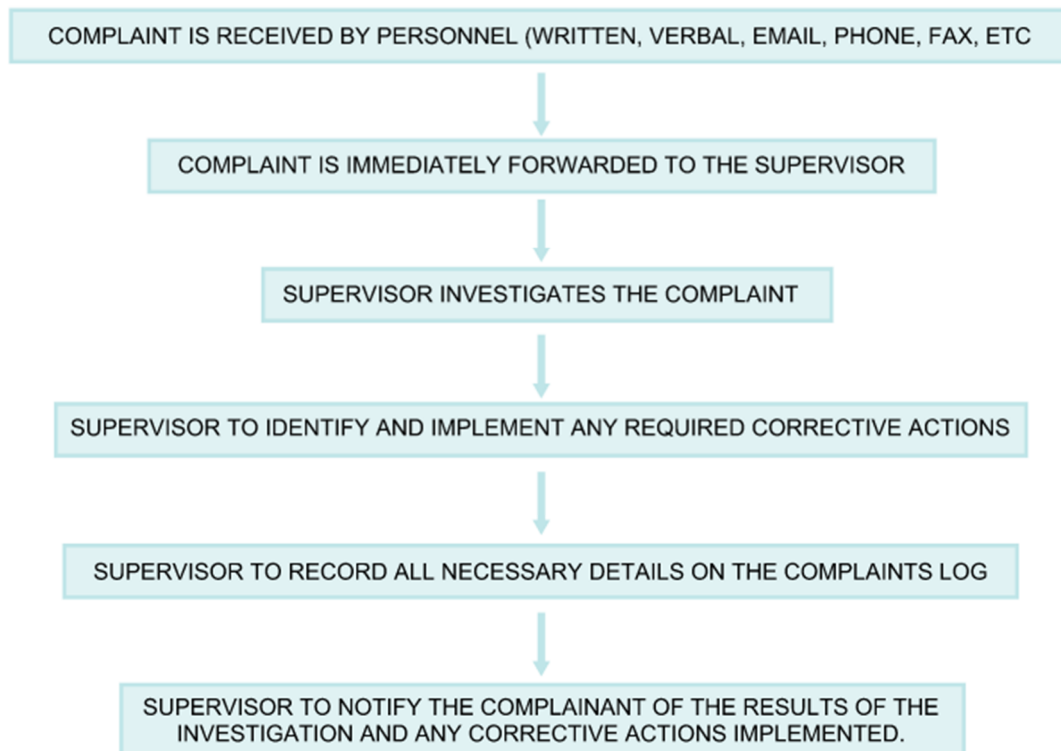
All complaints that are directly or indirectly received by Organic Nutrients staff are recorded in the monitoring spreadsheet (complaint log). Additionally, a complaint handling procedure has been developed to respond to complaints. This procedure will be followed each time a complaint, is received. The outcome of a complaint investigation is then provided to relevant local / state body as required.

A complaints log should be in use and updated for all complaints received.

The following details must be recorded for all complaints received:

1. Time, date, name, and contact detailed of the complaint.
2. Reasons for complaint.
3. Any investigations undertaken.
4. Conclusions formed; and
5. Any actions taken.

The complaints log must be provided to the administering authority on request. The procedure for recording and actioning complaints follows the steps outlined in **Figure 4-5**.



**Figure 4-5: Complaints Procedure.**

#### **4.4.8 Training, Records, Monitoring and Reviews**

##### **4.4.8.1 Training**

All staff employed on site to have completed a site induction by the Site Manager. The induction training will include the following:

- Familiarisation with the requirements of the proposed Site Based Management Plans, Risk Management Plans and Operational Requirements.
- Familiarisation with site environmental controls.
- Process for management of environmental incidents.
- Legislation applicable to the abrasive blasting and spray painting, fabrication industry, such as permits, approvals and licenses.
- Environmental duty of care and duty to notify.
- Spill kit use and response.
- Guidelines on waste management and flammable liquids
- Identification and source separation of recyclable materials.
- Equipment, maintenance, and replacement procedures
- Dust control measures.
- Stormwater management measures.

#### **4.4.8.2 Record Management**

A copy of the Development Permit, EPA License (operational license), Risk Management and Monitoring Program (RMMP) and EMP/SBMP shall be always kept at the site offices.

Any record or document required as an outcome of the RMMP, EMP/SBMP or requested by a regulatory authority must be kept at the site for a period of 5 years in accordance with the EPA requirements and be available to an authorised person.

Records must be kept of the key environmental performance indicators, monitoring results, corrective actions, environmental incidents and complaints, reports to management, and any records required by law such as regulated waste tracking, soil and groundwater monitoring.

#### **4.4.8.3 Monitoring: Design targeted monitoring based on risk**

Monitoring of the operation is key, and a full procedure will be defined in an RMMP or similar document. In general monitoring criteria and requirements will be determined based on risk characteristics and consequences.

## 4.5 Biosecurity

Biosecurity management practices are essential to prevent the spread of livestock diseases which is particularly crucial in the poultry industry.

Biosecurity measures are required for the management of the laying sheds with the inclusion of the following operational biosecurity controls:

- Individualised site-specific transportation vehicles e.g. trucks, trailers, forklifts to be site specific.
- Site specific Vehicle “Truckwash”. Where all vehicles entering and leaving the site will pass through.
- Individualised sanitation stations – foot washes, upon entrance to laying shed facilities.
- Site specific amenities building to allow all staff, contractors and visitors to the site to shower in/out of the facility including full laundry system for internal uniforms.
- Site specific equipment sanitisation transfer room and individual UV item transfers. All equipment and object taken into the facility are required to undergo a sanitisation process.
- Flocks should be transported in isolation from other flocks.
- Infrastructure and equipment should not be used for multiple flocks without appropriate sanitation between facilities.
- External stormwater design is to consider draining water away from the building to reduce prolonged ponding and not attract wild bird flocks. Further to this stormwater is to be directed away from the shed to avoid cross contamination from shed to shed.
- Each shed will be treated as its own biosecurity environment. The design of the common access corridor will create air locks to assist this. Staff in general will not go from shed to shed to avoid cross shed transfers.
- Egg collection will exit the shed at a single point through an airlock.
- A strict biosecurity protocol for operation will be implemented which will outline operational processes and movements.

Biosecurity philosophies will be both incorporated into both the design and operational processes. With the fundamental principles of design to prevent, control, isolate, and manage risks associated with diseases, pests and weeds.

## 4.6 Hazardous Substances and Dangerous Goods

Hazardous substances and dangerous goods are required for onsite operation. Potential hazardous substances and dangerous goods could include:

- Vermin baiting chemicals/products.
- Pests/Flies treatment chemicals.
- Herbicides/Vegetation poisons.
- Maggot Spot treatment chemicals.
- Petrol/Diesel + Oil + Coolant (Any chemicals/products used for machinery and vehicle operation).

- Gas
- Sanitation chemicals for cleaning/disinfecting
- General kitchen chemicals/products (in staffroom – cleaning products, medical supplies)
- Veterinary chemicals/treatments/products for outbreaks or any vaccination products.
- Any feed supplements e.g. copper.

To minimise the risks associated with these goods, the following controls have been designed:

- Any hazardous liquid substances are to be contained within self-bunded tanks away from animals and poultry sheds.
- Any hazardous liquid substances are to be located adjacent to the amenities building only.
- Any hazardous solids are to be stored in suitable containers away from animals and poultry sheds.
- Any handling of hazardous substances should be followed by extensive equipment cleaning and sanitation processes.

## 5. Surface and Ground Water Assessment

### 5.1 Surface and Ground Water Assessment Criteria

The Egg Industry Environmental Guidelines outline that free range areas are potential sources of environmental risk due to nutrient deposited in the soil. As such the potential risk needs to be managed by appropriate siting, design, and management of the range area.

The guideline provides a risk tool which applies risk ratings to key factors that influence and impact groundwater such as the nutrient source and transportation risks.

The risk assessment will determine the score rating of the shed sites. This will be compared to the risk score rating table in the Egg Industry Environmental Guidelines, refer to **Figure 5-1** below.

Risk Rating	Risk Score
Low	100 – 400
High	400 – 600
Very High*	>600

*\* A Very High rating indicates that the site is not suitable for a free range operation.*

**Figure 5-1: Egg Industry Environmental Guidelines Risk Score Rating Table.**

The assessment for surface water will be undertaken using Egg Industry Environmental Guidelines matrix, refer to **Figure 5-2** below:

RUNOFF FACTORS	FACTOR WEIGHT	FACTOR SCORE				RISK FOR FACTOR = WEIGHT X SCORE
		LOW	MODERATE	HIGH	VERY HIGH	
		1	2	4	8	
RAINFALL FACTOR	20	<5000	5,000 – <10,000	10,000 – 20,000	>20,000	
DISTANCE TO WATERWAYS	15	>200m	100 – 200m	30 – 100m	<30m	
FARM SIZE	15	<10,000	10,000 – <60,000	60,000 – <250,000	>250,000	
SOIL PROFILE	10	Refer to explanatory notes				
LAND SHAPE	10	Swales and contour banks	Uniform flat or sloping land	Slightly uneven, minor rills	Highly concentrated gully flow	
GROUND COVER	10	80 – 100%	60 – <80%	45 – <60%	<45%	
STOCKING RATE*	5	<750 birds/ha	750 – <1,500 birds/ha	1,500 – <5000 birds/ha	>5,000 birds/ha	
SLOPE	5	<1	1 – <3.75	3.75 – 15	>15	
SOIL P	5	Refer to explanatory notes				
TOPSOIL PBI	5	>280 (clay)	140 – 280 (clay loam)	35 – <140 (sandy loam)	<35 (sand)	

*\* Double stocking rate if trees are present on the range*

**Figure 5-2: Risk Assessment of Range Area Impacts to Surface Waters.**

The assessment for groundwater will be undertaken using Egg Industry Environmental Guidelines, refer to **Figure 5-3** below.

LEACHING FACTOR	FACTOR WEIGHT	FACTOR SCORE				RISK FOR FACTOR = WEIGHT X SCORE
		LOW	MODERATE	HIGH	VERY HIGH	
		1	2	4	8	
SOIL PROFILE	25	Refer to explanatory notes				
GROUNDWATER	20	>10m to groundwater where protected by clay or impermeable strata (otherwise >20m)	>2m to groundwater where protected by clay or impermeable strata (otherwise >10m)	>2m to unprotected groundwater	<2m to groundwater	
RAINFALL FACTOR	20	<5000	5,000 – <10,000	10,000 – 20,000	>20,000	
PASTURE TYPE	15	>30% Lucerne	>30% deep rooted perennials	>30% shallow rooted perennials	<30% perennials	
FARM SIZE	15	<10,000	10,000 – <60,000	60,000 – <250,000	>250,000	
STOCKING RATE*	5	<750 birds/ha	750 – <1,500 birds/ha	1,500 – <5000 birds/ha	>5,000 birds/ha	

\* Double stocking rate if trees are present on the range

**Figure 5-3: Risk Assessment of Range Area Impacts to Groundwater.**

It is noted that during the farm development consideration has been given to shed locations based on soil type, topography, drainage, and distance from any natural water course. Geotechnical testing has also been undertaken to determine soil types and if groundwater was present. Refer to **3.2 Geotechnical Investigation** for more information.

## 5.2 Farm Groundwater Assessment

An assessment and risk rating has been undertaken for the sheds and farm as a whole considering the terrain, layout and spacing is relatively uniform between sheds.

Common factors in the assessment include:

- Soil Profile: Well-structured/draining soils – sandy clay soils (refer to **Appendix B** for results).
- Groundwater Depth >2m to groundwater. This was determined by the Groundwater Hydrogeological Desktop Review where a groundwater source is located within the area of between 2-6m below surface.
- Rainfall Factor: < 5,000 (refer to **Figure 5-4** below).
- Pasture Type: >30% Lucerne (from desktop imagery).
- Farm Size: 20 Sheds at 40,000 birds, total of 800,000 birds per farm.
- Stocking Rate: >5000 birds/ha.

Refer below for the risk assessment of the groundwater impacts for the T-Block Free Range Layer Farm below:

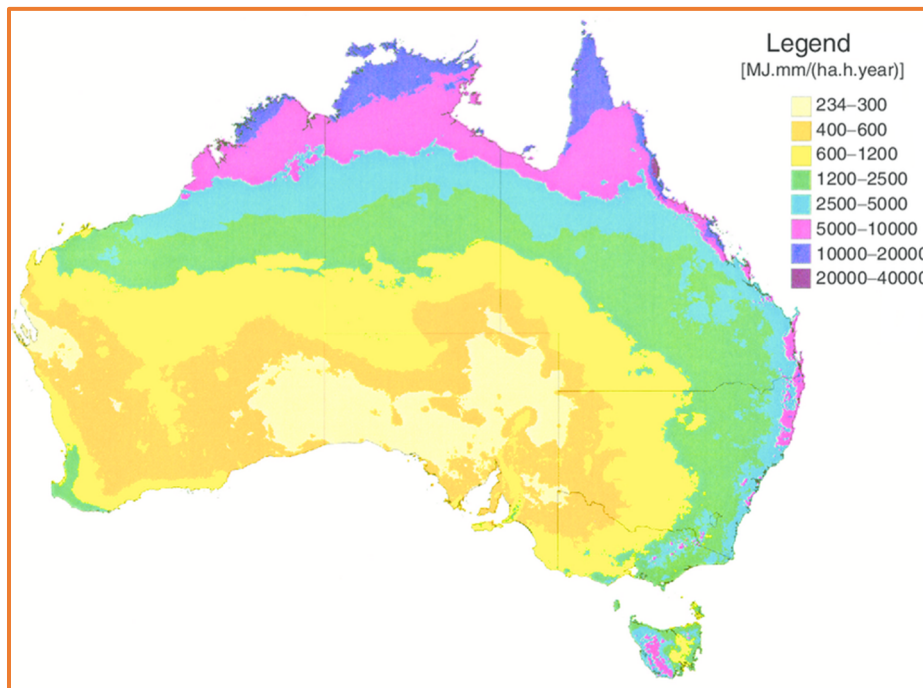


Figure 5-4: Rainfall Factor Map and Legend (R Factor) (Lu, Hua & Yu, Bofu. (2002).)

Table 11: Risk Assessment of Range Area Groundwater Impacts for T-Block Free Range Farm.

		Factor Score				
		Low	Moderate	High	Very High	Risk For Factor
Leaching Factor	Factor Weight	1	2	4	8	Weight x Score
Soil Profile	25	Sandy Clay				25
Groundwater*	20	>10m P	>2m P	>2m U	<2m	20
Rainfall Factor	20	<5000	5000- <10000	10000-20000	>20000	20
Pasture Type	15	<30%				15
Farm Size	15	<10,000	10,000- <60,000	60,000- <250,000	>250,000	120
Stocking Rate	5	<750	750- <1,500	1,500-<5,000	>5,000	40
<b>Total Risk Factor</b>						<b>240</b>

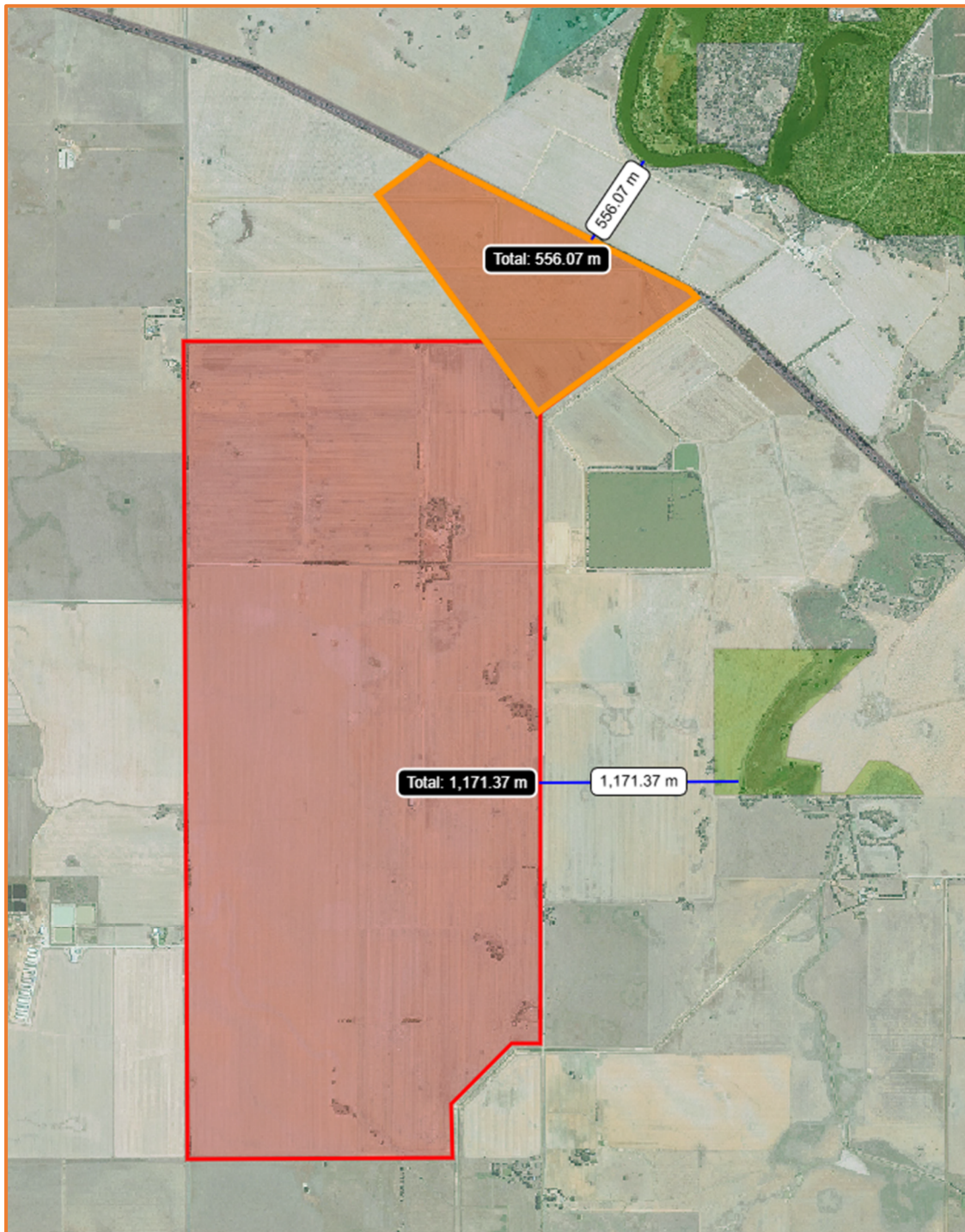
\*Where P refers to Protected Groundwater by clay or impermeable strata and U refers to Unprotected groundwater.

### 5.3 Farm Surface Water Assessment

An assessment and risk rating has been undertaken for the sheds as a whole considering terrain, layout and spacing is relatively uniform between sheds.

Common factors in the assessment include:

- Rainfall Factor: < 5,000 (refer to **Figure 5-4** above).
- Distance to Waterways: >200m (refer to **Figure 5-5** below).
- Farm Size: 20 Sheds at 40,000 birds, total of 800,000 birds per farm.
- Soil Profile: Well-structured/draining soils – sandy clay soils (refer to **Appendix B** for results).
- Land Shape: Uniform flat or sloping flat.
- Groundcover: 80-100%.
- Stocking Rate: >5000 birds/ha.
- Slope: <1.
- Soil Phosphorus: 8-12 (assumption).
- Topsoil PBI: >280 (clay).



**Figure 5-5: Distance to nearest mapped waterways from site boundary.**

Refer to the below tables for the farm surface water assessment.

**Table 12: Risk Assessment of Range Area Surface Water Impacts for T-Block Free Range Farm**

		Factor Score				
		Low	Moderate	High	Very High	Risk for Factor
Runoff Factors	Factor Weight	1	2	4	8	Weight x Score
Rainfall Factor	20	<5000	5000- <10000	10000- 20000	>20000	20
Distance to Waterways	15	>200m	100-200m	30-100m	<30m	30
Farm Size	15	<10,000	10,000- <60,000	60,000- <250,000	>250,000	120
Soil Profile	10					10
Land Shape	10					20
Groundcover	10	80-100%	60-<80%	45-<60%	<45%	10
Stocking Rate	5	<10,000	10,000- <60,000	60,000- <250,000	>250,000	40
Slope	5	<1	1-<3.75	3.75-15	>15	5
Soil Phosphorus	5					10
Topsoil PBI	5					5
<b>Total Risk Factor</b>						<b>270</b>

The total risk based on the ground water assessment in **Table 11** and the surface water assessment in **Table 12** identifies that T-Block Free Range Laying Farm is a “Low” risk farm according to the Egg Industry Environmental Guidelines Risk Ratings

## 5.4 Control Measures and Shed Design for Low-Risk Rating

The Egg Industry Environmental Guidelines outlines that on Low-Risk sites, increased nutrient deposition close to sheds does not pose a significant risk and minor controls are considered adequate to reduce nutrient loss.

Control measures have been proposed for each shed location. These have been developed based on the shed/site development principles outlined in the guidelines and using the High-Risk Site Zoning Criteria. The decision to use the High-Risk Site Zones was to demonstrate adequate controls within each impacted zone even though the sites are assessed as Low Risk.

The three zones are outlined as:

- Zone 1: 0 - 10.00m
- Zone 2: 10.00 - 25.00m
- Zone 3: 25.00m+

The proposed controls include:

- Manure in the sheds are expected to be cleaned out every three to four days and transported to the compost facility.
- A 2.5m concrete apron is anticipated to be constructed around the shed with a 150mm hob at the edge (located in Zone 1). The purpose of the external hob and concrete apron is to capture any manure/litter that leaves the shed. This can be collected/cleaned as required (i.e. mid batch). It must be noted that the proposed sheds also include an internal hob at the wall which retains manure and litter inside the shed. This has proven to be effective on previous constructions. As stated in the guidelines this is expected to restrict 50% of nutrient losses.
- Plastic mesh mats are also expected to be installed within zone 1 and zone 2. The mesh depending on terrain will extend 6 -12m from the edge of the external apron. The purpose of the mesh is assisted further with any manure/litter collection. The plastic mesh mats also assist with ground stabilisation.
- Selective bulk earthworks. From the soil test it was determined that each site has clay present. It is proposed, as good practice, to utilise the clay material as part of the bulk earth construction and be placed within zone 1 and zone 2 where practical. Clay has a naturally low permeability and therefore assists in protecting against seepage. The utilisation of the nature clay material vs imported compacted gravel is deemed more effective regarding permeability properties.
- Downpipes and gutters are proposed to direct roof water away from the sheds. There roof water will be captured and reused. Any overflow will be discharged well into Zone 3 of each shed.
- Monitoring - regular onsite soil testing is intended to be completed to monitor soil nutrient levels to mitigate unacceptable levels of nutrient accumulation.
- Clean water diversion bunds are proposed to be constructed to redirect surface water away from the sheds.
- Catch drains are proposed in zone 1 where applicable to stop any surface runoff mixing with the clean water.
- Proposed tree retention, tree planting and ground cover rejuvenation is likely to encourage flocks to naturally dissipate further into the range area. This is likely to reduce the manure deposit intensity close to the shed.

## 6. Conclusion

In accordance with the Victorian Code for Broiler Farms 2009 and the Australian Egg Industry Environmental Guidelines, the proposed T-Block Free Range Laying Farm has been designed to meet the requirements as set out in each of the guidelines. The two guidelines complement each other and detail the processes to consider for the design and operation of the poultry farm.

This farming operation has been designed with considerations for the animals' health and environmental impacts of a poultry farm in Torrumbarry. This report considers the requirements detailed in the guidelines including:

- Farm Location
  - › Climate, land, flora and fauna and landscaping and vegetation.
- Geotechnical Investigation
  - › Borehole locations, geotechnical assessment, erosion and sediment control assessment and groundwater locations.
- Proposed Facilities
  - › Size, infrastructure, by-product storage and management, biosecurity and hazardous substances and dangerous goods.
- Surface and Groundwater Assessment
  - › Groundwater assessment, Surface water assessment and control measures for shed design.

The laying farm operation has been classed as a 'low risk' farm based on assessments within this report.

## 7. References

Australian Eggs Limited, *Egg Industry Environmental Guidelines – Edition 2*, Effective May 2018.

Before You Dig Australia responses enquiry 50160081 obtained on Monday 12th June 2025.

Campaspe Shire Council, *Campaspe Planning Scheme*, Effective 7th April 2025.

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GeoVIC, *Online Interactive Overlay Mapping Service*, Accessed 28th May 2025.

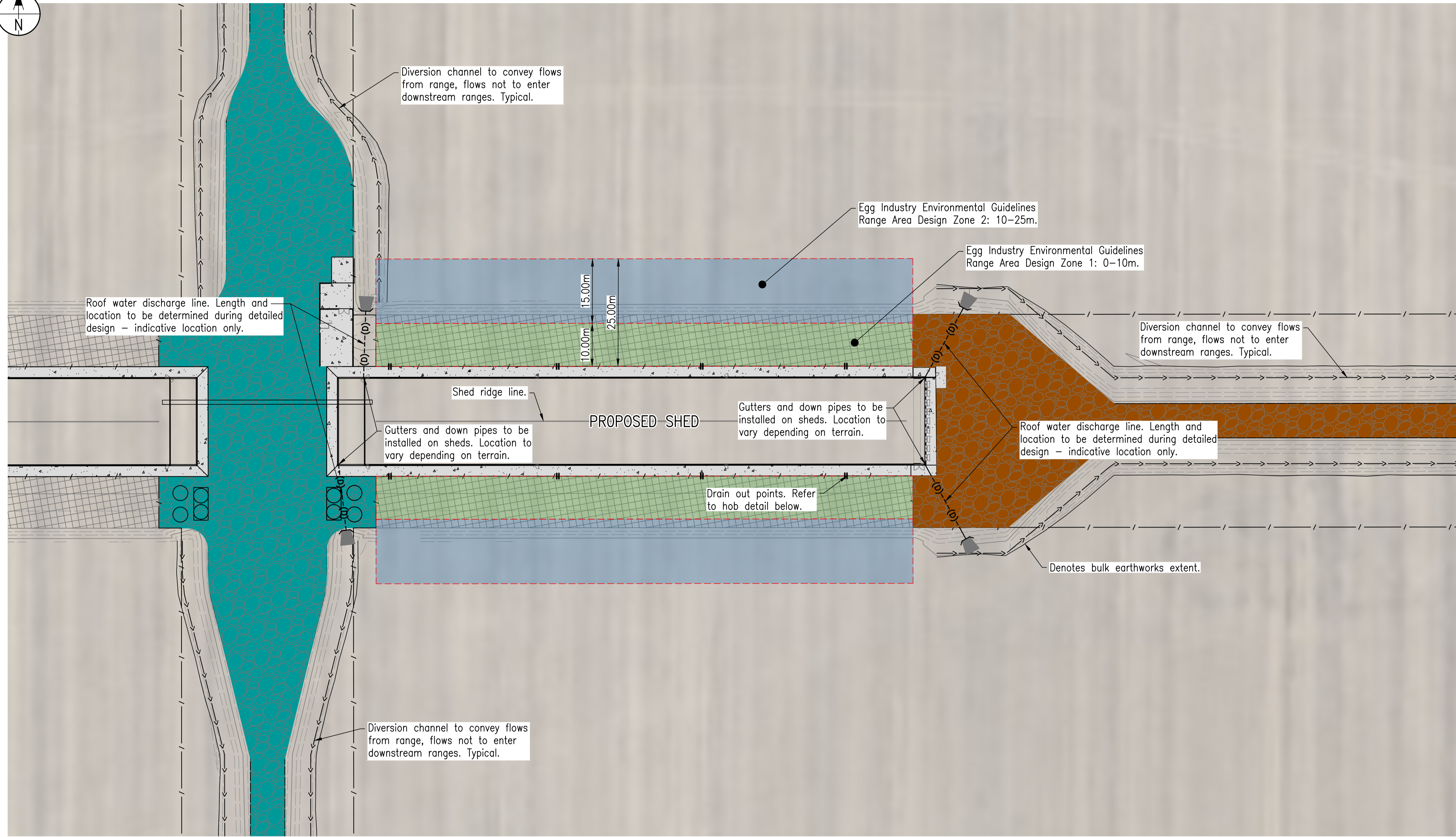
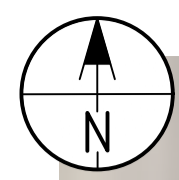
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Victoria State Government – Department of Transport and Planning, *Planning Property Report*, Obtained from [www.planning.vic.gov.au](http://www.planning.vic.gov.au) on 13th March 2025.

Victoria State Government, *Victorian Code for Broiler Farms 2009 – Plus 2018 Amendments*, Accessed 28<sup>th</sup> May 2025.

Lu, Hua & Yu, Bofu. (2002). Spatial and seasonal distribution of rainfall erosivity in Australia. *Soil Research*. 40. 887-901. 10.1071/SR01117.

## Appendix A Typical Shed Concept Layout Plans



**LEGEND:**  
PROPOSED

- Ranging Fence
- Proposed Stormwater Invert
- Clean Area Road Pavement
- Dirty Area Road Pavement
- Proposed Concrete Pavement
- Proposed Gravel Pavement
- Design Area Zone 1: 0-10m
- Design Area Zone 2: 10-25m
- Minor Contours
- Major Contours

**PLAN NOTES:**

P.1. Plan is intended to be viewed in colour.  
P.2. Intervals between contours - 0.2m.  
Contours are design surface levels.

**DISCLAIMER NOTES:**

D.1. This is a sketch plan only and is conceptual only.  
D.2. This sketch plan represents design intent and concepts only.  
D.3. Information shown on these plans has been compiled from varying sources and may not be accurate and will need verifying. This includes imagery, existing infrastructure, property boundaries and natural surface data.  
D.4. No reliance should be placed on the information on this plan for detailed design or any financial dealings involving this land.  
D.5. This plan shall not be used for tendering, financing, ordering of materials, construction or any other unintended purpose.  
D.6. Proposed mitigation strategies will be tested on a shed to determine bench marks. Best concepts to be adopted.  
D.7. Arrangement of each shed in indicative only. Final arrangements to be determined during detailed design.

**PROPOSED MITIGATION STRATEGIES**

C.1. Gutters and down pipes.  
C.2. External hobs.  
C.3. Defined external drainage points.

**PASSIVE**

P.1. Sample soil test to be determined during detailed design to define bench marks.  
P.2. Trial vegetation swales, types and locations to be determined during detailed design.

**OPERATIONAL**

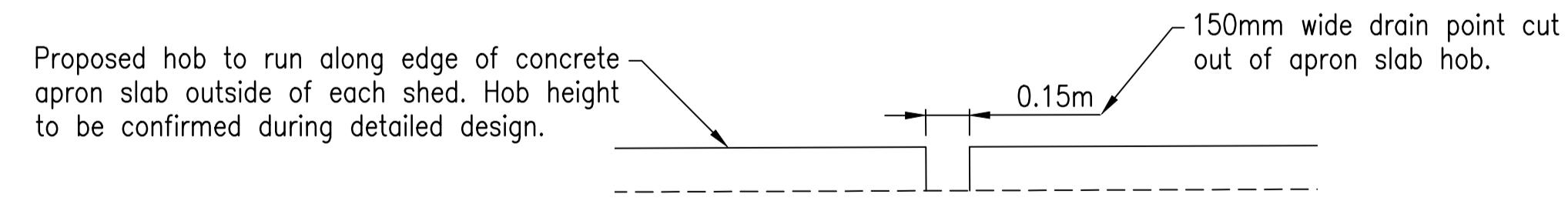
O.1. Trial mid batch apron cleaning.

**EGG INDUSTRY ENVIRONMENTAL GUIDELINES**

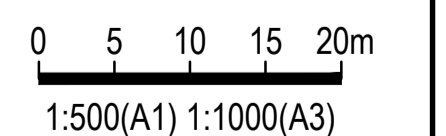
E.1. Zone 1: 0-10m  
E.2. Zone 2: 10-25m  
E.3. Zone 3: >25m

## T-BLOCK EGG INDUSTRY GUIDELINES CONCEPT LAYOUT PLAN

Scale 1:500 (A1)



**HOB DETAIL**  
Do Not Scale.



ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
1	FOR APPROVAL	16/10/25	BLL	BLL	GS	
0	FOR APPROVAL	15/08/25	BLL	BLL	GS	
A	FOR COMMENT	08/09/25	BLL	BLL	GS	

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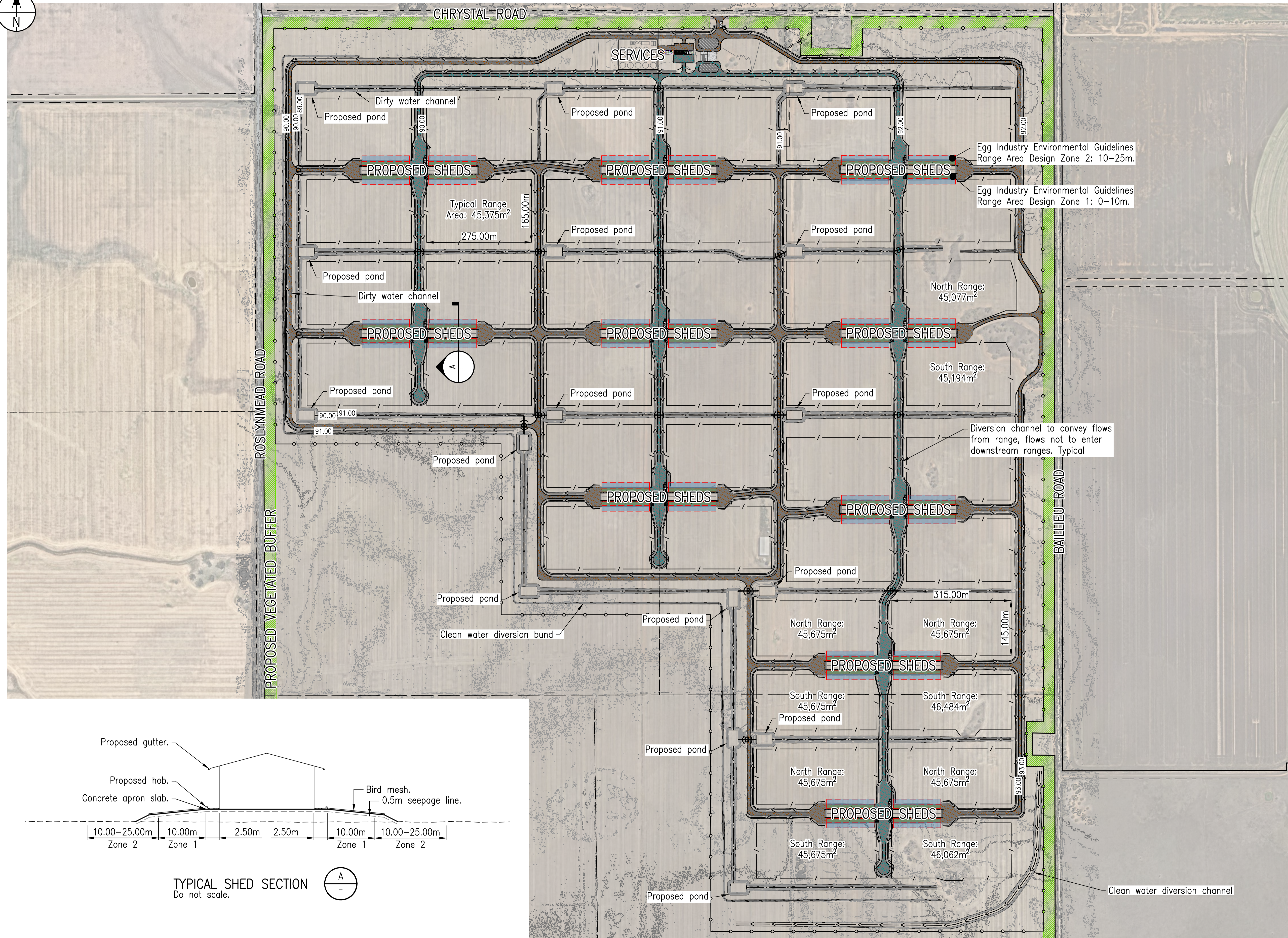
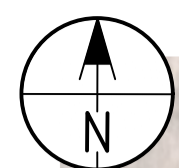
CLIENT  
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PO BOX 158  
PITTSWORTH, QLD 4356

PROJECT  
**INTEGRATED EGG LAYING OPERATION**  
MURRAY VALLEY HIGHWAY  
TORRUMBARRY, VIC 3562

TITLE  
**T-BLOCK EGG INDUSTRY GUIDELINES CONCEPT LAYOUT PLAN**

HEIGHT DATUM <b>AHD</b>	MAP GRID <b>VICGRID</b>	SIZE <b>A1</b>
COUNCIL RAL/MCU NO.		
COUNCIL OW NO.		
PROJECT NO. <b>25E-0010</b>	DRAWING NO. <b>P-SK3006</b>	ISSUE <b>1</b>

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**LEGEND:**

**PROPOSED**

- Ranging Fence
- Perimeter Fence
- Proposed Stormwater Invert
- Vegetation Buffer
- Clean Area Road Pavement
- Dirty Area Road Pavement
- Proposed Concrete Pavement
- Proposed Gravel Pavement
- Design Area Zone 1: 0-10m
- Design Area Zone 2: 10-25m
- Minor Contours
- Major Contours

**PLAN NOTES:**

P.1. Plan is intended to be viewed in colour.  
P.2. Intervals between contours - 0.2m.  
Contours are design surface levels.

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C.2. External hobs.  
C.3. Defined external drainage points.

**PASSIVE**

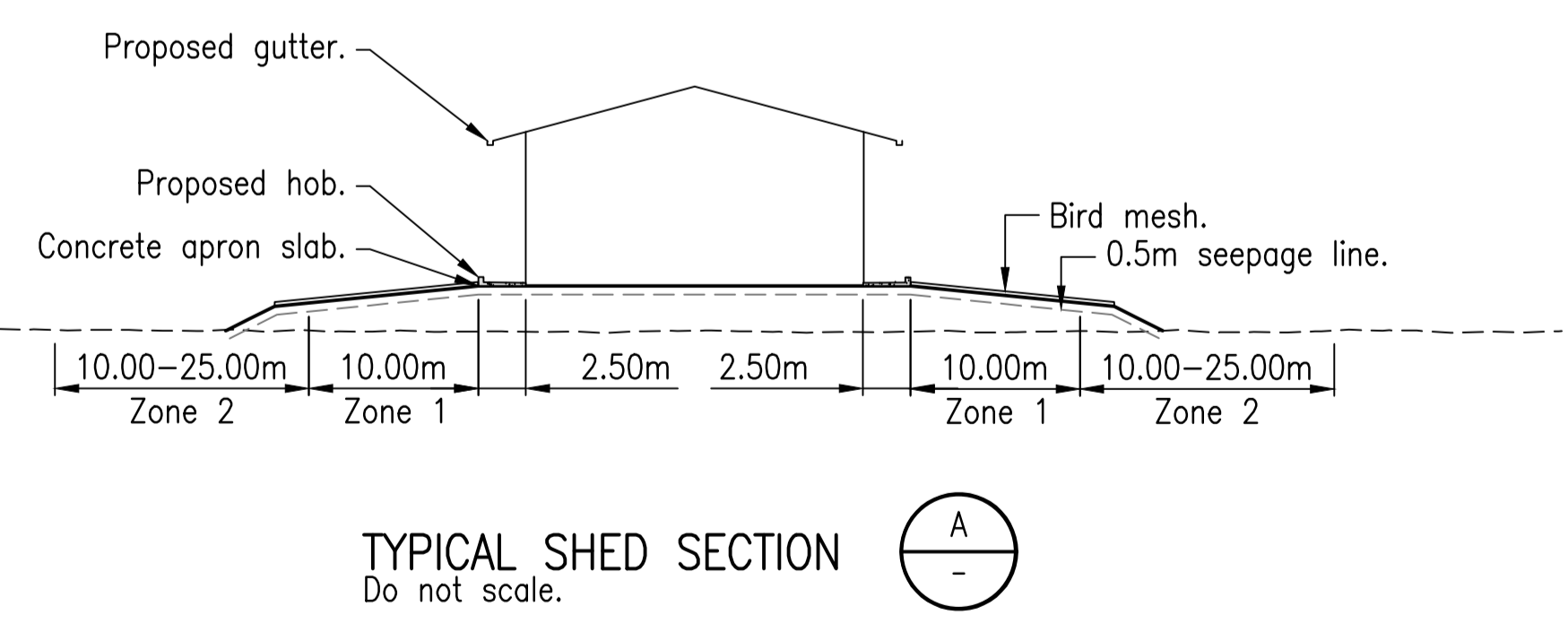
P.1. Sample soil test to be determined during detailed design to define bench marks.  
P.2. Trial vegetation swales, types and locations to be determined during detailed design.

**OPERATIONAL**

O.1. Trial mid batch apron cleaning.

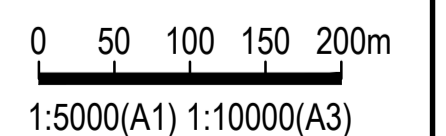
**EGG INDUSTRY ENVIRONMENTAL GUIDELINES**

E.1. Zone 1: 0-10m  
E.2. Zone 2: 10-25m  
E.3. Zone 3: >25m



# EGG INDUSTRY GUIDELINES DESIGN SITE LAYOUT PLAN

Scale 1:5000 (A1)



ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
1	FOR APPROVAL	16/10/25	BLL	BLL	GS	
0	FOR APPROVAL	15/08/25	BLL	BLL	GS	
A	FOR COMMENT	08/08/25	BLL	BLL	GS	

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**PO BOX 158**  
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PROJECT  
**INTEGRATED EGG LAYING OPERATION**  
**MURRAY VALLEY HIGHWAY**  
**TORRUMBARRY, VIC 3562**

TITLE  
**EGG INDUSTRY GUIDELINES DESIGN SITE LAYOUT PLAN**

HEIGHT DATUM <b>AHD</b>	MAP GRID <b>VICGRID</b>	SIZE <b>A1</b>
COUNCIL RAL/MCU NO.		
COUNCIL OW NO.		
PROJECT NO. <b>25E-0010</b>	DRAWING NO. <b>P-SK3007</b>	ISSUE <b>1</b>

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## Appendix B Geotechnical Investigation Report

# Geotechnical Investigation Report

Alpair Pty Ltd - McLean Farms

Project Number 25-S-0016

Project Name GA - Torrumbarry Property Victoria



## REPORT CONTROL SHEET

<b>RMA Ref No</b>	<b>25-S-0016</b>
<b>Site:</b>	Torrumbarry – Murray Valley Highway   Torrumbarry
<b>Report Title:</b>	Geotechnical Investigation Report

Document Control					
Revision	Author	Reviewer	Approved for Issue		
			Name	Signature	Date
1	Danny Coleborn <i>RPEQ24004</i>	Daniel Keogh <i>QBCC15072125</i>	Danny Coleborn <i>RPEQ24004</i>		20/02/2025

**Disclaimer:**

*This report is a professional opinion based on the information available at the time of writing. It is not intended as a quote, guarantee or warranty and does not cover any latent defects.*

*The conclusions in this report should not be read in isolation. We recommend that its contents be reviewed in person with the author so that the assumptions and available information can be discussed in detail to enable the reader to make their own risk assessment in conjunction with information from other sources.*

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# 1. Introduction

## 1.1 General

A broadscale investigation was undertaken for a proposed development within Lot 1 on registered plan LP86931, Lot 2 on registered plan PS547702, Lot 2 on registered plan PS404891, Lot 2 on registered plan LP69483 and Lot 4 on registered plan LP206281, Murray Valley Highway Torrumbarry.

The location of the site is shown in Figures 1 & 2 presented in Appendix A.

It is understood that the proposed development will likely include the construction of:

- Poultry Farm Sheds
- Internal Roads
- Other essential infrastructure

## 1.2 Scope of Services

RMA Soils component of the work is generally to undertake a site and soil assessment to inform on the due diligence phase of the project.

The objective of the geotechnical investigation was to provide information on the:

- Subsurface profile
- Indicative site classification/soil reactivity
- Assessment of materials for:
  - material usage
  - excavatability
- Assessment of potential geotechnical hazards for the site
- Construction recommendations
- Groundwater assessment

To collect the appropriate data and site information, the methodology and scope of works for the investigation and laboratory testing program included:

- Excavating test pits up to 2m depth or prior refusal
  - Plasticity
  - Dispersive potential

## 2. Geotechnical Investigation

### 2.1 Site Description

Lot 1 (LP86931) & Lot 2 (PS547702) are adjacent to each other. They are bound on the southern side by rural properties, on the eastern side by Baillieu Road, on the western side by Rosalynmead Road and on the northern side by Lot 2 on (PS404891). Crystal Road traverses the properties through the centre.

Lot 2 (PS404891) is bound on the southern side by Lot 1 (LP86931) & Lot 2 (PS547702), on the eastern side by rural properties, on the western side by Rosalynmead Road and on the northern side by the Murray Valley Highway.

Lot 2 (LP69483) is bound on the southern sides by rural properties, on the eastern side by rural properties & the Murphy Swamp Wildlife Reserve and on the western side by Baillieu Road.

Lot 4 (LP206281) is bound on the southern, eastern & western sides by rural properties and on the northern side by the Murray Valley Highway.

Access to the sites is from the Murray Valley Highway and Baillieu Road.

At present the sites are generally cultivated paddocks and are sparsely to moderately vegetated with short grasses and sparsely timbered with small to large trees.

A dam has been constructed around the centre of the northern boundary of Lot 2 (PS547702). The excavated material was used to construct a hardstand area on the western side of the dam.

The lots are gently sloping, generally towards the Murray River to the north.

Site characteristics are shown in photographs presented in Appendix A.

### 2.2 Field Investigation

The field investigation completed on the 15<sup>th</sup> of February 2025 was carried out using a 1.7t Excavator.

The excavator utilised a 0.6m wide tiger tooth bucket from the ground surface to the termination depth of the test pits.

The field investigation consisted of:

- Excavating & logging 7 test pits
- Disturbed samples collected for:
  - Atterberg Limits
  - Emerson Class Number

The soil classification descriptions, field and laboratory testing were carried out in general accordance with Australian Standards:

- AS1289: Methods of Testing Soils for Engineering Purposes
- AS1726-2017: Geotechnical Site Investigations

The borehole locations are shown on the Site Map presented in Appendix B. The borelogs are presented in Appendix C.

## 2.3 Laboratory Testing

### 2.3.1 General

Laboratory testing was carried out on selected samples collected from the field investigation program. The testing was directed towards assessing the plasticity & dispersive characteristics of the subsurface materials.

The laboratory testing was carried out in general accordance with the relevant Australian Standards from AS1289 Methods of Testing Soils for Engineering Purposes. Laboratory testing included:

- Atterberg Limits – to assess the plasticity
- Emerson Class Number – to assess the dispersive potential

The results of the laboratory testing is shown in the Sections below.

### 2.3.2 Atterberg Limits Testing Results

Disturbed samples were collected during the investigation and were used to undertake Atterberg Limits testing in accordance with AS1289.3.4.1 (LS) and 1289.3.9.2 (LL).

The Atterberg Limits test reports are presented in Appendix D and summarised in Table 1 below.

**Table 1: Laboratory Test Results – Atterberg Limits**

Test Locations	Depth (m)	Material Type	Liquid Limit (%)	Linear Shrinkage (%)
TP01	0.20 – 0.50	Sandy Silty Clay	53	13.0
	0.60 – 0.90	Sandy Silty Clay	50	13.5
	0.90 – 1.00	Sandy Clay	54	15.5
TP03	0.70 – 1.00	Sandy Clay	51	16.5
TP04	0.10 – 0.30	Sandy Clay	57	17.0
TP05	0.10 – 0.30	Sandy Silty Clay	63	17.5

Test Locations	Depth (m)	Material Type	Liquid Limit (%)	Linear Shrinkage (%)
TP06	0.20 – 0.40	Sandy Silty Clay	60	15.5
	0.80 – 1.00	Sandy Silty Clay	61	16.5

### 2.3.3 Emerson Class Number Results

Part of the sample used to complete Atterberg Limits testing was used to undertake Emerson Class Number testing. This testing was completed in accordance with AS1289.3.8.1.

The Emerson Class Number test results are outlined in Table 2 below with the reports presented in Appendix D.

**Table 2: Laboratory Test Results – Emerson Class Number**

Test Locations	Depth (m)	Material Type	Emerson Class Number	Dispersive Potential
TP01	0.20 – 0.50	Sandy Silty Clay	5	Low
	0.60 – 0.90	Sandy Silty Clay	5	Low
	0.90 – 1.00	Sandy Clay	4 *	Moderate
TP03	0.70 – 1.00	Sandy Clay	4 **	Moderate
TP04	0.10 – 0.30	Sandy Clay	6	Very Low
TP05	0.10 – 0.30	Sandy Silty Clay	6	Very Low
TP06	0.20 – 0.40	Sandy Silty Clay	5	Low
	0.80 – 1.00	Sandy Silty Clay	4 *	Moderate

\* Gypsum in the soil  
 \*\* Carbonate in the soil

### 3. Geotechnical Assessment

#### 3.1 Regional Geology

The 1:250,000 scale Bendigo Geological Map published by the Geological Survey of Victoria in 2001 indicates that the surface and near-surface geology of the site comprises:

- Quaternary age sediments: gravel, sand, silt (variably sorted and rounded) & clay, generally unconsolidated, includes deposits of low terraces & alluvial floodplain deposits
- Tertiary Quaternary age Shepparton Formation: clay, sand, silt, poorly sorted lenticular gravel, dissected flood plain alluvium (terraces 1-10 metres above present river channels & well-developed soil 2-3 m thick)

The subject site lies within the Tertiary Quaternary age Shepparton Formation sediments and residual soils. The regional geology of the area is shown on Figures 3 & 4 presented in Appendix A,

#### 3.2 Subsurface Profile

##### 3.2.1 General

The site investigation consisted of drilling and logging seven test pits. The test pits were excavated across the subject properties.

The target depth for termination of the test pits was 2m. All test pits were terminated at 1m depth due to the size & capacity of the excavator.

##### 3.2.2 Subsurface Profile

The subsurface profile encountered during both investigations is outlined in Table 3 below.

The borehole locations are presented in Appendix B. The test pit logs are presented in Appendix C.

**Table 3: Summary of the Subsurface Profile**

Test Pit		Soils		Bedrock	
Number	Depth (m)	Type	Thickness (m)	Depth (m)	Type
TP01	1.0	Sandy Silty Clay Sandy Clay	0.90 0.10	-	Not Encountered
TP02	1.0	Sandy Silty Clay Sandy Clay	0.80 0.20	-	Not Encountered

Test Pit		Soils		Bedrock	
Number	Depth (m)	Type	Thickness (m)	Depth (m)	Type
TP03	1.0	Sandy Silty Clay Sandy Clay	0.70 0.30	-	Not Encountered
TP04	1.0	Sandy Clay	1.00	-	Not Encountered
TP05	1.0	Sandy Silty Clay Sandy Clay	0.60 0.40	-	Not Encountered
TP06	1.0	Sandy Silty Clay	1.00	-	Not Encountered
TP07	1.0	Sandy Silty Clay	1.00	-	Not Encountered

### 3.3 Site Classification

The classification of soil reactivity for a particular site to allow for the design of foundations, strictly only applies to residential buildings up to two-storeys and to other buildings of similar size, loading and flexibility as defined in accordance with AS 2870–2011.

It does not strictly apply to industrial or commercial constructions or infrastructure applications and as such is not directly applicable for this development. It is, however, a valuable method of classification and provides an indication of the tendency of the ground surface to move with seasonal variation in moisture content.

The borelogs show variable depths to weathered basalt across the site and therefore potential surface movement will vary.

The site classification was based on a visual assessment of relevant site conditions, laboratory test results and the characteristic surface movement. The estimated  $Y_s$  and site classification of each borehole is outlined in Table 4.

**Table 4: Site Classification – RMA Soils Boreholes**

Test Pit	Characteristic Surface Movement, $Y_s$ (mm)	Site Classification
TP01	65 – 90	H2 – D / E – D

Test Pit	Characteristic Surface Movement, Ys (mm)	Site Classification
TP02	65 – 90	H2 – D / E – D
TP03	65 – 90	H2 – D / E – D
TP04	80 – 110	E – D
TP05	75 – 100	E – D
TP06	75 – 100	E – D
TP07	75 – 100	E – D

The characteristic surface movement and site classification outlined above is based on the following:

- Climate Categories 4 & 5
- Zone of moisture variation of 3m & 4m
- Cracked zone of 1.5m & 2.0m deep
- pF = 1.2
- No cut / fill
- Assumptions of material characteristics below 1m depth

The ‘-D’ suffix indicates that this site lies in a climatic zone that is typically dry. These areas have a design depth of suction change, Hs, of greater than or equal to 3 and generally experience deep-seated moisture changes which may lead to higher than usual soil movements.

The Ys values outlined above show that the underlying soil profile has a High to Extremely High potential to swell/shrink under normal climatic changes, in terms of reactivity. This swelling &/or shrinking of the soils, particularly clay soils, is attributed to the absorption &/or loss of moisture.

Good practice in design, construction and management of the site will be required to accommodate the potential site movements in the short and long term.

This will include management of surface and subsurface drainage throughout the site along with limits on landscaping and adequate moisture preparation of any fill areas.

Commentary on the management of sites is outlined in Appendix B of AS 2870-2011.

## 4. Engineering Assessment

### 4.1 Material Usage / Import Type

The clay fill and natural sandy & silty clay material, where free of organic and deleterious material, may be used for structural fills.

Topsoil and silt materials, where encountered, may not be used as fill. These materials should be stripped from the site and discarded.

It should be noted that the onsite soils could be expected to present difficulties in handling, placement, and compaction if the appropriate moisture content is not achieved, particularly if the soils are overly moist. The detailed design should consider the effect of earthworks on site classification.

If imported, reactive clay soils are to be used, close control of moisture content during placement and compaction is required so as to minimise the potential for swelling and shrinkage movement. A moisture content within the range of OMC (standard Optimum Moisture Content) -3% to OMC +1% is recommended. Foundation design must reflect the use of the potentially reactive clays if they are used as structural fill.

Any imported general fill material should be free of deleterious material, of good quality with a Liquid Limit of less than 60% & Linear Shrinkage of less than 15%, a maximum particle size of 75mm with at least 80% passing the 19mm sieve. Quality testing to confirm imported fill quality should be carried out prior to delivery to site.

### 4.2 Excavatability

The target depth for termination of the boreholes 2m. All test pits were terminated at 1m depth due to the size of the excavator. The excavator utilised a 0.6m wide tiger tooth bucket from the ground surface to the termination depth of the test pits.

Excavations within the fill and natural clays could be undertaken using conventional small to medium sized earthmoving equipment, such as drotts, backhoes or 5 to 15t (or larger) excavators.

Based on the borelogs & geological mapping, it is unlikely that harder materials will be encountered within the upper 3m to 4m of the subsurface profile.

It should be noted that the excavatability estimates are based on materials encountered at the test locations only and that conditions may differ for excavatability beyond these test locations and the termination depths drilled or excavated as part of this investigation.

### 4.3 Site Earthworks

All site earthworks should be carried out in accordance with the procedures outlined in AS3798 - 2007.

AS3798 recommends that before any construction work is attempted, each building site should be scraped free of all significant organic material and debris. All soils containing organic and deleterious matter should be stripped from the construction area to the base of the root systems. This material is not considered suitable for reuse as controlled fill. The stripped soils could be stockpiled for landscaping purposes only.

AS3798 recommends that grub holes produced during tree removal should be backfilled and compacted to prevent 'soft' spots occurring underneath the building which may lead to differential

settlement. Backfilling must be done in accordance with the procedures outline in AS3798. This will also apply to backfilling the following the removal of large floating rocks.

If cut and fill is required, then the fill should be clean spoil recovered from the site cut and laid down in 150mm (maximum) layers. Each layer should be moistened and compacted using suitable compaction equipment to a minimum 98% standard compaction. Each 300mm lift should be tested in accordance with AS1289.5.8.1 and 5.4.1 or 5.1.1.

The subgrade below any pavement layers or filled platform should be tyned to a depth of 150mm and recompacted a minimum of 98% standard compaction. The pavement layers for any carparks or driveways should be compacted to 100% standard compaction. The layers should be compacted in 150mm (maximum) layers. Each layer should be moistened and compacted using suitable compaction equipment. Each 300mm lift should be tested in accordance with AS1289.5.8.1 and 5.4.1 or 5.1.1.

Should compaction testing be required, RMA Soils can be engaged to carry out compaction density testing on the platform during construction of the building pad.

#### **4.4 Seismic Sub-Soil Class and Site Factor**

The site sub-soil class for earthquake actions in this report is based on assessment of geological information collected during the site investigations and methods provided in Australian Standard AS1170.4-2018 – Structural design actions - Part 4: Earthquake actions in Australia.

In accordance with Section 4.2 of AS1170.4 the site sub-soil class of the proposed site is “Class Ce – Shallow Soil.” In accordance with Table 4.1 and Figure 3.2(F) a Hazard Design Factor of 0.08 should be adopted for the proposed site.

#### **4.5 Site Trafficability**

At the time of the field investigation trafficking problems were not encountered.

Trafficking problems for earthworks and construction machinery will arise due to the clayey nature of the surface and near surface materials. These problems may be caused by:

- Rainfall events softening the surface and near surface soils.
- Disturbance of the surface and near surface soils with the removal of vegetation, rock & ground cover and construction of underground elements.
- Disturbance of the surface and near surface soils with the construction of underground elements.

To minimise these problems, the site trafficability may be improved by:

- Controlling water seepage/drainage by diverting runoff away from the construction area to prevent ponding.
- Adequate compaction of the fill material used to backfill any constructed underground elements.
- Proof rolling the exposed area following stripping, clearing and grubbing to identify any weak

areas and then compacting the subgrade to strengthen these areas

- “Sealing” the construction area by rolling with a smooth drum roller at the completion of each day or prior to any rain event.
- Providing an all-weather working layer consisting of either:
  - › crushed concrete type material, or
  - › large size gravel, or
  - › imported sub-base material.

Areas which demonstrate excessive movement and/or do not improve sufficiently after compaction should be removed and replaced as outlined in Section 4.4.

All subgrades below pavements, structures and heavy machinery should be inspected by competent persons to identify any weak areas in the founding materials. Weak areas may cause failures in pavements, structures and lead to issues with subsidence below heavy machinery during construction.

## 5. Ground Condition Assessment

### 5.1 General

The aim of the broadscale investigation is to identify potential issues that may cause issues during the construction of the future development.

An assessment of the surface and subsurface characteristics revealed potential issues which will include:

- Unsuitable materials may include:
  - Topsoil
  - Silt
- Fill
- Extremely expansive soils

Unsuitable materials are defined as those containing deleterious materials such as organics, silt, rubbish, soft or loose soils etc. Unsuitable materials encountered on the site include topsoil & silt.

The topsoil may not be used as structural fill and should be removed from site or used for landscaping purposes.

Where bulk earthworks are to be undertaken, removal of these materials will need to be considered during assessment of the cut and fill volumes.

The uncontrolled fill material is unsuitable as a founding material for future structures. Where structures are to be placed in this area, the fill shall be removed and, where suitable, may be used as fill for the construction of building platforms.

The clay materials have the potential for high reactivity when exposed to moisture changes. Based on the climate categories for this area, this then correlates as high to extreme potential surface movements, as shown by the site classification. These potential surface movements should be considered during the design of foundations for future structures.

### 5.2 Groundwater

At the time of the investigation groundwater was not encountered within the termination depth of the boreholes.

Differing material types were encountered during the drilling and seepage was encountered within some boreholes, and it is possible that seepage could be expected through the more permeable soils and material interfaces during and after periods of rainfall within other areas across the site.

## 6. Conclusions

A preliminary geotechnical investigation was undertaken for a proposed development within Lot 1 on registered plan LP86931, Lot 2 on registered plan PS547702, Lot 2 on registered plan PS404891, Lot 2 on registered plan LP69483 and Lot 4 on registered plan LP206281, Murray Valley Highway Torrumbarry.

It is understood that the proposed development will likely include the construction of:

- Poultry Farm Sheds
- Internal Roads
- Other essential infrastructure

The field investigation consisted of excavating & logging 7 test pits. The target depth for termination of the test pits was 2m. All boreholes were terminated at 1m depth due to the capacity of the excavator used to excavate the test pits.

The investigations found natural materials consisting of stiff silty & sandy clay. Bedrock was not encountered within the termination depth of the test pits.

Laboratory testing was undertaken on selected materials within the natural clay soils.

Atterberg limits testing indicate that the natural clay materials have high plasticity.

Emerson class number testing indicates that the natural clays have moderate to very low dispersive potential.

## 7. Construction Inspection

It is recommended that footing excavations and cut batter slopes in soil and rock together with building & pavement subgrades and placement of all structural fills, should be inspected by a suitably qualified Geotechnical Engineer/Engineering Geologist. Should subsurface conditions other than those described in this report be encountered, RMA Soils Pty Ltd should be consulted immediately and appropriate modifications developed and implemented if necessary.

## 8. Limitations

This investigation is intended as a preliminary investigation to assess the surface and subsurface materials. The preliminary assessment is to be used as part of the due diligence phase of the project.

We have prepared this report for the use by Alpair Pty Ltd or your preferred contractor for design purposes in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has not been prepared for use by parties other than the Alpair Pty Ltd or their civil and structural engineers and their approved consultants and/or contractors. It may not contain sufficient information for purposes of other parties or for other uses.

RMA Soils Pty Ltd offer a documentation review services to verify that the intent of geotechnical recommendations is properly reflected in the design. It is recommended that clients avail themselves of this service. Our standard fees would apply in those cases.

## 9. Appendices

### 9.1 APPENDIX A

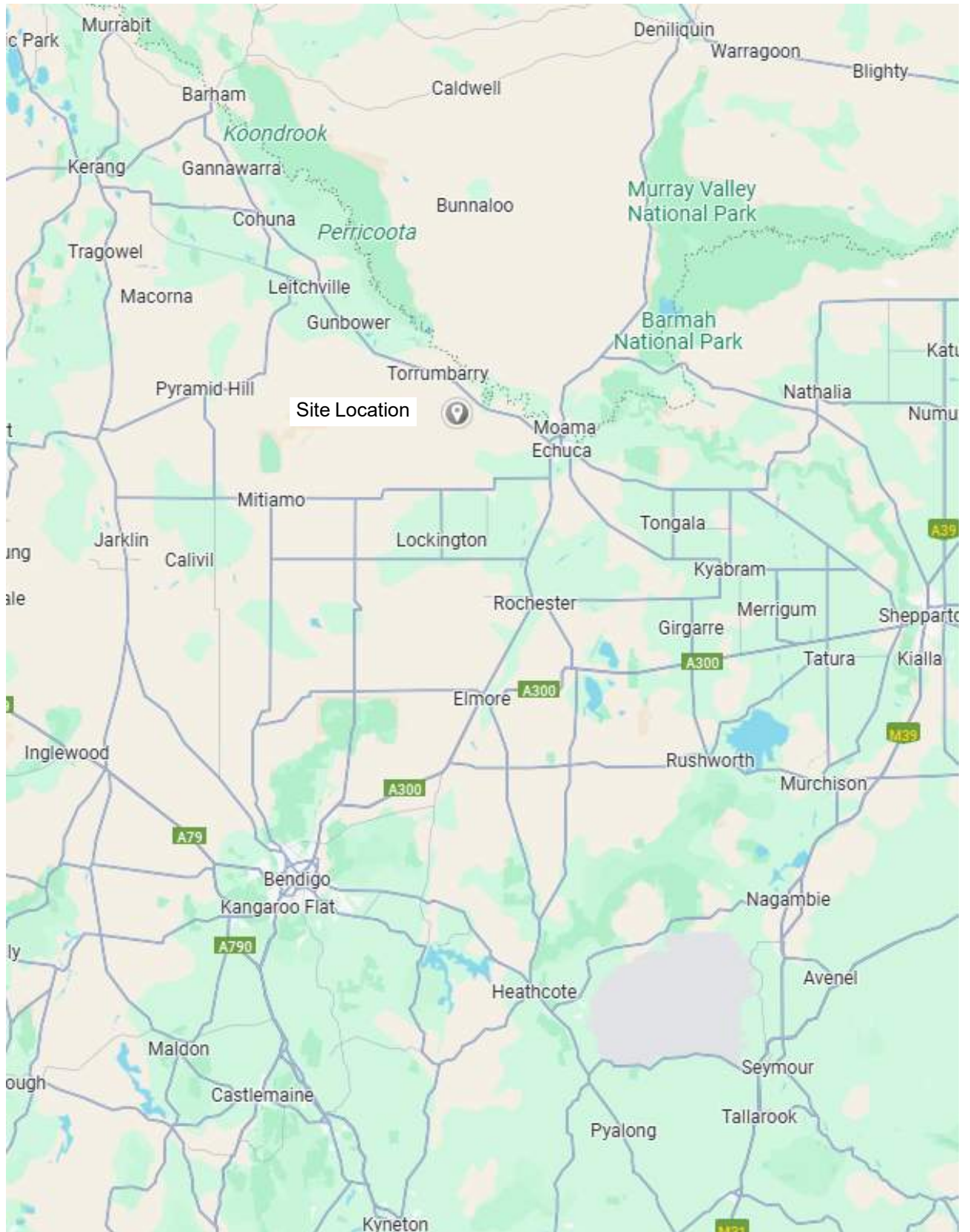


Figure 1: Site Location

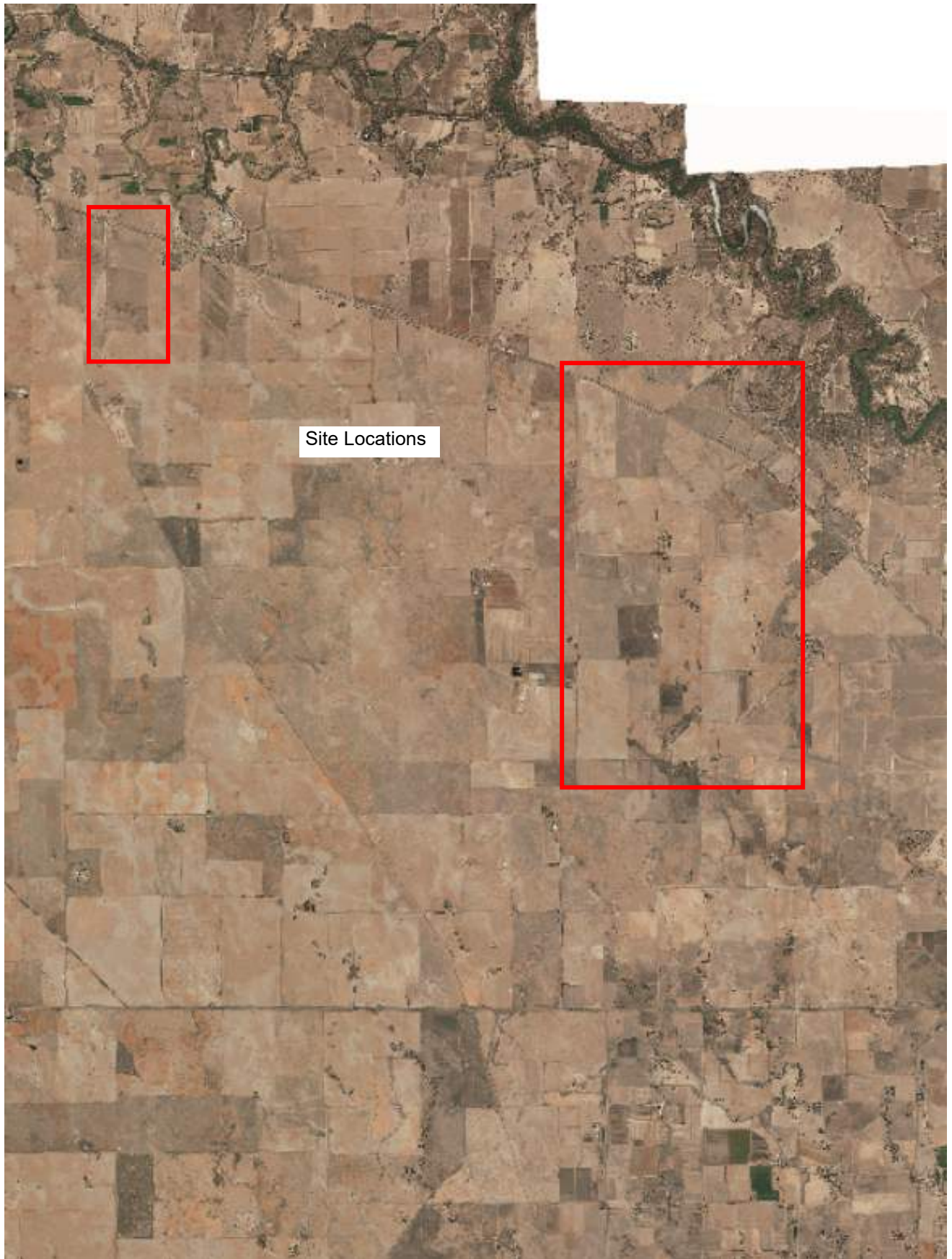


Figure 2: Aerial Map of the Site Location

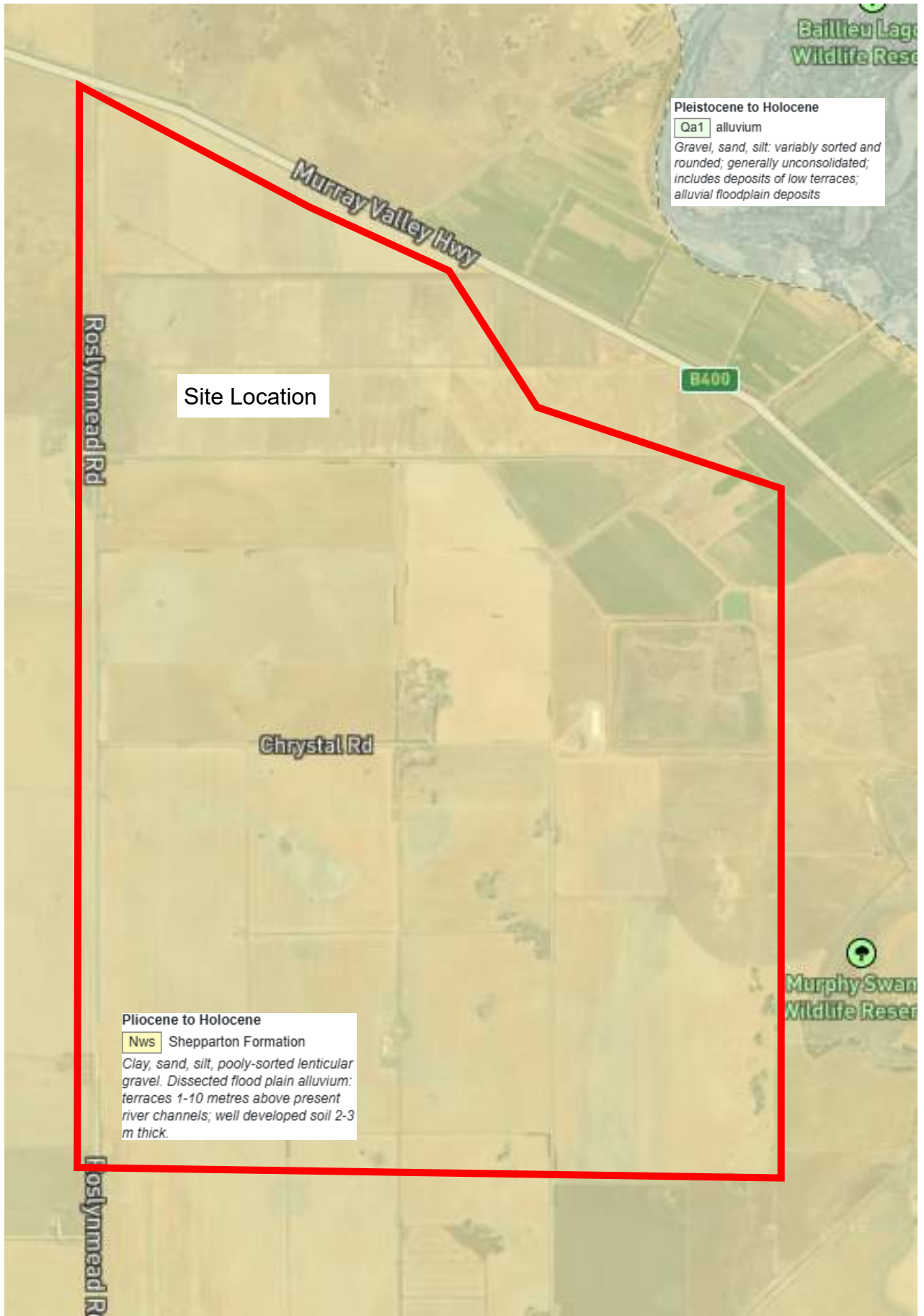


Figure 3: Regional Geology



Figure 4: Regional Geology



TP01 looking N



TP01 looking NE



 (07) 4639 4100  
 5 Bowen Street.  
 Toowoomba Qld 4350  
 enquiries@rmasoils.com.au

<b>Photo description</b>	P1		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP01	<b>TP Depth</b>	



TP01 looking E



TP04 looking SE



(07) 4639 4100



5 Bowen Street.  
Toowoomba Qld 4350



enquiries@rmasoils.com.au

<b>Photo description</b>	P2		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP01	<b>TP Depth</b>	



TP04 looking S



TP04 looking SW



 (07) 4639 4100  
 5 Bowen Street.  
 Toowoomba Qld 4350  
 enquiries@rmasoils.com.au

<b>Photo description</b>	P3		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP01	<b>TP Depth</b>	



TP04 looking W



TP05 looking N

	 (07) 4639 4100	<table border="1"> <tr> <td><b>Photo description</b></td> <td colspan="2">P4</td> </tr> <tr> <td><b>Client</b></td> <td colspan="2">Maclean Farms</td> </tr> <tr> <td><b>Location</b></td> <td colspan="2">Echuca VIC, Australia</td> </tr> <tr> <td><b>Project name</b></td> <td colspan="2">GA - Torrumbarry Property Victoria</td> </tr> <tr> <td><b>Project No</b></td> <td>25-S-0016</td> <td><b>Scale</b></td> <td>Not to Scale</td> </tr> <tr> <td><b>TP No</b></td> <td>TP01</td> <td><b>TP Depth</b></td> <td></td> </tr> </table>		<b>Photo description</b>	P4		<b>Client</b>	Maclean Farms		<b>Location</b>	Echuca VIC, Australia		<b>Project name</b>	GA - Torrumbarry Property Victoria		<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale	<b>TP No</b>	TP01	<b>TP Depth</b>	
	<b>Photo description</b>			P4																			
	<b>Client</b>			Maclean Farms																			
	<b>Location</b>			Echuca VIC, Australia																			
	<b>Project name</b>			GA - Torrumbarry Property Victoria																			
	<b>Project No</b>			25-S-0016	<b>Scale</b>	Not to Scale																	
	<b>TP No</b>			TP01	<b>TP Depth</b>																		
 5 Bowen Street. Toowoomba Qld 4350																							
 enquiries@rmasoils.com.au																							



TP05 looking NE



TP05 looking E



 (07) 4639 4100  
 5 Bowen Street.  
 Toowoomba Qld 4350  
 enquiries@rmasoils.com.au

<b>Photo description</b>	P5		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP01	<b>TP Depth</b>	



TP05 looking SE



TP06 looking S



 (07) 4639 4100  
 5 Bowen Street.  
 Toowoomba Qld 4350  
 enquiries@rmasoils.com.au

<b>Photo description</b>	P6		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP01	<b>TP Depth</b>	



TP07 looking N



TP07 looking NW

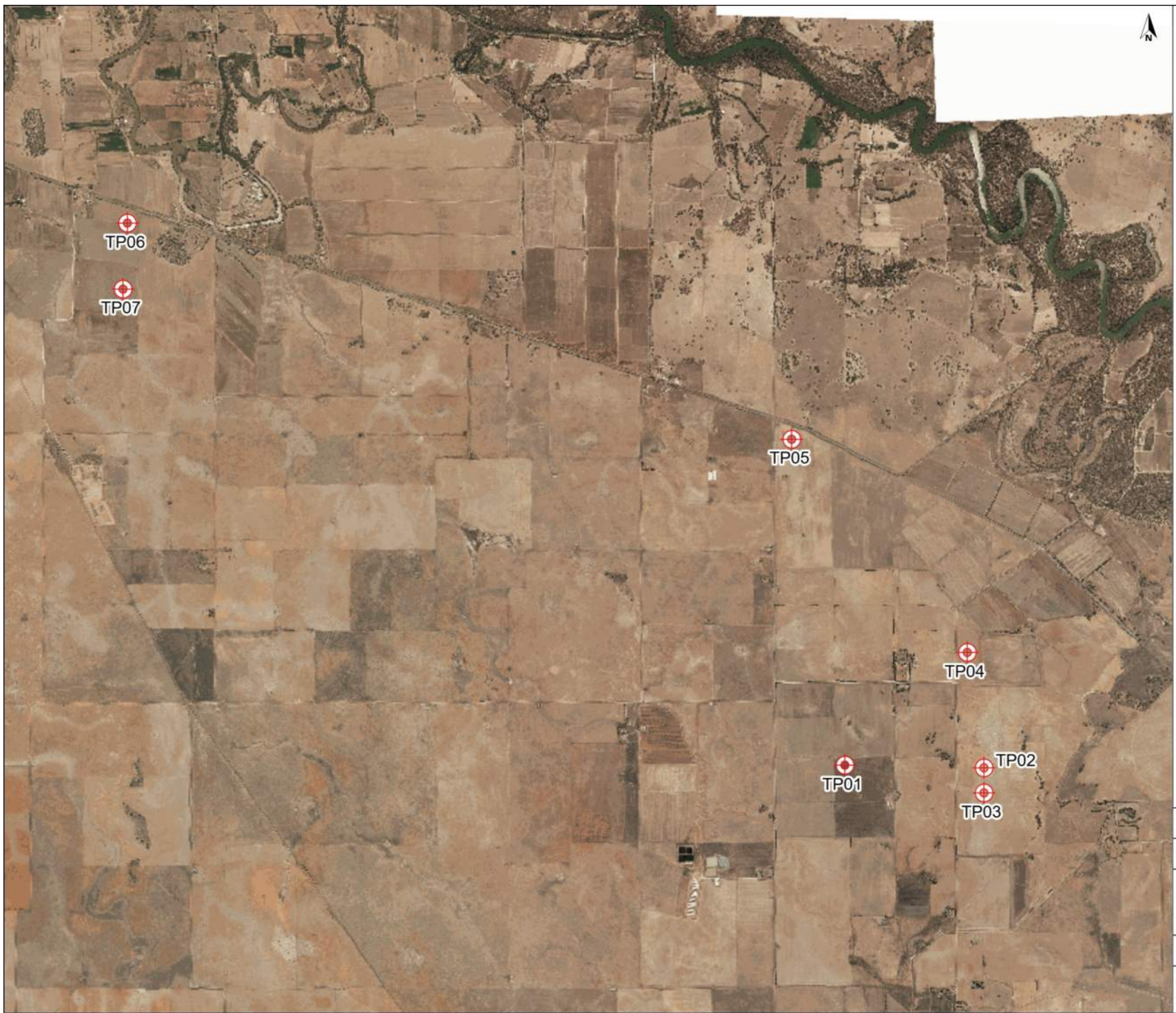


 (07) 4639 4100  
 5 Bowen Street.  
 Toowoomba Qld 4350  
 enquiries@rmasoils.com.au

<b>Photo description</b>	P7		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP01	<b>TP Depth</b>	

## 9.2 APPENDIX B

### 9.2.1 Site Map



**Legend**  
 sample\_group



Produced by **Datanest.earth**

Title: Untitled Figure		
Client: Alpair Pty Ltd		Size: A4
Project: GA - Torrumbarry Property Victoria	Drawn:	Figure No.: 1
Date:	Checked:	
Proj No: 25-S-0016	Scale: 1:60005	Version:

### 9.3 APPENDIX C

#### 9.3.1 Test Pit Logs TP01 – TP07



**RMA Soils**  
 5 Bowen Street, Toowoomba QLD 4350  
 Phone: 07 3846 5885

**Geotechnical Log - Testpit**

**TP01**

UTM : 55H	Excavator : 1.7t Excavator	Job Number : 25-S-0016
Easting (m) : 278528.84	Excavator Supplier :	Client : Maclean Farms
Northing (m) : 6005722.79	Logged By : Roberto Garcia Abreu	Project : GA - Torrumbarry Property Victoria
Ground Elevation : 91.00 (m)	Reviewed By :	Location : Echuca VIC, Australia
Total Depth : 1 m BGL	Date : 15/01/2025	Loc Comment :

Excavator Attachment	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Weathering	Moisture	Consistency/Density	Samples
		Natural		CH	Natural Sandy to silty CLAY CH: stiff, high plasticity, light grey brown, fine grained sand, inorganic, dry.		D	St	
	0.2	Natural		CH	Natural Sandy to silty CLAY CH: stiff, high plasticity, brown, fine grained sand, inorganic, moist.		M		Atterberg Limits / Emerson Class: LL - 53% LS - 13.0% Iss - 2.5 EC - 5
	0.6	Natural		CH	Natural Sandy to silty CLAY CH: stiff, high plasticity, light orange brown, fine grained sand, inorganic, moist to dry.		M-D		Atterberg Limits / Emerson Class: LL - 50% LS - 13.5% Iss - 2.6 EC - 5
	0.9	Natural		CH	Natural Sandy CLAY CH: stiff, high plasticity, light brown and yellow mottled white, fine grained sand, inorganic, moist to dry.				Atterberg Limits / Emerson Class: LL - 54% LS - 15.5% Iss - 3.3 EC - 4
<b>TP01 Terminated at 1m</b>									



TP01



 (07) 4639 4100  
 5 Bowen Street.  
 Toowoomba Qld 4350  
 enquiries@rmasoils.com.au

<b>Photo description</b>	TP01 Trench		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP01	<b>TP Depth</b>	



	 (07) 4639 4100	<b>Photo description</b>	TP01 Spoil		
	 5 Bowen Street. Toowoomba Qld 4350	<b>Client</b>	Maclean Farms		
	 enquiries@rmasoils.com.au	<b>Location</b>	Echuca VIC, Australia		
		<b>Project name</b>	GA - Torrumbarry Property Victoria		
		<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
		<b>BH No</b>	TP01	<b>BH Depth</b>	CorePhoto



UTM : 55H	Excavator : 1.7t Excavator	Job Number : 25-S-0016
Easting (m) : 278528.84	Excavator Supplier :	Client : Maclean Farms
Northing (m) : 6005722.79	Logged By : Roberto Garcia Abreu	Project : GA - Torrumbarry Property Victoria
Ground Elevation : 91.00 (m)	Reviewed By :	Location : Echuca VIC, Australia
Total Depth : 1 m BGL	Date : 23/01/2025	Loc Comment :

Excavator Attachment	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Weathering	Moisture	Consistency/Density	Samples
		Natural		CH	Natural Sandy to silty CLAY CH: stiff, high plasticity, light grey brown, fine grained sand, inorganic, dry.		D	St	
	0.2	Natural		CH	Natural Sandy to silty CLAY CH: stiff, high plasticity, brown, fine grained sand, inorganic, moist.		M		
	0.8	Natural		CH	Natural Sandy CLAY CH: stiff, high plasticity, light brown yellow mottled white, fine grained sand, inorganic, moist to dry.		M-D		
<b>TP02 Terminated at 1m</b>									



TP02



 (07) 4639 4100  
 5 Bowen Street.  
 Toowoomba Qld 4350  
 enquiries@rmasoils.com.au

<b>Photo description</b>	TP02 Trench		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP02	<b>TP Depth</b>	



	 (07) 4639 4100	<b>Photo description</b>		TP02 Spoil	
	 5 Bowen Street. Toowoomba Qld 4350	<b>Client</b>		Maclean Farms	
	 enquiries@rmasoils.com.au	<b>Location</b>		Echuca VIC, Australia	
		<b>Project name</b>		GA - Torrumbarry Property Victoria	
	<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale	
	<b>BH No</b>	TP02	<b>BH Depth</b>	CorePhoto	



**RMA Soils**  
 5 Bowen Street, Toowoomba QLD 4350  
 Phone: 07 3846 5885

**Geotechnical Log - Testpit**

**TP03**

UTM : 55H	Excavator : 1.7t Excavator	Job Number : 25-S-0016
Easting (m) : 278528.84	Excavator Supplier :	Client : Maclean Farms
Northing (m) : 6005722.79	Logged By : Roberto Garcia Abreu	Project : GA - Torrumbarry Property Victoria
Ground Elevation : 91.00 (m)	Reviewed By :	Location : Echuca VIC, Australia
Total Depth : 1 m BGL	Date : 23/01/2025	Loc Comment :

Excavator Attachment	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Weathering	Moisture	Consistency/Density	Samples
		Natural		CH	Natural Sandy to silty CLAY CH: stiff, high plasticity, light grey brown, fine grained sand, inorganic, dry.		D	St	
	0.2	Natural		CH	Natural Sandy to silty CLAY CH: stiff, high plasticity, brown, fine grained sand, inorganic, moist.		M		
	0.5	Natural		CH	Natural Sandy to silty CLAY CH: soft, high plasticity, light orange brown, fine grained sand, inorganic, moist to dry.		M-D	S	
	0.7	Natural		CI-CH	Natural Sandy CLAY CI-CH: stiff, medium to high plasticity, orange brown mottled white, fine grained sand, inorganic, moist to dry. fine to coarse sand size crystals were observed..			St	Atterberg Limits / Emerson Class: LL - 51% LS - 16.5% Iss - 3.7 EC - 4
<b>TP03 Terminated at 1m</b>									



TP03



 (07) 4639 4100  
 5 Bowen Street.  
 Toowoomba Qld 4350  
 enquiries@rmasoils.com.au

<b>Photo description</b>	TP03 Trench		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP03	<b>TP Depth</b>	



	 (07) 4639 4100	<b>Photo description</b>		TP03 Spoil	
	 5 Bowen Street. Toowoomba Qld 4350	<b>Client</b>		Maclean Farms	
	 enquiries@rmasoils.com.au	<b>Location</b>		Echuca VIC, Australia	
		<b>Project name</b>		GA - Torrumbarry Property Victoria	
		<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
		<b>BH No</b>	TP03	<b>BH Depth</b>	CorePhoto





TP04



 (07) 4639 4100  
 5 Bowen Street.  
 Toowoomba Qld 4350  
 enquiries@rmasoils.com.au

<b>Photo description</b>	TP04 Trench		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP04	<b>TP Depth</b>	



	 (07) 4639 4100	<b>Photo description</b> TP04 Spoil
	 5 Bowen Street. Toowoomba Qld 4350	<b>Client</b> Maclean Farms
	 enquiries@rmasoils.com.au	<b>Location</b> Echuca VIC, Australia
		<b>Project name</b> GA - Torrumbarry Property Victoria
	<b>Project No</b> 25-S-0016	<b>Scale</b> Not to Scale
	<b>BH No</b> TP04	<b>BH Depth</b> CorePhoto



**RMA Soils**  
 5 Bowen Street, Toowoomba QLD 4350  
 Phone: 07 3846 5885

**Geotechnical Log - Testpit**

**TP05**

UTM : 55H	Excavator : 1.7t Excavator	Job Number : 25-S-0016
Easting (m) : 278528.84	Excavator Supplier :	Client : Maclean Farms
Northing (m) : 6005722.79	Logged By : Roberto Garcia Abreu	Project : GA - Torrumbarry Property Victoria
Ground Elevation : 91.00 (m)	Reviewed By :	Location : Echuca VIC, Australia
Total Depth : 1 m BGL	Date : 23/01/2025	Loc Comment :

Excavator Attachment	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Weathering	Moisture	Consistency/Density	Samples
	0.1	Natural		CH	Natural Sandy to silty CLAY CH: stiff, high plasticity, light grey brown, fine grained sand, inorganic, dry.		D	St	
		Natural		CH	Natural Sandy to silty CLAY CH: high plasticity, dark brown, fine grained sand, inorganic, moist to dry.		M-D		Atterberg Limits / Emerson Class: LL - 63% LS - 17.5% Iss - 3.1 EC - 6
	0.6	Natural		CI-CH	Natural Sandy CLAY CI-CH: stiff, medium to high plasticity, orange brown mottled white, fine grained sand, inorganic, moist to dry. fine to coarse sand crystals were observed.			St	
<b>TP05 Terminated at 1m</b>									



TP05



 (07) 4639 4100  
 5 Bowen Street.  
 Toowoomba Qld 4350  
 enquiries@rmasoils.com.au

<b>Photo description</b>	TP05 Trench		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP05	<b>TP Depth</b>	



	 (07) 4639 4100	<b>Photo description</b>	TP05 Spoil		
	 5 Bowen Street. Toowoomba Qld 4350	<b>Client</b>	Maclean Farms		
	 enquiries@rmasoils.com.au	<b>Location</b>	Echuca VIC, Australia		
		<b>Project name</b>	GA - Torrumbarry Property Victoria		
		<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
		<b>BH No</b>	TP05	<b>BH Depth</b>	CorePhoto





TP06



 (07) 4639 4100  
 5 Bowen Street.  
 Toowoomba Qld 4350  
 enquiries@rmasoils.com.au

<b>Photo description</b>	TP06 Trench		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP06	<b>TP Depth</b>	



	 (07) 4639 4100	<b>Photo description</b>		TP06 Spoil	
	 5 Bowen Street. Toowoomba Qld 4350	<b>Client</b>		Maclean Farms	
	 enquiries@rmasoils.com.au	<b>Location</b>		Echuca VIC, Australia	
		<b>Project name</b>		GA - Torrumbarry Property Victoria	
	<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale	
	<b>BH No</b>	TP06	<b>BH Depth</b>	CorePhoto	





TP07



 (07) 4639 4100  
 5 Bowen Street,  
 Toowoomba Qld 4350  
 enquiries@rmasoils.com.au

<b>Photo description</b>	TP07 trench		
<b>Client</b>	Maclean Farms		
<b>Location</b>	Echuca VIC, Australia		
<b>Project name</b>	GA - Torrumbarry Property Victoria		
<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale
<b>TP No</b>	TP07	<b>TP Depth</b>	



	 (07) 4639 4100	<b>Photo description</b>		TP07 Spoil	
	 5 Bowen Street. Toowoomba Qld 4350	<b>Client</b>		Maclean Farms	
	 enquiries@rmasoils.com.au	<b>Location</b>		Echuca VIC, Australia	
		<b>Project name</b>		GA - Torrumbarry Property Victoria	
	<b>Project No</b>	25-S-0016	<b>Scale</b>	Not to Scale	
	<b>BH No</b>	TP07	<b>BH Depth</b>	CorePhoto	

## **9.4 APPENDIX D**

### **9.4.1 Atterberg Limits Test Reports**

### **9.4.2 Emerson Class Number Test Reports**

# Material Test Report



**Report Number:** 25-S-0016-1  
**Issue Number:** 1  
**Date Issued:** 24/01/2025  
**Client:** RMA Engineers  
 5 Bowen Street, Toowoomba QLD 4350  
**Project Number:** 25-S-0016  
**Project Name:** GA - Torrumbarry Property Victoria  
**Project Location:** Torrumbarry Victoria  
**Work Request:** 5713  
**Date Sampled:** 15/01/2025  
**Dates Tested:** 16/01/2025 - 21/01/2025  
**Sampling Method:** AS 1289.1.2.1 6.5.3 - Power auger drilling  
**Preparation Method:** AS 1289.1.1 - Sampling and Preparation of Soils  
**Remarks:** Test locations are shown in RMA Soils geotechnical investigation report 25-S-0016.  
**Site Selection:** Selected by RMA Soils Technician  
**Location:** GA - Torrumbarry, Victoria  
**Material Source:** Insitu

RMA Soils Pty Ltd  
 Toowoomba Laboratory  
 70 Mort Street North Toowoomba QLD 4350  
 Phone: (07) 4639 4100  
 Email: enquiries@rmasoils.com.au



Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Dylan Burley  
Laboratory Manager

NATA Accredited Laboratory Number: 19407

Sample Details					Min	Max
Sample Number	25-5713A	25-5713B	25-5713C	25-5713D		
Date Sampled	15/01/2025	15/01/2025	15/01/2025	15/01/2025		
Sample Location	TP01	TP01	TP01	TP03		
Sample Depth	0.2-0.5m	0.6-0.9m	0.9-1.0m	0.7-1.0m		
Material	Sandy Silty Clay, Brown	Sandy Silty Clay, Light Orange Brown	Sandy Clay, Light Brown and Yellow mottled White	Sandy Clay, Orange Brown mottled White		
Atterberg Limit (AS1289 3.9.2 & 3.4.1)					Min	Max
Sample History	Oven Dried	Oven Dried	Oven Dried	Oven Dried		
Preparation Method	Dry Sieve	Dry Sieve	Dry Sieve	Dry Sieve		
Liquid Limit (%)	53	50	54	51		
Plastic Limit (%)	**	**	**	**		
Plasticity Index (%)	**	**	**	**		
Linear Shrinkage (AS 1289 3.4.1)					Min	Max
Sample History	Oven Dried	Oven Dried	Oven Dried	Oven Dried		
Preparation Method	Dry Sieve	Dry Sieve	Dry Sieve	Dry Sieve		
Moisture Condition Determined By	AS 1289.3.9.2	AS 1289.3.9.2	AS 1289.3.9.2	AS 1289.3.9.2		
Linear Shrinkage (%)	13.0	13.5	15.5	16.5		
Cracking Crumbling Curling	Cracking & Curling	Cracking & Curling	Cracking	Cracking		
Emerson Class Number of a Soil (AS 1289 3.8.1)					Min	Max
Soil Description	Sandy Silty Clay, Brown	Sandy Silty Clay, Light Orange Brown	Sandy Clay, Light Brown and Yellow mottled White	Sandy Clay, Orange Brown mottled White		
Nature of Water	Distilled	Distilled	Distilled	Distilled		
Temperature of Water (°C)	25.0	25.0	25.0	25.0		
* Mineral Present	**	**	Gypsum	Carbonate		
Emerson Class	5	5	4 *	4 *		

# Material Test Report



**Report Number:** 25-S-0016-1  
**Issue Number:** 1  
**Date Issued:** 24/01/2025  
**Client:** RMA Engineers  
 5 Bowen Street, Toowoomba QLD 4350

RMA Soils Pty Ltd  
 Toowoomba Laboratory  
 70 Mort Street North Toowoomba QLD 4350  
 Phone: (07) 4639 4100  
 Email: enquiries@rmasoils.com.au

**Project Number:** 25-S-0016  
**Project Name:** GA - Torrumbarry Property Victoria  
**Project Location:** Torrumbarry Victoria  
**Work Request:** 5713  
**Date Sampled:** 15/01/2025  
**Dates Tested:** 16/01/2025 - 21/01/2025  
**Sampling Method:** AS 1289.1.2.1 6.5.3 - Power auger drilling  
**Preparation Method:** AS 1289.1.1 - Sampling and Preparation of Soils  
**Remarks:** Test locations are shown in RMA Soils geotechnical investigation report 25-S-0016.  
**Site Selection:** Selected by RMA Soils Technician  
**Location:** GA - Torrumbarry, Victoria  
**Material Source:** Insitu



Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Dylan Burley  
 Laboratory Manager

NATA Accredited Laboratory Number: 19407

## Sample Details

Sample Number	25-5713E	25-5713F	25-5713G	25-5713H
Date Sampled	15/01/2025	15/01/2025	15/01/2025	15/01/2025
Sample Location	TP04	TP05	TP06	TP06
Sample Depth	0.1-0.3m	0.1-0.3m	0.2-0.4m	0.8-1.0m
Material	Sandy Clay, Dark Red Brown	Sandy Silty Clay, Dark Brown	Sandy Silty Clay, Dark Grey Brown	Sandy Silty Clay, Brown

## Atterberg Limit (AS1289 3.9.2 & 3.4.1)

					Min	Max
Sample History	Oven Dried	Oven Dried	Oven Dried	Oven Dried		
Preparation Method	Dry Sieve	Dry Sieve	Dry Sieve	Dry Sieve		
Liquid Limit (%)	57	63	60	61		
Plastic Limit (%)	**	**	**	**		
Plasticity Index (%)	**	**	**	**		

## Linear Shrinkage (AS 1289 3.4.1)

					Min	Max
Sample History	Oven Dried	Oven Dried	Oven Dried	Oven Dried		
Preparation Method	Dry Sieve	Dry Sieve	Dry Sieve	Dry Sieve		
Moisture Condition Determined By	AS 1289.3.9.2	AS 1289.3.9.2	AS 1289.3.9.2	AS 1289.3.9.2		
Linear Shrinkage (%)	17.0	17.5	15.5	16.5		
Cracking Crumbling Curling	Cracking	Cracking	Cracking & Curling	Curling		

## Emerson Class Number of a Soil (AS 1289 3.8.1)

					Min	Max
Soil Description	Sandy Clay, Dark Red Brown	Sandy Silty Clay, Dark Brown	Sandy Silty Clay, Dark Grey Brown	Sandy Silty Clay, Brown		
Nature of Water	Distilled	Distilled	Distilled	Distilled		
Temperature of Water (°C)	25.0	25.0	25.0	25.0		
* Mineral Present	**	**	**	Carbonate		
Emerson Class	6	6	5	4 *		